

The Recourse Curse: An Experiment in Formalization

Pre-Analysis Plan

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Abstract

Much of the world's economic activity occurs in the informal sector, constraining a state's ability to tax and generate public goods. Despite pressure from international donors and domestic political actors, the informal sector in developing countries, including Senegal, remains vast. Past interventions have attempted to bring informal businesses into the formal sector by drastically reducing or eliminating the financial and time costs to formalization, but these evaluations have shown mixed results. Even when presented with interventions that reduce the economic costs to formalizing, many informal businesspeople express extreme reluctance to register their economic activity with the state or comply with taxation. We argue this is due to previously ignored *political dimensions*; namely, the lack of electoral and legal recourse informal businesses believe they would have in the formal sector. In partnership with the business registration authority in Senegal and a prominent local NGO, we will conduct a field experiment with novel interventions that increase access to forms of electoral and legal recourse, directly addressing the primary political constraints to formalization.

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1 Introduction

The benefits to formalization are well documented. A larger formal sector implies a wider tax base and greater potential for improved public goods provision (Levy 2010; De Giorgi, Ploenzke and Rahman 2015; Loayza 1996). The formal sector is also associated with better labor conditions and social protection, and in a more general sense, an efficient and functioning formal sector might improve general attitudes toward the state (van Elk and de Kok 2014). However, informal business owners rationally resist formalization (Hart 1973), and much of the economic activity in developing countries continues to occur in the informal sector.

We argue that the robustness of the informal sector is due, in part, to the recourse curse: the belief among informal businesses that formalizing will not afford them one of the key benefits of participating in a formal economic system—greater recourse in the case they are transgressed upon. This could take the form of **legal recourse** when a contract is broken, or, in a democratic system, **electoral recourse** when dissatisfied with regulations or the way taxes are being spent. This uncertainty around rights and access afforded by the formal sector contributes to the persistence of the informal sector, where options for recourse are arguably worse – at least for some. The result is that informal business owners remain stuck in an equilibrium with suboptimal access to recourse, and the state remains stuck in a low-tax, low-public-goods equilibrium.

Much of the literature regarding the unwillingness of business owners to transition from the informal to the formal sector focuses on the *economic obstacles* to registration with the state. These constraints to formalization include high entry costs, increased tax burden, and costs of compliance (e.g., De Soto 2000; Schneider 2012). Business owners, it is argued, cannot afford the often high fees for registration and compliance to formal-sector standards, nor are they willing to subject themselves to the taxes the state levies on formal businesses.

Existing impact evaluations have sought to overcome these obstacles to formalization, with mixed results. De Mel, McKenzie and Woodruff (2013) find in Sri Lanka that providing information about as well as offsetting the costs of registration had no effect on registration rates. Similarly, in impact evaluations in Malawi and Benin, few firms register when just given information

and assistance with the registration process (Campos, Goldstein and McKenzie 2015; Benhassine et al. 2017). Benhassine et al. (2017) find support that, when visited in person by highly trained staff and given information about registration and government training programs, support to open a bank account, and tax mediation services, a small but statistically significant proportion of informal firms—particularly larger ones—are more likely to formalize. However, this intervention is highly cost-ineffective, with the cost of formalizing a marginal firm at 11 times the average of baseline monthly profits.

We contend that these mixed results are due in part to the *political* constraints to formalization. Those in the informal sector typically face two non-financial constraints to formalizing. First, they perceive the government to be unaccountable, so they do not anticipate future benefits from paying into the public purse. Second, they do not trust the government to treat them fairly before the law, e.g., in a contract dispute with another firm, if they obtain formal status. We argue that these political constraints, which are particularly important among smaller and less lucrative informal businesses, are key factors behind firms' decisions not to formalize. We further argue that overcoming these constraints may require coordination among firms since beliefs about good performance or fair treatment by government are based partly on whether individuals believe they form a sufficiently large constituency.

Taking into account these political constraints to formalization, this project's primary research questions are as follows:

- Are interventions that mitigate *political* constraints to formalization more effective than interventions that only reduce *economic* obstacles?
- What role does coordination on the part of informal businesses play in the decision calculus to formalize?
- Does formalization affect political participation, and if so, through which channels?
- How do factors such as the size and revenue of the informal business, as well as the gender of the business owner, condition the effects of interventions to induce formalization?

A key problem in understanding the relationship between political empowerment and formalization is that the former is endogenous to the latter. In other words, firms that are more likely to formalize are also firms that have higher access to or trust in the government. To overcome this constraint to making causal inference, we will implement a field experiment in which we assign economic and political interventions to induce formalization to some informal businesses but not others. The economic intervention replicates interventions in similar countries that have reduced financial and transaction costs to business registration to increase formalization (e.g., [de Andrade, Bruhn and McKenzie 2013](#); [De Mel, McKenzie and Woodruff 2013](#); [Campos, Goldstein and McKenzie 2015](#)). The political interventions aim to additionally provide citizens with 1) greater **electoral recourse** through a participatory budgeting intervention or 2) greater **legal recourse** through access to trained community paralegals. Taking advantage of a recent progressive fiscal policy in our empirical case, we also provide information about this policy that may increase retrospective perceptions of access to electoral recourse among small formal firms that effectively lobbied to change their tax rate. To test the importance of coordination, we also experimentally manipulate and provide information about the concentration of these interventions within a given constituency.

We situate our study in Senegal, a developing country with a relatively stable and developed democracy such that interventions aimed to increase political and legal recourse among small firms are considered credible. The population of interest is informal business owners in urban centers who are sufficiently concentrated to form a political bloc, but who are not already well-organized like some of the market vendors in urban markets. Our interventions are made feasible by a partnership with APIX, the primary business registration authority in Senegal, as well as ENDA-Ecopop, an established NGO based in Dakar that is currently conducting a participatory budgeting intervention.

2 Hypotheses

First, we motivate our main hypotheses with respect to affecting the outcome of firm formalization, and preview the comparisons we will make across our treatment arms to test these (see Table 1 for summary of treatment arms). We then propose key moderators we will use to test for heterogeneous treatment effects. Finally, we propose hypotheses related to secondary economic and political outcomes we argue will also be affected by our treatment arms, by actual firm formalization, or both.

2.1 Main hypotheses

Bates and Donald Lien (1985) famously argue that citizens hold preferences not only about tax levels, but also about government policies, and that they seek to maximize both. Citizens are often willing to pay taxes if they see a commensurate increase in services. As Ross (2004) shows using cross-country data, people do not tend to rebel against taxation when there is a commensurate increase in government services. If business formalization comes with an increased likelihood of taxation,¹ then citizens should be more likely to formalize and risk greater taxation if they expect a commensurate increase in access to services.

Whether or not citizens anticipate that future tax payments and the resulting increases in public revenue will result in greater services (and services that are preferred by the electorate) depends on their perception of government's electoral accountability and responsiveness. A government that is perceived to be corrupt or non-transparent—or perceived as incapable of being held accountable for its actions—will not be trusted by citizens to be good stewards of their tax dollars. In many developing democracies, citizens have low expectations of government capacity and performance (Gottlieb 2016). We argue that, in these settings, informal business owners are less likely to perceive the benefits to formalization because they do not expect additional tax dollars to spent accountably.

¹While formalization policies in some settings do not imply tax registration, we are interested in formalizations policies in the many contexts that do.

Hypothesis 1 *Increasing perceptions of government transparency and responsiveness will make informal business owners more likely to formalize. (Arms 2/3 > Control)*

In addition to an increased likelihood of taxation, formalization also provides informal firms with increased benefits that come with legal status. First, formal firms can bid on often lucrative public contracts, gaining access to previously inaccessible markets via the government's procurement process. Second, formal firms are protected by laws that regulate a firm's interactions with other private and public entities—laws that go beyond the social enforcement mechanisms on which informal businesses typically rely. If a registered firm enters a contract with another private firm and that firm does not honor the contract, formality allows for legal recourse. Similarly, if a firm suffers unfair treatment by the government, e.g., through excessive taxation, formality provides the firm grounds to enter into litigation.

Firms will only perceive these benefits of formalization to be forthcoming if they have sufficient trust that the government will treat them fairly under the law.² For example, in their experiment to induce firm formalization in Sri Lanka, [De Mel, McKenzie and Woodruff \(2013\)](#) find that firms that formalized are more likely to trust the state. While they attribute the causal chain as running from formalization to increased trust, their instrumental variables approach (since they do not randomly assign trust) cannot rule out that the treatments increased trust in government among some participants who then subsequently chose to formalize.

Informal sector firms have little opportunity to interact with the judicial system, and may mistrust it as a result. Many who have never utilized legal institutions also presume that attaining access to legal recourse is prohibitively expensive, or at least more costly than rectifying the problem is worth. Further, they likely have little information about how to take advantage of legal recourse even if they expected justice to be faithfully applied. We thus argue:

Hypothesis 2 *Increasing access to and information regarding legal services will make informal business owners more likely to formalize. (Arm 4 > Control)*

²It also requires a baseline level of trust that the country's legal institutions function sufficiently.

Because of the relative infrequency of interactions with the judicial system and the relative salience of public service delivery in the daily lives of citizens, we posit that:

Hypothesis 3 *Increasing perceptions of government transparency and responsiveness will make informal business owners even more likely to formalize than will increasing access to legal services. (Arm 3 > Arm 4)*

Incumbent governments will be more likely to change their behavior, whether that is by increasing responsiveness to citizens in their spending decisions or by choosing to apply the law impersonally, the larger is the constituency they perceive is demanding such a change. The benefits of greater political or legal recourse may thus only accrue to informal businesses if they coordinate their actions. At the same time, perceived negative consequences to formalizing, such as individual targeting, may be mitigated by observing that neighboring businesses are following a similar path. Knowing this, informal businesses granted greater political or legal access may only choose to formalize if they believe that a sufficient number of others will do the same.

Hypothesis 4 *Increasing access to political and legal recourse among informal businesses will be more likely to increase formalization the greater is the belief among recipients that others like them will also formalize. (Arms 3/4-High dosage > Arms 3/4-Low dosage)*

While it is neither novel nor the focus of our study, we will still test whether decreasing financial and transaction costs to formalization increases the likelihood of firm formalization. Because of the success of such an intervention in Benin, a country with similar political institutions and with the very same legal code for small enterprises, we posit that:

Hypothesis 5 *Decreasing the costs of registration will make informal business owners more likely to formalize. (Arm 1 > Control)*

However, as theorized above, focusing solely on reducing the economic constraints to formalization risks overlooking a primary cause for informal business owners' hesitance to formalize—namely, the political constraints to formalization. We thus posit that:

Hypothesis 6 *Increasing access to political or legal recourse, in combination with decreasing the costs of registration, will be more likely to induce informal businesses to formalize, relative to only decreasing the costs of registration. (Arm 3/4 > Arm 1)*

2.2 Conditional hypotheses

The benefits of formalization may be less likely to accrue to certain populations, especially those that are likely to benefit more from informality. We expect our treatments to work less well among these populations.

[Lince \(2011\)](#), for example, argues that women may have a lot to lose by formalizing if they choose informality as a way to keep control over their income (and keep it away from male relatives). This would imply that:

Hypothesis 7 *Increasing access to political and legal recourse among informal businesses will be less likely to increase formalization among female business owners.*

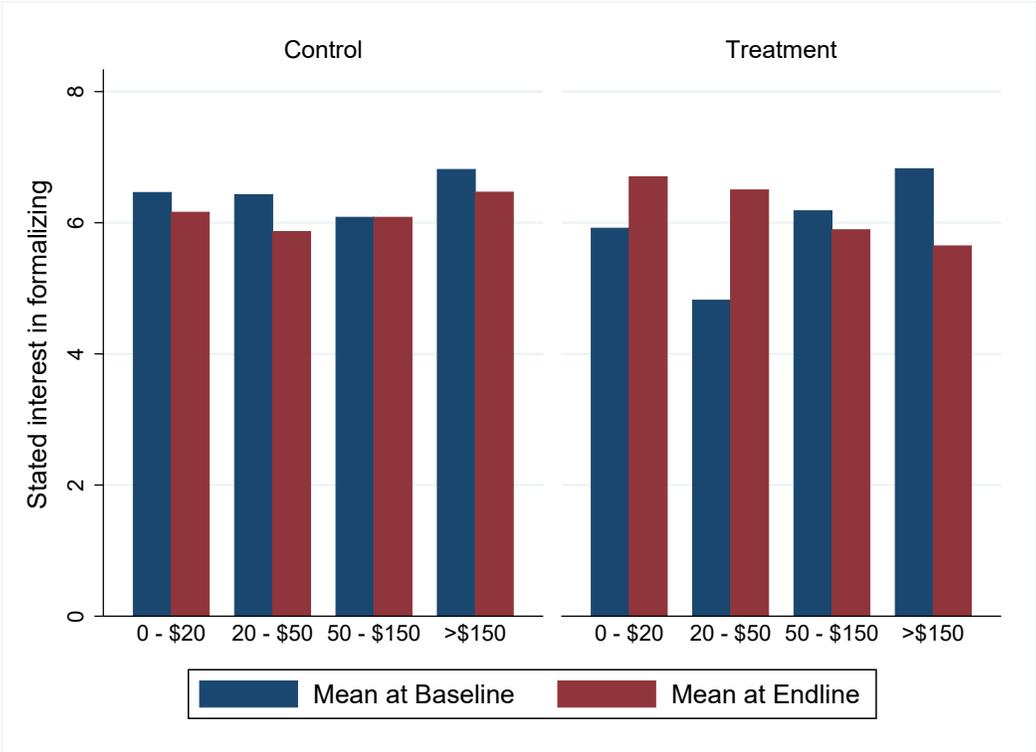
Larger informal firms that generate higher revenues may have more to gain from remaining informal. Rates of taxation in the formal sector are progressive, so larger firms would have to pay relatively more than smaller ones. Larger firms may also be able to hide more profits from informal tax collectors, or have greater negotiating power such that they pay lower rates of business taxes in the informal sector relative to smaller firms. Finally, given their greater economic clout, they may fare better in informal dispute resolution than do their smaller counterparts. In Liberia, [Sandefur and Siddiqi \(2013\)](#) find that more marginalized individuals benefit more from the formal legal system and more powerful individuals prefer informal dispute resolution mechanisms. We thus hypothesize that:

Hypothesis 8 *Increasing access to political and legal recourse among informal businesses will be less likely to increase formalization among larger and more profitable businesses.*

Notably, this hypothesis contrasts with [Benhassine et al. \(2017\)](#) who find that larger informal businesses in Benin are those most likely to formalize. They argue these businesses already look

the most like formal firms and so barriers to formalization are smaller. However, an information experiment in Dakar conducted by Gottlieb in 2017 provides initial evidence that the size of a firm makes a difference in terms of responsiveness to incentives to formalize. In the experiment, participants were provided with information about recent changes to the tax code that are favorable to small businesses. As Figure 1 shows, smaller firms in the treatment condition increase their stated interest in formalizing whereas larger firms, if anything, decrease their stated level of interest.

Figure 1: Treatment effect by monthly firm revenue



Participation in a system perceived to be corrupt or dysfunctional is unlikely to occur absent other benefits. Thus another group likely to resist formalization are business owners who have low baseline trust in the government, with regard to either the state’s corruption or its incompetence. Such businesses may expect taxation or extractive rents to increase when formalized, and may perceive themselves as powerless in eventual legal disputes if they expect the courts to favor more connected firms. Alternatively, those businesses with the lowest baseline trust may instead be the *most* affected by our additional treatment arms because they can make the largest updates to

their priors about trust in government. Those that already trust the government at high rates may face a ceiling effect and fail to formalize because their trust in government does not increase with treatment. Taken together, these hypotheses suggest that the relationship may be quadratic. Those at very high and low levels of baseline trust may be least likely to formalize while those with middling levels of trust may be most likely.

Hypothesis 9 *Increasing access to political and legal recourse among informal business owners will be least likely to increase formalization among those with very low or very high baseline levels of trust in the government.*

2.3 Secondary economic hypotheses

One of the reasons we care about firm formalization as an outcome is because it is often accompanied by a range of economic changes that benefit either the state, the firm, or both. Conventional explanations suggest that as a result of formalizing, firms gain access to new, often-lucrative markets, particularly via the state's procurement process or with more established firms which may only do business with other formal firms. At the same time, formalization provides firms with access to the legal contracting mechanisms run through the state that were previously inaccessible. Last, by paying taxes directly to the state rather than to local agents, formalization is thought to reduce tax harassment by local officials, as registration with a higher level of government provides new protections. We will thus test the following economic effects of both treatment and formalization induced by treatment.

Hypothesis 10 *Formalized businesses will be less likely to experience tax harassment.*

Hypothesis 11 *Formalized businesses will experience greater revenue growth.*

Hypothesis 12 *Formalized businesses will be more likely to use formal contracting mechanisms.*

Hypothesis 13 *Formalized businesses will be more likely to use formal dispute resolution mechanisms.*

2.4 Secondary political hypotheses

We expect the political interventions we offer participants will have effects on both attitudes toward the government and participation in civic and political activities, regardless of whether the firm formalizes. In particular, information about participatory budgeting activities should increase knowledge of local government and, thus, motivation and ability to participate in meetings or contact officials. More involved citizens may also increase their expectations of government, thereby becoming harder to satisfy.

Hypothesis 14 *Increasing access to political and legal recourse will increase knowledge about government and politics among business owners.*

Hypothesis 15 *Increasing access to political and legal recourse will increase expectations of government performance among business owners.*

Hypothesis 16 *Increasing access to political and legal recourse will decrease satisfaction with government performance among business owners.*

We additionally expect that the process of formalization will have effects on businesses. In particular, more systematic and fair treatment by tax authorities could lead them to increase their perception of government capacity. It could also lead them to become more informed about and involved in politics to monitor the spending of tax payments.

Hypothesis 17 *Formalized businesses will have higher perceptions of government capacity than businesses that do not formalize.*

Hypothesis 18 *Formalized businesses will be more likely to turn out in elections than businesses that do not formalize.*

Hypothesis 19 *Formalized businesses will be more likely to participate in civic activities than businesses that do not formalize.*

Hypothesis 20 *Formalized businesses will be more likely to sanction the incumbent for poor performance than businesses that do not formalize.*

3 Empirical Case: Senegal

The majority of Senegal’s economy is informal. A recent census by the Senegalese statistics bureau estimates that 97% of all economic units are informal. In spite of many of these units being small in size, the informal sector (excluding agriculture) is economically incredibly important: it accounts for 31.7% of GDP and employs over half of job-seekers. Because business and tax registration occur simultaneously, increasing formalization among informal sector businesses has the potential to yield substantial increases in public revenue. While many in the informal sector already pay on-the-spot taxes on business profits, they do so unsystematically and to local government agents, so not only is collection more difficult to administer, but revenue is difficult for the national government to trace.

The process of registering a business in Senegal is in theory neither expensive nor particularly difficult. APIX, the national agency for the promotion of investment and major works in Senegal, was created in 2000 and hosts a “one-stop shop” for business registration. What was previously a difficult formalization process that required visits to several agencies and which only the largest and most lucrative firms could afford, is now a process that can be achieved in a single day at APIX. The fee structure for registration varies, but for small firms with limited revenues, total registration fees are 30,000 CFA (approximately 60 USD). Despite the simplified and straightforward process, however, formalization rates remain incredibly low. Low current rates combined with a simple and straightforward formalization process make Senegal a viable case to test the relative effects of different interventions encouraging firm formalization as we expect relatively high rates of compliance with treatment.

3.1 Descriptive evidence of key assumptions

The political reasons we cite for firms failing to formalize are supported by evidence from a 2017 survey of small firms and formal sector employees conducted by Gottlieb in Dakar. Informal business owners cited the lack of perceived benefits as the primary constraint to formalization.

Compared to salaried employees working in the formal sector, informal business owners expect the government to be more corrupt and to be less likely to spend money on issues that are a priority for them—both of which reduce government satisfaction, and are less likely to be connected to formal or informal associations that could serve as a source of political pressure. While 71% of firms say they pay some business taxes, only 4% say they declare their revenue, indicating the rest pay through non-voluntary on-the-spot extraction. A third of those admit to negotiating with the collectors—an advantage they might fear losing if they were to formalize.

3.2 2013 fiscal reform generates another observable implication

The case of Senegal affords yet another advantage for this study. In 2013, the Government of Senegal passed a sweeping fiscal reform that changed the tax code in ways that both had immediate effects on tax rates and aimed to simplify legislation to increase compliance with the law by both tax collectors and taxpayers. It was a progressive reform with major effects on three economic groups: 1) income tax decreased by about 10% among salaried employees, 2) the rate of the CGU (simplified tax paid by small businesses) decreased by at least 10%, and 3) business taxes levied on medium and large enterprises increased from a rate of 25% to that of 30%. In fact, believing this law would make it more attractive to formalize, the government also passed an accompanying “Loi de regularisation” to give informal businesses a year to formalize. Most did not.

In a survey by Gottlieb in summer 2017, about half of surveyed salaried employees in the formal sector knew about the legislation. By contrast, only eight percent of small businesses surveyed claimed to know about the reform – which may be one reason why so few formalized as a result. As we explain in the next section, we will exploit this lack of knowledge of the reform among informal businesses as one test of Hypothesis 1.

3.3 Scope conditions

We expect the findings of this project to travel to other low- and middle-income settings where institutions are sufficiently stable that respondents find increased access to political recourse credible.

We expect that increasing access to electoral recourse would only work in an electoral democracy, while increased access to legal recourse could work in a non-democratic setting that guaranteed some adherence to the rule of law. According to the World Justice Project, Senegal scores higher than the average in other sub-Saharan African and other lower middle income countries on most indices pertaining to checks on government powers, stability and security, fundamental rights and regulatory enforcement. The places where Senegal falls behind are some of the very areas we seek to address in this intervention: transparency, corruption and improper influence of government over the judiciary ([World Justice Project 2015](#)).

A study in Uganda found that formalization had perverse consequences on open-air market vendors because it gave them less control and bargaining power than they had with their informally organized vendors' associations ([Lince 2011](#)). In Senegal, only 6.5% of the 1,488 small firms surveyed by Gottlieb said to be involved in any economic association – compared with 68% of public sector workers and 28% of private sector workers in formal firms. Thus, if the interventions we study are found to have an impact, these results may only generalize to populations with similarly low levels of existing associational ties. As [Lince \(2011\)](#) suggests, economic actors with strong associational ties may have more to lose and less to gain from formalization.

4 Research Design

4.1 Sample and randomization

We locate our study in Senegal's sprawling capital where the largest share of informal businesses are found. Because one of our interventions depends on being able to exploit an existing participatory budgeting intervention run by a partner NGO, we will locate our study in the seven urban communes of Dakar in which they operate. Within the sample, randomization will occur at the street-block level, and the treated units within these street clusters will be informal businesses. All surveys and experimental activities will occur with the owners of the informal businesses.

The experiment follows a cluster-randomized design with a two-stage randomization proce-

dure. First, from the sample of seven communes we will identify 750 street blocks that meet our criteria of having a sufficient density of informal businesses. We will use satellite imagery to maximize the distance between streets in our sample in order to minimize chances of spillovers from treatment to control.

Blocking on commune—the level of local government—we will randomly assign streets to receive Control, Arm 1, Arm 2, Arm 3, or Arm 4. Then, blocking on treatment arm, we will randomize streets into high-dosage and low-dosage for a fully factorial design. Per the power calculations below, we sample 150 clusters (streets) within each of the five main experimental groups; with eight firms per cluster in high-dosage, and two in low-dosage, this implies a total of 3,750 firms in the sample. We will recruit 4,125 at baseline in expectation of 10% attrition by endline.³

Table 1: Experimental Conditions and Assignment of Clusters to Treatment

	Low Dosage (2 businesses)	High Dosage (8 businesses)	Total
Control No intervention	75	75	150
Arm 1 Lowering costs	75	75	150
Arm 2 Fiscal policy info + Lowering costs	75	75	150
Arm 3 Political recourse + Lowering costs	75	75	150
Arm 4 Legal recourse + Lowering costs	75	75	150
Total clusters (Total businesses)	375 (750)	375 (3000)	750 (3750)

³Both authors have conducted phone-based endline surveys among a similar population in Senegal and achieved attrition rates below 10%.

4.2 Intervention descriptions

In **Arm 1**, assistance with formalization is provided to informal businesses. This will involve providing informal businesspeople resources to overcome the typical financial and time costs to registering, including the provision of vouchers to heavily offset registration fees. APIX will assist in training our enumerators to provide information about tax rates and legal status for small firms, costs and benefits to formalization, and details about the process. Leaflets containing this information will additionally be distributed.

In **Arm 2**, we will provide participants with information about the 2013 fiscal policy. If recipients perceive this information as a credible signal of increased government responsiveness, the intervention will serve as a test of Hypothesis 1. While this is a weaker version of a political accountability treatment than that in Arm 3, it is far more cost-effective. Further, Gottlieb's preliminary findings from offering a similar information treatment to a random sample of informal businesses suggest recipients not only increase interest in formalization as shown in Figure 1, but also increase electoral support for the incumbent government and decrease expectations of government corruption.

An alternative explanation for finding an effect of this treatment is that participants simply found formalizing to be less burdensome with respect to tax payment. Preliminary analyses suggest this is not the case, but we will adjudicate between these competing hypotheses by measuring perceptions of the tax burden for small businesses in the formal sector at baseline and midline. We will also ask the extent to which perceived tax burden is a constraint to formalization.

Arm 3 aims to more directly increase informal business owners' access to political recourse. Through our partnership with an NGO conducting an ongoing participatory budgeting intervention in our sample communes, this treatment arm will provide participants access to multiple types of information and opportunities to interface with government. At baseline, they receive 1) retrospective information about the 2017 local government budget including which priorities were expressed by fellow citizens at local fora and how the government responded, and 2) prospective information about upcoming local fora (Fall 2018) to collect citizen priorities for the 2019 budget and the

probability with which they will be invited to participate (participation is limited due to budget constraints). At midline, they receive further information about which priorities were expressed at their commune's recent forum and how their local government decided to integrate these priorities expressed by citizens into the 2019 budget.

In **Arm 4**, we will provide business owners better access to legal recourse in the form of assistance from paralegals and basic information about legal issues facing small firms. Some businesses may choose not to formalize because they have low trust in state processes that are currently assumed to benefit all in the formal sector. For example, contracting in the formal sector is thought to be more secure because of established legal guidelines and recourse to formal judicial processes. The reality is that these processes often work unevenly in favor of larger and more connected firms who can afford legal services. This treatment arm will provide 1) information about accessing the legal system and its main uses for small firms and 2) access to free legal services for firms that formalize in the form of assistance from trained paralegals. Training community paralegals has been successful in increasing access to justice in other settings ([Sandefur and Siddiqi 2013](#)).

In addition to these interventions, we will manipulate the dosage of the intervention to test the importance of coordination to economic and political outcomes of interest. Low-dosage street blocks will yield two participants while high-dosage street blocks will yield eight. Additionally, to all visible informal businesses on the high-dosage streets, we will provide the same intervention leaflets given to participants in the experimental sample. At baseline, participants on high-dosage streets will then 1) be informed that all businesses on their block received the information provided in the leaflets, and 2) will be given the estimated proportion of businesses in their commune that did as well. Participants on low-dosage streets will be informed that only one other business on their street was given the relevant information.

4.3 Partners

We will collaborate with two partner organizations for the field experiment, both of which are former partners of the research team. APIX, described above as the primary business registration

authority in Senegal, will share information and human resources with the research team to design and implement Arm 1, will increase capacity to register the additional businesses induced to formalize by the project, and will commit to scaling up activities if the project proves successful.

The second organization is a local NGO, ENDA-Ecopop, that operates governance-based activities in Senegal, and has a mission to boost local government accountability and public participation. ENDA has been operating participatory budgeting activities since 2015 across communes in and outside Dakar, and will continue these activities in conjunction with the present project. As indicated in their letter of support, they will make available existing data from the participatory budgeting activities for Arm 2 of the project, assist with the training of paralegals for Arm 3 of the research project, host dissemination activities, and commit to scale up the activities should the results warrant it.

4.4 Power

We calculate power for this design using a robust cluster standard error estimator designed to precisely replicate our randomization procedure and data generating process. Simulating the randomization process described above 10,000 times, and setting the number of clusters to 750 streets across five treatment arms with 3,750 informal businesses total, we find that at all feasible levels of ICC, the present design is sufficiently powered to detect an effect size of 0.25 standard deviations in the outcome. Note that this is a particularly conservative estimate, as it does not yet take into account individual-level covariate adjustment or block fixed effects. Per convention, we set $\alpha = 0.05$, but also run simulations using $\alpha = 0.125$ to take account of the risk of false detection rates as we make four comparisons. Figure 2 provides a graphical depiction of power as ICC increases, and shows that at plausible ICC levels ($ICC < 0.35$), the design is sufficiently powered for one-tailed tests at the conventional standard of 0.80.

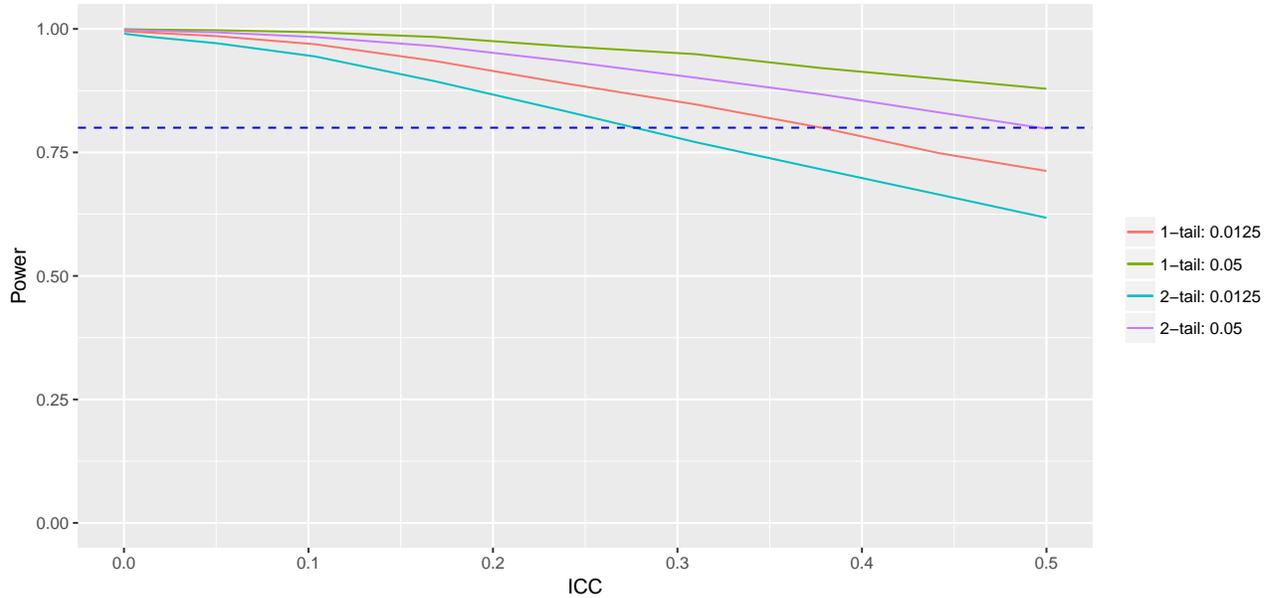


Figure 2: Power map based on simulations

5 Measurement

The primary outcomes of interest in the project are the rate of formalization and other tax-related and business-oriented outcomes. As existing theories of formalization suggest, the nature of taxes and contracts should be different across informal and formal firms, so we will collect data on outcomes related to tax harassment, tax burden, tax payment, business growth, the use of contracts, and the use of the legal system. Secondary outcomes of interest are political indicators including rates of contact of local officials, rates of participation in civic associations and political meetings, voter turnout in the 2019 national and local elections, and vote choice in the elections.

5.1 Survey rounds

We will conduct baseline, midline, and endline surveys timed to maximize the detection of effects in both political and economic outcomes:

- The in-person baseline survey, in summer 2018, will be immediately followed by the provision of treatment. Valuable pre-treatment covariate data will be collected, including de-

scriptive characteristics of the business owner (gender, age, and ethnicity) and features of the business such as number of employees, revenue, and prior experience paying taxes. We will use pre-treatment data of this type for covariate adjustment in our analyses.

- The in-person midline survey will occur in spring 2019, just prior to the elections. This timing will facilitate collecting information about vote intention, civic and political behavior, and attitudes toward government. Following the survey, Arm 3 participants will be provided with information about their local government's response to the citizen priority-setting fora; Arm 4 participants will be reminded of the contact information for the community paralegals.
- An endline survey will be conducted in August 2019, after national deadlines to file taxes and local attempts to collect them. This is a particularly appropriate time as it is immediately prior to the national holiday Tabaski (Eid al Adha) during which tax harassment in Senegal is at its highest. We will also collect retrospective data on turnout and vote choice in the elections.

5.2 Primary outcomes

The following are the primary outcomes we will use to test our main and conditional hypotheses (H1 - H9).

- *Attempt to formalize*: Because firms may take steps to become formal without completing the process, we will measure attempts to formalize including number of visits to APIX, obtainment of documents necessary for formalization, and submission attempts.⁴
- *Actual formalization*: We will measure formalization alternatively by successfully acceptance of the formalization request, the receipt of a formal business ID (called the NINEA), and by a declaration of starting business activities. Only the latter induces the government to begin collecting taxes.

⁴Submissions may be denied for improper paperwork or incorrect formulation of the request.

5.3 Secondary outcomes: Economic

We will use the following outcome measures to test Hypotheses 10 - 13 related to the economic consequences of firm formalization.

- *Tax harassment*: We will measure this by 1) the reported number of times a tax collector comes to visit the business to demand payment, and 2) the amount of money that the tax collector requested. We will also ask if negotiations over tax payments took place.
- *Tax morale*: We will use a list experiment where the sensitive item is “I’ve under-reported revenue to the tax authorities in the past to avoid paying more.”
- *Tax burden*: We will ask for the amount of taxes paid by the firm in the previous fiscal year and what these taxes were for. At baseline, we will ask about taxes in FY 2016. At midline, we will ask about taxes in FY 2017. At endline, we will ask about taxes in FY 2018.
- *Revenue growth*: We will detect business growth by asking about average weekly profits at each survey round and ask to see formal accounts when available. Because many small businesses do not keep formal accounts, we will have a secondary question with categories of weekly revenue amounts to increase reliability. We will assess tax burden relative to revenues.
- *Formal tax payment*: We will ask how taxes were paid including whether revenues were declared and taxes paid voluntarily, and whether there is a receipt for any taxes paid.
- *Use of contracts*: We will ask questions on the number of transactions with other firms that the business has conducted, as well as whether formal contracts were used in these transactions.
- *Business disputes*: We measure disputes by asking if any of the transactions with other firms resulted in unsatisfactory outcomes or broken contracts. We will also ask how, if at all, the dispute was resolved.

5.4 Secondary outcomes: Political

We have three goals in assessing political outcome indicators. The first is as a manipulation check on our interventions of interest: do participants in Arm 2 decrease their perception of the tax burden on small businesses in the formal sector, and do they think of taxation as less of a constraint to formalizing; did participants in Arm 3 attend participatory budgeting activities or learn more about government spending through them; and did participants in Arm 4 utilize the paralegals at their disposal.

- *Perceived tax burden for small businesses in the formal sector*
- *Whether tax burden is a primary constraint to formalization*
- *Knowledge of the government budget and spending priorities:* A suite of true/false questions on government spending will be asked.
- *Use of the legal system:* The number of times they have contacted the community paralegals or used other formal judicial procedures.

Our second goal is to understand mechanisms. By measuring attitudes toward government at baseline, we can assess whether those who are already more trustful or approving of the government are those most likely to formalize. By measuring these same attitudes at midline and endline, we can assess both whether treatment had an average effect on knowledge and attitudes, and whether an increase in these indicators are associated with a greater likelihood of formalization.

- *Knowledge of government performance*
- *Satisfaction with government*
- *Trust in government*
- *Expectations of government performance and corruption*

Our third goal is to understand the longer-term political outcomes of formalization. One of the possible effects of increased economic formalization is the activation of a constituency that will be more engaged in the democratic process because they are more likely to be affected by state policy. Those that participate in formal taxation may also increase their perception of state capacity relative to those who are taxed in an idiosyncratic way in the informal sector. We will thus assess the following indicators at both midline and endline.

- *Voter turnout*: Self-reported intention to vote at midline and self-reported turnout at endline.
- *Vote for the incumbent*: Self-reported vote choice at endline.
- *Civic participation*: At both midline and endline, we will measure the number of times the participant has contacted politicians or local bureaucrats, the number of times they have met with other small businesses to discuss a problem, and the number of times they have participated in a local meeting.
- *Perceptions of state capacity*

The challenge here is distinguishing the effect of formalization from the effect of treatment. We discuss how we intend to identify the effects of formalization on different outcomes in the next section.

6 Empirical specification

In our analysis of treatment effects we use design-based inference, and calculate p values with randomization inference.

6.1 Estimating Average Treatment Effects

To analyze treatment effects on the rate of formalization, we will use the following specification within which most of the projects' analyses can be nested:

$$Y_{ij} = \alpha_i + \beta_1 T1 + \beta_2 T2 + \beta_3 T3 + \beta_4 T4 + \gamma \mathbf{X}_i + \varepsilon_j$$

where Y_{ij} is the formalization status of business i in cluster j , T is a treatment indicator that corresponds to the similarly numbered treatment arm in Table 1 above, \mathbf{X}_i is a matrix of prognostic covariates and block dummies. In our primary specification, we will only use features of the design to estimate effects, e.g. treatment status and block. In a secondary specification we will add pre-treatment covariates to both account for potential imbalance and to improve precision of our estimates.

Estimation is conducted using logistic regression for binary outcomes and OLS, otherwise. Standard errors will be clustered at the street level, the unit of randomization. To compare treatment arms to one another, we will use a Wald test of the equality of coefficients for the relevant treatment indicators. Heterogeneous treatment effects will be estimated using a fully-interacted model with the moderating variable interacted with each treatment indicator and all included covariates. To test the effect of coordination on formalization, we construct an indicator that takes the value of 1 if the individual received *any* treatment in a high-dosage cluster and a value of 0 if the individual received treatment in a low-dosage cluster. We estimate the coefficient on the single indicator of high-dosage. Then, even though we are not sufficiently powered to make robust inference with respect to the effect of high-dosage in individual treatment arms, we will still run the analysis by interacting the indicator for high-dosage with each treatment arm.

6.2 Estimating the Effect of Formalization

In addition to analyzing the effect of treatment on formalization, we will additionally estimate the effect of assignment to treatment on other economic and political outcomes, and report the resulting intent-to-treat effects (ITTs). However, to test the effect of *formalization* on these outcomes, we will instead report the Complier Average Causal Effects (CACEs), where we use assignment to treatment as an instrument for formalization.

In the first stage:

$$Formalized_i = \alpha_0 + \alpha_1 T1 + \alpha_2 T2 + \alpha_3 T3 + \alpha_4 T4 + \varepsilon_i$$

and, in the second stage:

$$Y_i = \beta_0 + \beta_1 Formalized_i + u_i$$

where Y_i is the economic or political outcome of interest, and $Formalized_i$ are the fitted values from the first stage.

For such an instrumental variables approach to produce causal estimates, however, the exclusion restriction must hold. In other words, the instrument, or assignment to treatment, must not affect the outcome of interest except through the endogenous or instrumented variable, formalization. For the economic outcomes of interest such as use of formal contracts and experience of tax harassment, we posit that the exclusion restriction is credible. However, for political outcomes such as civic participation or voter turnout, we do not think the exclusion restriction holds as assignment to treatment Arms 3 and 4 could reasonably change political outcomes through channels other than formalization. We address this in two ways.

First, for civic and political activities, we will estimate CACE for these outcomes only among participants in Arm 1 relative to Control. Because our intervention will make clear that the baseline registration treatment is sponsored by an independent actor and not the government, we do not expect that informational and financial assistance for firm registration could plausibly alter political behavior, except through the process of firm formalization.

Second, for effects of formalization on political attitudes, we will take advantage of the mechanism through which we expect most changes in political outcomes to occur: formal tax payment. To do so, we will compare firms that formalize before tax day, and thus have a possibility of engaging in formal tax payment, and those that formalize after tax day, and thus cannot engage in formal tax payment. We will measure the relevant political outcomes at midline, which will be scheduled just after tax day, and at endline. By examining differences in differences – the change

from midline to endline across firms that formalized before and after tax day – we can evaluate the following expectation. If formalization leads to changes in political attitudes via formal tax payment, then we should expect those firms that formalized after tax day to have more consistent preferences from midline to endline than firms that formalized before tax day.

6.3 Multiple Comparison Corrections

When evaluating tests of our conditional hypotheses, we will correct for multiple comparisons. We will present both nominal p -values and corrected p -values using a false discovery rate (FDR) correction to control the Type-1 error rate.⁵ We control the FDR at level 0.05. Thus, for a given randomization with m (null) hypotheses and m associated p -values, we order the realized nominal p -values from smallest to largest, $p_{(1)} \leq p_{(2)} \leq \dots \leq p_{(m)}$. Let

$$k \text{ be the largest } i \text{ for which } p_{(i)} \leq \frac{i}{m} 0.05.$$

Then, we reject all $H_{(i)}$ for $i = 1, 2, \dots, k$, where $H_{(i)}$ is the null hypothesis corresponding to $p_{(i)}$. We will apply the same procedure when testing for conditional effects.

7 Policy Impact and Scale-up Potential

The interventions we propose here are of direct interest to our partner organizations and to boosting private sector development in Senegal. Formalization rates in Senegal remain low while taxation is unevenly distributed and unpredictable. We argue that there are political reasons behind these deficiencies, and while some larger firms may benefit from remaining informal, smaller firms have less to lose and more to gain from formalization. Results from our project will inform policies among the key actors in Senegal’s formalization process—including our partners—to spur formalization rates and consequently tax collection. The interventions proposed above are suitable for cost-benefit analyses, which will be conducted and shared with the partner organizations at the end

⁵See Benjamini and Hochberg (1995).

of the project. Both partner organizations are committed to scaling up these interventions should they prove successful. Note that all data generated from this project will be made available in an open-access, online database, as well as hosted on our academic websites and in the online appendix of the journal that publishes the resulting papers.

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