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Rethinking Indonesia's Informal Sector

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Summary. — This paper reviews competing theories about the causes of informality in developing countries and uses new data to determine which theory best explains the persistence and scale of Indonesia's informal sector. Using nationally representative survey data on micro, small, and medium-sized firms, we find that most of Indonesia's informal firms are very small, micro firms, with less than five employees. These firms pay low wages, are relatively unproductive when compared to large firms, are managed by individuals with low educational attainment, predominantly supply products to local markets, and have not recently attempted to expand their operations. From a small-scale, qualitative survey of firms, we find that many informal firms do not register their businesses either because they have no desire to expand or borrow from formal financial sources, or because they are avoiding taxes. Finally, we evaluate the impact of Indonesia's one-stop-shops for business registration program, a large-scale program that attempted to reduce registration costs. We find both that the program had no effects on firms' informality rates, and we also find that it did not reduce the probability that workers were informally employed. Taken together, the evidence suggests that a combination of the rational exit and the dual economy theories best explains why so many firms in Indonesia are informal.

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Key words — informal economy, informal sector

1. INTRODUCTION

In many developing countries, the informal economy, which includes the firms, workers, output, and production activities conducted by firms that are unregistered and do not pay taxes, accounts for a significant and growing portion of total economic activity (La Porta & Shleifer, 2008). In Indonesia, using labor force surveys, researchers have found that the informal sector employs between 61% and 70% of the total labor force (Alatas & Newhouse, 2010; Firdausy, 2000).¹ Policymakers in Indonesia and other developing countries are concerned about the size of the informal sector for several reasons. First, informal firms typically do not pay official taxes, and this restricts the government's ability to provide support for public goods and services (Levy, 2008).² Second, the coexistence of formal and informal firms means that firms competing in the same industry could face different marginal production costs. This may lead to an inefficient allocation of resources in the economy (Hsieh & Klenow, 2009; Levy, 2008). Third, the cost advantage for informal firms leads to unfair competition with law-abiding formal-sector firms, which could restrict economic growth (Farrell, 2004). Finally, informal firms may not be able to legally obtain credit from formal financial sources, access government programs, or export products. This could put informal firms at a disadvantage relative to other firms, limiting growth opportunities.

To identify the appropriate policy response toward the informal sector, we need to understand why so many firms remain informal. If informality is caused by burdensome regulations—the *exclusion model*—then reducing registration and compliance costs would increase formalization and could encourage the entry of new enterprises. Alternatively, if informality is a rational response to high regulatory costs and uncertain benefits—the *rational exit model*—then reducing

costs, making benefits larger and more salient, and greater enforcement may level the playing field and promote economic growth. A third explanation is that informal firms are part of a *dual economy* (Lewis, 1954). Firms are informal because they are serving different consumers or are not competing with larger, more modern, formal firms, and unlike other models, lowering registration costs will not significantly reduce the size of the informal sector. In this case, informality may merely be symptomatic of poverty, and the appropriate policy response is thought to be economic growth, which would raise incomes, increase demand for formal sector products, and reduce the size of the informal sector.

In this paper, we combine quantitative and qualitative survey data to shed new light on informality, using Indonesia as a case study. We first provide a brief review of the competing theories of informality, explaining how these theories lead to distinct policy recommendations. To understand which theory is most relevant for Indonesia, we use three different data

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sources to investigate firms and describe the prevalence and features of the informal sector.

We begin by describing our approach to characterizing the informal sector using data from two different quantitative surveys of firms: multiple waves of the Survey of Micro and Small Enterprises (*Survei Industri Mikro dan Kecil*, or IMK), and the 2009 World Bank Enterprise Survey (WBES 2009). To address the difficulty in measuring informality, we use two different definitions while acknowledging their limitations. We find that most informal firms in Indonesia are very small. The absence of a “missing middle” in the firm-size distribution is inconsistent with important implications of the exclusion model of informality. Based on the skewed firm-size distribution and the probability that micro and small firms are informal, we estimate that more than 93% of firms in Indonesia are informal.

We also find that informal firms in Indonesia tend to pay low wages and to have low productivity compared to larger, formal firms. Managers of informal firms also tend to have low educational attainment, and many informal firms serve small local markets and have not recently taken steps to expand their business. These stylized facts are consistent with the dual economy theory of informality; however because they are based on observations of equilibrium behavior, they cannot completely rule out the other theories. While these findings are similar to existing evidence on Indonesia's informal economy (e.g., [Alatas & Newhouse, 2010](#); [Firdausy, 2000](#), among others), they represent an update of previous work and are based on the most comprehensive survey data available.

Next, we draw on a small-scale, qualitative survey of approximately 200 firms, conducted in 2014, to provide more detailed accounts of firms' experiences with decisions to formalize ([Burger, Chazali, Gaduh, Rothenberg, Tjandraningsih, & Weilant, 2015](#)). Although the firms we interviewed indicated that the process of business registration was complicated, they also noted that the benefits of being registered were ambiguous, uncertain, and difficult to quantify. Many firms explained that because they were not interested in growing larger, or were catering to a lower-tier demand market, it did not make sense to try to formalize. In many cases, firm owners did not bother to investigate how to become formal and were unaware of the process. Because we also find some evidence of tax evasion, the qualitative survey findings support the dual economy and rational exit theories better than the exclusion model.

Finally, we empirically test whether informal firms respond to lower registration costs using a recent program in Indonesia: the one-stop-shop program (*Pelayanan Terpadu Satu Pintu*, or PTSP). The goal of the PTSP program was to consolidate business registration and licensing functions in one office at the district, making it easier for firms to formalize. Examining how firms responded to changes in registration costs is a useful way to distinguish between the different theories of informality. We use data on the date when individual PTSP offices opened to estimate the effect of PTSP on firm registration. We find relatively little evidence that the program reduced the rates of informality, consistent with recent experimental evidence from randomized control trials ([de Andrade, Bruhn, & McKenzie, in press](#); [De Giorgi & Rahman, 2013](#); [de Mel, McKenzie, & Woodruff, 2013](#); [Galiani, Meléndez, & Navajas, 2015](#)). This evidence that lowering registration costs alone will not be sufficient to shift firms into the formal sector is further evidence against the exclusion model.

This paper is organized as follows. In Section 2, we review competing theories of why firms choose to remain in the

informal sector. In Section 3, we provide an overview of the datasets used for studying Indonesian firms, which include nationally representative surveys and in-depth interviews. Section 4 describes statistics on the characteristics of informal firms, and Section 5 summarizes findings from qualitative interviews on what causes firms to be informal. In Section 6, we evaluate Indonesia's one-stop-shop program and assess its effect on registration promotion. In the final section, we conclude and offer policy recommendations based on our analysis.

2. THEORIES OF THE INFORMAL SECTOR

By the informal sector, we mean to encapsulate all economic activities conducted by firms that are not formally registered with the government and do not pay taxes. This definition, focusing on the absence of legal recognition, state protection, official taxation, or regulation, accords with informality studies across disciplines (e.g., [Babbitt, Brown, & Mazaheri, 2015](#); [Harriss-White, 2010](#); [Maloney, 2004](#); [Mead & Morrisson, 1996](#), among others). Several researchers have highlighted the benefits of informality, such as the fact that the informal sector may provide flexible employment for women who want to work close to home ([Alatas & Newhouse, 2010](#)) or low-wage workers who need to find jobs during economic crises ([Loayza & Rigolini, 2011](#)), and its presence may even signal a rising middle class in localities with poor governance ([van Klinken, 2009, 2014](#)). However, a substantial empirical literature also argues that the size of the informal sector is inversely related to economic growth, GDP per capita, tax revenues, and public goods provision.³ Because unofficial economic activity potentially encompasses many different phenomena—including tax evasion, black market activities, petty trading, commodity production, and subsistence agriculture—conceptualizing this activity, and explaining why it persists is difficult.

In the economics literature, there are three different broad classes of models explaining why firms remain in the informal sector ([La Porta & Shleifer, 2008, 2014](#)). Two classic theoretical traditions are the exclusion model and the rational exit model ([Parry, Maloney, Arias, Fajnzylber, Mason, & Saavedra-Chanduvi, 2008](#)). A third possibility is that the informal sector and the formal sector are different segments of a dual-economy, which are largely unrelated (e.g., [Harris & Todaro, 1970](#); [Lewis, 1954](#)). Although these models are stylized and overly simplistic, they provide a useful way for thinking about the sources of informality. More importantly, the appropriate policy response to informality depends crucially on the extent to which these different models explain why firms remain in the informal sector.

In the *exclusion model*, government regulations exclude, or hold back, a large potential pool of entrepreneurs ([De Soto, 1989, 2000](#)). Informal firms may be unable to obtain access to formal financial sources, undermining their ability to secure loans to expand their businesses, or they may not be able to legally export their products, denying them access to demand markets. In this view, informal firms are an untapped reservoir of entrepreneurial energy, which can be released by removing barriers to entry, cutting red tape, and improving legal environments. The exclusion view of informality also tends to be consistent with “missing middle” stories ([Hsieh & Olken, 2014](#); [Tybout, 2000](#)). If expensive regulations hold back firms, there may be a large pool of informal firms who cluster at the threshold of formality, leading to a U-shaped firm size distribution.

There are many possible sources of excessive regulations that could prevent firms from formalizing. The “structuralist” or “dependency” theories most closely associated with Moser (1978) and Castells and Portes (1989), argue that formal sector businesses benefit from the continued existence of a significant informal sector.⁴ Such firms, which tend to be politically connected, will lobby governments to create or sustain policy environments to maintain a select portion of the informal sector. Formal sector firms may want to prevent informal firms from registering and growing larger, because greater competition could reduce profits and undermine market share (Djankov, La Porta, Lopez-de Silanes, & Shleifer, 2002). Policies favoring restricted entry may reflect elite or bureaucratic capture and are fairly typical of economies characterized by extractive institutions (Acemoglu & Robinson, 2012). Separately, formal sector firms may reduce their costs of doing business by subcontracting with informal firms, because they can outsource labor-intensive production to firms that do not abide by labor regulations and are able to avoid other legal restrictions (Castells & Portes, 1989).

Regardless of their source, if cumbersome, expensive registration procedures were holding back firms and keeping them informal, the appropriate policy response is to drastically lower registration costs. This is a widely held view among policymakers and development experts, who feel that if only the costs of registration were lower, more firms would formalize. In Indonesia, many government programs, such as Indonesia’s one-stop-shops for business licenses (PTSP) which we evaluate later in the paper, focus on reducing the costs of business registration.

A second model, the *rational exit model*, associated with Levy (2008) and Maloney (2004), among others, posits that firms exit the formal sector when the costs of formality are greater than its benefits. When firms decide to formalize, they weigh the benefits of formality, such as reduced risks of informal payments to government officials, increased access to banks, courts, government contracts, or skilled labor, against the costs of formality, including official tax payments, registrations costs, and costs of compliance with different business regulations, such as labor laws. Firms make the formality decision like any other investment decision, evaluating expected benefits and costs.⁵

According to the rational exit model, informal sector firms may enjoy tax advantages, cheaper wage rates, and other cost advantages from not complying with tax rules and other regulations. Because of this, firms in the informal sector may be competing unfairly with formal sector firms in a way that undermines growth. In this model, the appropriate policy response to encourage more formality is not to just focus on registration costs, but also to increase the benefits of formality—or make existing benefits more salient—and to better enforce registration requirements.

Finally, in the *dual economy model*, informal firms and formal firms are fundamentally different (La Porta & Shleifer, 2014). Informality is a by-product of poverty. Informal firms are typically small, inefficient, and run by poorly educated entrepreneurs. The productivity of informal firms is generally too low to allow them to survive in the formal sector. Because of this, informal firms are largely segregated from the formal economy. They produce different products, with different labor, capital, and technological inputs, and they serve different customers.

Importantly, unlike in the first two models, changes in registration costs will have no impact on the size of the informal sector in the dual economy model. Instead, as a symptom of the problem of poverty, its only real cure is economic growth.

Because of Engel effects, demand-side factors play a large role in propping-up the informal sector; low quality, inferior goods produced by informal sector firms are purchased by low-wage informal sector employees.⁶ Economic growth, poverty reduction, and rising incomes will bolster demand for formal sector products, resulting in the exit of informal firms. This does not necessarily require policies that explicitly tax, or punish, informal firms for being informal. Instead, broad-based economic growth should both reduce the size of the informal sector and at the same time encourage the formation and expansion of formal firms. Over time, workers in the informal sector will move into the formal sector, reducing the adverse employment effects from the exit of firms and declining employment in the informal sector.

3. DATA

To investigate the sources of informality in Indonesia, in this paper, we combine nationally representative, quantitative survey data on small and medium-sized firms with data from a new, small-scale qualitative survey. In this section, we describe each of the different datasets used in the paper, noting their strengths and limitations.

We use two different sources of quantitative data on firms in Indonesia: (1) multiple rounds of the Survey of Micro and Small Enterprises (*Survei Industri Mikro Dan Kecil*, or IMK) and (2) the 2009 World Bank Enterprise Survey (WBES). The IMK Survey, conducted by Indonesia’s National Statistical Agency (*Badan Pusat Statistik*, or BPS), is an annual 1% sample of micro and small firms. In 2013, the survey contained data on more than 40,000 micro and small firms, operating in nearly 450 different industries and sampled from all of Indonesia’s 33 provinces. In the survey, firms are asked a range of different questions about their production, output, value added, capital, labor, and production technologies, among others.

Although the IMK 2013 survey contains rich quantitative information about firms and their factors of production, it does not have many detailed questions on the business environment or challenges to doing business. It also does not cover medium-sized firms. For these reasons, we supplement data from the IMK 2013 survey with the 2009 WBES. The WBES is a random sample of small, medium, and large firms in Indonesia, stratified by industry, size, and region. In addition to questions about employment, output, total sales, and compensation, the WBES asks firms about challenges associated with the business environment, registration, taxes, informal payments, and access to finance. Although the WBES is more detailed than the IMK 2013 survey, only 884 firms were interviewed in 2009, resulting in a much smaller sample from which to draw inferences.

We combine these quantitative datasets with information taken from qualitative surveys of SMEs, collected as part of the 2014 RAND/AKATIGA SME Survey (R + A 2014). In this survey, we conducted in-depth interviews with a small number of firms to better understand the choices they make and the environment in which they operate. Instead of focusing on the smallest, most vulnerable, and poorly managed firms, we tried to learn more about firms that were slightly larger, with a higher potential to be growth-oriented and a greater drive to expand.

Our research team designed a new survey for the purposes of eliciting detailed information about how these SMEs operate, the constraints they face, and the successes and failures of existing government programs and policies in helping these firms grow. The survey primarily focused on open-ended

Table 1. *Field research teams, industries, and sample sizes, R + A 2014*

Industry	Team 1	Team 2	Team 3	Team 4	Total interviews (by industry)
	West Java JABODETABEK Bandung	Central Java Solo, Pekalongan Jepara	North Sumatra Medan Aceh	South Sulawesi Makassar Tana Toraja/North Toraja	
Food processing	6		12	12	30
Services (restaurants)	3		6	6	15
Services (motorcycle repair shops)	3		6	6	15
Batik textiles		24			24
Modern muslim fashion	24				24
Teak furniture		24			24
Coffee			24	24	48
High value added ICT	12				12
Total interviews (by team)	48	48	48	48	192

Source: R + A 2014 Survey. JABODETABEK covers the urban area surrounding Jakarta including Jakarta, Bogor, Bekasi, Depok, Tangerang and South Tangerang.

questions and was designed as a guide for structured one-on-one interviews with owners of SMEs. Although the body of the survey was dedicated to fielding open-ended questions, we also included many quantitative response items that were more direct and focused. Each interview took about two hours and often involved follow up visits. Topics covered included basic firm and demographic characteristics, licensing, raw materials, access to markets, credit constraints, labor, taxation, and informal payments, among others.

Despite the breadth and richness of the survey, the firms interviewed were not randomly sampled. Although we attempted to use government registers of SMEs to construct a probability sample, in many cases, these lists were badly out of date, so we opted for less rigorous sampling practices. However, our surveys covered many key industries and, in an attempt to be broadly representative, we conducted interviews in six different provinces. More details on the design, sampling, and field work involved in carrying out the R + A 2014 can be found in [Burger et al. \(2015\)](#).

Table 1 describes the composition of interviews across industries and locations. The field teams conducted 48 interviews in each of the following provinces: West Java (and Jakarta), Central Java, Aceh (and North Sumatra), and South Sulawesi. Our sample includes 30 SMEs involved in food processing, 48 firms in the coffee industry, 30 firms in the services sector (restaurants and motorcycle repair), 48 firms in the garment industry (24 in Batik and 24 in modern Muslim fashion), 24 firms in the teak furniture industry, and 12 firms in the high value added ICT industry. In most instances, all interviews in the same industry were conducted in a single province, but the 60 food processing and services firms were spread across multiple provinces.

4. INDONESIA'S INFORMAL SECTOR: SOME STYLIZED FACTS

In the last few decades, Indonesia has experienced decades of remarkable economic growth that have transformed the structure of the economy. Figure 1 illustrates how from 1970 to the present, the Indonesian economy has changed from a primarily agriculture-based economy into one based more on manufacturing and services. The share of agriculture in gross domestic product (GDP) has fallen from 45% in 1970 to a mere 14% in 2014. As in other developing economies, this transformation coincided with urbanization, which in

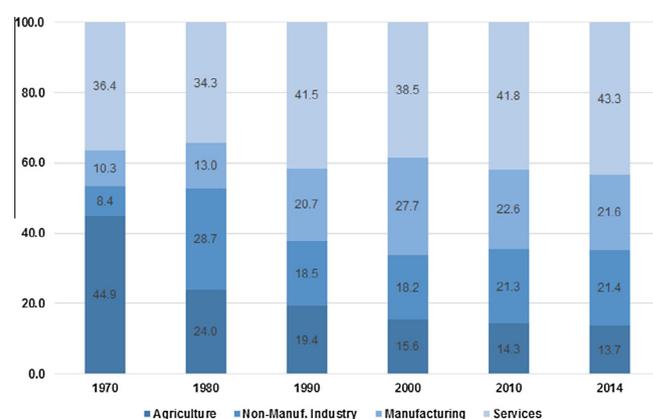


Figure 1. *Sectoral contribution to GDP, 1970–2014.*
Source: World Development Indicator.

turn—at least initially—resulted in a significant “informalization” of the urban economy.⁷ Robust subsequent growth in the manufacturing and service sectors expanded formal sector employment and eventually worked to revert this trend up until the crisis. The share of workers with formal jobs grew from 34.7% in 1990 to 44.9% in 1997 ([Alatas & Newhouse, 2010](#)).

The 1998 financial crisis put a stop to the robust growth of manufacturing and services. As the growth of these sectors faltered, this episode also illustrated what [Loayza and Rigolini \(2011\)](#) called the “safety net” role of the informal sector as workers who were laid off from the formal sector entered the informal sector ([Feridhanusetyawan & Gaduh, 2000](#)). In the first years after the crisis, formal sector expansion was halted and by 2003, the share of workers with informal jobs was 42%, almost 3 percentage points lower than it was in 1997. However, with the return of economic growth came a further expansion of the formal sector. During 2003–07, annual GDP growth was 6.3% and the transformation away from agriculture continued. In that period, the formal sector expanded by an average of 1.3 percentage points annually ([Alatas & Newhouse, 2010](#)).

The economic crisis also triggered a political crisis, which led to a regime change and political reform. One of the main components of political reform was the decentralization of power and key decision-making authority to the district

(*kabupaten*) level. Decentralization changed how district administrations responded to the demands of private citizens (Aspinall & Fealy, 2003; von Luebke, 2009). Among these changes, labor unions, who were suppressed by Suharto's "New Order" regime, gained their voice and bargaining power (Bird & Manning, 2008).⁸ Among their priorities was to push for rising minimum wages nationwide. There is evidence that this policy, among other labor regulations, increased the rigidity of the labor market and was responsible for the weak recovery of formal sector employment after the crisis, especially in the urban sector (Alatas & Newhouse, 2010; Bird & Manning, 2008; Suryahadi *et al.*, 2003).

With this economic and political background in mind, in this section, we present descriptive statistics on firms in Indonesia. We focus on micro, small, and medium-sized firms (MSMEs) and attempt to understand which of the theories of informality best explains the data. We first describe our approach to measuring informality. Using these definitions, our description of Indonesia's informal sector is organized around several key stylized facts. First, most firms in Indonesia are informal MSMEs that represent a considerable portion of Indonesia's economy and unemployment. Second, informal firms in Indonesia tend to pay low wages, and they tend to have low productivity, consistent with the dual economy theory. Third, managers of informal firms tend to have low educational attainment. Fourth, many informal firms serve very local markets and have not recently taken steps to expand their businesses. While these findings may not be surprising to researchers in this area, they are based on the latest and most comprehensive data available and represent a significant update of previous empirical work on Indonesia's informal sector (e.g., Asian Development Bank & BPS-Statistics Indonesia, 2011; Berry *et al.*, 2001; Cuevas *et al.*, 2009; Vial, 2011). We also argue that this evidence is more suggestive of the dual economy theory of informality than the exclusion or the rational exit models, though it is by no means definitive.

(a) Measuring informality

There are several reasons why measuring the size of the informal sector in Indonesia is difficult. First, firms are informal when they are operating beyond the boundaries of state regulation, and as Harriss-White (2010) argues, because regulations frequently change, so will the definition of what it means to be informal. Moreover, existing datasets often do not have ideal measures of regulatory compliance or business registration. Previous research has argued that using different proxies for informality, such as those based on firm size, capital intensity, or the poverty of workers, may lead researchers to support very different conclusions (e.g., Henley, Arabsheibani, & Carneiro, 2009; Mead & Morrisson, 1996).

Second, although most models of informality draw a stark contrast between being formal and informal, in reality, informality is a continuous variable rather than a binary one. Some firms partially complete the registration process, taking some steps but not others, while other firms avoid registration entirely. To officially register a business in Indonesia, there are at least 10 different procedures that firms are required to complete, depending on the industry and the location where the business operates. As an example, the list of procedures for doing business in Jakarta is shown in Table 2. These procedures involve interaction with several different ministries. Although many are officially free of charge, the initial cost of obtaining clearance for the company's name is substantial. According to the 2015 Doing Business Report for Indonesia, the entire process takes about 53 days to complete and costs 21.1% of annual per capita income (World Bank, 2014).

From the R + A 2014 survey, we found that many firms did not have access to clear information about registration requirements. Many of the firms we interviewed were confused about which permits were necessary and which level of government was responsible for managing the permit registration process. One firm owner mentioned that although he had

Table 2. Summary of procedures for starting a business, Jakarta

Step #	Description	Time to Completion	Total Cost
1	Obtaining clearance for the company's name at the Ministry of Law and Human Rights	6 days	Name clearance fee is IDR 200,000. Legal services fees are IDR 1,580,000. Maximum notary fee is 1.5% of the object of the deed
2	Apply to the Ministry of Law and Human Rights for approval of the deed of establishment	< 1 day (online)	No charge
3	Obtaining a building management domicile Certificate	1 day	No charge
4	Apply for the Certificate of Company Domicile	2 days	No charge
5	Apply at the Ministry of Industry and Trade for the permanent business trading license (Surat Izin Usaha Perdagangan, or SIUP)	15 days	No charge
6	Obtain company registration certificate (Tanda Daftar Perusahaan/TDP) from the Local Government Office	14 days	No charge
7	Register with the Ministry of Manpower	14 days	No charge
8	Apply for the Workers Social Security Program (BPJS Ketenagakerjaan)	7 days (simultaneous w/#7)	No charge
9	Apply for healthcare insurance with BPJS (Badan Penyelenggara Jaminan Sosial)	7 days (simultaneous w/#7)	No charge
10	Obtain a taxpayer registration number (NPWP) and a VAT collector number (NPPKP)	1 day (simultaneous w/#7)	No charge

Source: World Bank (2014).

secured a few of the permits required for doing business, local officials continued to harass him for not having all of the necessary permits. Many firms did not understand what permits were legally required for doing business in the industries in which they operated, and government officials could exploit this uncertainty to extract informal payments. Most work on informality ignores subtle differences between different levels of formality and simply categorizes firms as either formal or informal, and given the way most surveys of firms are conducted, this is often the best that can be done.⁹ However, it is important to recognize that this dichotomy may bias analysis in favor of finding stark contrasts. Better data collection, with an intent to collect richer measures of informality along multiple dimensions, may be important for further work.

Another challenge in measuring informality in developing countries is that most nationally representative surveys are collected by the government, and questions about business registration or tax compliance are unlikely to be answered truthfully by firms. Instead of focusing on firm-level data, much of the research on informality in Indonesia uses employment surveys (e.g., SAKERNAS) and measures informal jobs as those assigned to individuals who are self-employed, family, or unpaid workers (e.g., Asian Development Bank & BPS-Statistics Indonesia, 2011; Alatas & Newhouse, 2010; Comola & de Mello, 2011).¹⁰ This definition may be satisfactory for some purposes, but not others. For the purpose of understanding the causes of informality, it seems more appropriate to focus on firms instead of workers.

In this paper, we use Indonesia's firm-level surveys to measure the size and nature of the informal sector. For the IMK survey, we focus on the legal status variable, which measures the firm's self-reported form of incorporation. Firms that are self-reported to be individual businesses, or sole proprietorships (*perusahaan perseorangan*) are not taxed as other firms and typically have legal rights and responsibilities that are most similar to firms in the informal sector. Legal status measures have been used in prior work on the informal sector in Indonesia (Gultom, 2014), and this measure corresponds fairly well, though not perfectly, with measures from employment surveys. For instance, Asian Development Bank and BPS-Statistics Indonesia (2011), using a comprehensive survey of employment in Yogyakarta and Banten, found that over 90% of the informal employment in Yogyakarta and 73% of informal employment in Banten took place at sole-proprietorships.

After pooling the 2010–2013 waves of the IMK survey, we found that 96% of micro firms (with less than 5 employees) were informal, while 93.2% of small firms (5–19 employees) were informal. In contrast, in the WBES survey, firms are asked *directly* about what year, if ever, the firm formally

registered with the government. It is important to note that this survey does not cover micro firms, but using this direct measure, we found that 66.5% of small firms, 18.0% of medium-sized firms (20–99 employees), and 10.9% of large firms (>100 employees) were informal. The WBES survey also contains a question about the legal status of the firm that we can use to validate the sole-proprietorship measure of informality for small firms. We found that 72.7% of small sole proprietorship firms were informal, while 87.5% of small non-sole proprietorships were formally registered. Although the sole proprietorship measure of informality does not perfectly classify the informal sector, it is highly correlated with informality, and we work with it to measure informality in the IMK survey in the following sub-sections.

(b) *Informal firms in Indonesia are very small*

Before distinguishing between formal and informal firms, it is important to understand that the vast majority of firms in Indonesia are very small. MSMEs account for a large and significant portion of Indonesia's economic activity, representing more than 99% of total firms and 97% of total national employment (Mourougane, 2012). In Figure 2, we report the distribution of firm sizes in Indonesia, adapted from Hsieh and Olken (2014), who use Economic Census data from 2006. In this figure, the size of a firm is measured by the total number of workers it employs. In the left panel, the histogram shows the percentage of total firms that employ different numbers of workers. Although separate bars are drawn for every 10-worker interval, only the first two bars are distinguishable. This histogram depicts a highly skewed distribution, and the percentage of firms with less than 10 workers is difficult to distinguish visually from 100%.

In the center panel of Figure 2, the histogram is redrawn after dropping the very smallest, micro firms from the dataset. This panel restricts the range from 10 to 200 employees, and rescales the y-axis, effectively plotting the size distribution for non-micro SMEs, as well as larger firms. A similar skewed firm-size distribution also appears in this graph. Notice that the first bar, depicting the share of firms with 10–20 employees, is less than 2% of the total. In the right panel, we plot the histogram only for firms with 20 or more employees (medium and large firms). Contrary to widely held notions about firms in developing countries, these three graphs depict no evidence of a “missing middle” in Indonesia's firm size distribution.

Using data from the IMK 2013 survey, we focus more closely on micro and small firms, examining the distribution of firm sizes for firms that are no greater than 20 employees, and we can distinguish between informal and formal firms,

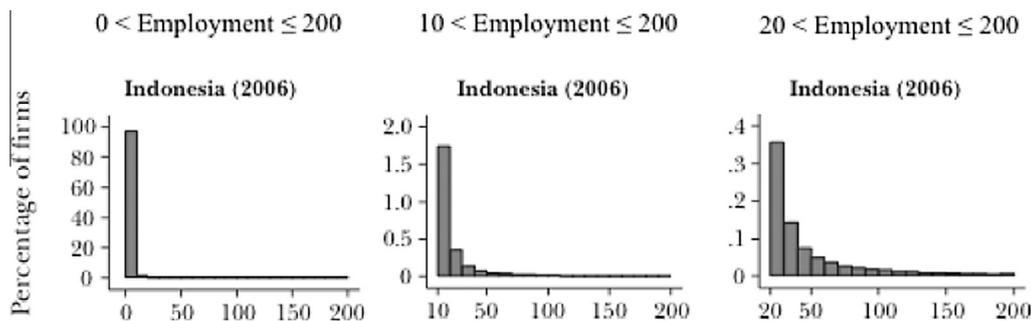


Figure 2. Distribution of firm size as measured by number of workers.

Source: Adapted from Hsieh and Olken (2014), Figure 1, who use firm-level data from the 2006 Economic Census. Separate bars are drawn for each 10 worker interval.

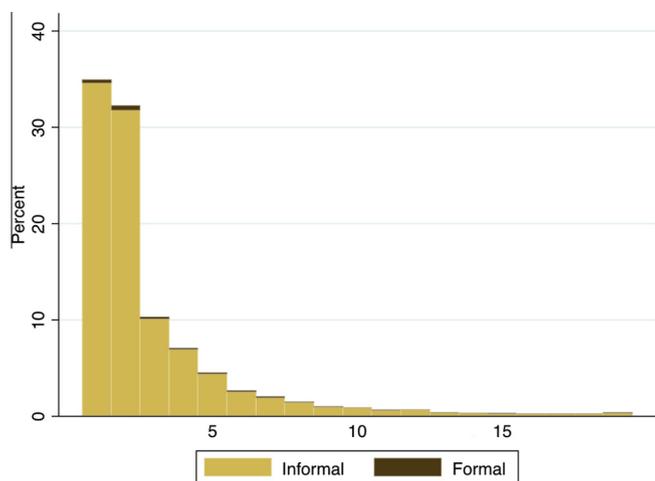


Figure 3. Histogram of number of workers by informality, micro and small firms. Source: Authors' calculations using IMK 2013 data. Separate bars are drawn for each integer number of workers, using the total of production and non-production workers in each firm.

using the sole-proprietorship measure discussed above. Figure 3 shows that even when we focus on just the micro and small firms, the distribution of employment sizes remains highly skewed. Over two thirds of micro and small firms had no more than two employees. If we focus only on small firms, with more than four but less than 20 employees, more than 45% of those firms only employed between five and six employees, and almost 75% had less than 10 employees. This histogram, with stacked bars for formal and informal firms, also confirms that the vast majority of micro and small firms are informal.

Taken together, Figures 2 and 3 show that the firm-size distribution in Indonesia is highly skewed, even the smallest firms tend to be very small, and these very small firms also tend to be informal. If over 95% of firms in Indonesia have less than 10 employees (Hsieh & Olken, 2014), and 98% of firms with less than 10 employees are informal, as measured in the IMK 2013 survey, then over 93% of firms in Indonesia are informal. While our estimates of the size of Indonesia's

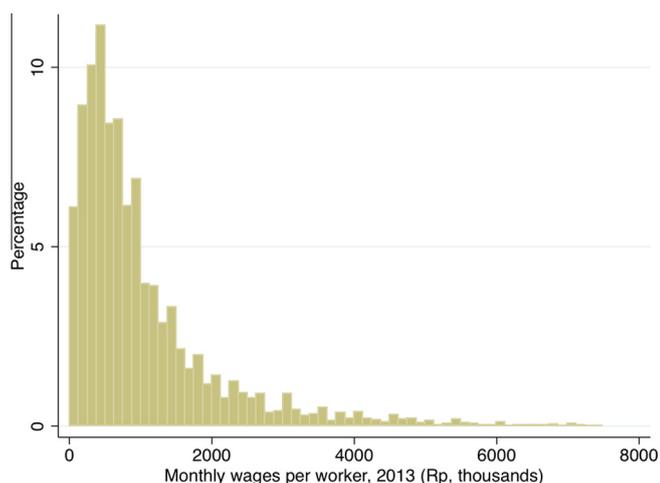


Figure 4. Histogram of monthly wages per worker, informal micro and small firms. Source: Authors' calculations using IMK 2013 data.

informal sector are significantly larger than other estimates, it is important to emphasize that other measures derived from firm-level surveys do not cover micro firms and therefore miss a substantial portion of the informal sector. The absence of a "missing middle" in the firm size distribution, both on its own and with respect to firms' informality status, casts doubt on the validity of predictions of the exclusion model of informality.

(c) Informal firms pay very low wages

Across individuals, wage income is typically highly correlated with actual income and reflects living standards. In a perfectly competitive environment with a large number of firms, wages will also equal the value of the firm's marginal product of labor. Because of this, examining wage distributions allows us to measure the relative productivities of informal firms, helping to shed light on theories of informality.¹¹

In Figure 4, we present a histogram of monthly wages paid by micro and small informal firms to their workers, using data from the IMK 2013 survey.¹² The histogram is drawn with wages reported using nominal Indonesian Rupiah (IDR). Like the firm-size distribution, the distribution of wages is skewed, but it tends to exhibit much more variation. We report the percentiles of the distribution of wages for micro, small, and medium-sized firms in Table 3, and convert IDR wage figures to U.S. dollars (USD) using purchasing-power-parity (PPP) adjusted exchange rates.¹³

Panel A, columns 1 and 2 of Table 3 show that many micro and small firms in Indonesia tend to pay very low wages to their workers. The median micro or small firm paid a monthly salary of IDR 716,500 in 2013, which is only \$193.39 in PPP-adjusted current US dollars (approximately \$6.34 per day). The bottom 25% of micro or small firms paid wages of less than IDR 375,000 per month, which is only \$101.21 in PPP-adjusted current US dollars, and the bottom 5% paid wages that would amount to living on less than \$1 per day. The lower portion of the wage distribution for informal firms is nearly identical to the lower portion of the wage distribution for all firms.

However, some micro and small firms do provide higher wages, with the top 5th percentile paying more than IDR 3.2 million per month to employees (approximately \$851 PPP-adjusted current dollars). Wages at the top of the distribution for informal firms were slightly lower than wages at the top of the distribution for all firms.

Medium-sized firms tend to pay larger wages than micro and small firms, presumably reflecting their larger productivity, although some medium-sized firms pay even lower wages than micro or small firms. The median medium-sized firm paid a monthly salary of IDR 1.4 million IDR, which was \$373.12 in PPP-adjusted current US dollars. This represents nearly a 60% increase in wages paid by the median micro or small firm. However, informal medium-sized firms typically paid much lower wages, as shown in Panel B.

To the extent that the low wages paid by firms in the informal sector reflects the low productivity of these firms, this provides some support for the dual economy theory of informality, although it does not rule out the other theories. For instance, barriers to formality could be holding back firms from growing larger, investing in capital, and becoming more productive, although the absence of bunching or non-skewness in the firm-size distribution shown in Section 4(b) is inconsistent with the exclusion model. In the next subsection, we provide more direct evidence on productivity differences.

Table 3. *Distribution of monthly wages per worker, MSMEs*

Percentile (%)	Micro and small		Medium-sized	
	IDR	USD (PPP ER)	IDR	USD (PPP ER)
<i>Panel A: all firms</i>				
1	40,000.00	10.80	1,328.77	0.36
5	112,500.00	30.36	102,492.56	27.67
10	190,000.00	51.28	240,334.31	64.89
25	375,000.00	101.21	690,961.06	186.56
50	716,500.00	193.39	1,381,922.10	373.12
75	1,300,000.00	350.87	2,072,883.40	559.68
90	2,275,000.00	614.03	3,144,758.80	849.08
95	3,152,666.75	850.91	4,145,766.80	1,119.38
99	5,040,000.00	1,360.31	9,596,683.00	2,591.10
<i>Panel B: informal firms</i>				
1	40,000.00	10.80	115,160.20	31.08
5	112,500.00	30.36	115,160.20	31.08
10	187,500.00	50.61	345,480.50	93.24
25	375,000.00	101.21	442,215.10	119.35
50	707,375.00	190.92	759,389.60	204.95
75	1,272,727.25	343.51	1,036,442.00	279.72
90	2,250,000.00	607.28	1,520,114.00	410.26
95	3,100,000.00	836.70	1,832,094.00	494.45
99	5,000,000.00	1,349.51	3,458,261.00	933.33

Note: Authors calculations using IMK 2013 data and ES 2009 data. Figures are converted to 2013 dollars using Purchasing Power Parity (PPP) exchange rates, using data from the World Bank's International Comparison Project.

(d) *MSMEs have relatively low labor productivity*

Although informal firms account for a large portion of Indonesia's firms and employ a considerable share of Indonesia's workforce, they tend to not be very productive when compared to larger, formal firms (Berry et al., 2001). Because informal firms are smaller, they tend to be more labor-intensive, make use of outdated technologies, and are typically run more inefficiently than larger firms.

To measure the relative productivity of informal firms compared to large formal firms, we constructed the following metric:

$$\rho_i = \frac{(VA/L)_i}{(VA/L)^{Large}} \quad (1)$$

where $(VA/L)_i$ denotes informal firm i 's value added per worker in the IMK 2013 or total sales per worker in the WBES 2009 dataset, and $(VA/L)^{Large}$ is the comparable average labor

Table 4. *Relative labor productivity of informal firms compared to large formal firms (percent)*

Percentile (%)	Micro and small	Medium-sized
1	0.17	0.13
5	0.41	1.58
10	0.65	2.74
25	1.52	6.98
50	4.46	13.66
75	11.94	34.16
90	26.71	101.51
95	41.94	153.27
99	111.43	761.29

Note: Authors calculations using IMK 2013 data, ES 2009 data, and SI 2013 data. Columns show the percent of value added per worker (for micro and small firms) or total sales per worker (medium firms) compared to the average value added (total sales) per worker for large firms.

productivity of large formal firms in Indonesia. This is effectively a relative productivity ratio, which we express in percentage terms.¹⁴

In Table 4, we report percentiles of the distribution of ρ across firms. These figures show that micro, small, and medium-sized informal firms in Indonesia are extremely unproductive when compared to large firms. The median micro or small firm has a value added per worker measure that is less than 5% of the average value added per worker of large firms. Even the 95th percentile of micro or small firms is only 41.9% as productive as the average large formal-sector firm. Only the top 1 percentile of informal micro and small firms employs a workforce that is more productive than the average large firm.

Although most medium-sized informal firms are considerably less productive than large formal firms, some are as or more productive than large formal firms. In fact, the top 5% of medium-sized informal firms are at least 50% more productive than the average large firm. However, productivity and firm size are not perfectly correlated. The bottom 25th percentile of medium-sized firms has only 7% of the value added per worker as the average large firm, and looks very similar to the bottom 25th percentile of small firms.

Again, evidence on productivity differences between formal and informal firms is inconclusive, but taken together with evidence presented in the other subsections, the dual economy theory seems most consistent.

(e) *Managers of informal firms have low educational attainment*

One reason why informal firms may suffer from relatively low levels of labor productivity is that they may not be well managed (Bloom, Mahajan, McKenzie, & Roberts, 2010). Managing and operating a firm is very difficult, requiring hundreds of different, complex decisions, some made almost constantly while production is taking place. While owners may abound in initiative and drive, they may not be making

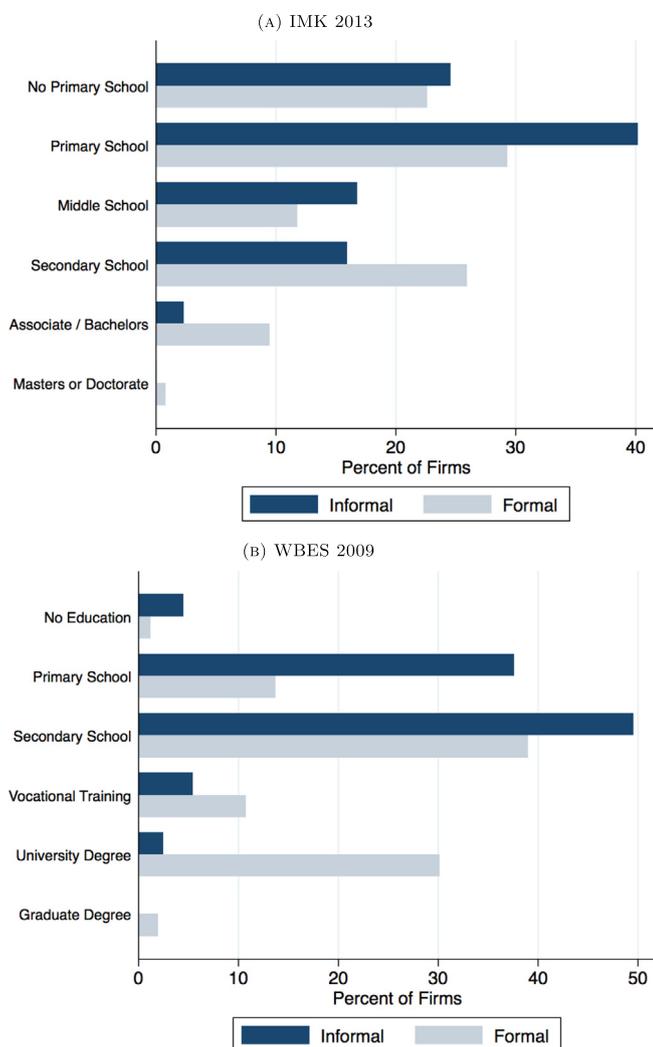


Figure 5. Educational attainment of MSME Managers/Operators.

Source: Authors' calculations using IMK 2013 data and ES 2009 data. Note that the education codes between these surveys were slightly different; the IMK 2013 survey does not ask about vocational school.

optimal decisions about how to invest, manage finances, hire workers, access capital, or market their products.

Although managerial skill is not directly observable, it may be correlated with education (La Porta & Shleifer, 2014). Indeed, a meta-analysis of empirical studies that link education and enterprise performance in developing countries found that a marginal year of schooling increased enterprise income by an average of 5.5% (van der Sluis, 2005). In Figure 5, we use IMK 2013 and WBES 2009 data to plot the highest level of education the manager obtained by the registration status of the firm. In Panel A, we plot data for micro and small firms,

while in Panel B, we do the same for small, medium, and large firms. These figures show that managers of registered firms were more likely to have higher levels of educational attainment than managers of unregistered firms.¹⁵

From Panel A, over 36% of registered micro/small firms were managed by individuals with at least a secondary school degree. However, only 18.4% of unregistered micro/small firms were managed by individuals with a secondary school degree, and less than a fraction of 1% of these firms were managed by individuals with a graduate degree. At the same time, 40.2% of unregistered micro/small firms were managed by individuals that had only completed primary school, while the same figure for registered micro/small firm owners was only 29.3%. Similar differences in educational attainment by formality status are seen when looking at small, medium, and large firm managers from the WBES 2009 survey (Panel B).

Interestingly, some of these educational differences can be explained by gender. Female-managed firms, which comprise nearly 42% of all micro and small enterprises in the IMK 2013 survey, were 1.2% more likely to be operating in the informal sector, and their managers more likely than male managers to have never attended or completed any schooling. Considering only informal firms, 31% of female managers, compared to only 20% of male managers in the IMK 2013 did not attend primary school.¹⁶ Moreover, 70% of female managers of informal firms completed, at most, a primary school education, while the same figure for male managers was only 60%. These comparisons across gender echo the findings of other researchers that suggest that women are more likely than men to be informal workers and that informality is desirable for females because it offers more flexible hours (Alatas & Newhouse, 2010).

These differences in educational attainment suggest that more educated entrepreneurs, particularly males, are more likely to register their firms. Such findings are difficult to reconcile with the rational exit or exclusion theories of informality, and lend some support for the dual economy theory.

(f) Informal firms serve local markets, have not expanded

Most informal firms have a very narrowly focused demand market. According to the IMK survey, nearly 75% of informal firms sold their entire output of goods locally, in the same district where those goods were produced, and 93.4% sold their entire output of goods in their same province. Less than 6% of informal firms sold output to markets outside of the same province, and less than 0.6% of informal firms exported any goods. This suggests that informal firms tend to serve very local, narrow demand markets.

Although it is difficult to measure the extent to which managers of SMEs want to grow or expand their business, the WBES 2009 survey asked firms several questions that should at least be correlated with the desire to grow. These questions involved asking establishment owners whether they applied for electrical connections or construction permits over the past

Table 5. Percent of firms taking steps to expand.

	Informal	Formal	Δ
Purchased fixed assets in last fiscal year?	19.9	34.5	-14.6***
Applied for a loan in the last fiscal year?	11.6	28.1	-16.5***
Applied for electrical connection in the last two years?	5.6	10.7	-5.0***
Applied for a construction permit in the last two years?	2.1	8.2	-6.1***

Note: Authors calculations using WBES 2009 data. *** denotes significantly different from zero at the 1% level, using a two-sided equality of means *t*-test with unequal variances.

two years, and whether over the last fiscal year, the establishment made any investments by purchasing fixed assets or applied for a loan.

Table 5 summarizes the results. In the previous twelve months, 19.9% of informal firms made investments by purchasing firm assets, compared to 34.5% of formal firms. Only 11.6% of informal firms applied for a loan, compared to 28.1% of formal firms. In the previous two years, only 5.6% of informal firms applied for a construction permit, and only 2.1% of informal firms applied for an electrical connection, and both rates were considerably lower than formal firms. Note that these differences, reported in column 3, are all highly statistically significant. These results suggest that informal firms are much less likely to have taken steps to expand than formal sector firms.

(g) Discussion

Taken together, the results presented in this section should, at the very least, cast some doubt on the exclusion model. However, it is important to recognize that the evidence presented so far is not conclusive. The variables we have summarized reflect actual firm behavior and cannot reveal what would have happened if registration costs or the institutional environment were different. A crucial question in distinguishing between theories of informality is to determine if many informal firms would like to grow, become more productive, or pay higher wages, but cannot, because of issues related to cumbersome registration requirements. In the next section, we first present qualitative analysis of case studies from the R + A 2014 survey that attempt to examine this more directly.

5. QUALITATIVE ANALYSIS

The qualitative nature of the R + A 2014 survey allows us to better understand why firms remain in the informal sector or decide to formalize. Of the 192 firms we surveyed, 150 of them, or 78%, had obtained an official business permit (*Surat Izin Usaha Perdagangan*, or SIUP). This large percentage of formally registered firms was due to the nature of our survey design, in which we attempted to cover the largest, most growth-oriented firms, instead of focusing on smaller firms. In our interviews, we tried to understand why firms decided whether or not to register, and we asked them to describe their experiences with the registration process.

Consistent with the dual economy story, many firms that had officially registered were larger, better managed, more capital intensive, and more interested in expanding their business, while those that did not register were smaller, produced lower quality goods, and catered to a lower-income demand market. Generally, the most commonly cited reason for registering was that it enabled firms to access formal financial sources, which allows them to borrow larger amounts and invest in physical capital or business expansion. Firms also found it beneficial to register because it allowed them to legally export their products (Interview 10, Central Java, August 15, 2014), or because they wanted to be able to compete for government contracts, particularly in the IT sector (Interview 43, Jakarta, August 19, 2014).

There were a variety of reasons why firms elected to not register their businesses, and many were also consistent with the dual economy theory. Firms who mainly cater to local demands often do not recognize the value in formality. Many of these informal firms have strong ties to their local

communities.¹⁷ In the words of a Muslim Fashion entrepreneur:

My business is still at the household scale. My place of work is at home and my workers are family members and people close to me. The scale of my business is still far from what is necessary to register (Interview 10, Bandung, August 13, 2014).

Meanwhile, for informal firms with a limited scale, predicting demand can be considered a barrier to registration, especially for businesses like restaurants. For these businesses, the benefits of registration would only be realized if the firm needed to expand, but it would not do so because of uncertain product demand (Interview 21, Bandung, August 12, 2014).

These firms recognize the fragmented nature of the market for their products and the different expectations in terms of quality. For instance, an owner of a furniture manufacturer did not register because he mostly caters to local demands:

[To access the export market] I can produce the goods—final or intermediate goods—and another [registered] firm will sell it [to the buyers]. The domestic market is more reliable, demands a lower quality, and has a lower risk compared to the export market (Interview 1, Jepara, Central Java, August 12, 2014).

This response of the aforementioned furniture owner also illustrates how firms who want to maintain their relatively small scale have ways to get around registration requirements. Similarly, a small batik producer in Pekalongan, Central Java with nine workers did not register and was content to deal with the consequences by paying a government official small bribes to look the other way. The firm was not interested in expanding their business and did not see any benefit to the hassle of registration when the informal payments were relatively small (Interview 31, Pekalongan, Central Java, August 19, 2014). Both cases illustrate how informality can provide a space for bureaucratic capture or, in the words of van Klinken (2014, p.19), “the crucial matrix for local-elite power.”

Many of these informal firms felt that the only reason for formalizing was to obtain access to formal finance, and until that firm had a clear need for a bank loan, registration is not necessary. One Muslim Fashion entrepreneur who employs eight workers believe that business registration would only benefit firms with a clear vision for how to expand their business. Content with its limited scale and scope with no intention to borrow capital to expand, she had not bothered to investigate the process of registration and chose to remain informal (Interview 31, Bandung, August 18, 2014). Government assistance programs may provide a temporary enticement to register, but the impact tends to be short-lived. As explained by one tofu producer from Medan:

In 2010... I spent IDR 2 million [PPP-adjusted \$583.89] and obtained the license in one week. I registered for the license because I heard the regional Industry and Trade Office was distributing assistance to tofu enterprises. Only registered businesses were eligible [to receive the program]. However, now I don't have any plan to borrow money from a bank, so I am not going to renew my license (Interview 23, Medan, August 22, 2014).

While many stories from our interviews point to the dual economy story, other stories were more closely aligned with the rational exit model or simply represented tax evasion. One IT firm, located in Jakarta, conducts most of its transactions online. Because most of their business is online, it did not seem necessary to register, as the firm was not aware of any regulations explicitly requiring them to register (Interview 10, Jakarta, August 13, 2014). The company does not seem constrained in its operations, and the decision to operate

informally probably reflects pure tax evasion or inadequate registration laws that have not kept pace with the changing business environment, more than anything else.

Another firm, a tofu distributor in Jakarta, grew large without a business license and, despite owning a factory and having 20 workers, has still not registered. This firm seems reasonably profitable, but the owner said that registration would require the firm to pay taxes, which it does not want to do. Interestingly, the same firm complained about Indonesia's poor transport infrastructure, which raises distribution costs and hurts profits, but it did not seem to understand that paying taxes could help to improve infrastructure (Interview 14, Jakarta, August 10, 2014). Generally, among both firms that had registered and also those that chose not to, there was skepticism over whether tax revenues were being put to good use. This could explain why many firms felt that there was little benefit from registration.

An IT company that we interviewed said that although it has not formally registered, it often borrows or operates under the licenses from another company. The firm said that it was discouraged from registration because the procedures were complicated, particularly for the IT sector, but now that it has not formalized, it feels like registration is something that it will do in the future, in order to serve bigger clients and attract talented personnel (Interview 4, Jakarta, August 15, 2014).

Despite a few stories from firms that conformed with either the rational exit model or tax evasion, most firms that registered seemed to be growing their businesses, while those that did not were content with their small scale and scope. Generally, our interviews with firms support both the dual economy theory and the rational exit model more than they support the exclusion model of informality.

6. EFFECTS OF POLICIES TO REDUCE REGISTRATION COSTS

One test for discriminating between the different theories of informality is to see what happens when registration costs change. In the exclusion model, lowering registration costs would cause firms to formalize their businesses, increase their demand for labor and capital, and ultimately lead to economic growth. However, under the rational exit model, reducing registration costs may only lead to some increase in formality, though possibly not much, while under the dual economy theory, because there are not many firms at the margin of formality, there would be no impact of changes in registration costs.

Recent experimental evidence on the effectiveness of programs to reduce registration costs is most consistent with either the rational exit or the dual economy theories. In a field experiment in Sri Lanka, [de Mel et al. \(2013\)](#) randomly alter the information costs and increase the monetary benefits of formalizing for firms. Their main finding is that providing information about how to register and paying firms' registration costs was not sufficient to induce firms to register. To cause firms to register, firms needed to be provided with substantial monetary compensation, in addition to covering the direct costs of registration. In another field experiment in Bangladesh, [De Giorgi and Rahman \(2013\)](#) randomize the provision of an information campaign to groups of firms in an effort to reduce registration costs. They find that treated firms became more aware of the business registration procedures, but the program itself had no impact on actual registration. In an experiment in Brazil, [de Andrade et al. \(in press\)](#) evaluate the effectiveness of providing information about

registration, combining information with paying registration costs, threatening firms with an enforcement visit from a municipal inspector, and threatening neighboring firms with an inspection. They find that enforcement increases the likelihood of registration, but the other treatments did not have any impact. Finally, a field experiment in Colombia shows that eliminating the cost of registering and implementing a tax exemption in the first year after formalization—which significantly reduced the fixed costs of being formal—failed to have any persistent effect on formalization ([Galiani et al., 2015](#)).

In this section, we complement this experimental evidence from other countries with non-experimental evidence on the effects of Indonesia's one-stop-shop program (PTSP). One-stop shops for business registration are local government offices that consolidate the processing of main business licenses from separate departments into one location, and aim to provide faster, simpler, and cheaper licensing services for firms. For districts that have a PTSP, their presence allows firms to avoid visiting many different local agencies to obtain permits, and this should reduce registration costs. The centers also aim to streamline business licensing by integrating the authority to issue licenses, commonly located in disparate government offices, into one government department ([Steer, 2006](#)). Currently, the program is supervised by Indonesia's Investment Coordinating Board (*Badan Koordinasi Penanaman Modal*, or BKPM).

The PTSP program was designed to alleviate licensing challenges that arose from decentralization. Because of Indonesia's big push toward decentralization, beginning in 2001, many key governmental powers, including taxation, provision of public services, and regulatory supervision, were transferred away from the central government to local governments. In the immediate aftermath, user charges for business licenses in many districts increased, and permit issuing processes became more cumbersome, creating difficulties for entrepreneurs trying to register their businesses ([The Asia Foundation, 2007b](#)). Initially, one-stop shop programs were created by individual district governments, but in 2006, a ministerial decree (Minister of Home Affairs Regulation Number 24 of 2006 on Guidelines for the Operation of One-Stop Integrated Services) was passed to promote the development of PTSP in all districts in Indonesia. However, although national level decrees provide legal guidance for the development of PTSP, local governments were not obliged to establish a PTSP, and their decisions about when a PTSP would open and the scope of services it would provide were made independently at the local level ([The Asia Foundation, 2007a](#)).

Using new data from BKPM which contains the locations of PTSP offices and the dates when they began operations ([Badan Koordinasi Penanaman Modal, 2014](#)), [Figure 6](#) shows the evolution of the locations of PTSP over time. In 2001, only two districts had a PTSP office. By 2006, the program had expanded to 23 districts, many on Java but also in North Sumatra and West Kalimantan. After the ministerial decree, the program rapidly expanded, with 256 of 444 districts (57.7%) covered by 2009. By 2013, only four districts were not covered.

(a) Estimating the effect of the PTSP program

Although we cannot directly measure the impact of the PTSP program on changes in registration costs, we can evaluate its impact by examining how the presence of the program in a district is associated with changes in firms' propensities to formalize in that district. To do so, we estimate panel regressions of the following form:



Figure 6. Locations of one-stop-shops in Indonesia. Shaded areas correspond to districts with a PTSP office. Source: Badan Koordinasi Penanaman Modal (2014).

$$y_{idt} = \alpha_d + \alpha_t + \beta PTSP_{dt} + \varepsilon_{it} \quad (2)$$

where i indexes firms, d indexes districts, t indexes years, y_{idt} is an outcome variable (such as an indicator for whether firm i is formally registered), α_d is a district fixed effect, α_t is a year fixed effect, $PTSP_{dt}$ is an indicator variable, equal to 1 if there is a PTSP in district d at time t and zero otherwise, and ε_{it} is an error term. We estimate the parameters of this model with fixed effects least squares, using data from the 2010–13 waves of the IMK survey. Our main concern for identifying β is that

the PTSP program was not randomly assigned, and our estimates of the program effects may be confounded with targeting bias. District fixed effects control for any district-specific, time-invariant targeting bias, while time effects control for any nationwide targeting bias that is specific to certain years but invariant across districts.

Estimates of β are reported in Table 6. In Panel A, columns 1 and 2 report the effect of the PTSP program on the probability that all firms are formally registered (with and without firm-level controls), columns 3 and 4 restrict the sample to micro

Table 6. PTSP: fixed effects regressions

	All		Micro		Small	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: dep var: formal (0 1)</i>						
OSS	0.005 (0.007)	0.005 (0.007)	0.010 (0.006)	0.010 (0.006)	−0.036 (0.026)	−0.036 (0.026)
N	154,536	154,478	133,069	133,021	20,092	20,083
Adjusted R^2	0.669	0.670	0.705	0.705	0.424	0.430
<i>Panel B: dep var: log total employment</i>						
OSS	−0.024 (0.037)	−0.022 (0.037)	−0.008 (0.016)	−0.008 (0.016)	0.020 (0.018)	0.021 (0.018)
N	152,651	152,594	132,559	132,511	20,092	20,083
Adjusted R^2	0.236	0.266	0.200	0.213	0.141	0.152
<i>Panel C: dep var: log total wages</i>						
OSS	0.310 (0.608)	0.309 (0.594)	0.309 (0.552)	0.316 (0.539)	0.052 (0.112)	0.052 (0.114)
N	70,816	70,795	50,801	50,787	19,528	19,521
Adjusted R^2	0.544	0.560	0.621	0.631	0.266	0.274
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	No	Yes	No	Yes	No	Yes

Entries in the table report coefficient estimates of β from fixed-effects least squares regression estimates of (2), with standard errors in parentheses. Each column in each panel reports estimates from a separate regression. ***/**/** denotes significantly different from zero at the 10%/5%/1% levels. Firm-level controls, included in columns 2, 4, and 6, are measures of the age and years of schooling of the entrepreneur.

firms, and columns 5 and 6 restrict the sample to small firms. Overall, we do not find any significant impacts of the program on the probability of formalization, even when focusing only on micro or small firms. These insignificant point estimates are not imprecisely estimated zeros that are explained by a lack of statistical power. In Panel A, Column 2, the confidence interval around the point estimate is $[-0.009, 0.019]$, meaning that we can confidently reject the hypothesis that the program caused a 1.9% increase in formality. This is roughly 1/20 of the standard deviation of the informality indicator, a very small effect size. In Panels B and C, we report effects of the PTSP program on log total employment and log total wages, and we also find no statistically significant impacts.

Using the same regression specification as (2), Table 7 reports the impact of the PTSP program on firms' self-reported problems with doing business. In each round of the survey, firms were asked to select whether their most important problem was obtaining access to raw materials, marketing, access to capital, fuel or energy, transportation, skills, wages, other problems, or no problems. If the PTSP program were having an impact, we would expect that firms in treated districts would have reported differences in their most important problems; for instance, PTSP districts would have had lower reported access to credit problems if registration costs prevented them from accessing credit. However, we find no significant effects of the PTSP program on any of the problem indicators. If anything, small firms in PTSP districts reported an increase in problems with access to skilled labor, a finding that is probably spurious.

A concern with the results presented so far is that they are estimated using the IMK data, which only cover the years 2010–13, toward the end of the program. Figure 6 shows that the largest expansion of the program took place during 2006–09, after the national ministerial decree was implemented. Unfortunately, the first nationally representative IMK survey took place in 2010, so we cannot go back to earlier years with this dataset.¹⁸ However, we can use data from BPS's national labor force survey (*Survei Angkatan Kerja Nasional*, or SAKERNAS) and several different indicators of informal employment to provide estimates of the impact of the PTSP program over a longer time horizon.

SAKERNAS is a household-based survey of individuals aged 15 years and older that attempts to capture characteristics of the Indonesian workforce. We use annual data from the 2000–11 SAKERNAS waves to construct four different measures of informal employment. An individual is determined to be employed in the informal sector if: (1) that individual reports their job status as an unpaid employee; (2) that individual is self-employed; or (3) that individual employs temporary or permanent workers.¹⁹ A fourth indicator of informal employment measures whether all three indicators above are also true. Across all years included in our analysis, 54% of the sample reported that they had worked in the last week. Of those that had worked, nearly 62% declared their employment status as one of the informal employment categories, 18% worked as an unpaid worker and 40 reported that they were self-employed. Using the SAKERNAS data, Table 8 reports estimates of β . For each of the separate measures of informal employment, there were no statistically significant effects of the PTSP program on reducing the probability of informal employment.

Another way to estimate the effect of the PTSP program is to see whether, over time, the program becomes more effective in reducing informality the longer it has been in operation. To do this, we estimate parameters of the following regression equation:

$$y_{idt} = \alpha_d + \alpha_t + \sum_{\substack{k \neq -1 \\ k = -4}}^{13} \theta_k \mathbb{1}\{t - s_d \leq k\} + \varepsilon_{it} \quad (3)$$

where s_d denotes the year when district d 's PTSP program began operation, and t denote years. This means that $\mathbb{1}\{t - s_d \leq k\}$ is an indicator for whether or not, at time t , district d 's PTSP has been around for k years. This allows the impact of the program to vary flexibly with years since treated, and it maintains the same fixed effects identification assumptions as our estimates of (2).

Figure 7 plots point estimates and 95% confidence intervals of θ_k over the range of k years since treated. In Panels A–C, we use data from the IMK surveys, while in Panel D, we use SAKERNAS data to evaluate the impact of the PTSD program on informal employment.²⁰ Overall, there are no significant impacts of the PTSP program using this duration treatment methodology. The confidence intervals always include zero, though they tend to widen as the years since treated increases because these coefficients are estimated on increasingly smaller numbers of observations. Taken together, these results suggest that the PTSP program, which attempted to reduce registration costs, did not have any statistically significant impacts on the probability that firms were informal or on the size of informal employment. This provides even more evidence against the exclusion model of informality.

Note that we do not have direct measures of business registration costs, and we cannot be sure that the PTSP program actually reduced registration costs in all districts. Problems with program implementation could be one reason for the absence of statistically significant effects.²¹ Moreover, even if the PTSP did reduce some portion of registration costs, if other factors, including minimum wage laws, production restrictions, or the broader institutional environment, were more important, we may not have statistical power to reject the exclusion model or to say much about the sources of burdensome regulations, including the “structuralist” or “dependency theories” (Castells & Portes, 1989; Moser, 1978).

7. CONCLUSION

A substantial share of all firms in Indonesia are micro, small, and medium-sized enterprises, and over 93% of firms are informal. The Indonesian government struggles with how to manage informal firms, and their presence in the economy can have adverse effects on tax revenue, market structure, and competition. There are competing explanations for why informal firms persist, and to craft effective policies to promote formalization, policymakers need to understand what drives informality. In this paper, we described the competing theories of informality and used quantitative and qualitative data to understand which theory best fits the data we observe in Indonesia. We also evaluated a program designed to promote formality by reducing registration costs, Indonesia's PTSP program.

We find little evidence to support the theory that high registration costs are the primary barrier to firms leaving the informal sector. Informal firms in Indonesia tend to be different from formal firms in important ways, from size, to employee wages and low labor productivity, to limited market reach. These characteristics are not consistent with the idea that the registration costs are preventing firms who would otherwise be formal from making that transition. Moreover, we find no evidence that a large-scale program designed to reduce reg-

Table 7. *PTSP: fixed effects regressions on most important problems*

Dep var: most important problem is ...	All		Micro		Small	
	(1)	(2)	(1)	(4)	(5)	(6)
Raw materials	-0.005 (0.011)	-0.005 (0.011)	-0.002 (0.012)	-0.002 (0.012)	-0.002 (0.018)	-0.002 (0.018)
Marketing	-0.004 (0.011)	-0.004 (0.011)	-0.004 (0.012)	-0.002 (0.012)	-0.028 (0.018)	-0.028 (0.018)
Capital	0.011 (0.013)	0.010 (0.013)	0.011 (0.014)	0.009 (0.014)	0.011 (0.023)	0.011 (0.023)
Fuel/energy	0.008 (0.006)	0.008 (0.006)	0.008 (0.011)	0.007 (0.008)	0.005 (0.006)	0.005 (0.006)
Transportation	0.003 (0.003)	0.003 (0.003)	0.004 (0.003)	0.004 (0.003)	-0.001 (0.003)	-0.001 (0.003)
Skills	0.002 (0.003)	0.002 (0.003)	-0.000 (0.003)	0.000 (0.002)	0.018 (0.008)**	0.018 (0.007)**
Wages	-0.001 (0.001)	-0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.003 (0.003)	-0.003 (0.003)
Other	-0.005 (0.006)	-0.005 (0.006)	-0.005 (0.006)	-0.005 (0.007)	-0.006 (0.015)	-0.006 (0.015)
None	-0.009 (0.013)	-0.009 (0.013)	-0.012 (0.014)	-0.012 (0.014)	0.006 (0.023)	0.006 (0.023)
<i>N</i>	154,554	154,479	133,070	133,022	20,092	20,083
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	No	Yes	No	Yes	No	Yes

Note: Entries in the table report coefficient estimates of β from fixed-effects least squares regression estimates of (2), with standard errors in parentheses. Each row reports the β estimates from a separate regression, with the binary dependent variable reported in the row title. The sample size row reports the number of observations for all regressions whose coefficients are reported in the same column. ***/** denotes significantly different from zero at the 10%/5%/1% levels. Firm-level controls, included in columns 2, 4, and 6, are measures of the age and years of schooling of the entrepreneur.

Table 8. *PTSP: fixed effects regressions (informal employment outcomes)*

	(1)	(2)
<i>Panel A: dep var: unpaid employee (0 1)</i>		
OSS	0.000 (0.003)	0.001 (0.003)
<i>N</i>	2,935,740	2,935,740
Adjusted R^2	0.079	0.226
<i>Panel B: dep var: self employed (0 1)</i>		
OSS	-0.007 (0.004)	-0.005 (0.005)
<i>N</i>	2,935,740	2,935,740
Adjusted R^2	0.024	0.144
<i>Panel C: dep var: employs temporary workers (0 1)</i>		
OSS	-0.001 (0.001)	-0.001 (0.001)
<i>N</i>	2,935,740	2,935,740
Adjusted R^2	0.005	0.018
<i>Panel D: dep var: informal (all definitions) (0 1)</i>		
OSS	-0.008 (0.005)	-0.005 (0.005)
<i>N</i>	2,935,740	2,935,740
Adjusted R^2	0.110	0.194
District FE	Yes	Yes
Year FE	Yes	Yes
Individual controls	No	Yes

Note: Entries in the table report coefficient estimates of β from fixed-effects least squares regression estimates of (2), with standard errors in parentheses. Each column in each panel reports estimates from a separate regression. ***/** denotes significantly different from zero at the 10%/5%/1% levels. Individual controls, included in column 2, are age, education, and gender.

istration costs increased formality rates. Instead, it appears many firms prefer to remain informal, consistent with the dual economy and rational exit theories of informality.²²

Even if many firms are not formalizing because of strategic reasons, it is still desirable to minimize business registration costs. Firms that are growth-oriented and want to formalize will benefit from lower registration costs, making them more efficient and potentially supporting more rapid growth. In addition, lower registration costs may encourage firms at the margins of formality to register.

Burger *et al.* (2015) find that information about required registration and certification procedures is not easy for firms to obtain. This creates an environment of uncertainty, and corrupt officials can exploit this uncertainty by unfairly penalizing firms that are making efforts to participate in the formal sector. Simplifying and streamlining the process of registration would be beneficial to firms and eliminate waste, even if it did not increase registration and formality rates. A national program that provides information to firms, either through bulletin boards, radio or media outlets, or web-based platforms, could reduce registration costs and remove the uncertainty in the system.

Beyond focusing on reducing costs of obtaining business licenses, local and national governments should focus more on making the benefits of formal registration stronger and more salient. Benefits could include the ability to obtain access

to cheaper credit from formal financial sources, the ability to compete for government contracts, and the likelihood of attracting skilled workers. An appropriately targeted information campaign that advertises the benefits of formalizing may encourage informal firms to formalize.

As businesses become officially registered, an effort to create a national registry of firms, accessible to both national and local policymakers, would be useful. This information system would contain basic information about the firm, such as the industry, location of production facilities, number of workers, and contact information. Policymakers could use this in the design and implementation of SME support programs, and it could be used for other purposes, such as measuring economic activity. One option is to decouple firm registry in this database from the formal registration and licensing process, gathering firm information without requiring registration. With high quality lists—even of informal firms—the Indonesian government, at the national or local level, could demonstrate some of the benefits of entering the “system” and then, once firms see the advantages of being known to the government, work to get them formally registered.

The government could do more to socialize the importance of registering businesses, paying taxes, and contributing to the common good. The public should better understand what taxes are being collected and how these funds are being used to finance transportation and communications infrastructure,

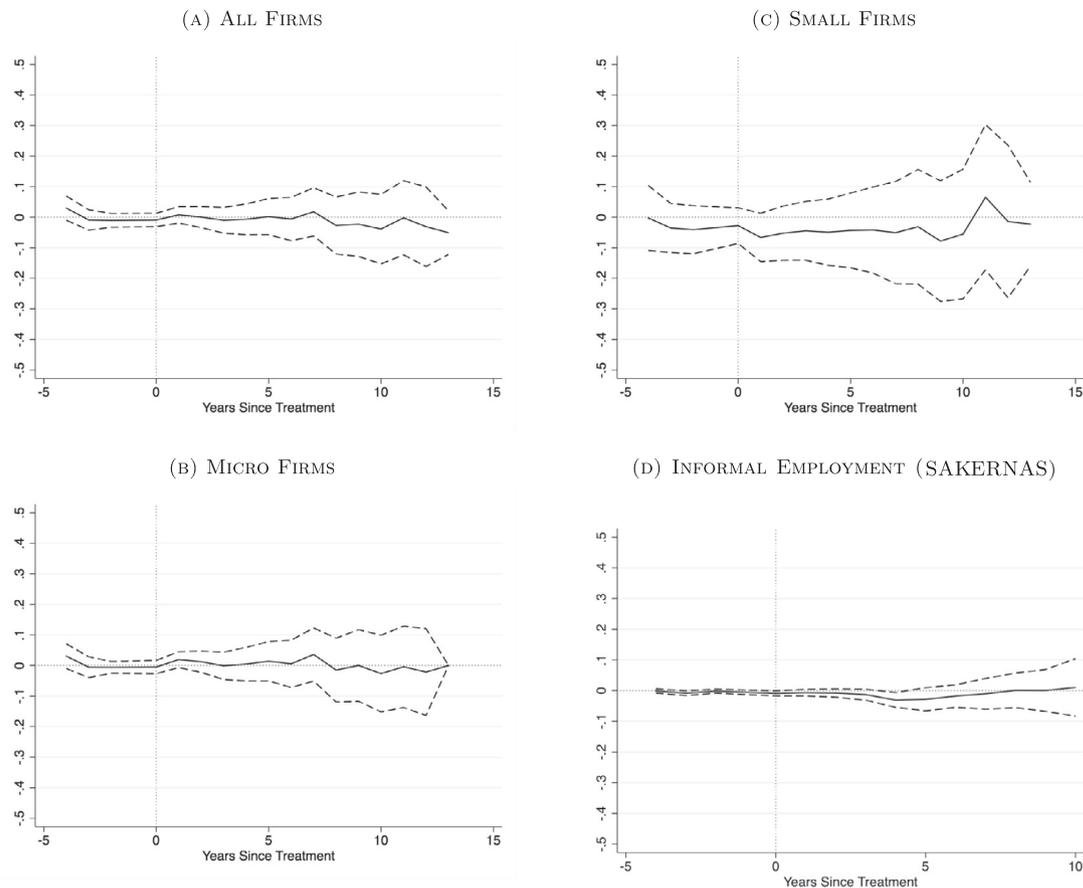


Figure 7. Differences in the Effect of the PTSP Program over Time.

Note: The graphs plot point estimates and confidence intervals of θ_k from (3) over the range of years since treatment. Panel D uses the “all definitions” indicator of informal employment, from SAKERNAS, but results are robust to using other definitions. The full estimates of these regression coefficients can be found in Appendix Table A1 (Panels A–C) and Appendix Table A2 (Panel D).

schools, ports, and other public goods that benefit firms and lower production costs. Setting the expectation that upstanding firms register could also make it easier to introduce penalties for not registering later, since those penalties won't be leveled on "good" firms.

Finally, because we believe there is some evidence to support the dual-economy theory of informality, broad based strategies to promote economic growth and poverty reduction

will lead to more formalization. Investments in infrastructure, health, and education, will eventually lead to an exit of informal sector firms, entry of formal firms, and a reallocation of workers to the formal sector. It is important to recognize that reducing the informality caused by the dual economy is a long-term process, and there are no quick fixes to rapidly change the situation.

NOTES

1. Because informal employment is difficult to measure, the magnitude of these statistics is subject to considerable debate. In an exercise to bound the size of informal employment in Indonesia, [Cuevas, Mina, Barcenas, and Rosario \(2009\)](#) argues that it is at least 29% but no larger than 71%.
2. While informal firms may pay bribes or other informal levies ([Berry, Rodriguez, & Sandee, 2001](#)), these typically go into the pockets of local officials and are not part of general government revenue used to pay for public services.
3. See [La Porta and Shleifer \(2008\)](#) for a review of this literature in economics.
4. Proponents argued that the size of the informal sector was such that it conferred the most benefit to the formal sector. For instance, [Davies \(1979, p. 101\)](#) argues that the formal sector would maintain "an optimum size, not too big so as not to represent dangerous competition to the formal sector, but not so small as to have no influence on wage."
5. [Rauch \(1991\)](#) presents a model in the spirit of rational exit, arguing that much of informality can be explained by negative selection of entrepreneurial ability. The most productive entrepreneurs are willing to operate big firms and exploit their economies of scale, despite the fact that they will be taxed, while the least productive entrepreneurs stay small and do not register.
6. A key prediction of the dual-economy model is that informal firms produce *inferior goods*, meaning that they have negative income elasticities of demand. As consumers grow wealthier, their demand for inferior goods falls, and this gives rise to the prediction that rising incomes will lead to an exit of the informal sector in equilibrium.
7. According to [Manning \(1998\)](#), during 1971–80, urban and rural *wage* sectors employment annually grew by 5% and 3% respectively, while the urban and rural *non-wage* (or informal) sectors respectively grew by 8% and 7%.
8. As evidence of this, [Bird and Manning \(2008\)](#) show that *real* minimum wages rose rapidly after 1998. Moreover, [Suryahadi, Widyanti, Perwira, and Sumarto \(2003\)](#) show that compliance with minimum wages was higher after the crisis than before.
9. An exception is [Medvedev and Oviedo \(2013\)](#), who use detailed data on registration procedures to measure a continuum of informality in a survey of 1,200 SMEs in Ecuador.
10. Another strand of research, focusing on cross-country estimates, measures informality indirectly, using electricity consumption (e.g., [Kaufmann & Kaliberda, 1996](#)) or using a simultaneous equations model, with the informal sector as a latent variable (e.g., [Comola & de Mello, 2010](#)).
11. While we focus on wages and the marginal product of labor in this section, a separate literature estimates the returns to capital inputs for small firms in developing countries. See [Karlan and Morduch \(2010\)](#) and [Siba \(2015\)](#) for a review.
12. Wages per worker are calculated as the firm's total wage bill divided by the number of workers employed. Note that wage data were only available for roughly 65% of firms, and that the data we work with were trimmed at the top 1%. For many firms—particularly small, informal firms—wages are hard to measure. This can be because such firms do not keep good records, firms may employ family workers and not pay them, or because these firms may be reluctant to share this information with survey enumerators.
13. Purchasing power parity (PPP) adjustments are used to estimate what exchange rate between two currencies would equalize the purchasing power of the two countries' currencies. Using market exchange rates can sometimes lead to misleading international comparisons, because market exchange rates fluctuate rapidly, while the purchasing power of local currency is often very stable.
14. Average labor productivity of large firms in 2013 was approximately IDR 266 billion, taken from BPS's *Survei Industri* (2013).
15. Using SAKERNAS data, [Alatas and Newhouse \(2010\)](#) found similar evidence of negative self-selection in terms of education into the informal sector among workers.
16. Differences are tested using *t*-tests on discrete and ordinal variables, and χ^2 tests on categorical and dichotomous variables. All results are significant at the 1% level.
17. These firms are similar to the small enterprises in Makassar studied by [Turner \(2003\)](#) for whom "family and friendship, as well as *kampung* relationships, not only remained critical to the continuing operations of many, but constituted essential support mechanisms . . . in an environment containing numerous barriers that hindered the small enterprises in realizing their objectives" ([Turner, 2003, p.201](#)).
18. BPS did administer an IMK survey in 2009, but it was not a nationally representative sample and did not contain a clear reference frame. Including the 2009 data in the regressions does not significantly change any of the estimates reported in [Tables 6 and 7](#).
19. These definitions of informal employment correspond to those used in prior research on informality in Indonesia (e.g., [Cuevas et al., 2009](#); [Firdausy, 2000](#)). Unpaid employees include family members and non-family members who work for another person and do not receive compensation in either cash or goods. The self-employed include respondents who either work alone or work with an unpaid or

temporary worker. Employers include respondents who employ and pay another person on a permanent basis. These classifications are not related to the type of work the respondent undertakes.

20. Full estimates of the regression coefficients plotted in Figure 7 can be found in Appendix Table A1 (Panels A–C) and Appendix Table A2 (Panel D).

21. In early evaluations of the PTSP program, The Asia Foundation (2007b) and Steer (2006) emphasize the heterogeneity in the performance of PTSP offices in Indonesia. PTSP offices that worked well were

supported with better local capacity on the part of civil servants who established and managed the office, and they experienced less resistance from vested bureaucratic interests. Steer (2006) notes that in some cases, the establishment of PTSP offices may have increased registration costs, as they became “one more stop” instead of “one stop”.

22. This finding echoes what has been shown in other contexts. For instance, Mandelman and Montes-Rojas (2009) find that the dual-economy model characterizes over two-thirds of the self-employed in the Argentinian economy.

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APPENDIX A. SUPPLEMENTARY DATA

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.worlddev.2015.11.005>.

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