

Pathways to Formalization:  
Going Beyond the Formality Dichotomy

The Case of Peru

*Juan José Díaz*

*Juan Chacaltana*

*Jamele Rigolini*

*Claudia Ruiz*



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## Abstract

Too often, academics and policy makers interpret formality as a binary choice and formalization as an irreversible process. Yet, formalization has many facets and shades on the business and labor fronts, and firms may not be able or willing to formalize all at once. This paper explores the joint process of business and labor formalization, using a unique panel data set of Peruvian micro enterprises. The paper finds that business formality does not imply labor formality, and vice versa. Further, there is significant churning in and out

of different dimensions of formality within a relatively short period. Using an instrumental variable approach, the paper infers that business formalization affects labor formalization but not the other way around, and that enforcement is a key driver of formalization. Overall, the analysis shows that formalization is a gradual and reversible process, with small entrepreneurs weighing their possibilities in each pathway to business (often) or labor (less often) formalization, but rarely both at the same time.

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# Pathways to Formalization: Going Beyond the Formality Dichotomy

## *The Case of Peru*

Juan José Díaz  
GRADE

Juan Chacaltana  
ILO

Jamele Rigolini  
World Bank and  
IZA

Claudia Ruiz<sup>1</sup>  
ILO

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## **1. Introduction**

Since the concept of the “informal sector” was coined half a century ago, countries all over the world have relentlessly promoted the formalization of small and medium-size enterprises (SMEs). Among others, the perceived benefits of formalization include better access to credit, justice, large formal clients, and, for the government, higher tax revenues. Yet, many formalization efforts, such as easing registration rules or introducing special tax regimes for SMEs, have delivered at best modest results (Bruhn 2011; Khamis 2014; McKenzie and Seynabou Sakho 2010).

Part of the challenge faced by formalization programs lays in a poor understanding of the complex formalization process among the heterogeneous set of firms and workers that form the informal economy (Oviedo et al 2009). Not all firms are informal for the same reason. Some firms were generated out of necessity, others by opportunity. Some have workers, others simply consist of own-account workers; and some firms are informal by choice, while others have no alternatives. For each of these firms, the ability or decision to go formal is the product of a multifaceted set of interlinked factors affecting businesses and workers. In addition to taxes, to name just a few, national and local licenses, business and occupational regulations, the cost of labor and credit, uncertainty about the future, and the ability to integrate into the supply chains of formal firms. Yet, too often formalization programs are based on the belief that easing a single constraint—say, the time and cost of registering a business, or the tax burden—will be sufficient to convince small entrepreneurs to formalize.

Another misleading perception is that formality is a binary status: firms are formal or informal. The concept and process of formalization are extremely complex and nuanced. Depending on the expected benefits, costs, and probability of being detected, small firms may experiment with some aspects of formalization (possibly those that deliver the most immediate benefits) while choosing to remain informal along some other dimensions. For instance, a firm may register with the tax authority and acquire municipal licenses to be able to access business opportunities with the government, but at the same time it may not register workers for social security. Even within the business or labor dimension, formalization is a gradual process: as is the case in this study, firms may choose to register with the tax authority, but may not acquire the required business licenses to operate (Kanbur 2017) or may not be compliant with tax payments.

Finally, too often formalization is perceived as a one-way process. Yet, as the benefits of formality are not necessarily evident for SMEs, entrepreneurs are not likely to know whether going formal will lead to greater benefits. Hence, many SMEs are likely to experiment with some aspects of formality, learn about the realized benefits, and choose whether to pursue further formalization or return to informality. A continuously changing business environment and fluctuations in enterprise performance and revenues may also affect the decision to become or remain formal.

The design of effective formalization strategies requires going beyond the traditional formal/informal dichotomy and gaining a better understanding of the nuances of the formalization process. Although some of these aspects have been documented in the literature, to the best of our knowledge there has been no attempt to analyze the pathways to formalization, looking jointly at business and labor formalization processes and how they influence one another.

In this paper, we use a unique panel data set of 888 Peruvian micro enterprises to document the joint process of business and labor formalization. The sample draws from small firms that registered with the Tax Authority (SUNAT). An interesting fact emerges: registration with SUNAT does not necessarily imply compliance with tax legislation. Matching the data set with actual tax data shows that some small firms, despite having registered, do not file taxes and appear in the tax database as inactive.

Because of the sampling design, we do not use tax status as an indicator of business formality; instead, our business formality indicator relies on whether in a given year the firm acquired the municipal licenses required for formal operation. Since licenses need to be renewed, the indicator has the benefit of allowing the tracking of movements toward formality and informality. The survey also contains information on whether firms have registered their workers with the Ministry of Labor in the Electronic Payroll Registry, which obliges firms to comply with labor regulations such as minimum wage legislation, health insurance payments, and social security. Again, registration in the Electronic Payroll Registry is not a one-off process: each month, firms are required to submit a listing of their workers —we observe a significant number of firms that stop providing such information while remaining active. Accordingly, we use worker registration in the Electronic Payroll Registry as our indicator of labor formality. It may appear surprising that active firms can stop acquiring licenses and submitting information about their workers. Nevertheless, overall levels of enforcement remain

relatively modest and vary significantly by sector and geographic location, so that for many firms the expected punishment of reverting to informality remains weak.

Several findings emerge. Business formality does not imply labor formality—and vice versa. Despite being registered with SUNAT, 10 percent of the firms in the sample neither have municipal licenses nor register workers with social security. Another 10 percent has workers registered with social security but does not have the municipal licenses to operate. Around 20 percent of the firms have municipal licenses but did not register workers. Finally, only 60 percent of the firms in a given year have the necessary licenses and have registered their workers with social security.

We also observe significant churning in and out of different dimensions of formality within relatively short periods of time. In the span of a year, only two-thirds of the firms maintain their status in the business and labor dimensions. The remaining one-third changes its formality status. Around 10 percent of the firms become more formal, and 20 percent of the firms become less formal. Most firms that change status appear to do so gradually. Very few firms acquire (or lose) business and labor formalization status at once. In most cases, firms choose to become more or less formal along the business or labor dimension, but not along both dimensions at the same time. Such a process supports the view that these firms embark in a gradual process of formalization; evaluate the realized benefits; and choose whether to pursue further formalization, stay partially informal, or even revert to informality in one or both dimensions.

We take advantage of the panel nature of the data to look at firm characteristics that influence year-to-year transitions toward business and labor formality and informality. Businesses with an incorporated legal status (as opposed to unincorporated or natural persons) are more likely to acquire municipal licenses and keep them. In contrast, young firms (less than age four years) are more likely to de-formalize by not renewing municipal licenses. These findings are consistent with the view that young entrepreneurs learn about their productivity in the formal and informal sectors and act upon it. Similarly, firms with greater value added per worker and from regions with larger proportions of firms registering with the Electronic Payroll Registry are more likely to register their workers and keep them registered. These findings suggest that enforcement matters, and—everything else being equal—firms must reach a certain level of productivity before they have the necessary potential to formalize their labor force.

Next, we attempt to infer the extent to which business formalization affects labor formalization and vice versa. Are firms that initiated the process of formalization more likely to conclude it?

And are there virtuous cycles under which business formalization leads to greater labor formalization and vice versa? The analysis calls for the use of instrumental variables to control for business and labor formalization being both dependent and explanatory variables. We use proximity to SUNAT as an instrument for business formalization, and the proportion of firms within a region (state) that registers their workers in the Electronic Payroll Registry as an instrument for labor formalization. The results support a pragmatic view of the formalization process, in which at each step firms weigh the advantages and disadvantages of formalizing. We find that business formalization favors labor formalization but not the opposite, which is consistent with the view that business formalization is a lighter and less costly process that can be more easily reversed.

Taken together, the results show that small entrepreneurs may find it more feasible to formalize gradually. At each step, they weigh the relative costs and benefits of formalization, choosing the most cost-effective path to business (often) or labor (less often) formalization—but rarely both at the same time. Small entrepreneurs are also ready to revert to informality if, after making the transition, they realize that the costs outweigh the benefits. Such a nuanced approach to the formalization process provides useful insights for the design of effective formalization policies. Given the propensity of small entrepreneurs to formalize gradually and take diverse pathways toward formality, approaches that focus on only one side of formalization are prone to failure. Successful policies not only need to be broad in scope and tackle the many obstacles affecting business and labor formalization; they also need to understand the specific constraints of each entrepreneur and develop better tailored solutions.

The paper unfolds as follows. The next section discusses the related literature; section 3 provides the context for SME formalization in Peru; section 4 discusses the methodology and data; section 5 presents the empirical analysis; and section 6 concludes.

## 2. Related Literature

Over the past decade, several studies have assessed the effects of various policy interventions to promote business and labor formality. Studies on policies to promote business formality delve primarily into efforts to increase registration at government entities, particularly the tax authority. Studies on policies to promote labor formalization delve into efforts to increase registration of workers in the payroll, pension, and health systems. We explore the emerging results of both areas of research.

Policies to promote business formalization include providing information to business owners; simplifying registration procedures (such as through one-stop shops and streamlining procedures); reducing costs, including tax reductions and special tax regimes; introducing incentives such as access to social security, increasing enforcement; providing counseling and coaching for business development, including access to government purchases; and even paying firms to formalize.

One set of policies consists of offering information and/or support on the process of formalization to business owners. Research on this topic includes initiatives in Bangladesh, Benin, Brazil, and Sri Lanka. Most studies do not find a significant impact on business registration, suggesting that information is not the sole constraint to formalization. Examples are the studies by De Giorgi and Rahman (2013) for Bangladesh; de Mel, McKenzie, and Woodruff (2013) for Sri Lanka; De Andrade, Bruhn, and McKenzie (2013) for SIMPLES in Brazil (special tax and social security regime for micro and small enterprises); and Benhassine et al. (2018) for the *entrepreneur* legal status in Benin.

Another set of policies aims at simplifying the process of business registration, through the implementation of one-stop shops that allow completing all the procedures, forms, and payments required to register a business in a single place (or website), greatly reducing the time required for registration. Evidence from Colombia, Mexico, Brazil, and Peru suggests an initial increase in business registration immediately after the introduction of these policies, but the impacts tend to fade or even disappear in the medium term. Some one-stop shops for business registration also include the registration of workers and payment of payroll taxes and social security contributions, such as *Mi simplificación registral* in Argentina, and *Programa do microempreendedor individual* and SIMPLES in Brazil (see, for instance, Bruhn and McKenzie 2013).

Other studies have looked at whether increasing enforcement promotes formalization. There is evidence that increased enforcement for business registration, including inspection visits as well as warnings of being targeted for inspection, has a positive effect on business formalization. However, the effect on business registration remains small and is only observed in large firms. See, for instance, De Andrade, Bruhn, and McKenzie (2013), who explore the effect of the visit of a municipal inspector in Brazil; and De Giorgi, Ploenzke, and Rahman (2015), who study the case of Bangladesh.

There have been several attempts to reduce the cost of business registration and being formal (primarily through tax reductions or special tax regimes for small firms). There is some evidence that cost reduction during the registration stage increases business registration, but the impact is usually short-lived. For example, Kaplan, Piedra, and Seira (2011) analyze the case of SARE in Mexico; Alcázar and Jaramillo (2012) and Jaramillo (2013) consider municipal licenses in Lima, Peru; De Andrade, Bruhn, and McKenzie (2013) study the SIMPLES regime in Brazil; and de Mel, McKenzie, and Woodruff (2013) look at formalization cost reimbursement in Sri Lanka. The evidence on the effect of tax reductions or special tax and social security regimes for micro and small enterprises is also mixed. A few studies find a positive effect on registration, while others find an effect only for specific sectors (such as retail) or no effect at all – see, for example, Fajnzylber, Maloney, and Montes-Rojas (2011); Monteiro and Assunção (2012); and Piza (2016) for the implementation of SIMPLES in Brazil; and Rocha; and Ulyssea, and Rachter (2014) for the *Programa do microempreendedor individual*, also in Brazil. A few studies look at other incentives for business formalization, including counseling and coaching for business development or directly providing a cash bonus for formalizing, The evidence here remains also limited and mixed (de Mel, McKenzie, and Woodruff 2013; Benhassine et al. 2018; Jaramillo 2013, van Elk et al 2014).

Some countries have tried to promote labor formalization with different policies including simplification of procedures, reductions of social security or health insurance contributions, special labor regimes for small firms, and increased enforcement. Overall, the evidence on impacts of these reforms is scarce and mixed.

In Argentina, for instance, a program to simplify worker registration procedures led to short-term increases in the registration of new workers, but the impacts faded over time. There is emerging evidence suggesting that stronger enforcement of labor codes sustains greater formalization. In particular, more frequent and stringent labor inspections have been associated with better compliance with labor legislation, including payroll taxes and social security registration. Other initiatives include substitution of fines with training on labor legislation for employers who initially did not comply with the labor law. These initiatives are found to have a positive but small effect on labor formalization. Ronconi and Colina (2011) study the simplification initiatives *Mi simplificación registral* and *Su declaración* in Argentina; Almeida and Carneiro (2012) and Viollaz (2016) consider enforcement in Brazil and Argentina, respectively; and Montero, Reinecke, and Zapata (2006) analyze the substitution of fines with training in Chile.

To the best of our knowledge, business and labor formalization have mostly been analyzed in isolation from each other. Only a handful of studies explore formalization in both dimensions for the same firms. In general, these exercises have been performed for programs that include the double purpose of formalizing firms and workers. In Latin America, the example of this type of approach is the simplified tax system, *monotributo*, which merges payroll taxes and social security contributions in a single payment. It is targeted to SMEs, and the cost is lower than that for larger businesses (general regime). The *monotributo* system has been implemented in Argentina, Brazil, and Uruguay, and more recently in Colombia. Several authors have studied the SIMPLES regimen in Brazil, which also provides a simplified tax and social security payment system. The studies observe a positive effect on workers' registration in the social security system (Fajnzylber, Maloney, and Montes-Rojas 2011; Monteiro and Assunção 2012; Piza 2016). Some authors have studied the tax reform in Colombia in 1993 and 2012; they find a negative relationship between payroll taxes and employment formalization. Kugler and Kugler (2009) study the Social Security Reform in Colombia in 1993; and Bernal et al. (2017); and Kugler, Kugler, and Herrera (2017) also explore Colombia's 2012 tax reform. Other authors also observe that a large reduction in labor costs in SMEs had little effect on the registration of workers (Chacaltana 2008). Our study complements these evaluations by exploring the formalization process over time, as opposed to the impacts of a specific reform.

### **3. Context of SME Formalization in Peru**

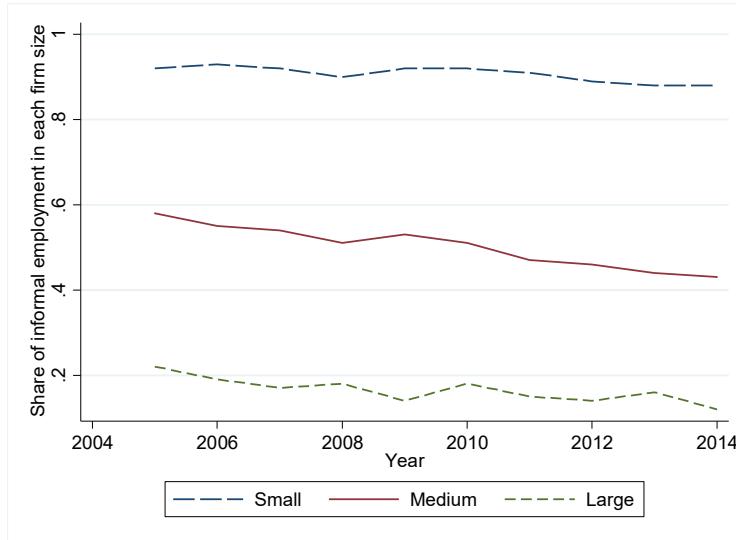
Labor informality in Peru was reduced from more than 81 percent in 2005 to 72 percent in 2016. This was a remarkable change in trend—confirmed by a diverse set of alternative measures of informality—in a country with traditionally high and persistent informality rates along the business and labor dimensions.

The academic discussion has highlighted important characteristics of the formalization process. Diaz (2014) remarks on the importance of the business cycle, finding that for every percentage point increase in output per worker, labor informality rates declined by 0.19 to 0.27 percentage point, depending on the definition of informal employment. This raises the question of whether the reduction in labor informality could have been larger and highlights the importance of the economic structure as a major driver of the transition to formality. Chacaltana (2016) finds that economic factors—growth and structural change—accounted for most of the reduction in informality in 2002–12, as opposed to the institutional changes introduced in this period.

Infante, Chacaltana, and Higa (2014) estimate that between 2000 and 2011, output per worker grew some 3.3 percent, of which some 2.8 percent was due to large firms and only 0.5 percent to SMEs.

An interesting feature of this process is that the reduction in labor informality was stronger among larger firms than smaller firms (figure 1). Between 2002 and 2012, labor formality rates increased from 12.5 to 15.2 percent among SMEs; in contrast, they increased from 60.9 to 70.5 percent among large firms. This happened despite the implementation of several policy interventions aimed at business and labor formalization of SMEs over this period, with mixed results.

Figure 1: Informality Rates among Wage Earners, by Firm Size, Peru



Source: Labor Ministry of Peru.

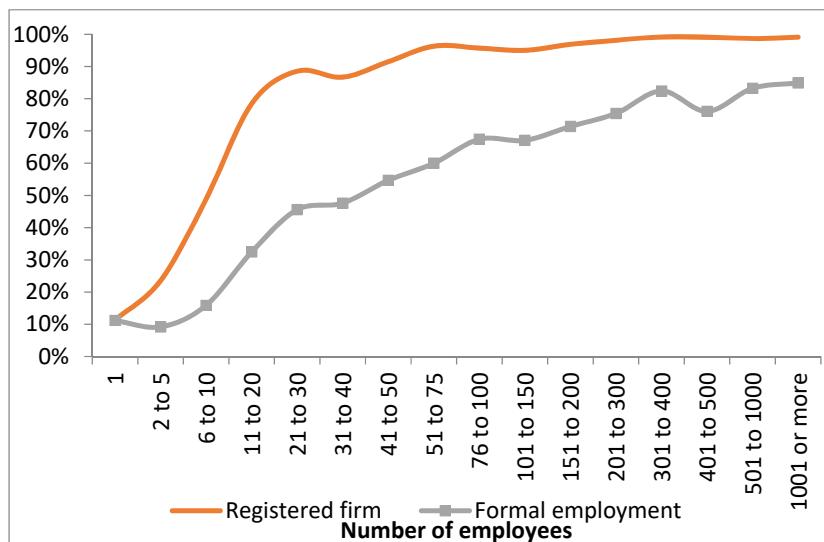
Business informality in Peru, defined as SMEs not complying with tax registration, decreased from 67% in 2011 to 53% in 2015 (PRODUCE 2017). Along the business dimension, promotional regimes were introduced during the same period. The *Registro Único Simplificado* system simplified and reduced the value-added tax. The *Regimen Especial de Renta* system reduces income taxes for small businesses. There are also some promotional programs, such as the National Plan to Promote and Formalize SMEs, which aim to enhance SME access to markets. The SME Law of 1998 gives SMEs access to a specific fund for competitiveness and technological upgrading. In 2006, the *Garantía Mobiliaria* law was approved to help SMEs with financial collateral. More recently, the *Mype-tributario*, a special tax regime for SMEs,

was created for firms with sales less than 700 Tax Units (nearly US\$1 million) per year, reducing their income tax from 30 percent (in the general regime) to 10 percent.

Along the labor dimension, a special SME labor regime (*Regimen Mype*) has been in place since 2003, in which the labor costs are reduced drastically, to almost to one-seventh of those in the general regime. Initially, the *Regimen Mype* was created for firms with fewer than 10 employees. The SME Law of 2008 added an intermediate regime for firms with more than 10 employees but fewer than 100, reducing labor costs to one-half those in the general regime. In the Peruvian case, these reductions in labor costs implied fewer workers' benefits.

In 2007, an electronic payroll system was created for firms with three or more employees, which is mandatory: this not only provides more information on firms' workers, but also increases the government's capacity for oversight and enforcement of labor rights. More recently, the National Superintendence of Labor Inspection was created, and a proposal is under discussion for giving local governments oversight capacity for firms with fewer than 10 workers.

Figure 2: Firm and Business Formality Rates, Peru, 2015



Source: ENAHO.

Note: Firm formality rates: proportion of firms declaring they are registered with SUNAT.  
Labor formality: persons with formal employment (registered with social security).

Until recently, business and labor promotional programs have operated independently from one another in Peru, which may have contributed to the low impacts of formalization policies.

Another factor that may have contributed is the confusion that often arises between business and labor formality, which are different but connected processes. Figure 2 shows both formality pathways by firm size. Firm formality (registration with SUNAT) grows faster with firm size and reaches almost 100 percent after the size of 20 workers. Instead, labor formality grows slower with firm size, reaching 80 percent in very large firms (more than 100 workers).

#### **4. Data and Methodology**

Our primary data come from firms in the Peruvian Survey of Micro and Small Enterprises (EMYPE for its acronym in Spanish), which was carried out by the National Bureau of Statistics (INEI). The sampling frame comes from companies registered with SUNAT as of 2008. To catch micro and small firms, SUNAT's registry is restricted to firms with annual sales less than US\$3.5 million. From this total, the registry is further restricted to firms in the manufacturing industry that located in the capital province from eight regions of the country, including firms from Lima and Callao (the capital city).

A particular characteristic of EMYPE that makes it suitable for our purposes is that it contains information on firms' business and labor formality. For business formality, the survey includes information on firms' compliance with municipal regulations for business operation. For labor formality, the survey includes information on firms' compliance with registration of their workers in the Electronic Payroll Registry. The survey also includes information on production and sales, total number of workers, age of the firm, specific branch of manufacturing, legal status of the firm (whether it is incorporated or not), as well as the sex and age of the manager of the firm.

EMYPE was carried out annually between 2010 and 2013 and recorded information from the previous fiscal year of business operations. Nevertheless, the information on business and labor formality was recorded only in the surveys for 2012 and 2013, corresponding to fiscal years 2011 and 2012, respectively.

We complement these data with public information from INEI, the Ministry of Labor, the Supervisory Agency for Investment in Energy and Mining (OSINERGMIN), and SUNAT. From these sources, we obtained additional data at the district or regional level. From INEI, we gathered data on district-level population. From OSINERGMIN, we retrieved data on district-level electricity consumption, a variable we use to proxy for local or district-level economic

activity, since there is no information on gross domestic product at the district level.<sup>2</sup>

From SUNAT, we retrieved information on the total number of firms from each region and the location of their local offices for all the regions covered by EMYPE. The location of local SUNAT offices allows constructing the distance from the EMYPE enumeration area to the nearest SUNAT office, which we use as a proxy variable for business formality enforcement.

From the Ministry of Labor, we retrieved regional-level information on the number of firms registered in the Electronic Payroll Registry. The registry records information on formal firms and their workers from the standpoint of labor regulations. All formal employers with more than two workers are required to submit payroll information to the Ministry of Labor. Registered employment represents the most formal employment in the country, since employers who report to the Electronic Payroll Registry comply with all the labor benefits and entitlements established by Peruvian labor laws. We combined the information on firms in the Electronic Payroll Registry with information on firms in the SUNAT registry to compute the fraction of firms that comply with the labor regulations by region. We use this variable as a proxy for labor formality enforcement.

Table 1 presents summary statistics for the main variables used in the analysis. In fiscal year 2009, when the sample was drawn, the average SME in the data set had 11 years of business operations, and 25 percent of the firms had been in operation for five or fewer years. In 2012, the average firm in the data generated monthly product per worker of about US\$2,670 and had eight workers, and 56 percent of the firms were incorporated businesses. Around 31 percent of the firms are in the apparel industry; 27 percent, metal-mechanics industry; 17 percent, leather and related industries; 14 percent, furniture industry; and the rest, wood (7 percent), food processing (2 percent), and jewelry and related industries (1 percent). Geographically, the SMEs are from eight regions (states) of the country, with the capital city (Lima and Callao), Arequipa, and La Libertad contributing to approximately 76 percent of the sample (31, 23, and 22 percent, respectively) and Junin, Lambayeque, Loreto, Piura, and Callao the remaining 24 percent (9, 7, 4, 3, and 1 percent, respectively).

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<sup>2</sup> We thank Nikita Cespedes who provided us with these data. He uses electricity consumption as a proxy for economic activity at the district level in a study assessing the elasticity of labor formality to economic activity (Cespedes 2015).

Table 1: Descriptive Statistics

	N	Mean	SD	Min	Max
<b>Dependent variables</b>					
License	888	0.787	0.410	0	1
Payroll registry	888	0.625	0.484	0	1
<b>Explanatory variables</b>					
<b>Enforcement</b>					
Log distance to SUNAT	888	0.837	0.720	-1.845	2.839
Firms in E-Payroll / firms in SUNAT	888	0.175	0.032	0.102	0.215
<b>Firm variables</b>					
Log product per worker	888	10.991	0.886	6.585	13.599
Log number of workers	888	1.626	0.890	0	4.934
Incorporated business	888	0.560	0.497	0	1
Age 1-4	888	0.236	0.425	0	1
Age 5-8	888	0.227	0.419	0	1
Age 9-12	888	0.196	0.397	0	1
Age 13-16	888	0.137	0.344	0	1
Age 17-+	888	0.203	0.402	0	1
Food	888	0.018	0.133	0	1
Leather products	888	0.176	0.381	0	1
Wood products	888	0.062	0.241	0	1
Metal products	888	0.276	0.447	0	1
Furniture	888	0.144	0.351	0	1
Jewelry	888	0.014	0.116	0	1
Lima & Callao	888	0.327	0.469	0	1
<b>District-level variables</b>					
Electricity consumption	888	1.144	1.171	0.185	9.157
Log district population	888	12.027	0.772	8.296	13.841

Source: EMYPE 2013.

Note: All figures are for fiscal year 2012.

### Methodology

We perform regression analysis to assess the relationship between business and labor formality. For business formality, we define the dummy variable *License*, which takes the value one if the firm has a municipal license, which means that the firm complies with local regulations for operation (aside from complying with tax regulations), and the value zero otherwise. In a similar way, for labor formality, we define the dummy variable *Payroll*, which takes the value one if the firm registers its payroll, which means that the firm complies with labor regulations. Next, we estimate linear probability regression models of the form:

$$License = \alpha_1 Payroll + \beta_1 Enforcement_1 + \gamma_1 X + \varepsilon_1 \quad (1)$$

$$Payroll = \alpha_2 License + \beta_2 Enforcement_2 + \gamma_2 X + \varepsilon_2 \quad (2)$$

For each formality regression, we include the other formality variable as an explanatory variable in its regression specification. In each regression, we also include a proxy for the enforcement of regulations. In addition, we include covariates related to the firm's capacity to comply with regulations, such as the product per worker and total employment, as well as firm characteristics.

Ordinary least squares (OLS) estimation does not take into account the simultaneity in the decisions to comply with business and labor regulations; this makes each formality variable an endogenous explanatory variable in the regression of the other formality variable. To address this problem, we apply two-stage least squares (2SLS) using instrumental variables to eliminate the endogeneity. We use the enforcement proxy for each type of formality as its instrumental variable in the regression of the other formality variable.

Specifically, for business formality (*License*), we use the proximity to SUNAT as our instrumental variable. Given that firms in Peru regard SUNAT as an institution with effective and high sanctioning capacity, the rationale behind the instrument is that the farther a firm is from a SUNAT office, the lower are the chances of detection. For labor formality (*Payroll*), we use the percentage of firms in the Electronic Payroll Registry of the total number firms in the Tax Registry. The rationale behind this instrumental variable is that the larger is the fraction of firms already in the Electronic Payroll Registry, the higher is the likelihood that the Ministry of Labor may target the firm for labor inspection in the region.

## 5. Pathways to Formality: Results

Before delving into the regressions, it is worth exploring trends and raw transition probabilities, as these provide a rich picture of the complexity of the pathways to formality.

Compliance with business and labor formality regulations is high in our sample, and compliance with business regulations is higher than compliance with labor regulations. When we analyze both dimensions, however, we find that compliance *decreased* between 2011 and 2012 along the business and labor dimensions: compliance with municipal regulations declined from 81 to 79 percent, and compliance with labor regulations declined from 68 to 63 percent in our data. Compliance with tax regulations remains unchanged for all the SMEs in our data between 2011 and 2012. However, using complementary data provided by INEI for 2016, we find that compliance with business formality from the standpoint of tax regulations declined from 100 percent in 2012 to 85 percent in 2016. The decrease in formality rates in this sample

of firms suggests that formality is not a one-way process—some firms may choose to de-formalize. The decrease also contrasts with the overall increase in formality observed in Peru during the same period; these opposing trends show how formalization is not a uniform process: while larger firms may have hired more formal workers, many smaller firms in our sample may have not.

Although the aggregate numbers only changed modestly across the two years, when looking at transitions of individual firms, we also find that there are much more dynamics and transitions going on beyond the aggregates. We define four groups of firms to explore compliance in a finer way: firms that comply with none of the formality regulations, firms that comply only with business regulations, firms that comply only with labor regulations, and firms that comply with business and labor regulations at the same time. Table 2 reports firm-level transitions across these categories between 2011 and 2012. Each row in the table reports the percentage of firms in a given status in 2012, given their status in 2011. For each of the four groups, the majority of firms preserve their initial status, as the larger fraction of firms in the main diagonal of the table reveals. However, the fraction of SMEs off the diagonal comprises a relatively large figure, revealing that many firms informalize or formalize during the same year—netting out the effect in the aggregate.

Table 2: Business and Labor Formality Transitions  
(percentage of firms, given initial status in 2011)

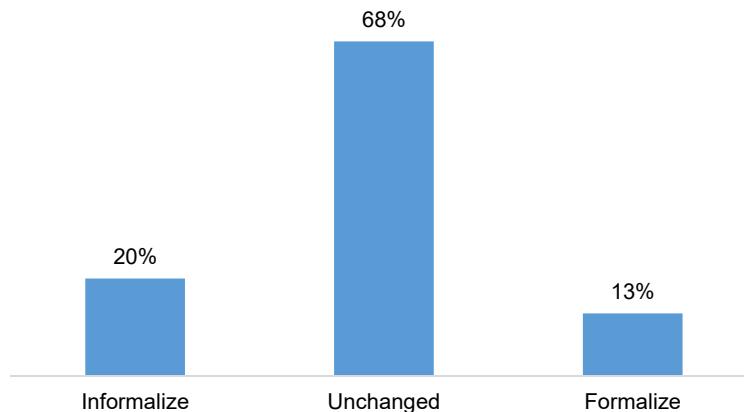
		2012			
		None	Only license	Only payroll	Both
2011	None	65	19	8	7
	Only license	10	52	5	32
	Only payroll	26	11	42	21
	Both	2	18	5	74

Note: Row percentages add to 100.

About one-third of the SMEs in our data changed their formality status between 2011 and 2012 (Figure 3). Furthermore, the transition figures reveal that there is a bidirectional process of formality compliance. We use the cells in table 2 to identify SMEs that informalized and formalized between 2011 and 2012. The firms that informalized are those that complied with

fewer regulations in 2012 with respect to 2011. The firms that informalized comprise approximately 20 percent of the total in the data. The firms that formalized are those that complied with more regulations in 2012 than in 2011. The firms that formalized comprise approximately 13 percent of the total in the data. About a third of the firms changed their formality status within a single year—going toward greater formality or informality.

Figure 3: Transitions Summary, 2011–12



*Source:* EMYPE 2012–13.

*Note:* The data are for fiscal years 2011 and 2012.

#### *Business and Labor Formality: Transition Regressions*

We use data from fiscal years 2011 and 2012 to construct variables that indicate transitions in formality status between those years. For instance, we construct a variable that indicates that a firm turned from not complying to complying and a variable that indicates that a firm turned from complying to not complying with business regulations between 2011 and 2012, respectively. We define similar variables for labor formality.

Table 3 reports the results from linear probability models of these transition variables on enforcement indicators and firms' characteristics. We ran these regressions to uncover transition patterns, controlling for several observable characteristics. The results suggest that the probability of moving from not complying with business formality in 2011 to complying in 2012 (that is, the probability of business formalization) is higher for incorporated businesses. We also find that the probability of moving from complying with business formality in 2011 to not complying in 2012 (that is, the probability of business informalization) is higher for

younger firms and lower for incorporated or larger firms. The correlation of business formality transitions with the business enforcement variable is somewhat odd. We find no relationship for the formalization indicator, but a positive association with the informalization indicator as the distance from the firm to the nearest SUNAT office increases.

Turning to the labor formality transitions, we find that the probability of moving from not complying with labor formality in 2011 to complying in 2012 (labor formalization) increases with the product per worker and for incorporated businesses. The labor enforcement variable is also positively correlated to labor formalization: when the fraction of firms already registered in the Electronic Payroll Registry increases, so does the probability that a firm formalizes. By contrast, the probability of moving from complying with labor formality in 2011 to not complying in 2012 (labor informalization) decreases with product per worker, for incorporated businesses, and for higher levels of labor enforcement.

Table 3: Transition Probability Regressions

	(1) OLS License 0 => 1	(2) OLS License 1 => 0	(3) OLS Payroll 0 => 1	(4) OLS Payroll 1 => 0
Variable				
Change t=2011 => t=2012				
Log distance to SUNAT	0.0135 (0.0575)	0.0438*** (0.0162)		
Firms in E-Payroll / firms in SUNAT			0.0156** (0.008)	-0.0150** (0.006)
Growth in per capita electricity consumption 2011/12	-0.191 (0.192)	0.00229 (0.0684)	0.102 (0.149)	-0.000937 (0.102)
Log product per worker	0.0100 (0.0315)	0.00474 (0.0128)	0.0658** (0.0310)	-0.0292* (0.0175)
Log number of workers	0.0677 (0.0497)	-0.0370*** (0.0137)	0.0595 (0.0443)	-0.0276 (0.0200)
Incorporated business	0.208** (0.0914)	-0.0875*** (0.0255)	0.277*** (0.0687)	-0.239*** (0.0401)
Age 1-4	-0.0267 (0.0777)	0.0598** (0.0265)	-0.0912 (0.0653)	-0.0437 (0.0383)
Constant	0.576 (0.579)	0.163 (0.211)	-0.706 (0.581)	1.234*** (0.338)
Observations	168	720	287	601
R-squared	0.086	0.078	0.161	0.105

Note: Standard errors are in parentheses. Significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

In this regression, we do not find a significant effect of local level of economic activity (measured by electricity consumption), nor do we find a relationship with output per worker. The lack of a longer series of data (we have only two years) and the proxy we use for economic activity may limit the analysis of the effect of economic growth and its structure in the formalization process, even though other studies have shown their key importance.

#### *Interaction between Business and Labor Formality: Main Results*

Table 4 reports the results of our main regression analysis on the interrelationship between business and labor formality. Columns (1) and (3) display OLS regressions results, and columns (2) and (4) display 2SLS regressions results. The dependent variables are indicator variables for complying with municipal business licenses for operation and payroll registry of workers. For each formality variable, we include a proxy variable for the enforcement of regulations. For business formality, we use the distance (in logs) from the business location to the nearest SUNAT office as our proxy for enforcement of municipal regulations. For labor formality, we use the percentage of firms already registered in the Electronic Payroll Registry as our proxy for enforcement of labor regulations.

In addition, we include a set of covariates related to the probability of complying with business and labor formality regulations. In this set of covariates, we consider the (log) product per worker, (log) total number of workers, age of the firm, an indicator variable for the legal status of the firm (incorporated versus unincorporated businesses), dummies for industry, (log) population of the district, and a dummy variable for Lima and Callao (the capital city).

The findings indicate that business formality affects labor formality, but not the other way around. Specifically, the OLS regressions find that both types of formality reinforce each other, as the estimated coefficients for the payroll registry and license variables in columns (1) and (3) show. However, when we control for endogeneity using the instruments, the 2SLS regression results tell a somewhat different story: firms that comply with business formality increase their probability of complying with labor formality by 0.7 percentage points (or by 54 percent). Nevertheless, complying with labor formality does not have a statistically significant effect on the probability of complying with business formality.

Table 4: Main Regression Results from OLS and 2SLS

Variable	(1) OLS License	(2) 2SLS License	(3) OLS Payroll	(4) 2SLS Payroll
Payroll registry	0.0738** (0.0298)	-0.0964 (0.206)		
License			0.107*** (0.0377)	0.686** (0.331)
Log distance to SUNAT	-0.0751*** (0.0190)	-0.0794*** (0.0198)		
Firms in E-Payroll / firms in SUNAT			0.019*** (0.005)	0.0238*** (0.006)
Log product per worker	0.0304* (0.0157)	0.0383** (0.0185)	0.0491*** (0.0176)	0.0267 (0.0234)
Log number of workers	0.0672*** (0.0167)	0.0835*** (0.0258)	0.0891*** (0.0185)	0.0522* (0.0293)
Incorporated business	0.154*** (0.0316)	0.211*** (0.0755)	0.310*** (0.0344)	0.205*** (0.0711)
Age 5-8	0.0355 (0.0370)	0.0352 (0.0373)	-0.0112 (0.0417)	-0.0326 (0.0480)
Age 9-12	0.112*** (0.0389)	0.120*** (0.0405)	0.0313 (0.0439)	-0.0314 (0.0605)
Age 13-16	0.154*** (0.0429)	0.142*** (0.0457)	-0.0754 (0.0486)	-0.163** (0.0735)
Age 17-+	0.201*** (0.0388)	0.204*** (0.0393)	-0.000107 (0.0443)	-0.120 (0.0839)
Constant	0.302 (0.267)	0.253 (0.275)	-0.736** (0.315)	-0.936** (0.370)
Observations	888	888	888	888
R-squared	0.188	0.157	0.267	0.068
Weak identification test		19.00		14.24

Note: Standard errors are in parentheses. Significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Stock-Yogo weak ID test critical values: 16.38 (10% maximal IV size); 8.96 (15% maximal IV size).

The 2SLS results are consistent with business formalization being an easier and less costly step than labor formalization: labor formalization may be a step that many less productive firms may not be willing or able to take, although an SME-specific labor regime exists in Peru. Under labor regulations, firms must comply with an array of requirements, including social security and health insurance payments (12 percent of the corresponding wage bill), granting paid vacations to their workers (a paid month per year), and making bi-annual deposits for severance payments (8.3 percent of the corresponding wage bill per year) in case of worker dismissal.

These results are also consistent with a higher probability of detection for business informality. In practice, labor regulations are more difficult to enforce, as the Ministry of Labor and its

regional offices lack the operative capacity to implement labor inspections. By 2010, there were 406 labor inspectors for the whole country. By contrast, once a firm registers with SUNAT, it becomes subject to regular oversight, notifications, and visits from tax inspectors. Such interpretation is consistent with previous studies that show a tax detection probability of around 60 percent and a labor detection probability of around 4 percent (Chacaltana 2001).

We also find that enforcement is relevant at both margins: the estimated coefficients for the enforcement proxy variables are statistically significant and of meaningful magnitude. The estimated coefficient for the distance to SUNAT in the 2SLS regression in column (2) implies that the probability of complying with business regulations drops by 5 percent for a firm located 2 kilometers farther from a SUNAT office. Similarly, the larger is the fraction of firms already registered in the Electronic Payroll Registry, the higher is the probability of complying with labor formality regulations. The estimated coefficient for the fraction of firms in the Electronic Payroll Registry in the 2SLS regression in column (4) implies that a 10 percent increase in this proportion increases the probability of complying with labor formality regulations by 3.4 percent.

The legal status of the firm is also relevant at both margins: incorporated businesses are more likely to comply with business and labor regulations. The estimated coefficients in the 2SLS regressions in columns (2) and (4) imply that the probability of complying with business and labor regulations increases by 21 percentage points (or by 12 percent) if we compute the effect with respect to the average fraction of incorporated businesses.

Finally, we find that the firm's age matters for business formality, but not for labor formality. The 2SLS estimated coefficients for the age dummies in column (2) show that the probability of complying with business regulations increases with the age of the firm. By contrast, no clear pattern emerges from the estimated coefficients for the age dummies in column (4).

### *Sample Split*

The legal status of the firm correlates positively with business and labor formality compliance. The legal status of the firm could conceal a higher propensity to formalize for several reasons, including better organizational structure or higher productivity potential. We further explore whether the relationship between the two formality dimensions is different when the legal status of the firm changes. To this end, we rerun the analysis separately for two sub-samples: unincorporated firms and incorporated firms. We report the results in table 5.

The findings remain qualitatively the same only for the sub-sample of unincorporated firms. For these firms, business formality has a positive impact on labor formality, although the estimated coefficient is statistically significant only at the 10 percent level (see 2SLS results in column (6)). Similarly, we do not find an effect of labor formality on business formality (see 2SLS results in column (2)).

In contrast, we find that business and labor formality do not affect one another among incorporated firms (see 2SLS results in columns (4) and (8)). These results suggest there is more scope for policies aimed at increasing business and labor formality among unincorporated firms, which are less likely to be formal in the first place.

Table 5: Sample Split by Firm Legal Status

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Unincorporated business OLS License	2SLS License	Incorporated business OLS License	2SLS License	Unincorporated business OLS Payroll	2SLS Payroll	Incorporated business OLS Payroll	2SLS Payroll
Payroll registry	0.118** (0.0478)	0.289 (0.228)	0.0233 (0.0373)	-0.316 (0.315)				
License					0.139*** (0.0528)	0.483* (0.253)	0.0480 (0.0556)	2.422 (2.470)
Log distance to SUNAT	-0.142*** (0.0351)	-0.138*** (0.0353)	-0.0272 (0.0210)	-0.0402 (0.0253)				
Firms in E-Payroll / firms in SUNAT					0.026*** (0.007)	0.026*** (0.007)	0.016** (0.007)	0.033 (0.023)
Log product per worker	0.0425 (0.0286)	0.0260 (0.0357)	0.00794 (0.0173)	0.0135 (0.0191)	0.104*** (0.0301)	0.0839** (0.0342)	0.0196 (0.0209)	-0.00725 (0.0529)
Log number of workers	0.124*** (0.0366)	0.0941* (0.0537)	0.0492*** (0.0167)	0.0719*** (0.0274)	0.183*** (0.0382)	0.141*** (0.0496)	0.0579*** (0.0202)	-0.0583 (0.128)
Age 5-8	-0.00893 (0.0706)	-0.0420 (0.0824)	0.0723* (0.0399)	0.0445 (0.0496)	0.188** (0.0736)	0.183** (0.0761)	-0.0933* (0.0486)	-0.264 (0.206)
Age 9-12	0.167** (0.0719)	0.125 (0.0899)	0.0434 (0.0434)	0.0268 (0.0487)	0.209*** (0.0750)	0.149* (0.0886)	-0.0575 (0.0528)	-0.151 (0.149)
Age 13-16	0.186** (0.0835)	0.170** (0.0855)	0.114** (0.0453)	0.0684 (0.0640)	0.0766 (0.0884)	0.00797 (0.104)	-0.129** (0.0552)	-0.388 (0.294)
Age 17-+	0.213*** (0.0716)	0.173** (0.0883)	0.180*** (0.0445)	0.150*** (0.0546)	0.194** (0.0753)	0.116 (0.0957)	-0.0791 (0.0550)	-0.501 (0.454)
Constant	0.547 (0.516)	0.695 (0.549)	0.660** (0.289)	0.816** (0.339)	-1.467*** (0.556)	-1.533*** (0.576)	0.0741 (0.379)	-1.839 (2.150)
Observations	391	391	497	497	391	391	497	497
R-squared	0.215	0.188	0.089	-0.068	0.178	0.084	0.068	-3.474
Weak identification test		17.06		7.77		18.26		1.13

Note: Standard errors are in parentheses. Significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Stock-Yogo weak ID test critical values: 16.38 (10% maximal IV size); 8.96 (15% maximal IV size).

### Lagged Effects

We further explore the possibility that there may be a sequence in the formalization process of the firm, by using lagged variables. We replicate our main regression analysis, but instead of using contemporary formality variables as explanatory variables, we use their lagged counterparts. This is possible because we have two observations for each firm in the sample (for fiscal years 2011 and 2012).

Table 6: Using Lagged Explanatory Variables

Variable	(1) OLS License	(2) 2SLS License	(3) OLS Payroll	(4) 2SLS Payroll
Payroll registry, t-1	0.0132 (0.0324)	-0.245 (0.590)		
License, t-1			0.176*** (0.0378)	0.573** (0.258)
Log distance to SUNAT	-0.0771*** (0.0190)	-0.0735*** (0.0212)		
Firms in E-Payroll / firms in SUNAT			0.0186*** (0.0047)	0.0195*** (0.0049)
Log product per worker	0.0328** (0.0159)	0.0518 (0.0461)	0.0446** (0.0175)	0.0252 (0.0222)
Log number of workers	0.0730*** (0.0168)	0.0973* (0.0580)	0.0909*** (0.0182)	0.0798*** (0.0204)
Incorporated business	0.174*** (0.0321)	0.263 (0.205)	0.306*** (0.0338)	0.253*** (0.0494)
Age 5-8	0.0360 (0.0372)	0.0241 (0.0467)	-0.0198 (0.0414)	-0.0479 (0.0471)
Age 9-12	0.115*** (0.0391)	0.123*** (0.0436)	0.0278 (0.0435)	-0.00616 (0.0506)
Age 13-16	0.149*** (0.0430)	0.149*** (0.0441)	-0.0917* (0.0484)	-0.164** (0.0691)
Age 17-+	0.201*** (0.0390)	0.223*** (0.0637)	-0.00724 (0.0437)	-0.0728 (0.0624)
Constant	0.288 (0.268)	0.156 (0.406)	-0.749** (0.313)	-0.863** (0.337)
Observations	888	888	888	888
R-squared	0.182	0.122	0.278	0.187
Weak identification test	2.767			21.11

Note: Standard errors are in parentheses. Significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Stock-Yogo weak ID test critical values: 16.38 (10% maximal IV size); 8.96 (15% maximal IV size).

Again, we use OLS and 2SLS regression models. For the 2SLS estimation, we use as instruments our proxy variables for enforcement as we did before. We report the results in table

6. Columns (1) and (3) display the OLS regressions results, and columns (2) and (4) display the 2SLS regressions results. Overall, the results obtained using lagged variables are similar to the results in the main analysis.

The results of the lagged analysis also reinforce the idea that labor formalization might be a more difficult step in the formalization process. We find that lagged business formality has a statistically significant and positive impact on labor formality, as the 2SLS regression result in column (4) shows. The estimated coefficient implies that lagged business formality increases labor formality by 0.6 percentage point (or by 46 percent). By contrast, the 2SLS regression results in column (2) suggest that there is no effect of lagged labor formality compliance on business formality.

#### *Estimation Using a System of Equations*

The previous analyses report OLS and 2SLS regression results for business formality and labor formality estimated from separate regressions. An alternative for estimating the formalization decisions of firms on the business and labor dimensions is to implement three-stage least squares (3SLS). Under this procedure, we estimate both formality dimensions in a system of simultaneous equations model and take into account that the error term in each equation is potentially correlated with the error term of the other equation.

Table 7 reports the results of estimating the two-equation system model with 3SLS. The results are qualitatively and quantitatively similar to the previous results: business formality affects labor formality, but labor formality does not affect business formality.

Table 7: System Estimation Using 3SLS

Variable	(1) License	(2) Payroll
Payroll registry	-0.050 (0.207)	
License		0.644** (0.313)
Log distance to SUNAT	-0.080*** (0.020)	
Firms in E-Payroll / firms in SUNAT		0.021*** (0.005)
Log product per worker	0.031* (0.018)	0.034 (0.021)
Log number of workers	0.073*** (0.026)	0.061** (0.026)
Incorporated business	0.189** (0.076)	0.221*** (0.066)
Age 5-8	0.033 (0.037)	-0.029 (0.047)
Age 9-12	0.113*** (0.040)	-0.020 (0.057)
Age 13-16	0.140*** (0.045)	-0.151** (0.070)
Age 17-+	0.196*** (0.039)	-0.103 (0.078)
Constant	0.455* (0.245)	-1.116*** (0.365)
Observations	888	888
R-squared	0.169	0.094

Note: Standard errors are in parentheses. Significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## 6. Conclusions

There are many pathways to formality for small entrepreneurs, and most of them are able or prefer to formalize gradually. When they can, they weigh at each step the relative costs and benefits of formalization, choosing the most cost-effective path to business (often) or labor (less often) formalization—but rarely both at the same time. Small entrepreneurs are ready to revert to informality if, after making the transition to formality, they realize that the costs outweigh the benefits.

Given the propensity of small entrepreneurs to formalize gradually taking a diversity of pathways, approaches tackling only one side of formalization are prone to failure. But successful policies not only need to be broad in scope and tackle the many obstacles affecting

business and labor formalization; they also need to understand the specific constraints of each entrepreneur and develop better tailored solutions.

Such a trial and error approach to formalization by firms can explain why many programs have led to modest impacts—and often in the short term only. Although a program may provide short-term incentives to experiment with formalization, firms are likely to revert to informality if they perceive the realized benefits of formalization to be low. Formalization programs that only address one aspect of formality may lead, at best, to partial formalization. And more ambitious, holistic programs are needed. In addition to considering the type of entrepreneur (by necessity or opportunity), the phase of development of the firm, etc. our results suggest that such programs may have to take into consideration the natural sequence of formalization, with business formalization often coming ahead of labor formalization. Policies aiming at accompanying enterprises that have formalized in the business dimension into deeper formalization are therefore needed.

In addition to providing incentives to formalize, countries should also consider scaling up enforcement—in particular when, such as in Peru, the costs of formalization have been significantly lowered for small firms. The analysis consistently finds that enforcement affects formality, and it is needed along with incentives to promote large-scale formalization. Incentives or enforcement alone and/or separated are not likely to be sufficient.

Finally, articulated efforts are required to promote an effective path toward formalization as the ILO Recommendation 204 on the Transition from the Informal to the Formal Economy suggests. Too often, regulations depend on different national and local government agencies that do not coordinate to promote formalization (registration agency, tax authority, municipalities, and labor authority). Unless firms see clear benefits in being formal, they may experiment with it, but eventually they will return to informality; and the benefits of formalization are greater when its different facets add value to each other.

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