

Molina, Ezequiel

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## Abstract<sup>\*</sup>

This article makes three contributions to the literature. First, it provides new evidence of the impact of community monitoring interventions using a unique dataset from the Citizen Visible Audit (CVA) program in Colombia. In particular, this article studies the effect of social audits on citizens' assessment of service delivery performance. The second contribution is the introduction a theoretical framework to understand the pathway of change, the necessary building blocks that are needed for social audits to be effective. Using this framework, the third contribution of this article is answering the following questions: i) under what conditions do citizens decide to monitor government activity and ii) under what conditions do governments facilitate citizen engagement and become more accountable.

**JEL classifications:** H40, H83

**Keywords:** Economic development, Political economy, Social audit, Bottom up, Citizen participation, Corruption

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## 1. Introduction

The evidence is clear. Public service delivery in developing countries is highly inadequate. In India, one quarter of all the teachers in public schools and more than a third of nurses and doctors were absent when enumerators arrived at the schools and hospitals (Chaudhury et al., 2006). Not only are teachers, nurses, and doctors “missing in action,” but also public resources. A landmark study in Uganda found that only 13 percent of public funds assigned by the central government to the school system reach their intended destination (Reinikka and Svensson, 2004, 2011). Leakages are also a problem for Tanzania, where elected officials are the recipients of more than half of the total amount of subsidized fertilizer price vouchers (Pan and Christiaensen, 2012). Additional examples of corruption and inefficient allocation of resources in service delivery abound in underdeveloped countries (World Bank, 2003). Crucial resources needed to increase opportunities among citizens, to improve infrastructure, and to reduce the learning gap are lost every day due to pockets of inefficiency and corruption.

Scholars have argued that the fundamental problems that give rise to inefficient delivery of basic services such as the teacher and nurse absenteeism, leakage, and missing public funds described above are accountability failures. The argument is succinctly explained by Devarajan, Khemani and Walton (2011). In a private market transaction (e.g., paying for a haircut) there is direct accountability of the provider to the client or consumer. The client pays the vendor directly; she can observe not only whether she receives the haircut but also the quality of the service. Moreover, if the market is reasonably competitive, the client can go elsewhere to get a haircut, and the salon and the hairdressers know that. The 2004 *World Development Report* named this relationship “the short route of accountability.” However, for markets characterized by natural monopolies such as the provision of electricity and sanitation as well as other strategic markets such as education and health, the government is involved in service provision. As a result, the relationship between the client and the service provider is no longer a direct one, but an indirect one, intermediated by the state. Citizens, in their role as voters, hold politicians accountable for allocating resources and regulating service provision. In turn, politicians and policymakers rely on managers, who at the same time rely on front-line providers such as teachers and policemen to deliver the service. This is the “long route of accountability.”

Problems arise because the formal institutions embedded in the “long route of accountability” are often weak in developing countries (Bardhan, 2002). Patronage, lack of state

capacity, or even weak electoral institutions may prevent citizens to hold officials accountable for the quality of service provision (Adserà, Boix and Payne, 2003; Besley and Persson, 2011; Persson and Tabellini, 2002). In order to address these challenges, many policies such as information campaigns, scorecards, social audits, and grievance redress mechanisms have been proposed to enhance involvement of beneficiaries in service provision. Table 1 below describes these policies. The idea that community members have incentives to monitor providers and demand better services (Stiglitz, 2002) led practitioners to believe that allowing communities to have monitoring power over providers could be beneficial in the short and in the long term. In the short term it could improve outcomes by identifying pockets of corruption and inefficiency in service provision. In the long term it may contribute to changing political norms, establishing a transparent and accessible channel of communication for the community to provide feedback to providers and politicians on a regular basis.

**Table 1. Policies Aimed at Increasing Civic Participation in Monitoring Public Officials and Providers**

<i><b>Policies</b></i>	<i><b>Description</b></i>
<b>Information Campaign</b>	These campaigns include i) information on how to monitor providers and ii) information on the providers and/or the importance of the service.
<b>Scorecard</b>	It is a quantitative survey that assesses users' satisfaction and experiences with various dimensions of service delivery. It often involves a meeting between the recipients of services and providers to discuss the findings of the survey and to develop a follow-up plan (Ringold et al., 2012).
<b>Social Audit</b>	Social audits allow citizens receiving a specific service to examine and cross-check the information the providers makes available against information collected from users of the service (Ringold et al., 2012).
<b>Grievance Redress Mechanims</b>	These are mechanisms that provide citizens with opportunities to use information to influence service delivery and give feedback on government programs and services, including complaint hotlines, informal dispute resolution mechanisms, and courts (Ringold et al., 2012).

Understanding whether such programs actually affect the behavior of beneficiaries, providers and politicians and in turn improve outcomes is an open empirical question.<sup>1</sup> Additionally, we still know little about the barriers and facilitators through which these interventions have an impact (or lack thereof). The goal of this paper is precisely to contribute to filling this gap. In particular, using a unique dataset from the Citizen Visible Audit (CVA) program in Colombia, the paper provides new evidence of the effect of social audits on citizens' satisfaction with infrastructure projects as well as subjective measures of the efficiency of the execution process. The article introduces a theoretical framework to understand the pathway of change, the necessary building blocks that are needed for social audits to be effective, which is often ignored in the literature.<sup>2</sup> Using this framework, this article attempts to determine both i) under what conditions citizens decide to monitor government activity and ii) under what conditions governments facilitate citizen engagement and become more accountable.

The answers to these questions are important for both practitioners and academics. Despite the lack of rigorous evidence on their effectiveness, local participatory and community monitoring interventions are widely accepted as a tool to improve transparency and accountability by all the major players in the practitioner world: governments, non-governmental organizations (NGOs), and the donor community. Increasing citizen participation in the government is the main objective behind Open Government Partnership (OGP), a global consortium of governments. Through OGP, more than 50 countries have already agreed to different goals related to transparency and citizen participation. International aid agencies increasingly require development projects to include “beneficiary participation” components. The World Bank alone has in the past decade channeled more than \$85 billion to local participatory development (Mansuri and Rao, 2012). NGOs with a focus on increasing government accountability through citizen participation continue to expand around the globe and manage an increasing amount of resources. For instance, Twaweza has an annual budget of \$17 million and engages in building citizen capacity to make governments accountable across East Africa.

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<sup>1</sup> See Molina (2013a) for a systematic review on whether community monitoring interventions help improve outcomes and curb corruption in service delivery in low-income communities.

<sup>2</sup> One notable exception is Lieberman, Posner and Tsai (2013), who develop a causal chain for information campaign interventions.



From a theoretical perspective, there is no clear prediction on these programs' expected impact. On the one hand, some authors have found reasons to expect community monitoring interventions to have a positive effect on improving service delivery and reducing corruption. First, community members have better incentives than bureaucrats to monitor a program that may improve their quality of life (Stiglitz, 2002). Second, scrutiny and monitoring by communities may alter the incentives of representatives and providers (i.e., bureaucrats and firms) either through reputational repercussions or the simple act of being observed (Ringold et al., 2012). Third, community gatherings bring together politicians, bureaucrats, firms and citizens and may generate a closer connection between representatives and the community. This may affect politicians' information set as it becomes less costly for them to know community preferences and to assess service providers' performance (Molina, 2013b).

On the other hand, some authors have argued that successful implementation of community monitoring interventions might prove more difficult than expected for several reasons. First, monitoring public projects is a public good, so there may be a free-rider problem (Olson, 1971). Second, community monitoring may be prone to capture by local elites (Bardhan, 2002; Bardhan and Mookherjee, 2006; Olken, 2007). Finally, citizens' beliefs regarding the probability of success of the community monitoring exercise may affect their participation rate, which in turn affects the visibility of services. When public officials and providers observe weak community monitoring and low visibility, their incentives to spend time and effort improving service delivery are diminished (Molina, 2013b).

Furthermore, empirical studies have not been able to provide a clear answer regarding the impact of community monitoring programs either. Table 2 provides an arbitrary summary of evaluations of community monitoring interventions. Evaluations have found what at first appears to be contradicting evidence regarding the effect of community monitoring schemes on service delivery outcomes. Björkman and Svensson (2009) found that community scorecards in Uganda significantly increased the quality and quantity of primary health care provision. The evidence from this study suggests that the most important causal mechanism that explains the positive outcome is the one derived from providers; behavioral change. Banerjee et al. (2010), however, found the opposite result when testing the effect of an information campaign in India. They reported that neither giving citizens information on how to use existing institutions to monitor schools nor training them in a testing tool to monitor children's learning had any statistical

impact on children's learning performance. Only the intervention that did not involve government action, training volunteers to help children learn to read, had a positive effect on children's reading skills (3-8 percent).

**Table 2. Evaluations of Community Monitoring Interventions Author/s Country Identification Intervention Results Strategy**

Author(s)	Country	Identification Strategy	Intervention	Results
Banerjee et al. (2010)	India	RCT	Empower parents in 3 ways: a) providing information b) providing a testing tool for children c) training volunteers to help teach children	a) and b) no impact on community involvement or learning outcomes c) improved children's reading skills (3.8%)
Björkman and Svensonn (2009)	Uganda	RCT	NGOs encouraged communities to be more concerned with the state of health service provision and strengthened their capacity to hold them accountable.	Increased monitoring, increased effort from service providers. Significant reduction in mortality and increased child weight.
Lieberman, Posner and Tsai (2013)	Kenya	Retrospective	NGOS encouraged communities to be more involved with the state of children's learning and strengthened their capacity to improve performance.	No impact on private or collective action measures.
Olken (2007)	Indonesia	RCT	a) increasing probability of top-down audit b) additional grassroots participation	a) reduced corruption by 8% b) reduced corruption by less than 3%

*Note:* RCT refers to randomized control trials.

Similar to Banerjee et al. (2010), Lieberman, Posner and Tsai (2013) analyzed Uwezo, a program in Kenya that provides parents with information on their children's reading and numeracy ability as well as information on how to become involved in children's learning. Results indicate that the information did not generate any improvement in citizens' private actions directed toward improving their children's performance or communities' collective action to demand improvements from their representatives and service providers.

The only article assessing the impact of a social audit, although not a traditional one, is Olken (2007), which studies the effect of grassroots participation in Indonesia. This seminal contribution analyzed the effect of additional participation in the community monitoring process on unaccounted expenditure from infrastructure projects. Invitations to community meetings were randomly distributed throughout the village to encourage participation in the monitoring process. By sending a formal invitation to citizens in randomly selected villages, the author studies the impact of having more attendees and representation in the community meeting on unaccounted expenditures. He finds, however, that increasing grassroots participation has little impact, reducing unaccounted expenditures only in situations with limited free-rider problems and limited elite capture.

This article makes three contributions to the literature. First, it provides new evidence of the impact of community monitoring interventions using a unique dataset from the Citizen Visible Audit (CVA) program in Colombia. In contrast with Olken (2007), where the community had the ability to manage the funds to build a given project, in the present study I assess the impact of a program aimed at empowering citizens through increasing their opportunity to make providers and local governments accountable but not as a group of peers. This means that citizens do not have decision power, but only the opportunity to monitor infrastructure projects. This reduces problems related with elite capture that may arise when the community has decision power over public resources. The second contribution is the introduction a theoretical framework to understand the pathway of change of the CVA program. Using this framework, the third contribution of this article is to determine both i) under what conditions citizens decide to monitor government activity and ii) under what conditions governments facilitate citizen engagement and become more accountable. Finally, to the best of my knowledge, this is the first article to evaluate the impact of a community monitoring program administered by the government instead of an NGO. This increases the external validity of the results, as NGOs have neither the logistical power nor the mandate to administer a program if scaling it up is necessary.

The remainder of the article is organized as follows. The next section provides background information on the CVA program. Section 3 introduces the pathway of change, and Section 4 describes the identification strategy. Section 5 presents the impact of the CVA program on project performance. Additionally, using the framework introduced in Section 3, Section 5 provides evidence of i) under what conditions citizens decide to monitor government activity

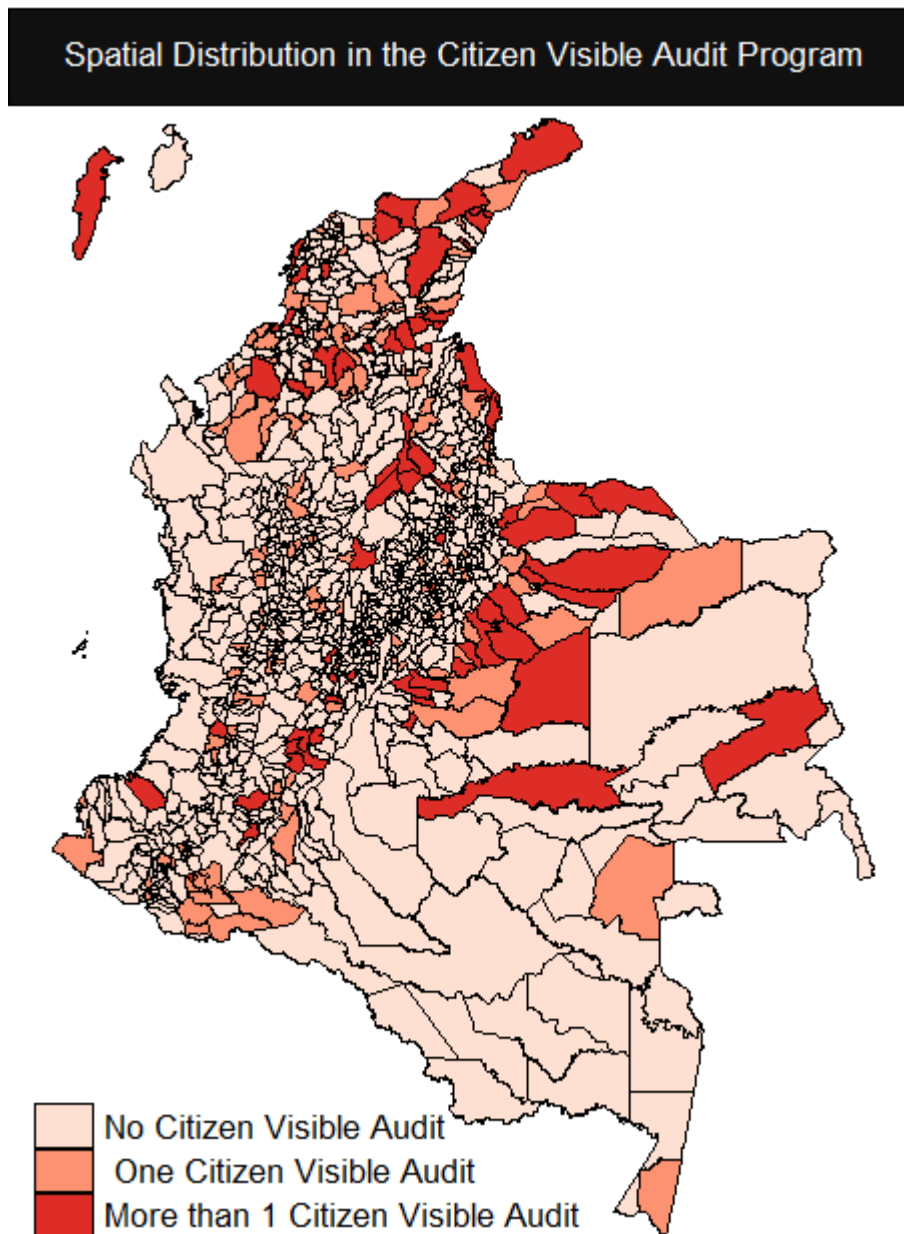
and ii) under what conditions governments facilitate citizen engagement and become more accountable. The article ends with the conclusions.

## **2. The Citizen Visible Audit Program**

Colombia's constitution and laws require that mining royalties be transferred to sub-national governments and allocated to public works in areas such as education, health, nutrition, and water. In order to prevent corrupt practices in the use of royalties, in 2008 the Colombian Anti-Corruption Presidential Commission launched the Citizen Visible Audits (CVA) program to promote transparency of royalty funds and citizen participation in the management of public investments. To date, the CVA program has been implemented in over 400 communities around Colombia. Furthermore, since 2012, the CVA program has been a central piece of Colombian Government agreement with the Open Government Partnership.

The selection process of specific projects to be audited by the community is based on the amount of royalties received, the number of previous irregularities in the management of royalties, and the expected social impact of the project. The type of projects that received the CVA program are infrastructure projects to facilitate provision of local public goods (i.e., access to water and sanitation, education, energy and housing) for a relatively small group of people who live in the nearby community. Almost 40 percent of the projects were related to access to water and sanitation. Another 35 percent was devoted to building educational infrastructure and housing. The typical project that underwent a CVA lasted on average 335 days and had two community forums, with 50 citizens participating in each forum. Additionally, the amount spent on each project was, on average, 6,240 million Colombian pesos (around US\$ 3.5 million), with more than 80 percent financed by royalties. Figure 1 below shows the spatial distribution of the CVA program.

**Figure 1. The Citizen Visible Audit Program Map**



*Source:* Authors' compilation based on data from Dirección Nacional de Planeación (DNP), Colombia.

The figure shows the number of citizen visible audits by municipality. Once a specific project is selected in a given municipality, the CVA program consists of the activities listed below.

1. Disseminating information about the CVA program in the neighborhoods where the project takes place through radio, newspapers, invitations and local television.
2. During the first public forum the infrastructure project is introduced to the community. Citizens are told about their rights and entitlements, including the activities they can undertake to monitor the project and the responsibilities of the executing firm. A group of beneficiaries composed of interested citizens is constituted and trained to carry out community monitoring activities.
3. Periodic public forums are held, bringing together local authorities, neighbors, and representatives from the firm that carries out the specific project. In these public forums, the state of the project is explained in detail to the community, which in turn might voice its suggestions and recommendations. Commitments are made by the firm, the local government, and the project supervisor to solve the problems that may arise during the construction of the project. These commitments are monitored by the community, the facilitators from the central government (DNP) and the project supervisor. If a commitment is not honored, facilitators and supervisors intervene to let the local government know about this. If the problem persists, administrative complaints are submitted to the Supreme Audit Body in the central administration.
4. In between public forums, the beneficiary group monitors the project and collects information on whether commitments are being honored and any other new problem that may arise.
5. Before making the final payment to the executing firm, the finalized project is presented to the community. The audit results are shared with all interested and concerned stakeholders.

### 3. Theoretical Framework

Figure 2 presents a stylized pathway of change of the CVA program, clarifying the mechanisms through which the CVA program is expected to have an impact on project performance.<sup>3</sup> The CVA program begins by attempting to make the project that it aims to monitor and the monitoring program widely known. A communication campaign (building block 1) through radio, newspapers, and local TV is launched to increase participation in the first public forum. This first contact with the community allows facilitators to give citizens information on the project, such as what the contract stipulates the firm has to deliver, how to monitor the executing firm, and to whom they should direct inquiries about deficiencies in the project. This is referred to in Figure 2 as capacity building (building block 2). Empowered with this new information, citizens are expected to solve the collective action problem and invest their time and effort to participate in monitoring the project (building block 3).

Participation in monitoring activities could take many forms. As an organized group, citizens can take turns visiting the construction site and collecting information on its problems. They can also use their voice to contact the project supervisor, representatives of the firm (building block 6) or elected officials (building block 4) to make complaints about the project and provide valuable information on the specific problems the project is facing. Citizens can even condition their votes on project performance or could threaten governments with costly protests. Citizens can also share the information collected on the project with their fellow neighbors that did not take part in monitoring activities (building block 5) to increase the visibility of the CVA program. Finally, citizens may also contact or threaten to contact opposition party leaders and the media to provide incentives for elected officials, firms and project supervisors to act.

In addition, in the CVA there are public forums where representatives from the local government, project supervisors, representatives from the executing firm, representatives from the central government and the community are present. This allows citizens to make their voice heard by supervisors as well as local officials and providers. This reduces the otherwise necessary time and effort citizens would need to invest to get an appointment with these officials. The public forums also reduce the cost of supervisors and central government representatives to be heard by local officials, as well as the cost of local officials' take actions to solve problems that arise during the construction of infrastructure projects, such as lack of planning, lack of

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<sup>3</sup> See Molina (2013a) for a generalized version of the pathway of change for community monitoring interventions.

resources to finish the project, and acts of corruption. Finally, the symbolic act of the public forum may signal to politicians and the executing firm the importance of performing well on this project, as citizens are paying extra attention.

In order for the CVA program to generate a change in politicians' behavior, at least one of the following conditions must be present:

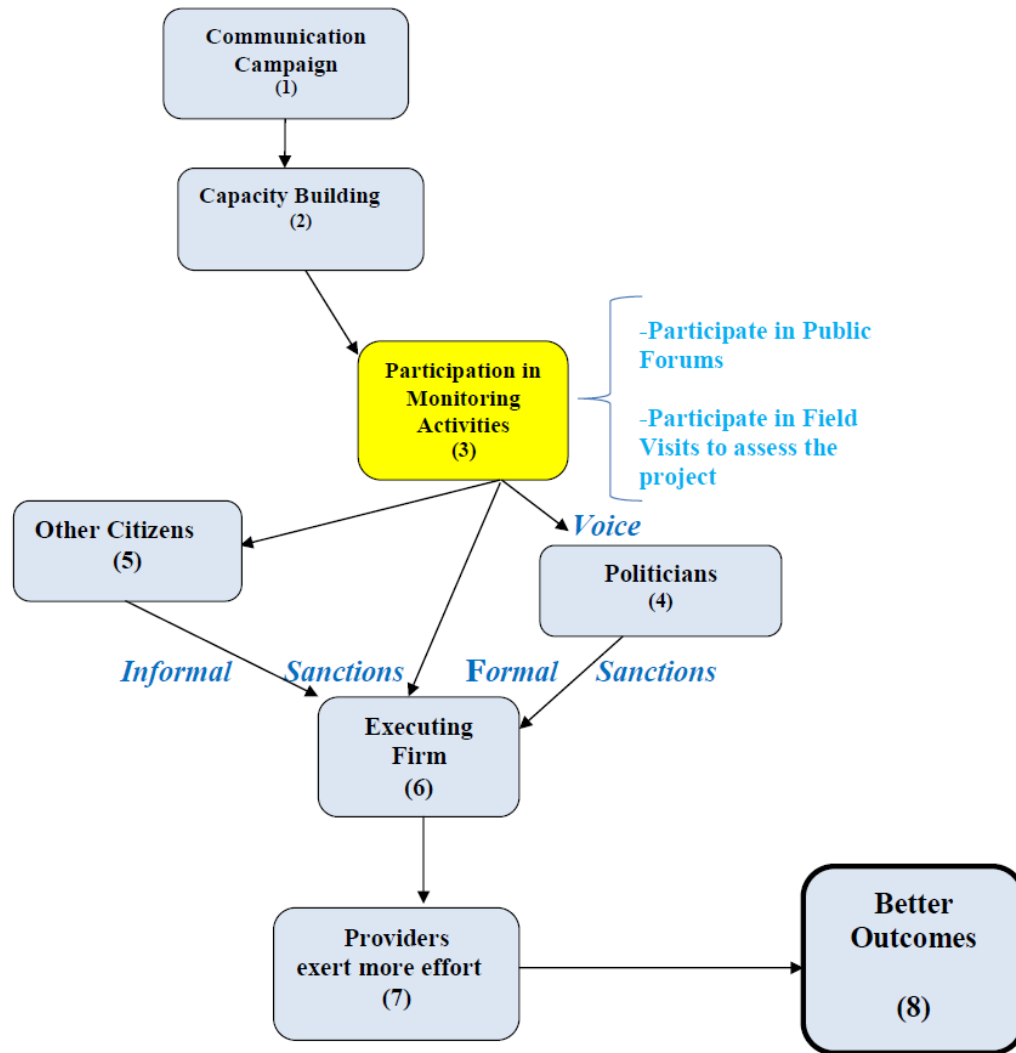
1. Citizens subsidize the work of politicians by monitoring providers and identifying pockets of corruption and inefficiency.
2. As a result of the CVA program it becomes more valuable for politicians to improve project performance, as citizens are better able to recognize whether elected officials are making an effort to improve project performance.

These conditions provide incentives for politicians and policymakers to put more pressure on providers to improve project performance and to allocate more resources, if necessary. Even further, politicians could enact new laws to change the way firms are selected and projects are executed. Facing formal sanctions by politicians and/or informal sanctions by citizens, providers are more likely to exert effort (building block 7) to improve project performance. As a result, the CVA program may improve project performance (building block 8).

However, in order for this path of change to accurately describe the mechanisms through which the CVA program impacts project performance, several assumptions are necessary. Citizens need to have adequate information on how to monitor the project, they should be able to pay the opportunity cost and coordinate their actions to monitor the project, they should believe the program has a potential to be successful, and politicians and providers need to be accountable. When these assumptions are not met, the program suffers from bottlenecks. Those bottlenecks may prevent the CVA program from having an impact on project performance.



**Figure 2. The Pathway of Change for the Citizen Visible Audit Program**



*Note:* This figure shows the mechanism through which the CVA program is expected to have an impact on project performance

Based on these bottlenecks, there are four alternative theories to explain why the program might not result in the expected outcome. The first two theories, deficient implementation theory and civic participation failure, refer to bottlenecks that prevent citizens from actively engage in monitoring the project. The third, non-accountable governments, is independent of whether civic participation in monitoring the project takes place. It refers to a lack of response on the part of the politicians and providers. The last explanation is the self-fulfilling prophecy theory, which takes into account both sides of the CVA's pathway of change: citizens' decision to participate in

monitoring the project and government willingness to facilitate that engagement and become accountable. Below I present each theory, its empirical implications and the measurement strategy.

(a) Deficient Implementation Theory: Scholars and policymakers have long argued that programs often fell short of their expectations because of implementation failures (for a recent review see Pritchett, Woolcock and Andrews, 2013). In the case of the CVA program there are two potential deficiencies: (a.1) the information on the project may have not been properly disseminated (building block 1), and/or (a.2) information on how to monitor the project was either not provided or not understood by the citizens (building block 2). This is relevant as if citizens do not know the project exists (a.1), it will be impossible for them to monitor it. If citizens do not know how to monitor the project (a.2), they may lose interest in participation in monitoring activities. And even if citizens decide to participate their effectiveness will be limited.

The empirical implications of the case of the CVA program are two:

(a.1) If the information on the project is not properly disseminated, citizens will not participate in monitoring activities.

(a.2) Citizens probability of participation in monitoring activities will be a function of the quality of the information they have.

I test (a.1) by focusing on the percentage of citizens in each community that knows about the project existence and test (a.2) by measuring the percentage of citizens in each community that evaluates the quality of information received on the project as adequate or very adequate.

(b) Civic Participation Failure Theory : One potential concern with the CVA program, and social accountability mechanisms in general, is citizens' failure to participate in monitoring the project. I group under this heading many bottlenecks that prevent citizens to participate in monitoring activities, which in turn reduces the potential impact of the program. In particular, if community monitoring activities are not carried out at all or carried out by a few citizens their ability to uncover problems and pressure the government for accountability is significantly reduced. I identify four potential bottlenecks: (b.1) citizens may not believe the infrastructure project is a priority for the community, and/or (b.2) even if the project is a priority for the community,

opportunity costs may prevent citizens from participation. In particular, this will be the case if citizens believe the CVA program is a tax on their time that undermines their ability to spend time in other equally or more important perceived activities such as working, relaxing and spending time with their family, and/or (b.3) if citizens were already monitoring the project in the absence of the CVA program, formal participation in the CVA program becomes irrelevant, and/or (b.4) Scholars have emphasized the collective action problems that can arise in the presence of a non-excludable local public good (Olson, 1971), such as monitoring a project which would benefit the community. In other words, if community members believe other fellow citizens will monitor the project, they may decide not to participate.<sup>4</sup> The literature has found that collective action problems of the kind described above can be ameliorated when citizens expect others to reciprocate cooperative behavior (Putnam, 1993; Svendsen and Svendsen, 2009). As a result, proxies for citizens' expectation of reciprocating cooperative behavior, often denoted as social capital, are used to study collective action problems. The empirical implication of these bottlenecks are:

(b.1) If citizens perceive the objective of the project as irrelevant for the community they will not participate in community monitoring activities.

(b.2) If opportunity cost of time is high, participants in community monitoring activities will have a higher probability of being inactive individuals, unemployed, or having lower income.

(b.3) If the kind of actions citizens are encouraged to take as a result of participation in the CVA program are not different from what they are already doing, they will not participate in community monitoring activities.

(b.4) If citizens expect other citizens would free-ride on their efforts to monitor the project, the probability and intensity of participation will be lower.

To test (b.1) I estimate the percentage of citizens that believe the project was a priority for the community. Regarding (b.2), I test whether CVA participants are statistically different from non-participants in the following characteristics: employment status, whether they work at home or not, and income level. In the case of (b.3), I estimate the difference in participation rates and time spent in community monitoring activities for both groups, i.e., citizens in the control

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<sup>4</sup> For an in-depth analysis of coordination problems as well as potential solutions in the context of civic participation, see Bardhan and Mookherjee (2006) and Mansuri and Rao (2012).

group and citizens in the treated group who participated in at least one community forum of the CVA program. To test (b.4) I use several measures. Since there is no ideal proxy for citizens' expectations of reciprocating cooperative behavior, following the literature I use trust in fellow neighbors as a proxy for social capital. Additionally, I use fractionalization indexes (Alesina and Wacziarg, 2003) as predictors of lack of social capital. In particular, I measure ethnicity, religion, and language fractionalization by community and test whether these measures can contribute to explain the variation in time spent in monitoring activities in each community. Finally, I use ethnic outsider, a measure suggested in the literature by Lieberman, Posner and Tsai (2013). This is a dummy variable equal to 1 if respondent's ethnicity is different from the ethnicity of the majority of respondents in that community, and 0 otherwise.

(c) Non-Accountable Governments Theory: The literature has found many reasons why politicians and, in turn, their agents, the providers, may not be accountable to their principals. Citizens may not be pivotal for politician's electoral strategy (Downs, 1957; Hotelling, 1929; Persson and Tabellini, 2002) or the political system does not work properly and institutions do not help translate the preference of the people into policy (Acemoglu and Robinson, 2008; Adsera, Boix and Payne, 2003). Another potential problem could be that politicians and providers might change their behavior as a result of the intervention, but not in the desired way.<sup>5</sup> The empirical implication is that if governments are not accountable to their citizens, I should find that politicians and providers performance does not increase as a result of the CVA program. I test the non-accountability theory by estimating the impact of the CVA program on citizens' evaluations of politicians and providers performance on the project.

(d) Self-Fulfilling Prophecy Theory: In Molina (2013b), I argue that there is a channel, often forgotten in the literature, through which the effect of a community monitor intervention could be diminished. If community members believe that after paying the opportunity cost of monitoring, coordinating their actions with fellow neighbors and identifying projects' problems

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<sup>5</sup> Gavazza and Lizzeri (2007) as well as Prat (2005) provide several examples that might be understood from this perspective. For example, they point to transparency policies aimed at disclosing how much time it takes for government agencies to carry out the simplest procedure, such as providing a driver's license. The problem about this information campaign that encourages individuals to use the most efficient agency is that it can generate excess demand without providing a commensurate change in the public employee compensation system. Anticipating this, the staff of these agencies might reduce their efficiency once the policy is put in place. Generally speaking, therefore, in those markets where there are price rigidities (in this case, public sector salaries), transparency policy can be counterproductive.

politicians and providers will not be responsive, citizens may not have an incentive to monitor the project in the first place. In other words, citizens may refuse to take advantage of the opportunity to influence government and providers if they believe the chances of success are low. In particular, I argue that under certain circumstances a case of self-fulfilling prophecy can occur.

The timing of the theory is the following:

(Part I) In the beginning, citizens' low expectations on leaders, officials, or service providers' accountability may generate low community participation in monitoring the project. As a result, project visibility is reduced, since there are fewer citizens disseminating the information from the project to other fellow citizens.

(Part II) Then, politicians observe community monitoring participation and project visibility. If participation in monitoring activities and project visibility are low, politicians have fewer incentives to spend time and effort improving project performance.

Note that this theory is the only one that engages with both sides of the pathway of change, the conditions under which citizens decide to monitor the project and the conditions under which politicians react by exerting more effort and improving performance.

The empirical implications are:

(d.1) Citizens who perceived themselves as influential have higher probability of participating in the CVA public forums and community monitoring activities.

(d.2) Citizens who participated in the CVA public forums disseminate the information of the CVA to other non-participating citizens.

(d.3) In projects with more participation in community monitoring activities and higher visibility politicians' performance is higher.

To test the empirical validity of these claims I follow the structure of the theory. For part I, I estimate a model at the individual level of the effect of citizens' perception of their influence on time devoted to monitoring the project and participation in the public forums of the CVA program. Then, I test whether citizens that participate in the CVA public forums disseminate the

information to other fellow citizens that did not participate in the public forums. To test part II, I estimate a model of percentage of citizens that know about the project and time spent monitoring the project at the community level on politicians' and project performance.

#### **4. Identification Strategy**

In order to assess the impact of the CVA project on citizens' satisfaction and explore its determinants, this article carries out a retrospective evaluation and uses indicators derived from a household survey instrument. For each project with the CVA program I look for similar projects without the program. In particular, I look for projects within the same sector (education, health, water and sanitation), with similar spatial concentration of its population, similar initial estimated timeline of the project and similar resources. Additionally I selected projects that were carried out in a non-contiguous community from the same municipality to guarantee same administrative procedures and same responsible local government.

Using this methodology, I find matches for 10 CVA projects out of the universe of 400 CVA projects. I expand the search for similar projects in similar municipalities to add three additional pairs to the final sample. I create a propensity score of municipalities using the following pretreatment variables: royalties (measured in US dollars), irregularity in the management of royalties, population size, percentage of citizens with access to water and sanitation, and primary and secondary enrollment. Tables 12 and 13 in the Appendix describe each project that was surveyed and its sector, object, municipality, amount of funds and estimated time frame at the beginning of the project.

To understand the effect of the CVA program and its mechanisms two different random samples were collected: i) a sample of individuals from treated and control projects that may or may not have participated in community monitoring activities and ii) a sample of participants in the public forums. For i) I use a household survey of 28 infrastructure projects, 13 of which were "treated" with the CVA program and 15 were "control projects." Each project was located in the cartographical map and sampled randomly from the surrounding areas. The random sample contains 30 households for all 13 projects in the treatment group and 11 in the control group. For the two CVA projects that have two controls each, each sample contains 20 households. The total sample is 390 treated and 410 control households. For ii), the contact information collected

for each community forum for each CVA project is used. I use a random sample of 10 participants in each of the 13 treated projects.

To explore whether the matching resulted in a balanced set of respondents in the two treatment conditions, Table 3 shows summary statistics for a wide range of variables that capture the social and economic characteristics of the respondents. I investigate whether the populations from treatment and control groups are statistically different in terms of observable characteristics that may affect their answers to the survey.

I present the results in Table 3.<sup>6</sup> While respondents from treatment and control communities are not statistically different in most characteristics, two differences are statistically significant. The population interviewed in the treatment group is, on average, older than the population interviewed in the control group. Also, the population in the treatment group has a lower percentage of individuals pursuing a post-secondary education. I use this information to control for those characteristics as well as other variables in the estimations of the impact of the program.

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<sup>6</sup> Asset Index is a variable created using principal components. I use a list of 12 assets: television, refrigerator, landline telephone, cellular phone, automobile, washing machine, microwave oven, motorcycle, indoor plumbing, indoor bathroom, computer, and flat panel TV. The principal component yields an asset index that assigns a larger weight to assets that vary the most across households. Political News (Daily) is a binary variable equal to 1 when respondents answer “daily” to the question: “How often do you pay attention to the news, whether on TV, the radio, newspapers or the internet?” Political Knowledge (Departments) is a binary variable equal to 1 when respondents provide a correct answer to the question: “How many departments does the country have?” Political Knowledge (Presidential Period) is a binary variable equal to 1 when respondents provide a correct answer to the question: “How long is the presidential term of office in Colombia?”

**Table 3. Summary Statistics: Covariate Balance Analysis**

Variables	(1) Treatment (Mean)	(2) Control (Mean)	(3) Difference
<b>1.Socioeconomics</b>			
1.1 Income Brackets (1 to 16)	6.87	7.05	-0.19
1.2 Asset Index	-0.18	-0.01	-0.16
<b>2.Demographics</b>			
2.1 Gender (Male=1)	0.38	0.45	-0.08
2.2 Age	46.61	43.46	3.14***
2.3 Married/Relationship	0.65	0.70	-0.06
2.4 Number of children	3.12	2.85	0.27
<b>3.Ethnicity</b>			
3.1 White	0.29	0.30	-0.01
3.2 Mixed (Mestizo)	0.53	0.49	0.04
3.3 Indigenous	0.08	0.12	-0.03
<b>4.Education</b>			
4.1 Years of Education	7.37	8.20	-0.83
4.2 Incomplete Primary	0.27	0.23	0.04
4.3 Complete Primary	0.18	0.18	0.00
4.4 Incomplete Secondary	0.17	0.14	0.04
4.5 Complete Secondary	0.26	0.24	0.03
4.6 Superior	0.12	0.21	-0.09**
<b>5.Knowledge</b>			
5.1 Have Internet	0.25	0.33	-0.08
5.2 Political News (Daily)	0.94	0.95	-0.01
5.3 Political Knowledge (Departments)	0.26	0.28	-0.02
5.4 Political Knowledge (Presidential Period)	0.90	0.89	0.01
<b>6.Activity</b>			
6.1 Inactive	0.07	0.07	0.01
6.2 Not Remunerated Work at Home	0.30	0.29	0.01
6.3 Religion (At least Attended Once a Week)	0.77	0.77	0.00
<b>6.Social Programs</b>			
7.1 'Familias en Accion' (Cash Transfer)	0.24	0.26	-0.03
7.2 Sisben (Health)	0.68	0.68	0.00

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Notes:* Columns (1) and (2) present the mean of the listed variable in the treatment group and the control group, respectively. Column (3) presents the difference between treatment and control group, estimated with robust standard errors clustered at the community level. Using asterisks I report results from a test of the null hypothesis that the listed variable is not different between treatment and control group. The number of observations for all variables range between 795 and 800. See footnote 2 for an explanation on how I construct these variables.



## **5. Empirical Results**

This section discusses the main findings. The first subsection presents the results of the impact of the CVA program on measures of satisfaction with the project and on subjective measures of the efficiency of the execution process. Using the pathway of change developed in Section 3, the second subsection examines the mechanism behind the functioning of the CVA program. In particular, I examine the empirical validity of the four alternative theories described in the previous section: deficient implementation, civic participation failure, non-accountable governments and self-fulfilling prophecy. Examining these theories allows me to provide an answer to both: i) under what conditions citizens decide to monitor government activity and ii) under what conditions governments facilitate citizen engagement and become more accountable.

### ***5.1 Citizen Visible Audit Program Impact on Project Performance***

To measure the impact of the CVA program on project performance I use a wide variety of measures, including overall performance, compliance with established time for completion, adequacy in the administration of resources, adequate inputs, adequate planning and probability of deciding to carry out the same project again. Table 4 describes in detail the set of variables included in the analysis.

**Table 4. Measures to Evaluate Project Performance**

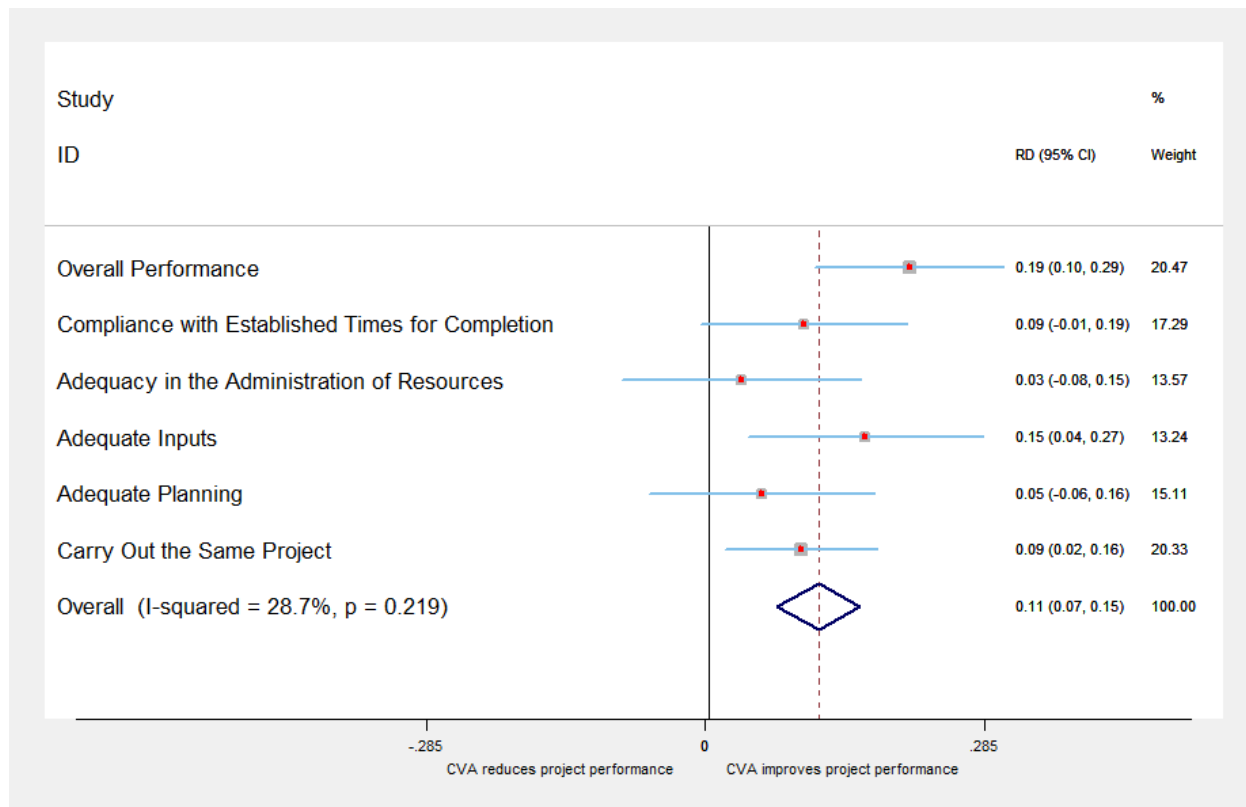
<i>Measures</i>	<i>Description</i>
<b>Overall Performance</b>	A binary variable, where one refers to citizens that evaluate the project above or well above similar infrastructure projects in the community.
<b>Compliance with Established Times for Completion</b>	A binary variable, where one refers to citizens that report the project was finished on schedule.
<b>Adequacy in the Administration of Resources</b>	A binary variable, where one refers to citizens that report the resources for the project were adequately managed.
<b>Adequate Inputs</b>	A binary variable, where one refers to citizens that report adequate quality input to build the project.
<b>Adequate Planning</b>	A binary variable, where one refers to citizens that report adequate planing for the project.
<b>Carry Out the Same Project</b>	A binary variable, where one refers to citizens who, knowing what they know now, would have carried out this project against an alternative one.

Using this set of measures, I assess the effect of the CVA program on project performance. Figure 2 below presents the risk difference for each measure in Table 4. The risk difference is the difference between the proportions of individuals with the outcome of interest between the treatment and control group. Each circle represents the estimated effect of the program using each measure, and the horizontal lines represent the 95 percent confidence intervals. All the measures show a positive impact of the CVA program and three out of six measures are statistically significant different from zero. The magnitude of the changes in citizens' satisfaction is substantial. To interpret the magnitudes, note that the CVA program resulted in an increase of 19 percentage points in citizens who report being satisfied with the projects, a 15 percentage point increase in citizens who report the project use adequate inputs and a 9 percentage point increase in citizens who would carry out the same project again.

A concern in the literature with using perception measures is the possibility of introducing uninformative noise (Olken, 2009). To ameliorate these concerns, I aggregate the measures using meta-analysis. The weight to aggregate each measure is proportional to its precision, which is defined as the inverse of its squared standard error. This is represented in the

figure by the size of each square associated with the estimated effect of each measure. The aggregate effect is represented by the dashed line and the lateral tips of diamond represent the 95 percent confidence intervals. The aggregate effect is positive and statistically significant. This shows that the positive result does not rely on only one measure, but several complementary measures points to a positive impact of the CVA program on project performance.

**Figure 3. Impact of the Citizen Visible Audit on Project Performance**



Notes: The figure shows the effect of the CVA on various measures of project performance. Each circle represents the estimated effect for each measure and the horizontal lines represent the 95 percent confidence intervals. The vertical dashed line represents the aggregated effect of the program and the tips of the diamond represent the confidence intervals. The size of the squares represents the weight of each measure in the aggregation procedure.

To test the robustness of the results shown in Figure 3, I estimate equation (1) using a probit model where  $h$  is a household in a given community, which is denoted as  $c$ .  $TREATED$  is a binary variable which equals 1 for respondents in communities with CVA projects and 0 otherwise.  $OUTCOME$  refers to the variables explained in Table 4.

$$\frac{\partial OUTCOME_{ch}}{\partial TREATED_{ch}} = \frac{\partial \Phi(x_{ch}\beta)}{\partial TREATED_{ch}} = \Phi(x_{ch}\beta)\beta_{ch} \quad (1)$$

Columns (1)-(3) of Table 5 present the results. Column (1) shows the number of observations for each specification. Column (2) shows the coefficients for the marginal effect. The standard errors are adjusted for clustering at the community level  $c$ , and I include a set of control variables: gender, age group dummies, income, education dummies and ethnicity dummies. Column (3) shows the  $p$ -value for the null hypothesis of no effect.

As seen in Table 5, the CVA program resulted in greater community satisfaction across a wide variety of measures. Among the communities with CVA projects, citizen were more likely to report that project performance was higher as well as more likely to report more adequate inputs for building the project. Once I account for all the controls, I find that the point estimates are higher and more significant than in Figure 3. Overall performance for CVA communities increases from 19 to 22.8 percentage points, adequate inputs from 15 to 20.9 percentage points, and citizens reporting that if they have the power they would carry out the same project increases from 9 to 10.8 percentage points.

For columns (4) and (5) of Table 5 I use the same variables from Table 4 but on a different scale. Each variable is used as it was asked on the survey, on a 5-point scale from 1 (best) to 5 (worst). As a result, negative coefficients will indicate an improvement in project performance. For ease of interpretation, I estimate the regression in equation (2) using ordinary least squares (OLS).

$$OUTCOME_{ch} = \alpha + \beta TREATED_c + X'_{ch}\gamma + \varepsilon_{ch} \quad (2)$$

Again, I cluster standard errors by community to take into account that there are multiple respondents  $h$  in each community  $c$ . The vector  $X$  represents a set of respondent control variables: gender, age group dummies, income, education dummies and ethnicity dummies. Regression results confirm the patterns shown in Figure 3 and in columns (2) and (3) of Table 5. Overall, the point estimates are now generally negative and statistically significant. Estimation using ordered probit and logit models produces qualitatively similar results.

**Table 5. Impact of the Citizen Visible Audit Program on Project Performance, Probit OLS**

Measures	(1) No of obs.	Probit		OLS	
		(2) Coef.	(3) <i>p</i> -value	(4) Coef.	(5) <i>p</i> -value
Overall Performance	422	0.228	0.000	-0.441	0.002
Compliance with Established Times for Completion	356	0.078	0.321	-0.217	0.250
Adequacy in the Administration of Resources	279	0.015	0.854	0.019	0.919
Adequate Inputs	272	0.209	0.017	-0.192	0.050
Adequate Planning	316	0.089	0.129	-0.082	0.153
Carry Out the Same Project	420	0.108	0.009	–	–

*Notes:* Each cell in column (2) and (4) is the coefficient on the treatment dummy from a different regression. In columns (2) and (3) I use the binary version of the variables explained in table 3. All regressions are estimated computing the marginal effect using probit model with robust standard errors, adjusted for clustering at the community level. To compute the marginal effect, I evaluate all other variables at their means. Results are qualitatively similar using OLS, logit models as well as when evaluating the other variables at zero or one when computing the marginal effects. In columns (4) and (5) all questions are multiple-ordered response questions on a scale from 1 (best) to 5 (worst). All regressions are estimated using OLS with robust standard errors, adjusted for clustering at the community level; results are qualitatively similar using ordered probit and probit models. All regressions include controls for gender, age, income, ethnicity and educational background.

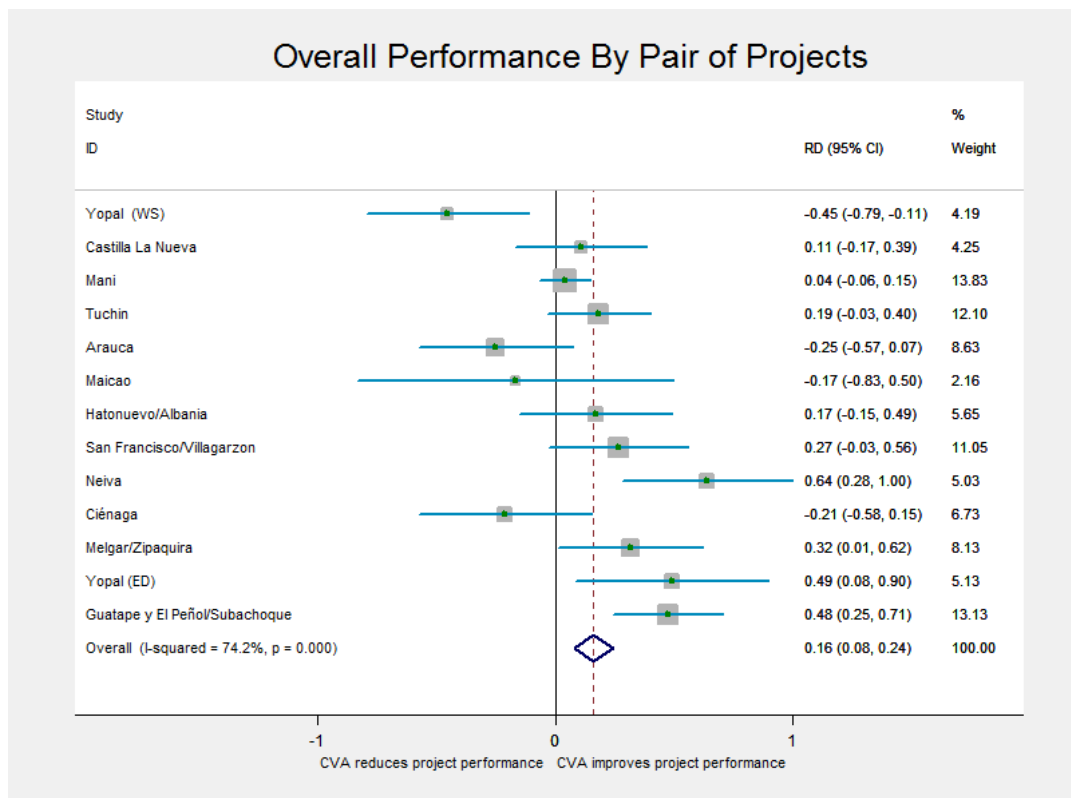
One potential concern with the results is whether the overall positive average treatment effect on the treated is masking differences across pair of projects. In other words, can a CVA program improve project performance in any context? Have all CVA programs been equally successful? If the CVA program were to be scaled up, would it be reasonable to expect that every infrastructure project increases its project performance between 7 and 15 percentage points, at least as evaluated by citizens? To study whether treatment effects were heterogeneous across projects, I use the fact that for each CVA project I have a similar project without the CVA program. I take advantage of this fact to decompose the overall performance measure by pair of projects.<sup>7</sup> Although within each pair samples are too small to yield conclusive results, the evidence from Figure 4 is striking. While the CVA program is positive and statistically significant on average, not all projects that underwent the CVA program are equally successful. In particular, the CVA program estimated effects for Yopal, Arauca, Maicao and Cienaga are discouraging. Though not statistically significant, results suggest that the CVA program worked very differently than in Neiva or Tulin.<sup>8</sup> Furthermore, even in the same municipalities results

<sup>7</sup> I found similar results for the other measures.

<sup>8</sup> Yopal is the only one where the difference is statistically significant. Once we control for respondents' socio-economics characteristics, Yopal remains negative but is not statistically significant.

differ. While the water and sanitation infrastructure project in Yopal did not seem to have improved as a result of the CVA, the one where educational facilities were built showed a highly positive effect. This result suggests that more information is needed in order to understand why a program succeeds or fails. there is a need for more information. In particular, understanding the pathway of change of the CVA program is necessary. In the next section I explore the bottlenecks that explain why the program was not equally successful across projects.

**Figure 4. Decomposing the Average Treatment Effect of the CVA Program**



*Notes:* The figure shows the heterogeneity of citizens satisfaction with the program by pairs of projects. Each circle represents the estimated effect and the horizontal lines represent the 95 percent confidence intervals. The vertical dashed line indicates the aggregated effect of the program and the tips of the diamond represent the confidence intervals.

## 5.2 Uncovering the CVA Program Mechanisms

In Section 3 I presented the pathway of change for the CVA program and discussed four alternative theories. In this section I use that framework to shed light on two important questions to which the literature has not been able to provide a clear answer: i) under what conditions do citizens decide to monitor the project to improve accountability? and ii) under what conditions

do governments facilitate citizen engagement and become more accountable? Table 6 presents the four alternative theories discussed in Section 3 and re-introduces the empirical implications of each theory.

**Table 6. Alternative Theories and Empirical Implications**

Theory	Focus	Empirical Implications
<i>(a) Deficient Implementation Theory</i>	C	<p>(a.1) If the information on the project is not properly disseminated, citizens will not participate in monitoring activities.</p> <p>(a.2) Citizens probability of participation will be a function of the quality of the information they have.</p>
<i>(b) Civic Participation Failure</i>	C	<p>(b.1) If citizens perceive the objective of the project is irrelevant for the community they will not participate in community monitoring activities.</p> <p>(b.2) If opportunity cost of time is high, participants in community monitoring activities will have a higher probability of being inactive individuals, unemployed, or having lower income.</p> <p>(b.3) If the kind of actions citizens are encouraged to take as a result of participation in the CVA program are not different from what they are already doing, they will not participate in community monitoring activities.</p> <p>(b.4) If citizens expect other citizens could free-ride on their efforts to monitor the project, the probability and intensity of participation will be lower.</p>
<i>(c) Non-Accountable Politicians and Providers</i>	G	if governments are not accountable to their citizens, politicians' and providers' performance should not increase as a result of the CVA program.
<i>(d) Self-Fulfilling Prophecy</i>	B	<p>(d.1) Citizens who perceived themselves as influential have higher probability of participating in the CVA public forums and community monitoring activities.</p> <p>(d.2) Citizens who participated in the CVA public forums disseminate the information of the CVA to other non-participating citizens.</p> <p>(d.3) In projects with more participation in community monitoring activities and higher visibility politicians' performance is higher.</p>

*Notes:* Focus refers to which segment of the path of changed is emphasized, citizen ability to monitor project performance (C), governments accountability (G) or both (B).

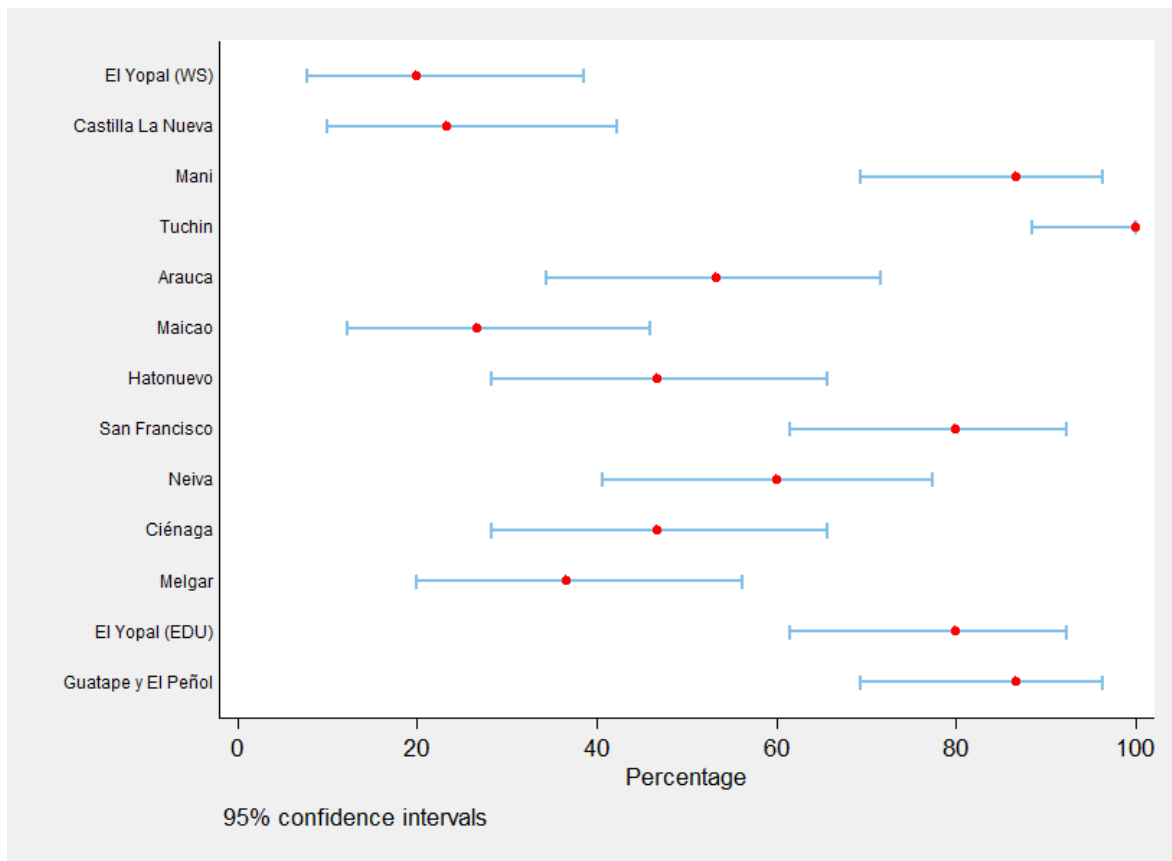
Below I assess the empirical merits of each theory.

### 5.2.1 Deficient Implementation Theory

I test (a.1) by focusing on the percentage of citizens in each community that knows about the project existence. Results in Figure 5 indicate that, for many CVA projects (Yopal, Water and Sanitation Project—WS, Castilla La Nueva, Melgar, Maicao), less than 50 percent of the potential beneficiaries, citizens who live close by the location of the project, know about its existence. I test whether this could be explained by recollection bias, which arises when

respondents' answers are a function of the time that has passed since the project was built. The evidence shows that the percentage of citizens who report knowing about a given project is not correlated with when the project begin or finished.<sup>9</sup>

**Figure 5. Do Citizens Know the Project?**



*Notes:* The figure shows the percentage of citizens who know the project in each treated community. The circle represents the estimated effect and the horizontal lines represent the 95% confidence intervals.

Without information on whether the project exists, the potential effect of the CVA program is reduced. If citizens do not know the project exists, it is impossible for them to monitor it. Another potential deficit in the implementation of the CVA program relates to those who knew the project but might not have a clear understanding of how to engage governments and providers to improve the project. Without good information on how to monitor the project

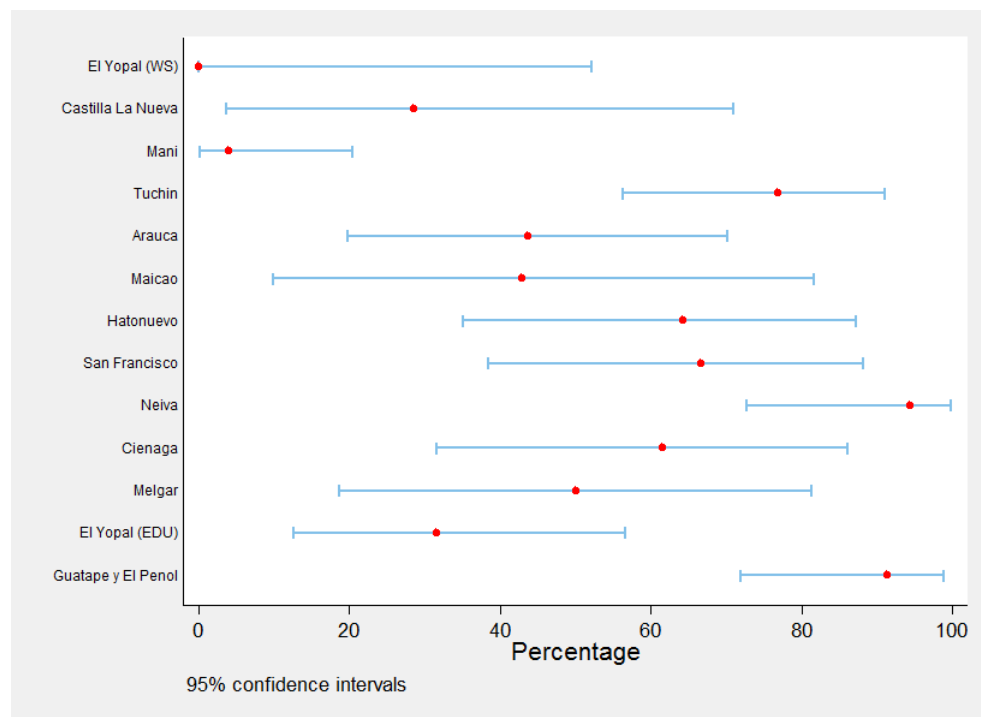
<sup>9</sup> Citizens were told about the location, the name and the objective of the project to help them remember it. In addition, citizens that did not live in the community for at least two years before the time the project was executed were excluded from the protocol and not surveyed.



and hold the government accountable even the best program can fail. In order to test (a.2) I measure the percentage of citizens in each community that evaluates the quality of information received on the project as adequate or adequate.

As seen in Figure 6 below, results are highly heterogenous. While in some projects information provided to the public was adequate, in some others it seems as it did not facilitate the community monitoring scheme. Again, there is evidence of problems with CVA program implementation. This is relevant, as the evidence shows a high correlation between reporting to have received adequate information about the project and spending time in monitoring activities. Perception of good quality information is associated with an increase of almost seven (3-11) additional monitoring minutes a week among citizens.

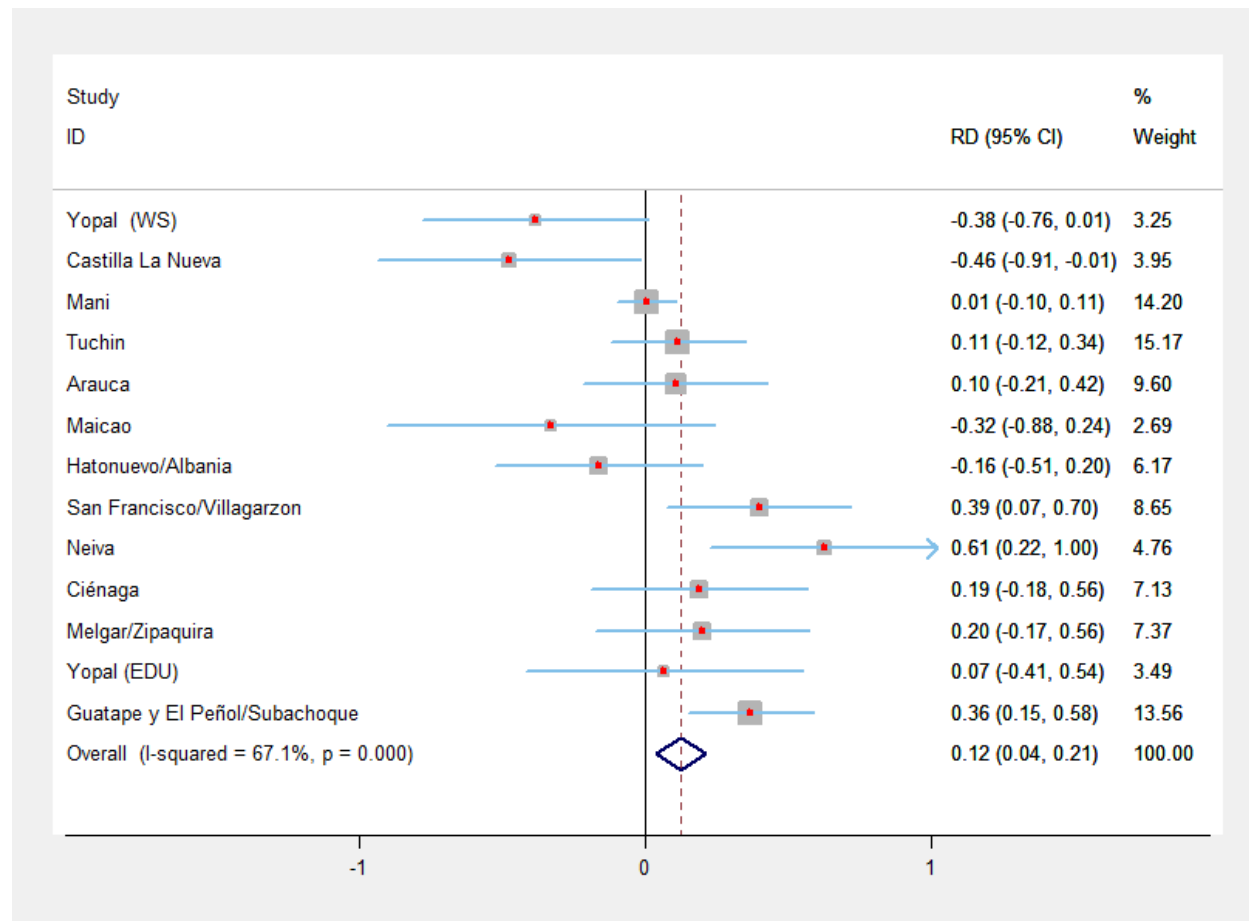
**Figure 6. Do Citizens Have the Necessary Information to Monitor the Project?**



*Notes:* The figure shows the percentage of citizens satisfied with the quality of information received on each treated project. The circle represents the estimated effect, and the horizontal lines represent the 95 percent confidence intervals.

Though the absolute percentages in some communities are low, it is relevant to know what would have been the counterfactual to assess the degree of deficiency of CVA program implementation. Results from Figure 7 indicate that the CVA program improves the information citizens received by 12 percentage points. The magnitude is not only substantial but also statistically significant (0.04-0.21). Again, results are highly heterogenous across communities.

**Figure 7. Does the CVA Program Improve the Information Citizens Receive?**



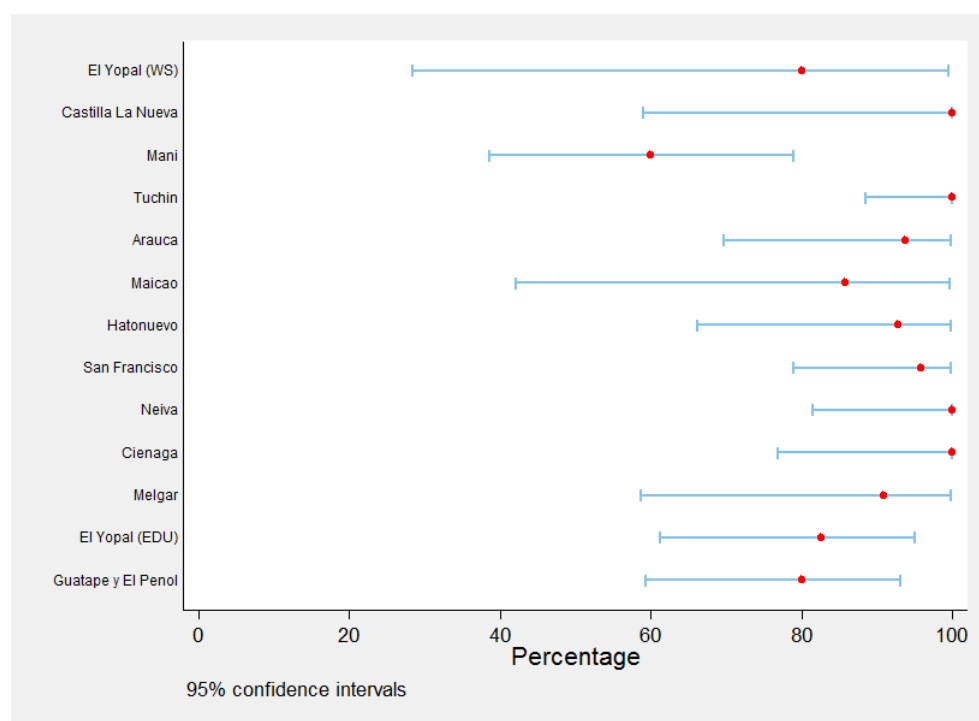
*Notes:* The figure shows the effect of the CVA program on the percentage of citizens satisfied with the quality of information received. Each circle represents the estimated effect, and the horizontal lines represent the 95 percent confidence intervals. The dashed vertical line indicates the aggregated effect of the program and the tips of the diamond represent the confidence intervals.

### 5.2.2 Civic Participation Failure Theory

Since the CVA program started after the infrastructure project was already selected by the government without any community participation, whether the project is really a priority for the community is an open question. If the project was not a priority, we would not expect that the

CVA program would induce the community to monitor the project. To test (b.1) I estimate the percentage of citizens that believe the project was a priority for the community. Figure 8 presents the evidence. On average, more than 80 percent of citizens believe the project was a priority for their community, which suggests that lack of interest in the project was not a binding constraint.

**Figure 8. Is the Project a Priority for the Community?**



*Notes:* The figure shows the percentage of citizens who classify the project as a priority for the community. Each circle represents the point estimate and the horizontal lines represent the 95 percent confidence intervals.

To assess whether opportunity cost of participation is a bottleneck (b.2), I explore whether CVA participants are statistically different from non-participants in the following characteristics: employment status, whether they work at home or not, and income level.<sup>10</sup> Table 6 presents the results. I estimate a participation model using a probit model and robust clustered standard errors at the community level and could not isolate individual characteristics as determinants of participation in CVA public gatherings. I present the marginal effect of these variables, controlling for demographics characteristics, educational dummies and participation in government funded social programs. This result suggests opportunity cost of participation is not

<sup>10</sup> Results using the asset index provides qualitatively the same results.

a crucial bottleneck, as there are not statistical significant difference in employment status, working at home, and income level among participants and non-participants.<sup>11</sup>

**Table 7. Opportunity Costs and Participation in Public Forum(s) of the Social Audit**

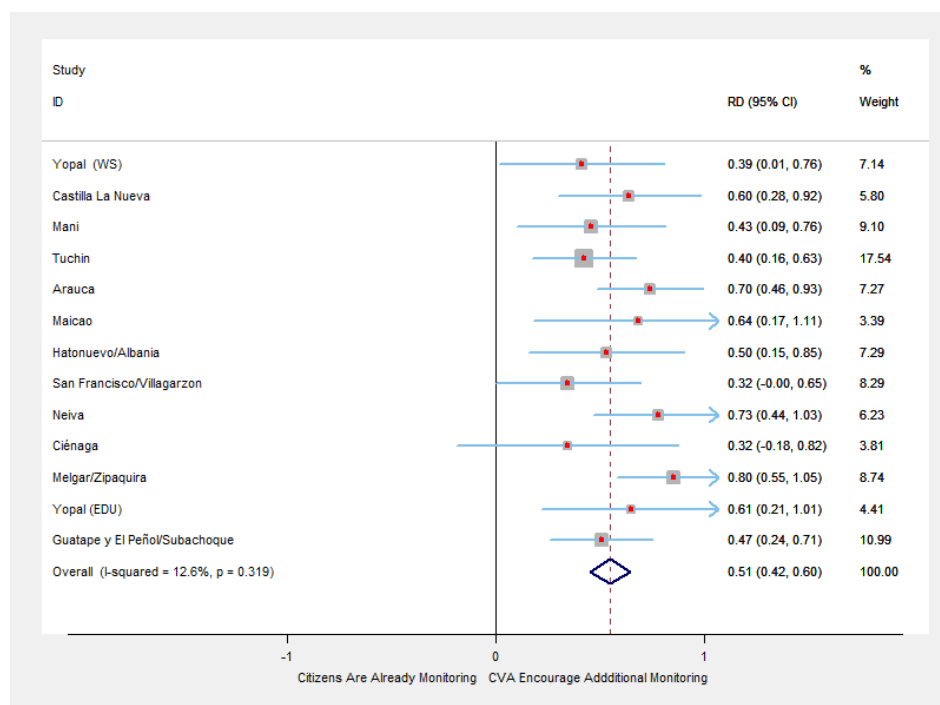
Variables	Participation in Public Forum/s of the Social Audit	
	(1) Coef.	(2) <i>p</i> -value
<b>Socioeconomics</b>		
Income Brackets (1 to 16)	0.00	0.983
<b>Activity</b>		
Inactive	-0.15	0.201
Not Remunerated Work at Home	-0.068	0.286
Employed	-0.08	0.315
<b>Controls - Demographics</b>		
Gender (Male=1)	0.08	0.175
Adult (25-40 years old)	-0.14	0.115
Middle Age (41-64 years old)	-0.135	0.138
Old Age (65+ years old)	-0.07	0.517
Married/Relationship	0.04	0.213
<b>Controls - Education</b>		
Complete Primary	0.00	0.998
Incomplete Secondary	0.07	0.369
Complete Secondary	0.09	0.207
Higher Education	0.17	0.057
<b>Control - Participation in Social Programs</b>		
'Familias en Accion' (Cash Transfer)	0.07	0.293
Sisben (Health)	0.02	0.694
Pseudo $R^2$	0.04	
No. of observations	516	

*Notes:* In columns (1) and (2) I use participation in at least one community forum, which only citizens in treated community would be able to attend, as a dependent variable. The regression is estimated using a probit model with robust standard errors, adjusted for clustering at the community level. To compute the marginal effect I evaluate all other variables at their means. Results are qualitatively similar using OLS, logit models and when evaluating the other variables at zero or one when computing the marginal effects.

<sup>11</sup> Reports from the field indicate that the time of each community forum as well as location was agreed with the community to maximize the number of participants.

In the case of (b.3), if participants were encouraged to do the same activities they would have done in the absence of the program, formal participation in the CVA program may be irrelevant. I estimate the difference in participation rates as well as time spent in community monitoring activities for both groups (i.e., the citizens in the control group and the citizens in the treatment group who participated in at least one public forum of the CVA program). The evidence from Figure 9 suggests that the percentage of CVA participants that spend time monitoring is higher than citizens in the control group. On average, there is a 51 percentage point increase in participation rate in monitoring activities for CVA participants. Not only more citizens spend time monitoring, but they also spend, on average, 30 minutes doing monitoring activities in a week while citizens in the control group only spend, on average, eight minutes a week. This does not seem to be a crucial bottleneck for the success of the CVA program, as in the absence of the program most citizens are not actively engaged in community monitoring activities.

**Figure 9. Are the Kind of Actions Citizens Encouraged to Take Different from What They Are Already Doing?**



*Notes:* The figure shows that the percentage of community forums participants in treated communities that spend time monitoring the project is significantly and statistically higher than these percentage among citizens in the control group projects. Each circle represents the estimated effect and the horizontal lines represent the 95 percent confidence intervals.

To test (b.4), collective action failures, I use several different measures. Since there is no ideal proxy for citizens' expectations of reciprocating cooperative behavior, I follow the literature in using trust in fellow neighbors as a proxy for social capital. Additionally, I compute fractionalization indexes, using the traditional formula  $(1 - \sum_{i=1}^n s_i^2)$  where  $s_i$  is the share for each group  $i$ , as predictors of lack of social capital.<sup>12</sup> In particular, I measure ethnicity, religion, and language fractionalization by community.

Table 8 present the results. Column (1) shows the percentage of citizens in each community who report trusting in their fellow neighbors and columns (2)-(4) present ethnic, religion and language fractionalization indexes for each treated community. The measure of trust in their fellow neighbors shows, on average, that 68 percent of citizens trust in one another. This would indicate a high level of social capital, as does the language fractionalization index. Ethnic fractionalization and religion fractionalization display a bigger range.

**Table 8. Proxies for (Lack of) Social Capital**

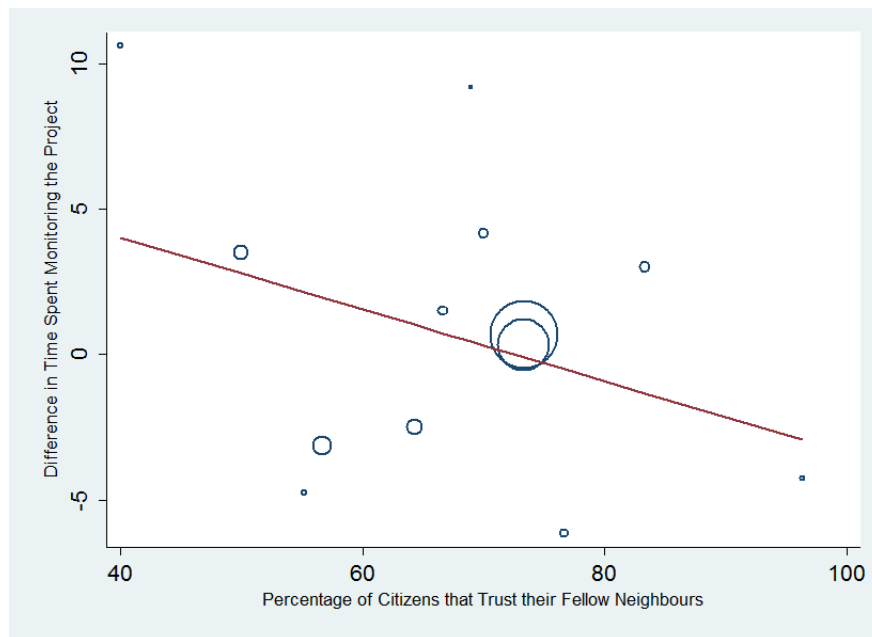
Project	(1) Trust	(2) Ethnic Fractionalization	(3) Religion Fractionalization	(4) Language Fractionalization
Yopal (WS)	0.64	0.42	0.29	0.00
Castilla La Nueva	0.50	0.50	0.38	0.00
Mani	0.83	0.26	0.39	0.00
Tuchin	0.69	0.19	0.66	0.00
Arauca	0.57	0.62	0.62	0.00
Maicao	0.67	0.67	0.50	0.00
Hatonuevo	0.70	0.71	0.47	0.00
San Francisco	0.55	0.65	0.12	0.10
Neiva	0.60	0.58	0.25	0.00
Ciénaga	0.77	0.53	0.43	0.00
Melgar	0.73	0.47	0.28	0.00
Yopal (EDU)	0.73	0.43	0.39	0.00
Guatapé y El Peñol	0.96	0.57	0.06	0.00

*Notes:* Column (1) refers to the percentage of citizens in each community who report to trust some or a lot in their fellow neighbors. Columns (2)-(4) present my own calculations for the ethnic, religion and language fractionalization indexes in each of the treated communities using the traditional formula  $(1 - \sum_{i=1}^n s_i^2)$  where  $s_i$  is the share for each group  $i$ .

<sup>12</sup> See Alesina and Wacziarg (2003) for details.

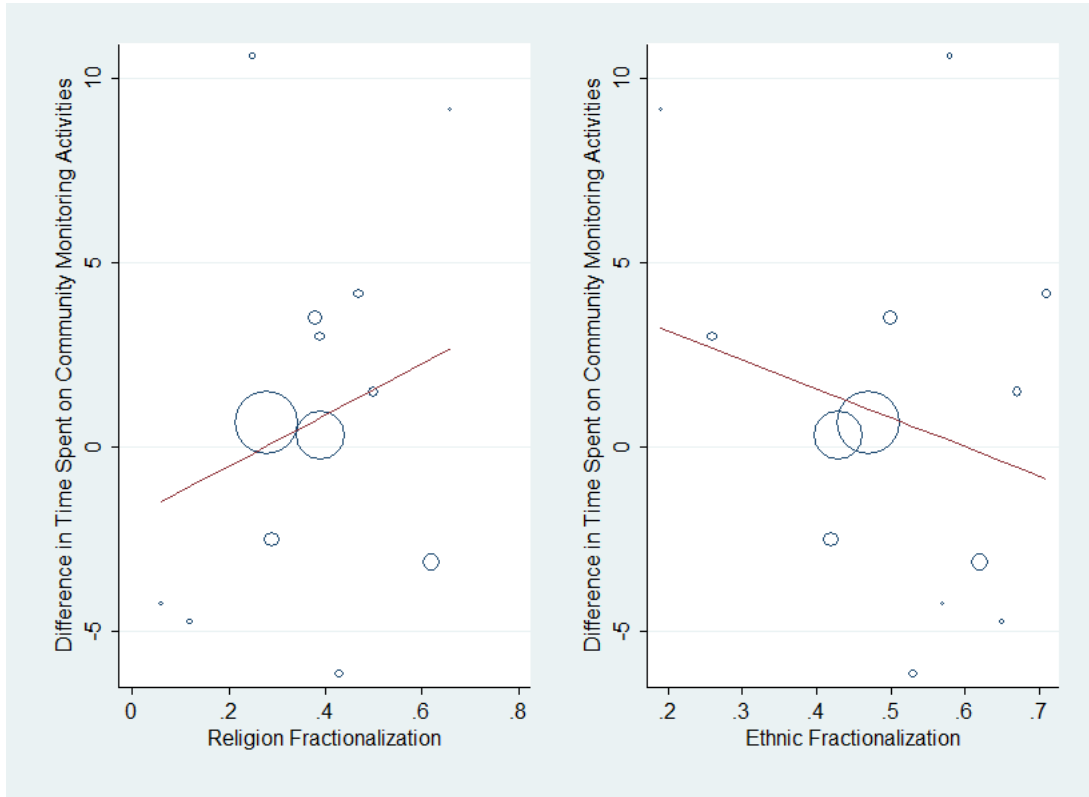
Below, I test whether they can explain the heterogeneity in the willingness of the community to monitor the infrastructure project, using the proxies for social capital (or lack thereof). To construct the variable minutes spent in community monitoring activities I use responses to “Did you devote any of your time to monitor the project?” (1) No time, (2) Less than 10 minutes a week, (3) Between 10 and 30 minutes a week, (4) Between 31 and 60 minutes a week and (5) More than an hour a week. Using average time thresholds for each bracket (0, 5, 15, 45, 60), I compute the variable for both treated and control communities. Figure 10 and Figure 11 show the results from a meta-regression for the 13 projects on which I collected data. I estimate a meta-regression model to account for the fact that for some projects few individuals answer the question about time spent in community monitoring activities. Meta-regression allows more precise estimates to have more weight in the regression, which is represented in the figure by the size of the circles. The results indicate that neither trust nor ethnic or religion fractionalization has any statistically significant effect on the difference in time spent monitoring by each pair of communities.

**Figure 10. The Effect of Citizens’ Trust on Participation in Monitoring Activities**



*Notes:* Using meta-regression the figure shows that citizens’ trust in one another is not behind the observed differentials in community monitoring activities. Each circle represents the estimated effect and the lines represent the 95 percent confidence intervals. To construct time spent in community monitoring activities I use responses to “Did you devote any of your time to monitoring the project?” (1) No time, (2) Less than 10 minutes a week, (3) Between 10 and 30 minutes a week, (4) Between 31 and 60 minutes a week and (5) More than an hour a week. Using thresholds for each bracket (0,5,15,45,60) I compute this variable for both treated and control communities.

**Figure 11. The Effect of Ethnic and Religion Fractionalization on Citizens' Participation in Monitoring Activities**



*Notes:* The figure shows a meta-regression. The size of each circle represents the weight of each project and the line represents the estimate of the coefficient of ethnic/religion fractionalization on the difference in time spent monitoring by each pair of communities. To construct time spent in community monitoring activities I use responses to “Did you devote any of your time to monitoring” the project?” (1) None of my time, (2) Less than 10 minutes a week, (3) Between 10 and 30 minutes a week, (4) Between 31 and 60 minutes a week and (5) More than an hour a week. Using average time thresholds for each bracket (0, 5, 15, 45, 60) I compute the variable for both treated and control communities.

Overall, the evidence suggests that citizens’ expectations of other fellow citizens’ reciprocating behavior cannot explain why citizens in some CVA programs decide to spend more or less time monitoring the project than their counterfactual would indicate.

### *5.2.3 Non-Accountable Governments Theory*

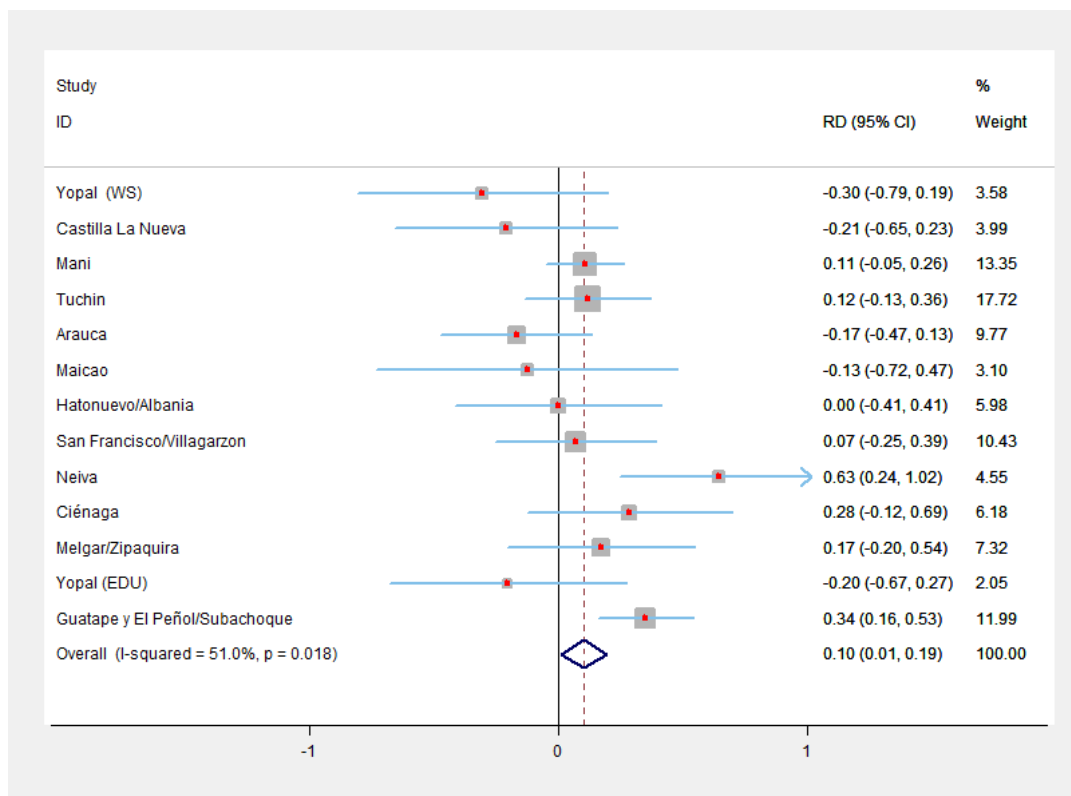
I test this theory by estimating the impact of the CVA program on citizens’ evaluations of politicians’ and providers’ performance on the project. In particular, I measure politicians’ (providers’) performance with a binary variable equal to 1 when citizens evaluate the work of local politicians (providers) in the project as good or very good, and 0 otherwise.



Figure 12 presents the forest plot to test whether the CVA program has an impact on politicians' behavior. In this figure I compute the risk difference for each pair of projects. Each circle represents the estimated effect of the program on politicians' behavior, as evaluated by citizens. The horizontal lines represent the 95 percent confidence interval.

Figure 12 shows an overall improvement in politicians' behavior as a result of the CVA program. I aggregate the measures using meta-analysis and the weight to aggregate each measure is proportional to its precision, which is defined as the inverse of its squared standard error. This is represented in the figure by the size of each square associated with the estimated effect of each measure. The aggregate effect is represented by the dashed vertical line and the lateral tips of diamond represent the 95 percent confidence intervals. The aggregate effect shows that the CVA program improves politicians' performance by 10 percentage points, and it is statistically significant [0.01-0.19].

**Figure 12. The Impact of the CVA Program on Politicians' Performance**



*Notes:* The figure shows the difference in percentage of citizens who evaluate the work of politicians in the project as good or very good by each pair of communities. Each circle represents the estimated effect and the horizontal lines represent the 95 percent confidence intervals. The vertical dashed line indicates the aggregate effect of the program and the tips of the diamond represent the confidence intervals.

To estimate the robustness of the results shown in Figure 12, I estimate the same regression as in equation (1) but with a different dependent variable, politicians' performance. Table 9 presents the results. Column (1) of Table 9 shows the number of observations for each variable, column (2) the coefficient of the marginal effect and column (3) shows the  $p$ -value. As usual, the standard errors are adjusted for clustering at the community level  $c$ , and I include a set control variables: gender, age group dummies, income, education dummies, and ethnicity dummies.

As seen in Table 9, the CVA program resulted in greater community satisfaction with politicians' performance. Citizens in the CVA communities were more likely to report that politicians' performance was good or very good. Once I account for all the controls, I find that the point estimates are higher and more significant than in Figure 12. Evaluation of politicians' performance increased from 10 to 15 percentage points for CVA communities.

To test the effect of the CVA program on providers' performance I follow the same strategy as with politicians' performance. Table 9 presents the results. Although the estimated effect is positive, it is not statistically significant. In columns (4) and (5) I use the same variables but on a different scale. Each variable is used as it was asked on the survey, on a 5-point scale from 1 (best) to 5 (worst). As a result, negative coefficients will indicate an improvement in evaluation of politicians' and providers' performance. Regression results confirm the results shown in Figure 16 and those from columns (2) and (3).

**Table 9. Impact of the CVA Program on Politicians and Providers Performance**

Measures	(1) No of obs.	Probit		OLS	
		(2) Coef.	(3) $p$ -value	(4) Coef.	(5) $p$ -value
Politicians Performance	356	0.15	0.036	-0.25	0.086
Providers Performance	326	0.11	0.147	-0.13	0.239

*Notes:* Each cell in column (2) and (4) is the coefficient on the treatment dummy from a different regression. In columns (2) and (3) I use a binary version of the variables. All regressions are estimated computing the marginal effect using probit model with robust standard errors, adjusted for clustering at the community level.

To compute the marginal effects I evaluate all other variables at their respective means. Results are qualitatively similar using OLS, logit models and when evaluating the other variables at zero or one when computing the marginal effects. In columns (4) and (5) all questions are

multiple-ordered response questions on a scale from 1 (best) to 5 (worst). All regressions are estimated using OLS with robust standard errors, adjusted for clustering at the community level. Results are qualitatively similar using ordered probit and probit models. All regressions include controls for gender, age, income, ethnicity and education background. I measure politicians' (providers') performance with a binary variable equal to 1 when citizens evaluate the work of local politicians (providers) in the project as good or very good, and 0 otherwise.

The evidence presented in this section indicates that the theory of non-accountable politicians is not valid in the CVA context, as I find improvements in politicians' performance as a result of the project. Then the relevant question becomes not whether politicians are accountable, but rather under what conditions are they accountable? The next subsection sheds light on this issue.

#### *5.2.4 Self-Fulfilling Prophecy Theory*

To test this theory's empirical validity I follow the structure of the theory. For part I, I estimate a model at the individual level of citizens' perception of their influence on time devoted to monitoring the project and participation in the public forums of the CVA program.<sup>13</sup> Then, I test whether citizens that participate in the CVA public forums disseminate the information to other fellow citizens who did not participate in the public forums. To test part II, I estimate a model of percentage of citizens that know about the project and time spent monitoring the project at the community level on politicians' and project performance.

##### *Part I*

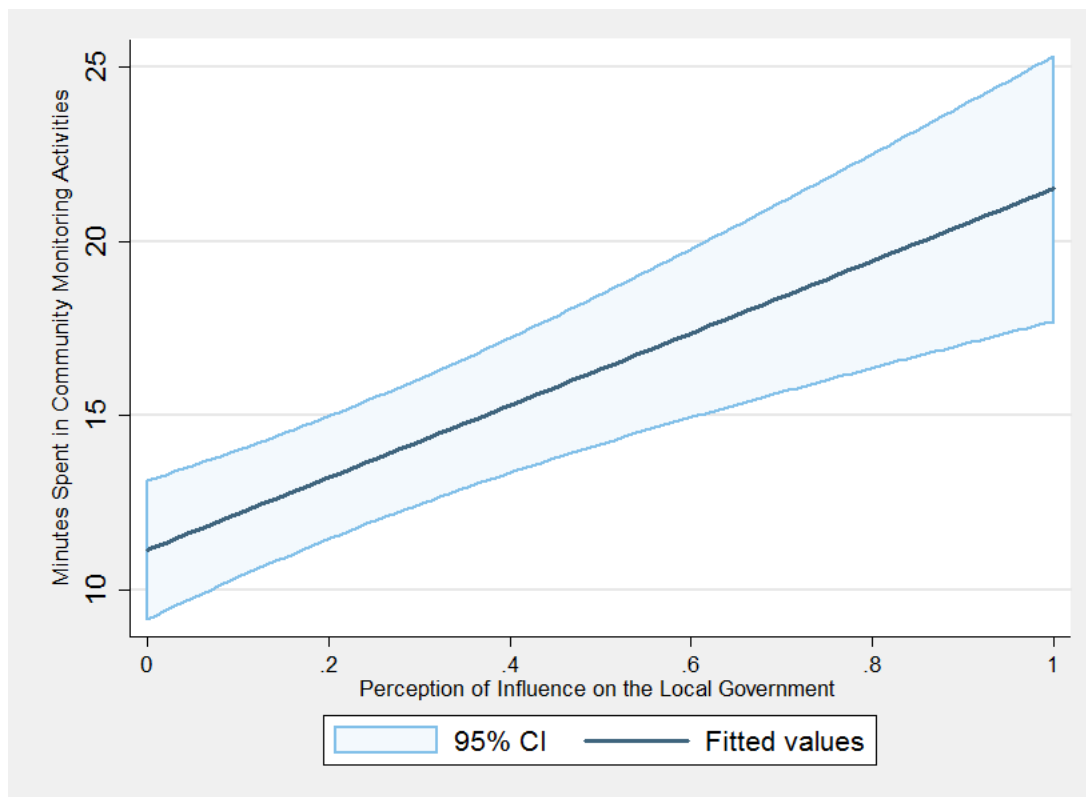
If citizens think they are not influential in government activities, even if they spend time uncovering pockets of corruption and inefficiencies, the probability of an improvement in project performance may be low. As a result, they may decide not to spend their time monitoring the project. In fact, on average, less than 20 percent of citizens in the treated communities believe that they have some or a lot of influence in municipal government activities, which are responsible for managing the infrastructure project.

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<sup>13</sup> As a robustness check I study whether citizens believe they should have an important role as monitors of public officials. If the answer to this question is negative and citizens believe monitoring public officials is not their responsibility, then the theory of self-fulfilling prophecies would not be empirically valid. This is because citizens may decide not to participate in the CVA process even if they perceived themselves as highly influential. Results, which are available upon request, indicate that more than 75 percent of citizens do believe they should have an important role as monitors of public officials.

Figure 13 shows graphically an estimation using the simple linear probability model. I study whether citizens' perception of their influence on local governments is associated with community participation in monitoring activities. Perception of influence on the local government is a binary variable equal to 1 when citizens report to have some or a lot of influence on the local government administration and 0 otherwise. Minutes spent in community monitoring activities measure was explained above. The results from Figure 13 indicate that perception of influence is positive and highly correlated with the time citizens spent in community monitoring activities.

**Figure 13. Perception of Influence and Time Spent in Community Monitoring Activities**



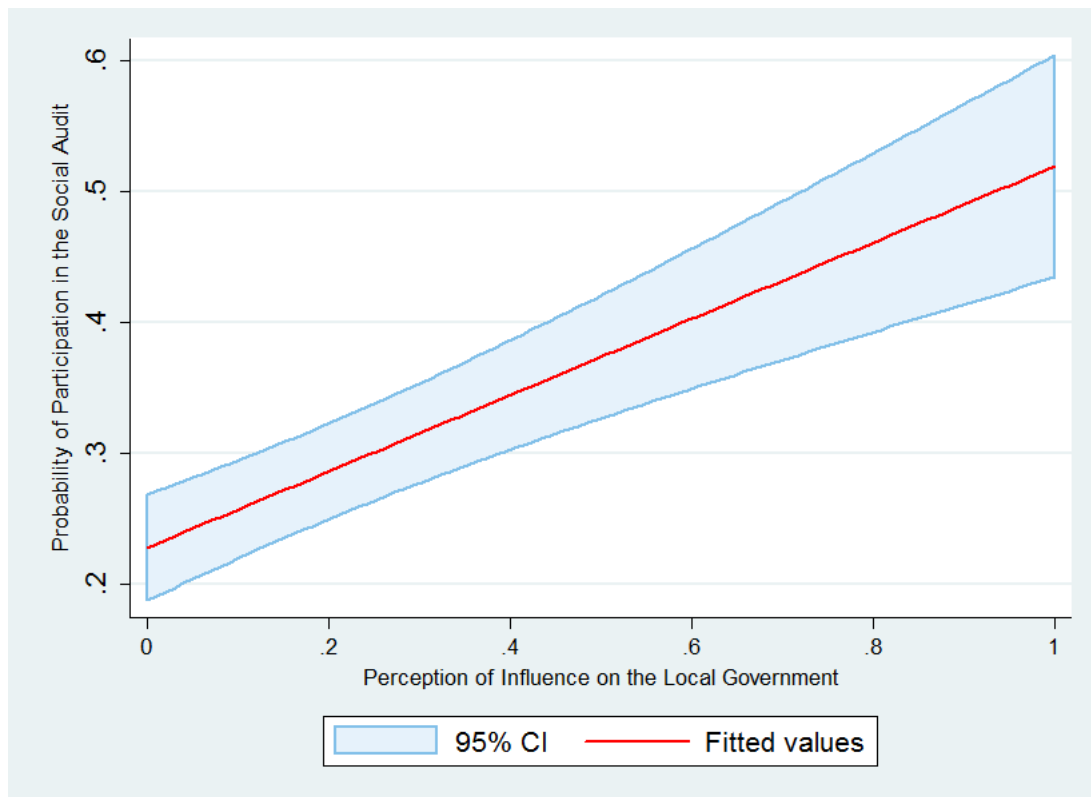
*Notes:* The figure shows the fitted line and the 95 percent confidence intervals of the effect of citizens' perceptions of their influence on time spent monitoring the projects using the linear probability model.

To construct minutes spent in community monitoring activities I use responses to “Did you devote any of your time to monitoring the project?” (1) No time, (2) Less than 10 minutes a week, (3) Between 10 and 30 minutes a week, (4) Between 31 and 60 minutes a week and (5) More than an hour a week. Using average time thresholds for each bracket (0, 5, 15, 45, 60), I

compute the variable for both treated and control communities. Perception of influence in the local government is a binary variable equal to 1 when citizens report having some or a lot of influence on the local government administration and 0 otherwise.

Figure 14 displays the estimation of the relationship between perception of influence on the local government and probability of participation in the social audit. The former is a binary variable equal to 1 when a citizen reports to have participated of at least one community forum in the CVA project, and 0 otherwise. Note that in this case only citizens in treated communities are part of the sample on which I estimate this model. Results from Figure 14 indicate that perception of influence is positively correlated with the probability of participating in the community forum. This relationship is not only substantial but also highly significant.

**Figure 14. Perception of Influence and Participation in Public Forums in the CVA Projects**



*Notes:* The figure shows the fitted line and the 95 percent confidence intervals of the effect of citizens' perceptions as influential on participation in community forums in the CVA projects using a linear probability model.

Probability of Participation in a Social Audit refers to a binary variable equal to 1 when a citizen report having participated in at least one community forum in the CVA project, and 0 otherwise. Note that in this case only citizens in treated communities are part of the sample on which I estimate this model. Perception of influence in the local government is a binary variable equal to 1 when citizens report having some or a lot of influence on the local government administration, and 0 otherwise. The evidence suggests that citizens' perceptions of their influence is associated with higher participation in monitoring activities in the treated and control groups and higher participation in the public forums in the CVA program.

To test the robustness of the results shown in Figures 13 and 14, I estimate the regression in equations (3) and (4)

$$MONITORING_{ch} = \alpha + \beta INFLUENCE_{ch} + X'_{ch}\gamma + \varepsilon_{ch} \quad (3)$$

*MONITORING* refers to the binary variable *minutes spent in community monitoring activities* explained above. *INFLUENCE* refers to the binary variable Perception of influence in the local government is also explained above. For ease of interpretation, I estimate equation (3) using OLS. I report the results in columns (1) and (2) of Table 8. The regression is estimated with robust standard errors, adjusted for clustering at the community level. The vector  $X$  represents deficient implementation and civic participation failure theories discussed above and a set of control variables, including demographics and educational dummies. Results are qualitatively similar using ordered probit and logit models.

I estimate equation (4) using a probit model, where  $h$  is a household in a given community, denoted as  $c$ . I use participation in at least one community forum, which only citizens in treated community would be able to attend, as a dependent variable. The regression is estimated using probit model with robust standard errors, adjusted for clustering at the community level. Columns (3) and (4) of Table 8 show the coefficient for the marginal effect and the  $p$ -value, respectively.

$$\frac{\partial PARTICIPATION_{ch}}{\partial INFLUENCE_{ch}} = \frac{\partial \Phi(x_{ch}\beta)}{\partial INFLUENCE_{ch}} = \phi(x_{ch}\beta)\beta_{ch} \quad (4)$$

In the regression exercises, I control for the two theories, deficient implementation theory and civic participation failure, that attempt to explain when citizens are unable to engage with governments to monitor project performance. On the one hand, I confirmed what the previous

evidence presented above suggested. Civic participation failure theory does not have any explanatory power in the CVA context. In particular, in the case of the opportunity cost of time, income can explain neither time spend in community monitoring activities nor participation in community forums. To test the effect of citizens' expectations of reciprocating behavior on citizens willingness to monitor the project, I use two measures, a measure of trust introduced above and a measure of ethnic outsider, suggested in the literature by Lieberman, Posner and Tsai (2013). This is a dummy variable equal to 1 if the respondent's ethnicity is different from the ethnicity of the majority of respondents in that community, and 0 otherwise.

Both measures fail to explain the variation in the dependent variables. On the other hand I find that deficient program implementation and citizens' beliefs about their perception of influence are majors bottlenecks which constrain citizens' ability to engage with government to monitor project performance. In the first case, I find that having access to high quality information is crucial in the decision whether to monitor the project. In particular, it increases time spent in monitoring activities by almost 7 additional minutes, and increases probability of participation in the community forum by almost 16 percentage points. In the case of beliefs, perceiving oneself as somewhat or highly influential on local government increases time spent monitoring by almost eight additional minutes as well as increases the probability of participation in the community forum by almost 27 percentage points. These results go in line with the theory of self-fulfilling prophecies, as citizens participation in monitoring activities are dependent on whether citizens perceive themselves as influential in local government, which is a proxy for citizens' expectations of local government accountability.

**Table 10. When Are Citizens Able to Engage with Governments to Monitor Project Performance? Time Spent in Community Participation in Monitoring Activities Public Forum/s of Social Audit**

Variables	Time Spent in Community Monitoring Activities		Participation in Public Forum/s of Social Audit	
	(1)	(2)	(3)	(4)
	Coef.	<i>p</i> -value	Coef.	<i>p</i> -value
Perception of Influence	7.62	0.001	0.264	0.008
Information Quality	6.55	0.009	0.159	0.000
Priority	4.51	0.160	0.191	0.080
Trust in Fellow Neighbors	-0.359	0.907	0.062	0.437
Ethnic Outsider	3.39	0.701	-0.105	0.415
Income	0.503	0.125	0.000	0.945
<b>Controls</b>				
Gender (Female=0)	5.50	0.066	0.051	0.544
Adult (25-40 years old)	7.25	0.028	-0.248	0.073
Middle Age (41-64 years old)	13.33	0.001	-0.235	0.105
Old Age (64+ years old)	13.11	0.076	-0.196	0.327
White	0.02	0.998	-0.226	0.151
Mixed	0.25	0.978	-0.198	0.203
Indigenous	7.45	0.476	-0.067	0.706
Complete Primary	2.30	0.523	0.105	0.233
Incomplete Secondary	5.86	0.116	0.186	0.133
Complete Secondary	3.96	0.318	0.192	0.096
Higher Education	12.50	0.024	0.241	0.064
Adj. $R^2$	0.15		Pseudo $R^2$	0.10
No. of obs	482		No. of obs	301

*Notes:* In columns (1) and (2) I use time spent in community monitoring activities as a dependent variable, which captures both citizens in control and treated communities. To construct this variable I use responses to “Did you devote any of your time to monitoring the project?” (1) No time, (2) Less than 10 minutes a week, (3) Between 10 and 30 minutes a week, (4) Between 31 and 60 minutes a week and (5) More than an hour a week. Using average time thresholds for each bracket (0, 5, 15, 45, 60), I compute the variable. *Priority* is a binary variable equal to 1 when respondents’ report that the project was a priority for the community, and 0 otherwise. The regression is estimated using OLS with robust standard errors, adjusted for clustering at the community level. Results are qualitatively similar using ordered probit and probit models. In columns (3) and (4) I use participation in at least one community forum, which only citizens in treated community would be able to attend, as a dependent variable. The regression is estimated using probit model with robust standard errors, adjusted for clustering at the community level. To compute the marginal effect I evaluate all other variables at their means. Results are qualitatively similar using OLS, logit models and when evaluating the other variables at zero or one when computing the marginal effects.



One concern with results from Table 10 is that there is a potential confounding effect. Taking part in community monitoring activities could also affect citizens' perception of influence on the local government. If this were true and participation in community monitoring activities was crucial in changing citizens' perceptions of their influence vis-à-vis the municipal government, I should find that spending additional time monitoring a project increases the probability that the citizen changes his/her perception of influence. I take advantage of the fact that among those who spend time monitoring projects there is wide variation, with the coefficient of variation being  $\frac{\hat{\sigma}}{\hat{\mu}} = 1.67$ . I find that among this group, additional time spent in community monitoring activities has no effect on perception of influence. A further empirical implication of the endogeneity theory is that those who participate in community monitoring activities and find the work of representatives of municipal government unsatisfactory should have a lower perception of being influential. The fact that they were not able to increase politicians accountability while participating in monitoring the project should have an effect on updating their priors regarding how influential they perceive themselves to be. However, this is not the case, as 31 percent of those individuals believe they are influential, not statistically different from the 34 percent among those who evaluate the work of local officials as satisfactory. These numbers are substantially higher and statistically different than the 17 percent of citizens who perceive themselves as influential using the whole sample. The evidence suggests that once the person has decided to spend time monitoring the project, neither additional time spent in community monitoring activities nor the perceived performance of local officials has an impact on perception of their own influence on the municipal government. As a result, it seems that perception of influence in government is not easy to change and it is crucial to understand why citizens decide to participate and spend time in community monitoring activities such as the ones encouraged by the CVA program.

In order to test (d.2), I assess whether increased (decreased) participation in the CVA increases (decreases) project visibility. Using responses from participants in community forums in the CVA program I estimate the participant multiplier effect. For each participant, four [2.4-5.52] other neighbors who did not participate in any of the public forums were told about the CVA program and the infrastructure project. This piece of evidence explains the micro-linkages between participation in the public forums and citizens knowledge about the infrastructure project which was being built in the community.

## Part II

The evidence from Figure 12 and Table 9 above suggest that the CVA program improved politicians' behavior, as evaluated by citizens. As I argued above, there are two potential explanations: i) citizens subsidized the work of politicians by monitoring providers and identifying pockets of corruption and inefficiency and ii) improvements in project performance becomes more valuable for politicians, as citizens are better able to recognize politicians' effort.

Table 10 presents the results from examining whether these theories have empirical validity. I estimate the regression in equation (5) and (6) using OLS, where *OUTCOME* refers to the differential in overall performance and difference in politicians' performance.<sup>14</sup> In equation (5) *MONITORING* refers to time spent in monitoring activities, explained above. This variable is used to test potential explanation i). In equation (6) *VISIBILITY* refers to the percentage of citizens that know about the project in each community. This variable is used to test theory ii).

$$OUTCOME_c = \alpha + \beta MONITORING_c + \varepsilon_c \quad (5)$$

$$OUTCOME_c = \alpha + \beta VISIBILITY_c + \varepsilon_c \quad (6)$$

Columns (6) and (7) from Table 10 assess the validity of potential explanation i) using OLS and columns (8) and (9) using metaregression. I use metaregression to account for the fact that variables for some communities are estimated with a small sample. Metaregression allows me to compute a weight for each pair of projects based on their standard error, ameliorating the small sample problem within projects. I found that time spent monitoring projects cannot explain politicians' performance improvement in CVA projects. In particular, using OLS or metaregression, average time spent monitoring activities by CVA project is not associated with changes in Difference in Politicians' Performance. Point estimates are small and have no statistical significance. Similar results are found for Difference in overall performance in columns (2) and (3) using OLS and (4) and (5) using metaregression.

Columns (6) and (7) from Table 10 also assess the validity of potential explanation ii) using OLS and columns (8) and (9) using metaregression. The evidence from Table 10 suggests stronger treatment effects of the CVA program on politicians' and project performance in

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<sup>14</sup> Difference in overall performance refers to the difference between the proportion of citizens who evaluate the project performance as good or very good by pair of communities. Difference in politicians' performance refers to the difference between the proportion of citizens who evaluate the work of politicians as good or very good by pair of communities.

communities where a higher percentage of citizens had knowledge of the program's existence. Using OLS, the point estimate indicates that increasing project visibility by 10 percentage points in CVA projects increases Difference in Politicians' Performance by 3.8 percentage points. This effect is not only substantial but also statistically significant at a 93 percent significance level. In the case of Difference in overall performance in columns (2) and (3), the point estimate is stronger and significant at the 95 percent level. The estimated effect and its significance levels weaken when I estimate the coefficient using metaregression in columns (4) and (5) as well as columns (8) and (9).

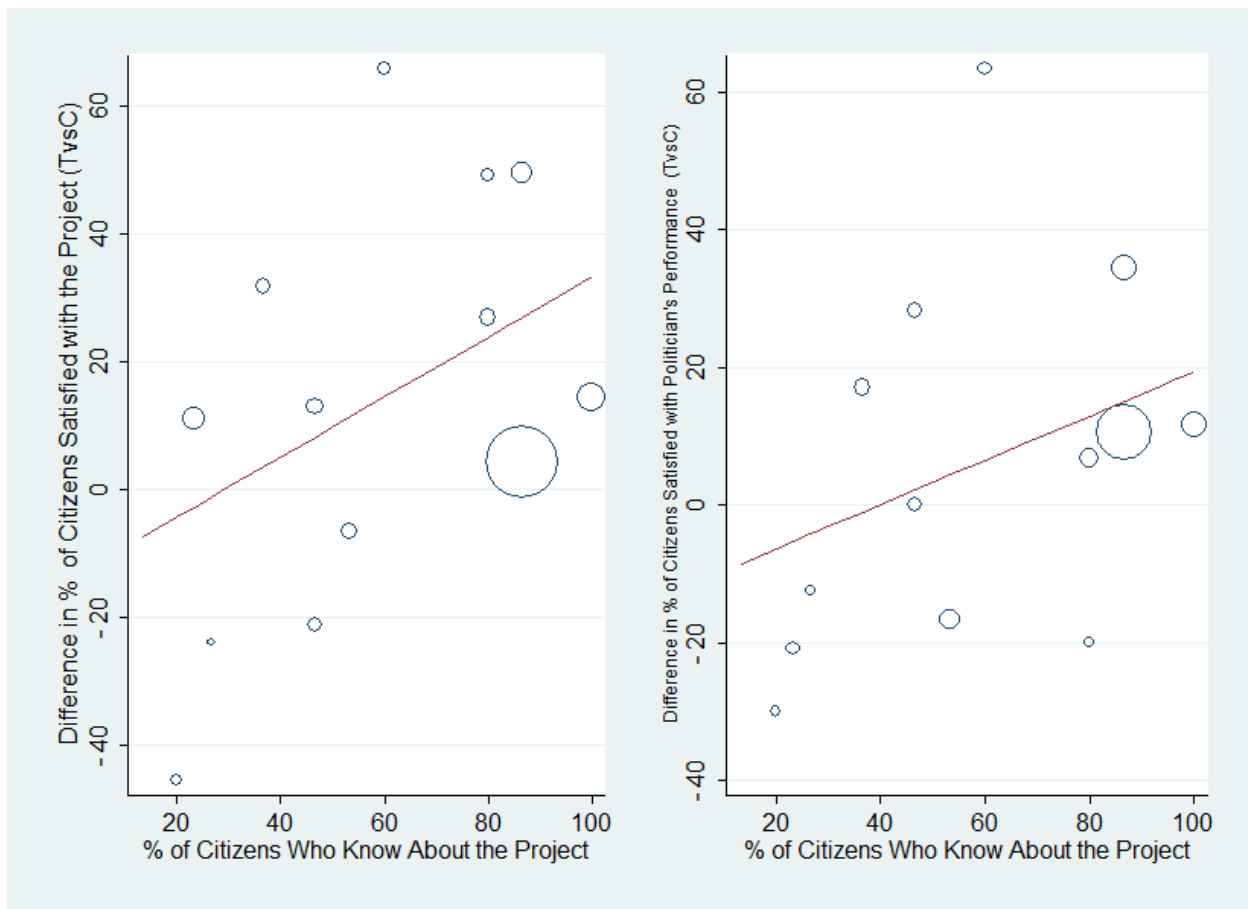
**Table 11. Determinants of Behavioral Change in Politicians' and Project Performance, Difference-in-Difference in Overall Performance and Politicians' Performance, OLS Metaregression**

Measures	(1) No of obs.	Difference in Overall Performance				Difference in Politicians' Performance			
		OLS		Meta-regression		OLS		Meta-regression	
		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Coef.	<i>p</i> -value	Coef.	<i>p</i> -value	Coef.	<i>p</i> -value	Coef.	<i>p</i> -value
Time Spend	13	0.02	0.287	0.01	0.300	0.02	0.197	0.01	0.211
Monitoring Projects									
Project Visibility	13	0.64	0.048	0.47	0.136	0.38	0.069	0.32	0.194

*Notes:* Each cell in column (2), (4), (6) and (8) is the coefficient from a different regression. In columns (2), (3), (6), and (7) regressions are estimated using an OLS model with robust standard errors. In columns (4), (5), (8), and (9) regressions are estimated using meta-regression. The measure overall performance as well as time spent monitoring projects measure has been explained above. Difference in overall performance refers to the difference in overall performance by pair of communities. Project visibility refers to the percentage of citizens who know about the project in each community. Difference in Politicians' Performance refers to the percentage of citizens who evaluate the work of politicians as good or very good between the pairs of communities.

Figure 15 complements Table 10 and graphically displays the metaregression estimation. Although this procedure weakens statistical significance, there is evidence of stronger treatment effects of the CVA program on politicians' and project performance on communities where a higher percentage of citizens had knowledge of its existence.

**Figure 15. The Effect of Project Visibility on Government Accountability and Project Performance**



*Notes:* The figure shows a meta-regression. The size of each circle represents the weight of each project and the line represent the estimate of the coefficient of project visibility, as measured by percentage of citizens who know about the project, on the difference in percentage of citizens that evaluate the work of local politicians as good or very good by pairs of communities.

The findings from this section support the theory of self-fulfilling prophecies (Molina, 2013b). In communities where citizens believe they are not influential in governmental activities it is less likely that citizens participate in the CVA program and spend time monitoring projects. This reduces the visibility of the project. As a result, lack of visibility reduces the incentives for

politicians to improve performance. In other communities, where citizens believe they are more influential, they participate in monitoring activities more often and give more visibility to the project, which in turn, motivates politicians to change their behavior and improve overall performance of the project.

## **6. Conclusions**

This article examines the impact of the Citizen Visible Audit (CVA), a social audit aim to monitor the use of royalties in Colombia, on project performance. The results suggest that the CVA program is successful in improving project performance in almost all performance measures I compute, including an aggregate one. This suggests a highly positive impact of the program in improving citizens' satisfaction with the project as well as citizens' assessment of the quality of the project's execution. However, treatment effects are highly heterogeneous across communities.

I developed a theoretical framework for social audits that allows me to identify the potential bottlenecks of the CVA program. My theory contributes to explain a) under what conditions citizens decide to monitor the project and b) under what conditions governments facilitate citizen engagement and become more accountable. In the case of a), I found that neither opportunity cost of participation nor collective action bottlenecks can explain the variation in citizens' willingness to participate in monitoring the project. The evidence suggests that heterogeneity in citizens monitoring efforts is the result of two major bottlenecks: i) citizens' knowledge about the program and how to monitor the program and ii) citizens' beliefs about the probability that participation in monitoring activities will lead to improvements in project performance.

In the first case, I find that in some communities citizens did not know the infrastructure program existed, and in some others, they knew the project existed but did not have access to information on how to monitor it. This prevents citizens from taking an active role in CVA community forums and community monitoring activities in general. In the case of beliefs, the evidence suggests that perceiving oneself as influential in local government is crucial for deciding whether to spend time in community monitoring activities. The rationale is that citizens may refuse to take advantage of the opportunity to monitor government and providers if they believe that after paying the opportunity cost of monitoring, coordinating their actions with

fellow neighbors and identifying projects' problems, politicians and providers will not be responsive. Regarding b), there is supporting evidence of stronger treatment effects of the CVA program on politicians' performance in communities where the project had higher visibility among the population.

Overall, the results give supporting evidence for what I have called a theory of self-fulfilling prophecy in service delivery. In Molina (2013b), I argue that there is a channel, often not accounted for in the literature, through which the effect of a community monitor intervention could be diminished. In particular, I argue that citizens' low expectations of leaders', officials' or service providers' accountability may generate low community participation in monitoring the project. As a result, project visibility is reduced, since there are fewer citizens talking about this program to other fellow citizens. Politicians and providers, in turn, observing weak community monitoring participation and project visibility, may have fewer incentives to spend time and effort improving project performance. Future work should aim to collect more and better data to allow for a better understanding of the pathway of change of social audits and community monitoring interventions in general.

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## Appendix

**Table 12. Projects: Part I**

<i>Status</i>	<i>Pair</i>	<i>Object</i>	<i>Municipality</i>	<i>Sector</i>	<i>Amount</i> (Millions)	<i>Timeline</i>
T	1.1	Construction and Optimization of pluvial sewage (21, 22, 24, 25 st between 23 and canal)	Yopal	WS	13700	18 Months
C	1.2	Construction and Optimization of pluvial sewage (24a , 29 st between campiña canal and caño seco)	Yopal	WS	8450	6 Months
T	2.1	Study, Design and Construction of San Lorenzo Educational Institution	Castilla La Nueva	EDU	11352	12 Months
C	2.2	Construction of the Second Stage of Castilla La Nueva Educational Institution	Castilla La Nueva	EDU	7797	8 Months
T	3.1	Construction of aqueduct system in Las Islas	Mani	WS	6319	18 Months
C	3.2	Optimization of sewage networks in other places	Mani	WS	3000	12 Months
T	4.1	Construction of aqueduct in Las brisas, Guafal Pintado, and other places	Tuchin	WS	1125	7 Months
C	4.2	Construction of aqueduct system San Juan de la Cruz and Guaymaral and optimization for Barbacoas	Tuchin	WS	602	4 Months
C	4.3	Rehabilitation aqueduct systems in Flecha, Optimization of Vidales and Fecha's aqueduct Guafal Pintado, and other places	Tuchin	WS	560	3 Months
		Improvement of aqueducts of Nueva Estrella, Bella Vista, and Esmeralda sur. Construction of a drinking water plant in Nueva Estrella				
T	5.1	Design and construction of canals, collectors, ditches, etc in Olaya Herrera Avenue and Libertadores neighborhood .	Arauca	WS	2850	5 Months
C	5.2	Design and construction of canals, collectors, ditches, etc in Quinta-El Dique Avenue neighborhood.	Arauca	WS	3968	6 Months
C	5.3	Design and construction of canals, collectors, ditches, etc in 16 st from Caño Córdoba to Humedal Pozo Las Babas and la 15 st between 15 and 16 st.	Arauca	WS	4000	8 Months
T	6.1	Construction of pluvial sewage in zone Nf1, Víncula Palacio, Almirante Padilla and zone Nf.2, Colombia Libre, Jorge Arrieta.	Maicao	WS	4337	12 Months
C	6.2	Construction of pluvial sewage in zone Nf1 San Antonio, Alfonso López, Santa Fe, La Unión and Rojas Pinilla, Zone 2, Simón Mejía	Maicao	WS	2551	3 Months
T	7.1	Design and Construction of Eje Educativo. Víncula Palacio, Almirante Padilla and zone Nf.2, Colombia Libre, Jorge Arrieta.	Hatonuevo	EDU	14998	12 Months
C	7.2	Construction of Third Stage of the Educational Institution San Rafael	Albania	EDU	8328	11 Months

*Notes:* T refers to treatment group and C refers to control group. WS refers to Water and Sanitation sector; EDU refers to Education sector; GAS refers to Natural Gas sector; Timeline refers to the estimated duration of the project before it is actually executed.

**Table 13. Projects: Part II**

<i>Status</i>	<i>Pair</i>	<i>Object</i>	<i>Municipality</i>	<i>Sector</i>	<i>Amount</i> (Millions)	<i>Timeline</i>
T	8.1	Implementation of sewage master plan in San Francisco's urban region	San Francisco	WS	1807	16 Months
C	8.2	Improving Sewage system of Villagarzon's urban region	Villagarzón	WS	1120	6 Months
T	9.1	Construction of a aqueduct system in San Francisco neighbourhood	Neiva	EDU	1414	10 Months
C	9.2	Construction in sewage system in Guacirco, San Luis and El Colegio	Neiva	EDU	2734	2 Months
T	10.1	Construction educational institution Manuel J Del Castillo, Isaac J Pereira and Liceo Moderno	Cienaga	EDU	6123	8 Months
C	10.2	Construction educational institution San Juan del Cordoba	Cienaga	EDU	8498	8 Months
T	11.1	Final Stage of Construction Educational Institution Sumapaz	Melgar	EDU	4988	7 Months
C	11.2	First Stage Education Institution Megacolegio	Zipaquira	EDU	5527	8 Months
T	12.1	Construction of Educational Center Víncula Palacio, Almirante Padilla	Yopal	EDU	5009	10 Months
C	12.2	Construction and Improvement of Educational Institution	Yopal	EDU	4486	6 Months
T	13.1	Construction of Natural Gas Infrastructure to increase connection among low income individuals	Guatape y El Penol	GAS	6892	3 Months
C	13.2	Construction of Natural Gas Infrastructure to increase connection among low income individuals	Subachoque	GAS	1067	6 Months

*Notes:* T refers to treatment group and C refers to control group. WS refers to Water and Sanitation sector; EDU refers to Education sector; GAS refers to Natural Gas sector; Timeline refers to the estimated duration of the project before it is actually executed.