

Understanding the Business Environment in South Asia

Evidence from Firm-Level Surveys

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Abstract

This paper examines the relationship between firm performance and growth and the business environment in the countries of the South Asia Region—Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka—using firm-level data from the World Bank’s Enterprise Surveys. The analysis uses an approach in which the responses of firms to questions about the quality of the business environment can be interpreted as shadow prices: estimations by managers of the cost imposed on the firm by inadequacies of an aspect of the business environment—public inputs such as regulation, physical infrastructure, availability of skilled labor,

macroeconomic conditions, rule of law, etc.—for the growth of their firm. The analysis finds, in line with this approach, that higher-productivity and better-performing firms in the region, and in particular firms that recently expanded their employment and created jobs, report significantly higher constraints in terms of the supply of public inputs. The authors discuss the differences across countries in the importance of various industries, how they relate to various firm characteristics, how informal and rural sector firms are constrained by public inputs, and how firms in the South Asia Region countries compare with firms in the rest of the world.

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**Understanding the Business Environment in South Asia:
Evidence from Firm-Level Surveys***

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1. Introduction

This paper examines the relationship between firm performance and growth and the business environment in the countries of the South Asia Region (SAR): Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. The analysis uses data collected for the Enterprise Surveys conducted by the World Bank of formal sector firms in the region, along with surveys of informal sector and rural firms in several countries. The paper serves as an input to the World Bank South Asia Region's flagship report, "More and Better Jobs in South Asia".

Surveys of firms across countries can be used to provide a rich description of how managers perceive the costs to them of the business environment in which they operate. Interpreting these surveys requires a conceptual framework, and the analysis in this paper uses the approach set out in Carlin et al. (2006, 2010, 2012) and Carlin and Schaffer (2012). In this framework, the responses of firms to questions about the quality of the business environment can be interpreted as *shadow prices*: estimations by managers of the cost imposed on the firm by inadequacies of an aspect of the business environment – regulation, physical infrastructure, availability of skilled labor, macroeconomic conditions, rule of law, etc. – for the growth of their firm. Expenditures on mitigation of these costs as reported by firms also fit naturally into this framework. When taken to the data, these predictions inform the policy maker whether, for example, it is the case that improvement in a particular element of the business environment is likely to benefit well- or poorly performing firms; whether public input bottlenecks are more pressing in urban or rural areas; and whether there are important differences across industries in the burden of weaknesses in the business environment. Since the focus of the flagship report is on jobs, we examine in particular how different elements of the business environment affect firms that are expanding employment.

Our modeling framework allows us to interpret clearly the different business-environment related measures collected in enterprise surveys and to formulate hypotheses as to how they relate to firm efficiency and growth. It predicts in particular that well-performing firms report *higher* costs of constraints. This insight

has the implication that relaxing the constraints on these firms is likely to produce the largest increases in output and that scarce resources available to policy makers would be better directed toward easing such bottlenecks than in focusing on the bottlenecks reported by poorly performing firms.

The structure of the paper is as follows. In Section 2, we summarize the analytical framework used in the rest of the paper and the predictions it generates about how a firm's evaluation of the costs of constraints imposed by its external environment would vary with its characteristics; the model is set out in detail in Appendix 1. Section 3 describes the Enterprise Survey data available for the SAR countries and how the variables in the model map onto the data. In Sections 4-6 we analyze the survey data from formal firms in the region. As expected, firms that had created jobs in the preceding three years reported higher costs of constraints than did other firms. Reported costs – shadow prices – varied in the expected way with a number of other firm characteristics such as size and location. In Sections 7-8, we use country averages of costs of constraints reported by formal sector firms to assess which elements of the external environment are more problematic for firms across the region and in each country, and in Section 9 we compare these country averages for the SAR countries with those reported by formal sector firms in other countries at a similar level of development. Section 10 compares business environment constraints reported by formal sector firms in the region with those reported by rural and informal sector firms. Section 11 concludes.

2. Modeling framework

Our modeling builds on the framework in Carlin et al. (2006, 2010, 2012). The framework allows us to interpret clearly the different business-environment related measures collected in the Enterprise Surveys and to formulate hypotheses as to how they relate to firm efficiency and growth. Our modeling framework predicts that well-performing firms report *higher* costs of constraints. This insight has the implication that relaxing the constraints on these firms is likely to produce the largest increases in output and that scarce resources would be better directed toward easing such bottlenecks than in focusing on the bottlenecks reported by poorly performing

firms. However, it is important to remember that the data collected in the business environment surveys provides information only about the constraints facing *existing* enterprises. It is not a useful source for addressing the constraints facing potential firms.

Before discussing our framework in more detail, it is useful to address the question of why the importance of the business environment for economic performance cannot be readily estimated directly using firm-level indicators.

Why can't the importance of the business environment be estimated directly using firm-level indicators?

A commonly-employed approach to using firm-level data to estimate the impact of variations in the business environment on firm performance is to estimate a regression in which firm performance is the dependent variable and with a measure of the business environment as reported by the firm used as a regressor along with various covariates. For example, firm-level data can be used to estimate a total factor productivity equation in which output appears on the left-hand side and inputs and other covariates appear on the right-hand-side along with one or more business environment measures. There are three reasons why such an attempt to estimate the effect of variations in the business environment at the level of the firm on productivity (or growth) is likely to be unsuccessful.

First, the many dimensions of the business environment are likely to be correlated, which makes it very difficult to tease out their separate effects on performance. Inclusion in the regression of single measures of the business environment reported by the firm is likely to result in endogeneity/omitted variable bias, whereas including many measures and controls will typically lead to very imprecisely estimated coefficients (the “curse of dimensionality” problem). This is the same problem faced by attempts to uncover the institutional determinants of growth in cross-country studies.³

³ See, e.g., Easterly (2009), Dethier (2008, 2010), or Durlauf et al. (2005) for discussions of the macro literature.

Second, even if there was only one candidate dimension of the business environment, for its effect on firm-level productivity to be estimated requires that it vary at the level of the firm. This is clearly not the case for a number of elements of the business environment such as macroeconomic stability and the court system.

Third, in cases where there is variation at the level of the firm, its effect on performance can be estimated only if there is a way of isolating the quality of such a firm-level micro-business environment from the firm's characteristics.

A simple example illustrates the problems. It is plausible that a higher productivity firm will attract more attention from rent-seeking bureaucrats; hence, a naïve regression of firm performance on the number of visits would produce a positive estimate of the effect of bureaucratic attention on performance. The major research strategy adopted to get around this problem and uncover the effect of inspections on firm performance separate from the effect of firm performance in attracting inspections has been to use the so-called "cell averages" approach. Instead of using the firm's own report on the number of visits, the average number reported by firms with similar characteristics (such as firm size, industry and location) is used. The cell averages approach is one of the strategies for addressing the endogeneity bias problem recommended by Dethier et al. (2008, 2010) in their survey paper.

However, the cell averages approach runs into an immediate problem. Unobservable characteristics that cause or are correlated with higher productivity of the firm in question will also tend to raise the productivity levels of the other firms in the cell (e.g., a local demand or industry-specific shock will boost capacity utilization and performance). This will tend to raise the prevalence of inspections, expenditure on abatement such as bribes and the seriousness of this element of the business environment reported by the firm. This is an example of Manski's (1993) "reflection problem".

The econometric challenge in trying to tease apart differences in the institutional environment faced by firms in a *single* country while avoiding the problem of endogeneity, is too much for the data to bear, which is why a recent careful study of

the data for transition economies that tried to do just this, Commander and Svejnar (2009), found largely null results.

The three problems with attempting to uncover the relevance of elements of the business environment by estimating directly a production function augmented by business environment indicators can be avoided by taking a different approach. Following Carlin et al. (2006, 2010), we take as our starting point that the business environment is external to the firm and that to an important extent, firms in a country share the same environment. This suggests that firm level information be used in a different way from the augmented production function method. Specifically, we formulate predictions as to how the firm's response to its business environment in terms of its expenditure on abatement and its evaluation of the costs imposed on it by deficiencies in the business environment varies with its characteristics, including its performance. In short, a firm-level assessment of the business environment is an endogenous variable in the modeling framework and as the dependent variable in estimations. The framework can be also used to address the relative importance of different aspects of the business environment in different countries.

Modeling framework: Summary

The model is set out in Appendix 1 and we summarize it here. We use a simple single-period firm production function with 4 inputs, L , E , B and G , which are combined to product output Y . L is employment; E is an intermediate input that is a flow of services which results from combining a public input B with G , an input the firm purchases in order to mitigate the effects of the unreliability of the public input. Firms also differ in productivity, which we capture with a productivity parameter A . We index countries by j and firms by i . In our basic model, the public input B that is supplied on identical terms to all firms in a country, so we write it as \bar{B}_j . This captures the notion of a shared “business environment” – \bar{B}_j varies across countries but not across firms within a given country. We then extend the model to cover the case where the public input varies with the firm's productivity or profitability.

For example, if \bar{B}_j is the quality of the electricity supply from the grid, and G_{ij} is the firm's generator, then \bar{B}_j and G_{ij} combine to create the firm's electricity input E_{ij} . Spending money on G_{ij} means the firm can generate its own electricity when there is an interruption in supply from the main electricity grid (\bar{B}_j). Electricity is then combined with labor to create output. Although the quality of the business environment at country level cannot be directly observed, there are country-level proxies for \bar{B}_j such as the degree of reliability of the electricity supply (e.g., in terms of outages).

Corruption is another example. In this case, \bar{B}_j is a measure of the honesty of government bureaucrats in country j , but the public input B_{ij} supplied to firm i depends not only on \bar{B}_j but also on productivity A_{ij} : high productivity firms will attract attention from dishonest government officials looking for bribes. As a consequence, the quality of the public input supplied to high productivity firms will be lower than that supplied to low productivity firms that are ignored by the bribe-seeking officials. Thus if \bar{B}_j is the honesty of the bureaucracy in country j , B_{ij} is the inverse of the number of inspections that a firm with productivity A_{ij} attracts (more inspections means a lower quality public input B_{ij} supplied to the firm), and G_{ij} is bribes.

Central to our analysis are the "Subjective Severity" indicators collected in the Enterprise Surveys. These are responses to questions about a feature of the business environment faced by the firm, where the question takes the form, "How much of an obstacle is X to the operation and growth of your business?", and the respondent rates the severity on a 5-point scale of 0 ("no obstacle") to 4 ("very severe obstacle").

The key point about these subjective severity indicators is that these are *not* estimates of the country-wide public input \bar{B}_j , or even of the public input B_{ij} supplied to firm i ; they are *valuations* of the public input. A simple and intuitive interpretation is that the "reported cost" R_{ij} of a public input is the gap between the firm's profit in the

hypothetical situation where the public input provided is of such high quality that it poses a negligible obstacle to the firm's operations, and the firm's profit in reality, given the actual quality of public input provided. We show in the Appendix that R_{ij} can be interpreted as the *shadow price* of shortcomings in the public input \bar{B}_j .

The core predictions of the model (see the Appendix) are that better performing firms (faster growing, higher productivity, etc.)

- spend more on mitigation, G_{ij}^* (e.g., are more likely to have a generator; are more likely to pay bribes);
- report better public input services E_{ij}^* in cases where the input service is not a function of firm-level productivity (e.g., are more likely to report fewer delays at customs);
- report higher or lower public input services E_{ij}^* in cases where the input service is a positive function of firm-level productivity (e.g., outcome depends on the offsetting effects of a higher number of inspections and greater expenditure on bribes);
- report higher costs of public input constraints, MRC_{ij}^* .

3. Mapping the framework to the data

In this section, we show how the framework is matched with the data in the Enterprise Surveys. We begin by identifying a number of proxy variables for unobserved firm productivity and firm growth. We then summarize the variables that are proxies for the reported costs or shadow prices of constraints, R_{ij} , mitigation costs G_{ij}^* , the flow of public input services E_{ij}^* and the shared business environment \bar{B}_j .

Performance variables

We define the following measures of firm performance that are available in the Enterprise Surveys.

- *Growth of permanent employment*: this is a dummy variable that takes the value of 1 if there was an increase in the number of permanent employees over the preceding three years.⁴
- *Labor productivity*: the log of value added per worker, where value added is defined as sales less spending on raw materials and deflated using a PPP-based year-specific exchange rate.
- *Total factor productivity*: this variable is constructed as a simple residual using logs of sales, employment, fixed capital and material, with weights on the latter three variables set to 0.25, 0.10 and 0.65, respectively.
- *R&D-firm*: this is a dummy variable that takes the value of 1 if the firm reports that it does R&D.
- *Process or product innovation*: this is a dummy variable that take the value of 1 if the reports that it introduced a new process or product during the previous three years.
- *Sales to MNCs*: the percentage of sales reported to have been made to multinational companies. We interpret this as an indicator of external evaluation of the firm's quality.
- *Education top level of the manager*: this is measured in years of education.
- *Average education level of the production workforce*: this is also measured in years of education.
- *Training offered*: this is a dummy variable that indicates whether the firm has an in-firm training program.
- *Per cent of production workers trained*: this relates to the firm's in-firm training.

The reported costs of public input constraints

Measures of R_{ij} , the reported cost or shadow price of public inputs, are available in the SAR data: "How much of an obstacle is XX to the operation and growth of your business?" The model predicts that these will be positively related to measures of productivity and growth: they will be increasing in A_{ij} and positively correlated with

⁴ If permanent employment data is not available for a firm for 3 years earlier, a shorter period is used.

measures that are also correlated with A_{ij} . The public inputs for which we have data are:

- Electricity
- Telecoms
- Transport
- Customs
- Unfair competition
- Access to land
- Crime/theft/disorder
- Tax administration
- Business licensing
- Political instability
- Government policy instability
- Corruption
- Operation of the courts and legal system
- Macroeconomic instability
- Labor regulation
- Skilled labor shortages

There is another question that is best interpreted along with the reported costs measures. Firms are asked about the adequacy of their access to water. When they report “insufficient water”, this can be interpreted as meaning that “insufficient water” is an obstacle to production. Had they answered “sufficient water” then this would be equivalent to the answer above of “not an obstacle”. We therefore consider water together with the other public input constraints.

- Sufficient supply of water

Mitigation outlays

Measures of mitigation costs G_{ij}^* will also be increasing in A_{ij} . The following indicators of mitigation outlays are included in the Enterprise Surveys.

- Bribes (=1 if the firm paid bribes, =0 if not)
- Managerial time dealing with regulatory issues (%)
- Generator (=1 if the firm has its own generator, =0 if not)

The flow of public input services

Measures of the flow of services E_{ij}^* that are available in the Enterprise Surveys are:

- Average number of days for exporter to get goods through customs. This is an inverse measure of the speed with which goods are processed through customs.
- Total number of inspections by officials per year. This is also an inverse measure; a higher number of inspections reduces the flow of services from the relevant public input.

Firm-level estimates of the shared business environment

There is only one indicator of \bar{B}_j in the Enterprise Surveys, namely the firm's experience of interruptions to the power supply. We use this in dummy variable form:

- Power cuts (=1 if more than one per month, =0 otherwise)

How can the answers to the "Access to Finance" and "Tax Rates" questions be interpreted?

There are a number of reasons why "finance" and "tax rates" cannot be interpreted in the same way as the public input constraints (Carlin et al. 2006).

If finance had the character of a public good like telecoms or customs regulation then we would expect that a high score would mean that better access to finance would boost output. However, because of the agency problems characteristic of the firm, better access to finance may result in more funding of pet projects that do not raise output (on average) but lead to higher default rates.

Where the finance system is working well, we would expect that access to finance is a constraint on at least some managers. This is not the case of a well-functioning electricity system or customs administration.

Finally, if financial institutions are functioning well, the perception of its availability as a constraint should be inversely related to the quality of investment projects the firm has available to fund, so that high scores may indicate poor quality projects rather than the potential for increased output.

The interpretation of responses to managers as to the importance of tax rates for the operation of their business faces similar difficulties as the interpretation of the importance of access to finance, and partly for similar reasons. Just as managers do not take account of the social benefits of a financial system that constrains access to finance by aiming to screen out poor projects, they also do not take account of the social benefits arising from government spending funded by the taxes they pay.

We suggest that the way to interpret the responses of managers on tax rates is that they point to the costs imposed on firms if public inputs are supplied at the cost of higher taxes than necessary. Tax rates are very highly ranked as a constraint by managers in virtually all countries (irrespective of their level of development) but it does not follow that it is a priority everywhere to cut taxation. A high ranking is probably better interpreted as indicating that policies to reduce tax rates while holding other aspects of public infrastructure provision constant (for instance, by improving administrative efficiency) would improve firm performance.

For the public input constraints, we use the survey answers to get at the private cost to the firm of inadequate or unreliable public inputs or burdensome regulation. It is not possible to use micro data of this kind to uncover whether tax rates are a key constraint to firms – firms are unlikely to take into account the public inputs that are paid for by taxation when responding to the question.

4. Are job-creating firms in the South Asia Region also high-performance firms?

The analysis in this paper relates to formal-sector firms in 8 South Asia Region (SAR) countries: Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka. The data were collected in a series of surveys over the 10-year period 2000-2010. Tables 1 and 2 present the number of firms and the median permanent employment by country and year. Firms in the three most-populous countries – India, Bangladesh and Pakistan – account for 80% of the total sample. Most of the firms surveyed are SMEs; median permanent employment is 19 persons. This is true of the individual surveys as well; the exceptions are the surveys in Bangladesh and Sri Lanka in 2002 and 2003, where permanent employment in the median firm exceeded

100 persons. All the estimations reported below, both regressions and correlations, use country fixed effects. This includes pairwise correlations, i.e., these are pairwise partial correlations with country effects partialled out.

When investigating the role of external constraints on firm performance, our modeling framework highlights that it is the firms that are performing well that are predicted to report higher costs of constraints. This insight has the implication that relaxing the constraints on these firms is likely to produce the largest increases in output and that scarce resources would be better directed toward easing such bottlenecks than in focusing on the bottlenecks reported by poorly performing firms.

Before introducing the results on business environment constraints, it is important to understand the correlations among the indicators of firm performance. Country means for these performance measures are given in Table 3. Differences across countries will be discussed in a separate piece. Note that these are unconditional means, and the differences by country are influenced by differences in sample composition (e.g., manufacturing vs. services). Note also that some measures, notably R&D activity and sales to MNCs, are not available for some countries.

Is it the case that permanent employment growth is concentrated in firms that are also successful when measured by the other performance criteria? Broadly speaking the answer is yes. The green cells in Table 4 show a positive and significant correlation between the growth of employment variable and whether the firm does R&D, its introduction of a new process or product, the education level of the top manager and of the workforce, as well as measures of in-firm training.

These are unconditional correlations (more precisely, they are conditioned on country fixed effects only). It is also important to know whether the performance correlations with the growth of employment remain once other firm characteristics are taken into account. As a first step, Table 5 shows that larger, more established, more internationally engaged firms, and those located in large cities are also the ones where jobs are most likely to have been created.

Definitions of the control variables for firm characteristics:

- *Firm size*: measured by the log of the firm's average number of employees over the previous three years.
- *New firm*: this is a dummy variable equal to one if the firm is 4 years old or less.
- *Services*: this is a dummy variable that takes the value of one for firms in the services sector; the benchmark is manufacturing.
- *Foreign*: this is a dummy variable that takes the value of one if the firm has a foreign owner with a stake of at least 10%.
- *Exporter*: this is a dummy variable that the value of one if the firm exports at least 10% of its sales, either directly or through intermediaries.
- *Importer*: this is a dummy variable equal to one if the firm imports directly.⁵
- *Small city or rural*: this is a dummy variable that takes the value of one if the firm is located in a small city or rural area.

Table 6 reports the means for these controls by country and for the sample as a whole.

Once we partial out these firm characteristics and re-do the correlations of performance measures, Table 7 shows that the patterns shown in Table 4 remain broadly unchanged. The employment growth variable is significantly correlated with most of the other performance measures – and each of those continues to be correlated with most of the other measures.

Note that employment growth is not positively correlated with the *level* of labor productivity or total factor productivity. This is explained by the fact that there will be a spurious negative correlation between a firm's employment growth and its level of productivity when it hires additional labor in order to expand output. When the control variables are included, the correlation between employment growth and labor productivity is significantly negative. The reason is that part of the positive correlation between the controls and both job growth and labor productivity is

⁵ Since the importer status variable is missing for some countries, we include a "missing importer" dummy variable that allows us to include many firms for which this variable is missing.

removed once the controls are included. Hence, the spurious negative correlation between employment growth and labor productivity is then much stronger.

The outcome of this initial descriptive analysis is that job creation is associated with specific firm characteristics and with a wide range of other indicators of firm performance. Job growth takes place in larger, more established firms that are internationally engaged – and these firms are also more likely than others to be innovative, and to have a more educated manager and workforce. On the basis of this, we move to examine how the reported costs of constraints vary with firm performance.

5. How does firm performance affect the evaluation of constraints imposed by the external environment?

Our modeling framework predicts that better-performing firms report higher constraints from the external environment. Do we find this pattern in the data? In the analysis that follows, we look first at how the evaluation of business environment constraints varies with firm performance. In order to do this, we regress the firm's evaluation of the seriousness of each element of the external environment on the performance measure and on the standard set of controls introduced above (firm size, firm age, industry, ownership, exporter status, importer status, and location, plus country fixed effects). The results we report use heteroskedastic-robust standard errors.

Means by country of the firm's evaluation of constraints, and of mitigation outlays, the flow of services of public inputs, and of the shared business environment, are reported in Tables 8 and 9. The virtually universal problems with electricity supply in **Afghanistan, Bangladesh, Nepal** and **Pakistan** are highlighted by the results reported in column 8 of Table 9: almost all firms report at least one power cut per month (and most report at least one per week). Note that although almost all firms in these countries face a poor quality business environment in this respect, their *valuations* of this aspect of the environment (the “subjective severity” question on electricity) vary. Over one-third of firms in each of these three countries report that

electricity is at most a “moderate” obstacle (3 on the 0-4 scale). This provides a good illustration of how our framework works: all firms in these three countries report that the quality of this particular public input (\bar{B}_j) is poor, but they differ in their estimates of how costly this is for them (R_{ij}).

Public input constraints and firm performance

We begin with the public input constraints (Table 10). The coloring of the cells in the table provides an immediate visual impression that firms performing well across each of the performance dimensions shown in the top row of the table report higher costs of constraints than do less well performing firms (green cells). In the lower part of the table, a number of indicators of mitigation expenditure are shown. The predominance of green cells there shows that expenditure on mitigation (e.g., bribes, generators) is also positively correlated with firm performance.

Benchmark performance measure: job-creation

Turning to firms that have recently **expanded permanent employment** (first column in Table 10), it is apparent that such firms report higher costs of constraints across virtually the whole range of external constraints both in terms of physical infrastructure and in the regulatory and broader policy environment. The only exceptions among the sixteen constraints (including insufficient water supply) are those imposed by “unfair competition” and political instability. Job-creating firms also report a higher tendency to pay bribes, are the target of more inspections by officials, report a higher frequency of power outages and are more likely to have a generator.

Alternative performance measures

Using the static efficiency measures of performance, **higher productivity firms** complain more about most institutional aspects of the business environment (see Table 10). Since higher productivity firms are not necessarily engaged in expansion, it is unsurprising that physical infrastructure and access to land and skilled labor are reported as less onerous than is the case for job-creating firms. Of the physical infrastructure elements, higher productivity firms appear somewhat more troubled by poor telecoms than are less productive firms.

Firms that have **undertaken R&D** and those that have **innovated** (introduced a new process or product) do not report higher costs of electricity or telecoms constraints than do other firms. R&D-firms report fewer problems with transport than other firms but higher constraints across the board otherwise. The complaints of innovating firms are a little more narrowly focused than for R&D-firms. In both cases, however, higher costs of anti-competitive behavior, customs regulation, corruption, access to land, an inadequately educated labor force, policy uncertainty and macroeconomic instability are reported.

Firms with more **highly educated managers** also identify a broad range of elements of the external institutional environment as more costly than do firms with less well-educated managers. Like higher productivity firms, those that do R&D and have highly educated managers are more likely to pay bribes, have a generator and attract more inspections. They also report more management time spent with officials.

The constraints reported by firms with a **higher share of educated production workers** are rather different. In particular, such firms report lower costs associated with tax administration and corruption than do other firms and there is no greater tendency to pay bribes, spend management time with officials or be inspected than is the case for other firms. It is notable that firms with a more educated labor force do not report access to skilled labor as more costly than other firms. However, firms that are engaged in training do report access to skilled labor as more costly.

Firms that **sell to MNCs** are prone to report higher costs of access to suitably qualified labor and of the courts than firms that are not involved in an MNC relationship. Otherwise, reported constraints are lower or no different from non-MNC related firms.

To summarize, across a wide range of performance indicators, reported costs of public input constraints are significantly higher in better-performing firms. Such firms are also likely to be engaged in more activity to mitigate the effects of poor physical and institutional infrastructure.

Access to finance is different

We conclude this section by examining the results for access to finance. As explained above, a firm's evaluations of access to finance will behave differently from the public good constraints, because when asked about the obstacle to their activities posed by difficulties with access to finance, the firm's own circumstances will directly affect the terms on which finance is available and hence its answer to the question. In particular, the firm's answer to a question about how much of an obstacle to its operation and growth is posed by access to finance will be influenced by its investment plans and its internal financial resources (retentions). One element of the firm's ability to access external finance will be the "objective" state of the financial system in the economy (or region). However, the terms on which external finance is available and hence the firm's answer as to its ease of access will be heavily conditioned by its need for finance relative to internal sources, and the collateral it has available. A characteristic of a well-functioning financial system is precisely its ability to direct finance according to firm (or project) -specific quality.

Looking at Table 10, we can see that irrespective of the performance measure, for public input constraints, the typical pattern is for better performing firms to report higher costs of constraints (green cells). This is not the case for access to finance. More efficient firms (as indicated by higher labor productivity and TFP) report *lower* problems with access to finance than do other firms (red cells). This is also the case for firms that sell to multinational companies. This highlights the likely causal chain from good firm performance to the availability of internal finance and easier access to external finance based on sound prior performance and the associated availability of collateral.

High productivity firms may also be closer to their optimal capital stock and hence have a more limited need for additional external finance. Consistent with this interpretation is the finding that firms doing R&D report *higher* financial constraints than firms that do not do R&D. This suggests that informational asymmetries associated with innovation are likely to make access to external finance difficult – even if R&D is a signal of a potentially dynamic firm.

6. How do the costs of constraints vary with firm characteristics?

In this section, we report the results of our baseline regression, where each business constraint is regressed on the job creation variable and a set of controls. These are reported in Table 11. The coefficient on the indicator for expanding employment is identical to that in Table 10 and was discussed above. Here we discuss the how the reported cost of the public input constraints are related to other characteristics of the firm.

In our model, the size of the firm is endogenous, i.e., the level of employment chosen is the profit maximizing one given the constraint of the supply of public input services, the firm's level of productivity, and prices. The implication is that if we could observe the level of productivity, there would be no separate scale effect on reported costs of constraints. However, since productivity is not measured perfectly, we would expect that variables that are correlated with it to also attract a positive coefficient in the reported constraints regressions.

- In particular, **firm size** is positively correlated with productivity and we would therefore expect larger firms to report higher costs and more mitigation. As column 1 in Table 11 shows, this prediction is borne out by the data. Apart from electricity and access to land, larger firms report higher costs of constraints, and in most cases the effect is significant (green cells). Larger firms report significantly lower costs associated with electricity and with access to land. Larger firms report fewer outages are more likely to have a generator. Nevertheless, the negative and significant coefficient on electricity is an unusual finding. The sign is positive and significant in a large sample of firms from across the world; including in the sub-sample of countries with levels of per capita GDP similar to those in the SAR sample
- Firms in **services** are typically less capital-intensive, less unionized, more dependent on communications, and less engaged in trade than are manufacturing firms. They would be predicted to be less burdened by the electricity network, and by labor regulations and customs administration, and to report a higher cost of poor telecommunications. This is the case in the data. Services firms also report a significantly lower burden in relation to anti-

competitive behavior and corruption and a higher burden of the courts, political instability, access to land and business licensing.

- Given their access to their parent firm's internal capital market it would be predicted that **foreign-owned** firms report fewer problems with access to finance than domestically owned ones. This is indeed the case among the surveyed firms. They are also less prone to bribe and encounter fewer days of customs delay. The only dimensions on which foreign-owned firms report more costly constraints than do domestic firms is in relation to political instability and government policy uncertainty.
- **Exporters and importers.** There are a number of interesting differences in the constraints reported by these firms. In terms of physical infrastructure, exporters report electricity as a costly constraint whereas importers report telecoms and transport as well as electricity as more costly than do non-importing firms. It is importers rather than exporters that are particularly bothered by customs administration. In line with expectations, exporters report fewer problems with anti-competitive behavior than do non-exporters; importers report the opposite. Macroeconomic instability is especially problematic for both types of internationally engaged firms, which is likely to reflect sensitivity to exchange rate movements and uncertainty.
- **Location.** A direct extension of the modeling framework is the prediction that in an economy characterized by uneven development between less dynamic rural and more dynamic urban locations, firms in the more urban locations would report higher costs of constraints. Under the assumption that the supply of public goods is uniform across the country, this prediction simply follows from the greater demands on public inputs in the faster-growing locations, which in low income countries are typically the urban ones. To the extent more rural locations have objectively worse levels of public input supply, this would tend to make it less likely that we would observe the predicted dualism result of higher reported constraints in more urban locations. However, the predominance of red cells in the final column of Table 11 confirms the dualism prediction: firms in small cities or rural locations report *lower* costs of constraints across the board (including water); the only exception is telecoms, which is a low-ranked constraint everywhere and where there is no significant

difference by location. Firms in more rural locations are more likely to have a generator and report more power outages than do firms in more urban locations, but large-city firms report a higher cost of constraint in relation to electricity.

- **Established versus new firms.** The modeling framework does not have any particular predictions as to how firm age should relate to the reported cost of constraints. However, as noted above, it is established firms that tend to be expanding employment. In terms of reported constraints, there is no difference between new and established firms across most institutional elements. New firms report higher costs of constraints for telecoms and transport, and lower costs for corruption and crime.

7. Are there country differences in the way constraints vary?

Before looking at the way constraints vary across countries, we check for country differences in the correlations between the job creation variable and firm characteristics (Table 12). The procedure is the same as that for the pooled sample: for each country sample, we report the correlation and partial correlation between the job creation variable and the characteristic in question. The “corr” and “pcorr” columns report these correlations. For comparison purposes, the correlations for the pooled sample in Table 5 are repeated in Table 12 in the rows labeled “All”. We also report whether these correlations are significantly different from those for the rest of the pooled sample; these are reported in the “Diff?” columns. These latter tests are obtained by a pooled estimation in which a dummy variable for the country of interest is interacted with the other variables.

As noted above, in the sample as a whole, firms that expanded employment tended to be larger, more established ones located in urban areas that were internationally engaged via ownership, exporting or importing. In the **India** sample, we see that the rural-urban pattern is less pronounced than that in the sample as a whole: firms in large cities report higher employment growth than in small cities but the difference disappears once the other controls are added. The pattern we saw above for the

sample as a whole – employment growth in large cities – is driven by the firms in Bangladesh, Bhutan, Pakistan and Sri Lanka.

The positive correlation between employment growth and the age of the firm in the sample as a whole is driven by firms in the sample from Afghanistan, Bangladesh and Pakistan. Elsewhere there is no strong age of firm effect.

Once other characteristics are accounted for, the positive association between employment growth and international engagement is strongest in **India**.

In the sample as a whole, there is no strong association between job-creating firms and either sector or ownership. However, there are some country variations. In Bhutan, Nepal, Pakistan and Sri Lanka, it is services rather than manufacturing firms that are more likely to be job-creating.

Reported constraints – do countries differ?

Our investigation of differences across countries in reported constraints uses a similar approach to that above. We estimate the same regression as with the pooled sample, but separately for each country. Significance tests are reported based on these country-by-country estimations. The results are reported in Table 13; for comparison purposes, the results for the pooled sample in Table 11 are repeated here in the rows labeled “All”. We also report in the “Different?” columns whether regression coefficients are different in the country of interest vs. the rest of the sample, again using the simple procedure of a pooled regression in which the country dummy is interacted with the other regressors.

As we have seen earlier, in the sample as a whole in the benchmark regression (job creation plus controls), firms that expanded employment reported higher costs of constraints virtually across the board. When we look at the individual country samples, we find this pattern very clearly for **India** and **Pakistan** (note the green and the “greater” cells). The countries that look different are **Afghanistan** and **Bangladesh**. In both the latter countries, job-creating firms tend to report lower rather than higher costs of constraints (red and “smaller” cells). It is also growing firms that

are less likely to pay bribes and spend less manager time dealing with officials. In Bangladesh, growing firms report lower constraints from anti-competitive behavior by other firms and labor regulation.

There are also some interesting cross-country differences in reported constraints for the firm characteristics, which may be relevant for policy.

The most striking difference among the SAR countries concerns the **location** characteristic. Earlier we found that in contrast to the rest of the region, job-creation was uncorrelated with location in **India** once we controlled for other firm characteristics. Elsewhere, employment creation was more prevalent in big city locations. Turning to the constraints regression analysis, we find once again that India does not reflect the dualism pattern found elsewhere in low income countries. The typical pattern is that it is firms in urban (large city) locations that report higher costs of constraints than do firms in rural areas including small cities. Indeed for electricity, Indian firms in more rural locations report higher constraints than do firms in urban areas. In India, large-city firms report higher constraints only in relation to transport, courts, labor regulation, and customs administration. However, for the *majority of constraints*, there is no significant large city – small city gap in the reported cost of constraints in India.

The standard dualism pattern for low-income countries (found in the large multi-region dataset) is characteristic of most SAR countries apart from India. It is especially pronounced in Bangladesh and Pakistan (red cells). This suggests that in terms of the reported constraints on growth, India is a more integrated economy between rural, small city and large city areas than are the other countries in this sample.

The positive **firm size** effects across a range of constraints are weaker in **India** than elsewhere. The difference between **services** and manufacturing firms is also different in India, where it is services firms that complain more about electricity. Unlike the case elsewhere, they are also more likely to have a generator and have more frequent power outages than do manufacturing firms. In Pakistan, services firms complain much less about electricity than do manufacturing firms and are more likely to have a

generator and fewer outages. However, services firms in Pakistan report more problems in relation to the availability of educated labor than do manufacturing firms.

The other key difference is in relation to **exporting** firms: in the sample as a whole (and elsewhere in the world) exporting firms tend to complain more about physical infrastructure and institutions than do non-exporters. In **India** these exporter effects are even stronger. In **Bangladesh** by contrast, the results are the opposite: exporters report lower costs of constraints relative to non-exporters for electricity and most aspects of institutional infrastructure. Thus, in relation to exporters, it is Bangladesh that stand out from the regional and multi-region sample: for example, exporters complain *less* about customs administration than do non-exporters. In Bangladesh, also in contrast to experience elsewhere, exporters complain less about macroeconomic instability than do non-exporters. Although the constraints reported by Bangladeshi **importers** are very much in line with the sample overall, Pakistani importers stand out from the sample. Importing firms there generally report lower constraints than non-importers and than importing firms elsewhere in the region. These differences point to the need for more detailed research to uncover what lies behind them.

Are there important industry-specific effects?

An important question for policy-makers is whether there are systematic differences across industries in the extent to which the quality of public inputs imposes costs on firms. We focus on six industries (garments, food and beverages, chemicals, electronics, machinery and textiles) and use the samples from the three large countries (Bangladesh, India and Pakistan) where each of the six industries is well-represented.

As a first step, we look at whether job creation is concentrated in particular industries. We do this by using the pooled sample for the six industries in the three countries and, for each industry separately, regress the job creation variable on the dummy variable for the industry of interest plus country fixed effects. The results are in Table 14 in the “corr” column. They show that job creation is higher in garments and textiles (except in India) and lower in food and beverages, and electronics (except in Pakistan). It is lower in the machinery sector in Pakistan.

However, from a policy perspective, what matters is whether these industry differences persist once we control for the other important firm characteristics, i.e. size, age, etc. It is very striking that once the standard set of firm-level controls are introduced, the differences across industries in job creation mainly disappear. This is shown in the column “pcorr” in Table 14, where for the pooled sample, only the electronics industry dummy retains its significance. There are few significant country differences. Strikingly in the case of Bangladeshi garments, its role as especially job-creating in the initial regression without the controls switches to the opposite once we control for the firm characteristics – it is then less likely to be job-creating than other industries.

Finally, when we look at how reported constraints vary by industry either in the pooled sample or by country, there are very few significant industry effects. The implication of these results for the policy-maker is that there is no basis for discriminating across industries when identifying priorities for improving the business environment, once the key characteristics we have analyzed here – international engagement, size, location, etc. – have been accounted for.

Summary

We summarize the core results of this section by returning to the predictions of the modeling framework. Using our baseline performance indicator of job creation, the model predicts that firms that expanded employment will:

- Report higher costs of public input constraints R_{ij} , i.e., higher shadow prices. Such firms report higher costs of constraints in fourteen of the sixteen dimensions (including adequacy of water supplies).
- Spend more on mitigation, G_{ij}^* . The results reported above confirm that such firms are more likely to have a generator and to pay bribes. Contrary to expectation, they are not more likely to spend management time dealing with officials.
- Report better public input services E_{ij}^* (in cases where the input service is not a function of firm-level productivity). We find that such firms do not report

shorter delays at customs (although higher productivity firms do report shorter delays).

These results provide a strong case for a policy focus on the constraints identified by firms as most costly. In the next piece, we examine how the relative importance of different public input constraints reported by firms varies across countries in the sample.

8. Which elements of the business environment matter most for firms and how do they vary across countries?

In this section, we use the country averages of the costs of public inputs reported by firms, R_{ij} , to assess which elements of the external environment are more problematic for firms across the region and in each country. We also compare the country average evaluations with those in other countries at a similar level of development.

The data that we use in this section pools the surveys of the SAR countries used above with data from the surveys available from the World Bank's Enterprise Surveys portal. We consider only formal sector firms in the analysis. Altogether, the surveys cover almost 120,000 firms from over 230 different surveys in 126 countries over the period 2000-2010. Of these, about 16,000 firms were from the 8 SAR countries. We use these firm-level data to calculate country average evaluations, i.e., country means.

In order to correct for differences in survey samples when comparing reported constraints across countries, we construct the "conditional country means" for each constraint for a standard firm. The controls included in the estimations are the same as those used above: size (log employment), and dummy variables for whether the firm is newly established, expanding employment, has substantial foreign ownership, is a significant exporter or importer, and is located in a small city.⁶ Log employment is centered on $\ln(30)$. The estimations are identical to the country regressions reported earlier; the country conditional means are, in fact, the estimated intercepts

⁶ Also as previously, we include a dummy variable in case the importer dummy is missing, in order to increase the sample size and number of surveys included.

reported in the first column of Table 13. The intercepts can therefore be interpreted as estimates of the constraint level in a given country for a benchmark manufacturing firm with 30 employees that is domestically owned, with no foreign ownership or import/export activity, and that is located in a large or capital city. These intercepts are the “country conditional means” that we analyze below.⁷ For those SAR countries for which we have surveys in multiple years, we obtain year-specific conditional means from the means by year of the residuals from the firm-level regression.

The implication of the modeling framework set out above is that job-creating firms are likely to benefit most from the success of policy-makers in relaxing the most pressing external environment constraints. For the reasons discussed earlier, we focus on business environment constraints with a public good character and therefore do not include the “Tax Rates” or “Access to Finance” constraints in the main analysis. The latter measures are considered briefly in Appendix 2.

The ranking of constraints by country

The conditional country means are reported for each of the SAR countries and for the region as a whole in Table 15. The countries are listed according to GDP per capita. Because the conditional means are sometimes based on surveys from more than one year, GDP per capita used in the table and in the diagrams is a weighted average of GDP per capita, where the weights are the survey sample size in the relevant sample years. For the region as a whole, political instability, electricity and corruption are the three top-ranked constraints. However, there is considerable variation across the countries.

The differences between “finance” and the public good constraints discussed above mean it is not possible to interpret the country conditional mean for finance as comparable with the other constraints. As an example, think of the following experiment. If the economy is affected by a positive productivity shock, we would expect the average firm to report a higher cost of a public good constraint but lower cost of access to finance. Since the responses to the finance question are non-

⁷ The results for the unconditional country means, i.e., when using simple means across firms in a given survey, are very similar.

comparable with the answers to the other constraint questions, it is not possible to create a ranking of constraints that includes finance. Finance is therefore not reported in Table 15.

For each country, the country mean score for each constraint is reported and the constraints are ordered from the most to the least costly.

- In every country except Bhutan and the Maldives, **electricity** is one of the two highest ranked constraints.
- In five of the eight countries, **corruption** is among the four highest ranked constraints.
- **Political instability** is in the top three except in Bhutan– but was not included in the survey instrument for India, Sri Lanka and the Maldives.

Nepal

Political instability is the top-ranked constraint in Nepal. This is followed by electricity, transport and corruption. Only in Bhutan is transport also one of the top-ranked constraints. Least problematic are access to land, business licensing and the courts.

Nepal was surveyed in 2000 and 2009. Electricity and transport were included in the two surveys and reported constraints went up in both cases.

Bangladesh

In Bangladesh, the ranking is electricity, political instability, corruption, and then access to land. Least problematic to firms are transport, the courts, and labour regulation.

Surveys were conducted in Bangladesh in 2003 and 2007. Most aspects of the business environment were included in each survey. There were few substantial changes over time: although concern with customs, transport, tax administration and anti-competitive practices went down.

Afghanistan

Political instability is the top-ranked constraint in Afghanistan, followed by electricity, corruption, and access to land. Problems with business licensing, access to skilled labor and labor regulation come at the bottom.

Surveys were conducted in Afghanistan for the years 2006, 2009 and 2010. Only a handful of the set of constraints were included in all three surveys. All three surveys were relatively small, however, each with only about 100-200 firms used in the estimations. No clear trends emerge. We note that the prevalence of power outages more than once a month fell sharply between 2009 and 2010 in the unconditional mean estimate but once sample composition is controlled for, there is no difference between the two years. This highlights the importance of controlling for the influence of sample composition.

Pakistan

The top-ranked constraint in Pakistan is tax administration, followed by a group comprising electricity, political instability, government policy uncertainty, the courts and corruption. The only other SAR country where the courts are highly ranked as a problem is the Maldives. At the bottom of the ranking in Pakistan are transport, access to skilled labor and telecoms.

Pakistan was surveyed in 2002, 2007 and 2010. As elsewhere in the SAR, only a handful of constraints were included in the 2010 survey. The reported cost of electricity as a constraint went up over time. By contrast, concern with corruption had a hump-shaped pattern, with the peak in 2007.

India

Consistent with their importance elsewhere in the region, electricity and corruption are ranked top in India. The next most costly elements of the business environment are tax administration and labor regulation. Access to land is a problem elsewhere in the region but in India, it is one of the least problematic aspects of the business environment, along with courts and telecoms.

For India, there are surveys from the years 2002, 2003, 2005 and 2010. Only a handful of constraints were included in the 2010 survey. However, for those that were included, a sharp increase in problems is reported. In particular, electricity emerged clearly as the most costly constraint for firms in 2010. It is interesting to note that the likelihood of power outages remained fairly constant between 2005 and 2010. This is consistent with higher reported costs from electricity as an obstacle to production if firms were improving their performance / growing faster and hence suffering larger losses from an unchanged level of unreliability of the electricity grid. Labor regulation is also reported to be markedly more problematic in 2010 than in 2005.

Sri Lanka

The top five ranked constraints in Sri Lanka are electricity, government policy uncertainty, macroeconomic instability, anti-competitive practices, and labor regulations. Firms were not asked for their evaluation of the extent to which policy uncertainty and macro instability affected their business in Afghanistan, Bhutan and Nepal. Among the countries where these aspects were included, Sri Lanka is the only one where they are highly ranked as problems. Firms in Sri Lanka rated business licensing, customs, and access to land as least problematic. (A question about the obstacles posed by the courts was not included in the surveys in Sri Lanka.)

Sri Lanka was surveyed in 2004 and 2010 but few aspects of the business environment were included in 2010; there were no marked changes.

Maldives

Given its physical environment, it is not surprising that the top-ranked constraint in the Maldives is access to land. This is followed by corruption, the courts, and access to skilled labor. The least problematic aspects of the business environment in the Maldives are telecoms, macro instability, and business licensing. The Maldives was only surveyed once, and the survey size was small (about 140 firms were used in the calculation of most of the conditional means), so these results should also be treated cautiously, despite their plausibility.

Bhutan

The business environment in Bhutan (which was only surveyed once, in 2009) impinges on firms quite differently from elsewhere in the region. The top-ranked constraints are transport, access to skilled labor regulation, and tax administration. Of least concern are the courts, telecoms and political instability. The contrast between Bhutan and Nepal in the importance of electricity as an obstacle is particularly striking; across the SAR countries, the constraint is lowest in Bhutan and second highest in Nepal. This is not explained simply by the abundance of hydropower in Bhutan (about 4/5ths of total generation), since Nepal has the second-most abundant hydropower in the region (over 1/4th of total generation). The size of the Bhutan sample was relatively small, however – about 250 firms were used to calculate the country conditional means – so the above results should be treated cautiously.

9. How do the SAR countries compare with those outside the region?

It is useful to compare the constraints reported by firms in the SAR countries with those outside the region but at similar levels of GDP per capita. The non-SAR country conditional means are constructed using the same set of controls as for the SAR countries, but in a single regression with country-survey fixed effects. The fixed effects correspond to the conditional means for individual country surveys. For compatibility with the results reported above, we continue to use a single conditional mean for each SAR country, i.e., we do not disaggregate by survey.

The SAR and non-SAR conditional means are reported for the main constraints of interest in Figures 1-9 below (results for the other constraints are reported in Appendix 2). The log of GDP per capita in PPPs is on the horizontal axis and the reported cost of the constraint on the vertical. Heteroskedasticity-robust confidence intervals of 5% are shown individually for the SAR countries; these are simply the confidence intervals for the estimated constants in Table 13. The figures also show a regression line based on a quadratic in log GDP per capita for the country-survey conditional means for the rest of the world. A 95% confidence interval based on the

standard error of the predicted mean is also displayed; this confidence interval is robust to heteroskedasticity and within-country correlation.⁸

Electricity, outages and generators

There is a clear downward-sloping gradient in the electricity chart (Fig 1): firms in richer countries report lower obstacles to production from electricity. The high level of constraint reported in Nepal, Afghanistan and Bangladesh are partly accounted for by these being very poor countries. However, even for such poor countries, the problems look serious. This is particularly striking for Nepal, which as noted above is well-endowed with hydro power. Outages are also very high for these three countries (Fig 1). The constraints imposed on firms by unreliable electricity in Pakistan and India are, respectively, at the upper and lower ends of the confidence interval for countries at their levels of GDP per capita. Sri Lanka looks unusual in that it reports costs of constraints on the high side for its level of development but low outages. However, this may be partly accounted for by its higher use of generators. In general, use of generators is higher in the SAR countries than is typical elsewhere.

Fig. 1 highlights the fact that the low reported constraints in the Maldives and Bhutan (although imprecisely estimated because of small sample sizes) are partly related to their higher income per head than the other countries in the region. But the chart also indicates that these two countries are at the low end of problems with electricity (including outages) compared with other countries at their level of development.

Corruption and bribes

The relationship between the reported cost of the corruption constraint and GDP per capita is characterized by low levels and low variation in reported constraints in rich countries and much more variation in poor and middle-income ones (Fig. 2). Of the richer SAR countries, Sri Lanka and Bhutan have lower levels of reported constraints than is typical at that level of GDP per capita. This appears true of India and

⁸ A non-overlap of a SAR country confidence interval and the non-SAR country regression line confidence interval provides a conservative test of the difference between the estimated means. That is, non-overlap suggests a statistically significant difference, whereas the estimated means could still be significantly different even if the confidence intervals overlap.

(possibly) Nepal as well. Bangladesh has higher levels than typical, whereas Afghanistan and Pakistan look unexceptional.

The data on the prevalence of bribes line up with those on corruption, with a high prevalence of firms making bribe payments in Bangladesh even for such a poor country and a low prevalence in Nepal. The low cost of constraint reported in the richer SAR countries of Sri Lanka and Bhutan is reflected in a low prevalence of bribes for countries at this level of GDP per capita.

Political instability

Among the SAR countries in which the role of political instability was included in the survey, there is a very clear downward income-constraint locus. The richer country Bhutan registers a very low cost of this constraint (in the cross-country comparison), which contrasts with the higher than typical costs reported in Nepal, Afghanistan and Bangladesh. Pakistan is also on the high side for countries at its level of GDP per capita.

Access to Land

There is an interesting degree of variation in the evaluation of problems related to access to land among the SAR countries (Figure 4). Across countries in the world, the constraint slopes downward as income per capita rises. Among the SAR countries, four have predicted values above the regression line and four, below. There are richer and poorer countries in each group. In the “high” group are Bangladesh, Afghanistan, Pakistan and the Maldives. The exceptional problems of the Maldives are highlighted in the chart. Afghanistan and Bangladesh (and Pakistan in the 2007 survey) also look unusual relative to other poor countries in the extent of access to land problems. The contrast with Nepal is very clear. In India and Sri Lanka access to land appears to be less problematic as compared with countries at a similar level of development.

Water

Problems with the availability of water (Figure 5) tend to be high in the SAR countries as compared with countries at similar levels of development (the exception is the Maldives). The problems in Pakistan are especially notable.

Labor regulation

The chart (Figure 6) suggests that this element of the business environment becomes more costly to firms as GDP per capita rises. Most of the SAR countries report elevated levels of this constraint as compared with other countries at their level of development. This is especially in the case for Nepal, India and Sri Lanka.

Courts

Problems with the courts look unusually serious in Pakistan (Figure 7). By contrast, this dimension of the business environment appears less problematic than might be expected at their level of GDP per capita in Nepal, India and Bhutan. The contrast between Pakistan and India along this dimension of the business environment is very striking.

Inadequately educated labor

Firms in the SAR countries do not identify problems posed by inadequate access to skilled labor as especially serious – as compared with countries at their level of development (Figure 8). The only exception is the case of Bhutan. Indeed for Nepal, Afghanistan, India and Pakistan, the costs of this element of the external environment are rated below that of their comparators.

Telecoms

The chart (Figure 9) highlights the fact that for most countries in the world, telecoms is a low-ranked constraint. This is also true of firms in the South Asia region. Problems appear more serious in Bangladesh, Afghanistan and Sri Lanka than is typical of countries at their levels of development.

10. A comparison of business environment constraints between formal sector firms and rural and informal sector firms

Surveys have been conducted of rural firms in Bangladesh, Pakistan & Sri Lanka and of informal sector firms in Afghanistan, India and Pakistan. However, the sample for India is much larger (over 2,000 firms as compared with about 200 and 400 firms for the other two countries with informal sector surveys). We therefore confine the

comparison of informal firms to India. We compare the reported constraints on firm growth for rural and informal sector firms with those of formal sector firms, which were used in the previous analysis in the paper. The informal sector survey of India includes only manufacturing firms.

For the formal/rural comparison, we pool the rural sector firms for the three countries. For both the formal/rural and formal/informal comparisons, the comparison group are the firms in the Enterprise Surveys for the relevant set of countries, which we call “formal”. Only manufacturing firms in the Enterprise Surveys are included for the comparison with informal firms.

We do two exercises for the formal/rural and formal/informal comparisons. The first is to compare the levels of the reported constraints in the two groups of firms (Tables 16 and 18). The second is to examine whether there are any differences between formal and rural or informal sector firms in how constraints are ranked (Tables 17 and 19).

In the left hand panel of Table 16 (specification 1), we show the unconditional mean evaluations of each obstacle for formal sector firms and informal or rural sector ones. To facilitate comparison between the formal and informal/rural sectors, we show the results for small formal sector firms (dropping from the samples those firms with more than 20 employees). The column headed “Diff?” shows whether there is a statistically significant difference between the mean for the small formal and the informal/rural sector firms.

The right hand panel of Table 16 (specification 2) includes a size control for firm characteristics interacted with an informal or rural dummy (plus country-survey fixed effects). This allows the two groups of firms being compared (formal vs. informal and formal vs. rural) to have their own coefficients on the size control. We can interpret the constant or the constant plus the dummy as means conditioned on size.

The benchmark firm is the same as in the rest of the analysis except that it is centered at average employment of 5 persons, which is more appropriate given the size distribution of informal and rural firms. In the comparison of small formal vs. rural

firms in Bangladesh, India and Sri Lanka, median employment in small formal firms is 10 (compared to 35 employees for all formal firms in these three countries), and in rural firms is 1.5. In the comparison of small formal vs. informal manufacturing firms in India, median employment in small formal firms is again 10 (compared to 20 employees for all formal manufacturing firms in the India surveys), and in informal firms is 4. The remaining size disparity between small formal firms, on the one hand, and rural or informal firms, on the other, is why we condition on size in specification 2 as described above.

Levels comparisons between rural and formal sector firms

The results for the comparison of rural with formal sector firms are clear and echo the results reported above in Section 7 for the large city / small city comparison using the Enterprise Survey data (Table 16). Rural firms almost always report that the elements of the business environment represent less serious obstacles to their firm's production and growth than is the case for managers of formal sector firms. This is highlighted by the predominance of red shaded cells in both specifications. (Note that the number of observations for "Competition" and "Crime, theft and disorder" is very small and these results should be treated with caution.)

The results in the lower part of the table are interesting because they accord with what one would expect of rural firms: they have much lower engagement with officials (bribes, inspections, management time) and report lower costs of corruption and the range of institutional constraints. Rural firms report similar levels of power outages and they are more likely to have a generator than formal sector firms. They rate the problems associated with access to electricity as less problematic than do formal sector firms, which suggests that they make less use of electricity in their production process.

Comparison of rankings of constraints by rural and formal sector firms

Table 17 presents the results in a slightly different way in order to highlight how the different firm types rank the constraints. Using the unconditional means in the first column, we see the results familiar from above, namely that electricity, political instability, and corruption are the highest ranked constraints for formal sector firms.

In the second column, we see that little changes if we restrict attention to the small formal sector firms. The constraints most important to rural firms are rather different. Three of the top four constraints are common to the two groups of firms: electricity, macroeconomic instability and political instability.

The most striking difference is that for rural firms, corruption is a much lower ranked constraint: this is consistent with the results reported above that rural firms are less engaged in bribes and spend much less time with officials.

Rural firms rank transport more highly as a constraint than do formal sector firms. Thus even though rural firms *rate* transport as less problematic for their business than do formal sector firms, they rank it more highly as a concern. The former result is consistent with the model used in the paper: formal sector firms value the losses associated with unreliable transport more highly than do rural firms. However, rural firms *rank* transport more highly, which likely reflects the fact that the transport infrastructure is considerably poorer in rural areas and that among the various business environment constraints, this one is especially burdensome.

The higher ranking of anti-competitive practices and crime, theft and disorder by rural than formal sector firms is based on a very small sample and probably not much can be inferred safely from this.

Levels comparisons between informal and formal sector firms (Manufacturing & India only)

It is important to keep in mind when reviewing these results that they are drawn from a single country (India) and relate only to manufacturing sector firms.

In contrast to the results for the rural firms, informal sector firms report higher constraints in 12 of the 17 cases (Table 18). They report lower constraints in two (electricity and customs) and the same level for corruption.

Informal sector firms report a lower engagement in bribes and spend less management time with officials – as would be expected. However, they report the same number of

inspections as do formal sector firms. They report more frequent power cuts but are no more likely to have a generator than formal sector firms.

Comparison of rankings of constraints by informal and formal sector firms

In terms of rankings (Table 19), we note first that political instability was absent from all of the India surveys. Electricity, corruption and tax administration were the three highest ranked constraints among formal sector firms (“all” and “small”). The ranking of constraints by informal sector firms was quite different. Electricity was in the middle of the ranking – so although informal firms reported more power cuts and there was the same prevalence of generators, their lower ranking of electricity suggests they were typically much less dependent on it in their production process than were formal sector firms.

The top-ranked constraints for informal sector firms were transport, business licensing, inadequately educated labor force and access to land. Access to land is ranked much lower by formal sector firms – as are business licensing and transport, and to a lesser extent access to educated labor. It seems that informal firms answering the question about the obstacles to the growth of their firm are reflecting on the core factors of production that limit them attaining scale and perhaps making it worthwhile attaining “formal” status.

11. Conclusion

We have used firm-level data from surveys of firms in the South Asia Region to assess the constraints presented to firms by shortcomings in the provision of public inputs. As predicted by the modeling framework, better performing firms, and notably those that are job-creators, are more constrained by these shortcomings than are other firms, and are more likely to be engaged in activity to mitigate these shortcomings. We also find that characteristics associated with high productivity, such as export activity and firm size, are also associated with higher reported constraints. We also find significant variation across countries in terms of which firm characteristics are associated with constraints originating with which public inputs,

and in terms of which public input constraints firms rank as most important in their countries.

Table 1: Sample sizes by country and year

Country	1999	2001	2002	2003	2004	2005	2006	2008	Total
Afghanistan						325		640	965
Bangladesh			1,085				1,504		2,589
Bhutan								250	250
India	886	1,825	260		2,286				5,257
Maldives					145				145
Nepal	222							368	590
Pakistan		964				931			1,895
Sri Lanka				425					425
Total	1,108	2,789	1,345	425	2,431	1,256	1,504	1,258	12,116

Table 2: Median employment by country and year

Country	1999	2001	2002	2003	2004	2005	2006	2008	Total
Afghanistan						15		10	11
Bangladesh			153				45		80
Bhutan								15	15
India	40	18	28		17				20
Maldives					28				28
Nepal	82							15	25
Pakistan		26				12			20
Sri Lanka				113					113
Total	48	20	108	113	17	13	45	11	24

Table 3: Means of measures of firm productivity and growth

Country	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Afghanistan	0.23	9.37	3.07	0.79	na	na	10.81	7.4	0.13
Bangladesh	0.41	8.27	2.84	0.32	0.45	5.83	11.97	7.06	0.2
Bhutan	0.64	9.61	na	na	na	na	na	na	0.26
India	0.38	9.45	3.11	0.28	0.53	32.7	13.38	10.72	0.18
Maldives	0.61	9.63	3.56	na	0.44	43.92	11.55	9.33	0.69
Nepal	0.43	8.61	2.76	na	0.21	na	12.47	7.63	0.1
Pakistan	0.37	9.55	3.27	0.47	0.12	35.46	12.65	6.87	0.11
Sri Lanka	0.51	8.78	3.07	0.1	0.21	28.95	11.44	9.05	0.4
Total	0.39	9.16	3.07	0.31	0.44	31.7	12.63	8.92	0.18

Notes: (1) Expanding employment; (2) log VA/L; (3) TFP; (4) R&D; (5) Sales to MNCs; (6) Education of the top manager; (7) education of the workforce; (8) training programme in place; (9) trained workers.

Table 4: Correlations of expanding permanent employment with other indicators of firm productivity and growth

	expand_p	log_lprod	tfp	rd	newPP	sales_MNC	edu_topma	edu_prodW	ftrain	pct_prod_workers_train		
expand_p				Pos	Pos	Pos	Pos	Pos	Pos	Pos	Expanding permanent employment	
N		7,824	6,662	9,117	9,633	2,352	11,007	9,587	11,468	6,885		
log_lprod			Pos	Pos	Pos	Pos	Pos	Pos	Pos	Pos	Log VA/L	
N	7,824		6,463	6,031	6,405	2,112	7,282	6,503	7,415	4,351		
tfp				Pos	Pos	Pos	Pos	Pos	Pos	Pos	TFP	
N	6,662	6,463		5,577	5,547	1,860	6,444	5,730	6,357	4,110		
rd					Pos	Pos	Pos	Pos	Pos	Pos	Firm does R&D	
N	9,117	6,031	5,577		7,959	2,279	8,835	8,228	8,973	6,085		
newPP						Pos	Pos	Pos	Pos	Pos	Introduced new product/process	
N	9,633	6,405	5,547	7,959		2,278	9,164	8,366	9,155	5,926		
sales_MNC							Pos		Pos	Pos	Percent of sales to MNCs	
N	2,352	2,112	1,860	2,279	2,278		2,332	2,177	2,320	367		
edu_topma								Pos	Pos	Pos	Education level of top manager in years	
N	11,007	7,282	6,444	8,835	9,164	2,332		9,070	10,515	6,548		
edu_prodW									Pos	Pos	Average education level of the production workforce in years	
N	9,587	6,503	5,730	8,228	8,366	2,177		9,070		9,554	6,135	
ftrain										Pos	Pos	Training offered
N	11,468	7,415	6,357	8,973	9,155	2,320		10,515	9,554		6,565	
pct_prod_v										Pos	Pos	% of production workers that were trained
N	6,885	4,351	4,110	6,085	5,926	367		6,548	6,135	6,565		

Notes: Partial correlations; country fixed effects are partialled out.

“Pos” and green indicates a positive correlation significant at the 5% level.

Table 5: Correlations of expanding permanent employment with firm characteristics

Characteristic	Country	corr	N	pcorr	N
Size (log average L)	All	0.049**	11,953	0.035**	11,893
New firm	All	-0.056**	12,139	-0.039**	11,893
Services	All	-0.009	12,201	0.045*	11,893
Foreign	All	0.050	12,201	-0.012	11,893
Exporter	All	0.143**	12,201	0.087**	11,893
Importer	All	0.121**	12,201	0.053**	11,893
Small city or rural	All	-0.027**	12,201	-0.003	11,893

corr = Controls are country fixed effects.

pcorr = Controls are country fixed effects plus other firm characteristics

Notes: Green indicates a positive correlation; red a negative correlation.

*=significant at the 5% level; **=significant at the 1% level.

Table 6: Means of firm controls

Country	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Afghanistan	2.59	0.51	0.77	0.05	0.06	0.34	0.06
Bangladesh	4.38	0.13	0.08	0.02	0.34	0.40	0.18
Bhutan	2.85	0.24	0.65	0.06	0.18	0.65	0.71
India	3.38	0.15	0.01	0.02	0.16	0.14	0.31
Maldives	3.39	0.29	0.66	0.00	0.09	0.66	1.00
Nepal	3.35	0.21	0.19	0.05	0.18	0.09	0.52
Pakistan	3.16	0.11	0.05	0.02	0.16	0.13	0.21
Sri Lanka	4.80	0.08	0.00	0.19	0.68	0.42	0.76
Total	3.54	0.17	0.12	0.03	0.21	0.23	0.29

Notes: (1) Log employment; (2) New firm; (3) Services firm; (4) Foreign ownership >10%; (5) Exporting >10% of sales; (6) Direct importer; (7) Small city or rural location.

Table 7: Partial correlations of expanding permanent employment with other indicators of firm productivity and growth

	expand_p	log_lprod	tfp	rd	newPP	sales_MNC	edu_topma	edu_prodV	ftrain	pct_prod_workers_train	
expand_p		Neg		Pos	Pos	Pos	Pos		Pos		Expanding permanent employment
N		7,791	6,625	8,903	9,375	2,290	10,731	9,509	11,299	6,859	
log_lprod	Neg		Pos	Pos	Pos	Pos	Pos	Pos	Pos	Pos	Log VA/L
N	7,791		6,437	6,006	6,373	2,095	7,252	6,476	7,383	4,339	
tfp		Pos		Pos	Pos	Pos	Pos			Pos	TFP
N	6,625	6,437		5,545	5,511	1,835	6,410	5,701	6,321	4,098	
rd	Pos	Pos	Pos		Pos	Pos	Pos		Pos	Pos	Firm does R&D
N	8,903	6,006	5,545		7,751	2,228	8,642	8,171	8,870	6,065	
newPP	Pos	Pos	Pos	Pos		Pos	Pos	Pos	Pos		Introduced new product/process
N	9,375	6,373	5,511	7,751		2,216	8,930	8,291	9,033	5,902	
sales_MNC	Pos	Pos	Pos	Pos	Pos		Pos		Pos	Pos	Percent of sales to MNCs
N	2,290	2,095	1,835	2,228	2,216		2,271	2,140	2,274	362	
edu_topma	Pos	Pos	Pos	Pos	Pos	Pos		Pos	Pos		Education level of top manager in years
N	10,731	7,252	6,410	8,642	8,930	2,271		9,000	10,378	6,527	
edu_prodV		Pos			Pos		Pos		Pos		Average education level of the production workforce in years
N	9,509	6,476	5,701	8,171	8,291	2,140	9,000		9,477	6,114	
ftrain	Pos	Pos		Pos	Pos	Pos	Pos	Pos		Pos	Training offered
N	11,299	7,383	6,321	8,870	9,033	2,274	10,378	9,477		6,540	
pct_prod_v		Pos		Pos			Pos		Pos		% of production workers that were trained
N	6,859	4,339	4,098	6,065	5,902	362	6,527	6,114	6,540		

Notes: Controls are: country fixed effects; log employment (size); new firm; services; foreign; exporter; importer; missing importer indicator; small city. “Pos” and green indicates a positive correlation significant at the 5% level. “Neg” and red indicates a negative correlation significant at the 5% level.

Table 8: Means of evaluations of external constraints

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Afghanistan	2.69	1.58	1.41	1.37	1.43	2.12	1.32	1.17	2.95	2.25	1.09	1.98	0.38	0.99	na	na	0.24
Bangladesh	2.93	1.37	1.26	1.56	1.33	1.96	1.99	1.32	2.80	2.46	1.21	1.91	0.83	1.52	1.84	1.83	0.22
Bhutan	0.84	0.53	1.30	1.09	0.58	0.86	1.29	1.20	0.20	0.74	0.50	1.67	1.31	1.35	na	na	0.36
India	1.75	0.52	0.85	1.01	0.87	0.71	1.55	0.89	na	1.70	0.44	1.16	1.13	1.02	1.03	0.92	0.21
Maldives	1.13	0.81	1.25	1.12	1.07	2.27	0.59	0.47	na	1.87	1.69	2.59	1.23	1.93	1.52	0.87	0.01
Nepal	2.74	0.57	1.58	0.98	0.97	0.29	0.90	0.33	3.41	1.32	0.11	1.11	1.02	0.54	na	na	0.21
Pakistan	2.33	0.75	0.94	1.02	1.28	1.45	1.84	1.05	2.15	2.21	2.00	1.64	0.88	0.95	1.96	2.12	0.45
Sri Lanka	2.04	0.95	1.16	0.88	1.07	0.50	0.80	0.50	na	1.04	na	1.14	1.37	1.32	1.66	1.60	0.35
Total	2.24	0.80	1.08	1.17	1.10	1.23	1.61	1.00	2.55	1.95	0.91	1.51	0.97	1.13	1.43	1.44	0.26

Notes: (1) Electricity; (2) Telecoms; (3) Transport; (4) Customs; (5) Competition; (6) Access to land; (7) Tax admin.; (8) Bus. licensing; (9) Political instability; (10) Corruption; (11) Courts; (12) Access to financing; (13) Labour regulations; (14) Inadequately trained labour; (15) Government policy uncertainty; (16) Macro instability; (17) Insufficient water supply.

Table 9: Means of measures of mitigation, public input services, and the shared business environment

Country	(1)	(2)	(3)	(4)	(5)	(6)
Afghanistan	0.49	12.25	0.75	n.a.	11.88	1.00
Bangladesh	0.86	4.01	0.62	16.59	8.72	0.96
Bhutan	0.05	17.17	0.23	n.a.	2.10	0.24
India	0.45	6.48	0.59	8.91	8.44	0.69
Maldives	0.38	6.33	0.41	2.98	4.67	0.04
Nepal	0.08	8.50	0.48	n.a.	10.08	0.99
Pakistan	0.46	2.62	0.36	9.52	10.01	0.56
Sri Lanka	0.16	3.84	0.75	16.16	7.80	n.a.
Total	0.51	5.97	0.56	11.27	8.59	0.75

Notes: (1) Bribes; (2) Management time; (3) Firm owns a generator; (4) Number of inspections; (5) Days delayed in customs; (6) Power cuts more than once per month.

Table 10: Public input constraints and firm productivity/growth

	Expand L	N	Log VA/L	N	TFP level	N	R&D (1/0)	N	Innovate	N	Sales to MNCs	N	Man. educ (years)	N	L educ (years)	N
Electricity	0.081**	10,913	0.011	6,921	-0.003	5,825	-0.052	7,951	0.004	8,397	0.001	2,285	0.005	9,809	-0.014**	8,893
Telecoms	0.060**	9,192	0.020*	5,364	0.040*	4,328	0.022	6,746	0.044	6,945	0.000	2,266	0.015**	8,348	0.010*	7,535
Transport	0.140**	10,809	0.017	6,885	0.008	5,807	-0.061*	7,921	0.104**	8,343	-0.002**	2,284	-0.002	9,712	0.011**	8,852
Customs	0.112**	9,916	0.045**	6,408	0.001	5,453	0.107**	7,643	0.116**	7,652	-0.001	2,239	0.025**	8,932	0.026**	8,344
Competit	0.040	10,398	0.029*	6,493	0.045	5,452	0.087*	7,706	0.232**	7,901	-0.001	2,274	0.010*	9,351	0.021**	8,613
AccessLand	0.049*	10,590	-0.002	6,832	-0.021	5,777	0.212**	7,699	0.032	8,101	-0.002**	2,282	-0.016**	9,530	-0.005	8,611
TaxRates	0.114**	10,556	0.050**	6,649	0.055*	5,600	0.158**	7,893	-0.001	8,078	0.000	2,263	0.025**	9,510	-0.006	8,792
TaxAdministration	0.170**	10,530	0.048**	6,643	0.062*	5,594	0.164**	7,891	0.020	8,057	0.000	2,261	0.038**	9,487	-0.009*	8,772
BusLicensing	0.078**	10,437	0.022*	6,650	0.001	5,729	0.103**	7,660	0.039	7,973	0.000	2,197	0.013**	9,381	0.006	8,481
PoliticalInstability	0.040	3,607	0.030	2,650	0.001	1,958	0.107	1,388	0.052	2,378	n.a.	-	0.012	2,839	-0.002	2,324
Corruption	0.216**	10,588	0.023	6,677	0.061*	5,615	0.183**	7,920	0.070*	8,143	-0.001	2,272	0.035**	9,537	-0.012*	8,835
Courts	0.098**	5,747	0.012	4,469	0.047	3,582	0.108*	3,479	0.019	4,418	0.001*	1,975	0.028**	4,921	0.016*	4,170
AccessFinancing	0.012	10,783	-0.029**	6,831	-0.063**	5,779	0.132**	7,939	0.020	8,300	-0.002**	2,278	-0.005	9,707	-0.002	8,810
LaborReg	0.054*	10,321	0.017	6,666	-0.012	5,617	0.066*	7,687	0.063*	7,877	-0.001	2,269	0.018**	9,307	0.000	8,590
InadEduLabor	0.131**	10,815	0.014	6,873	-0.003	5,804	0.081**	7,923	0.109**	8,324	0.002*	2,286	0.022**	9,734	0.001	8,827
GovPolicyUnc	0.114**	8,149	0.034**	5,492	0.016	5,084	0.194**	7,642	0.199**	7,186	0.000	2,255	0.020**	7,954	0.006	7,648
MacroInstability	0.109**	8,847	0.018	6,010	-0.011	5,303	0.192**	7,529	0.147**	7,885	0.000	2,245	0.019**	8,514	0.002	8,391
bribe	0.035**	9,711	0.014**	5,958	0.027**	5,051	0.059**	7,562	0.066**	7,403	0.000	2,233	0.010**	8,739	0.001	8,144
mng_time	-0.252	11,534	0.019	7,528	-0.102	6,408	0.772**	8,830	-1.363**	9,074	0.014*	2,251	0.130**	10,437	-0.064*	9,442
generator	0.020*	10,779	0.044**	7,341	0.036**	6,280	0.076**	8,645	0.091**	8,980	0.002**	2,234	0.019**	9,864	0.010**	9,422
insufficient_water	0.035**	9,518	0.012**	6,769	0.018*	5,859	0.015	7,445	0.070**	7,878	0.000**	1,867	0.003	8,838	0.010**	8,216
num_insp	2.078**	7,995	0.392*	5,752	0.016	5,390	2.651**	7,581	-0.642	7,047	-0.008	1,835	0.216**	7,841	0.043	7,324
days_customs	-0.495	2,926	-0.529*	1,948	-0.264	1,798	-0.798	2,657	-0.845	2,559	-0.007	381	-0.319*	2,757	0.053	2,728
m_power_out	0.052**	9,797	-0.001	6,434	0.000	5,369	-0.035**	7,397	0.049**	7,868	0.000	1,979	0.000	8,798	-0.010**	8,350

Notes: Controls are: country fixed effects; log employment (size); new firm; services; foreign; exporter; importer; missing importer indicator; small city.

“Pos” and green indicates a positive coefficient; “Neg” and red indicates a negative coefficient.

*=significant at the 5% level; **=significant at the 1% level. Standard errors are robust to heteroskedasticity.

Table 11: Public input constraints, firm growth and firm characteristics

Country	Indicator	Size (log L)	New firm	Expanding L	Services	Foreign	Exporter	Importer	Missing importer	Small city	Obs
All	Electricity	-0.053**	0.004	0.081**	-0.164**	-0.089	0.079*	0.023	0.261**	0.043	10,913
All	Telecoms	0.041**	0.092**	0.060**	0.142**	-0.094	-0.055	0.146**	0.002	-0.014	9,192
All	Transport	0.018	0.070*	0.140**	-0.057	0.052	-0.030	0.270**	-0.072	-0.101**	10,809
All	Customs	0.101**	0.077*	0.112**	-0.016	0.028	0.025	0.294**	-0.265**	-0.217**	9,916
All	Competit	0.017	0.063	0.040	-0.111*	0.047	-0.172**	0.126**	-0.013	-0.115**	10,398
All	AccessLand	-0.045**	0.080*	0.049*	0.062	0.000	0.072*	0.041	0.186**	-0.048	10,590
All	TaxRates	0.058**	-0.094**	0.114**	-0.061	-0.184*	-0.079*	0.066	-0.079	-0.190**	10,556
All	TaxAdministration	0.082**	-0.059	0.170**	0.003	-0.143	-0.051	0.058	-0.322**	-0.178**	10,530
All	BusLicensing	0.024*	-0.031	0.078**	0.052	0.023	0.095**	0.099**	0.110*	-0.104**	10,437
All	PoliticalInstability	0.011	-0.008	0.040	0.120*	0.221*	0.323**	0.067	0.028	-0.226**	3,607
All	Corruption	0.038**	-0.088*	0.216**	-0.032	-0.050	0.038	0.163**	0.202**	-0.154**	10,588
All	Courts	0.049**	-0.032	0.098**	0.129*	0.116	0.174**	0.031	-0.061	-0.121**	5,747
All	AccessFinancing	0.000	0.081*	0.012	-0.317**	-0.308**	-0.111**	0.016	-0.257**	-0.145**	10,783
All	LaborReg	0.084**	-0.032	0.054*	-0.094*	-0.123	0.083**	0.023	-0.263**	-0.130**	10,321
All	InadEducLabor	0.045**	0.016	0.131**	0.085	-0.107	-0.010	0.029	-0.153**	-0.062*	10,815
All	GovPolicyUnc	0.051**	-0.079	0.114**	-0.020	0.181	-0.047	0.145**	0.272**	-0.189**	8,149
All	MacrolnInstability	0.050**	-0.046	0.109**	-0.013	0.083	0.086*	0.204**	0.405**	-0.110**	8,847
All	bribe	0.010*	-0.001	0.035**	-0.018	-0.056*	0.029*	0.040**	-0.157**	-0.008	9,711
All	mng_time	0.327**	0.446	-0.252	0.518	-0.176	1.221**	0.070	-1.034**	-0.248	11,534
All	generator	0.131**	-0.012	0.020*	0.114**	-0.039	0.111**	0.071**	0.010	0.093**	10,779
All	insufficient_water	0.011**	0.015	0.035**	0.085**	0.002	-0.008	0.038**	-0.180**	-0.036**	9,518
All	num_insp	2.568**	0.099	2.078**	2.322	1.496	1.977	2.848**	2.193	1.438	7,995
All	days_customs	0.593**	-0.492	-0.495	0.406	-2.921**	2.261**	-1.465*	-1.614	1.416*	2,926
All	m_power_out	-0.031**	0.000	0.052**	-0.045**	-0.045	0.015	0.027*	0.282**	0.076**	9,797

Notes: “Pos” and green indicates a positive coefficient; “Neg” and red indicates a negative coefficient.
 *=significant at the 5% level; **=significant at the 1% level. Standard errors are robust to heteroskedasticity.

Table 12: Country-specific correlations of expanding permanent employment with firm characteristics

Characteristic	Country	corr	Diff?	N	pcorr	Diff?	N
Size (log average L)	All	0.049**	n.a.	11,953	0.035**	n.a.	11,893
New firm	All	-0.056**	n.a.	12,139	-0.039**	n.a.	11,893
Services	All	-0.009	n.a.	12,201	0.045*	n.a.	11,893
Foreign	All	0.050	n.a.	12,201	-0.012	n.a.	11,893
Exporter	All	0.143**	n.a.	12,201	0.087**	n.a.	11,893
Importer	All	0.121**	n.a.	12,201	0.053**	n.a.	11,893
Small city or rural	All	-0.027**	n.a.	12,201	-0.003	n.a.	11,893
Size (log average L)	Afghanistan	-0.005	Smaller	941	0.006	Smaller	938
New firm	Afghanistan	-0.187**	Smaller	982	-0.184**	Smaller	938
Services	Afghanistan	0.074*	Greater	985	0.108**	Greater	938
Foreign	Afghanistan	-0.067	Smaller	985	-0.031	n.a.	938
Exporter	Afghanistan	-0.062	Smaller	985	-0.104	Smaller	938
Importer	Afghanistan	-0.052	Smaller	985	-0.037	Smaller	938
Small city or rural	Afghanistan	0.234**	Greater	985	0.214**	Greater	938
Size (log average L)	Bangladesh	0.079**	Greater	2,589	0.045**	n.a.	2,581
New firm	Bangladesh	-0.086**	n.a.	2,598	-0.079**	n.a.	2,581
Services	Bangladesh	-0.246**	Smaller	2,606	-0.045	Smaller	2,581
Foreign	Bangladesh	0.237**	Greater	2,606	0.105	Greater	2,581
Exporter	Bangladesh	0.188**	Greater	2,606	0.047	n.a.	2,581
Importer	Bangladesh	0.204**	Greater	2,606	0.054*	n.a.	2,581
Small city or rural	Bangladesh	-0.250**	Smaller	2,606	-0.125**	Smaller	2,581
Size (log average L)	Bhutan	0.027	n.a.	250	0.015	n.a.	250
New firm	Bhutan	-0.004	n.a.	250	0.031	n.a.	250
Services	Bhutan	0.192**	Greater	250	0.169**	n.a.	250
Foreign	Bhutan	-0.038	n.a.	250	-0.066	n.a.	250
Exporter	Bhutan	-0.125	Smaller	250	-0.028	n.a.	250
Importer	Bhutan	0.140*	n.a.	250	0.114	n.a.	250
Small city or rural	Bhutan	-0.180**	Smaller	250	-0.140*	Smaller	250
Size (log average L)	India	0.038**	Smaller	5,122	0.028**	n.a.	5,089
New firm	India	-0.017	Greater	5,234	0.003	Greater	5,089
Services	India	-0.003	n.a.	5,269	-0.048	n.a.	5,089
Foreign	India	-0.031	Smaller	5,269	-0.116*	Smaller	5,089
Exporter	India	0.196**	Greater	5,269	0.154**	Greater	5,089
Importer	India	0.110**	n.a.	5,269	0.043	n.a.	5,089
Small city or rural	India	0.078**	Greater	5,269	0.090**	Greater	5,089
Size (log average L)	Maldives	0.029	n.a.	145	0.033	n.a.	145
New firm	Maldives	0.150	Greater	148	0.172*	Greater	145
Services	Maldives	-0.079	n.a.	148	-0.131	Smaller	145
Foreign	Maldives	0.000	n.a.	148	0.000	n.a.	145
Exporter	Maldives	0.001	n.a.	148	-0.155	n.a.	145
Importer	Maldives	0.071	n.a.	148	0.000	n.a.	145
Small city or rural	Maldives	0.000	n.a.	148	0.000	n.a.	145
Size (log average L)	Nepal	0.036*	n.a.	590	0.045**	n.a.	587
New firm	Nepal	-0.049	n.a.	588	-0.032	n.a.	587
Services	Nepal	0.025	n.a.	591	0.093	n.a.	587
Foreign	Nepal	0.199*	n.a.	591	0.172	Greater	587
Exporter	Nepal	-0.002	Smaller	591	-0.028	Smaller	587
Importer	Nepal	-0.047	Smaller	591	-0.022	n.a.	587
Small city or rural	Nepal	-0.033	n.a.	591	-0.031	n.a.	587
Size (log average L)	Pakistan	0.052**	n.a.	1,891	0.032**	n.a.	1,881
New firm	Pakistan	-0.039	n.a.	1,890	-0.050	n.a.	1,881
Services	Pakistan	0.170**	Greater	1,900	0.212**	Greater	1,881
Foreign	Pakistan	0.185*	n.a.	1,900	0.067	n.a.	1,881
Exporter	Pakistan	0.058	Smaller	1,900	0.043	n.a.	1,881
Importer	Pakistan	0.133**	n.a.	1,900	0.049	n.a.	1,881
Small city or rural	Pakistan	-0.118**	Smaller	1,900	-0.112**	Smaller	1,881
Size (log average L)	Sri Lanka	0.041**	n.a.	425	0.032	n.a.	422
New firm	Sri Lanka	0.026	n.a.	449	0.027	n.a.	422
Services	Sri Lanka	0.000	n.a.	452	0.000	n.a.	422
Foreign	Sri Lanka	-0.038	n.a.	452	-0.112	n.a.	422
Exporter	Sri Lanka	0.080	n.a.	452	0.018	n.a.	422
Importer	Sri Lanka	0.118*	n.a.	452	0.108	n.a.	422
Small city or rural	Sri Lanka	-0.134*	Smaller	452	-0.073	n.a.	422

Notes: corr=Controls are country fixed effects (“All” only).
pcorr=Controls are country fixed effects (“All” only) plus other firm characteristics.
Green indicates a positive correlation; red a negative correlation.
*=significant at the 5% level; **=significant at the 1% level.

Table 13: Country-specific public input constraints, firm growth and firm characteristics

Notes: “Pos” and green indicates a positive coefficient; “Neg” and red indicates a negative coefficient.
 *=significant at the 5% level; **=significant at the 1% level. Standard errors are robust to heteroskedasticity.

Country	Indicator	Size (log L)	Different?	New firm	Different?	Expanding L	Different?	Services	Different?	Foreign	Different?	Exporter	Different?	Importer	Different?
All	Electricity	-0.053**	n.a.	0.004	n.a.	0.081**	n.a.	-0.164**	n.a.	-0.089	n.a.	0.079*	n.a.	0.023	n.a.
All	Telecoms	0.041**	n.a.	0.092**	n.a.	0.060**	n.a.	0.142**	n.a.	-0.094	n.a.	-0.055	n.a.	0.146**	n.a.
All	Transport	0.018	n.a.	0.070*	n.a.	0.140**	n.a.	-0.057	n.a.	0.052	n.a.	-0.030	n.a.	0.270**	n.a.
All	Customs	0.101**	n.a.	0.077*	n.a.	0.112**	n.a.	-0.016	n.a.	0.028	n.a.	0.025	n.a.	0.294**	n.a.
All	Competit	0.017	n.a.	0.063	n.a.	0.040	n.a.	-0.111*	n.a.	0.047	n.a.	-0.172**	n.a.	0.126**	n.a.
All	AccessLand	-0.045**	n.a.	0.080*	n.a.	0.049*	n.a.	0.062	n.a.	0.000	n.a.	0.072*	n.a.	0.041	n.a.
All	TaxRates	0.058**	n.a.	-0.094**	n.a.	0.114**	n.a.	-0.061	n.a.	-0.184*	n.a.	-0.079*	n.a.	0.066	n.a.
All	TaxAdministration	0.082**	n.a.	-0.059	n.a.	0.170**	n.a.	0.003	n.a.	-0.143	n.a.	-0.051	n.a.	0.058	n.a.
All	BusLicensing	0.024*	n.a.	-0.031	n.a.	0.078**	n.a.	0.052	n.a.	0.023	n.a.	0.095**	n.a.	0.099**	n.a.
All	PoliticalInstability	0.011	n.a.	-0.008	n.a.	0.040	n.a.	0.120*	n.a.	0.221*	n.a.	0.323**	n.a.	0.067	n.a.
All	Corruption	0.038**	n.a.	-0.088*	n.a.	0.216**	n.a.	-0.032	n.a.	-0.050	n.a.	0.038	n.a.	0.163**	n.a.
All	Courts	0.049**	n.a.	-0.032	n.a.	0.098**	n.a.	0.129*	n.a.	0.116	n.a.	0.174**	n.a.	0.031	n.a.
All	AccessFinancing	0.000	n.a.	0.081*	n.a.	0.012	n.a.	-0.317**	n.a.	-0.308**	n.a.	-0.111**	n.a.	0.016	n.a.
All	LaborReg	0.084**	n.a.	-0.032	n.a.	0.054*	n.a.	-0.094*	n.a.	-0.123	n.a.	0.083**	n.a.	0.023	n.a.
All	InadEduLabor	0.045**	n.a.	0.016	n.a.	0.131**	n.a.	0.085	n.a.	-0.107	n.a.	-0.010	n.a.	0.029	n.a.
All	GovPolicyUnc	0.051**	n.a.	-0.079	n.a.	0.114**	n.a.	-0.020	n.a.	0.181	n.a.	-0.047	n.a.	0.145**	n.a.
All	MacroInstability	0.050**	n.a.	-0.046	n.a.	0.109**	n.a.	-0.013	n.a.	0.083	n.a.	0.086*	n.a.	0.204**	n.a.
All	bribe	0.010*	n.a.	-0.001	n.a.	0.035**	n.a.	-0.018	n.a.	-0.056*	n.a.	0.029*	n.a.	0.040**	n.a.
All	mng_time	0.327**	n.a.	0.446	n.a.	-0.252	n.a.	0.518	n.a.	-0.176	n.a.	1.221**	n.a.	0.070	n.a.
All	generator	0.131**	n.a.	-0.012	n.a.	0.020*	n.a.	0.114**	n.a.	-0.039	n.a.	0.111**	n.a.	0.071**	n.a.
All	insufficient_water	0.011**	n.a.	0.015	n.a.	0.035**	n.a.	0.085**	n.a.	0.002	n.a.	-0.008	n.a.	0.038**	n.a.
All	num_insp	2.568**	n.a.	0.099	n.a.	2.078**	n.a.	2.322	n.a.	1.496	n.a.	1.977	n.a.	2.848**	n.a.
All	days_customs	0.593**	n.a.	-0.492	n.a.	-0.495	n.a.	0.406	n.a.	-2.921**	n.a.	2.261**	n.a.	-1.465*	n.a.
All	m_power_out	-0.031**	n.a.	0.000	n.a.	0.052**	n.a.	-0.045**	n.a.	-0.045	n.a.	0.015	n.a.	0.027*	n.a.

Table 13 (continued): Country-specific public input constraints, firm growth and firm characteristics

Country	Indicator	Size (log L)	Different?	New firm	Different?	Expanding L	Different?	Services	Different?	Foreign	Different?	Exporter	Different?	Importer	Different?
Afghanistan	Electricity	0.023		-0.105		-0.231*	Smaller	-0.358**	Smaller	0.386	Greater	-0.206		0.134	
Afghanistan	Telecoms	0.015		0.138		-0.160	Smaller	0.147		-0.246		0.452*	Greater	0.252*	
Afghanistan	Transport	0.088		-0.059		0.209		0.166	Greater	-0.129		0.414*	Greater	0.320**	
Afghanistan	Customs	0.146**		0.067		-0.163	Smaller	-0.131		0.105		0.371*		0.822**	Greater
Afghanistan	Competit	0.124*	Greater	0.234*		-0.203	Smaller	-0.164		-0.302		0.332	Greater	0.128	
Afghanistan	AccessLand	0.051	Greater	0.191		-0.049		-0.005		-0.012		0.227		-0.137	
Afghanistan	TaxRates	0.056		0.035		-0.130	Smaller	-0.014		-0.591**	Smaller	-0.079		0.380**	Greater
Afghanistan	TaxAdministration	0.074		0.224*	Greater	-0.018	Smaller	0.069		-0.383		0.094		0.231*	Greater
Afghanistan	BusLicensing	-0.118**	Smaller	-0.051		0.173		0.234*	Greater	-0.277		0.160		0.360**	Greater
Afghanistan	PoliticalInstability	0.158**	Greater	-0.030		-0.209*	Smaller	0.068		0.381		0.146		0.124	
Afghanistan	Corruption	0.048		-0.025		-0.023	Smaller	-0.060		-0.661**	Smaller	0.361*		0.402**	Greater
Afghanistan	Courts	0.040		-0.064		0.204		-0.080	Smaller	-0.177		0.152		0.128	
Afghanistan	AccessFinancing	0.022		0.130		-0.177		-0.225		-0.635**		0.173		0.128	
Afghanistan	LaborReg	0.030	Smaller	0.020		0.078		0.001		0.056		0.072		0.105	
Afghanistan	InadEduclabor	-0.058	Smaller	0.007		-0.025		0.243*		0.274		0.031		-0.106	
Afghanistan	GovPolicyUnc	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Afghanistan	Macrolnstability	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Afghanistan	bribe	0.050**	Greater	0.045		-0.189**	Smaller	-0.011		-0.098		0.101		0.274**	Greater
Afghanistan	mng_time	2.341**	Greater	3.420**	Greater	-3.444**	Smaller	3.806*	Greater	0.692		3.378		0.356	
Afghanistan	generator	0.025	Smaller	-0.027		0.005		-0.134**	Smaller	0.080		-0.092	Smaller	0.003	
Afghanistan	insufficient_water	-0.022		-0.037		-0.076		0.183**	Greater	0.072		0.068		0.068	
Afghanistan	num_insp	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Afghanistan	days_customs	4.173*		-6.235*	Smaller	-1.905		3.943		-18.180*	Smaller	-1.817		3.969	
Afghanistan	m_power_out	-0.004	Greater	0.006		0.005	Smaller	-0.006	Greater	0.003		0.002		0.005	

Table 13 (continued): Country-specific public input constraints, firm growth and firm characteristics

Country	Indicator	Size (log L)	Different?	New firm	Different?	Expanding L	Different?	Services	Different?	Foreign	Different?	Exporter	Different?	Importer	Different?
Bangladesh	Electricity	-0.064**		-0.062		0.018		0.005		-0.029		0.059		-0.056	
Bangladesh	Telecoms	0.086**		0.142		0.017		-0.294*	Smaller	0.149		-0.219*	Smaller	0.074	
Bangladesh	Transport	0.021		0.118		0.057		-0.404**	Smaller	0.031		-0.097		0.240**	
Bangladesh	Customs	0.117**		0.127		0.050		-0.264**	Smaller	-0.485**	Smaller	-0.298**	Smaller	0.376**	
Bangladesh	Competit	-0.037	Smaller	0.097		-0.128*	Smaller	-0.275**	Smaller	-0.183		-0.395**	Smaller	0.133	
Bangladesh	AccessLand	-0.054*		0.118		-0.011		0.474**	Greater	0.203		0.079		-0.076	Smaller
Bangladesh	TaxRates	0.088**		-0.205**		-0.083	Smaller	0.098		0.034		-0.245**	Smaller	0.067	
Bangladesh	TaxAdministration	0.128**	Greater	-0.142		0.041	Smaller	0.191		-0.198		-0.234**	Smaller	0.158*	Greater
Bangladesh	BusLicensing	0.009		0.084	Greater	-0.001	Smaller	0.110		-0.011		0.156**		-0.015	Smaller
Bangladesh	PoliticalInstability	-0.042	Smaller	-0.125		-0.024		0.164		0.430**		0.188**	Smaller	0.164*	
Bangladesh	Corruption	0.066**		-0.190*		0.100	Smaller	-0.102		0.285	Greater	-0.040		0.101	
Bangladesh	Courts	0.020		-0.112		0.080		0.333**	Greater	0.473*		0.187*		-0.042	
Bangladesh	AccessFinancing	-0.071**	Smaller	0.143*		-0.112*	Smaller	-0.450**	Smaller	-0.542**		-0.192**		0.056	
Bangladesh	LaborReg	0.019	Smaller	0.042		-0.172**	Smaller	-0.218**	Smaller	-0.185		0.178**		0.099	
Bangladesh	InadEduclabor	0.003	Smaller	0.135*	Greater	0.143**		-0.150	Smaller	0.174		0.073	Greater	0.016	
Bangladesh	GovPolicyUnc	0.035		-0.142		0.045		0.118		0.238		-0.107		0.135*	
Bangladesh	Macrolnstability	0.083**		-0.197*	Smaller	0.075		0.123		0.173		-0.164**	Smaller	0.133*	
Bangladesh	bribe	0.046**	Greater	-0.070**	Smaller	-0.007	Smaller	0.045	Greater	-0.080		-0.029	Smaller	-0.002	Smaller
Bangladesh	mng_time	0.235**		-0.217		0.837**	Greater	-1.301**	Smaller	-0.184		0.468	Smaller	1.042**	Greater
Bangladesh	generator	0.173**	Greater	-0.019		0.007		n.a.	n.a.	-0.110*		0.026	Smaller	0.029	
Bangladesh	insufficient_water	-0.006	Smaller	0.000		0.015		-0.086**	Smaller	0.006		0.065**	Greater	0.042	
Bangladesh	num_insp	1.836**		-2.416		3.243**		1.056		10.461		1.672		5.527**	
Bangladesh	days_customs	0.544		1.595	Greater	-2.623**	Smaller	10.019**	Greater	-0.676		0.488	Smaller	-0.874	
Bangladesh	m_power_out	-0.012**	Greater	-0.035*	Smaller	0.023**	Smaller	0.004	Greater	-0.015		-0.031**	Smaller	-0.036**	Smaller

Table 13 (continued): Country-specific public input constraints, firm growth and firm characteristics

Country	Indicator	Size (log L)	Different?	New firm	Different?	Expanding L	Different?	Services	Different?	Foreign	Different?	Exporter	Different?	Importer	Different?
Bhutan	Electricity	0.117*	Greater	0.042		0.204		-0.062		-0.426**	Smaller	-0.189		0.006	
Bhutan	Telecoms	0.131*		0.226		0.077		0.026		-0.200		-0.023		-0.041	
Bhutan	Transport	0.263**	Greater	0.299		0.167		-0.312		-0.121		-0.089		-0.277	Smaller
Bhutan	Customs	0.135*		0.384**	Greater	0.081		0.060		-0.006		-0.073		-0.045	
Bhutan	Competit	-0.034		0.051		0.070		-0.307		-0.075		-0.221		0.038	
Bhutan	AccessLand	0.095		0.048		0.237		0.258		-0.388		-0.141		0.416*	Greater
Bhutan	TaxRates	-0.073		-0.105		0.052		-0.084		-0.419		-0.156		0.399*	Greater
Bhutan	TaxAdministration	0.049		0.018		0.159		-0.147		-0.901**	Smaller	-0.620**	Smaller	0.110	
Bhutan	BusLicensing	0.089		0.125		0.117		-0.078		1.635**	Greater	-0.032		-0.182	
Bhutan	PoliticalInstability	0.014		0.103		0.032		-0.068		0.099		-0.061	Smaller	-0.176	Smaller
Bhutan	Corruption	0.042		0.167		0.088		-0.230		-0.433**	Smaller	-0.423*	Smaller	0.022	
Bhutan	Courts	-0.041		0.055		-0.142	Smaller	-0.096		-0.458**	Smaller	0.007		0.204	
Bhutan	AccessFinancing	-0.060		0.160		-0.047		-0.089		0.374		-0.118		-0.188	
Bhutan	LaborReg	0.047		-0.122		0.140		-0.289		-0.807**	Smaller	-0.254		0.250	
Bhutan	InadEduclabor	0.269**	Greater	-0.091		0.162		-0.256		-0.627**	Smaller	-0.240		0.245	
Bhutan	GovPolicyUnc	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Bhutan	MacrolnInstability	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Bhutan	bribe	-0.010		0.031		-0.014		0.036		-0.068**		-0.003		0.022	
Bhutan	mng_time	2.459		-1.885		-1.504		0.724		-10.584**	Smaller	-2.766		-0.885	
Bhutan	generator	0.112**		-0.002		-0.004		0.067		0.064		0.038		-0.038	
Bhutan	insufficient_water	0.044		0.109		-0.007		0.120		-0.018		-0.133		-0.190*	Smaller
Bhutan	num_insp	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Bhutan	days_customs	0.626		-1.326*		0.294		0.161		n.a.	n.a.	0.491		-3.236	
Bhutan	m_power_out	0.062*	Greater	0.126		0.032		-0.079		-0.055		-0.271**	Smaller	0.009	

Table 13 (continued): Country-specific public input constraints, firm growth and firm characteristics

Country	Indicator	Size (log L)	Different?	New firm	Different?	Expanding L	Different?	Services	Different?	Foreign	Different?	Exporter	Different?	Importer	Different?
India	Electricity	-0.079**		0.099	Greater	0.165**	Greater	0.415*	Greater	-0.438**	Smaller	0.253**	Greater	-0.185**	Smaller
India	Telecoms	-0.008	Smaller	0.023		0.069*		0.118		0.037		-0.075*		0.187**	
India	Transport	0.011		0.056		0.169**		0.186		0.096		0.014		0.125*	Smaller
India	Customs	0.066**	Smaller	0.044		0.168**	Greater	0.065		0.128		0.286**	Greater	0.102	Smaller
India	Competit	0.003		-0.021		0.040		0.394		0.305		-0.009	Greater	0.278**	Greater
India	AccessLand	-0.061**		0.057		0.020		-0.128		0.079		0.068		0.139**	Greater
India	TaxRates	0.007	Smaller	-0.067		0.219**	Greater	-0.098		-0.080		0.170**	Greater	-0.070	Smaller
India	TaxAdministration	0.015	Smaller	-0.092		0.279**	Greater	0.087		-0.140		0.182**	Greater	-0.074	Smaller
India	BusLicensing	0.045**	Greater	0.005		0.076*		0.156		-0.019		0.121*		0.190**	
India	PoliticalInstability	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
India	Corruption	0.007	Smaller	-0.089		0.271**	Greater	0.375		0.024		0.214**	Greater	0.075	
India	Courts	0.075**		-0.107*		0.081		n.a.	n.a.	0.418*		0.130*		0.035	
India	AccessFinancing	0.006		0.028		0.040		0.262	Greater	-0.168		-0.053		0.092	Greater
India	LaborReg	0.064**		-0.016		0.150**	Greater	0.224		-0.058		0.185**	Greater	-0.001	
India	InadEduclabor	0.032*		0.021		0.106**		0.572**	Greater	-0.185		-0.066		-0.007	
India	GovPolicyUnc	0.039*		-0.060		0.103*		0.068		0.325*		0.105	Greater	0.173**	
India	MacroInstability	0.032*		0.098	Greater	0.054		0.292		0.097		0.268**	Greater	0.298**	Greater
India	bribe	-0.017**	Smaller	-0.018		0.080**	Greater	-0.348**	Smaller	-0.054		0.111**	Greater	0.037	
India	mng_time	-0.071	Smaller	-0.172		-0.036		-3.966**	Smaller	0.545		2.671**	Greater	-1.728**	Smaller
India	generator	0.108**	Smaller	-0.019		-0.001		0.272**	Greater	0.012		0.147**	Greater	0.108**	Greater
India	insufficient_water	-0.002	Smaller	-0.017	Smaller	0.018		0.069		-0.066		-0.058**	Smaller	0.105**	Greater
India	num_insp	2.274**		0.721		2.466*		-0.827		-0.735		3.294*		3.887*	
India	days_customs	0.054	Smaller	-1.230		0.771	Greater	-6.322**	Smaller	-1.395		5.544**	Greater	-0.711	Greater
India	m_power_out	-0.051**	Smaller	0.044*	Greater	0.088**	Greater	0.126**	Greater	-0.152*	Smaller	0.094**	Greater	-0.018	Smaller

Table 13 (continued): Country-specific public input constraints, firm growth and firm characteristics

Country	Indicator	Size (log L)	Different?	New firm	Different?	Expanding L	Different?	Services	Different?	Foreign	Different?	Exporter	Different?	Importer	Different?
Maldives	Electricity	-0.265**	Smaller	-0.251		0.117		0.112		n.a.	n.a.	-0.060		n.a.	n.a.
Maldives	Telecoms	-0.114	Smaller	-0.073		0.058		0.536**		n.a.	n.a.	-0.026		-0.146	
Maldives	Transport	-0.052		0.215		0.151		0.128		n.a.	n.a.	-0.516		0.070	
Maldives	Customs	-0.110	Smaller	-0.190		-0.034		0.776**	Greater	n.a.	n.a.	-0.031		-0.114	
Maldives	Competit	0.012		0.150		-0.061		0.281		n.a.	n.a.	0.177		0.244	
Maldives	AccessLand	-0.148		0.019		0.139		-0.117		n.a.	n.a.	0.098		n.a.	n.a.
Maldives	TaxRates	-0.045		-0.403		0.418		-0.161		n.a.	n.a.	1.059		-0.162	
Maldives	TaxAdministration	-0.064	Smaller	-0.176		0.116		0.238		n.a.	n.a.	0.388		-0.691**	Smaller
Maldives	BusLicensing	-0.059		-0.176		0.221		0.283		n.a.	n.a.	0.129		n.a.	n.a.
Maldives	PoliticalInstability	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Maldives	Corruption	-0.140		0.298		0.518		-0.103		n.a.	n.a.	-0.523		n.a.	n.a.
Maldives	Courts	0.050		0.436		0.396		-0.148		n.a.	n.a.	-0.359		n.a.	n.a.
Maldives	AccessFinancing	0.023		0.130		0.291		-0.037		n.a.	n.a.	0.078		-0.141	
Maldives	LaborReg	0.126		-0.161		-0.143		0.288		n.a.	n.a.	0.671		n.a.	n.a.
Maldives	InadEduclabor	0.057		0.027		0.185		-0.023		n.a.	n.a.	-0.881		0.587*	Greater
Maldives	GovPolicyUnc	-0.056		0.381		-0.342		0.584*	Greater	n.a.	n.a.	0.785		0.072	
Maldives	MacroInstability	-0.084		0.098		0.024		0.559*	Greater	n.a.	n.a.	0.472		n.a.	n.a.
Maldives	bribe	-0.014		0.075		0.025		-0.010		n.a.	n.a.	-0.133		-0.259**	Smaller
Maldives	mng_time	-0.324		-2.868		4.068		8.164**	Greater	n.a.	n.a.	3.933*		1.333	
Maldives	generator	0.175**		-0.055		0.034		-0.014		n.a.	n.a.	0.097		n.a.	n.a.
Maldives	insufficient_water	0.004		-0.021		0.022		0.013	Smaller	n.a.	n.a.	0.003		-0.218**	Smaller
Maldives	num_insp	0.106	Smaller	-1.385		1.310		4.836**		n.a.	n.a.	1.220		n.a.	n.a.
Maldives	days_customs	-2.607	Smaller	-1.902		-1.508		8.430**	Greater	n.a.	n.a.	3.599		2.703	
Maldives	m_power_out	0.017	Greater	-0.058*	Smaller	0.000		-0.021		n.a.	n.a.	-0.043		n.a.	n.a.

Table 13 (continued): Country-specific public input constraints, firm growth and firm characteristics

Country	Indicator	Size (log L)	Different?	New firm	Different?	Expanding L	Different?	Services	Different?	Foreign	Different?	Exporter	Different?	Importer	Different?
Nepal	Electricity	-0.031		-0.002		-0.120		0.185	Greater	-0.046		-0.465**	Smaller	-0.113	
Nepal	Telecoms	0.103		-0.023		-0.194	Smaller	0.376*		-0.223		0.031		n.a.	n.a.
Nepal	Transport	-0.138**	Smaller	-0.217	Smaller	0.033		0.544**	Greater	-0.227		-0.442**	Smaller	-0.063	
Nepal	Customs	0.159**		0.028		-0.014		0.619**	Greater	0.156		-0.097		0.101	
Nepal	Competit	-0.003		-0.121		-0.038		0.195	Greater	0.534		-0.256		-0.642*	Smaller
Nepal	AccessLand	-0.038		0.139		0.022		0.189		0.095		-0.164**	Smaller	0.044	
Nepal	TaxRates	0.147*		-0.276*		0.099		0.250	Greater	-0.049		0.598**	Greater	0.269	
Nepal	TaxAdministration	0.166**		-0.065		0.223*		0.018		0.207		0.563*	Greater	0.231	
Nepal	BusLicensing	0.096**	Greater	0.152		0.078		-0.063		0.258		0.202		0.242	
Nepal	PoliticalInstability	0.083		0.070		0.059		0.116		-0.300	Smaller	0.292		0.109	
Nepal	Corruption	0.315**	Greater	-0.057		0.115		0.249		-0.081		-0.283		-0.059	
Nepal	Courts	0.076*		0.023		0.050		0.030		0.321		-0.094	Smaller	0.253*	
Nepal	AccessFinancing	0.092*	Greater	0.082		-0.055		0.065	Greater	-0.256		0.117		-0.138	
Nepal	LaborReg	0.320**	Greater	-0.079		0.067		-0.207		-0.020		0.204		-0.056	
Nepal	InadEduclabor	-0.009		-0.142		0.023		0.123		0.082		-0.463**	Smaller	-0.009	
Nepal	GovPolicyUnc	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Nepal	MacroInstability	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Nepal	bribe	0.016		-0.070**	Smaller	0.009		-0.071*		0.048		-0.049		0.026	
Nepal	mng_time	0.347		-0.928		-3.747*	Smaller	-1.190		-2.474		-5.083*	Smaller	7.270	
Nepal	generator	0.106**		0.105		-0.051		n.a.	n.a.	-0.154		0.158**		0.283**	Greater
Nepal	insufficient_water	0.005		-0.034		0.085		n.a.	n.a.	-0.117		-0.057		0.010	
Nepal	num_insp	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Nepal	days_customs	1.623		-3.521		-1.907		-6.383		46.191		-13.746*	Smaller	-6.007	
Nepal	m_power_out	0.002	Greater	0.008		0.005	Smaller	0.010	Greater	0.011	Greater	-0.015		-0.003	Smaller

Table 13 (continued): Country-specific public input constraints, firm growth and firm characteristics

Country	Indicator	Size (log L)	Different?	New firm	Different?	Expanding L	Different?	Services	Different?	Foreign	Different?	Exporter	Different?	Importer	Different?
Pakistan	Electricity	-0.019		-0.237*	Smaller	-0.004		-0.643**	Smaller	-0.143		0.083		0.322**	Greater
Pakistan	Telecoms	0.063**		0.160		0.181**	Greater	0.605**	Greater	0.280	Greater	0.029		0.207*	
Pakistan	Transport	0.016		0.056		0.077		-0.164		0.415*		-0.110		0.136	
Pakistan	Customs	0.152**	Greater	-0.058		0.093		0.365**	Greater	0.274		-0.117		-0.071	Smaller
Pakistan	Competit	0.040		0.007		0.263**	Greater	0.029		0.152		-0.225*		-0.023	
Pakistan	AccessLand	-0.060*		-0.028		0.091		-0.420**	Smaller	-0.087		0.142		0.039	
Pakistan	TaxRates	0.207**	Greater	-0.130		0.168*		-0.456**	Smaller	-0.471		-0.339**	Smaller	-0.260*	Smaller
Pakistan	TaxAdministration	0.175**	Greater	-0.325**	Smaller	0.104		-0.048		-0.174		-0.485**	Smaller	-0.342**	Smaller
Pakistan	BusLicensing	0.058*		-0.229*	Smaller	0.149*		-0.270*	Smaller	0.164		-0.156	Smaller	-0.143	Smaller
Pakistan	PoliticalInstability	0.054		-0.013		0.279**	Greater	0.489**	Greater	0.251		0.631**	Greater	-0.376*	Smaller
Pakistan	Corruption	0.053		-0.138		0.375**	Greater	-0.379*	Smaller	-0.223		-0.110		0.019	
Pakistan	Courts	0.080		0.432*	Greater	0.154		0.554**	Greater	-0.137		0.624**	Greater	-0.313	
Pakistan	AccessFinancing	-0.005		-0.169	Smaller	0.057		-0.182		-0.317		-0.414**	Smaller	-0.501**	Smaller
Pakistan	LaborReg	0.139**	Greater	-0.144		0.094		0.254*	Greater	-0.237		-0.227**	Smaller	-0.048	
Pakistan	InadEduclabor	0.080**		-0.071		0.155**		0.393**	Greater	-0.357*		0.105		0.138	
Pakistan	GovPolicyUnc	0.129**		-0.105		0.234*		-0.529*		-0.136		-0.370**	Smaller	-0.085	
Pakistan	MacroInstability	0.042		-0.280*	Smaller	0.231**	Greater	-0.250		-0.053		0.018		-0.039	Smaller
Pakistan	bribe	0.042**	Greater	0.003		0.050*		0.092		-0.258**	Smaller	-0.075*	Smaller	-0.103*	Smaller
Pakistan	mng_time	0.875**	Greater	0.793		-0.353		0.865		3.323		-0.158	Smaller	0.676	
Pakistan	generator	0.167**	Greater	-0.068*		0.048*		0.302**	Greater	-0.093		0.101**		-0.017	Smaller
Pakistan	insufficient_water	0.009		-0.003		0.052*		0.817**	Greater	-0.089		-0.032		-0.089*	Smaller
Pakistan	num_insp	5.045**	Greater	1.959		-3.156	Smaller	13.842		12.870		-3.146	Smaller	-2.293	Smaller
Pakistan	days_customs	-0.483	Smaller	-1.896		-3.766**	Smaller	-1.874		-3.506		-5.749**	Smaller	-0.768	
Pakistan	m_power_out	-0.011		-0.089*	Smaller	0.013	Smaller	-0.335**	Smaller	0.054		0.001		0.157**	Greater

Table 13 (continued): Country-specific public input constraints, firm growth and firm characteristics

Country	Indicator	Size (log L)	Different?	New firm	Different?	Expanding L	Different?	Services	Different?	Foreign	Different?	Exporter	Different?	Importer	Different?
SriLanka	Electricity	0.052	Greater	0.413		0.220		n.a.	n.a.	0.019		-0.093		-0.099	
SriLanka	Telecoms	0.076		0.232		-0.104		n.a.	n.a.	-0.224		-0.076		-0.423**	Smaller
SriLanka	Transport	0.107*		0.271		0.217		n.a.	n.a.	0.087		-0.124		0.577**	
SriLanka	Customs	0.070		-0.237		0.032		n.a.	n.a.	0.009		-0.125		0.820**	Greater
SriLanka	Competit	0.037		-0.235		0.129		n.a.	n.a.	-0.002		-0.470**		0.094	
SriLanka	AccessLand	0.011		0.297		0.298**	Greater	n.a.	n.a.	-0.207		0.132		0.057	
SriLanka	TaxRates	0.065		-0.276		0.142		n.a.	n.a.	-0.179		-0.634**	Smaller	0.397*	Greater
SriLanka	TaxAdministration	0.008		-0.444**	Smaller	0.030		n.a.	n.a.	0.038		-0.059		0.401**	Greater
SriLanka	BusLicensing	0.021		-0.121		-0.020		n.a.	n.a.	-0.038		-0.056		0.084	
SriLanka	PoliticalInstability	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SriLanka	Corruption	0.165**	Greater	-0.408*		0.036		n.a.	n.a.	-0.074		-0.241		0.505**	Greater
SriLanka	Courts	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SriLanka	AccessFinancing	-0.041		-0.001		0.161		n.a.	n.a.	-0.222		-0.032		0.211	
SriLanka	LaborReg	0.222**	Greater	-0.342		-0.079		n.a.	n.a.	-0.161		-0.253	Smaller	0.027	
SriLanka	InadEduclabor	0.197**	Greater	-0.360		0.079		n.a.	n.a.	-0.262		-0.166		-0.142	
SriLanka	GovPolicyUnc	0.068		-0.311		-0.039		n.a.	n.a.	0.018		-0.373*		0.361*	
SriLanka	MacrolnStability	0.115*		-0.235		-0.022		n.a.	n.a.	-0.049		0.122		0.302	
SriLanka	bribe	-0.003		0.025		0.031		n.a.	n.a.	0.010		0.001		0.136**	Greater
SriLanka	mng_time	0.264*		-0.033		-0.443		n.a.	n.a.	-0.178		0.256	Smaller	-0.616	
SriLanka	generator	0.125**		-0.074		0.025		n.a.	n.a.	-0.066		0.128**		0.061	
SriLanka	insufficient_water	0.006		-0.025		0.037		n.a.	n.a.	0.084		-0.063		0.197**	Greater
SriLanka	num_insp	3.650**		-5.238*	Smaller	-2.303	Smaller	n.a.	n.a.	-3.022		-0.517		-6.970**	Smaller
SriLanka	days_customs	4.121**	Greater	-1.707		-1.301		n.a.	n.a.	-7.004**	Smaller	5.113		-16.293**	Smaller
SriLanka	m_power_out	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Table 14: Industry- and country-specific correlations of expanding permanent employment with firm characteristics

Industry	Country	corr	Diff?	N	pcorr	Diff?	N
Garments	All	0.057**	n.a.	7,809	0.011	n.a.	7,718
Garments	Bangladesh	0.077**		1,866	-0.075*	Smaller	1,843
Garments	India	0.039		4,590	0.009		4,530
Garments	Pakistan	0.068*		1,353	0.039		1,345
Food & beverages	All	-0.078**	n.a.	7,809	-0.032	n.a.	7,718
Food & beverages	Bangladesh	-0.139**	Smaller	1,866	-0.018		1,843
Food & beverages	India	-0.055*		4,590	-0.054*		4,530
Food & beverages	Pakistan	-0.001	Greater	1,353	0.074	Greater	1,345
Chemicals	All	0.003	n.a.	7,809	-0.003	n.a.	7,718
Chemicals	Bangladesh	0.062		1,866	0.074*	Greater	1,843
Chemicals	India	-0.011		4,590	-0.012		4,530
Chemicals	Pakistan	-0.016		1,353	0.030		1,345
Electronics	All	-0.049**	n.a.	7,809	-0.028	n.a.	7,718
Electronics	Bangladesh	-0.108**		1,866	-0.057		1,843
Electronics	India	-0.042*		4,590	-0.016		4,530
Electronics	Pakistan	-0.026		1,353	-0.028		1,345
Machinery	All	-0.004	n.a.	7,809	0.016	n.a.	7,718
Machinery	Bangladesh	-0.058		1,866	0.046		1,843
Machinery	India	0.010		4,590	0.026		4,530
Machinery	Pakistan	-0.046		1,353	-0.056	Smaller	1,345
Textiles	All	0.029*	n.a.	7,809	0.019	n.a.	7,718
Textiles	Bangladesh	0.054		1,866	0.035		1,843
Textiles	India	0.032		4,590	0.016		4,530
Textiles	Pakistan	-0.012		1,353	-0.017		1,345

Notes: corr=Controls are country fixed effects.
pcorr=Controls are country fixed effects plus other firm characteristics.
Green indicates a positive correlation; red a negative correlation.
*=significant at the 5% level; **=significant at the 1% level.

Table 15: Rankings of constraints by country

TOTAL	TOTAL	AFG	AFG	BGD	BGD	NPL	NPL	PAK	PAK	IND	IND
PoliticalInstability	2.58	PoliticalInstability	3.16	Electricity	3.11	PoliticalInstability	3.20	TaxAdministration	2.29	Electricity	1.61
Electricity	2.17	Electricity	2.89	PoliticalInstability	2.86	Electricity	3.11	Electricity	2.15	Corruption	1.58
Corruption	1.83	Corruption	2.13	Corruption	2.39	Transport	2.21	PoliticalInstability	2.12	TaxAdministration	1.44
TaxAdministration	1.66	AccessLand	2.08	AccessLand	2.13	Corruption	1.63	GovPolicyUnc	2.09	LaborReg	1.12
GovPolicyUnc	1.37	CrimeTheftDisorder	1.69	TaxAdministration	1.99	LaborReg	1.46	Courts	2.06	InadEducLabor	0.98
MacroInstability	1.32	Competit	1.55	GovPolicyUnc	1.89	Competit	1.29	Corruption	2.04	GovPolicyUnc	0.97
Competit	1.16	Telecoms	1.32	MacroInstability	1.83	Customs	1.03	MacroInstability	1.97	Customs	0.93
CrimeTheftDisorder	1.15	TaxAdministration	1.24	Competit	1.59	TaxAdministration	1.03	Competit	1.36	CrimeTheftDisorder	0.93
AccessLand	1.15	Customs	1.20	Customs	1.50	InadEducLabor	0.83	CrimeTheftDisorder	1.36	BusLicensing	0.83
Customs	1.13	Transport	1.18	Telecoms	1.48	CrimeTheftDisorder	0.81	AccessLand	1.35	MacroInstability	0.83
InadEducLabor	1.07	Courts	1.17	InadEducLabor	1.47	Telecoms	0.48	Customs	1.27	Competit	0.82
LaborReg	1.05	BusLicensing	0.76	CrimeTheftDisorder	1.32	AccessLand	0.38	LaborReg	1.12	Transport	0.81
Transport	1.04	InadEducLabor	0.74	BusLicensing	1.29	BusLicensing	0.26	BusLicensing	1.08	AccessLand	0.68
BusLicensing	0.94	LaborReg	0.33	Transport	1.24	Courts	0.10	Transport	0.92	Telecoms	0.47
Courts	0.87	MacroInstability	-	Courts	1.15	MacroInstability	-	InadEducLabor	0.91	Courts	0.47
Telecoms	0.71	GovPolicyUnc	-	LaborReg	0.87	GovPolicyUnc	-	Telecoms	0.67	PoliticalInstability	-

Table 16 Comparison of reported constraints by formal, small formal and rural firms									
	Unconditional means				Survey fixed effects and log(L) (centered on L=5)				
	All formal	Small formal	Rural	Diff?	Small formal	Rural	Diff?	Obs (SF)	Obs (R)
Electricity	2.575	2.563	1.470	Smaller	2.446	1.828	Smaller	2,234	4,888
Telecoms	0.969	0.694	0.318	Smaller	0.602	0.316	Smaller	1,355	4,881
Transport	1.081	0.874	0.696	Smaller	0.864	0.725	Smaller	2,166	4,750
AccessLand	1.606	1.701	0.100	Smaller	1.613	0.066	Smaller	1,747	4,157
InadEduLabor	1.254	0.986	0.183	Smaller	0.929	0.322	Smaller	1,755	4,210
MacroInstability	1.978	1.939	1.619	Smaller	1.795	1.785		1,716	2,428
GovPolicyUnc	1.868	1.622	0.535	Smaller	1.608	0.395	Smaller	955	1,846
PoliticalInstability	2.457	2.290	0.681	Smaller	2.206	0.884	Smaller	1,316	4,029
AccessFinancing	1.677	1.655	1.086	Smaller	1.687	1.013	Smaller	2,143	4,827
Competit	1.308	1.243	1.394		1.200	1.430		1,766	66
TaxAdministration	1.854	1.569	0.099	Smaller	1.328	0.137	Smaller	1,756	4,197
TaxRates	1.820	1.669	0.146	Smaller	1.431	0.205	Smaller	1,762	4,195
LaborReg	0.904	0.677	0.042	Smaller	0.631	0.056	Smaller	2,143	4,202
Customs	1.296	0.811	0.020	Smaller	0.660	0.029	Smaller	1,520	4,091
BusLicensing	1.140	1.035	0.177	Smaller	0.933	0.173	Smaller	1,668	1,763
Courts	1.585	1.553	0.163	Smaller	1.543	0.195	Smaller	1,000	4,231
Corruption	2.137	1.978	0.146	Smaller	1.888	0.159	Smaller	2,211	4,229
CrimeTheftDisorder	1.405	1.271	0.791	Smaller	1.199	0.819	Smaller	1,799	67
bribe	0.591	0.464	0.288	Smaller	0.404	0.212	Smaller	1,691	52
bribe1	0.269	0.205	0.077	Smaller	0.181	0.062	Smaller	1,394	52
mng_time	4.467	2.884	0.118	Smaller	2.436	0.286	Smaller	2,170	5,398
generator	0.515	0.146	0.062	Smaller	0.056	0.091	Greater	1,631	5,416
insufficient_water	0.343	0.302	0.014	Smaller	0.321	0.020	Smaller	1,664	4,031
num_insp	12.652	5.809	0.451	Smaller	5.168	1.608	Smaller	1,283	2,970
days_customs	8.242	5.204	5.204	n.a.	7.396	7.396	n.a.	142	0
m_power_out	0.751	0.727	0.669	Smaller	0.723	0.702		2,014	2,671

Small numbers of observations are noted in red. Differences are heteroskedasticity-robust tests with a 5% significance level.

Table 17 Ranking of constraints: formal, small formal and rural firms				
Unconditional means			Survey fixed effects and log(L) (centered on L=5)	
Formal	Small formal	Rural	Small formal	Rural
Electricity	Electricity	MacroInstability	Electricity	Electricity
PoliticalInstability	PoliticalInstability	Electricity	PoliticalInstability	MacroInstability
Corruption	Corruption	Competit	Corruption	Competit
MacroInstability	MacroInstability	CrimeTheftDisorder	MacroInstability	PoliticalInstability
GovPolicyUnc	AccessLand	Transport	AccessLand	CrimeTheftDisorder
TaxAdministration	GovPolicyUnc	PoliticalInstability	GovPolicyUnc	Transport
AccessLand	TaxAdministration	GovPolicyUnc	Courts	GovPolicyUnc
Courts	Courts	Telecoms	TaxAdministration	InadEducLabor
CrimeTheftDisorder	CrimeTheftDisorder	InadEducLabor	Competit	Telecoms
Competit	Competit	BusLicensing	CrimeTheftDisorder	Courts
Customs	BusLicensing	Courts	BusLicensing	BusLicensing
InadEducLabor	InadEducLabor	Corruption	InadEducLabor	Corruption
BusLicensing	Transport	AccessLand	Transport	TaxAdministration
Transport	Customs	TaxAdministration	Customs	AccessLand
Telecoms	Telecoms	LaborReg	LaborReg	LaborReg
LaborReg	LaborReg	Customs	Telecoms	Customs

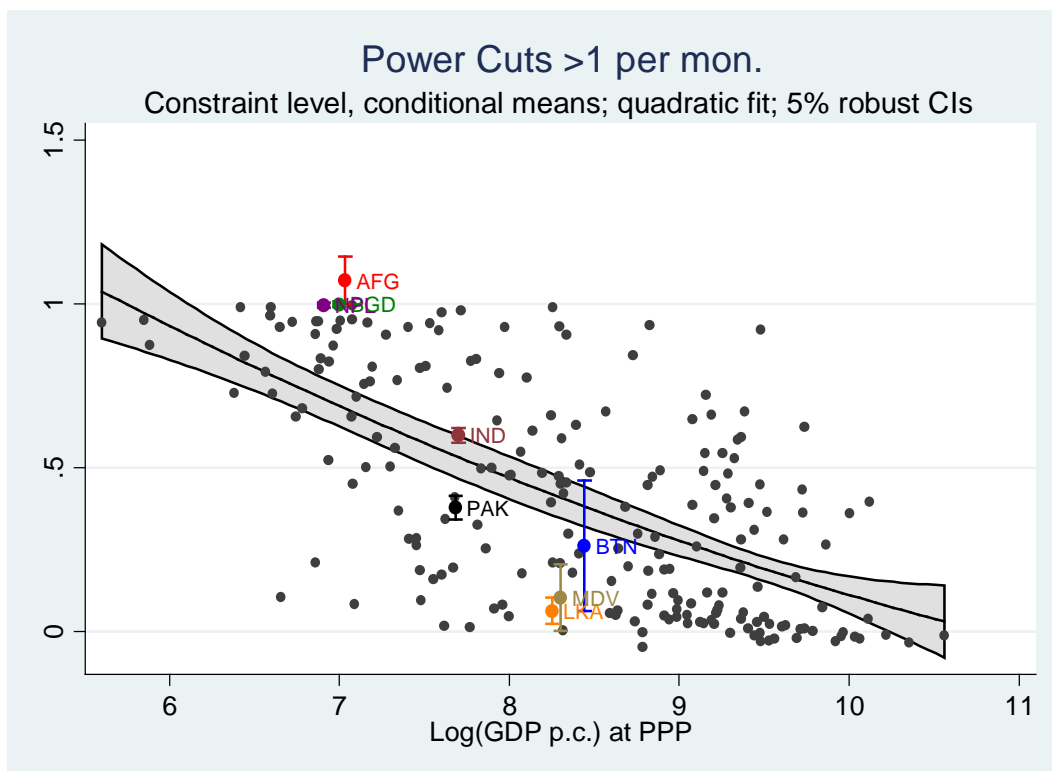
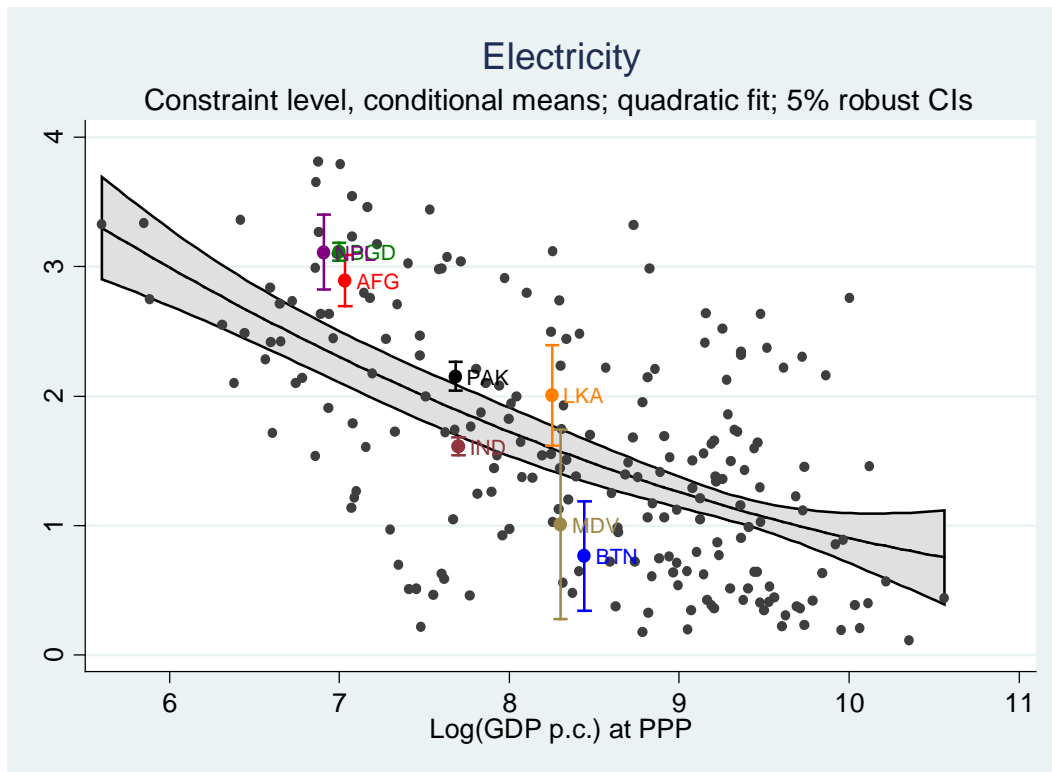
Small numbers of observations are noted in red.

	Unconditional means			Diff?	Survey fixed effects and log(L) (centered on L=5)				
	All formal	Small formal	Informal		Small formal	Informal	Diff?	Obs (SF)	Obs (I)
Electricity	1.790	1.818	1.572	Smaller	1.817	1.574	Smaller	2,247	1,951
Telecoms	0.515	0.497	0.920	Greater	0.522	0.998	Greater	2,144	1,951
Transport	0.905	0.826	1.836	Greater	0.838	1.840	Greater	2,244	1,951
AccessLand	0.713	0.752	1.672	Greater	0.901	1.686	Greater	2,149	1,951
InadEduLabor	1.013	0.974	1.714	Greater	0.860	1.720	Greater	2,151	1,951
MacroInstability	0.913	0.832	1.149	Greater	0.677	1.160	Greater	2,104	402
GovPolicyUnc	1.033	0.954	1.192	Greater	0.809	1.184	Greater	2,114	402
AccessFinancing	1.203	1.168	1.533	Greater	1.113	1.567	Greater	2,238	1,951
Competit	0.863	0.824	1.376	Greater	0.767	1.382	Greater	2,127	1,951
TaxAdministration	1.551	1.486	1.455		1.432	1.414		2,149	1,951
TaxRates	1.682	1.639	1.531	Smaller	1.586	1.492		2,152	1,951
LaborReg	1.169	1.061	1.576	Greater	0.879	1.588	Greater	2,234	1,951
Customs	1.011	0.878	0.590	Smaller	0.783	0.595	Smaller	2,021	402
BusLicensing	0.891	0.802	1.826	Greater	0.710	1.818	Greater	2,032	1,549
Courts	0.441	0.336	1.591	Greater	0.272	1.585	Greater	1,129	1,951
Corruption	1.681	1.637	1.451	Smaller	1.507	1.431		2,241	1,951
CrimeTheftDisorder	0.960	0.993	1.582	Greater	0.994	1.561	Greater	2,148	1,951
bribe	0.444	0.438	0.237	Smaller	0.312	0.266	Smaller	2,230	1,936
bribe1	0.175	0.173	0.084	Smaller	0.158	0.096	Smaller	1,966	1,623
mng_time	6.624	6.436	1.624	Smaller	5.685	1.704	Smaller	2,538	1,942
generator	0.588	0.417	0.197	Smaller	0.246	0.226		2,410	1,951
insufficient_water	0.213	0.207	1.000	n.a.	0.205	1.000	Greater	-999	5
num_insp	8.743	5.832	5.063		4.140	5.125		2,309	128
days_customs	8.470	7.136	7.136	n.a.	5.928	5.928	n.a.	295	0
m_power_out	0.686	0.719	0.942	Greater	0.671	0.943	Greater	2,179	1,320

Small numbers of observations are noted in red. Differences are heteroskedasticity-robust tests with a 5% significance level.

Table 19 Ranking of constraints: formal, small formal and informal sector firms (manufacturing & India only)				
Unconditional means			Survey fixed effects and log(L) (centered on L=5)	
Formal	Small formal	Informal	Small formal	Informal
Electricity	Electricity	Transport	Electricity	Transport
Corruption	Corruption	BusLicensing	Corruption	BusLicensing
TaxAdministration	TaxAdministration	InadEducLabor	TaxAdministration	InadEducLabor
LaborReg	LaborReg	AccessLand	CrimeTheftDisorder	AccessLand
GovPolicyUnc	CrimeTheftDisorder	Courts	AccessLand	LaborReg
InadEducLabor	InadEducLabor	CrimeTheftDisorder	LaborReg	Courts
Customs	GovPolicyUnc	LaborReg	InadEducLabor	Electricity
CrimeTheftDisorder	Customs	Electricity	Transport	CrimeTheftDisorder
MacroInstability	MacroInstability	TaxAdministration	GovPolicyUnc	Corruption
Transport	Transport	Corruption	Customs	TaxAdministration
BusLicensing	Competit	Competit	Competit	Competit
Competit	BusLicensing	GovPolicyUnc	BusLicensing	GovPolicyUnc
AccessLand	AccessLand	MacroInstability	MacroInstability	MacroInstability
Telecoms	Telecoms	Telecoms	Telecoms	Telecoms
Courts	Courts	Customs	Courts	Customs

Figure 1. Electricity, Outages and Generators



Generator (y/n)

Constraint level, conditional means; quadratic fit; 5% robust CIs

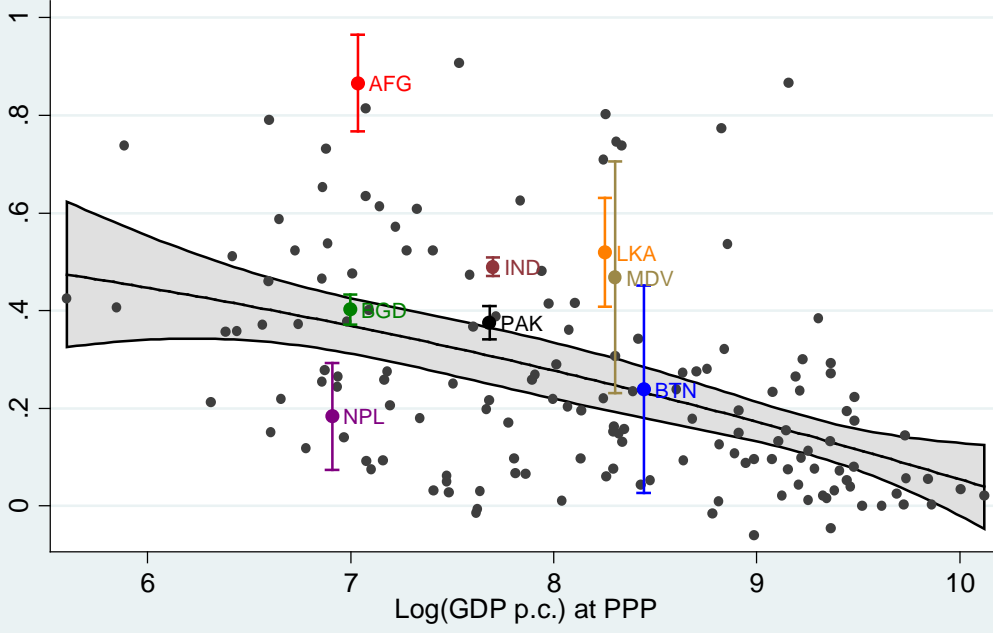


Figure 2. Corruption and bribes

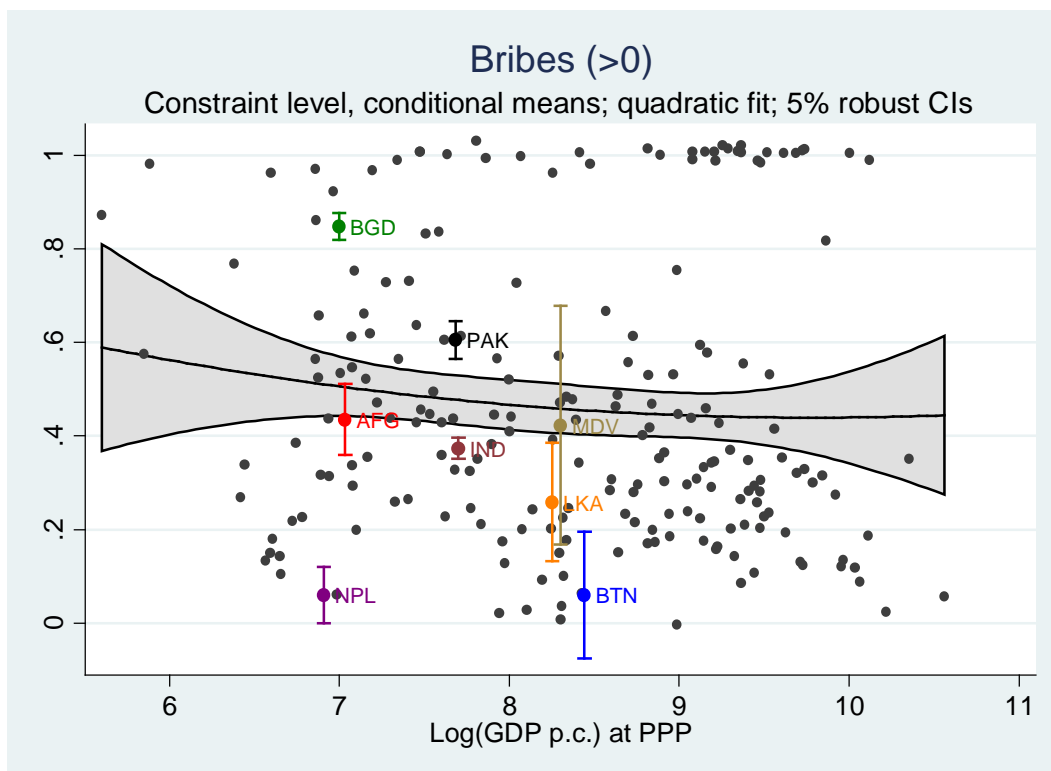
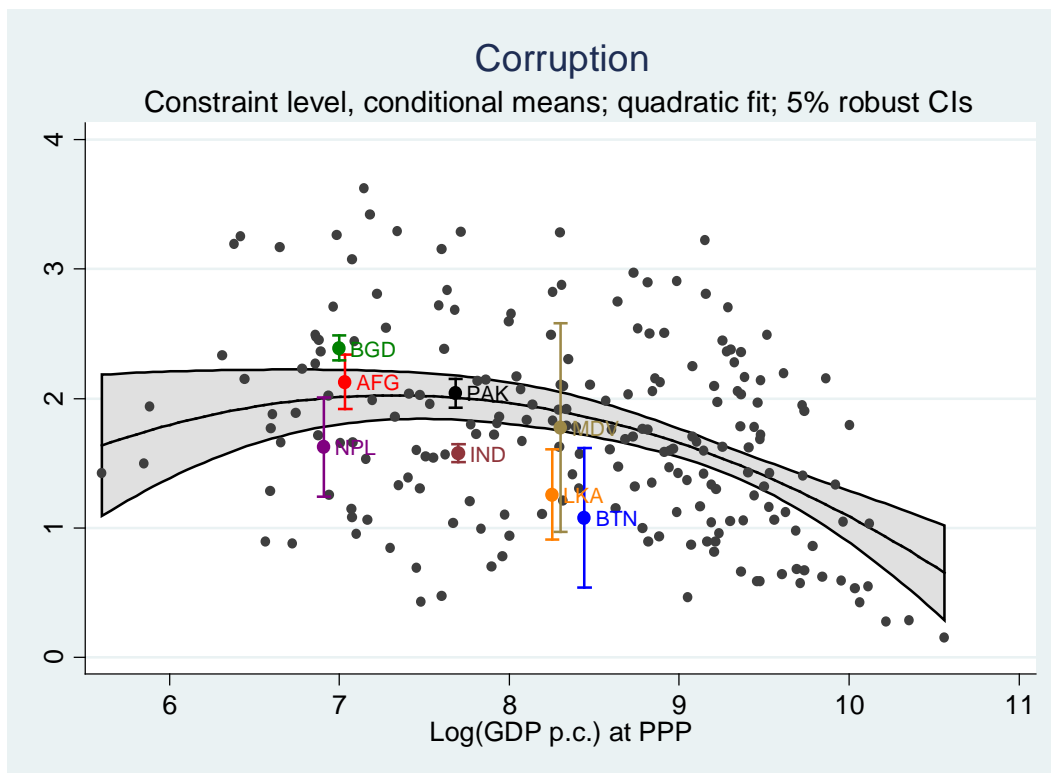


Figure 3. Political instability

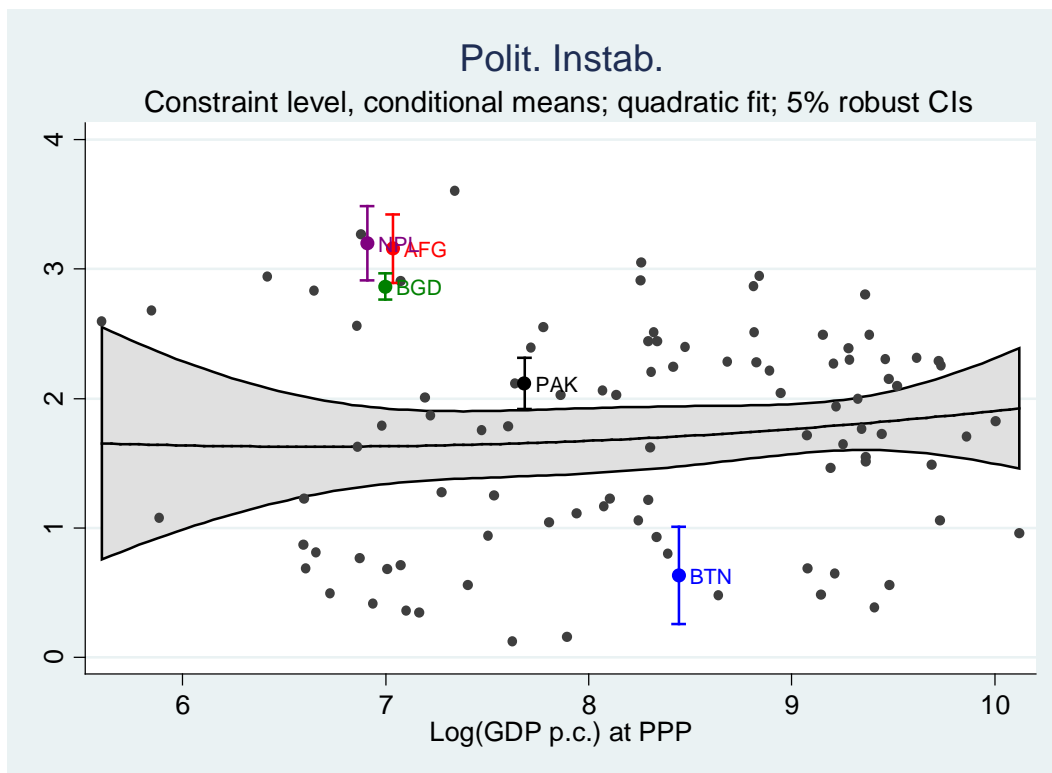


Figure 4. Access to Land

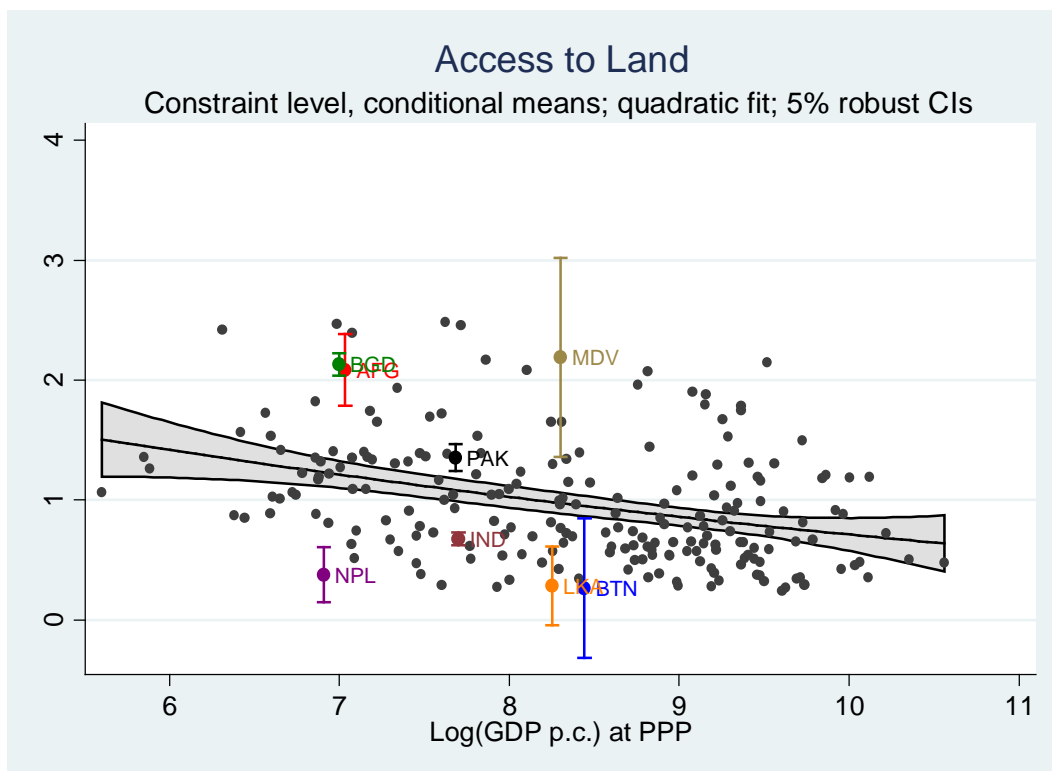


Figure 5. Insufficient water

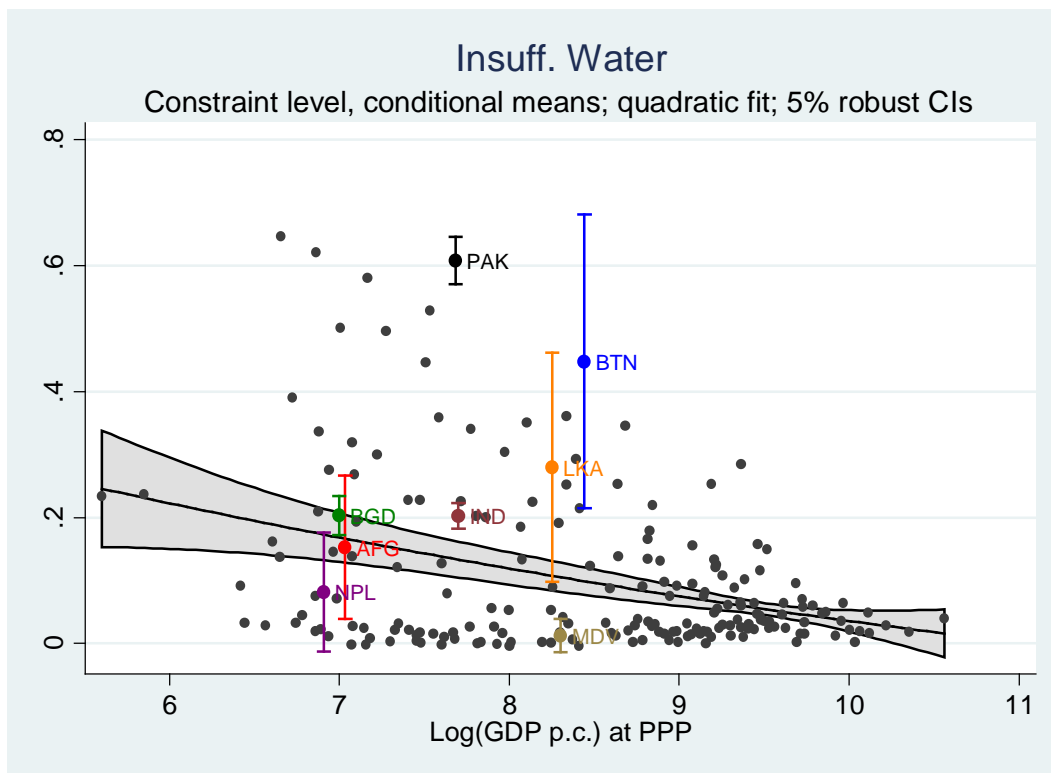


Figure 6. Labour Regulation

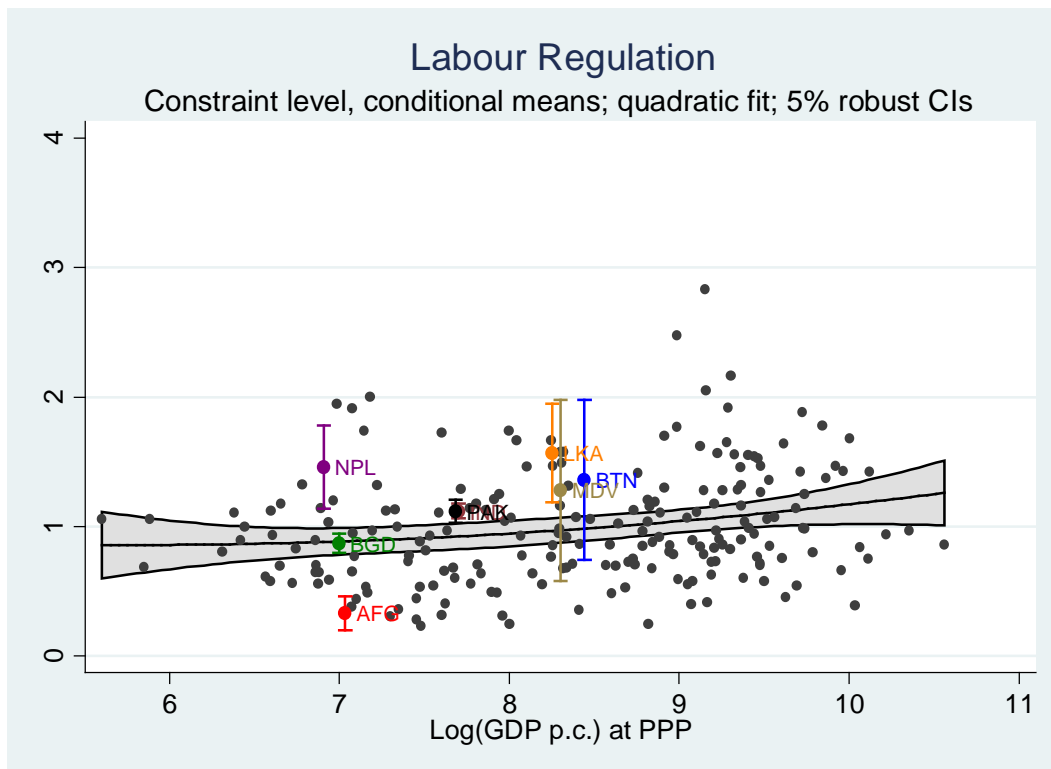


Figure 7. Courts

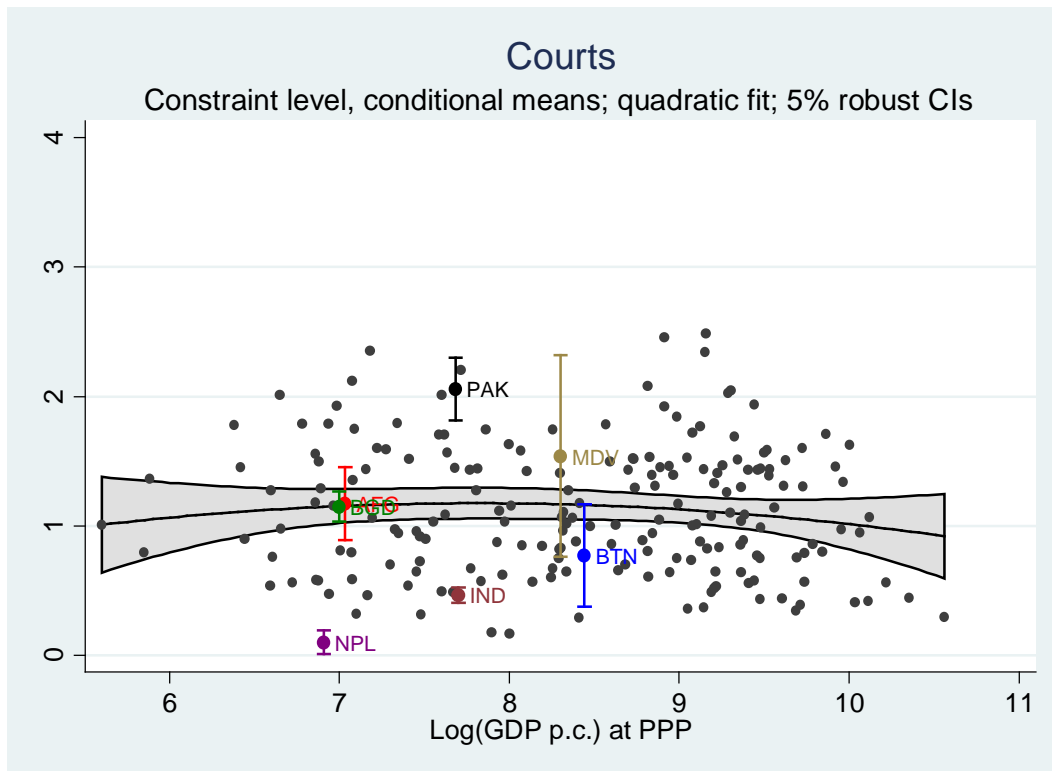


Figure 8. Inadequately educated labour

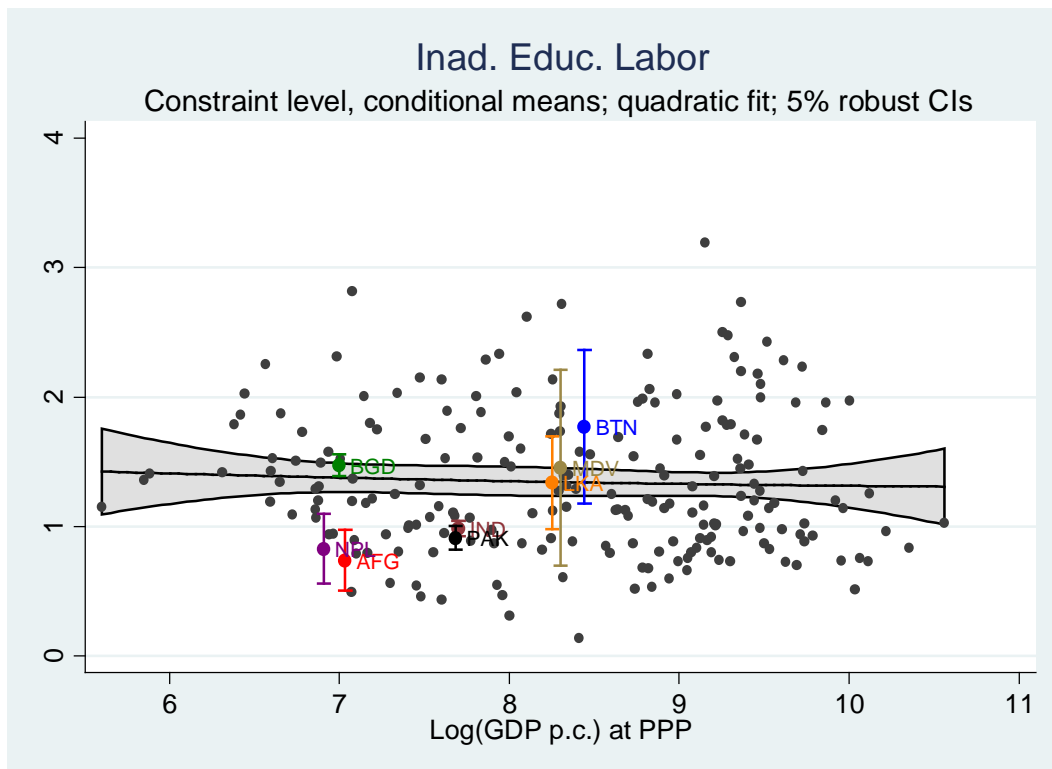
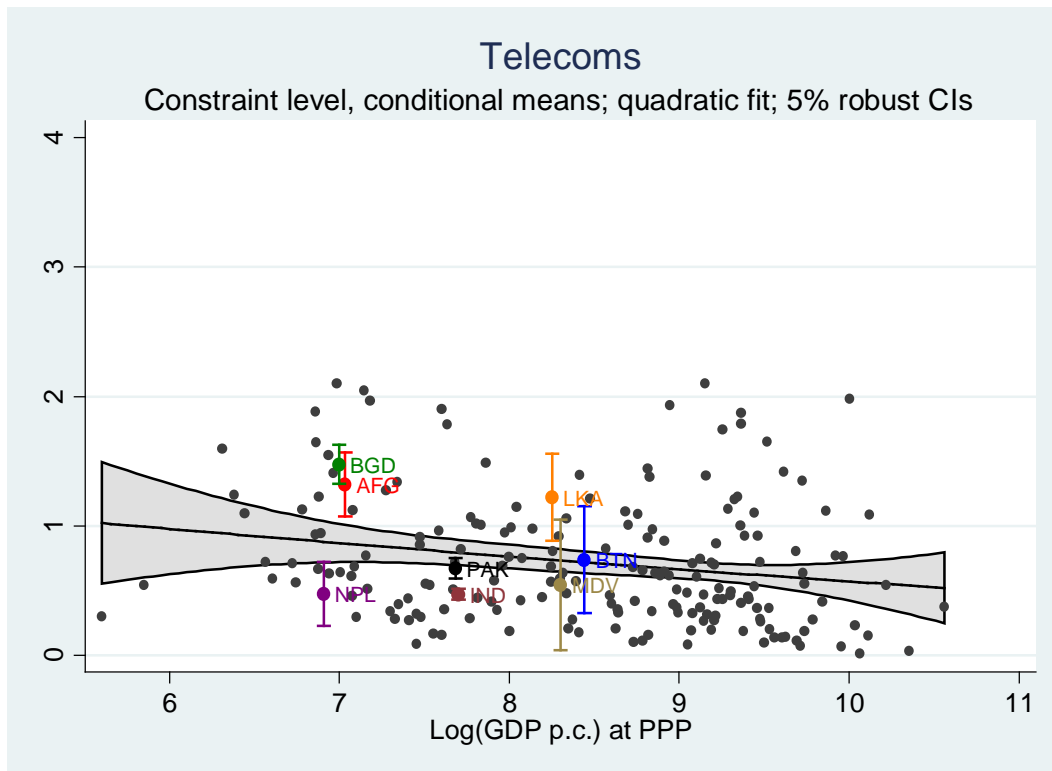


Figure 9. Telecoms



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Appendix 1: Modelling framework

G_{ij} is a private input chosen by the firm. \bar{B}_j and G_{ij} are substitutes in the production of intermediate input E_{ij} , created via an intermediate input production function $E(\bar{B}_j, G_{ij})$. G_{ij} is a mitigation cost or input that substitutes for deficiencies in the public input \bar{B}_j . Intermediate input E_{ij} is combined with labour input L_{ij} via a final output production function F and firms-specific technology level A_{ij} , to generate output $Y_{ij} = A_{ij}F(L_{ij}, E_{ij})$:

$$E_{ij} = E(\bar{B}_j, G_{ij}) \quad (1)$$

$$Y_{ij} = A_{ij}F(L_{ij}, E(\bar{B}_j, G_{ij})) \quad (2)$$

The firm's problem is choose L_{ij} and G_{ij} to maximize profits for given technology A_{ij} , public input \bar{B}_j , and relative prices of labour and mitigation, denoted as w_j and p_j , respectively (we normalize the output price to 1; all firms in country j face the same prices), and the intermediate input and final output production technology.⁹

It is useful to write these as maximum-value or indirect objective functions. Denoting profit-maximizing quantities with a superscript *, we have the input demand functions for labour and mitigation, the supply function for output, and the profit function for the firm's maximized profit, all written as functions of the exogenous variables A_{ij} , \bar{B}_j , w_j and p_j .

$$L_{ij}^* = L^*(A_{ij}, \bar{B}_j, w_j, p_j) \quad (3)$$

$$G_{ij}^* = G^*(A_{ij}, \bar{B}_j, w_j, p_j) \quad (4)$$

$$E_{ij}^* = E(\bar{B}_j, G_{ij}^*) = E^*(A_{ij}, \bar{B}_j, w_j, p_j) \quad (5)$$

$$Y_{ij}^* = Y^*(A_{ij}, \bar{B}_j, w_j, p_j) = A_{ij}F(L_{ij}^*, E(\bar{B}_j, G_{ij}^*)) \quad (6)$$

$$\pi_{ij}^* = \pi^*(A_{ij}, \bar{B}_j, w_j, p_j) = Y^*(A_{ij}, \bar{B}_j, w_j, p_j) - w_j L_{ij}^* - p_j G_{ij}^* \quad (7)$$

⁹ In addition to the assumption of weak separability that we have already made, $F(L, B, G) = F(L, E(B, G))$, and the usual assumptions about the production functions E and F , we also assume that E is strictly quasi-concave and homothetic.

So far we have assumed that the public input \bar{B}_j is supplied identically to all firms in a country. An example of a public input of this kind is macroeconomic stability. A more realistic assumption would allow for B_{ij} to vary across firms. This could result from regional variation in the quality of the public input within a country, or simply because of random variation in the reliability of the public input, e.g., some firms were luckier than others with respect to the number power outages they faced.

An important issue relates to possible differences in infrastructure quality across locations. We find in the paper that firms in large cities report higher constraints across most dimensions of the business environment than do firms in more rural locations. However, this is not because the supply of public inputs, B_{ij} is lower in cities; in fact, our prior is that if infrastructure quality varies between rural areas and cities, it is higher in the latter. Thus, when we find that firms in large cities are more constrained, this is in spite of having, if anything, better public inputs.

In some cases, however, the public input supplied to the firm will vary with the firm's profitability or productivity. (Since maximized profit is a function of productivity A_{ij} – see above – we simplify and consider productivity A_{ij} as a proxy for profitability.)

In this case, we have

$$B_{ij} = B(\bar{B}_j, A_{ij}) \quad \frac{\partial B_{ij}}{\partial \bar{B}_j} > 0 \quad \frac{\partial B_{ij}}{\partial A_{ij}} < 0 \quad (8)$$

$$E_{ij} = E(B_{ij}, G_{ij}) = E(B(\bar{B}_j, A_{ij}), G_{ij}) \quad (9)$$

An example: \bar{B}_j is the honesty of the bureaucracy in country j , B_{ij} is the inverse of the number of inspections that a firm with productivity A_{ij} attracts (more inspections means a lower quality public input B_{ij} supplied to the firm), and G_{ij} is bribes.

We now consider how the firm's optimal choices of inputs and output, and the firm's valuations of the public input, vary with the quality of the public input \bar{B}_j , and with the productivity of the firm A_{ij} .

In the model above, supply and profits are, not surprisingly, increasing in the quality of the public input \bar{B}_j :

$$\frac{\partial Y_{ij}^*}{\partial \bar{B}_j} > 0, \quad \frac{\partial \pi_{ij}^*}{\partial \bar{B}_j} > 0 \quad (10)$$

Many such country-level measures are available and have been used in country-level studies. Firm-level surveys do collect some information about the quality of the business environment \bar{B}_j . However, these measures are best interpreted as estimates by an individual firm of the quality of the shared environment, in the same way that a firm's answers on a price survey provide information about the market price for a specific product. An example of such a measure from the Enterprise Surveys would be a firm's report of the number of electricity supply interruptions it faced.

Information on mitigation costs G_{ij}^* is also collected from firms. Mitigation expenditures are endogenously chosen by the firm. These expenditures will be decreasing in the quality of the public input \bar{B}_j and increasing in the productivity of the firm, A_{ij} :

$$\frac{\partial G_{ij}^*}{\partial \bar{B}_j} \leq 0, \quad \frac{\partial G_{ij}^*}{\partial A_{ij}} \geq 0 \quad (11)$$

The second expression is of interest to us in the empirical analysis and has a twofold intuitive justification. In the benchmark case where the public input supplied to all firms is identical and independent of firm productivity, i.e. $B_{ij} = \bar{B}_j$, higher productivity firms spend more on mitigation because the payoff is bigger than it is to low productivity firms. In the case where the quality of the public input varies

inversely with firm productivity, as in the example of higher productivity firms attracting more attention from rent-seeking officials, i.e. $B_{ij} = B(\bar{B}_j, A_{ij})$, the effect is reinforced. More profitable firms have an even lower quality public input, and hence the payoff to spending on mitigation is even bigger.

The above implies that firm productivity, and proxies for productivity and growth, should be associated with higher mitigation outlays. Moreover, the partial derivative

$\frac{\partial G_{ij}^*}{\partial A_{ij}}$ can vary systematically across countries, and in particular it will be decreasing in the quality of the public input \bar{B}_j :

$$\frac{\partial^2 G_{ij}^*}{\partial A_{ij} \partial \bar{B}_j} \leq 0 \tag{12}$$

i.e., countries with a lower quality public input, \bar{B}_j should see stronger correlations between mitigation outlays and firm-level productivity.

If the quality or quantity of the public input \bar{B}_j is sufficiently high, the marginal cost of additional expenditure on mitigation will be greater than the marginal benefit to the firm, in which case optimal mitigation G_{ij}^* is zero. Examples would be expenditure on a new generator when the quality of electricity supply is so high that the cost of the generator cannot be justified or expenditure on bribes when public officials are already so honest that there is no point bribing them. In these circumstances, there would be no correlation between mitigation costs and firm-level productivity.

Firms also provide information about the flow of services E_{ij}^* obtained from the combination of the public input and mitigation expenditures. An example is the speed with which goods clear customs, which is an endogenous result of the quality of the customs bureaucracy (\bar{B}_j) and of the optimal mitigation costs such as management time and bribes aimed at getting the firm's goods through customs (G_{ij}^*). In the benchmark case where the public input supplied to all firms is identical and

independent of firm productivity, the flow of intermediate inputs, E_{ij}^* , is increasing in the productivity of the firm; this follows from the property that mitigation outlays are also increasing in the productivity of the firm:

$$\frac{\partial E_{ij}^*}{\partial A_{ij}} = \frac{\partial E(\bar{B}_j, G_{ij}^*(A_{ij}))}{\partial A_{ij}} = \frac{\partial E_{ij}}{\partial G_{ij}} \frac{\partial G_{ij}^*}{\partial A_{ij}} \geq 0 \quad (13)$$

A simple and intuitive interpretation of the ‘‘Subjective Severity’’ indicators collected in the Enterprise Surveys is that they represent the ‘‘reported cost’’ R_{ij} of a public input is the gap between the firm’s profit in the hypothetical situation where the public input provided is of such high quality that it poses a negligible obstacle to the firm’s operations, and the firm’s profit in reality, given the actual quality of public input provided. If we denote the level of public input provided in an ideal, high-quality business environment as $\bar{\bar{B}}_j$, we have

$$R_{ij} = \pi^*(A_{ij}, \bar{\bar{B}}_j, w_j) - \pi^*(A_{ij}, \bar{B}_j, w_j) \quad (14)$$

The marginal analogue of the reported cost R_{ij} for small changes in the public input, or ‘‘marginal reported cost’’, is therefore simply the derivative of the profit function:

$$R_{ij} \approx \frac{\partial \pi_{ij}^*}{\partial \bar{B}_j} \equiv \lambda_{ij} \quad (15)$$

We can think of the profit function π_{ij}^* as resulting from a constrained maximization by the firm, where the public input \bar{B}_j is supplied to the firm at a level or quality that means the firm would prefer a higher quality or more of it. By the envelope theorem for constrained maximization, the derivative of the profit function π_{ij}^* with respect to a constrained or fixed input is simply the shadow price of the input. Thus we follow

Carlin et al. (2006) and interpret the responses to “Subjective Severity” questions as the *shadow price* λ_{ij} of shortcomings in the public input \bar{B}_j .¹⁰

The shadow price of \bar{B}_j is decreasing in \bar{B}_j :

$$\frac{\partial \lambda_{ij}}{\partial \bar{B}_j} \equiv \frac{\partial^2 \pi_{ij}^*}{\partial \bar{B}_j^2} < 0 \quad (16)$$

The shadow price of a constraint is also increasing in the productivity of the firm:

$$\frac{\partial \lambda_{ij}}{\partial A_{ij}} \equiv \frac{\partial^2 \pi_{ij}^*}{\partial \bar{B}_j \partial A_{ij}} > 0 \quad (17)$$

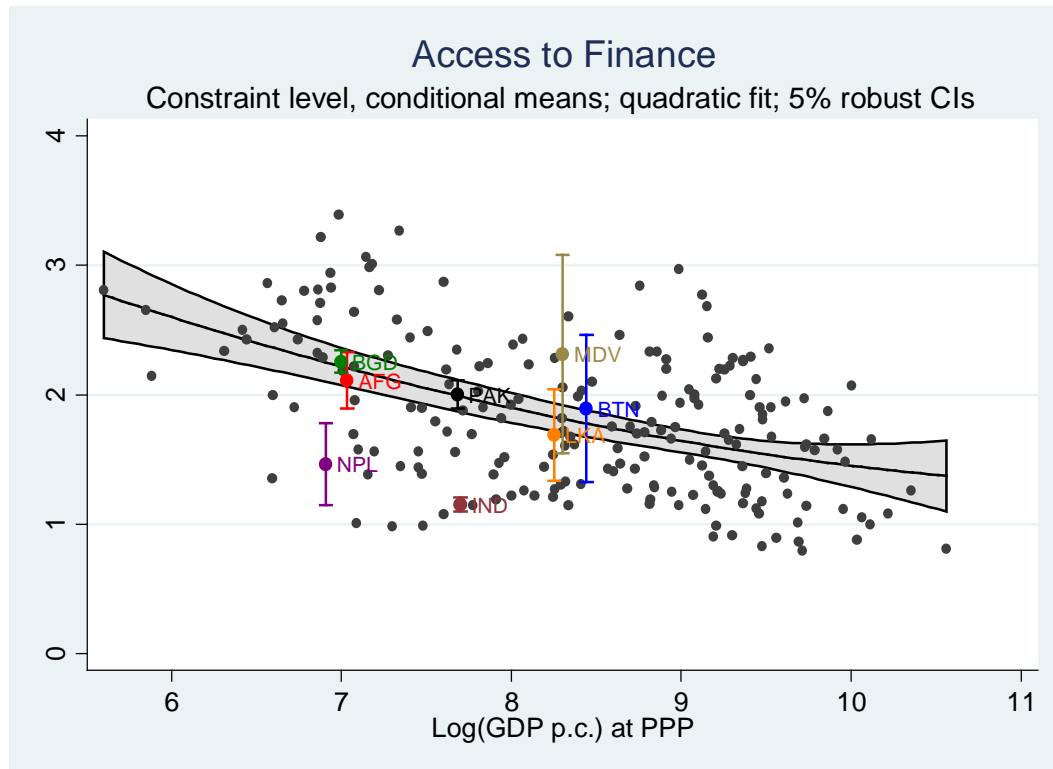
i.e., a higher productivity firm will report higher costs of a poor public input than a lower productivity firm – even though they share the same business environment.

Lastly, we are interested in firm growth as well firm productivity. The simplest extension to the model that accommodates this is to extend the model to include a quasi-fixed input such as capital or workers with permanent contracts. Now, in addition to the optimizing choice of variable inputs L_{ij}^* and G_{ij}^* , the firm also chooses an optimal level of investment I_{ij}^* in the quasi-fixed input. I_{ij}^* will be increasing in the firm-specific parameters that capture future profitability such as A_{ij} . Hence, we expect direct measures of I_{ij}^* , or proxy measures for the parameters that drive the cross-firm variation in I_{ij}^* , to be correlated with G_{ij}^* , E_{ij}^* and MRC^* in the same way as A_{ij} is above.

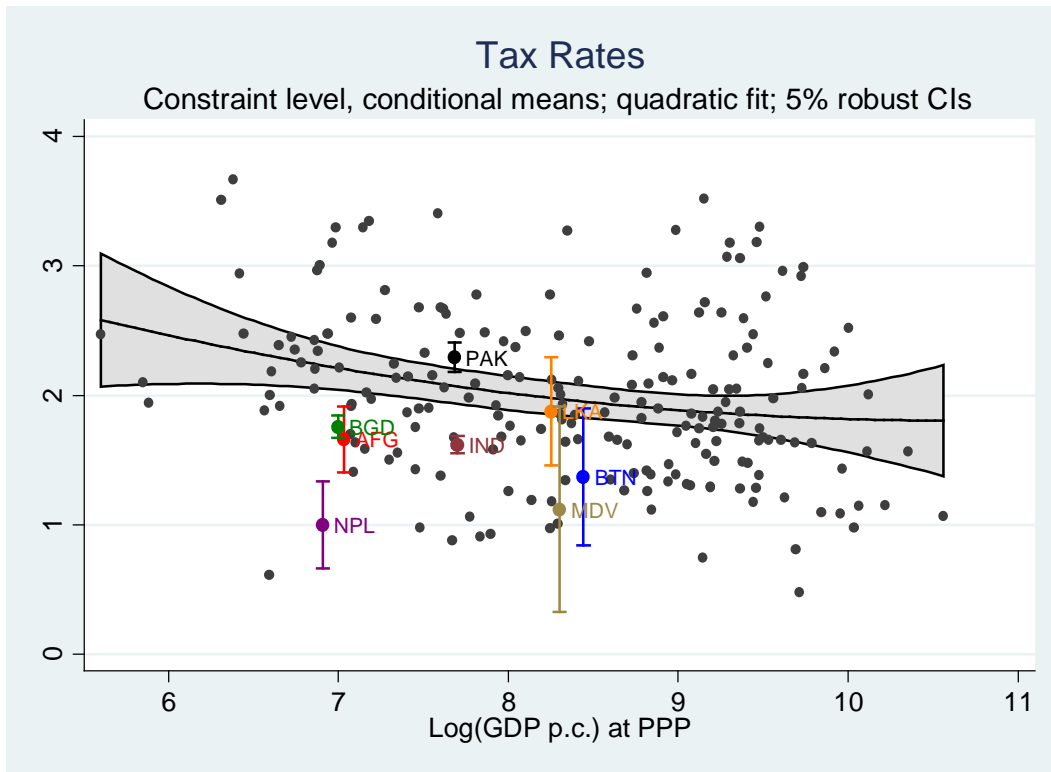
¹⁰ Carlin et al. (2010) interpret the responses as “reported costs” (RC) in a slightly different framework to the one adopted here, namely an O-ring production function in which the quality of the public input is measured by the probability that it fails and output is zero. This allows a response of 0 to be interpreted naturally as a zero probability of failure, which in turn implies the firm’s evaluation of the quality of the public input is that it is so high that additional improvements would not benefit the firm. The difference in formal frameworks is immaterial to the analysis here.

Appendix 2: Charts for Access to Finance, and Tax Rates, and the remaining elements of the external environment

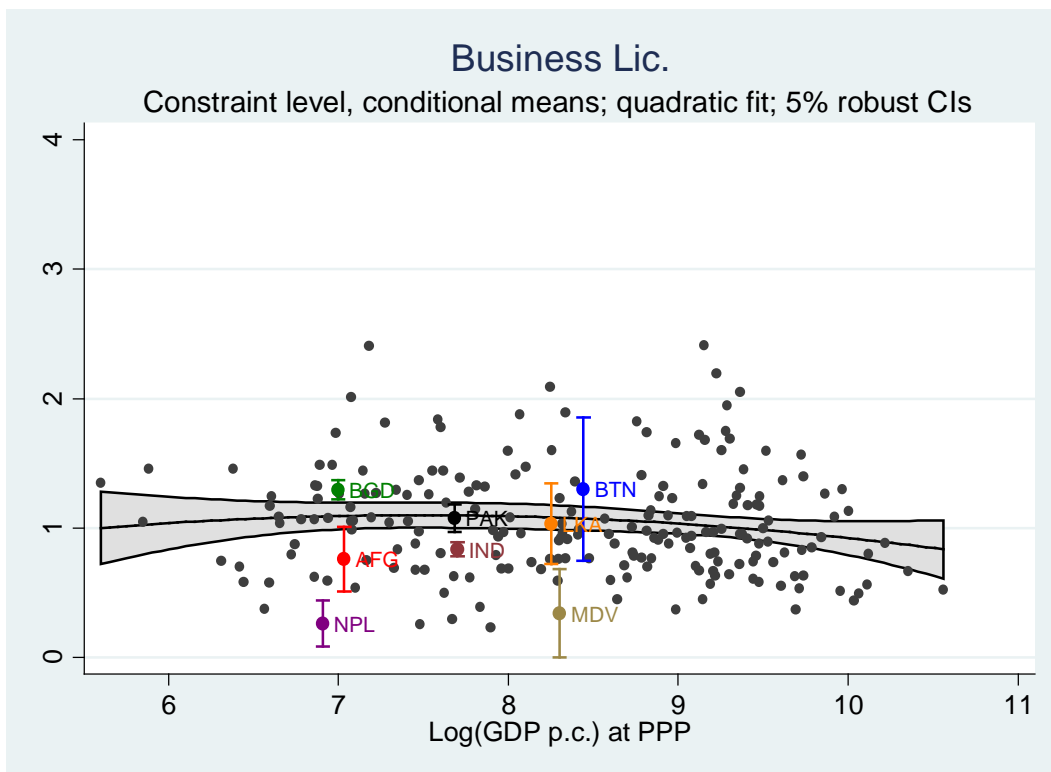
Although we cannot compare the level of the finance obstacle with the public good elements of the business environment, we can look at the cross-country patterns. The results for Nepal and India stand out. In both cases, firms report access to finance as a less serious obstacle than is the case in other countries at comparable levels of development.



As discussed in the paper, it is difficult to interpret managers' answer to the question about tax rates. The cross-country chart reflects the finding that firms in countries at all levels of development complain a lot about tax rates. The SAR countries – with the exception of Pakistan and the Maldives, which are typical of countries at their level of development – tend to report lower obstacles from the tax rate than do firms in other countries.

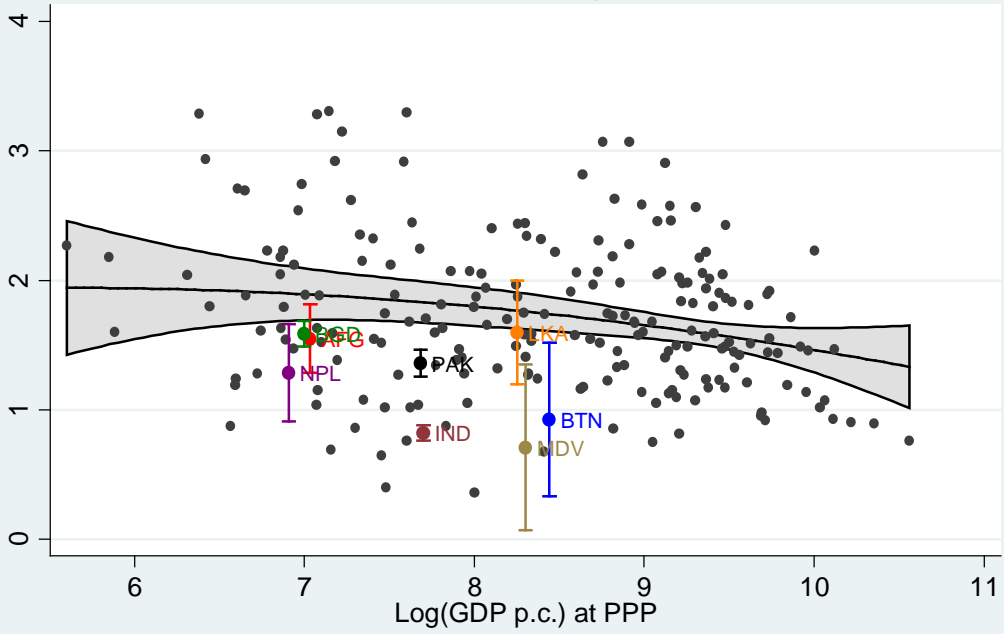


Other elements of the business environment



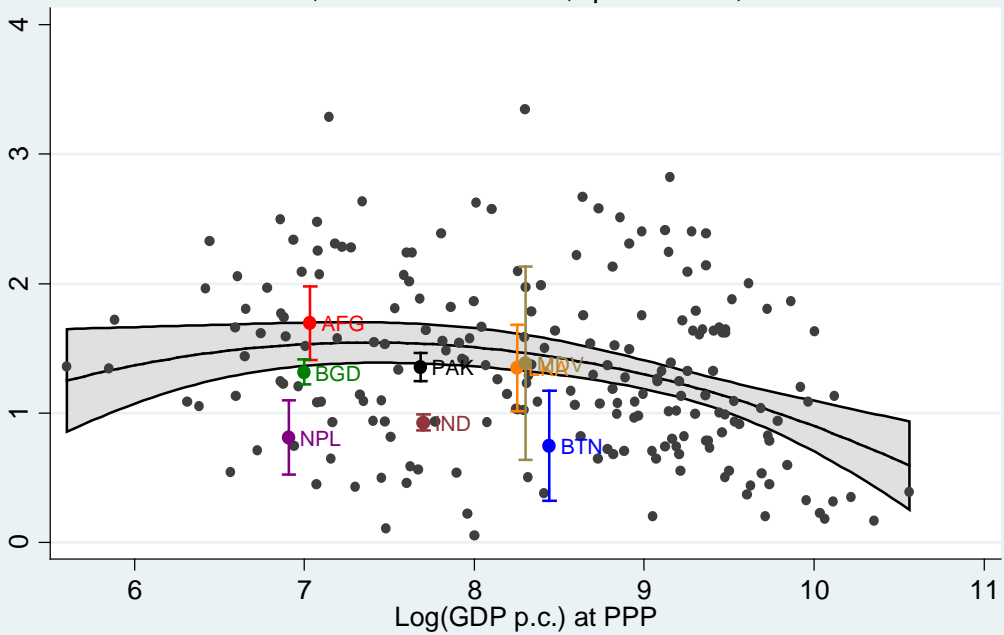
Competition

Constraint level, conditional means; quadratic fit; 5% robust CIs



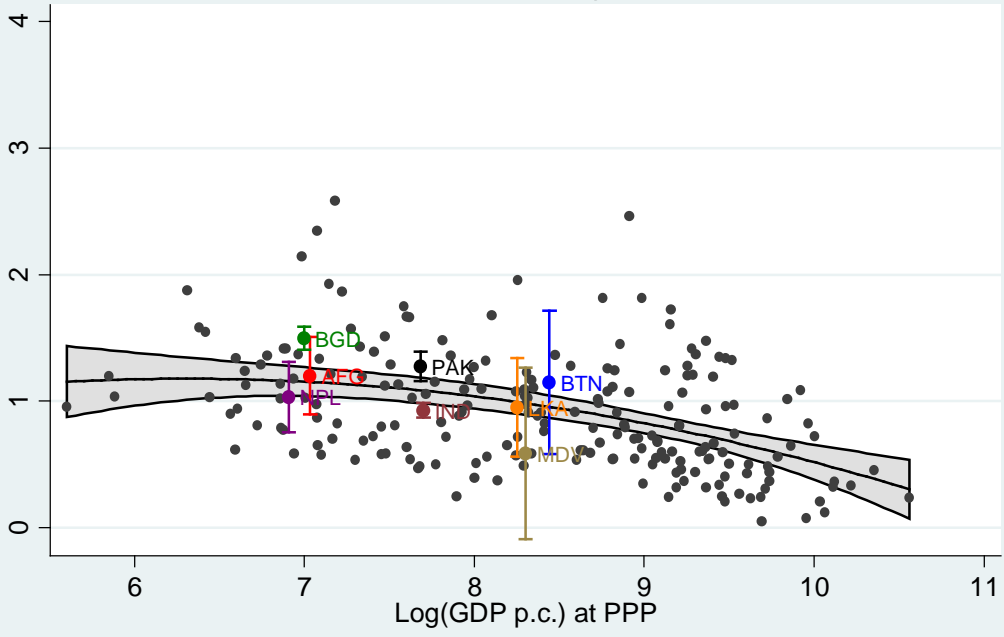
Crime/Theft/Disorder

Constraint level, conditional means; quadratic fit; 5% robust CIs



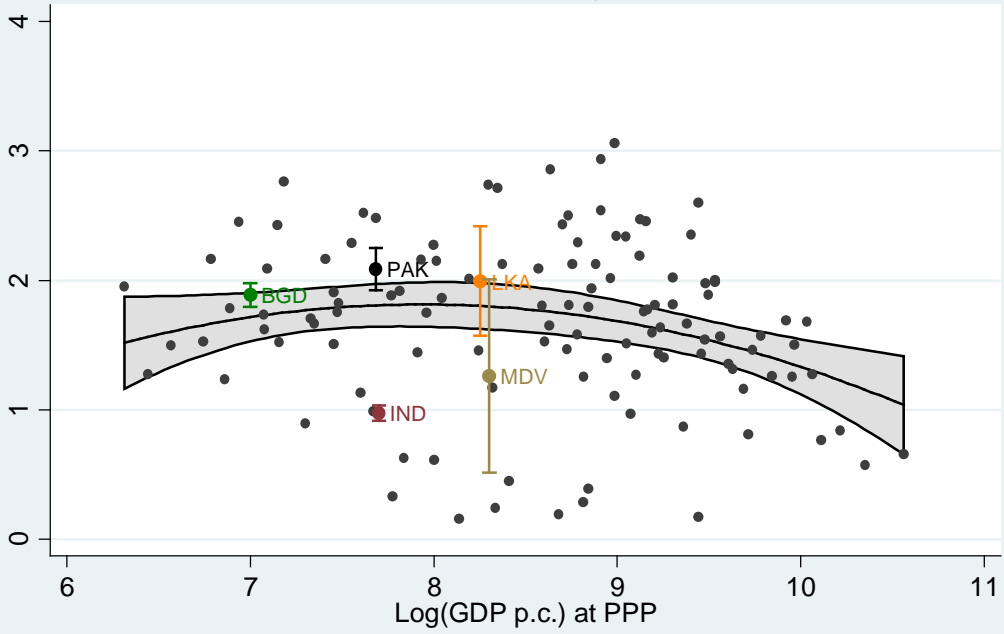
Customs

Constraint level, conditional means; quadratic fit; 5% robust CIs



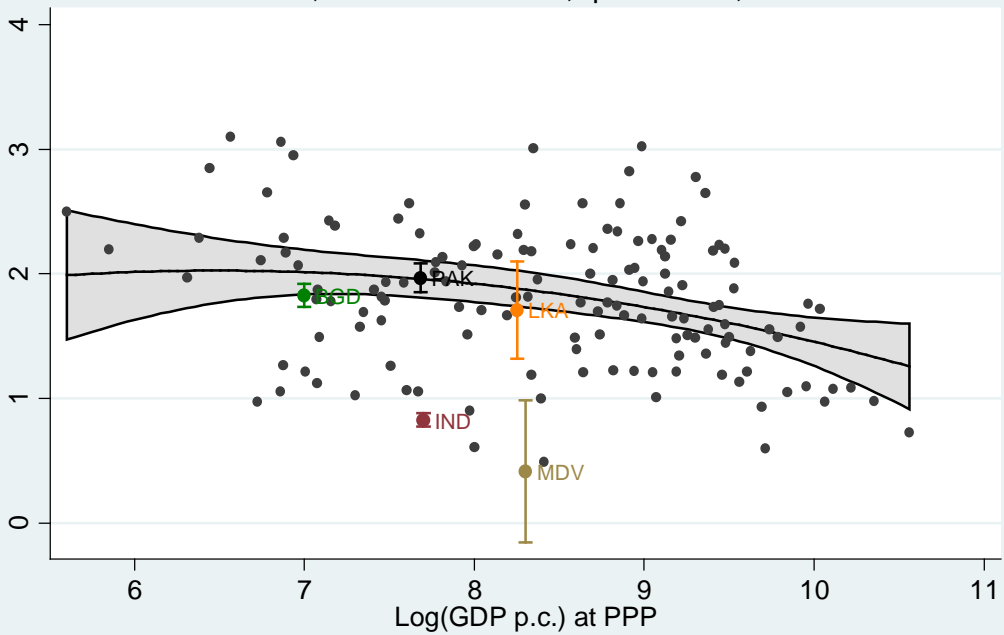
Gov. Policy Uncert.

Constraint level, conditional means; quadratic fit; 5% robust CIs



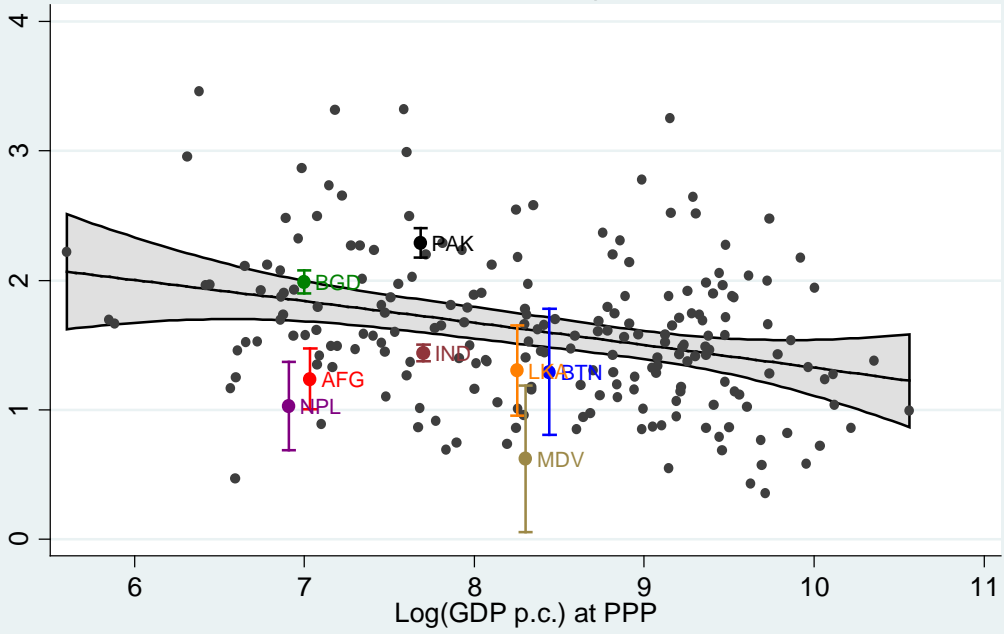
Macro Instability

Constraint level, conditional means; quadratic fit; 5% robust CIs



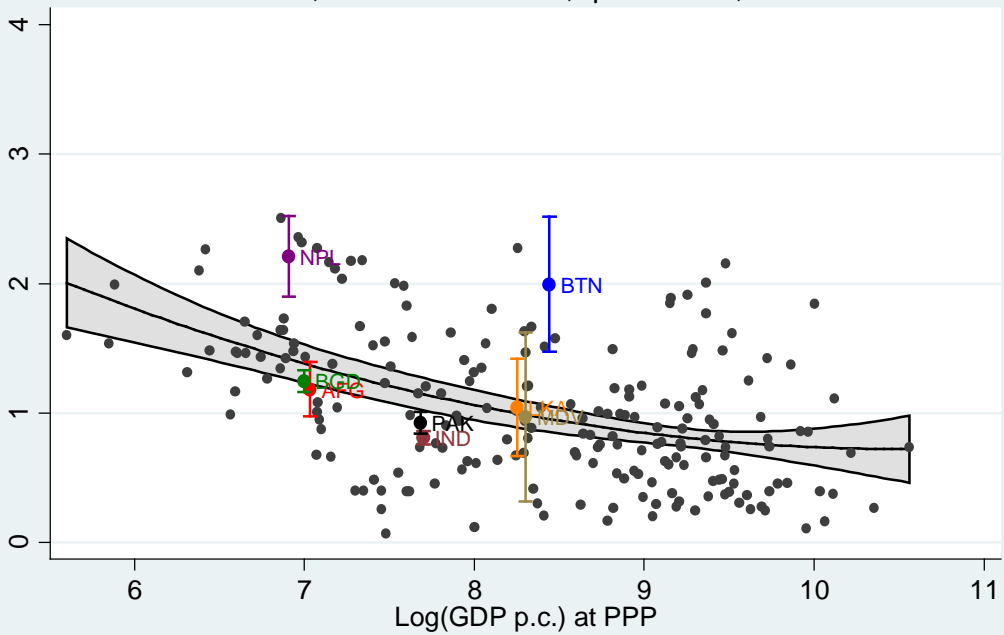
Tax Admin.

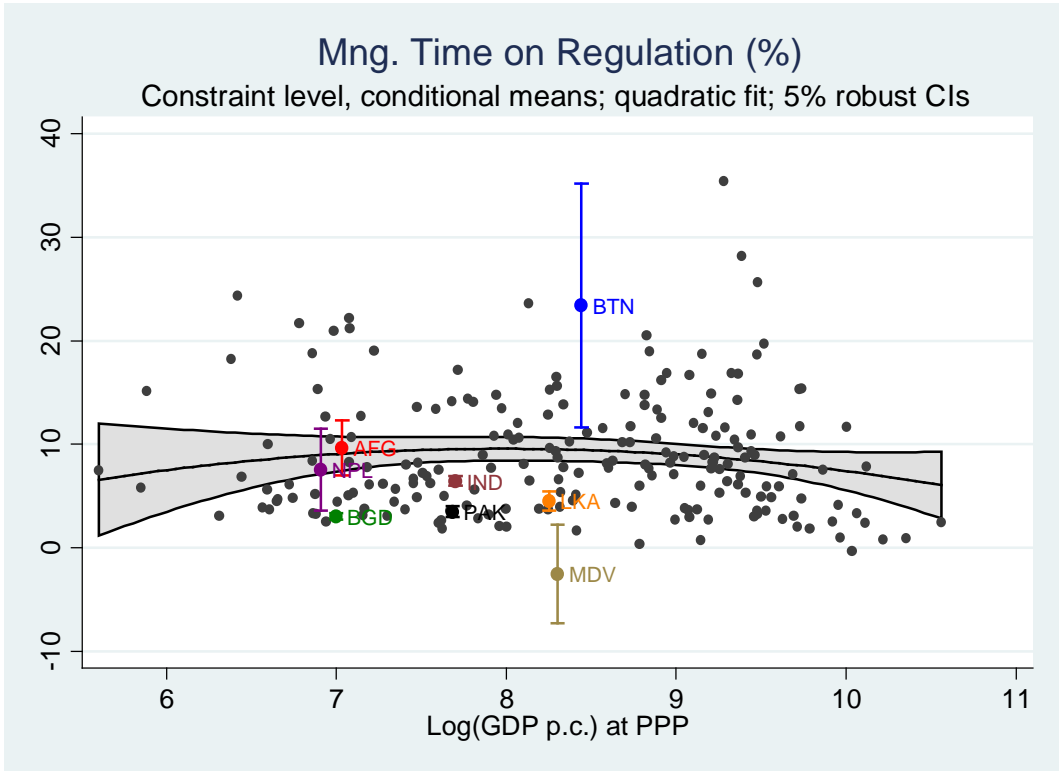
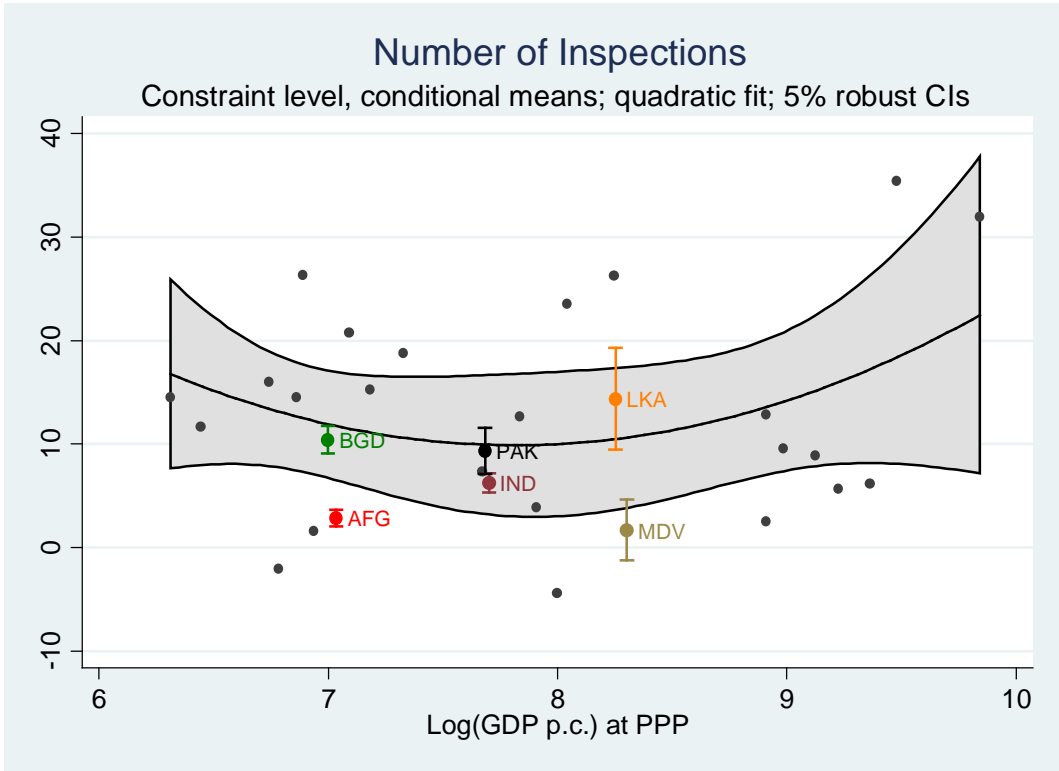
Constraint level, conditional means; quadratic fit; 5% robust CIs



Transport

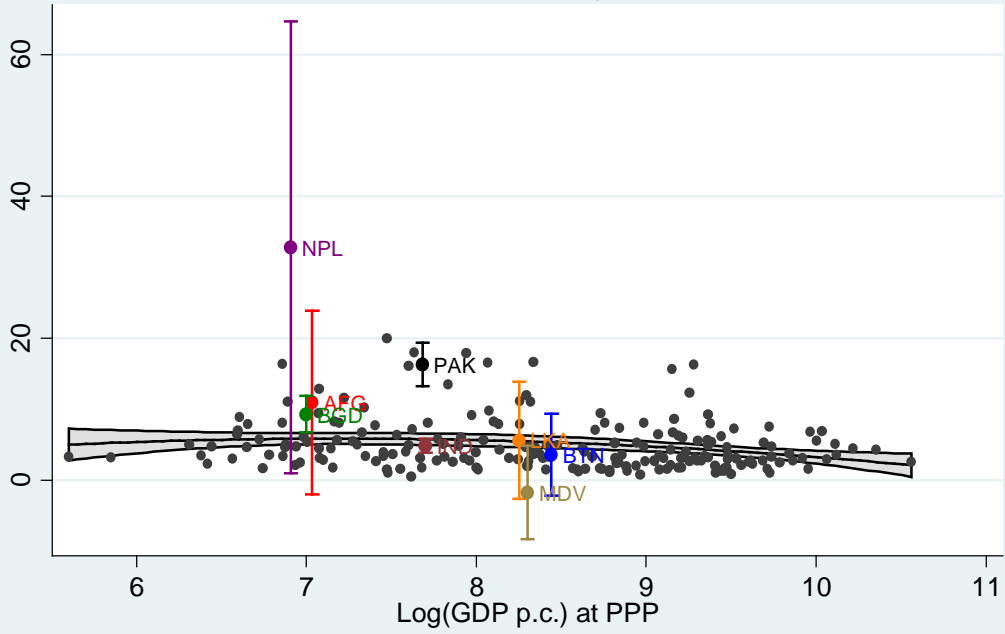
Constraint level, conditional means; quadratic fit; 5% robust CIs





Days to Clear Customs

Constraint level, conditional means; quadratic fit; 5% robust CIs



Bribes (>1% sales)

Constraint level, conditional means; quadratic fit; 5% robust CIs

