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# The Impact of the One-Stop Shop for Business Registration in the Dominican Republic

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**Abstract**

Digital one-stop shops for firm registration can significantly reduce costs and increase access to information for firms entering the formal sector. This paper examines the impact of a nationwide program with a one-stop registration shop and lower registration fees. In addition to analyzing its impact on the number of firms registering in the formal sector, this study explores how the program reshapes the labor market for women and men. The empirical setting, the Dominican Republic, is characterized by high levels of firm and labor informality. The government launched the digital one-stop shop called Formalízate in 2013. To analyze its impact, this paper takes advantage of the sequential rollout of the program across provinces in the country. Results show that the launch of the program in a province is associated with a greater number of micro firms entering the formal market. Interestingly, these firms are concentrated in sectors in which informality was high prior to rollout of the program, especially the commerce and tourism sector. In addition, the results show that women's participation in the labor forced is impacted by the program, but men's participation is not. More specifically, the presence of Formalízate increased women's participation in the labor market as self-employed entrepreneurs.

**JEL Classifications:** O17; O12; J40

**Keywords:** formalization, entry regulation, impact evaluation, micro firms, self-employment

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## 1. Introduction

In many countries, economic activity occurs in the informal sector, where micro and small firms are typically the main participants. For these firms, formality is a choice that depends on several factors, including the costs of registration in the formal sector and the regulation burden, financial market development, and the quality of the legal system. High levels of informality are a key characteristic of low- and middle-income countries. There are several consequences of informality that are of interest to policymakers, including the reduction of the expected tax base, which negatively impacts the provision of public goods for society; the lack of coverage and protection of workers[1] (i.e., pension systems and health insurance); and the potential inefficient allocation of resources, as formal and informal firms compete in the same market but have different marginal costs. Informal firms have lower regulatory costs than formal firms (i.e., by not paying taxes and having lower labor costs thanks to their reliance on informal labor), resulting in a misallocation of resources in the economy (Hsieh and Klenow 2009). By proposing to bring informal firms into the formal sector, the government does not just aim to increase its tax base, but also tries to provide a range of benefits to these firms, including access to formal financial sector services, and the ability to take advantage of various government services, become a supplier to the public sector, and export their products. These benefits can improve firm productivity and facilitate growth.

Governments of many developing countries have undertaken significant efforts to increase formalization rates through programs and policies focused on either firms or workers. Among the former, programs have typically focused on incentivizing firm formalization through tax breaks, information campaigns, simplified registration procedures or cost reductions, reductions of payroll taxes, and interventions enforcing formalization (Bruhn and McKenzie 2014).

This paper examines the impact of Formalízate, the one-stop registration shop in the Dominican Republic introduced in October 2013. The goal of the shop is to increase firms' incentives to be part of the formal sector by reducing the time and costs required to register and by providing information about the different processes involved. By exploiting the fact that the introduction of Formalízate took place at different times and in different provinces of the country, the analysis uses a staggered difference-in-differences model to estimate the impact on the number of firms operating formally at the provincial level. The focus is on examining the effects of the program on firm registration and exploring its heterogeneous effects on employment.

The present study finds a positive and significant impact of Formalízate on the number of micro firms entering the formal sector, accounting for a nearly 30 percent increase relative to pre-treatment average values. These firms are concentrated in sectors where informality was high before the program (i.e., services, commerce, and tourism); in these sectors most firms are very small and female representation in the labor force is high. Furthermore, significant impacts were found on female labor force participation, with women entering the labor market as self-employed entrepreneurs once the one-stop shop is in place.

Results show that a significant reduction in time and registration costs is associated with a higher number of micro firms entering the formal market each year. This follows from the fact that

[1] Please note that in the Spanish version of this document, non-inclusive masculine grammar is used regardless of the sex of the persons referred to.

the most impacted firms were micro firms for which the one-time cost reduction is more likely to make a difference. This result is in line with other studies such as Klapper and Love (2010), who used a cross-country analysis to establish that fairly large regulatory changes are needed to generate any meaningful effects in terms of formality rates. According to their results, costs need to decrease by at least 40 percent to have an impact, and reforms should ideally target multiple aspects of the problem at the same time. In the case of Formalízate, the reduction in the registration cost was very large, going from US$1,000 to US$150. However, it is important to mention that even with reforms of that scope, some studies that establish statistically significant impacts find that the size of such impacts is fairly modest. For instance, in a study of a Portuguese policy reform that decreased firm registration fees by 80 percent and the time needed to register from months to hours, Branstetter et al. (2013) found that almost 5,000, mostly smaller, firms were created as a result over the course of two years.

The empirical findings of this paper contribute to the literature by studying the effects of reducing the costs and improving the access to information for firms to formalize in a context characterized by having very high firm and labor informality. By exploring heterogeneous effects and looking at impacts on the labor market by gender, it is possible to determine that some of the mechanisms that could generate an increase in business registration induced by the program include the formalization of existing microenterprises in sectors with high informality and the increase of labor force participation as self-employed entrepreneurs. This latter result is particularly important for women, who traditionally face barriers to accessing formal employment and may be turning to formal entrepreneurship as a way to generate income and achieve economic autonomy while being able to access Social Security.

The remainder of the paper is organized as follows. Section 2 provides a literature review, and Section 3 describes the background of the Formalízate Program. Section 4 presents data sources, Section 5 specifies the empirical methodology, Section 6 presents the main results, and Section 7 reports robustness checks. The final section, Section 8, presents the conclusions from the analysis.

## 2. Literature Review

In a recent quantitative analysis of the literature on formalization programs in low- and middle-income countries, Jessen and Kluve (2021) found mixed evidence regarding their effectiveness. However, the literature does suggest that some types of interventions are less likely to be successful than others. For instance, evidence is fairly consistent regarding interventions that focus on information campaigns to address the potential lack of knowledge regarding the process and benefits of formalization. In an experimental study in Bangladesh, De Giorgi and Rahman (2013) found that providing information to firms regarding the procedures and benefits of registration had no effect on formality. Neither were information campaigns successful in raising formality rates in Sri Lanka (De Mel, McKenzie, and Woodruff 2013) or Brazil (de Andrade, Bruhn, and McKenzie 2013), despite the fact that the campaigns were effective in increasing knowledge. This suggests that addressing the lack of knowledge is not sufficient, and that informal firms need an additional incentive to formalize. That incentive may come in the form of increased enforcement (i.e., potential fines) or cash payments to firms that register. For instance, a ”stick”

approach of the threat of tax or municipal authority fines does appear to have motivated firms in Bangladesh (De Giorgi, Ploenzke, and Rahman 2018) and Brazil (de Andrade, Bruhn, and McKenzie 2013) to register, though the size of the effect was quite small. De Mel, McKenzie, and Woodruff (2013) found that monetary incentives in the form of cash payments to informal firms also worked to raise formality rates, though it is unclear if such a policy would be scalable.

Interventions that focus on simplifying the registration process and reducing the cost of formalization have met with somewhat greater success. For example, Bruhn (2011) found that Mexico's SARE Program, which aimed to simplify the process of firm registration, had significant positive impacts: first, on formality (5 percentage points), with most of the increase coming from newly formed firms; and second, on employment and firm income. Using a different dataset, Kaplan, Piedra, and Seira (2011) found somewhat more modest benefits of the same program in both size and duration. Their results also suggest that most of the temporary increase in formalization was due to the registration of existing informal firms, rather than an increase in business formation. Positive effects on formality were also found by Branstetter et al. (2013) in a study of reforms in Portugal. On the other hand, in their experimental work in Brazil, de Andrade, Bruhn, and McKenzie (2013) found no effect of reforms based on simplification and cost reduction, which is similar to the results found in the non-experimental studies from Indonesia (Rothenberg et al. 2016), and Brazil (Rocha, Ulyssea, and Rachter 2018). For effects that go beyond formalization rates – outcomes such as revenues, profits, or employment rates – evidence is scarce, and positive impacts appear to often be limited to specific segments of the population – for instance, a small number of high-performing firms (De Mel, McKenzie, and Woodruff 2013) or medium-sized firms (McKenzie and Sakho 2010).

A possible explanation for the limited impact of these programs taken together is a lack of complementary reforms, as the costs to firms of high taxes and other fees may offset any benefits of formalizing, especially for smaller firms. For example, firms in Brazil with more than two employees are required to use an accountant, which significantly increases the ongoing costs of formality and in fact is found to deter registration (de Andrade, Bruhn, and McKenzie 2013). Campos, Goldstein, and McKenzie (2018) found that informal firms in Malawi had little interest in registering with the tax authorities, as opposed to just obtaining a business registration certificate, which suggests that the cost of taxes tends to outweigh the perceived benefits of formalization, even with reduced costs associated with the latter. This is confirmed by Rocha, Ulyssea, and Rachter (2018), who found no effect of the reduction in the costs of entry into the formal sector but did find significant impacts when the ongoing costs of formality (i.e., taxes) are reduced. In fact, simplifying and reducing the tax burden of firms may also improve firm performance (Fajnzylber, Maloney, and Montes-Rojas 2011).

## 3. Background

In 2014, the Dominican Republic was going through an economic boom. In fact, while the Latin America and Caribbean region was growing that year at 1.1 percent on average, Dominican GDP grew at 7.1 percent. At the same time, however, much of the job growth was concentrated in low-productivity sectors, such as services or wholesale and retail trade. In this context, the

government decided to decisively tackle one of the most relevant challenges that characterize the economy, and those sectors in particular: the high rate of business and labor informality.

The informal economy accounted for 44 percent of GDP in the Dominican Republic in 2013 (MICM-RD 2014), with business informality concentrated among micro businesses.[2] While almost all (97.2 percent) small and medium-sized firms were properly registered in 2013 as formal businesses, only 10.2 percent of micro firms were registered. Thus, to reduce informality, it was important to focus on the barriers and incentives those firms face to formally register their operations.

This is particularly relevant given that micro firms are the most important source of employment in the country. In 2013, they represented 97.7 percent of all businesses in the Dominican Republic and accounted for 75.9 percent of all employment.[3,4] Therefore, it was plausible that an impact on formal registration of firms might also have an indirect effect on formal employment because of its requirement for payroll registration.

### 3.1 Formalízate: A One-Stop Shop for the Registration of Businesses

The government of the Dominican Republic and the Inter-American Development Bank (IDB) designed the two-part programmatic policy-based loan series DR-L1072 and DR-L1121 to address the issues faced by the economy in terms of lagging productivity.[5] To tackle the specific problem of informality, one component of the program included launching a formalization web portal known as Formalízate to serve as a one-stop shop for the registration of businesses, including registration with the Chamber of Commerce, Internal Revenue Office, Social Security, National Industrial Property Office, and the Ministry of Labor's employer registry. While the existing system required an applicant to fill out different sets of forms for each relevant institution or authority, Formalízate simplified this process by integrating all the forms, thus requiring significantly less paperwork.

The goal of the program was to increase firms' incentives to formalize their operations by significantly reducing the time and costs necessary to do so. In this, the program was quite successful. Prior to the launch of the program, registering a firm took on average 20 business days, at least seven in-person visits to various offices, and a cost of around US$1,000 (including the cost of intermediaries).[6] With Formalízate, only one in-person visit is needed,[7] the cost (US$150) is only a fraction of the previous amount, and the entire process can be completed in seven business days.

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[2] A business is considered formal when it complies with government registration requirements, which include registering the trade name, a tax identification number, and a payroll (MICM-RD 2014).
[3] The estimates are based on the Report of the Module of Characterization of Micro, Small and Medium Enterprises in the 2013 National Household Survey of Multiple Purposes (ONE, 2015).
[4] In terms of value added, micro businesses only represented 19.1 percent of GDP in 2013 (ONE, 2015).
[5] For more details of the two programs, see www.iadb.org/en/project/DR-L1072 and www.iadb.org/en/project/DR-L1121.
[6] This is an average cost that includes payments to a law firm to manage the registration of the firm. It is important to note that the registration cost depends on the amount of social capital of the firm.
[7] This is only the case if the payment is done online. If the payment cannot be completed online, a second visit is required.

The one-stop registration shop can be used to register firms with two legal structures: (i) limited-liability sole proprietorships (*Empresa Individual de Responsabilidad Limitada* - EIRL); and (ii) limited-liability companies (*Sociedad de Responsabilidad Limitada* - SRL). In 2017, the program also began to facilitate the formal registration of individuals (*personas físicas*), such as micro firm and independent professionals who previously did business in the informal sector. Despite these changes, it is important to note that the portal did not fully replace the in-person registration process in the provinces where it was implemented. In fact, in 2018, almost 70 percent of firms still registered in the traditional way (see Section 4 for more details).

The rollout of the program was led by the Ministry of Industry, Commerce, and SMEs. The program was implemented at the provincial level, and its rollout started in late 2013 in seven provinces. By the end of 2018, Formalízate was in place in 30 of the country's 32 provinces (see Appendix 1 for a timeline of the rollout).[8] The timing of the introduction of the one-stop registration shop in each province depended on the capacity (primarily technical) of the local Chambers of Commerce, as these were the entities implementing the program. As a result, among the first to introduce Formalízate were the National District and its surrounding province of Santo Domingo, as well Santiago, the province that is home to the country's second-largest city. Smaller, less economically developed provinces, on the other hand, tended to introduce the program later.

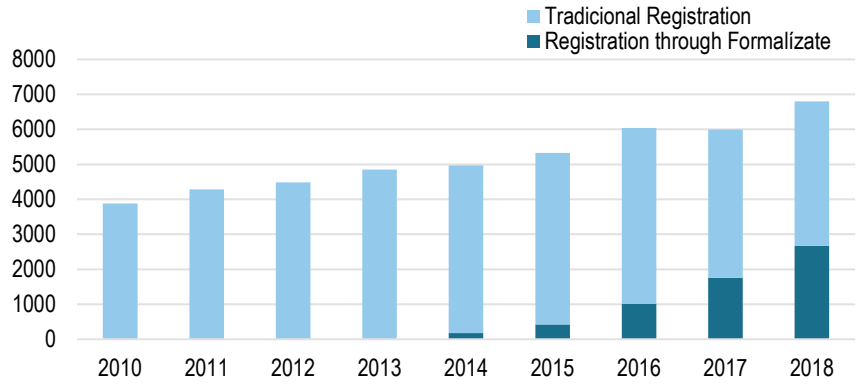
## 4. Data Sources

This paper uses three main sources of information: (i) national administrative records of firm registration from 2010 to 2018; (ii) nationally representative labor force surveys from 2012 to 2018;[9] and (iii) a Formalízate user survey that was collected by the project team. Additionally, to construct covariates at the provincial level, public data were used from the 2010 Population and Housing Census,[10] the Directory of Companies and Establishments,[11] the Ministry of Tourism,[12] and the National Statistics Office.[13]

National administrative records of firm registration were provided by the Dominican tax authority (*Dirección General de Impuestos Internos* - DGII). For each firm, characterized by an anonymized identifier, the records show its sector, province of origin, and whether it was registered using the Formalízate platform. The income reported by firms for all the years they were in operation between 2010 and 2018 is also shown. Figure 1 shows that the use of Formalízate among newly registered formal firms increased over time, from 5 percent in 2014 to 39 percent in 2018.

[8] Note that the rollout of Formalízate predates the start of the IDB's program. However, the IDB program had a significant role in supporting the expansion of the one-stop shop nationwide.
[9] The surveys are the *Encuesta tradicional con población ajustada por zona y regiones (ENFT)* and the *Encuesta continua (ENCFT).* The surveys were administered by the Central Bank of the Dominican Republic.
[10] Censo de Población y Vivienda 2010.
[11] Directorio de Empresas y Establecimientos, DEE 2010–2013 and DEE 2016–2020.
[12] Administrative records of the Departamento de Estadísticas, Ministerio de Turismo.
[13] Oficina Nacional de Estadística (ONE), Estimaciones y Proyecciones Nacionales de Población, 1950–2100 and 2014.

**Figure 1. Micro Firms Entering the Formal Sector by Registration Method**

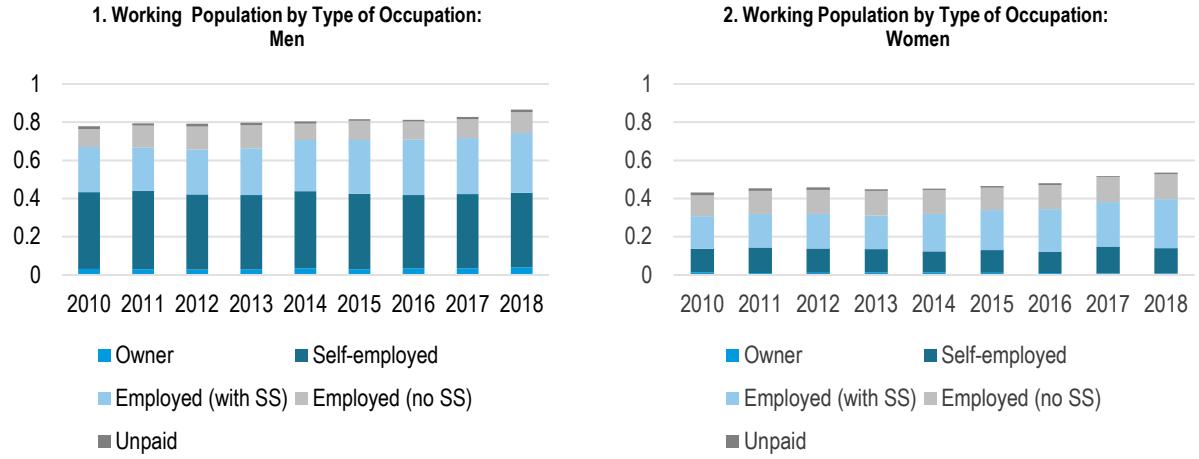



Source: National administrative records of firm registration, *Direccion General de Impuestos Internos.*

This paper also explores how Formalízate has shaped labor force participation for men and women. Using nationally representative labor force surveys, the analysis establishes participation variables by gender and year for all provinces in the country. The focus is on the working population distinguished by type of occupation (business owner, self-employed, employed, and unpaid workers). Within the employed population, those individuals with access to Social Security were identified, but it is important to note that, for the period of analysis, information on access to Social Security for business owners, self-employed, and unpaid workers was not available.

Before the rollout of Formalízate in 2013, 80 percent of men participated in the labor force. From this group, only 31 percent were formally employed (i.e., with access to Social Security), and 49 percent were self-employed (Figure 2). In contrast, female labor force participation was significantly lower at only 45 percent. Among those working, only 39 percent were formally employed and only 27 percent participated in the labor market as self-employed. This study aims to determine whether labor force participation by gender is impacted by the presence of the one-stop-shop window. In particular, the interest is in exploring participation in the labor market as a formal employee (employed with access to Social Security) and as an entrepreneur (reported as self-employed).

**Figure 2. Working Population Disaggregated by Type of Occupation**




Source: 2012 National Labor Force Survey (*Encuesta Nacional de Fuerza de Trabajo* - ENFT).
Note: SS: Social Security.

Finally, to confirm the mechanisms explaining the results, an online survey was conducted of Formalízate users for this study. The survey collected data on firm characteristics, aspects of the program that firms find useful, and perceptions of the benefits of becoming a formal firm. In sum, the survey shows that micro firms, especially the smaller ones in this group, perceived that the program facilitated a significant reduction in the cost and time required to formally register their firm. More information about the survey is included in Appendix 3.

## 5. Empirical Strategy

A staggered difference-in-differences model was used to estimate the impact of Formalízate on the number of firms operating formally at the provincial level. Formalízate was implemented at different times in each province, which allowed for using non-treated provinces as controls. The impact of the program on the employment market is also explored using this methodology.

Recent literature such as Goodman-Bacon (2021) reveals problems with the interpretation of the standard two-way fixed-effects (TWFE) estimators when using staggered treatment implemented over time. It has been shown that the standard TWFE estimator is a weighted average of all possible two-by-two difference-in-differences estimators. These weights are generated to ensure the principle of least squares, but they lack economic interpretation, making the estimator difficult to interpret and in some cases leading to biased conclusions.

Several approaches have been presented in recent years to address this issue. This paper follows the staggered difference-in-differences model presented by Callaway and Sant 'Anna (2021), which estimates average treatment effects, for each cohort and period, denoted as ATT (g, t) "group-time average treatment effects on the treated." Such effects are computed using the canonical differences in differences approach, and not-yet-treated or never-treated cohorts are used as controls. Results are then summarized using weighted averages of such effects.

To implement the staggered difference-in-differences model, no anticipation was assumed. By design, a firm is only able to register through Formalízate after the program has been

implemented in its province.[14] Moreover, since Formalízate allows firms to register at a lower cost, firms are not expected to change their propensity to formally register in anticipation of the implementation of the program.

Irreversibility of treatment is also assumed. A binary staggered treatment is used, meaning that Formalízate is either implemented or not in each province. Once the program is implemented, the province remains treated in all following periods. During the period of analysis, there were no cases in which a province that had already been treated stopped providing Formalízate services.

Finally, conditional parallel trends based on "not-yet-treated" provinces are assumed. Therefore, not-yet-treated provinces are used as the control group in the estimations. To test for parallel trends between treated and not-yet-treated provinces, results from an event study specification are included in Appendix 2. To account for the fact that intrinsic characteristics of larger provinces could drive differences in trends between treatment and control groups, the following covariates are included: (i) the population growth rate in the pre-treatment period; (ii) the formal firm registration growth rate in the pre-treatment period; and (iii) average years of schooling in the pre-treatment period. These controls are included in a matching algorithm that employs inverse probability weighting (IPW) (Abadie 2005).

Data were structured as a balanced panel at the province level with annual measures. The analysis includes 32 geographical units (31 provinces and 1 Federal District), which were studied over the period from 2010 to 2018.

## 6. Results

The literature has shown that one-stop shops for firm registration can be effective in promoting firm registration. The analysis for the present study allows for advancing further in characterizing which types of businesses could have a greater benefit from such programs.

The analysis finds a positive and significant impact on the number of firms operating formally. It shows that this effect is mainly driven by the formalization micro firms on the lower side of the gross sales distribution (i.e., the smallest micro firms). This result is consistent with the theory that marginal firms (i.e., firms induced to enter the formal sector by the lower registration costs available through Formalízate) face a relatively higher cost of registration.

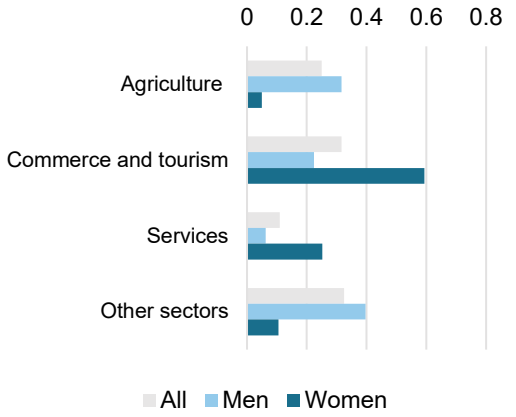
Moreover, the analysis finds that firms encouraged by the program to enter the formal sector are mainly operating in the commerce and tourism sector. Data from the National Labor Force Survey (ENFT and ENCFT) show that self-employment for women is mostly concentrated there (Figure 3, panel A). Consistent with this data point, results for employment show a positive and significant impact on self-employment among women. Panel B of Figure 3 shows the distribution of income received from their main occupation for the self-employed population. If a salary-sales ratio for self-employed businesses of 15 percent is assumed, the average income for self-employed women of RD$7,087 would correspond to monthly sales of RD$47,246 and annual sales RD$566,952. This value is substantially below the RD$9,118,990.74 threshold; firms with sales below this amount would be considered micro firms in the Dominican Republic.

[14] There are cases in which a firm tried to register through Formalízate in a province that had no access to the program. These firms were asked to register in a nearby province. These cases were induced by the program implementation agency, so we can identify them. However, only 10 firms registered through Formalízate before the program was implemented in their province, suggesting that treatment anticipation is not a concern.

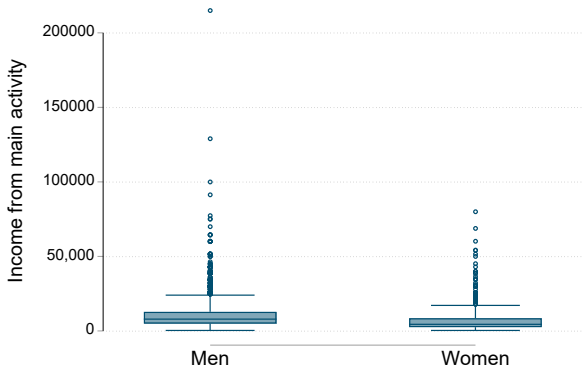
In conclusion, firms benefiting from Formalízate are mainly concentrated in the commerce and tourism sector and are led by women. These firms are also among the smallest micro firms, since they lie on the lower side of the annual sales distribution and constitute sources of self-employment. The next subsections describe in detail the variables used in this analysis and discuss the results.

**Figure 3. Self-Employed Population**

**A. Distribution of Self-Employed Population by Economic Sector, 2012**




**B. Income Distribution for Self-Employed Population (Monthly Income), 2012**




| | Men | Women |
|---|---|---|
| Average monthly income: | **RD$10,131** | **RD$7,087** |

Source: 2012 National Labor Force Survey (*Encuesta Nacional de Fuerza de Trabajo* - ENFT).

## 6.1 Impact in the Number of Firms Operating Formally

This section presents results for the estimated impact of Formalízate on the number of firms entering and exiting the formal sector. A firm is considered to operate formally in a given year if it reports a positive income to the DGII, the country's tax authority. In light of this definition, to compute the number of firms entering the formal sector, the number of firms reporting positive income for the first time in year *t* in each province is examined.

To estimate the impact of Formalízate on the number of firms exiting the formal sector, firms that start reporting income in year *t* and stop reporting positive income in year *t+1* are examined. When interpreting results for this outcome, it is important to keep in mind that it is not possible to determine if firms stopped reporting because they no longer actively operate or because they exited the formal system and continue to operate informally.

To compute entry and exit rates, the number of firms entering and exiting the formal sector as numerators, respectively, is used. The average number of formal firms in each province during the pre-treatment period is used as the denominator.

Table 1 presents estimates for the impact of Formalízate on the number of firms entering and exiting the formal sector. Panel A presents results for micro firms, according to the official

definition for firm size in the Dominican Republic,[15] and panel B presents results for the subset of micro firms with gross annual revenue below RD$5 million (i.e., the smallest micro firms).

The analysis shows a positive and statistically significant impact on the number of micro firms entering the formal sector. This effect accounts for nearly a 30 percent increase relative to pre-treatment average values. The estimated impact for the subset of micro firms with sales below RD$5 million is very similar to that estimated for the entire set of micro firms, suggesting that the effect is driven by the smallest micro firms.

The estimated impact on the entry rate is relatively large (an approximate 15 percent increase relative to baseline levels). However, these effects are not statistically different from zero. The low statistical significance of these results could be partially driven by the small size of the sample.

The analysis also finds a positive and significant impact on exit rates. The result is consistent with the hypothesis that firms that decide to register in the formal sector due to the lower entry costs provided by Formalízate are firms that find it harder to continue operating formally.

When disaggregating the number of firms entering the formal sector by economic activity, the analysis finds that the increase in firms operating formally is largely driven first by commerce and tourism micro firms, followed by firms in the agricultural sector.

### 6.2 Impact on Employment Rates

Data from the National Labor Force Survey (ENFT and ENCFT) are used to compute, within each province, the working-population rate for the working-age population (individuals between 16 and 60 years old). This rate is then aggregated here by type of occupation and gender.

The National Labor Force Survey includes four categories of occupational status: employed, self-employed, business owner, and unpaid workers. For this analysis, in light of the definition of formality from the ENFT, a worker is considered formal if he or she has access to Social Security. It is important to note that, for the period before 2017, the National Labor Force Survey only measured formality among working individuals who reported being employed. Data on formality for working individuals who reported being self-employed, a business owner, or an unpaid worker are only available for 2017 onward. Therefore, formality rates for the self-employed population could not be incorporated into the analysis for this study. Although results are reported on the program's impact on formality rates for the employed population, it should be recognized that this only provides a partial picture of formality in the total working population, due to the lack of information for the self-employed population.

Table 2 provides estimates for the average treatment effect of Formalízate on employment rates. There is a positive and significant impact on self-employment for women. No statistically significant effect is found on the share of the working population or the share of employed individuals.

Finally, there is no impact on the share of the employed population with access to Social Security (i.e., formal employees). However, this does not necessarily mean that Formalízate has no impact on formality. As mentioned earlier, there are no data available on formality for the self-employed population. Furthermore, it was detected that the program has a greater impact on the

[15] In the Dominican Republic, the threshold for a firm to be considered micro is having up to 10 employees and annual gross sales up to RD$9,118,990.74.

entry of microenterprises, particularly those of smaller size. Consequently, it is expected that if there were any effect on formal employment, it would be concentrated on the generation of formal self-employment through the registration of these businesses. Although it is possible to observe formality for the self-employed population, the results suggest that the program induces an increase in self-employment among women.

**Table 1. Staggered Difference-in-Differences Results**
Impact on Firms Entering and Exiting the Formal Sector at the Provincial Level

**Panel A. Micro Firms**

| | | Firm Entry | | Firm Exit | | Firms Entering the Formal Sector by Economic Activity | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Firms Entering the Formal Sector | Entry Rate | Firms Exiting the Formal Sector in t+1 | Exit Rate | Agriculture | Commerce and Tourism | Services | Other |
| No controls | ATT | 45.23** | 0.0117 | 7.542** | 0.00567*** | 1.975** | 34.45** | 4.522 | 4.485 |
| | | (18.72) | (0.0170) | (3.535) | (0.00218) | (0.953) | (15.33) | (3.314) | (2.882) |
| | N | 288 | 288 | 288 | 288 | 288 | 288 | 288 | 288 |
| | P-value | 0.016 | 0.49 | 0.033 | 0.009 | 0.038 | 0.025 | 0.172 | 0.12 |
| Controls | ATT | 32.99* | 0.00490 | 4.066 | 0.00410** | 5.838*** | 28.99* | -2.018 | 0.512 |
| | | (18.25) | (0.0222) | (3.088) | (0.00209) | (2.234) | (16.84) | (4.540) | (4.077) |
| | N | 272 | 272 | 272 | 272 | 272 | 272 | 272 | 272 |
| | P-value | 0.071 | 0.825 | 0.188 | 0.05 | 0.009 | 0.085 | 0.657 | 0.9 |
| Pre-treatment means | | 155.254 | 0.080 | 10.003 | 0.003 | 1.53 | 71.09 | 44.54 | 38.09 |

**Panel B. Micro Firms with Annual Income below RD$5 million**

| | | Firm Entry | | Firm Exit | | Firms Entering the Formal Sector by Economic Activity | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Firms Entering the Formal Sector | Entry Rate | Firms Exiting the Formal Sector in t+1 | Exit Rate | Agriculture | Commerce and Tourism | Services | Other |
| No controls | ATT | 41.45** | 0.0113 | 7.365** | 0.00566*** | 1.964** | 32.51** | 3.443 | 3.722 |
| | | (16.65) | (0.0172) | (3.444) | (0.00218) | (0.951) | (13.95) | (3.191) | (2.786) |
| | Number | 288 | 288 | 288 | 288 | 288 | 288 | 288 | 288 |
| | P-value | 0.013 | 0.511 | 0.032 | 0.009 | 0.039 | 0.02 | 0.281 | 0.182 |
| Controls | ATT | 29.67* | 0.00769 | 4.007 | 0.00409** | 5.823*** | 27.87* | -3.131 | -0.566 |
| | | (16.22) | (0.0217) | (3.087) | (0.00209) | (2.235) | (15.25) | (4.840) | (4.054) |
| | Number | 272 | 272 | 272 | 272 | 272 | 272 | 272 | 272 |
| | P-value | 0.067 | 0.723 | 0.194 | 0.05 | 0.009 | 0.068 | 0.518 | 0.889 |
| Pre-treatment means | | 130.348 | 0.068 | 8.739 | 0.003 | 1.25 | 57.97 | 39.08 | 32.06 |

Source: Prepared by the authors.
Note: Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01. Matching method to incorporate covariates: inverse probability weighting. Covariates at the provincial level: pre-treatment trend for population, pre-treatment trend for number of formal firms, and pre-treatment mean of average years of schooling. The pre-treatment mean is computed using values for 2014, the year prior to implementation of the Formalízate Program. Entry and exit rates are computed using the average number of firms registered in the formal sector in the pre-treatment period as denominator. ATT: average treatment effect on the treated.

**Table 2. Staggered Difference in Difference Results**
Impact on Employment Rates of the Working-age Population at the Provincial Level

| | | Working Population | | | Working Population | | | | | | Employed Population with Access to Social Security | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Self-Employed Population | | | Employed Population | | | | | |
| | | All | Men | Women | All | Men | Women | All | Men | Women | All | Men | Women |
| No controls | ATT | 0.0103 | -0.00166 | 0.0220 | 0.0192 | 0.0159 | 0.0204* | 0.00137 | -0.0108 | 0.0164 | 0.00577 | -0.00299 | 0.0170 |
| | | (0.0136) | (0.0193) | (0.0191) | (0.00982) | (0.0229) | (0.0120) | (0.00997) | (0.0125) | (0.0133) | (0.00685) | (0.00926) | (0.00882) |
| | Number | 288 | 288 | 288 | 288 | 288 | 288 | 288 | 288 | 288 | 288 | 288 | 288 |
| | P-value | .448 | .931 | .248 | .05 | .487 | .088 | .891 | .388 | .216 | .4 | .747 | .054 |
| Controls | ATT | 0.00453 | 0.00490 | 0.0146 | 0.0177 | 0.0180 | 0.0248** | -0.00367 | 0.00226 | -0.00663 | -0.00635 | -0.0120 | 0.00156 |
| | | (0.0106) | (0.0132) | (0.0115) | (0.0112) | (0.0165) | (0.0110) | (0.00938) | (0.0119) | (0.0130) | (0.00998) | (0.0112) | (0.0110) |
| | Number | 272 | 272 | 272 | 272 | 272 | 272 | 272 | 272 | 272 | 272 | 272 | 272 |
| | P-value | .668 | .71 | .202 | .114 | .274 | .024 | .696 | .85 | .609 | .525 | .285 | .887 |
| Pre-treatment means | | 0.62 | 0.83 | 0.41 | 0.31 | 0.48 | 0.13 | 0.28 | 0.30 | 0.26 | 0.19 | 0.22 | 0.15 |

Source: Prepared by the authors.
Note: Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01. Matching method to incorporate covariates: inverse probability weighting. Covariates at the provincial level: pre-treatment trend for population, pre-treatment trend for number of formal firms, and pre-treatment mean of average years of schooling. Working-age population is defined as individuals between 14 and 60 years old. For the analysis time frame, we are not able to observe access to Social Security among self-employed population. Pre-treatment mean is computed using values for 2014, the year prior to implementation of the Formalízate Program. ATT: average treatment effect on the treated.

## 7. Robustness Checks

### 7.1 Parallel Trends Placebo Test

To test for deviations from the pre-treatment parallel trend assumption, results are estimated using a placebo treatment on the pre-treatment period. Only observations for the period prior to the implementation of Formalízate (2010–2013) are used. Provinces where Formalízate was carried out in 2014 and 1015 received a placebo treatment in 2011, and provinces treated after 2015 received a placebo treatment in 2012.

The main conclusions are robust to this test. Table 3 shows results for estimated placebo treatment effects on firm entry and employment rates, respectively. No positive or significant placebo treatment effects are found for firm entry, firm exit, or self-employment rates. This supports the assumption of parallel trends between treated and not-yet-treated provinces in the pre-treatment period.

Statistically significant placebo effects on firm entry are found when disaggregating by economic sector. However, for firms in the most relevant sector, services, the estimated placebo effect is negative. Finally, for firms in the agricultural sector, the placebo treatment is positive and significant. This is considered when deriving conclusions and the increase in the number of formalized firms is not attributed to the program for firms in the agricultural sector.

**Table 3. Placebo Test for Staggered Difference-in-Differences Results**
Firms Entering and Exiting the Formal Sector at the Provincial Level

**Panel A. Micro Firms**

| | | Firm Entry | | Firm Exit | | Working Population |
|---|---|---|---|---|---|---|
| | | | | | | Self-Employed Population |
| | | Firms Entering the Formal Sector | Entry Rate | Firms Exiting the Formal Sector in t+1 | Exit Rate | Women |
| Main results including controls | ATT | 32.99* | 0.00490 | 4.066 | 0.00410** | -0.00663 |
| | | (18.25) | (0.0222) | (3.088) | (0.00209) | (0.0130) |
| | Number | 272 | 272 | 272 | 272 | 272 |
| | P-value | .071 | .825 | .188 | .05 | .609 |
| Placebo treatment on pre-treatment period | **ATT placebo** | **2.916** | **-0.0127** | **-3.234** | **-0.00644** | **-0.0214** |
| | | (5.555) | (0.00866) | (1.987) | (0.00410) | (0.0144) |
| | Number | 128 | 128 | 128 | 128 | -0.0214 |
| | P-value | .6 | .142 | .104 | .116 | (0.0144) |

**Panel B. Micro Firms with Annual Income Below RD$5 million**

| | | Firm Entry | | Firm Exit | |
|---|---|---|---|---|---|
| | | Firms Entering the Formal Sector | Entry Rate | Firms Exiting the Formal Sector in t+1 | Exit Rate |
| Main results including controls | ATT | 29.67* | 0.00769 | 4.007 | 0.00409** |
| | | (16.22) | (0.0217) | (3.087) | (0.00209) |
| | Number | 272 | 272 | 272 | 272 |
| | P-value | .067 | .723 | .194 | .05 |
| Placebo treatment on pre-treatment period | **ATT placebo** | **2.179** | **-0.00981** | **-3.196** | **-0.00644** |
| | | (4.820) | (0.00923) | (1.986) | (0.00411) |
| | Number | 128 | 128 | 128 | 128 |
| | P-value | .651 | .288 | .108 | .117 |

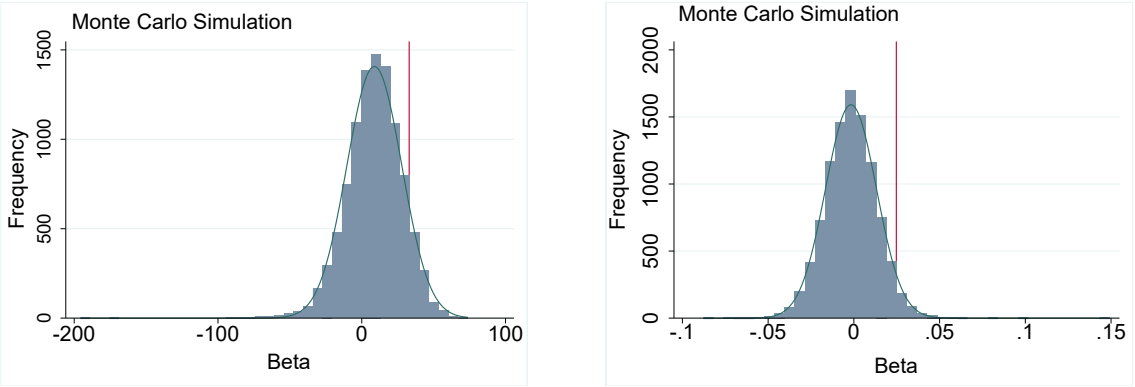
Source: Prepared by the authors.
Note: Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01. Matching method to incorporate covariates: inverse probability weighting. Covariates at the provincial level: pre-treatment trend for population, pre-treatment trend for number of formal firms, and pre-treatment mean of average years of schooling. Analysis period for placebo tests: 2010–2013; Placebo treatment in 2011: Groups 2014 and 2015; Placebo treatment in 2012: Groups 2016, 2017, and 2018. Entry and exit rates are computed using the average number of firms registered in the formal sector in the pre-treatment period as denominator. ATT: average treatment effect on the treated.

### 7.2 Randomization Inference

Randomization inference p-values are also consistent with the main results. A Monte Carlo simulation was run for this exercise. At each iteration, the year in which Formalízate was implemented in each province was randomized, and the staggered difference-in-differences model was estimated in the same way that it was done for the main results. The estimated ATTs were to construct the distribution of estimated effects under the sharp null hypothesis. Randomization inference p-values were obtained by comparing the ATT from the main results (original assignment) to the distribution of estimated effects under the sharp null hypothesis (hypothetical random assignments). Randomization inference p-values are then interpreted as the probability of observing a treatment effect of similar size to that estimated under different hypothetical random assignments for the rollout of Formalízate. Figure 4 shows the distribution of the estimated effects under the strong null hypothesis, as well as the estimated impact under the original assignment, for the main outcomes of this analysis. Table 4 presents the randomization inference p-values for the main results.

**Figure 4. Distribution of Estimated Impacts under the Sharp-Null Hypothesis**

**A. Firms Entering the Formal Sector** **B. Self-Employed Women**




Source: Prepared by the authors.
Note: Distribution computed with 10,000 iterations. The vertical line represents the estimated impact under the original assignment.

**Table 4. Randomization Inference P-values**
**Staggered Difference-in-Differences Results**
Firms Entering and Exiting the Formal Sector at the Provincial Level

| **Micro Firms** | | | | | | | | | | **Working Population** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Firm Entry** | | **Firm Exit** | | **Disaggregation of Firms Entering the Formal Sector by Economic Activity** | | | | **Self-Employed Population** | | |
| | | **Firms Entering the Formal Sector** | **Entry Rate** | **Firms Exiting the Formal Sector in t+1** | **Exit Rate** | **Agriculture** | **Commerce and Tourism** | **Services** | **Other** | **All** | **Men** | **Women** |
| Main Results including controls | ATT | 32.99* | 0.00490 | 4.066 | 0.00410** | 5.838*** | 28.99* | -2.018 | 0.512 | 0.0177 | 0.0180 | 0.0248** |
| | | (18.25) | (0.0222) | (3.088) | (0.00209) | (2.234) | (16.84) | (4.540) | (4.077) | (0.0112) | (0.0165) | (0.0110) |
| | P-value | | | | | | | | | | | |
| | Statistical inference | .071 | .825 | .188 | .05 | .009 | .085 | .657 | .9 | .114 | .274 | .024 |
| | Randomization inference | 0.092 | 0.4304 | 0.408 | 0.084 | 0.0002 | 0.0381 | 0.779 | 0.572 | 0.086 | 0.249 | 0.035 |

Source: Prepared by the authors.
Note: Standard errors in parentheses. * p<0.1 **, p<0.05, *** p<0.01. Matching method to incorporate covariates: inverse probability weighting. Covariates at the provincial level: pre-treatment trend for population, pre-treatment trend for number of formal firms, and pre-treatment mean of average years of schooling. Working-age population is defined as individuals between 14 and 60 years old. Randomization inference p-values computed for 10,000 Monte Carlo simulations. Entry and exit rates are computed using the average number of firms registered in the formal sector in the pre-treatment period as denominator. ATT: average treatment effect on the treated.

## 8. Conclusions

This paper has examined the impact of Formalízate, a one-stop registration shop to register businesses in the Dominican Republic. The program was introduced in 2013 with the goal of increasing firms' incentives to formalize their operations by reducing the costs of registration. The program also contributed to making information about the different processes involved in registration more accessible to owners of micro firms.

Formalízate was implemented at different times in different provinces of the country. This allowed the use of a staggered difference-in-differences model to estimate the impact of the program. The analysis focused on its effects on firm registration and also explored heterogeneous effects by economic sector. To better understand the mechanisms driving the main results, the impact on employment rates was also examined disaggregating by type of occupation and gender.

Results show that the implementation of a one-stop shop for firm registration is associated with a higher number of micro firms entering the formal market. Formalízate induced an increase of nearly 30 percent in the number of micro firms entering the formal sector relative to pre-treatment values in the average province. This effect is mainly driven by firms in the services, commerce, and tourism sectors. These sectors are characterized by high levels of labor informality; they consist mostly of very small businesses and have a high female representation in the workforce. Furthermore, the analysis found a positive and significant impact of the program on female labor force participation as entrepreneurs (self-employed), suggesting that firms whose registration in the formal sector was induced by the program are led largely by women.

The empirical findings described in this paper contribute to the literature by studying the effects of reducing costs and improving access to information on firm formal registration in a context characterized by high levels of firm and labor informality. By exploring heterogeneous effects and impacts on the labor market, it is possible to determine that some of the mechanisms that could be driving the increase in firm registration produced by the program include formalizing existing microenterprises in sectors with high informality and increasing labor participation as self-employed entrepreneurs. This latter result is especially important for women, who traditionally have faced barriers to accessing formal employment and may be turning to formal entrepreneurship as a way to generate income and achieve economic autonomy while enabling them to access Social Security benefits.

The findings also provide useful information for policymakers by generating evidence on the effectiveness of the program overall, as well as on those population groups that could derive more significant benefits, in the context of the Dominican Republic. Further research is needed to fully understand the impact of the program on labor informality and to further analyze the obstacles faced by micro firms to continue operating formally after their registration.

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## Appendices

## Appendix 1. Rollout Time

**Table A1. Formalízate: Rollout Timeline**

| | Date | Province |
|---|---|---|
| 1 | Oct-2013 | Santiago |
| 2 | Oct-2013 | Santo Domingo (Distrito Nacional) |
| 3 | Oct-2013 | Santo Domingo (Provincia) |
| 4 | Oct-2013 | San Cristóbal |
| 5 | Oct-2013 | La Vega |
| 6 | Oct-2013 | Puerto Plata |
| 7 | Oct-2013 | San Pedro de Macorís |
| 8 | Jan-2014 | Espaillat |
| 9 | Mar-2014 | La Altagracia |
| 10 | Apr-2014 | Valverde |
| 11 | May-2014 | Sánchez Ramírez |
| 12 | May-2014 | El Seibo |
| 13 | Jun-2014 | Peravia |
| 14 | Jun-2014 | Duarte |
| 15 | Oct-2014 | Hato Mayor |
| 16 | Feb-2015 | María Trinidad Sánchez |
| 17 | Dec-2015 | Barahona |
| 18 | Jan-2016 | Samaná |
| 19 | Jun-2016 | Dajabón |
| 20 | Aug-2016 | La Romana |
| 21 | Jul-2017 | San José de Ocoa |
| 22 | Jul-2017 | San Juan |
| 23 | Jan-2018 | Independencia |
| 24 | Feb-2018 | Hermanas Mirabal |
| 25 | Apr-2018 | Monseñor Nouel |
| 26 | Apr-2018 | Santiago Rodríguez |
| 27 | May-2018 | Bahoruco |
| 28 | Jun-2018 | Montecristi |
| 29 | Jul-2018 | Azua |
| 30 | Oct-2018 | Monte Plata |

Source: Prepared by the authors.
Note: This table only includes provinces where Formalízate had been implemented by 2018.

## Appendix 2. Event Study to Test Parallel Trends Assumption

This appendix presents the results following an event study specification to test for parallel trends between treated and non-treated provinces in the pre-treatment period. The event study results presented here can be interpreted as a disaggregation of the coefficients presented in the main results in Section 6.

Since Formalízate was implemented gradually in the provinces, the number of observations available for the control group decreases over time. This leads to lower power when estimating confidence intervals for event study coefficients, particularly in the latest periods, when only a few provinces are left to be used as controls. Table A2.1 shows the number of observations by cohort and year used in the staggered difference-in-differences analysis.

To avoid potential power issues, we decided to include the aggregated estimator for the post-treatment period in the main results. However, the event study coefficient can be useful to analyze trends in the pre-treatment periods, and to check the parallel assumption. Figure A2.1 shows the event study coefficients for the two main outcomes of interest: panel A shows the number of firms entering the formal sector; and panel B shows changes in self-employment among women. This analysis incorporates the same controls and matching method that were used for the main results.

As expected, we are not able to obtain precise estimators for the event study coefficients in the periods that lie two or three years after the implementation of the program, when the number of observations in the control group is significantly reduced. However, these plots are useful to evaluate the existence of different trends between treated and not-yet-treated provinces in the pre-treatment periods. We do not find evidence of significant differences in pre-trends in the main outcomes of interest between treated and not-yet-treated provinces.

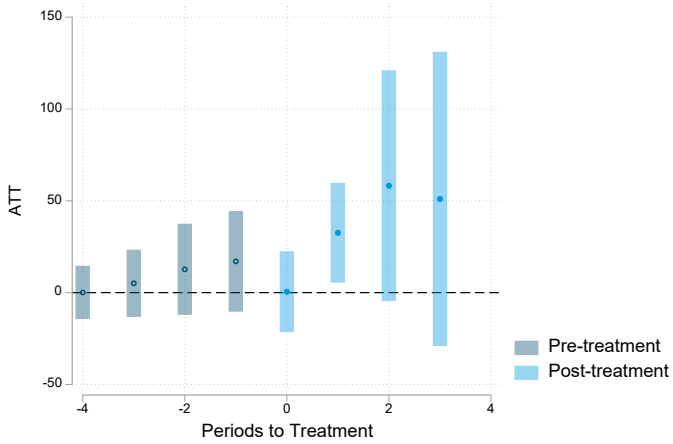
**Table A2. Observations (Provinces) Used in the Staggered Difference-in-Differences Analysis**

| | Cohort (By Treatment Year) | | | | | |
|---|---|---|---|---|---|---|
| **Year** | 2014 | 2015 | 2016 | 2017 | 2018* | **Total** |
| 2010 | 14 | 2 | 4 | 2 | 10 | 32 |
| 2011 | 14 | 2 | 4 | 2 | 10 | 32 |
| 2012 | 14 | 2 | 4 | 2 | 10 | 32 |
| 2013 | 14 | 2 | 4 | 2 | 10 | 32 |
| 2014 | 14 | 2 | 4 | 2 | 10 | 32 |
| 2015 | 14 | 2 | 4 | 2 | 10 | 32 |
| 2016 | 14 | 2 | 4 | 2 | 10 | 32 |
| 2017 | 14 | 2 | 4 | 0 | 10 | 30 |

Source: Prepared by the authors.
* All the provinces that would be treated in 2018 or later are included in this cohort. In 2018, Formalízate was implemented in eight provinces, and two provinces had not yet been treated.

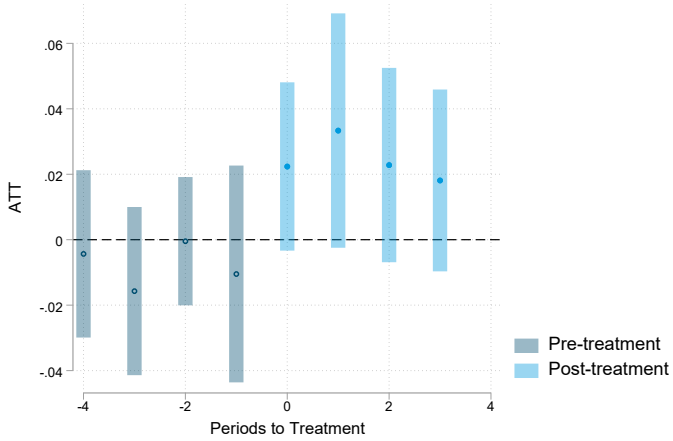
## Figure A2. Staggered Difference-in-Differences Results: Event Study Coefficients for Main Results

### A. Firms Entering the Formal Sector: Impact on Firms Entering the Formal Sector at the Provincial Level




Source: Prepared by the authors.
Note: Bars represent the 95 percent confidence interval around the average treatment effect on the treated (ATT). For each period, the ATT is indicated by a circle. Matching method to incorporate covariates: inverse probability weighting. Covariates at the provincial level: pre-treatment trend for population, pre-treatment trend for number of formal firms, and pre-treatment mean of average years of schooling.

### B. Self-Employed Women: Impact on Employment Rates among Working-age Women at the Provincial Level



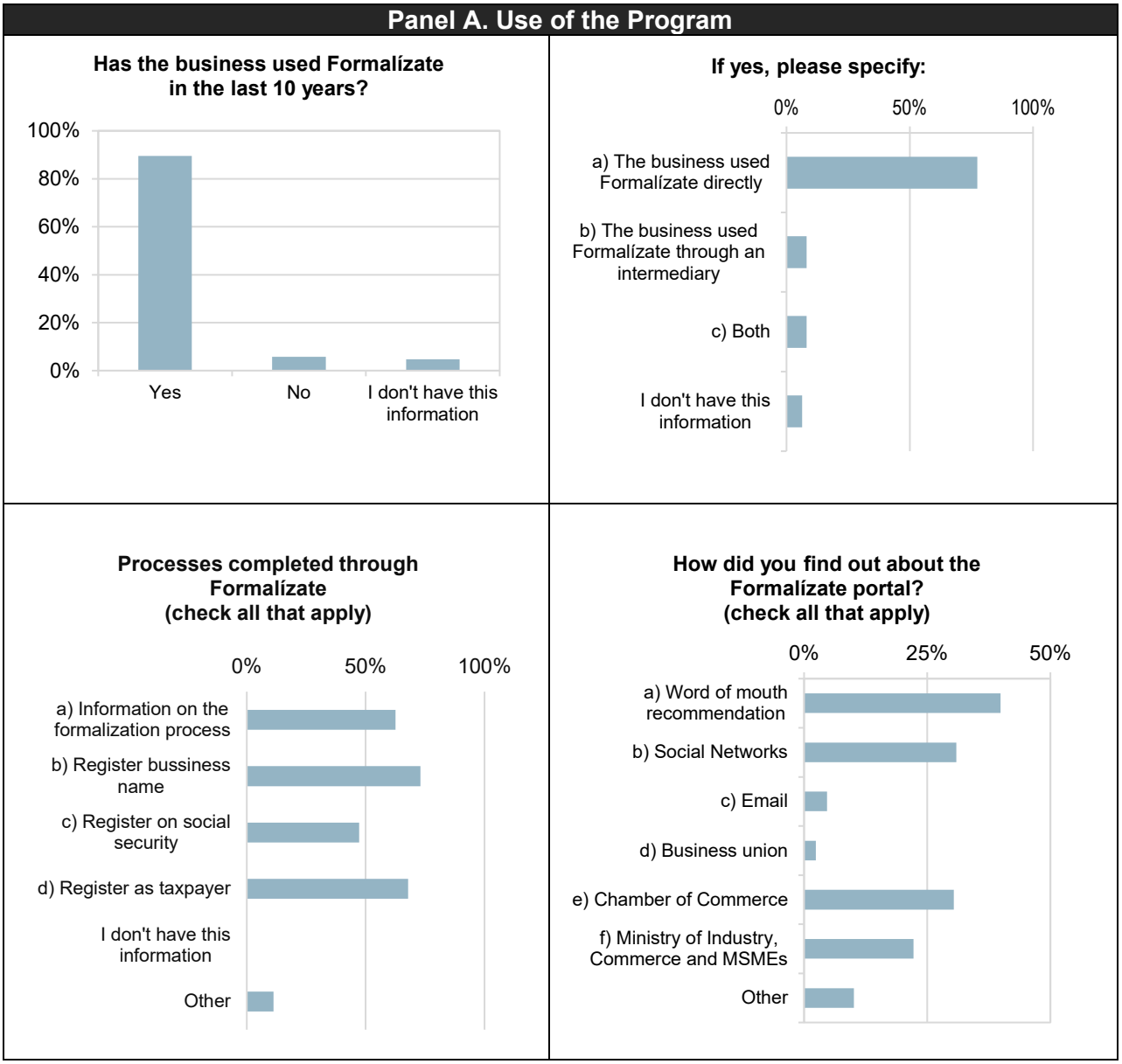

Source: Prepared by the authors.
Note: Bars represent the 95 percent confidence interval around the average treatment effect on the treated (ATT). For each period, the ATT is indicated by a circle. Matching method to incorporate covariates: inverse probability weighting. Covariates at the provincial level: pre-treatment trend for population, pre-treatment trend for number of formal firms, and pre-treatment mean of average years of schooling. Working-age population is defined as individuals between 14 and 60 years old.

## Appendix 3. User Survey

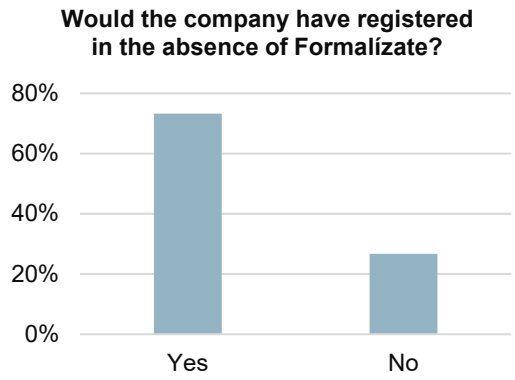
We conducted an online survey of businesses with an account on the Formalízate portal. The goal of the survey was to better understand the characteristics of the firms using Formalízate, and to get a sense of the main benefits perceived by firms and their reasons for using the portal. We also find this survey important to inform future improvements to the program.

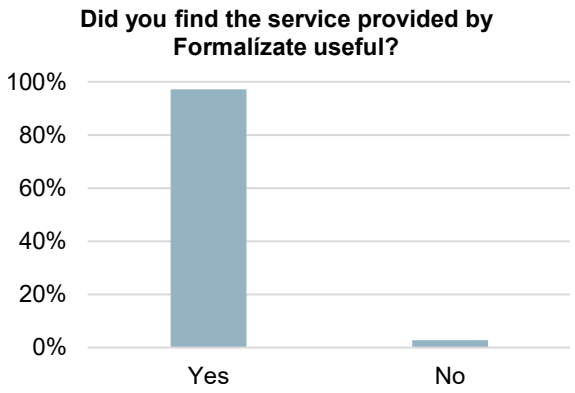
The survey was conducted between March and April 2022. It was sent to 15,803 businesses with an account on the Formalízate website. The response rate was of 14 percent. We received answers from 2,248 businesses, of which 1,866 completed the survey. Figure A3.1 presents general statistics on responses to questions in the survey.

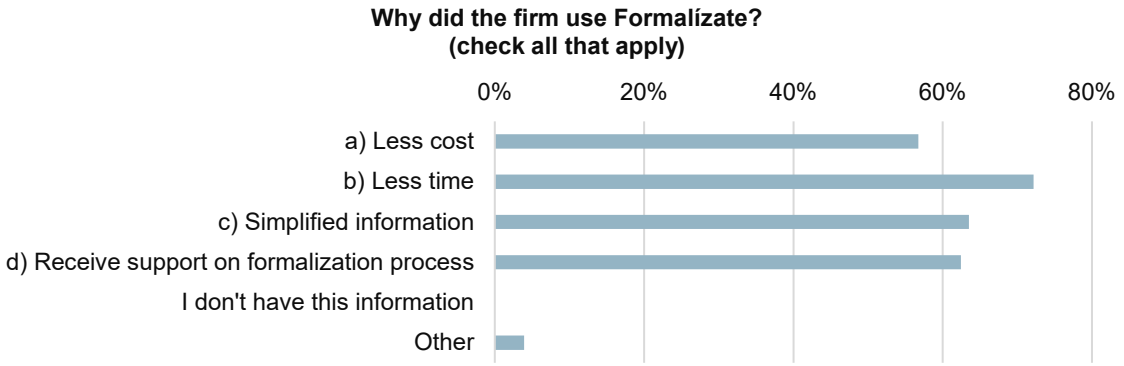
**Figure A3 Results of the Online Survey to Companies with an Account on Formalízate**

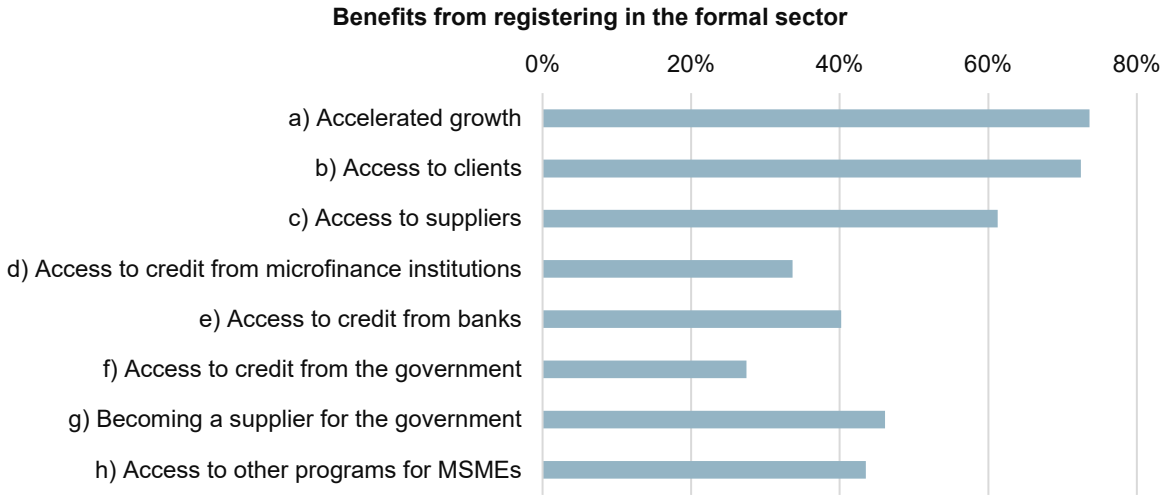


## Panel B. Perceived Benefits of the Program

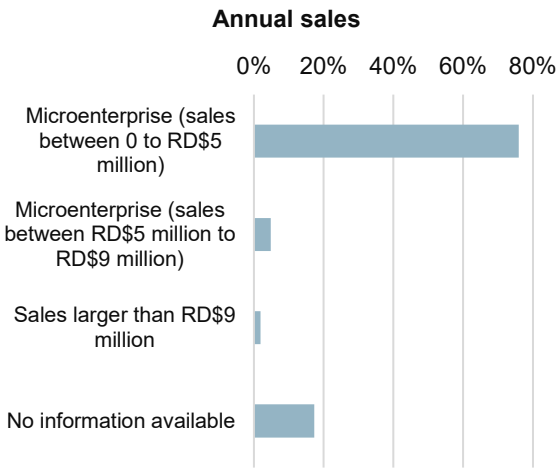


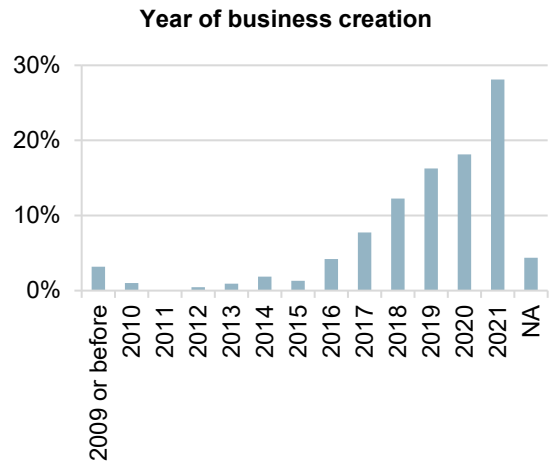



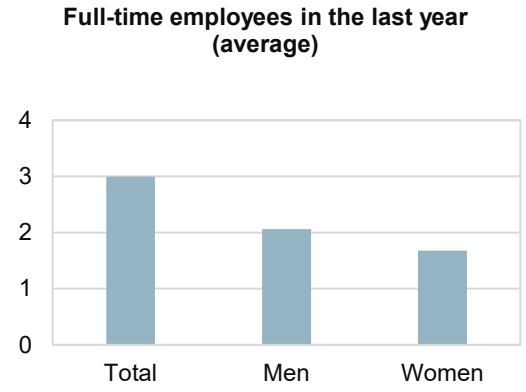



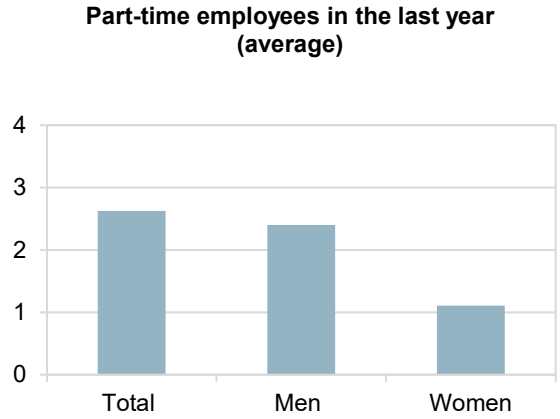



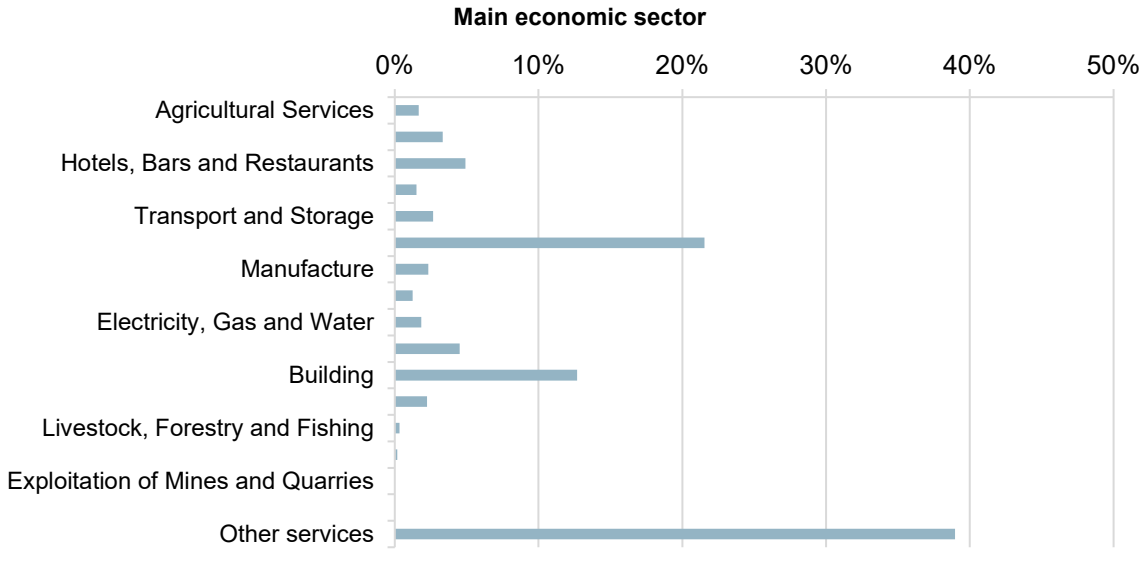
## Panel C. Firm Characterization



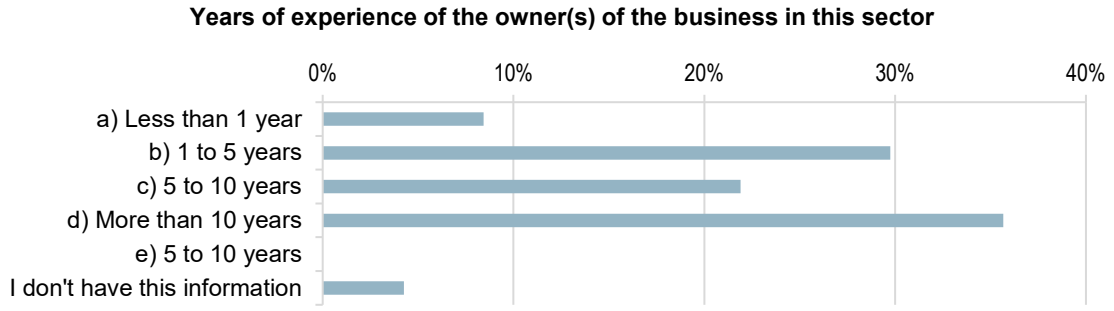



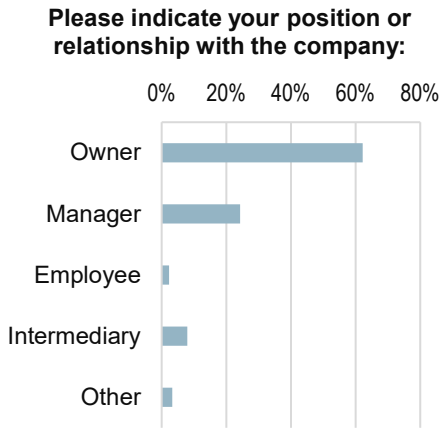



## Panel D. Firm Characterization






Source: Prepared by the authors.
Note: MSME: micro, small, and medium-size enterprise.