Labor Inspections in the Developing World: Stylized Facts from the Enterprise Survey*

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This paper empirically explores the incidence of labor inspections across registered firms in 72 developing countries. Results show that larger firms are more likely to be inspected than smaller firms. Interestingly, inspections are less likely to occur among firms with a larger share of low-skilled workers, and that operate in industries with more tax evasion. We explore the heterogeneity of these findings across income and geographic groups, and conclude by briefly discussing the consistency of the stylized facts with competing theories of inspection agencies' behavior.

Introduction

In developing countries, the size of the informal sector suggests that enforcement of labor regulations is weak and evasion of the labor law is widespread (Schneider and Enste 2000). The large gap between the regulations stated in the books (*de jure*) and their effective implementation (*de facto*) is also a reflection of this. This gap is relevant for both social development and economic growth. The noncompliance with labor regulations mainly affects low-wage workers. It can produce workplace accidents and affects the notion that the law applies equally to all. Furthermore, it distorts the allocation of resources because it provides an unfair advantage to firms that evade regulations.

The lack of compliance with labor regulations, and the effects on labor-market outcomes, is beginning to receive attention in the literature on informality and labor regulations (see, e.g., Almeida and Carneiro [2009] and Pires [2008] for Brazil; Kanbur, Ronconi, and Wedenoja [2013] for Chile; Gindling and Terrell [2007] for Costa Rica; Ronconi [2010] for Argentina; Gimpelson, Kapelyushnikov, and Lukyanova [2010] for Russia; and Bhorat, Kanbur, and

Mayet [2011] for South Africa). However, the analysis of the performance of the enforcement agencies has, as of yet, received little attention (Basu, Chau, and Kanbur 2010).[1]

We explore a harmonized firm level survey collected by the World Bank (Enterprise Survey) of registered firms in seventy-two developing countries to analyze the main patterns of inspections of labor regulations. Using an objective measure of labor inspections (i.e., whether the firm was inspected last year), we provide a number of stylized facts across firms and countries. This is the main contribution of the paper. In addition, we present alternative objective functions of enforcement agencies, and—tentatively—discuss their consistency with our main empirical findings. This second objective is inherently difficult to achieve due to data limitations, but given the lack of research in this area, we consider it is worth confronting the challenge.

The topic is important for different reasons. First, all around the world laws are defined so that firms will comply with them. The role of enforcement is crucial to establish the right incentives for firms to comply. Second, the economic effects of labor laws depend on how the laws are actually implemented and enforced (Kanbur and Ronconi 2016). While most of the literature looking at the effects of labor regulations explores variation in *de jure* regulations, more recent work has emphasized the importance of enforcement (e.g., Boeri and Jimeno 2005; Albrecht, Navarro, and Vroman 2009, Ronconi 2010; and Almeida and Carneiro 2012). Third, labor-market regulations—and thus their enforcement—focus on features of jobs that are usually desirable to workers. Fourth, in many countries labor regulations are criticized for being restrictive and their enforcement may create constraints to economic activity. Some firms may be more affected than others so a better understanding of this incidence within countries is important for efficiency. Fifth, there is theoretical debate over the objectives of labor inspection agencies but very little empirical knowledge on their actual behavior.

Our analysis focuses on labor inspections and will not fully capture the degree of enforcement faced by firms. There are many aspects of enforcement, including penalties, persuasion, or conciliation, that are simply not captured in the Enterprise Survey.[2] The measure of labor inspection we use, however, rep-

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[1] There is a growing literature that analyzes enforcement of labor law in Latin America (Piore and Schrank 2008). See Amengual (2010) for the Dominican Republic and Pires (2011) for Brazil. Murillo, Ronconi, and Schrank (2011) and Ronconi (2012) analyze labor inspection resources and activities in eighteen Latin American countries. There is also a literature that analyzes enforcement of other laws including Neuman (2009) for access to information law; Graetz, Reinganum, and Wilde (1986) for taxes; and Mookherjee and Png (1992) for environmental regulations.

[2] For some recent qualitative work on the differences between labor inspections and enforcement see Pires (2008), Piore and Schrank (2008), and Amengual (2010).

resents an important improvement over the existing cross-country literature that traditionally has relied on subjective measures. For instance, Caballero et al. (2004) explore perceptions-based measures of "government effectiveness" and of "rule of law" that are at best crude proxies for the concept of enforcement of the labor law. Botero et al. (2004) assume that labor laws are more likely to be enforced in countries where the population is more educated without providing proof of this claim. Furthermore, at least in some settings, the intensity of inspections has been shown to influence compliance (e.g., Levine, Toffel, and Johnson 2012; Ronconi 2010).

One shortcoming of the data that, unfortunately, we cannot address is that we only observe a sample of registered firms. The Enterprise Survey does not include unregistered firms and therefore leaves out the majority of the firms in many countries. Our findings will simply focus on the formal sector and cannot be taken as representative of the entire economy. To what extent inspections agencies in the developing world focus their effort in the formal economy is an open question that surprisingly has received very little attention. The most solid evidence we could gather suggests that, in the majority of developing countries, agencies mainly focus on inspecting registered firms. According to the opinions of more than five thousand owners of unregistered firms located in eighteen countries in Asia, Africa, and Latin America, 27 percent report that one of the reasons they do not register their business is because of the inspections that would take place if registered, and 2.5 percent report that this is the main reason for not registering their business.[3]

Our empirical strategy is very simple. We explore variation in the incidence of labor inspections across registered firms within countries, and also analyze differences in the level of inspections across countries. The data we use is particularly useful for several reasons. First, the data is harmonized and comparable across countries. Second, the survey informs us about whether the firm was inspected by the labor agency during the previous year. This is an objective and comparable indicator of a dimension of enforcement of labor law that is usually not available in other studies. Third, the survey collects detailed information on a large set of firm characteristics including, among others, location, size, sector of activity, skills of the workforce, degree of unionization, market power, and participation in a business association. This information allows us to determine the characteristics of inspected firms, and hence, per-

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[3] The data is from the informal surveys conducted by the World Bank and it is available at https://www.enterprisesurveys.org/. The countries are: Angola, Argentina, Botswana, Burkina Faso, Cameroon, Cape Verde, Democratic Republic of Congo, Ghana, Guatemala, Ivory Coast, Kenya, Madagascar, Mali, Mauritius, Nepal, Niger, Peru, and Rwanda. Regrettably, the informal survey does not ask whether a labor and/or social security inspector inspected the firm and therefore we focus on registered firms.

mits—to some extent—discussing the consistency of the findings with alternative theories of inspection agencies' behavior. Do agencies exclusively focus on reducing labor violations? Or do they care about the potential job destruction that inspections could produce? Are they mainly concerned about collecting revenues? Are they affected by lobby groups?

We do not attempt to make a simple covering law for the entire developing world, but there are some interesting patterns that are worth emphasizing. First, the findings are at odds with the assumption that agencies exclusively focus on reducing violations. We do not observe more labor inspections among firms with a larger share of low-skilled workers (i.e., where violations are arguably more likely), and we find that firms that operate in sectors of activity with less tax compliance are less likely to be inspected by the labor agency. Second, larger firms (i.e., with more employees) are more likely to be inspected in almost every country.

The paper proceeds as follows. The next section briefly reviews the competing theories of regulatory agencies' behavior and discusses implications for the distribution of labor inspections across firms. We then discuss the data and provide descriptive statistics for the main variables used in the empirical analysis. Following that we propose a simple empirical approach and present the main findings; explore heterogeneity across regions and income levels; and then conclude by briefly, and tentatively, discussing the consistency of the stylized facts with competing theories of inspection agencies' behavior.

Models of Enforcement of Labor Regulations

Key ingredients of any model of public enforcement of the law include the objective function of the enforcement agency and the information set available to the agency when identifying firms to inspect and accomplishing its objectives. In this section we briefly review alternative models.

The agency objective function.   There are competing theories about the behavior of public enforcement agencies. A brief review of the alternative approaches include, first, the economic theory of public enforcement of the law, which is based on the assumption that public enforcers act so as to maximize social welfare (Polinsky and Shavell 2000). A second approach, more dominant in public administration, tends to explain enforcement agencies' behavior in terms of idiosyncratic aspects of inspectors and the nature of the task (Bardach and Kagan 1982). Third is the capture theory, which emphasizes the importance of elected officials and lobby groups in determining agency structure, tasks, and budgets (Calvert, McCubbins, and Weingast 1989).

Fourth, public enforcement agencies are assumed to maximize revenue (Niskanen 1968).

There is a large literature that discusses these alternative explanations for the distribution of enforcement in countries with cohesive bureaucracies (see Huber [2007] for a review). This literature is mostly focused on the U.S. context. There is, however, a growing literature on the behavior of regulatory agencies in developing countries. Some work stresses that, at least compared to the United States, labor inspectors in Brazil and the Dominican Republic tend to have more discretion and that they use it to balance society's demand for protection with the economy's need for efficiency (Pires 2011). Other work points out that labor inspectorates in developing countries are usually not independent but are controlled by the executive power and therefore politicized (Holland 2015; Ronconi 2012); even in this context, however, linkages between bureaucrats and allied civil society facilitate routinized resource sharing and the construction of pro-enforcement coalitions (Amengual 2014).

To discuss the role that firm characteristics play under different theories of enforcement we proceed as follows. First, we present a very simple and static model in which the agency is assumed to maximize the net difference between the agency's revenues and the costs of labor inspections. Second, we analyze how predictions differ depending on the theoretical framework.

Assume that the cost variables are the wages of inspectors (w) and transportation cost from the inspection agency to the firm (d). Also assume that the monetary benefits of conducting inspections are fines collected and payroll tax compliance per violation (t); and that the government has an estimate of the probability that a firm violates a labor and social security regulation (θ) and an estimate of whether the firm would react to enforcement via compliance (δ) or via job destruction. Finally, assume that firms are more likely to react to enforcement via job destruction when fines and taxes are higher (i.e., $d\delta/dt < 0$). Therefore, the net monetary benefit (B) of inspecting firm i is: $B_i = \theta_i * \delta(t)_i * t * S_i - w_i - d_i$, where S is the number of employees.[4]

This simple model suggests that a firm is more likely to be inspected when it is located near the agency, when it takes less of the inspector's time to conduct the inspection, when the firm has more employees, when the firm is more likely to be a noncomplier, and when the firm is more likely to react to inspection via formalization. The effect of taxes and fines is ambiguous because they have a positive direct effect on revenues but also a negative indirect effect

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[4] Assuming a static model makes more sense when the inspection agency has a very short-term horizon. We think that this is a reasonable assumption because in developing countries the inspection agency is usually not in the hands of an independent civil service but controlled by the executive power (see Ronconi [2012] for Latin America).

because they reduce the probability that a firm would react to enforcement via formalization.

It is worth noting that, if the objective of the agency is to maximize revenues, then the cost factors would not matter. If the objective is to minimize violations, then the agency would ignore potential job destruction; it would sort firms according to θ and inspect those firms that are more likely to be violating labor regulations. Finally, according to capture theory the quantity and distribution of inspections depends on the interests and power of lobby groups. For example, firms that have political connections or that are members of a business association would be less likely to be inspected if the group is powerful. Similarly, unionized firms would be more likely to be inspected if unions are powerful.[5]

The agency information set. Inspection agencies usually neither know which firms are complying nor which firms would react to enforcement via formalization. Agencies can obtain information about violations by providing a toll-free number for workers to make complaints. However, this information is usually not conclusive, because some workers simply ignore their rights or are afraid of being fired. Furthermore, the information obtained via complaints may not help determine whether enforcement would produce formalization or job destruction. Therefore, it is reasonable to assume that the agency uses observable characteristics of the firm as proxies for θ and δ.

But, which characteristics of the firm does the agency actually observe? It is likely that the agency knows the main line of business of each firm in the economy and that the agency has an estimate of the rate of noncompliance across sectors of activity (E). The agency might also know whether the firm intensively uses low-skilled labor (L) and that violations are more prevalent among these workers. That is, we expect that θ is a positive function of both E and L. As proxies for δ, the agency would like to have information about the market power (P) of firms. That is, the agency would like to know if the firm can translate the increase in labor costs produced by inspections into higher prices. Because a direct measure of a firm's market power is usually not available, the agency could use observable characteristics as proxies, such as the size of the firm (S), exports (X), or market share (M).

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[5] Unionization is also likely to be influential when agencies maximize net revenues for several reasons. First, unionized workers are presumably more aware of their rights and more confident that they would not be fired if they denounce violations. Second, because in some countries labor unions are more likely to organize in more profitable firms, the agency could take unionization as an indicator that the firm would react to enforcement via formalization and not via job destruction.

Data and Descriptive Statistics

In this section we present a number of stylized facts, and discuss—very tentatively—whether the empirical findings are consistent with the alternative theories of enforcement agencies.

Data. We explore the Enterprise Survey collected by the World Bank. It provides information on labor inspections at the firm level for a representative sample of registered firms in the private sector in a large number of countries. The Enterprise Survey is a stratified random sample with replacement. Business owners and top managers are the survey respondents, and the survey usually includes 1,500 firms in large countries, 360 firms in medium-sized economies, and 150 interviews in small economies. A priori, firms with fewer than five employees are excluded from the sample.[6]

The World Bank has conducted the survey since 2002 in almost every country of the world. In some countries the survey included a question about labor and social security inspections. More specifically, it asked whether the establishment was inspected during the last year by labor and/or social security officials.[7] We restrict our analysis to firms located in developing countries where the survey included this question. We adopt the World Bank and International Monetary Fund's World Economic Outlook Report definition of developing country. This resulted in a total of 46,719 firms located in seventy-two countries (nineteen in Africa, eleven in Latin America, twenty-six in Asia, and sixteen in Europe).[8] Our main sample, which we name sample A, is obtained by restricting to firms with nonmissing data on size, location, foreign ownership, sector of activity, and exports. Sample A includes 44,545 firms located in seventy-two countries.

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[6] For more details see the survey website https://www.enterprisesurveys.org/.

[7] The questionnaire does not allow distinguishing whether the firm was only inspected by labor officials, only by social security officials, or by both. Our objective is to measure whether the firm was inspected or not by the agency (or agencies) that are responsible for making sure that workers receive the benefits to which they are legally entitled. Some benefits (such as the minimum wage) tend to be inspected by the labor agency while other benefits (such as contribution to the pension or unemployment insurance system) tend to be inspected by the social security agency. We thus believe that we are capturing violations of workers' rights more broadly by capturing both types of inspections.

[8] Albania, Armenia, Azerbaijan, Bangladesh, Belarus, Benin, Bhutan, Bosnia, Brazil, Bulgaria, Burkina Faso, Cambodia, Cameroon, Cape Verde, Chile, China, Costa Rica, Croatia, Dominican Republic, Ecuador, Egypt, El Salvador, Eritrea, Ethiopia, Georgia, Guatemala, Guyana, Honduras, Hungary, India, Indonesia, Kazakhstan, Kenya, Kyrgyzstan, Lao, Latvia, Lebanon, Lithuania, Macedonia, Madagascar, Malawi, Malaysia, Mali, Mauritius, Moldova, Montenegro, Morocco, Nicaragua, Niger, Oman, Pakistan, Peru, Philippines, Poland, Romania, Russia, Saudi Arabia, Senegal, Serbia, South Africa, Sri Lanka, Syria, Tajikistan, Tanzania, Thailand, Turkey, Uganda, Ukraine, Uzbekistan, Vietnam, Yemen, and Zambia.

Regrettably, due to changes in the questionnaire across countries and years, many important variables that could affect inspections according to the discussion in the previous section are only available for a fraction of the countries and firms in sample A. Therefore, we create three alternative samples: B, C, and F.

Sample B includes firms in sample A with information on all of the following three proxies of θ: share of workers with temporary contracts, share of workers with five or fewer years of schooling, and percentage of sales reported for tax purposes by the typical firm in the same line of business.[9] Sample B includes 27,575 firms located in sixty countries. In sample C, we restrict firms in sample A to those with information on unionization and participation in a business association. The sample shrinks to 21,002 firms located in thirty-nine countries, mainly because of lack of unionization data. Finally, the number of firms with information for all of the analyzed variables is only 9,802 firms located in thirty countries (Sample F).

Main patterns of labor inspections. This section presents basic statistics for labor inspections. We first present some cross-country patterns using our main sample and relate it with country variables. Then, we explore the incidence of inspections across firm's characteristics.

The mean value of labor inspections across countries is 0.51, meaning that labor and/or social security officials inspect slightly more than half of registered firms per year. This figure is apparently high, but it should be noted that the sample is restricted to registered firms with (a priori) five or more employees. As noted in the introduction, nonregistered businesses—which constitute the majority in the developing world—are presumably less likely to be inspected.

Table 1 presents the mean value of labor inspections across regions. The Middle East and North Africa (MENA) region has the highest level of inspections and Central Asia the lowest. Furthermore, there is heterogeneity within regions as shown by the relatively high standard deviation.

We observe than richer countries are slightly more likely to conduct inspections, but the correlation is very weak. Figure 1 is a scatterplot between (log) GDP per capita and the share of registered firms that report being inspected in each of the seventy-two analyzed developing countries. The pairwise correlation coefficient is 0.1 and statistically insignificant. This, of course, does not imply that rich and poor countries inspect at a similar level because the Enterprise Survey only covers registered firms and in the developing world informal business is much more prevalent.

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[9] We assume that tax evasion is closely correlated with labor-law violations and evasion of social security taxes.

TABLE 1

Labor Inspections across Regions

	Share of Firms Inspected by Labor and/or Social Security Agency	Standard Deviation
Central Asia	0.35	0.17
East Asia	0.56	0.18
Europe	0.45	0.12
Latin America and Caribbean	0.48	0.07
Middle East and North Africa	0.67	0.24
South Asia	0.64	0.10
Sub-Saharan Africa	0.49	0.19

NOTE: Regional estimates are computed weighting the country values by the population.

FIGURE 1

Labor Inspections and GDP per Capita across Countries

$y = 0.0169x + 0.3888$
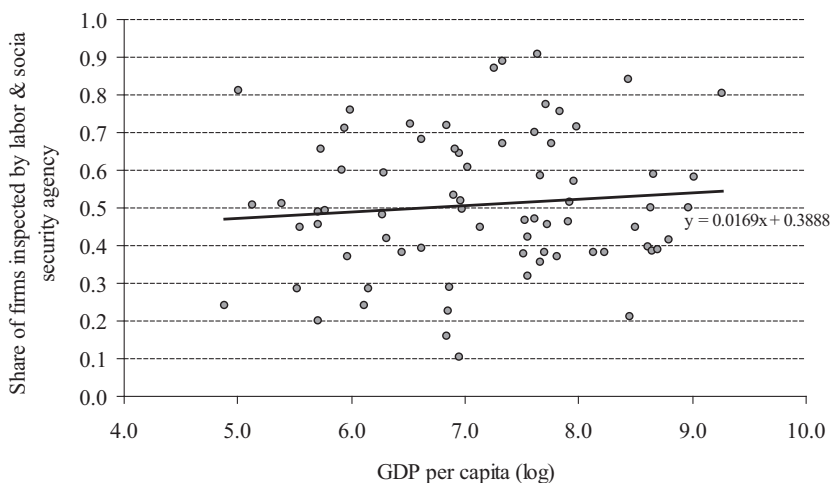
There is, however, a stronger correlation between inspections and the size of the informal economy (Figure 2);[10] and between inspections and a rule of law index (Figure 3).[11] Countries with more inspections have less informality

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[10] The measure of the informal economy, as a percentage of GDP, is from Schneider (2002).

[11] The rule of law index captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence (Kaufmann, Kraay, and Mastruzzi 2010). The index is constructed by averaging data from different sources, and varies between –2.5 and 2.5, with higher values corresponding to better outcomes. The data are available at the Worldwide Governance Indicators (WGI) website together with details on the aggregation procedure. http://info.worldbank.org/governance/wgi/sc_country.asp

FIGURE 2

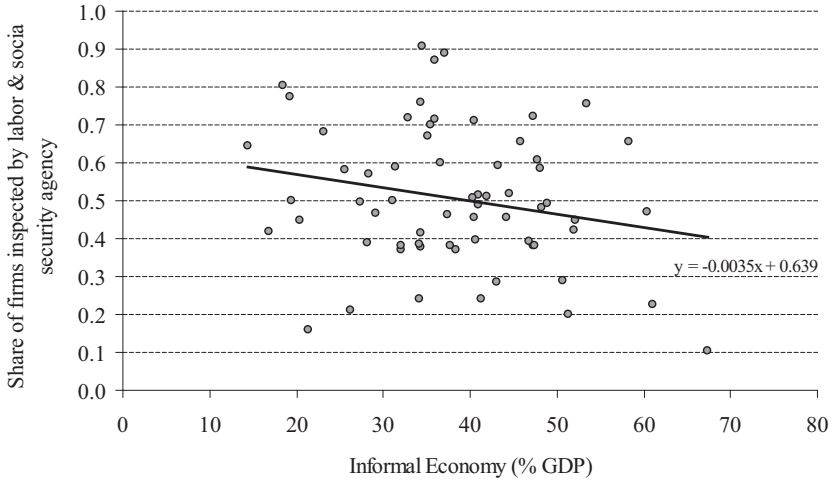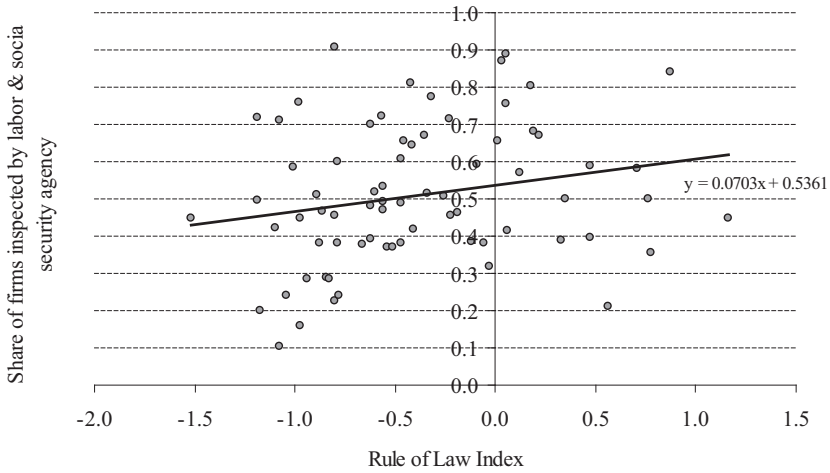LABOR INSPECTION AND INFORMALITY ACROSS COUNTRIES

FIGURE 3

LABOR INSPECTIONS AND RULE OF LAW ACROSS COUNTRIES

(pairwise correlation equal to –0.21 and significant at the 10-percent level), and countries with a higher value in the rule of law index have more inspections (pairwise correlation equal to 0.22 and significant at the 10-percent

TABLE 2

Characteristics of Inspected and Not Inspected Firms

Variable	Not Inspected	Inspected	t-value
Located in capital city	0.44	0.47	−4.70
Foreign ownership	0.10	0.15	−12.20
% Workforce with 5 or fewer years schooling	12.33	11.70	1.93
% Workforce temporary contract	10.05	9.38	2.78
% Sales reported for tax purpose in industry	80.01	82.27	−6.59
% Sales exported	14.16	21.28	−16.90
% Inputs imported	26.81	33.30	−11.78
% Sales to government	5.64	7.50	−6.31
Market share	24.78	18.95	8.89
Unionization rate	22.11	25.85	−5.78
Participation in business association	0.52	0.62	−14.87

Notes: Table reports the mean value of the variables for the sample of firms that during the last year were inspected by the labor and social security inspectors and the sample of firms that were not inspected. The last column reports the t-value of the test of equality of means between the two samples.

level). Although these simple correlations do not imply causality, they are consistent with the hypothesis that more inspections increase compliance.

Table 2 provides the mean value of a set of firm characteristics for those that have and have not been inspected by the labor and/or social security agency during the previous year. The statistics suggest that inspected firms (compared to those that were not inspected) are more likely to be located in the capital city, to be foreign, to export and import, to sell to the government, and to have a larger proportion of their workforce unionized. More surprising is the finding that inspected firms are more likely to be members of a business association; to have a more educated workforce; to operate in industries with higher tax compliance; and that inspected firms have, on average, a smaller market share compared to firms that have not been inspected.

Figure 4 shows the incidence of labor inspections across firm size and region. Larger registered firms (i.e., with more employees) are more likely to be inspected compared to smaller registered firms in the seven groups. Furthermore, in sixty-six out of the seventy-two analyzed countries, the average size of inspected firms is larger than the average size of noninspected firms,[12] and the econometric evidence below shows that this is a very robust relationship and quantitatively the most important determinant of inspections.

Figure 5 shows the incidence of labor inspections across firms' market power.[13] A firm is assumed to have more market power if quantities sold

[12] The six exceptions are Azerbaijan, Egypt, Montenegro, Morocco, Peru, and Saudi Arabia.

[13] Information about firm's market power is only available in 39 out of the 72 countries in the main sample. Given the small sample, we do not disaggregate by region.
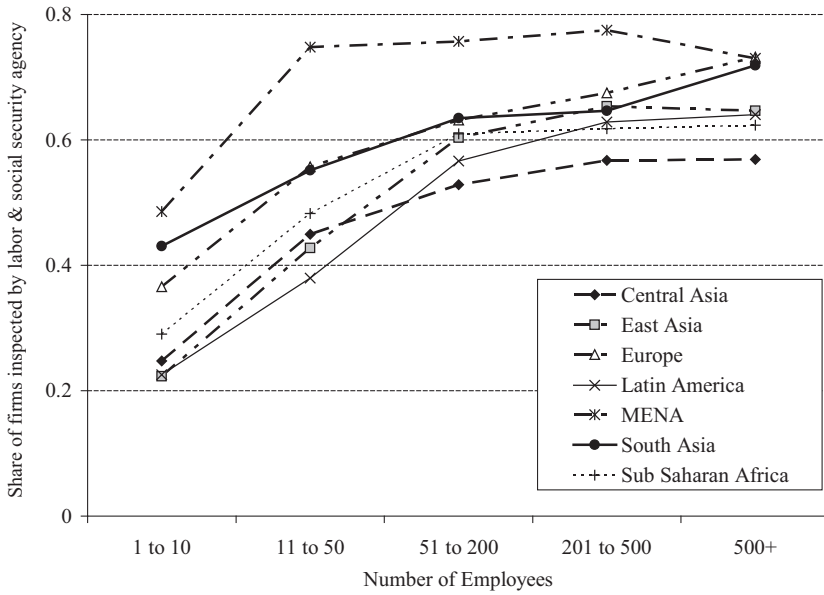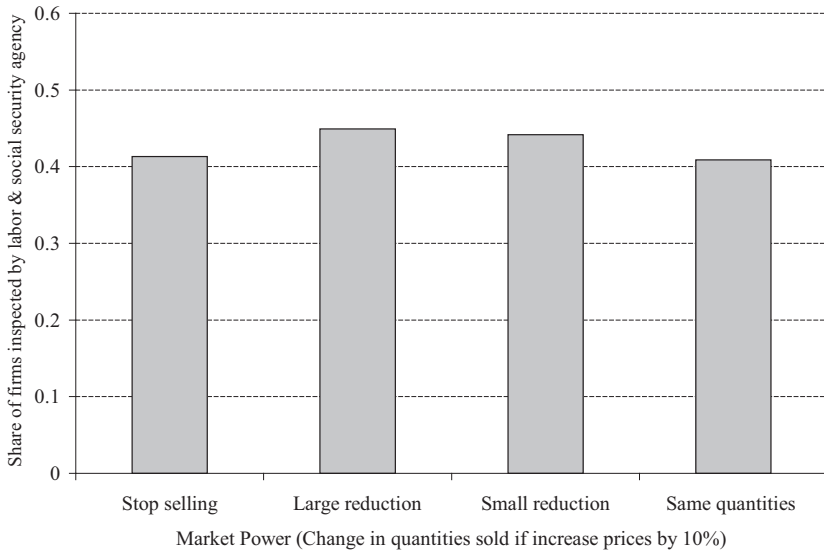
FIGURE 4

LABOR INSPECTIONS AND FIRM SIZE

FIGURE 5

LABOR INSPECTIONS AND FIRMS' MARKET POWER

decrease little after increasing prices (and assuming that competitors keep prices constant). Firms with greater market power can translate the increase in labor costs produced by inspections into higher prices, and hence, are more likely to react to enforcement via formalization rather than job destruction. Interestingly, we find that firms that have more market power are less likely to be inspected compared to firms that expect a sharp reduction in sales. This result, along with the finding that firms that have a larger share of the national market are actually less likely to be inspected compared with firms with smaller market shares, is at odds with the assumption that inspection agencies have the willingness (or ability) to focus on firms that are more likely to react to inspection via formalization and not via job destruction.

Econometric Model and Main Findings

In this section we estimate at the firm level the correlation between the incidence of labor inspections and several firm characteristics. In particular, we assume that:

$$Inspection_{ij} = \alpha_j + \psi X_{ij} + \epsilon_{ij} \tag{1}$$

where $Inspection_{ij}$ is an indicator equal to 1 if firm i in country j was inspected by labor and/or social security officials during the previous year and 0 otherwise, X is a vector of firm characteristics, and α_j is a set of country fixed effects. We assume that ε_{ij} is normally distributed and estimate equation (1) with a probit model. Standard errors are clustered at the country level.

Table 3 presents the results for different specifications depending on the firm characteristics included. In column 1 we include the set of baseline firm characteristics that are observable in the main sample (i.e., firm size, location, foreign ownership, sector of activity, and exports). In columns 2 to 10 we add several other characteristics of the firm, capturing the net benefits of inspections. As discussed above, unfortunately, these characteristics are only available for a subset of firms in sample A.

The findings in Table 3 show that few variables are consistently correlated with the incidence of labor inspections among registered firms in developing countries. In particular, larger firms are more likely to be inspected than smaller firms. Across specifications the magnitude of the effect is also reasonably constant. The main differences are between firms with one to ten employees and firms with eleven to fifty employees (15-percent increase in the probability of being inspected), and between with firms with fifty-one to two hundred employees (an additional 10-percent increase). Firms that export are also more likely to be inspected.

TABLE 3
ESTIMATES OF THE INCIDENCE OF LABOR INSPECTIONS ACROSS FIRM CHARACTERISTICS

Variable	1	2	3	4	5	6	7	8	9	10
Firm size: 11–50 employees	0.16***	0.16***	0.16***	0.15***	0.12***	0.18***	0.14***	0.08***	0.10†	0.10**
Firm size: 51–200 employees	0.25***	0.25***	0.24***	0.24***	0.21***	0.29***	0.26***	0.18***	0.22***	0.23***
Firm size: 201–500 employees	0.27***	0.27***	0.26***	0.25***	0.22***	0.32***	0.26***	0.18***	0.21***	0.22***
Firm size: 500+ employees	0.27***	0.28***	0.25***	0.24***	0.23***	0.36***	0.28***	0.18***	0.26***	0.24***
City location	−0.03†	−0.03**	−0.04**	−0.04**	−0.02	−0.03	0.01	−0.03	0.07**	0.05
Foreign ownership	0.01	0.01	−0.01	−0.01	0.03†	0.01	0.04**	0.01	0.03	0.02
% Sales exported	0.01***	0.01***	0.01**	0.01**	0.01**	0.01**	0.01***	0.01**	0.01†	0.01
% Sales government	—	0.01	—	—	—	—	—	—	—	—
% Temporary workers	—	—	−0.01	−0.01	—	—	—	−0.01	−0.01**	−0.01**
% Low-skilled workers	—	—	−0.01†	−0.01†	—	—	—	−0.01†	−0.01	−0.01
% Tax compliance	—	—	—	0.01**	—	—	—	0.01	0.01**	0.01
% Workers unionized	—	—	—	—	0.01**	—	—	0.01**	0.01	0.01
Participates in business association	—	—	—	—	0.06***	—	—	0.05**	0.08***	0.05**
Market power	—	—	—	—	—	−0.01	—	—	−0.02†	—
Market share	—	—	—	—	—	—	−0.01	—	—	−0.01
Observations	44,545	41,094	33,511	27,575	21,002	16,854	15,028	9802	4600	5041

NOTES: The dependent variable is a binary indicator equal to 1 if the firm was inspected and 0 otherwise. All models include country fixed effects and are computed using a probit model. The table reports the marginal effects. Standard errors are clustered at the country level (omitted). The omitted firm size category is 1 to 10 employees. †Significant at the 0.1, ** 0.05, and *** 0.001 level.

There is some evidence that inspections are more likely among firms with a high-skilled workforce, with less market power, with higher unionization, and among firms that are members of a business association and that operate in sectors of activity with higher tax compliance.[14] However, these results are not always robust across specifications. A number of other firm characteristics, including location, foreign ownership, sales to the government, and other traits not included in the table (i.e., age, imports, technology, and changes in employment) are usually not correlated with inspections.

There are several explanations for the robust correlation between labor inspections and firm size. First, it is plausible that inspection agencies want to maximize revenues but have little capacity to discriminate firms with and without market power. Therefore, they may use firm size as a proxy. Second, most of the inspections have lower costs in larger firms because documentation is organized and it is easier to follow the process. In small or middle-sized firms information is not so structured and inspectors would probably lose more time without a final "payoff" of having many fines. Third, the positive correlation could be driven by corruption: Because larger firms tend to be more productive they have the resources to pay higher bribes. Fourth, because larger firms are more visible to the media and the public, targeting them could be part of a signaling strategy. Finally, it is worth stressing that we cannot disentangle correlation from causality. It is plausible that there is some reverse causality if labor inspections increase firm efficiency (Piore and Schrank 2008). This in turn may promote higher exports, technological adoption, and ultimately larger firm size.[15]

Heterogeneity of the Main Findings across Income and Region

In this section we investigate the heterogeneity of our baseline findings across income groups and regions. In particular, we are interested in analyzing whether the objective functions of inspection agencies differ by levels of economic development or by region. We categorize countries in three income groups (low-income, lower-middle income, and upper-middle income or more)

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[14] The fact that members of business associations are more likely to be inspected is apparently at odds with the idea that powerful businesses with political connections receive special treatment in weakly institutionalized countries. We think that participation in a business association is a very poor proxy for political connections.

[15] The strong positive correlation between incidence of inspections and firm size relates closely to a broad literature relating *de jure* labor regulations with the size distribution of firms in developing countries (see Hsieh and Olken [2014] for a critical review).

TABLE 4
ESTIMATES OF THE INCIDENCE OF LABOR INSPECTIONS ACROSS FIRM CHARACTERISTICS BY INCOME GROUP

Variable	Low Income			Lower-Middle Income			Upper-Middle Income		
	1	2	3	4	5	6	7	8	9
Firm size: 11–50 employees	0.22***	0.12***	0.26***	0.11***	0.13***	0.19***	0.15***	0.07**	0.16***
Firm size: 51–200 employees	0.29***	0.21***	0.32***	0.17***	0.20***	0.32***	0.28***	0.19***	0.26***
Firm size: 201–500 employees	0.34***	0.24***	0.37***	0.15**	0.18***	0.29***	0.32***	0.20***	0.32***
Firm size: 500+ employees	0.30***	0.31***	0.35***	0.14**	0.18**	0.36***	0.33***	0.20***	0.35***
City location	0.01	−0.03	0.02	−0.04**	−0.01	0.01	−0.05†	−0.02	−0.06
Foreign ownership	0.08	0.06	0.11***	−0.01	0.04	0.03	−0.03	0.01	−0.02
% Sales exported	0.01†	0.01**	0.01	0.01***	0.01	0.01**	0.01†	0.01**	0.01
% Temporary workers	−0.01	—	—	−0.01	—	—	−0.01	—	—
% Low-skilled workers	−0.01**	—	—	−0.01**	—	—	0.01	—	—
% Tax compliance	0.01	—	—	0.01**	—	—	0.01	—	—
% Workers unionized	—	0.01†	—	—	0.01***	—	—	0.01	—
Participates in business association	—	0.07**	—	—	0.08***	—	—	0.04**	—
Market power	—	—	0.01	—	—	−0.01	—	—	−0.01
Observations	2165	3679	1481	12,867	7968	6118	12,543	9355	9255

NOTES: The dependent variable is a binary indicator equal to 1 if the firm was inspected and 0 otherwise. All models include country fixed effects and are computed using a probit model. The table reports the marginal effects. Standard errors are clustered at the country level (omitted). The omitted firm size category is 1 to 10 employees. †Significant at the 0.1, ** 0.05, and *** 0.001 level.

TABLE 5
ESTIMATES OF THE INCIDENCE OF LABOR INSPECTIONS ACROSS FIRM CHARACTERISTICS BY REGION

Variable	Central Asia			East Asia			Europe			Latin America		
	1	2	3	4	5	6	7	8	9	10	11	12
Firm size: 11–50 employees	0.20***	0.20***	0.21***	0.15***	0.11**	0.08***	0.18***	0.06	0.19***	0.11***	0.13***	0.16***
Firm size: 51–200 employees	0.28***	0.28***	0.28***	0.40***	0.20***	0.22***	0.26***	0.16†	0.27***	0.30***	0.28***	0.35***
Firm size: 201–500 employees	0.30***	0.31***	0.32***	0.45***	0.22***	0.24***	0.31***	0.03	0.31***	0.37***	0.34***	0.36***
Firm size: 500+ employees	0.35***	0.34***	0.34***	0.48***	0.21***	0.30***	0.34***	0.24***	0.35***	0.37***	0.33***	0.41***
City location	0.01	−0.02	−0.01	−0.01	−0.03	0.08†	−0.10***	−0.05	−0.11***	−0.04	0.01	0.05
Foreign ownership	0.06***	0.06	0.06†	0.01	0.03**	0.05***	−0.03†	−0.05	−0.04†	0.02	0.03	0.05
% Sales exported	0.01	0.01	0.01	0.01	0.01***	0.01	0.01	0.01	0.01	0.01	0.01	0.01
% Temporary workers	0.01	—	—	−0.01***	—	—	−0.01†	—	—	−0.01	—	—
% Low skilled workers	0.01	—	—	−0.01	—	—	0.01	—	—	0.01†	—	—
% Tax compliance	0.01	—	—	0.01	—	—	0.01†	—	—	−0.01	—	—
% Workers unionized	—	—	—	—	0.01**	—	—	−0.01***	—	—	0.01†	—
Participates in business association	—	0.07***	—	—	0.03	—	—	0.11***	—	—	0.08***	—
Market power	—	—	0.01	—	—	−0.01	—	—	−0.01	—	—	−0.01
Observations	2385	2497	2457	2942	6247	1637	6457	685	6460	3425	5258	3831

Table 5 (cont.)

Variable	MENA			South Asia			Sub-Saharan Africa		
	13	14	15	16	17	18	19	20	21
Firm size: 11–50 employees	0.10***	0.05	0.13***	0.05***	0.09†	—	0.17***	0.12***	0.25**
Firm size: 51–200 employees	0.12**	0.09	0.16***	0.04	0.13†	—	0.28***	0.22***	0.32***
Firm size: 201–500 employees	0.10	0.07	0.17	0.08***	0.12**	—	0.24***	0.20***	0.27***
Firm size: 500+ employees	0.02	−0.01	0.06	0.07***	0.18†	—	0.24**	0.21***	0.33***
City location	−0.02	0.06**	−0.05	−0.08**	−0.02	—	0.01	−0.06	0.03
Foreign ownership	−0.09**	−0.12***	−0.05	−0.05	0.03	—	0.05	0.03	0.05
% Sales exported	0.01***	0.01	0.01	0.01**	0.01	—	0.01	0.01	0.01
% Temporary workers	0.01**	—	—	0.01	—	—	−0.01	—	—
% Low-skilled workers	−0.01	—	—	−0.01***	—	—	−0.01***	—	—
% Tax compliance	0.01	—	—	−0.01***	—	—	0.01	—	—
% Workers unionized	—	−0.01	—	—	0.01†	—	—	0.01***	—
Participates in business association	—	0.02	—	—	0.10***	—	—	0.06***	—
Market power	—	—	−0.04***	—	—	—	—	—	0.01
Observations	8076	1156	1685	2199	4275	—	2091	3381	784

NOTES: The dependent variable is a binary indicator equal to 1 if the firm was inspected and 0 otherwise. All models include country fixed effects and are computed using a probit model. The table reports the marginal effects. Standard errors are clustered at the country level (omitted). The omitted firm size category is 1 to 10 employees. Information about unionization and market power is not available for any of the firms in Central Asia and South Asia, respectively. MENA, Middle East and North Africa. †Significant at the 0.1, ** 0.05, and *** 0.001 level.

following the World Bank classification. In Tables 4 and 5 we replicate the main specifications for the different income groups and regions.

Interestingly, the estimates are quite similar across income groups. Inspection agencies focus on registered firms that have more employees, export, and participate in a business association. Location, ownership, and market power are usually not significantly correlated with the incidence of inspections. The main difference across income groups appears to be related to the skills of the workforce and their participation in a labor union. In low and lower-middle–income countries the agency is less likely to inspect firms with low-skilled workers and more likely to inspect unionized firms, but that relationship is not observed in upper-middle–income countries. One plausible interpretation of this result is that inspection agencies in poorer countries have lower technical capacities to detect violations, and hence, rely more on complaints, which are more likely among workers who are aware of their rights (that is, unionized workers and those that have more education).

The regional estimates show some interesting patterns. In particular, inspection agencies in the MENA countries appear to focus their efforts differently compared to agencies in other regions. First, while the largest firms (200+ employees) are more likely to be inspected in all regions this is not the case in MENA. Second, inspection agencies in MENA are less likely to inspect foreign firms while a positive correlation is usually observed in other regions (developing countries in Europe are another exception). Third, MENA is the only region in which firms with more market power are less likely to be inspected; no significant correlation is observed in other regions. Fourth, firms with a larger share of low skilled workers are more likely to be inspected in MENA (as well as in Latin America), but the opposite occurs in the other regions.

Conclusion

This paper empirically explores the incidence of labor inspections across registered firms that operate in seventy-two developing countries. Given the relatively little knowledge on the behavior of inspection agencies, our primary objective is to present a collection of stylized facts. Pooling registered firms across countries, and exploiting variation within country, we find that firms with more employees are more likely to be inspected and the result is robust to the inclusion of several controls. Few other variables are statistically correlated with inspections. Exporting firms, members of a business association, firms that have a larger share of high-skilled and unionized workers, and that operate in sectors of activity with more compliance are more likely to be

inspected, although these results are not as robust as the effect of firm size. Other characteristics of the firm, such as location, foreign ownership, market power, share of sales to the government, imports, and recent changes in employment are not correlated with inspections.

We group countries by the level of economic development and by region to explore heterogeneity across these categories. Although we find some heterogeneity, most of the results obtained using the pooled sample of registered firms hold. The most salient exceptions are: First, the higher incidence of inspections among firms with a more skilled and unionized workforce is only observed in the low and lower-middle–income groups. Second, inspection agencies in the Middle East and North Africa present some anomalies, such as being less likely to inspect firms that are foreign, larger, and with more market power.

Are these results consistent with any particular theory of inspection-agency behavior? Answering this question is complex because the behavior of enforcement agencies not only depends on their objectives but also on their capacity to access and process information about firms' characteristics. Furthermore, the dataset has several limitations to reach strong conclusions, in part because inferring the objectives of inspection agencies based on firm-level data is an indirect approach and also because the data itself have shortcomings as discussed earlier. Finally, countries are likely to have different objective functions and using data that is pooled across countries masks those variations. Keeping these caveats in mind, we briefly and tentatively discuss some plausible interpretations of the key results.

First, the finding that the incidence of inspections is lower among firms that operate in industries with more tax evasion and that have a larger share of low-skilled workers it is at odds with the predictions of the "minimize-violations" approach. If labor inspection agencies were exclusively, or at least mainly, concerned about ensuring compliance, then they should focus their efforts on firms with low-skilled workers (because this is where violations usually occur) and in sectors with more tax evasion (because noncompliance with taxes and labor regulations are likely to be positively correlated across firms). This information is usually easily available to the agency, and hence, it is unlikely that the problem is lack of technical capacity to pursue a "legalistic" objective. Second, the finding that the probability of inspection increases with unionization is consistent with the idea that most of the inspections conducted by the agencies are complaint driven, not proactive. As discussed by Weil (2008), however, proactive inspections are a necessary component of a strategic approach that aims at achieving adequate working conditions. An excessive reliance on complaint-driven inspections is certainly not the most effective strategy. Finally, the positive correlation between inspection probability and

firm size observed in the large majority of countries could be interpreted as evidence of alternative objectives. For example, if larger firms are more likely to react to inspections via compliance compared to smaller firms, then an inspection agency concerned about both avoiding job destruction and collecting revenues would target them.

To conclude, we would like to make clear that labor inspectorates should not necessarily act in the same way in all developing countries. We do not propose a simple one-size-fits-all theory. The dataset we explore, however, shows that there are some interesting common patterns that occur in the majority of developing countries and are worth emphasizing. Of course, much could be gained by conducting case studies that point out the particularities of each country. We view our work as a complement to the qualitative case study literature.

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