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ABSTRACT

This paper analyzes the impact of the elimination of the initial fixed costs of registration on the decision of informal firms to operate formally in Bogotá, Colombia. The Chamber of Commerce of Bogotá (CCB) conducts workshops for prospective formal-sector entrants and arranges personalized meetings for them with CCB agents. The CCB's decision to significantly reduce the transaction costs of registration and the entry into force of Act No. 1429 of 2010, which eliminated the costs of the initial procedure for registering as a formal enterprise and provided exemptions from relevant taxes during the first years after formalization, provided us with an ideal experiment for studying how the elimination of the initial fixed costs of formalization would influence firms' decision to operate formally or not. We obtained two important results. First, while a workshop treatment had no effect on firms' formalization decisions, meetings at the firm with CCB agents raised the likelihood that a business would begin to operate formally by 5.5 percentage points for all the firms that were invited, at random, to participate in this arm of the intervention and by 32 percentage points for the firms that accepted the invitation. Second, the effect on the treatment firms did not persist over time. After a year of formal operation, it disappeared. These results indicate that substantial reductions in the fixed costs of operating formally are not effective in formalization choices, since such reductions had no lasting effect on formalization decisions.

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1. Introduction

Informality is widespread in most developing countries. Policymakers are concerned about this problem because it entails an inefficient allocation of resources, inasmuch as formal and informal firms compete in the same market but have different marginal costs (Hsieh and Klenow, 2009). Galiani and Weinschelbaum (2012) develop a general equilibrium model in which both firms and workers choose whether to operate formally or informally. On that basis, they conduct an extensive static comparative analysis. Since the work of De Soto (1989), a great deal of emphasis has been placed on the burden represented by fixed formal-sector entry costs. Another major barrier to formality is thought to be the high taxes levied on profits and labor. While there is an ample body of literature that evaluates the costs and benefits of formality, there is much less experimental evidence regarding the impact of fixed costs on the decision to operate formally. An exception is the empirical work of De Mel, McKenzie and Woodruff (2008 and 2013), which evaluates the influence of different interventions on a firm's decision to formalize. One of the approaches that they tested consisted of giving information to potential entrants about the registration process and about the possibility of obtaining reimbursement for direct registration costs. They found that this kind of intervention had no effect on the decisions made by the informal Sri Lankan firms covered in their study as to whether to formalize or not. In contrast, other treatments, in which actual payments were made, in addition to the provision of information and the reimbursement of registration costs, had a significant effect on the firms' decisions to operate formally.

This paper analyzes the impact of the elimination of initial fixed registration costs on informal firms' decision to operate formally in Colombia. In order to enter the formal sector of the Colombian economy, firms must register with the tax agency (*Dirección de Impuestos y Aduanas Nacionales* (DIAN)) and obtain a taxpayer identification number and card (*Registro Único Tributario* (RUT)), as well as obtain a license (*matrícula mercantil*) from the local chamber of commerce. Fees are charged for these procedures. Firms also need to renew their licenses every year, which increases the fixed costs of operating in the formal sector of the economy. In addition, in general, firms have to pay payroll taxes, value added taxes and income taxes.

In this paper we evaluate two interventions lead ECON ESTUDIO (EE), a research institute in Colombia (www.econestudio.com) working together with the Chamber of Commerce of Bogotá (CCB). These initiatives were designed to eliminate the initial fixed costs for firms that wished to operate formally. EE together with the CCB organized workshops (first intervention) and arranged personalized meetings (second intervention) to inform entrepreneurs about registration procedures and the advantages of operating formally. In both treatments, firms interested in starting the process of formalization would later receive the assistance of CCB agents in conducting all the necessary paperwork. In addition to the assistance of the CCB agents, the Formalization and Job Creation Act No. 1429 of December 2010 establishes that the registration process is to be cost-free for small and micro firms (the population of our study) that are registering for the first time.[2] This initiative thus provided us with an ideal experiment for studying how the elimination of the initial fixed costs of formalization would influence firms' decision to operate formally or not, thanks to the combination of the experiments (workshops and meetings), which has also eliminated all the

[2] This law defines small firms as firms with fewer than 50 employees and total assets of less than 5,000 minimum legal monthly wages (MLMW). One MLMW was equivalent to Col$ 515,000 in 2011 (US$ 265 using the exchange rate as of December 31, 2011). All firms included in our sample fit this definition.

transaction costs of registration, and Act No. 1429, which eliminated the costs of the initial registration for firms created between 2011 and 2014. What is more, Act No. 1429 also establishes that, in the short run, firms are to be exempted from paying all taxes, thus giving them a clean slate for the start-up of their formal-sector operations. This intervention was expected not only to induce firms that were on the verge of entering the formal sector to actually do so, but also to give other firms the opportunity to experiment with formality at no cost for a year. This latter aspect also adds a special feature to our experiment, since it enabled us to analyze the sustainability of the project-induced decision to operate formally once the firms had to renew their licenses (the fee for which, in the first year after registration, was cut by 50% under Act No. 1429).

Thus, we were able to take advantage of this experiment to study the effect of the virtual elimination of formalization costs on the decision to operate formally in a context in which no tax liabilities would be incurred for at least two years. In addition, we were also able to test whether the effects of this intervention would be sustainable once firms had had the opportunity to learn about the advantages or disadvantages of operating formally and had to opt to remain in the formal sector by paying a small fee (which would still be 50% less than it would otherwise have been).

EE conducted a randomized control trial to evaluate these programs' impact on the decision of a sample of informal firms in southern Bogotá as to whether to formalize or not. Bogotá, the capital city of Colombia, has a large concentration of small businesses. Because no frame of reference was available that could be used to identify which firms should be included in the baseline sample, we started with one neighborhood, Restrepo, in the center of the locality of Antonio Nariño, which had not come within the scope of the CCB interventions. In October 2010, a group of research assistants went door-to-door to screen firms, asking their owners or managers some basic questions that helped them to identify informal firms that could be included in the baseline sample. The objective was to pinpoint those firms which had not taken any steps to begin the formalization process. In order to obtain a large sample, the survey area was expanded by adding the areas located in concentric circles surrounding Restrepo, thus maintaining this neighborhood in the center of the circle; we also made sure that the additional survey areas were ones in which the CCB programs had not yet been implemented.

By matching our baseline sample data with the CCB's official records, we were able to obtain exact information on which firms actually formalized after the interventions were conducted. Furthermore, this data also showed which of the firms that did decide to formalize as a result of the intervention remained in the formal sector when the time came for them to renew their business licenses.

We have two important results to report. First, while the workshop treatment had no effect on the decision regarding formalization, the CCB agents' visits raised the likelihood of formal operation by 5.5 percentage points for all the firms that were randomly invited to participate (in other words, this is the intention-to-treat parameter) and by 32 percentage points for those firms that had been invited and then accepted the invitation (in other words, this is the local average treatment effect). Second, and very interestingly, the effect of the treatment did not persist over time. After a year of formal operation, both effects disappeared. What it is more, this was not the result of businesses in the control group entering the formal sector in order to "catch up" with the others but instead reflects the decisions of formalized firms not to renew their licenses. This is a very interesting result, since it suggests that some firms that experiment with formality do not find that it is advantageous for them to continue operating as formal-sector enterprises even when they do not have to pay taxes and only have to pay 50% of the license renewal fee.

These results show that a substantial reduction in the fixed costs of operating formally does not play a key role in a firm's decision whether or not to formalize, since that reduction had no enduring effect on the decision to operate in the formal sector. A considerable number of the firms in the study chose to become formal when it was cost-free but later, when they would be called upon to pay a relatively small fee, they decided to return to the informal sector. In this sense, this study corroborates the findings of De Mel et al. (2013), since it suggests that firms remain informal, not because burdensome entry costs deter them from operating formally, but because they perceive the benefits of formality to be modest at best.

There is a vast body of literature on the impacts of different types of programs on informality. Bruhn (2010) and Kaplan, Piedra and Seira (2011) use different panel datasets to analyze the effect of a Mexican program implemented in 2002 which reduced the time required to register as a business from 30 to 2 days. Bruhn (2010) uses data from the Mexican National Employment Survey and finds that the program raised the registration rate of eligible firms by 5%, but that this increase was a reflection of the creation of new firms rather than the formalization of existing informal enterprises. They also find that formal employment in eligible industries increased by 2.8%. On the other hand, Kaplan et al. (2011) use data from the Mexican Social Security Institute and also find that the program increased the number of formal firms. However, this study did not find significant effects in terms of the formal employment rate either. Monteiro et al. (2006) and Fajnzylber et al. (2011) analyze a simplification program in Brazil which reduced both the costs of registration and business taxes. The first study relies on a difference-in-differences strategy applied to ineligible firms as a control group for eligible ones. It shows that the program increased formalization by 13 percentage points in the case of retail firms but had no impact on other sectors. Furthermore, these researchers find that the effect is stronger for mid-sized firms. Fajnzylber et al. (2011) relies instead on a regression discontinuity design and finds that the program has had an effect on formalization: a 7.5 percent increase in the number of firms registered as formal legal entities, a 6.3 percent increase in the registration of microenterprises and a 7.2 percent increase in registration with the tax authorities. In addition, they find that the program has had an effect on other outcomes, since the intervention raised the revenues, employment figures and profits of the formalized firms. However, these authors have not been able to disentangle the various components of the program in order to determine which of those components has been responsible for the documented effects. Finally, McKenzie et al. (2010) rely on an instrumental variables (IV) approach by using the distance to the registration office as an instrument for gauging registration costs in Bolivia. They find that firms with from 2 to 5 employees that register as businesses then increase their profits, but that profits of smaller or bigger firms that register as businesses actually decrease. Their results show that while, in the presence of high formalization costs, some firms would stand to gain in net terms if they register as businesses with the tax authorities, others would lose from doing so. In the latter case, operating informally would be a rational choice.

The rest of this paper is organized as follows. Section II describes the process involved in registering as a formal-sector enterprise in Colombia. Section III describes the intervention and Section IV, the experimental design. In Section V, we present our findings. Finally, Section VI briefly concludes.

2. Establishing a Formal-Sector Business in Colombia

There are two types of registration procedures required of any firm that wishes to operate formally in Colombia. The first is registration with the tax authorities of Colombia (*Dirección de Impuestos y Aduanas Nacionales* (DIAN)), which issues a taxpayer identification number. The second involves obtaining a license (*matrícula mercantil*) from the local chamber of commerce in the district where the firm is located.

First of all, a firm must record its name, its legal status (natural person or legal entity) and its industrial classification category as per the International Standard Industrial Classification (ISIC) nomenclature. This process is cost-free and takes just one day. The steps required to obtain the taxpayer identification number depend on the legal status of the firm (i.e., natural person or legal entity) but, since our sample is made up entirely of small firms whose legal status is that of a natural person, we will only focus on the procedure to be followed by that type of business.

The applicant must submit an online form and the business owner's identity number to the corresponding chamber of commerce, which, working in conjunction with the DIAN, then issues a taxpayer identification number and a business license to the applicant. Under the terms of Act No. 1429, this procedure was cost-free during the period 2011-2014 for firms registering for the first time.

Once a business has received its taxpayer identification number, it is registered with the DIAN. However, this does not necessarily mean that it is liable for taxes. Small firms, such as those included in our sample, have to pay income taxes based on their income level, but, under Act No. 1429, small firms are exempted from paying income taxes for the first two years after registration regardless of their income level. Additionally, under the legally mandated Simplified Regime, the small firms included in our experiment did not have to pay value-added taxes.

A firm's business license is like a person's ID number. It is evidence that the firm exists and is authorized to engage in legal transactions with other firms and with the State. Every year, firms must renew their business licenses before March 31st by paying a fee to the local chamber of commerce; the amount of that fee depends on the value of their assets. Under Act No. 1429, between 2011 and 2014, firms renewing their licenses for the first time have to pay just 50% of the usual fee; the second time around, they pay 75% of the usual fee, and it is only after the third year of their registration that they have to pay the full amount. In 2013, the renewal cost ranged from US$ 17 for firms whose asset value was less than US$ 650, to US$ 844 for firms with assets valued at more than US$ 284 million.[3] The taxpayer identification card must be renewed only when the firm has changed its line of business or activity, and the renewal is free of charge.

Additionally, in order to operate formally, a firm must pay labor taxes. However, here again, under Act No. 1429, for the first two years firms are exempt from paying these payroll taxes. These provisions created an ideal experimental environment for our study of the effect that the elimination of fixed costs has on firms' decision to operate formally, since, in the short-run, firms

[3] These amounts were converted into dollars using the average exchange rate for March 2013.

were exempted from paying taxes.[4] In addition, given the unusual system put in place for the renewal of business licenses, although firms did not have to incur any of the administrative fixed costs of registration if they renewed their licenses, they did need to choose to remain in the formal sector one year after their initial decision.

3. Interventions

The CCB designed two programs to promote the formalization of small informal firms in Bogotá. Both interventions had been conducted previously by the CCB in other outlying districts of the city. ECON ESTUDIO partnered with the CCB to design a system for evaluating these types of initiatives based on a randomized control trial for the two interventions, which focused on: (1) giving precise information about the costs and benefits of formalization and the procedure involved in obtaining a business license; and (2) reducing the non-monetary costs of the registration process. In addition, as mentioned earlier, Act No. 1429 reduced the initial registration costs by establishing that the registration process would be free of cost for small firms that were registering for the first time and by exempting firms from paying taxes for the first two years.

Firms were randomly assigned to the target groups for the two interventions or to a control group. One of the interventions consisted of workshops run by CCB instructors. The CCB invites informal-sector entrepreneurs to these workshops so that it can provide them with information about the advantages and disadvantages of operating formally. It also provides information about the registration process. Workshops of this type had never been offered before in the area of Bogotá where the firms in our sample are located, and the CCB agreed not to hold any additional workshops there until after our study was completed. The workshops that took place during our study were held at the local CCB office in Restrepo, which was close to the firms included in our sample.

The workshop included: (1) a description of what formality in Colombia entails; (2) a discussion of the advantages of operating in the formal sector, including the possibility of doing more and better business with other formal-sector firms, of attending free training courses and of receiving assistance from the CCB to improve the way in which the business was being managed; (3) instructions about how to navigate the registration process; and (4) examples of successful firms that started out in the informal sector but then moved into the formal sector of the economy.

The workshop lasted two hours and then allowed for additional time to provide more information about the registration process to interested entrepreneurs. The person in charge of providing this information to the entrepreneurs then contacted them by telephone in order to arrange a meeting at the CCB to start off the registration procedure. This follow-up support began at the time that the entrepreneur expressed interest in registration after the workshop and ended when the firm obtained its business license.

[4] Under the terms of Act No. 1429, during the first two years, firms are exempted from paying both labor and income taxes. Thereafter, they benefit from a gradated scale of reductions. Firms do not have to pay the total amount of the corresponding taxes until six years after their registration.

A personalized letter, signed by the CCB, inviting the selected entrepreneurs to the workshop was mailed to them, and this was followed up by a telephone call in order to confirm their attendance at the workshop and their contact information. The calls were made in two stages: the first in October and November 2011, and the second in January and February 2012.

The second intervention consisted of personalized visits to interested firms by CCB agents who gave them the same information that was imparted at the workshop and assisted them with the registration process if they wished to have that type of support. As is also true of the workshop, this kind of program is a regular activity of the CCB. The firms included in our sample had never received these kinds of visits, however, and an arrangement had been made with the CCB not to make such visits again until the experiment was over. The CCB-trained agents visited entrepreneurs after having phoned them and, if they agreed, setting a date and time for the visit. The CCB does not send agents to visit entrepreneurs unless they agree to meet with a CCB agent during the initial phone call. After the first visit, which is for information purposes only, CCB agents return only to the firms that agree to register.

Throughout the rest of this discussion, all the firms that were assigned to the first or the second treatment will be designated as Intention-to-Treat Group No. 1 or No. 2 (ITT1 and ITT2, respectively). Similarly, all the firms that agreed to participate in the first or second treatment will be designated as T1 or T2, respectively.

4. Experimental Design

4.1. Experimental Sample

EE conducted a randomized control trial to evaluate the impact of their interventions. The study took place in the south of Bogotá, the capital city of Colombia, which has a large concentration of small businesses. Because no frame of reference was available that could be used to identify which firms should be included in the baseline sample, we started with one neighborhood, Restrepo, in the center of the locality of Antonio Nariño. In October 2010, a group of research assistants went door-to-door to screen firms by asking entrepreneurs some basic questions that would help them to identify informal-sector firms that could be included in the baseline sample.

The objective was to identify firms that had not taken any steps to initiate the formalization process. In order to obtain a large sample, the number of firms surveyed was expanded by including areas in concentric circles surrounding Restrepo, while keeping that neighborhood in the center of the circle. More firms than we expected said that they were operating formally: from a sample of 7,871, only 2,099 admitted that they did not have any type of registration or said that they had not completed the second stage of the formalization procedure (i.e., they did not have a current business license). Our baseline sample was thus made up of these 2,099 firms. The baseline survey was collected in October, 2010.

However, when we cross-checked our baseline records with the official records of the CCB, we realized that some entrepreneurs who had said that they did not have a current business license actually did have one. These firms were removed from the sample, leaving a total of 1,927 informal-sector firms that did not have a business license and had fewer than 10 employees (thus fitting the definition of microenterprises set out in the Microenterprise and Small and Medium-Sized

Enterprises Act of Colombia. These firms are sited in seven localities in south and central Bogotá, and 30% of them are located in the Restrepo neighborhood of Antonio Nariño.

4.2. Business Characteristics

The firms included in the baseline sample have the following characteristics: 59.3% of them have only one employee, 25.4% have two employees and just 6.8% have four or more employees. Most of them (71.7%) have been operating for less than 10 years; 63.5% of the firms are retail firms, 14.1% are hotels and restaurants, 12.8% are manufacturing industries and the rest (9.7%) provide other types of services. Most of them are located in shops (71%) or in other fixed locations (20.6%); 7.4% of them are located in the entrepreneur's house and the rest are located in a factory or office. The premises of 65% of the firms are quite small (less than 10 m^2); 96.7% of the firms do not have branches, 2.4% are a branch of another business and 0.8% are the main branch. In 25.2% of all cases, the entrepreneur owns the property where the business is located.

In all, 96% of the firms have total assets amounting to less than Col$ 85.5 million at 2011 prices (US$ 442,000)[5] and 2.5% have assets of more than Col$ 257.5 million at 2011 prices (US$ 1,350,000).[6] In terms of sales, 13% report monthly sales of less than one minimum legal monthly wage (MLMW),[7] 29.2% report sales of between one and three MLMW, and 34.4% report sales of between three and nine MLMW. Most firms report profits per month of less than two MLMW (79.7%); 9.7% report monthly profits of between two and three MLMW, and only 10.4% report profits of more than three MLMW. A total of 65.5% do not keep any type of accounting records; 29% have a log book in which they register their operations; and 3% state they that use some other type of accounting system. Only 2.3% say that they keep formal accounting records. A full 76% of the firms do not give any type of receipt to their clients; 7.3% give a receipt; and only 16.7% bill clients after the transaction is completed.

Some of these statistics can be compared with the results from a 2010 nationwide survey conducted by the National Statistics Department (*Departamento Administrativo Nacional de Estadística* (DANE)) of Colombia. This survey includes only firms with fewer than 10 employees. Table 1 shows the results, which indicate that the firms in the baseline sample are smaller, in terms of both income and number of employees, than the firms in the DANE sample. This difference is to be expected, since the firms covered in the DANE survey include both informal and formal businesses, while the firms in our baseline sample are all informal-sector businesses and, as attested to by the economic literature, informal businesses tend to be smaller than formal enterprises (La Porta and Shleifer, 2008). The distribution of the types of activity is similar, although services are under-represented in our sample relative to the DANE sample. This may be attributable to the fact that we restricted our sample to firms in Bogotá, whereas the DANE survey covered the entire country.

[5] This was equivalent to 166.7 minimum legal monthly wages (MLMW) at 2011 prices converted to dollars using the exchange rate as of December 31, 2011.

[6] This amount was equivalent to 500 minimum legal monthly wages (MLMW) at 2011 prices converted to dollars using the exchange rate as of December 31, 2011.

[7] A minimum legal monthly wage was equivalent to Col$ 515,000 in 2011 (US$ 265 using the exchange rate for December 31, 2011).

4.3. Self-Reported Reasons for Operating Informally

Firm owners were asked what they knew about the registration process and what they believed to be the costs and benefits of obtaining a taxpayer identification number and business license. A total of 48% of the owners said that they knew about business licenses, and 54.4% said that they knew about taxpayer identification numbers. Those who admitted knowing about taxpayer identification numbers and business licenses were then asked why they did not have them. Regarding the identification numbers, 32.8% said that they were "useless"; 27% said that they "could not afford one because their business is too small or young"; and, 17.2% felt that they "do not have enough time to obtain one". As for business licenses, 21% responded that they were "useless" and another 21% said that "it would mean that you would have to pay taxes"; 18% felt that they "could not afford one because my business is too small or young"; another 11.5% answered that they already had one (which was false, according to the data obtained from the CCB).

With respect to the potential benefits of operating formally, the most frequent answers were "avoiding penalties" (41.6%), "improving the image of the firm" (33.5%), "having greater growth opportunities" (23.5%), "having more marketing opportunities" (20.1%), "having access to financial markets" (19%) and "gaining access to inputs" (15%). Only 10% of the entrepreneurs answered that operating formally does not have any benefits.

4.4. Experimental Group Balance

The sample of 1,927 firms was randomly divided into three groups. The first one, with 362 firms (19% of the sample), was the control group and did not receive any treatment. The second group, made up of 1,017 firms (53% of the total), was designated Group ITT1. The third group, composed of 548 firms (28% of the total), was designated Group ITT2.

Tables 2 and 3 show the balance between each treatment group and the control group. In both tables, we can see that, for almost all the variables, we do not reject the null hypothesis of no mean differences among groups. There are only two exceptions in Table 2, where only two variables are unbalanced (out of 59) at the 10% significance level. This provides evidence that the control group and Group ITT1, on the one hand, and the control group and Group ITT2, on the other hand, were statistically equivalent before the treatment.

5. Empirical Results

5.1. Take-up

Not every firm assigned to a treatment group accepted the invitation to join one of the treatment groups. Possible reasons for this include the following: some firms may have closed down or moved between the time that the baseline survey was conducted and the time that the invitations were issued; they may have changed their telephone number; there may have been an error in the

number recorded during the survey; or they may have never received the letter of invitation sent because there was a change of addresses in Bogota during the first half of 2011.

Of the 1,017 firms assigned to Group ITT1, 119 did not receive the invitation and 762 received the invitation but did not accept the treatment. Therefore, from that group, only 136 firms actually received Treatment One (T1). Similarly, of the 548 firms assigned to Group ITT2, 281 could not be contacted in order to arrange a meeting with a CCB agent and 172 were contacted but did not agree to a meeting. Thus, only 95 firms actually received Treatment Two (T2).

Table 4 presents the relationship between assignment to treatment and actual take-up, which can be described as:

$$Firm\ take-up_i = \alpha + \gamma\ ITT(k)_i + \beta\ X_i + \varepsilon_i \quad (1)$$

Where the dependent variable is a dummy that takes the value of 1 if firm *i* takes up the treatment that it has been assigned to; $ITT(k)_i$ is a dummy that takes the value of 1 if firm *i* belongs to Group ITT1 or Group ITT2 (see columns 1, 2 and 3 in Table 4) or either of them separately (columns 4, 5 and 6 in Table 4), and X_i is a set of control variables measured at baseline. Some specifications include as regressors the age of the business and an interaction between the age of the business and the corresponding intention–to-treat variable. All the specifications are presented with and without variables that control for the characteristics of the firm (locality, area and sector of the business, number of employees and average education level of the staff).

The likelihood of receiving the treatment can be gauged on the basis of a firm's assignment to either treatment (ITT) or to Treatment One (ITT1) or Treatment Two (ITT2). Specifically, being assigned to either treatment raises the likelihood of take-up by 14 percentage points. On the other hand, being assigned to Treatment One increases the likelihood of take-up by 15 percentage points, while being assigned to Treatment Two increases the likelihood of take-up by 16 percentage points. These results indicate that the effects of assignment to Group ITT1 and Group ITT2 on the likelihood of take-up are similar.

In regard to the age of the business, columns 3 and 6 show that older firms are more likely to take up treatment, while the interaction between a firm's age and the intention-to-treat dummy is significant only for Group ITT1.[8]

5.2 Intention-to-Treat Effects

We now analyze the official records of the CCB to determine which of the firms in our sample became formal after the treatments. We found that some of the firms in each group did so: 9 firms from the control group started to operate formally; of the firms in Group ITT1, 17 firms that were

[8] Other specifications, including nonlinear terms for the firms' age, have been considered, but the additional terms were not statistically significant.

never contacted or that rejected the treatment and 12 firms that received the treatment started to operate formally; and, finally, of the firms in Group ITT2, 17 firms that were never contacted or rejected the treatment and 27 firms that received the treatment formalized.

Table 5 shows the impact of being assigned to treatment on the decision regarding formalization, which can be described as follows:

$$Firm\ is\ formal\ in\ year\ t_i = \alpha + \gamma\ ITT(k)_i + \beta\ X_i + \varepsilon_i \quad (2)$$

Columns 1 to 6 present the results of the model in which the dependent variable is a dummy that takes a value of 1 if a firm operates formally in 2012; columns 7 to 12 provide the same information in the event that a firm operates formally in 2013. Both dependent variables were obtained from the CCB records. As in Table 4, the independent variables are assignment to any treatment (ITT), on the one hand (columns 1, 2, 3, 7, 8 and 9), or assignment to Treatment One (ITT1) or Treatment Two (ITT2), on the other hand (columns 4, 5, 6, 10, 11 and 12). Again, some specifications include independent variables for the age of the business and an interaction between the age of the business and the intention-to-treat variable. All specifications are presented with and without a set of variables that control for the characteristics of the firms.

Being assigned to any treatment raises the likelihood of formalization by 2.1 or 2.9 percentage points in 2012, depending on the specification. However, when we evaluate the impact of each treatment separately, we find that assignment to Treatment One has no effect on the likelihood of formalization. On the other hand, assignment to Treatment Two has an effect of 5.5 or 6 percentage points in 2012, depending on the specification. Yet, one year later, in 2013, none of the treatments had any effect on the decision to formalize.

All the specifications provide evidence that the age of the business is not significant in terms of the decision to formalize, regardless of which intention-to-treat group the firm was in.

Although some firms from every group have formalized, more of the firms from Group ITT2 formalized after the treatment. However, in order to ascertain whether the firms from that group formalized because of the treatment, it is important to determine whether the formal firms from that group actually received Treatment Two. Table 6 shows that more firms from Group T2 formalized after the treatment and, specifically, that 4.9% of the firms that were assigned to Group ITT2 formalized after the treatment. This percentage is higher than the percentage of firms from other groups that formalized (2.9% for Group ITT1; 1.1% for Group T1; 2.5% for the control group).

5.3 The Effects of Receiving Treatment

Table 7 shows the impact that receiving any of the treatments has on the decision to operate formally. We rely on an instrumental variables (IV) identification strategy where we instrument the treatment variable with the assignment of treatment (ITT). This IV strategy provides evidence about

the causal relationship between the treatment and the formalization decision. Specifically, we estimate the following system:

$$T(k)_i = \alpha + \delta\, ITT(k)_i + \theta\, X_i + \nu_i \quad (3)$$

$$Firm\ is\ formal\ in\ year\ t = \alpha + \gamma\, \widehat{T(k)_\iota} + \beta\, X_i + \varepsilon_i \quad (4)$$

Where regressions (3) and (4) are the first and second stages of the 2SLS estimator of the local average treatment effect. As in Table 5, we present different specifications for the different dependent variables (2012 or 2013).

The results indicate that receiving any treatment (TT) raises the likelihood of formalization during the next year by 14 or 20 percentage points, depending on the specification. However, this effect is derived entirely from the second treatment. If we evaluate each treatment separately, we find that the workshop (Treatment One) had no effect on the formalization decision. In contrast, receiving visits from CCB agents (Treatment Two) raised the likelihood of formalization by 30, 32 or 37 percentage points, depending on the specification. Once again, there was no effect exerted by any of the treatments in the following year (2013) and, for all the specifications, the age of the business was not significant in terms of the likelihood of formalization.

These tables yield two important results. First, the workshops are ineffective in raising the likelihood of formalization. In contrast, the CCB agents' visits increased the likelihood of formalization. There are several possible explanations for this differential result. One possibility is that Treatment Two is more effective than the workshops. Another alternative could be that the firms that decided to take up Treatment Two are different from the ones that received Treatment One. Also, obviously, the real reason could be a combination of these two possibilities. However, we do not have sufficient experimental variability to determine which of these options is an accurate explanation of why Treatment Two increased the likelihood of formalization while Treatment One did not. Table 8 shows a comparison of the groups that self-select into receiving Treatment One and Treatment Two that may be useful in determining whether there were any significant differences between the groups before the treatment.

As Table 8 shows, firms that received Treatment Two have been in business for a longer period of time, have higher asset values, profits and investments, and belong to higher socioeconomic strata.[9] Thus, firms with these characteristics seem to have been more predisposed to take up Treatment Two. This result could explain why Treatment Two had an effect on firms' formalization decisions while Treatment One did not. However, we cannot rule out the possibility that differences in the treatments themselves are what made one treatment more effective than the other.

[9] In Colombia, socioeconomic strata are area classifications on a scale from 1 to 6 (where 1 represents the lowest-income area and 6 the highest). Based on this classification, the lower strata (1 and 2) receive subsides for public services, while the higher strata (5 and 6) have to pay taxes to fund them.

Another important result is that Treatment Two influenced the decision to operate formally only in the first year after treatment; the following year, when newly formalized firms had to renew their license, the treatment had no effect on the formalization outcome variable. In other words, firms that were persuaded to formalize after the treatment were operating informally again in 2013. This result indicates that the types of treatments studied in this paper do not have a sustained effect. It is important to note that this result was not generated by decisions on the part of control-group firms to formalize a year after the treatment, thereby "catching up" with the outcome for the treatment group, but rather by the decision of formalized firms not to renew their legal certification (see Figure 1).

This result provides evidence that, at least in Colombia, the fixed costs of formalization are not what prevents firms from operating in the formal sector of the economy. Even when firms are already operating formally, they sometimes decide to return to the informal sector. Thus, this choice must be based on other types of margins. This result backs up the results of De Mel et al. (2008 and 2013), which indicate that firms remain informal, not because of burdensome entry regulations that deter them from operating formally, but rather because they perceive the benefits of operating formally as being quite modest at best. It is important to recall that, for those firms that registered for the first time after the experimental Act No. 1429 had exempted them from paying taxes during the first two years and from paying the full fee for renewing their business licenses, the costs of remaining formal during 2013 were extremely low. This, in turn, suggests that firms perceive the benefits of formality as being so modest that, even when the costs of continuing to operate formally have been greatly reduced, they nonetheless prefer to return to the informal sector.

6. Conclusions

In most developing countries, policymakers are concerned about the extent of informal economic activity and its consequences. Although there are several factors that could affect the size of the informal sector in equilibrium (Galiani and Weinschelbaum, 2012), ever since the work of De Soto (1989), a great deal of emphasis has been placed on the burden represented by fixed formal-sector entry costs. While there is an ample body of literature on the evaluation of the costs and benefits of formality, there is much less experimental evidence regarding the impact of fixed costs on the decision to operate formally.

This paper analyzes the impact of the elimination of initial registration fixed costs on the decision of informal firms to operate formally in Colombia. We rely on a randomized control trial (RCT) strategy for evaluating the effectiveness of two types of interventions which the CCB conducts (workshops and meetings with CCB agents). These two interventions reduce the fixed costs of registration by: (1) giving precise information about the costs and benefits of formalization and the procedure for obtaining a business license (m*atricula mercantil*), and (2) reducing the non-monetary costs of the registration process. In addition, Act No. 1429 reduced initial registration costs by establishing that the registration process was to be cost-free for small businesses that were registering for the first time and by exempting such firms from paying taxes for the first two years. Thus, the CCB's elimination of all the transaction costs associated with registration as a formal-sector enterprise and the entry into force of Act No. 1429, which did away with initial registration fees for such firms, provided us with an ideal natural experiment to use in studying the effects of the elimination of

initial fixed costs on firms' decisions as to whether to operate formally or to remain in the informal sector.

We have two important results to report. First, while the workshop treatment had no effect on formalization decisions, meetings with CCB agents raised the likelihood that a business would begin to operate formally by 5.5 percentage points for the population of all the firms that were invited to participate at random (in other words, this is the intention-to-treat parameter) and by 32 percentage points for the firms that accepted the invitation (in other words, this is the local average treatment effect). Second, and very interestingly, the effect of the treatment did not persist over time. After a year of formal operation, both effects disappeared. What it is more, this was not the result of decisions by firms in the control group to formalize and thus "catch up" with the others, but was instead a reflection of the fact that formalized firms decided not to renew their licenses. This is very interesting, since it suggests that some of the firms that experiment with formality do not find it sufficiently beneficial to remain in the formal sector even when they do not have to pay taxes and only have to pay 50% of the usual fee for renewing their license.

These results indicate that substantially reducing the fixed costs of operating formally does not play a key role in firms' formalization choices, since it has no lasting effect on their decision. Specifically, firms choose to be formal when it is cost-free but, the following year, when they are faced with a small monetary cost, many of them decide to return to the informal sector. This paper thus corroborates the results of De Mel et al. (2013), since it suggests that firms remain informal, not because burdensome entry costs deter them from operating formally, but rather because they perceive the benefits of formality to be modest at best.

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Tables

Table 1: Comparison between DANE firms and sample firms.

Sector of economic activity	% of businesses		Average workers		Income (in thousands)		Any type of accounting	
	DANE	**Sample**	**DANE**	**Sample**	**DANE**	**Sample**	**DANE**	**Sample**
Trade	57.7	63.5	1.8	1.5	4.580	3.459	40.8	69.1
Services	32.8	23.7	2.3	1.8	4.090	3.101	34.8	57.1
Industry	9.5	12.8	2.5	1.6	4.140	4.025	47.9	63.4
Total	100	100	2.0	1.7	4.380	3.444	39.4	65.5

Table 2: Mean Comparison between firms assigned to Treatment One and firms assigned to Control Group

Variable		Number of firms assigned to Treatment One	Number of firms assigned to control group	Average for firms assigned to Treatment One	Average for firms assigned to control group	Difference	P-value
Age of the business (in years)		1.003	355	8,89	9,17	0,28	0,68
Visibility		1.017	362	91,90	90,30	-1,60	0,35
Personnel (last month)	Owners	1.017	362	1,09	1,10	0,01	0,67
	Unpaid workers	1.017	362	0,04	0,06	0,01	0,45
	Employees	1.017	362	0,56	0,55	-0,01	0,87
	Total personnel	1.017	362	1,69	1,71	0,01	0,87
Pays payroll taxes	*Caja de Compensación*	983	349	1,70	2,30	0,60	0,51
	ICBF	971	346	0,90	1,40	0,50	0,42
	Pensions	988	349	4,60	5,20	0,60	0,65
	ARP	985	349	3,10	3,40	0,30	0,79
	Health	989	349	16,40	17,80	1,40	0,55
	SENA	971	346	1,00	1,40	0,40	0,53
Requested a loan in the last year		1.017	362	22,90	19,90	-3,00	0,24
Knows what the *Matrícula Mercantil* business license is		1.017	362	45,90	50,30	4,40	0,15
Knows what the taxpayer ID number (RUT) is		751	269	56,10	53,50	-2,60	0,48
Probability that the firm agrees to obtain a business license		900	316	44,20	41,54	-2,66	0,31
Probability that the firm agrees to obtain a tax ID number		721	264	51,91	52,65	0,74	0,80
Total expenditure in the six-month period (USD)		1.017	362	7562,05	6955,28	-606,77	0,48
Firms surveyed in the follow-up exercise		1.017	362	41,60	39,50	-2,10	0,49
Area of the shop	Less than 10 m2	1.017	362	0,64	0,67	0,03	0,38
	Between 10 and 50 m2	1.017	362	0,31	0,27	-0,03	0,22
	Between 51 and 100 m2	1.017	362	0,04	0,06	0,02	0,19
	More than 100 m2	1.017	362	0,01	0,00	-0,01	0,11
Sector of activity	Manufacturing	1.017	362	0,13	0,13	0,00	0,85
	Commerce	1.017	362	0,64	0,66	0,02	0,60
	Hotels and restaurants	1.017	362	0,15	0,11	-0,04	0,10
	Real estate services	1.017	362	0,02	0,01	-0,01	0,30
	Transportation and communications	1.017	362	0,03	0,04	0,01	0,25
	Other services	1.017	362	0,04	0,05	0,01	0,39
Socioeconomic stratum of the business	Strata 1and 2	1.017	362	0,20	0,20	0,00	0,95
	Strata 3 and 4	1.017	362	0,80	0,80	0,00	0,98
	Strata 5 and 6	1.017	362	0,00	0,00	0,00	0,55
Branches	Business without branches	1.017	362	0,96	0,98	0,02	0,08
	One of the branches of the business	1.017	362	0,03	0,02	-0,01	0,19
	The main branch of the business	1.017	362	0,01	0,00	-0,01	0,24

Asset value	Less than US$ 47,739	1.017	362	0,96	0,96	0,00	0,89
	Between US$ 47,739 and US$ 71,607	1.017	362	0,00	0,01	0,00	0,48
	More than US$ 71,607	1.017	362	0,03	0,03	-0,01	0,72
Profits (monthly average in last 6 months)	Less than US$ 142	1.017	362	0,22	0,22	0,00	0,97
	Between US$ 142 and US$ 286	1.017	362	0,27	0,29	0,02	0,50
	Between US$ 286 and US$ 572	1.017	362	0,27	0,26	-0,01	0,80
	Between US$ 572 and US$ 859	1.017	362	0,09	0,09	0,00	0,98
	More than US$ 859	1.017	362	0,11	0,09	-0,02	0,27
Income from sales (monthly average in last 6 months)	Less than US$ 286	1.017	362	0,13	0,13	0,00	0,95
	Between US$ 286 and US$ 859	1.017	362	0,37	0,38	0,02	0,58
	Between US$ 856 and US$ 2,577	1.017	362	0,34	0,35	0,01	0,84
	Between $2,577 and $7,733 USD	1.017	362	0,13	0,11	-0,02	0,44
	More than US$ 7,733	1.017	362	0,04	0,03	-0,01	0,48
Investment (in last 6 months)	Less than US$ 286	1.017	362	0,12	0,11	-0,01	0,60
	Between US$ 286 and US$ 859	1.017	362	0,15	0,17	0,02	0,53
	Between US$ 856 and US$ 2,577	1.017	362	0,13	0,11	-0,02	0,36
	Between US$ 2,577 and US$ 7,733	1.017	362	0,07	0,07	0,01	0,65
	More than US$ 7,733	1.017	362	0,03	0,03	0,00	0,98
Personnel´s level of education (as of the last month)	Personnel with primary education	1.017	362	0,52	0,49	-0,02	0,62
	Personnel with secondary education	1.017	362	0,95	1,00	0,05	0,47
	Personnel with technical education	1.017	362	0,14	0,14	0,00	0,95
	Personnel with undergraduate education	1.017	362	0,07	0,04	-0,02	0,15
	Personnel with graduate education	1.017	362	0,00	0,01	0,00	0,78
	Personnel with other level of education	1.017	362	0,02	0,03	0,01	0,43

Table 3: Mean Comparison between firms assigned to Treatment Two and firms assigned to Control Group

Variable		Number of firms assigned to Treatment Two	Number of firms assigned to control group	Average for firms assigned to Treatment Two	Average for firms assigned to control group	Difference	P-value
Age of the business (in years)		538	355	8,61	9,17	0,56	0,46
Visibility		548	362	90,70	90,30	-0,40	0,86
Personnel (last month)	Owners	548	362	1,09	1,10	0,01	0,84
	Unpaid workers	548	362	0,03	0,06	0,03	0,11
	Employees	548	362	0,62	0,55	-0,07	0,36
	Total personnel	548	362	1,74	1,71	-0,04	0,66
Pays payroll taxes	*Caja de Compensación*	524	349	2,10	2,30	0,20	0,85
	ICBF	513	346	0,80	1,40	0,60	0,35
	Pensions	527	349	5,70	5,20	-0,50	0,73
	ARP	527	349	4,20	3,40	-0,80	0,58
	Health	528	349	18,60	17,80	-0,80	0,77
	SENA	512	346	0,80	1,40	0,60	0,35
Requested a loan in last year		548	362	20,80	19,90	-0,90	0,74
Knows what the *Matrícula Mercantil* business license is		548	362	50,20	50,30	0,10	0,98
Knows what the taxpayer ID number (RUT) is		402	269	52,00	53,50	1,50	0,70
Probability that the firm agrees to obtain a business license		495	316	43,16	41,54	-1,61	0,57
Probability that the firm agrees to obtain a tax ID number		382	264	50,66	52,65	1,99	0,54
Total expenditure in the six-month period (USD)		548	362	7.128	6.955	-172,46	0,86
Firms surveyed in the follow-up exercise		548	362	40,90	39,50	-1,40	0,68
Area of the shop	Less than 10 m2	548	362	0,64	0,67	0,02	0,47
	Between 10 and 50 m2	548	362	0,29	0,27	-0,02	0,45
	Between 51 and 100 m2	548	362	0,05	0,06	0,01	0,40
	More than 100 m2	548	362	0,01	0,00	-0,01	0,10
Sector of activity	Manufacturing	548	362	0,13	0,13	0,00	0,99
	Commerce	548	362	0,61	0,66	0,05	0,13
	Hotels and restaurants	548	362	0,14	0,11	-0,03	0,18
	Real estate services	548	362	0,01	0,01	0,00	0,69
	Transportation and communications	548	362	0,05	0,05	0,00	0,83
	Other services	548	362	0,06	0,04	-0,02	0,18
Socioeconomic stratum of the business	Strata 1 and 2	548	362	0,18	0,20	0,02	0,56
	Strata 3 and 4	548	362	0,81	0,80	-0,01	0,81
Branches	Business without branches	548	362	0,97	0,98	0,01	0,28

	One of the branches of the business	548	362	0,02	0,02	0,00	0,70
	The main branch of the business	548	362	0,01	0,00	-0,01	0,17
Asset value	Less than US$ 47,739	548	362	0,96	0,96	0,00	0,81
	Between US$ 47,739 and US$ 71,607	548	362	0,01	0,01	0,00	0,54
	More than US$ 71,607	548	362	0,03	0,03	0,00	0,98
Profits (monthly average in last 6 months)	Less than US$ 142	548	362	0,24	0,22	-0,02	0,45
	Between US$ 142 and US$ 286	548	362	0,27	0,29	0,02	0,53
	Between US$ 286 and US$ 572	548	362	0,24	0,26	0,02	0,56
	Between US$ 572 and US$ 859	548	362	0,09	0,09	0,00	0,89
	More than US$ 859	548	362	0,10	0,09	-0,01	0,64
Income from sales (monthly average in last 6 months)	Less than US$ 286	548	362	0,14	0,13	-0,01	0,62
	Between US$ 286 and US$ 859	548	362	0,36	0,38	0,03	0,39
	Between US$ 856 and US$ 2,577	548	362	0,35	0,35	0,00	0,92
	Between $2,577 and $7,733 USD	548	362	0,12	0,11	-0,01	0,68
	More than US$ 7,733	548	362	0,04	0,03	-0,01	0,38
Investment (in last 6 months)	Less than US$ 286	548	362	0,13	0,11	-0,02	0,37
	Between US$ 286 and US$ 859	548	362	0,16	0,17	0,01	0,64
	Between US$ 856 and US$ 2,577	548	362	0,14	0,11	-0,03	0,13
	Between US$ 2,577 and US$ 7,733	548	362	0,07	0,07	0,00	0,95
	More than US$ 7,733	548	362	0,02	0,03	0,00	0,91
Personnel´s level of education (as of the last month)	Personnel with primary education	548	362	0,55	0,49	-0,06	0,29
	Personnel with secondary education	548	362	0,95	1,00	0,05	0,51
	Personnel with technical education	548	362	0,17	0,14	-0,03	0,40
	Personnel with undergraduate education	548	362	0,04	0,04	0,00	0,89
	Personnel with graduate education	548	362	0,01	0,01	0,00	0,85
	Personnel with other level of education	548	362	0,03	0,03	0,00	0,86

Table 4: The relationship between assignment to treatment and actual take-up

Dependent variable: Dummy = 1 if treated	(1)	(2)	(3)	(4)	(5)	(6)
ITT	0.148***	0.146***	0.157***			
	(0.00897)	(0.00950)	(0.0122)			
ITT 1				0.130***	0.156***	0.155***
				(0.0111)	(0.0141)	(0.0147)
ITT 2				0.177***	0.162***	0.161***
				(0.0166)	(0.0205)	(0.0204)
Age of the business		-0.000267	0.000698**	-0.000246		0.000727**
		(0.000645)	(0.000335)	(0.000641)		(0.000339)
ITT*Age of the business			-0.00122			
			(0.000782)			
ITT 1*Age of the business					-0.00280***	-0.00286***
					(0.000759)	(0.000816)
ITT 2*Age of the business					0.00172	0.00193
					(0.00158)	(0.00156)
Constant	0.0000	-0.0379	-0.0468	-0.0403	0.0000	-0.0533
	(0.0000)	(0.0388)	(0.0383)	(0.0387)	(0.0000)	(0.0384)
Observations	1,927	1,881	1,881	1,881	1,896	1,881
R-squared	0.032	0.057	0.057	0.061	0.040	0.066
F statistic	270.72	13.91	13.22	13.27	66.75	12.10
Locality dummies		x	x	x		x
Area of the business dummies		x	x	x		x
Sector dummies		x	x	x		x
Number of workers		x	x	x		x
Average education of the workers		x	x	x		x

Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 5: The impact of being assigned to treatment on the decision of formalization

	2012						2013					
Dependent variable: Dummy = 1 if firm is formal	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ITT	0.0218**	0.0210**	0.0298**				0.00573	0.00384	0.0101			
	(0.00977)	(0.0103)	(0.0128)				(0.00661)	(0.00669)	(0.00878)			
ITT 1				0.00365	0.00343	0.0130				0.00277	0.00207	0.0116
				(0.00971)	(0.0103)	(0.0127)				(0.00684)	(0.00702)	(0.00936)
ITT 2				0.0554***	0.0537***	0.0603***				0.0113	0.00713	0.00750
				(0.0142)	(0.0145)	(0.0179)				(0.00864)	(0.00834)	(0.0104)
Age of the business		-0.000199	0.000560		-0.000176	0.000567		0.000073	0.000627		0.000074	0.000633
		(0.000381)	(0.000887)		(0.000376)	(0.000887)		(0.000273)	(0.000793)		(0.000273)	(0.000794)
ITT * Age of the business			-0.000958						-0.000700			
			(0.000948)						(0.000828)			
ITT 1 * Age of the business						-0.00105						-0.00106
						(0.000927)						(0.000817)
ITT 2 * Age of the business						-0.000712						-0.000014
						(0.00125)						(0.000991)
Constant	0.0249***	0.00288	-0.00415	0.0249***	0.000224	-0.00694	0.0115**	0.00904	0.00388	0.0115**	0.00873	0.00264
	(0.00819)	(0.0274)	(0.0280)	(0.00819)	(0.0271)	(0.0280)	(0.00570)	(0.0149)	(0.0154)	(0.00570)	(0.0148)	(0.0153)
Observations	1,927	1,881	1,881	1,927	1,881	1,881	1,861	1,817	1,817	1,861	1,817	1,817
R-squared	0.002	0.017	0.017	0.014	0.028	0.029	0.000	0.007	0.008	0.001	0.007	0.009
F statistic	4.97	2.79	2.64	9.11	2.54	2.36	0.75	1.43	1.34	0.92	1.35	1.21
Locality dummies		x	x		x	x		X	x		x	x
Area of the business dummies		x	x		x	x		X	x		x	x
Sector dummies		x	x		x	x		X	x		x	x
Number of workers		x	x		x	x		X	x		x	x
Average education of the workers		x	x		x	x		X	x		x	x

Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Percentage of formal firms by group

Group	Formal firms	Total
ITT1	29 (2.9%)	1017
T1	12 (1.1%)	
ITT2	44 (8%)	548
T2	27 (4.9%)	
CONTROL	9 (2.5%)	362

Table 7: The impact of receiving treatment on the decision to operate formally

Dependent variable: Dummy = 1 if firm is formal	2012						2013					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Treatment	0.148**	0.144**	0.201**				0.0384	0.0261	0.0735			
	(0.0656)	(0.0696)	(0.0890)				(0.0442)	(0.0454)	(0.0639)			
Treatment 1				0.0273	0.0267	0.119				0.0206	0.0160	0.112
				(0.0725)	(0.0789)	(0.101)				(0.0509)	(0.0542)	(0.0841)
Treatment 2				0.320***	0.302***	0.373***				0.0633	0.0393	0.0447
				(0.0790)	(0.0788)	(0.107)				(0.0485)	(0.0460)	(0.0625)
Age of the business		-0.000160	0.000477		-0.000444	0.000424		0.000079	0.000622		0.000054	0.000617
		(0.000369)	(0.000907)		(0.000369)	(0.000906)		(0.000269)	(0.000821)		(0.000254)	(0.000818)
Treatment * Age of the business			-0.00704						-0.00592			
			(0.00858)						(0.00754)			
Treatment 1 * Age of the business						-0.0140						-0.0151
						(0.0144)						(0.0135)
Treatment 2 * Age of the business						-0.00696						-0.000419
						(0.00655)						(0.00502)
Constant	0.0249***	0.00832	0.00157	0.0249***	0.0122	0.00272	0.0115**	0.01000	0.00347	0.0115**	0.0103	0.00143
	(0.00819)	(0.0256)	(0.0264)	(0.00819)	(0.0248)	(0.0260)	(0.00570)	(0.0148)	(0.0164)	(0.00570)	(0.0150)	(0.0171)
Observations	1,927	1,881	1,881	1,927	1,881	1,881	1,861	1,817	1,817	1,861	1,817	1,817
R-squared	0.053	0.064	0.054	0.074	0.085	0.070	0.007	0.011		0.006	0.011	
F statistic	5.06	1.58	1.54	10.06	2.26	2.08	0.75	1.28	0.88	0.92	1.22	0.95
Locality dummies		x	x		x	x		X	x		x	x
Area of the business dummies		x	x		x	x		X	x		x	x
Sector dummies		x	x		x	x		X	x		x	x
Number of workers		x	x		x	x		X	x		x	x
Average education of the workers		x	x		x	x		X	x		x	x

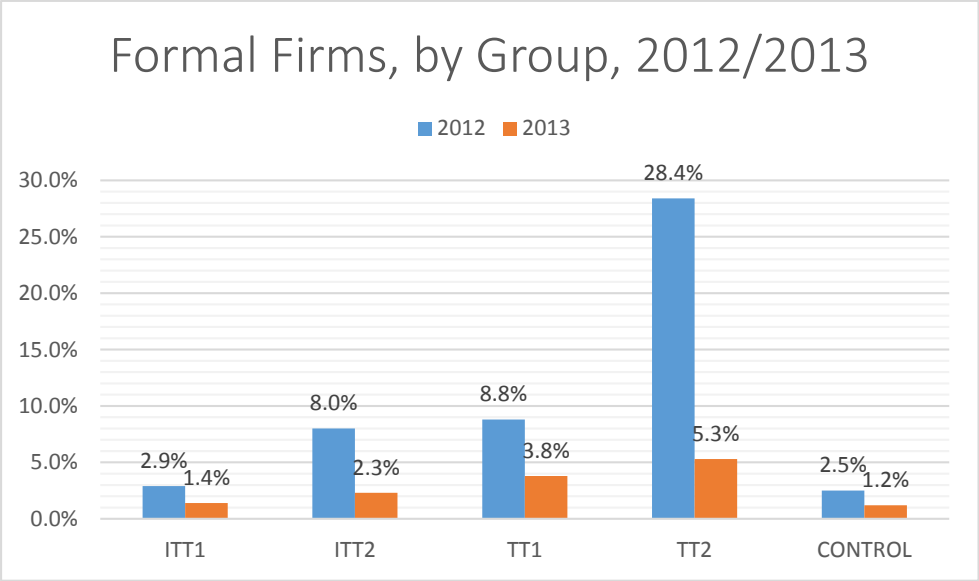
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 8: Mean Comparison between firms that received Treatment One and firms that received Treatment Two

Variable		Number of firms that received Treatment One	Number of firms that received Treatment Two	Average for firms that received Treatment One	Average for firms that received Treatment Two	P-value
Age of the business (in years)		131	95	6,37	9,72	0,01
Visibility		136	95	89,00	91,60	0,52
Personnel (last month)	Owners	136	95	1,15	1,17	0,74
	Unpaid workers	136	95	0,12	0,05	0,23
	Employees	136	95	0,59	0,79	0,20
	Total personnel	136	95	1,85	2,01	0,34
Pays payroll taxes	*Caja de Compensación*	136	90	2,90	2,20	0,74
	ICBF	134	90	1,50	1,10	0,81
	Pensions	136	91	3,70	8,80	0,11
	ARP	136	91	2,90	5,50	0,34
	Health	136	91	18,90	28,60	0,07
	SENA	134	90	1,50	1,10	0,81
Requested a loan in last year		136	95	37,50	26,30	0,08
Knows what the *Matrícula Mercantil* business license is		136	95	52,90	57,90	0,46
Knows what the taxpayer ID number (RUT) is		96	66	63,50	65,20	0,84
Probability that the firm agrees to obtain a business license		122	87	49,71	50,53	0,89
Probability that the firm agrees to obtain a tax ID number		94	63	55,73	64,38	0,19
Total expenditure in the six-month period (USD)		136	95	7113,55	8605,38	0,32
Firms surveyed in the follow-up exercise		136	95	58,80	64,20	0,41
Area of the shop	Less than 10 m2	136	95	0,54	0,52	0,76
	Between 10 and 50 m2	136	95	0,38	0,38	0,95
	Between 51 and 100 m2	136	95	0,07	0,08	0,77
	More than 100 m2	136	95	0,01	0,01	0,80
Sector of activity	Manufacturing	136	95	0,15	0,19	0,49
	Commerce	136	95	0,56	0,45	0,11
	Hotels and restaurants	136	95	0,15	0,26	0,04
	Real estate services	136	95	0,04	0,01	0,14
	Transportation and communications	136	95	0,05	0,04	0,74
	Other services	136	95	0,04	0,04	0,84
Socioeconomic strata of the business	Strata 1and 2	136	95	0,21	0,08	0,01
	Strata 3 and 4	136	95	0,79	0,91	0,02
Branches	Business without branches	136	95	0,94	0,98	0,17
	One of the branches of the business	136	95	0,04	0,02	0,35

	The main branch of the business	136	95	0,02	0,00	0,24
Asset value	Less than US$ 47,739	136	95	0,99	0,92	0,01
	Between US$ 47,739 and US$ 71,607	136	95	0,00	0,01	0,23
	More than US$ 71,607	136	95	0,01	0,04	0,08
Profits (monthly average in last 6 months)	Less than US$ 142	136	95	0,18	0,20	0,76
	Between US$ 142 and US$ 286	136	95	0,29	0,24	0,39
	Between US$ 286 and US$ 572	136	95	0,32	0,20	0,04
	Between US$ 572 and US$ 859	136	95	0,05	0,19	0,00
	More than US$ 859	136	95	0,13	0,13	0,98
Income from sales (monthly average in last 6 months)	Less than US$ 286	136	95	0,08	0,08	0,93
	Between US$ 286 and US$ 859	136	95	0,34	0,31	0,60
	Between US$ 856 and US$ 2,577	136	95	0,45	0,45	0,95
	Between $2,577 and $7,733 USD	136	95	0,11	0,14	0,55
	More than US$ 7,733	136	95	0,02	0,02	0,96
Investment (in last 6 months)	Less than US$ 286	136	95	0,15	0,13	0,66
	Between US$ 286 and US$ 859	136	95	0,15	0,15	1,00
	Between US$ 856 and US$ 2,577	136	95	0,20	0,15	0,32
	Between US$ 2,577 and US$ 7,733	136	95	0,05	0,05	0,97
	More than US$ 7,733	136	95	0,01	0,04	0,08
Personnel´s level of education (as of the last month)	Personnel with primary school	136	95	0,46	0,44	0,84
	Personnel with secondary school	136	95	1,12	1,21	0,55
	Personnel with technical education	136	95	0,17	0,25	0,23
	Personnel with undergraduate education	136	95	0,08	0,08	0,94
	Personnel with graduate education	136	95	0,00	0,00	1,00
	Personnel with other level of education	136	95	0,02	0,02	0,97

Figure 1


Formal Firms, by Group, 2012/2013
2012
2013
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
2.9%
1.4%
8.0%
2.3%
8.8%
3.8%
28.4%
5.3%
2.5%
1.2%
ITT1
ITT2
TT1
TT2
CONTROL