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Corruption, the Business Environment, and Small Business Growth in India

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Abstract

This paper estimates a dynamic business growth equation on a sample of small-scale manufacturers. The results suggest that excessive labor regulation, power shortages, and problems of access to finance are significant influences on industrial growth in India. The expected annual sales growth rate of an enterprise is lower where labor regulation is greater, power shortages are more severe, and cash flow constraints are stronger. The effects of each of the three factors on business growth seem also to depend on a fourth element, namely, corruption. Specifically, labor regulation affects the growth only of enterprises for which corruption is not a factor in business decisions. By contrast, power shortages seem to be a drag on the growth only of enterprises self-reportedly held back by corruption. Lastly, sales growth is constrained by cash flow only in businesses that are not affected by labor regulation, power shortages, or corruption. The analysis uses corruption as a proxy for the quality of "property rights institutions" and considers labor regulation and small business financing as instances of "contracting institutions."

The findings on the interaction between corruption and other aspects of business environment then seems to indicate that the quality of property rights institutions exerts more abiding influence on economic outcomes than the quality of contracting institutions. Moreover, there might also be a hierarchy among contracting institutions in their effect on manufacturing growth.

This paper—a product of the Growth and Macroeconomics Division, Development Research Group of the Development Economics Vice Presidency Department—is part of a larger effort in the department to understand the role of institutional factors in sub-national regional inequality in developing economies. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The authors may be contacted at mhonorati@worldbank.org and tmengistae@worldbank.org.

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Produced by the Research Support Team

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1. Introduction

As it becomes all too evident that India's economy has finally 'taken off', two themes have recurred in discourse on its recent and current performance. One is if and when the pace of growth will eventually catch up with China's, or, rather, why that has not happened already. The second is that the rapid growth of the past decade and half has not spread evenly across all the regions of the country, being too concentrated in about half a dozen 'advanced states'. Although lagging regions have also grown consistently over the period, this has been at a much lower pace than the 'advanced regions' (World Bank 2006a; Purfield, 2006). Just as the contrast between India's growth performance and that of China's is most striking in manufacturing, concern with regional inequality within India has also largely related to disparity in industrial growth. It is not necessarily obvious that regional inequality in industrial development per se poses a policy problem for India, any more than does the mere fact that its GDP growth rate has so far been smaller than China's. Still, there does seem to be considerable consensus among experts on some of factors explaining both instances of disparity.

One point of consensus is that India's labor markets are less flexible than China's and probably have made Indian manufacturing industries less competitive in international markets. This is attributed by some to India's highly intrusive labor laws, which, while common to all parts of the country, have also been enforced to a degree that varies considerably across states depending on the political orientation and tradition of state governments. Several studies report that this in turn has generated significant regional differences in effective labor regulation, and is a major reason why industry has not done so well in some states as in others. A second point of consensus on the reasons why manufacturing is not growing as fast in India as it is in China, is that India's physical infrastructure is significantly poorer particularly in the area of power supply to industry. As a result of years of underinvestment associated with serious property rights and contract enforcement problems relating to power, India has been in a state of perennial power shortages that have proved to be a significant drag on manufacturing productivity and growth. Moreover, depending on how supportive local governance and politics have been of power sector reforms, the gravity of this problem has varied enormously across states.

There is less agreement as we move beyond excessive labor regulation and power shortages to other institutional factors behind growth trends in India. However, two potential constraints happen to be rated highly by respondents to World Bank business surveys in the country. These are corruption and access to formal external finance. In fact both of these factors are reported to be constraints by a greater proportion of respondents to those surveys than is labor regulation. At first sight the high rating of access to finance seems hard to square with the facts. As a World Bank report points out India has recently been a net exporter of capital, reflecting its excess savings and low interest rates (World Bank, 2006a). Also, thanks to rapid reforms of the stock market since the early 1990s,

large firms have not had difficulty raising external finance. However, the report also notes that, bank lending to the private sector has hardly increased over the same period. This has partly to do with India's huge fiscal deficits. It is partly because the banking sector remains to be predominantly state-owned and heavily regulated. What this means is that small business access to finance may not have improved significantly over the years since, unlike large firms, SMEs in India are not yet attractive to equity markets or to FDI.

In this paper we analyze enterprise level data from the 2002 and 2005 waves of the Firm Analysis and Competitiveness Survey of India (FACS survey-henceforth) of the World Bank and the Confederation of Indian industry in order to help quantify the effect of all four factors, namely, labor regulation, power shortages, access to finance and corruption on manufacturing growth in India. As we have pointed out already, there is considerable business survey evidence that labor regulation and power shortages are powerful influences on regional differences in industrial growth within India as well as on the growth of Indian industry relative to international comparators. However, we are not aware of similar investigations of the role of the other two factors. How important are corruption and access to finance as influences in manufacturing growth compared to labor regulation or power shortages? How much of the regional gap in industrial growth within India does each of the four factors account for?

We seek to address these questions by estimating a dynamic annual sales growth equation at the enterprise level on the FACS survey dataset for industrially advanced and lagging regions separately, as well as on the all-India sample, with business environment indicators among the right hand side variables. In specifying the equation we have made use of the hierarchy that Acemoglu and Johnson (2005) establish between what they call 'property rights institutions' and 'contracting institutions' as influences on long run economic growth. Property rights institutions provide private agents protection from predation by the state or powerful elites, while contacting institution regulate contracts between private parties. Acemoglu and Johnson argue and offer evidence that property institutions exert stronger influence on long term economic outcomes than contracting institutions. The reason that they give for this is that private agents usually get around the problem of poor contracting institutions by developing informal substitutes for them albeit at a possible cost. On the other hand, there is little they could do to counter predatory exercise of political power and therefore withdraw entirely from activities or transactions that they would have undertaken under secure property rights. In other words, the economic outcomes of the failure of contracting institutions tend to be less extreme than those of the failure of property rights institutions.

Following the contribution of Fernandes and Kraay to World Bank (2006b), we will think of corruption as a proxy for the quality of property rights institutions. As Fernandes and Kraay (2006) argue, corruption is ultimately the use of political authority in order to make private economic gain (in the form bribes). Its incidence should therefore be higher where property rights institutions are weaker. On the other hand we treat labor regulation,

and the financial system as what Acemoglu and Johnson (2005) call 'contracting institutions'. If the Acemoglu-Johnson hypothesis of the primacy of property rights institutions over contracting institutions is correct, and we are right in using corruption as a proxy for the first type of institutions, then one would expect the growth effects of labor regulation, access to finance and power shortages all to depend on the incidence of corruption. Specifically, we would expect weak contracting institutions to be a binding constraint on performance only where property rights institutions are not. One way of testing this is to estimate the effects of the first three conditional on the incidence of corruption and compare the results with those of unconditional (on corruption) estimates of effects, which is what we have done in this paper.

Briefly, we find that labor regulation, power supply and access to finance are all major influences on business growth, accounting for a very large proportion of the SME growth rate gap we observe between what we classify as high-income and high-growth states and states in the low-income and low-growth category. More importantly, and consistent with the Acemoglu-Johson hypothesis, we find that the effect of each of the three factors on business growth is dependent on the incidence of corruption. Specifically, labor regulation is a factor only in the growth of enterprises for which corruption is not a significant influence on business decisions. Secondly, external finance is a constraint only on businesses that are not reportedly affected by labor regulation, power shortages or corruption. Thirdly, there is positive association between corruption and the growth effect of power shortages: power shortages significantly reduce the growth only of enterprises that are self-reportedly held back by corruption.

We note that the positive association between the growth effect of power shortages and corruption is consistent with the Acemoglu-Johnson hypothesis as is the negative association between corruption and the growth effects of labor regulation and poor access to finance. The reason is that while labor regulation and the ease of access to finance relate to contracting institutions, India's persistent problem of power shortages is bound up with property rights problems within the power industry. Specifically, three of the main causes of shortages arise from inadequate protection of the property rights of power companies (World Bank, 2006a). One of these is the excessive transmission and distribution losses of electricity due to theft, which is estimated to be up to one third of total generation. The second is that power companies are often unable to collect large portions of their bills, which can be thought of as an instance of the failure of contract enforcement institutions, which failure is probably related to the political constraints under which enforcement institutions and power companies operate. The third is the governments' tradition of subsidizing household electricity consumption by levying high tariffs on industrial uses. Probably more than anything else, the financial losses that these three factors have imposed on power companies seems to be responsible for the state of long-term underinvestment in generation, distribution and transmission that has sustained the shortages.

The rest of the paper is organized as follows. We describe our data in section 2. We discuss specification, identification, and estimation issues in section 3. Details of estimation results are presented in section 4. Section 5 concludes.

2. Data: regional gaps in performance and institutional environment

The data on which we have estimated business growth equations come from the 2002 and 2005 waves of the FACS survey. The 2002 wave covered some 1856 predominantly small and medium sized enterprises sampled from 11 two-digit industries and 40 cities in 12 states. The states were Andra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Punjab, Tamil Nadu, West Bengal and Uttar Pradesh. The industries were garments, textiles, leather goods, pharmaceuticals, consumer electronics, white goods, machinery, auto parts, metal products, chemicals and plastics, food processing. The 2005 wave successfully revisited 975 of the enterprises surveyed in the 2002 wave and expanded the full sample to 2287 by including more than a dozen new cities from four additional states. The newly added states were Bihar, Jharkhand, Orissa, and Rajasthan. Although the survey instrument diverges significantly between the two waves, there was large enough overlap to generate a panel dataset on a wide range of economic indicators and business environment variables. Also, each wave collected production statistics and financial data on the preceding three years. The length of the panel for production statistics is therefore six years rather than two. It is this aspect of the data that we have exploited in estimating a dynamic specification of sales growth.

In order to bring regional differences in industrial performance and business environment into sharp relief, we have classified the 16 states covered by the FACS survey into a smaller set of categories based industrial development and growth. The idea is to estimate the relationship between growth and business environment variables for each category separately. This allows us take into account the possibility of the heterogeneity or effects of institutions across regions. It is also an essential element of our strategy for the identification of the effects of access to finance on growth. The strategy relies on our interpretation of the coefficient of financial variables in the estimated growth equation. While, there are no unambiguous rules for identifying such effects in the context of a single growth equation, identification is possible through cross equation comparison of coefficients of financial variables.

In view of the small size of the over all sample, we would like to keep the number of categories to the minimum so as to maximize the degrees of freedom available for inference on the sub sample within each category. We also would like to make our categories match as much as possible those already established in the policy literature- that is, with what are already grouped as ‘lagging states’ and those called ‘advanced states’. Following Purfield (2006) we make the classification in two dimensions: level of development and recent growth performance. We measure level of development by per capita income in 1994 and recent growth performance by average annual growth rate in real GDP in the first decade since then. We divide states first by level of development into high-income states and low-income states with the average state level per capita GDP of 1994 as the dividing line. Each of these two groups is then further classified into

high-growth states and low-growth states as the average annual state level GDP growth rate for 1994-2003 as the cutoff point. The combined result is the four-quadrant grouping of states shown in Figure 1, with Gujarat, Haryana, Kerala, Maharashtra and Tamil Nadu as the high-income high-growth group of quadrant I; Andra Pradesh, Karnataka, Rajasthan, and West Bengal as the low-income high-growth states of quadrant II; Bihar, Madhya Pradesh, Orissa and Uttar Pradesh as the low-income low-growth states of quadrant III; and Punjab as the sole high-income low-growth state of quadrant IV. We take Delhi as a quadrant-I state but group Jharkhand along with the low-income, low-growth states.[2] Quadrant-III states are what are sometimes referred to as 'lagging regions' in the policy literature in contrast to the 'advanced states' of quadrant I, with the 'up-and-coming' states of quadrant II in the middle. Our analysis will mainly focus on two- way comparisons of quadrant III or low-income and low-growth states as base group with quadrant I and quadrant II states.

The enterprise performance indicators that we compute from the FACS survey data by state groups are consistent with the macroeconomic performance contrast implied by Figure 1. Thus average sales per worker is highest for enterprises from quadrant-I states but lowest in quadrant- III states (Figure 2) which is consistent with quadrant-I states being richer. Also, consistent with the income disparity between state groups, the gap in output per worker reflects the higher TFP levels of the average enterprise in quadrant-I states. Notice, however, that, although output per worker and productivity are higher in enterprises in higher income states, production is more capital intensive in lower income states. Moreover, wage rates are significantly higher in quadrant-II states than in quadrant-I states. Both suggest that the labor market might be most flexible in quadrant-I states than in quadrant-II states- a suggestion that is born out by matching differences between the two states in terms of the ratings of labor regulation as a constraint to business growth by respondents to the FACS survey.

The patterns in business growth that we see in Figure 3 are also consistent with what we should expect given our state grouping criteria. Average business sales growth rates in low-income low-growth states are less than half of those of enterprises in high growth states. This pattern holds up when we measure growth in terms of fixed assets rather than sales. Though not reported here in detail, one major reason for the pattern is that gross fixed investment rates are consistently lowest in low-income low-growth states than in the higher growth states of both quadrant I and quadrant II. A second reason, but again one details of which are not reported here, is that enterprise productivity growth rates are also consistently and significantly lower in low-income low-growth states than in high-growth states.

These patterns seem to suggest that, over all, the policy and institutional environment of quadrant I and quadrant II states might be more conducive to business growth than that in quadrant III states, or 'lagging regions'. We see from Table 1 that this is indeed the case in terms of the incidence of corruption as our proxy for the quality of property rights institutions, and our indicators of the state of power supply and indicators of two

[2] The difference between the classification in Puriefied (2006) and ours here is that we are using more recent data, and consequently arrive at a slightly different grouping compared to hers.

contracting institutions that the literature identifies to be of particular importance to the performance of Indian industry, namely, labor regulation, the financial system.

The table is based on an item in the instruments of the 2002 and 2005 waves of FACS survey that asked enterprise managers to rate problems in some 20 different elements of their business environment as constraints to their growth and operations on the following scale: 0=no obstacle, 1= minor obstacle, 2=moderate obstacle, 3=Major obstacle, and 4=very sever obstacle. We show in Figure 4 the percentage of respondents that reported problems with each aspect to be a significant obstacle, that is, rated the aspect at scale 2 or higher as a constraint, over the full sample pooled across states, but for each survey wave separately. Although there are sizeable differences between states in terms of the relative importance of any particular element, it is safe to say that corruption, power shortages, access to finance, and labor regulation are rated in both waves among the top 5 or 6 constraints in all states without exception.

Ideally one would seek to identify the effects of all potential growth bottlenecks rated by a significant proportion of respondents in the context of the growth equation we have estimated. Unfortunately this is not feasible for lack of good instruments arising from the fact that we have relatively little variation over time in the ratings. Among the respondent reported bottlenecks the effects of which cannot be identified with the data at hand are problems of tax administration, high taxes, and crime and violence.[3]

As Figure 4 and table 1 indicate, labor regulation is regarded as a significant growth constraint by a sizeable proportion of businesses in both waves. Although this proportion decreased between the two waves of the survey for the full sample, the decline is confined to high growth states (table 1). More significantly, labor regulation is rated as an obstacle by a large proportion of businesses in all state groups, the proportion being twice as large in high-growth states as it is in low growth states. Turning to power shortages, twice as many businesses rate it as an obstacle to growth as those who rate labor regulation in the same way. Unlike labor regulation, power shortages do not seem to have weakened as an obstacle to growth between the two waves if we measure the strength of an obstacle by the proportion of those who report it as such. But, again this conceals the diversity of the situation across states. In fact a smaller proportion of businesses in high-growth states complained about power shortages in the 2005 than did in the same states in the 2002 wave. On the other hand, things seem to have worsened in low growth states in the sense of more businesses complaining about shortages there in 2005 than did in 2002.

About a quarter of enterprises surveyed in 2002 rated problems of access to finance as a moderate to very severe obstacle over the all India sample. This dropped steeply in the 2005 wave, but mainly on account of sharp falls in the proportion reporting the problem in high income states. In contrast, the proportion of who complained about poor access to

[3] Another potentially strong bottleneck to industrial growth that did not turn out to be statistically significant in our growth regression is access to land, which comes out as major factor in McKinsey (2001).

finance nearly doubled between the two waves in low-income states, including high growth ones as well as low-growth states.

The proportion of those who complained against corruption was comparable to those who complained against power shortages. At the same time it was far higher than those who complained against labor regulation or access to finance. This is very much in line with our designation of corruption as proxy for the quality of property rights institution and the link that exists between the latter and the power shortage problem in India. Nearly 40 percent of enterprises in the 2002 wave reported corruption as a moderate to severe obstacle to their growth over the full sample. This too dropped sharply in the 2005, mainly on account of fall in the proportion in quadrant I states. The reduction in quadrant III states was also substantial. The proportion did increase, however, in quadrant II states, and quite drastically.

When managers rate corruption as an obstacle to the growth of their businesses, they usually have in mind payment of bribes as speed money or for access to services and markets. Complaints about access to finance refer to inability to borrow at the going interest rate due to non-price barriers such as high collateral requirements and too much hassle and unpredictability in loan processing. When they complain about labor regulation they often have in mind restrictions on hiring and firing practices including restriction on the hiring of casual or temporary labor. Indeed, the proportion of businesses that cited restrictions on hiring and firing decisions in the 2005 wave was almost as large as the proportion rating labor regulation as an obstacle to growth (table 2). When rating power shortage as a constraint people would seem to consider not only the frequency and unpredictability of power outages and the loss in revenue these entail, but also the cost of generators that businesses have to run as a way of coping with outages. Thus more than 60 percent of businesses in the 2002 wave run their own generators which accounted for nearly a fifth of the electricity they needed (table 3). Although the proportion of business running generators decreased substantially by 2005, the share of own generated electricity actually went up both over the full sample and across state groups, which is consistent with the fact that the proportion of businesses rating power shortages as a growth constraint did not fall between the two waves.

Table 4 provides selected objective indicators of the problems behind managers' ratings of labor regulation, power shortages, access to finance and corruption as constraints to growth as summarized in table 1. The indicators are the frequency of inspection visits that labor officials make to factory floors for labor regulation, the percentage of reported revenue loss due to power outages for power shortages, availability of bank overdraft facility for access to finance, and whether or not a business pays bribes to get things done for corruption. The picture that this table draws of variation in each constraint across state groups is strikingly similar to that we get from table 1. In particular, labor regulation appears to be more widespread or stronger in quadrant I states than in quadrant III states, but the relative position of the two groups of states reverses when it comes to power shortages. Corruption seems to be a more severe or more widespread problem in quadrant III states than in quadrant I states, as seems to be poorer access to finance.

In the business growth equations we will estimate in section 3, we chiefly rely on subjective ratings as regressors, the main exception being that we use hard financial data as indicators of problems of access finance. Part of the reason for this is that they are faithful to the picture provided by objective indicators such as those given in table 4. Part is that survey response rates happen to be much higher for questions inquiring about subjective ratings compared to those asking for objective indicators. We therefore obtain more reliable impact estimates and make more reliable inferences than could be possible if we worked exclusively with data on objective indicators. We offer more formal evidence of the faithfulness of subjective ratings to objective indicators in table 5, which shows marginal effects obtained from the estimation of a probit models of a firm identifying labor regulation, power shortages, poor access to finance or corruption as constraints to its growth. In relating a rating to an objective indicator we control in each case for line of business, state of location, year of observation, and the size and age of the business. Given all of these, the probability that a business rates labor regulation as a constraint increases significantly with the number of labor inspection visits it gets per year. Reported sales loss due to power outages is a significant predictor of the rating of power shortages in the same sense, as is the payment of bribes of the rating of corruption as an obstacle to growth.

Before turning to the relationship between business growth rates and institutional determinants, we note that, on average, businesses grow faster in quadrant I states than in quadrant II states, and in the latter than in quadrant III states. Although our hypothesis is that better institutional quality or better business environment would mean higher average business growth, our business environment indicators do not map into our development categories of states as neatly as this might suggest. For example, high-income states do not score better than low-income states on all four of our indicators, just as we cannot say that high-growth states have a better business environment in all respects than low-growth states. We can nonetheless say that, on the whole, the institutional environment of quadrant I states (or advanced regions) is significantly better than that of quadrant III states (or lagging regions). The only qualification to this statement is that labor regulation is less of a problem in quadrant III states than it is in quadrant I states on the subjective as well as objective indicators of it that we report in tables 3 and 4 respectively. On the other hand, both the subjective indicators of table 3 and the objective indicators of table 4 indicate that the business environment of quadrant I states is better in all the other three areas. In particular both indicators suggest that corruption is a more serious problem in quadrant III states than it is in quadrant I states. This has to be seen in the light of greater importance we attach to corruption than we do to labor regulation or the other two indicators in the light of our interpretation of the incidence of corruption as a proxy for the quality of property rights institutions, and the latter's primacy over contract institutions as determinants of long run economic outcomes. Both power shortages and problems of access to finance are also more severe in quadrant III states than in quadrant I states (table 3), again on subjective as well as subjective indicators (table 4)

3. Empirical framework

The sales growth equations that we estimate is based on the panel data structure that Goddard, Wilson and Blandon (2002) propose as a framework for testing Gibrat's law, that is, roughly the proposition the expected growth rate of a firm is independent of its initial size. Let y_{it} log annual sales of business i in year t. A specification of the DGP of y_{it} nesting Gibrat's law is

$$\Delta y_{it} = \alpha_i + \delta_t + (\beta - 1) y_{it-1} + u_{it}; \quad u_{it} = \rho u_{it-1} + \nu_{it} \tag{1}$$

where α_i and δ_t are firm effects and time effects respectively, ν_{it} is a zero-mean, error term distributed iid normal with variance σ_ν^2; ρ is a persistence parameter, and β is a 'convergence' parameter governing the relationship between the size of a firm and its growth rate. Gibrat's law implies $\beta = 1$, in which case all firms grow at a uniform mean rate (unrelated to size), and the variance and concentration of the size distribution increases over time. If $\beta < 1$, on the other hand, firm size is mean-reverting, smaller firms growing faster, and the variance of the distribution tends to an equilibrium value. For the purpose of estimation we use the following re-parameterization of the process:

$$\Delta y_{it} = \alpha^*_{ii} + \delta^*_t + (\beta - 1) y_{it-1} + \rho \Delta y_{it-1} + \upsilon_{it} \tag{2}$$

where $\alpha^*_i = \alpha_i (1 - \rho)$, $\delta^*_t = \delta_t - \rho \delta_{t-1}$, $\upsilon_{it} = \nu_{it} + \rho(1 - \beta) y_{it-2}$ so that $\upsilon_{it} = \nu_{it}$ under the null $\beta = 1$.

We bring business environment variables into this picture by assuming that they account for some of the unobserved individual firm and time effects subsumed under $\alpha^*_i + \delta^*_t$. The easiest way of identifying the potential effect of access to finance on $\alpha^*_i + \delta^*_t$ is probably to include the financial variables that are commonly included in econometric investment functions to test for liquidity constraints, that is, to augment equation (2) by including lagged profitability, $(\Pi / K)_{it-1}$, and lagged indebtedness, $(D / K)_{it-1}$ among the right hand side variables. The rationale for the augmentation is that terms in such financial variables naturally emerge from the structural investment equation that we estimate in a companion paper.[4] If the same variables do indeed explain any part of the observed variation in investment rates, one would expect then to enter firm growth equations significantly as well.

We seek to assess the effects of corruption, labor regulation and power shortages on $\alpha^*_i + \delta^*_t$ by appending indicators thereof to equation (2) along side of financial variables, or by interacting them with the more basic regressor, that is, with initial size. Again the justification for this is that institutional variables enter investment functions as influences on the user cost of capital or through their association with uncertainty. To the extent that

[4] See Honorati and Mengistae (2007). The equation is due to Bond and Meghir (1994).

they influence the rate of investment through either of these channels, one should expect them to account for part of the observed variation in business growth.

Equation (2) cannot be consistently estimated by OLS since the lagged dependent variables must be correlated with unobserved firm effects of the error term of the specification being estimated. One way of addressing this problem is to use the first difference GMM estimator of Arellano and Bond (1991), which eliminates the unobserved firm effects by first differencing and using appropriately lagged values of all endogenous variables as instruments. This would provide consistent estimates as long as the error term of the levels specification is serially uncorrelated once the firm effects are removed. However, the difference GMM estimator generally performs poorly with our sales growth data which show a high degree of persistence. Blundell and Bond (1998) show that when such persistence is high enough, the first difference GMM estimator could be biased in small samples since lagged values provide weak instruments in that case. We therefore have used instead the GMM estimator that Blundell and Bond (1998) introduced as a solution to this problem. Essentially, the solution leads to the system GMM estimator, which involves to the use of lagged differences of endogenous variables as additional instruments over and above those of the difference estimator.

A problem with our data that could potentially reduce the advantages of the ADL-GMM estimation framework is that we have only two observations on each institutional variable made in two three-year intervals over the six year period covered by our production and investment series. We have sought to surmount this problem by assuming that the value of an institutional variable for a firm during a survey year is the best predictor of the true value of the same indicator for the preceding two year for which production data were collected as part of the same survey. This obviously introduces measurement error into the specifications we have estimated. It also means that the effective number of natural instruments that we have for the institutional variables for the system GMM estimator is quite limited. We have sought to address this problem by using city or location averages of institutional variables as additional (excluded) instruments. The validity of location averages as instruments obviously assumes that location decisions are strictly exogenous or predetermined. While this would be a questionable assumption for large businesses, other studies (e.g., Dollar et al. 2006, and Lall and Mengistae, 2005) suggest that it holds for small scale manufacturers in developing economies.

4. Results

Additional descriptive statistics of the variables used in the growth equations we estimate are provided in table 6. We report in tables 7, 8 and 9 results of GMM-sys estimates of equation (3) over a variety of sub-samples of the FACS dataset, using t-2 and earlier lags in levels of growth, sales, profitability and indebtedness and t-1 and earlier lags in first

differences of the same as instruments. The variable "outage loss" in each of the three tables is the percent of output that managers reported to have lost every year as a result of power outages. It is observed at the individual enterprise level. The variable "constrained by labor regulation" is a dichotomous indicator of whether enterprise management considered labor regulation as a significant obstacle to its growth. Each column in each of the three (save one column in table 7) includes industry dummies (assumed to be endogenous), year dummies, and state dummies. The inclusion of stated dummies is particularly significant here since it removes the risk that our indicators of labor regulation and power shortages are contaminated by unobserved state policy effects. In each of the three tables we report three diagnostic statistics: Hansen's test of overidentification of moment restrictions and the Arellano-Bond test for AR(1) and AR(2) in first differences of errors, labeled as 'm1' and m2 respectively. Figures in parentheses relate to absolute value z-statistics.

Table 7 provides our baseline regressions where we focus on the relationship between business growth and the three 'contracting institution' indicators, namely, labor regulation, access to finance and power shortages, bearing in mind also the property rights dimension of the last of these that we have already highlighted. We report in the first two columns of table 7, results of estimating equation (1), with and without institutional indicators, on the full sample pooled across all 12 states covered in 2002 and 2005 waves of FACS. We report estimates by subsamples of state groups in the other columns of the same table. Since we are controlling for unobserved state and enterprise effects, the absence of corruption or any other direct control for the quality property rights institutions should not bias our estimates of the effects of the contracting institutions. We can therefore conclude that table 7 brings out labor regulation as a powerful drag on business growth especially in high-growth-high income states. However, there is no evidence that it matters at all in low-growth, low-income states, where the coefficient of the constraints dummy is small and not statistically significant. There is also some evidence in the same table that growth is held by power shortages. Although the evidence is not as overwhelming in the table as it is for the effect of labor regulation, the influence of power shortages on business growth is particularly strong for firms complaining about corruption in high-growth, low-income states.

At the same time, there is no evidence in table 7 that growth is constrained by access to finance. If growth occurred under credit rationing, more profitable firms would grow faster on average. A corollary is that businesses that borrow more also grow faster. On the other hand, profitability and borrowing history would enter growth equations with negative coefficients or not at all, if all firms could borrow as much as they wanted at a uniform cost of borrowing. The coefficients of $(\Pi / K)_{it-1}$ negative and statistically significant in all five columns as should be expected in the absence of financial constraints. The coefficient of $(D / K)_{it-1}$ should also be zero or negative in the absence of financial constraints, which is the case in all columns except that of column 4 (for high-growth, low-income states). Since the coefficient of $(\Pi / K)_{it-1}$ is also negative and

statistically significant in column 4 as well, we conclude that there is no evidence that firm growth is financially constrained.

We should note here that the justification for our inclusion of financial variables as indicators of financial constraints and of the interpretation of their coefficients as just stated is that those variables figure as in the structural investment equations such as that in Bond and Meghir (1994). The reason that a positive coefficient of the cash flow variable would indicate that financial constraints to investment is that the structure adequately controls for any expectations of future profitability so that the cash flow variable does not contain any information in that regard. It would then be legitimate to attribute a positive coefficient of the same variable to liquidity constraints rather than to expectations of higher returns to investment. This argument does not necessarily prove that the cash-flow variable of equation (2) does not contain information about prospective profitability so that a positive coefficient of it would necessarily imply financial constraints to growth. However, following Bond et al. (2003) it can be argued that cross-country or regional differences in the size of the coefficient of the cash-flow variable can nonetheless be used to identify financial constraints provided we can assume that the degree to which the cash-flow variable is informative of the future profitability of current investment does not vary between countries or regions.

The main purpose of table 8 is to bring corruption as a proxy for the quality of property rights institutions into the relationship between business growth and indicators of the three 'contracting institutions', namely, labor regulation, power supply, and access finance. This we do by interacting our indicator of corruption not only with the indicators of the contracting institutions but also with all other right hand side variables, that is, by estimating the growth equation for firms constrained by corruption separately state group by state groups. Ideally we should have estimated the growth equation group by group for those unconstrained by corruption as well. Unfortunately this second estimation was feasible only for quadrant I states, there not being a sufficient number of observations for within-group estimation for the other state groups.

If corruption or the quality of property rights institutions matters for business growth directly or through its influence on contracting institutions, then the coefficient vectors of for each group of states should be different between table 7 and table 8. We should also have significant differences between the coefficient vector of column 1 of table 8 and column 5 of the same table. This is in fact the case. In particular, the contrast between columns 1 and 5 of table 8 suggests a negative association between corruption and the effect of labor regulation on growth. According to table 7, labor regulation is a significant drag on firm growth in those states. Table 7 suggest that the effect of labor regulation in high-growth-high-income states mainly reflects its role in the growth performance of businesses unconstrained by corruption since the labor regulation coefficient for firms constrained by corruption is not statistically different from zero. One interpretation of this result in the context of the Acemoglu-Johnson thesis would be that labor regulation becomes a binding constraint to growth only in business settings of

secure property rights, or that labor regulation is of second order concern in settings that property rights are so uncertain that businesses would contemplate few investment projects in any case.

On the other hand, corruption seems to reinforce the adverse effect of power shortages on business growth. The negative impact of power shortages on business growth that we read from the first column of table 7 is primarily reflection of what is happening in the low-income-high-growth group of states and in the high-income low-growth (or quadrant IV) group of states as power shortages do not have statistically significant influence on business growth in the other two-groups of states in the same table. Table 8 suggests that there is positive correlation between the effect of power shortages and that of corruption in both groups of states. In that table, the coefficient of the loss-due-to-outage variable is negative and statistically significant in the two groups of states only for businesses whose growth is reportedly constrained by corruption. A possible explanation for this positive association between corruption and the effect of power shortages on business growth is that power shortages in India partly arise from the ambiguity of property rights under which power form the public grid is provided. One indications of the ill definition of property rights of power companies is that distribution and transmission losses amount up to a third of the power generated partly as a result of theft. A second indicator is that large portions of the bills owed the companies go uncollected probably more for political reasons than because the technical failure of contract enforcement mechanisms. The financial losses of the power companies that stem from these have in turn led to the underinvestment that is behind the shortages. One would expect the underinvestment and the shortages to be more severe in states where property rights are less secure, which is where also we expect the incidence of corruption to be greater.

An obvious point of difference between the sets of estimates in table 7 and table 8 is that the lack of association between access to finance and business growth is far more obvious in the case of firms whose growth is reportedly constrained by corruption. The coefficients of profitability are all negative and statistically significant for this group of firms as are the coefficients for all firms in table 7, but they are also significantly larger in absolute value. Indeed in the case of high-growth-high-income states for which we have estimated a separate equation for firms unconstrained by corruption, the coefficient of the profitability term is not statistically significant. We get a stronger result in terms of the association between corruption and the role of access to finance in business growth when we turn to table 9. This is where we extend the idea of interaction between institutions in impacting on growth by conditioning our estimation of the effect of each contracting institution not on corruption but also on one or more of the other contracting institution indicators.

In the first four-column panel of table 9, we regress financial variables and the cost of power outages alongside basic controls on sales growth conditional on firms being constrained by some combination of labor regulation and corruption. In the second four-column panel, we regress financial variables and being constrained by labor regulation on sales growth conditional on firms being constrained by some combination of power

outages and corruption. The main conclusion that we draw from the regression results of table 7 and table 8 on the relative unimportance of access to finance as a constraint survives by and large this dual conditioning of the regression in table 9. It does turn out, though, that access to finance is in fact a constraint to the growth of businesses that report to be unconstrained by corruption, labor regulation or power shortages. This can be seen from the fact that the coefficient of the profitability term is positive and statistically significant in columns 4 and 8 of the table. The reason that firm growth is not constrained by access to finance in table 7, for example, seems that the average firm is "too constrained" by corruption, power shortages or labor regulation for problems of access to finance to matter. It would thus seem that if corruption has a first order effect on business growth because it is a proxy for the quality of property rights intuitions, and labor regulation has a second order effect on growth as a contracting institution, there seems to a further hierarchy among contracting institutions as influences on growth. In this particular case access to finance seems to have a third order effect in that it becomes a binding constraint only where the property rights are secure and labor markets are flexible enough, or where neither factor is relevant to business decisions.

Turning to magnitudes of impact, how important are labor regulation, power shortages and access to finance quantitatively as influences on business growth? What fraction of the growth gap that we observe between lagging regions and advanced states does each account for? In addressing the second of these questions we note that we have allowed for the entire parameter set of the estimated growth equation to vary between the four regions. One implication of this is that the contribution of any of the three institutional variables on the growth gap between any two state groups would normally have two components- a component due to possible differences in the relevant variable and a component due to possible differences in the coefficient of the variable, that is, in the variable's marginal effect. Suppose the variable of interest is X_K and we are interested in its contribution in the growth gap, Q, between high-growth state group, H, and the low growth groups of states, L. Let β_{kH} be the coefficient of X_K in for H and β_{kL} the corresponding coefficient for L. We know that, as a rule, X_K differs between H and L for any given observation of (X_K, Q). Our estimation results also suggest that $\beta_{kH} \neq \beta_{kL}$. The growth gap between H and L due to their differences in terms of X_K should then have two components one of which originates in the fact $X_{kH} \neq X_{kL}$ and the second of which arises from that $\beta_{kH} \neq \beta_{kL}$. The first corresponds to the "endowment component" of the Oaxaca-Blinder decomposition of earnings differentials while the second corresponds to the 'rate of return" component of the same.[5] Let $\Delta EQ|_{X_k}$ be the growth gap between H and L in terms of Q due to their differences in terms of X_k, all else given. The Oaxaca-Blinder decomposition of the gap is given by

[5] The Oaxaca-Blinder decomposition was introduced into the literature by Oaxaca (1973) and Blinder (1973) in the early 1970's as technique for accounting for wage gaps between labor market groups and sectors. As a purely statistical technique it clearly has a much wider relevance than the analysis of labor market earnings.

$$\Delta EQ|_{X_k} = \beta_{kH}(\overline{X}_{k,H} - \overline{X}_{kL}) + \overline{X}_{kH}(\beta_{kH} - \beta_{kL}) \quad (3)$$

Clearly it is not necessary that $X_{kH} \neq X_{kL}$ for us to attribute part of the growth gap to differences in X_k. It is sufficient that the rate of return varies between the two groups of states.

We present in table 10, the Oaxaca-Blinder decomposition of the effect of labor regulation, power shortages and access to finance on business growth. All effects in the table relate to businesses that are unconstrained by corruption in the sense having reported that corruption was no obstacle to the growth of their businesses. The first panel of the table relates to the growth gap between quadrant I states and quadrant III states. The second relates to the gap between quadrant II states and quadrant III states.

We see from the table that the partial effect of power shortages is as large as the entire actual growth shortfall of low-income low-growth states against high-growth states. It should be noted that the difference between low-income low-growth states and the two groups of high-growth states in this regard is not that power shortages are more sever in low-income low-growth states, which they are not, but rather that the marginal effect of the shortages is stronger. In other words, power shortages contribute to the performance gap between the two groups of states, not as an endowment effect, but as a rate of return effect.

The partial effect of labor regulation on growth is about 40 % of the actual growth shortfall of low-income low-growth states vis-à-vis high-income high growth states and almost twice the actual shortfall against low-income high-growth states. Again one is dealing with a rate-of-return effect of labor regulation. The labor regulation indicator is actually better in low-income low-growth states, and the growth rate should have been higher in low-income low-growth states than in the other groups of states on this account alone if differences in marginal effects of labor regulation did not work against better performance in the low-income low-growth group.

5. Summary and conclusion

Based on the analysis of data from the FACS survey of the World Bank and the Confederation of Indian Industry, this paper has offered a quantitative assessment of the effects of corruption, labor regulation, access to finance and the quality of power supply on the growth of manufacturing businesses in India. All four institutional factors are highly rated by business managers as obstacles to business operations and business growth almost in every state covered by the survey. The ratings are backed up by data on objective indicators of the incidence of corruption, the intrusiveness of labor regulation, the costliness of power shortages and the quality of access to formal external finance. India's states vary enormously on all these indicators just as they do in terms of per capita incomes and GDP growth.

Businesses are most productive on average in what we have classified as high-income and high-growth states (or"quadrant-I states"), but least productive in low-income, low-growth states ("quadrant-III states'). Businesses in low-income high-growth states (or

'quadrant-II states') capture the middle ground in terms of productivity. Business growth rates are also much higher in high-growth states than in low-growth rates. The paper has shown that, although these patterns in business performance rates do not map neatly into a pattern whereby the better performing states are also better in every important aspect of their business environment. It remains to be the case that low-income, low-growth states have the worst indicators of all institutional variables except for labor regulation. Corruption appears to be most prevalent in those states while the cost of power outage and poorer access to finance are also highest for the same group of states.

In order to assess the role of the four institutional variables in the performance gaps between the four groups of states, we have estimated a dynamic business growth equation for each group of states on the FACS survey sample. Our estimates show that excessive labor regulation, power shortages and problems of access to finance are all significant influences on industrial growth in India. The average business growth rate is lower where labor regulation is greater, power shortages are more severe, and financial constraints stronger. We also find that the effect of each of the three factors on business growth depends on the incidence of corruption. Specifically, labor regulation affects the growth only of enterprises for which corruption is not of any concern in business decisions. On the other hand, power shortages are a drag on the growth only of enterprises self-reportedly held back by corruption. Lastly, sales growth is constrained by cash-flow only in businesses that are not affected by labor regulation, power shortages or corruption. We have interpreted this as indication that corruption is a proxy for something more fundamental than the payments of bribes, namely, the quality of 'property rights institutions' in the sense of Acemoglu and Johnson (2005). On the other hand, our indicators of labor regulation and access to finance gauge the quality of 'contracting institutions'. The positive association between the growth impact and power shortages can be explained by the fact that there is a property rights dimension to power shortages in India. Our findings on the interaction between corruption and other three institutional variables is therefore consistent with the Acemoglu-Johnson view that the quality of property rights institutions exerts more abiding influence on economic outcomes than the quality of contracting institutions. Further, our findings suggest that there might also be a hierarchy among contracting institutions as influences on growth. Specifically, it looks that employment contract institutions dominate over financial institutions in as far as access to finance constrains the growth only of businesses unaffected by labor regulation.

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Table 1. Percent of reporting factor as significant constraint to business growth

Proportion of those constrained by	Panel firms			All firms		
	2001	2004	Δ(04-01)	2001	2004	Δ(04-01)
Labor regulation						
Low income states:						
Low growth	0.09	0.10	0.01	0.07	0.09	0.02
High growth	0.23	0.21	-0.02	0.28	0.21	-0.07
High income states:						
Low growth	0.12	0.22	0.10	0.15	0.24	0.09
High growth	0.19	0.13	-0.07	0.19	0.13	-0.06
Total	0.17	0.14	-0.03	0.17	0.14	-0.03
obs.	1042	1173		1972	2274	
Power shortages						
Low income states:						
Low growth	0.54	0.55	0.02	0.47	0.61	0.14
High growth	0.18	0.15	-0.03	0.16	0.28	0.12
High income states:						
Low growth	0.24	0.41	0.17	0.24	0.36	0.12
High growth	0.27	0.20	-0.07	0.27	0.24	-0.03
Total	0.30	0.30	0.00	0.29	0.36	0.07
obs.	1050	1174		1981	2279	
Access to finance						
Low income states:						
Low growth	0.11	0.29	0.18	0.07	0.25	0.18
High growth	0.15	0.29	0.14	0.11	0.23	0.12
High income states:						
Low growth	0.27	0.20	-0.06	0.18	0.12	-0.06
High growth	0.31	0.13	-0.17	0.23	0.11	-0.13
Total	0.25	0.19	-0.06	0.17	0.16	-0.01
obs.	1177	1177		1981	2279	
Corruption						
Low income states:						
Low growth	0.43	0.36	-0.08	0.39	0.30	-0.08
High growth	0.21	0.33	0.12	0.33	0.34	0.01
High income states:						
Low growth	0.35	0.32	-0.03	0.37	0.35	-0.01
High growth	0.41	0.21	-0.20	0.39	0.23	-0.16
Total	0.39	0.27	-0.13	0.38	0.28	-0.10
obs.	1050	1174		1978	2279	

Table 2 . Aspects of labor regulation, 2005

	Proportion facing cost/restriction of dismissal	Proportion of facing restrictions on casual labor	Proportion facing restrictions on hiring temporary workers
Low income states:			
Low growth	0.10	0.11	0.06
High growth	0.26	0.20	0.13
High income states:			
Low growth	0.07	0.06	0.05
High growth	0.11	0.10	0.10
Total	0.13	0.11	0.09
obs.	2267	2271	2270

Table 3. Coping with power shortage

	Panel firms			All firms		
	2001	**2004**	**Δ(04-01)**	**2001**	**2004**	**Δ(04-01)**
Proportion owning generator:						
Low income states:						
Low growth	0.56	0.58	0.02	0.56	0.56	-0.01
High growth	0.56	0.51	-0.05	0.56	0.39	-0.17
High income states:						
Low growth	0.44	0.33	-0.11	0.42	0.30	-0.13
High growth	0.68	0.59	-0.08	0.70	0.59	-0.11
Total	0.61	0.55	-0.07	0.62	0.52	-0.10
obs.	1011	1141		1759	2219	
Electricty from own generator (%)						
Low income states:						
Low growth	16.68	21.09	4.41	16.56	26.89	10.32
High growth	21.57	24.10	2.53	22.50	19.60	-2.90
High income states:						
Low growth	12.64	19.29	6.64	11.72	22.47	10.75
High growth	19.81	18.08	-1.73	21.40	19.57	-1.83
Total	18.23	19.25	1.01	18.97	21.90	2.93
obs.	1011	608		1759	1126	

Table 4. Selected business environment indicators

	Panel firms			All firms		
	2001	2004	Δ(04-01)	2001	2004	Δ(04-01)
Labor inspection visits per year						
Low income states:						
Low growth	1.20	1.65	0.45	1.09	1.41	0.32
High growth	1.11	1.61	0.50	1.02	1.55	0.53
High income states:						
Low growth	0.95	1.06	0.10	1.28	1.04	-0.24
High growth	2.22	2.15	-0.07	2.08	1.91	-0.17
Total	1.69	1.85	0.16	1.61	1.62	0.01
obs.	583	1101		1073	2157	
Sales lost to outages (%)						
Low income states:						
Low growth	15.91	8.04	-7.87	13.77	11.47	-2.29
High growth	5.66	3.39	-2.27	6.30	4.83	-1.47
High income states:						
Low growth	7.21	5.41	-1.79	7.49	5.78	-1.70
High growth	7.65	6.21	-1.44	8.29	6.47	-1.82
Total	8.97	6.39	-2.58	8.89	7.78	-1.11
obs.	926	822		1780	1674	
Proportion with overdraft facility						
Low income states:						
Low growth	0.45	0.48	0.03	0.43	0.41	-0.02
High growth	0.63	0.58	-0.06	0.57	0.55	-0.02
High income states:						
Low growth	0.55	0.53	-0.02	0.55	0.48	-0.07
High growth	0.65	0.66	0.00	0.62	0.60	-0.01
Total	0.60	0.60	-0.01	0.57	0.53	-0.04
obs.	1041	1174		1976	2282	
Proportion reporting payment of bribes						
Low income states:						
Low growth	0.58	0.72	0.14	0.56	0.51	-0.06
High growth	0.46	0.46	-0.01	0.45	0.44	-0.01
High income states:						
Low growth	0.78	0.47	-0.31	0.75	0.40	-0.35
High growth	0.67	0.55	-0.12	0.62	0.51	-0.11
Total	0.66	0.57	-0.09	0.62	0.49	-0.14
obs.	906	1169		1740	2269	

Table 5. Objective vs. Subjective Indicators

	Probit Estimates - Marginal effects			
	Labor regulation is an obstacle	**Power shortage is an obstacle**	**Poor access to finance is as an obstacle**	**Corruption is an obstacle**
Number of labor inspections	0.052*			
	(0.012)			
Business age	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Log employment	0.002	0.022*	0.007	-0.006
	(0.007)	(0.008)	(0.007)	(0.007)
Located in a big city	0.009	-0.081**	-0.006	0.043
	(0.031)	(0.034)	(0.033)	(0.029)
% sales lost because of power outages		0.009*		
		(0.001)		
Share of external finance			-0.001*	
			(0.000)	
Pays bribes				0.156*
				(0.017)
Dummies for Industry	yes	yes	yes	yes
Dummies for States	yes	yes	yes	yes
Dummies for Year	yes	yes	yes	yes
Observations	2,061	3,100	2,469	3,603
R-squared	0.084	0.139	0.065	0.050
note: .01 - *; .05 - **; .1 - *;**				

(Standard Errors in parentheses)

Table 6: More descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
All states:					
y_{it}	4997	8.79	1.73	4.35	17.26
Δy_{it}	3461	0.09	0.41	-0.99	4.83
$(\Pi / K)_{it-1}$	4997	0.43	0.33	-1.00	1.00
$(D / K)_{it-1}$	4997	0.65	0.61	0.00	4.96
High-income high growth states:					
y_{it}	2319	8.83	1.63	4.35	17.26
Δy_{it}	1674	0.09	0.48	-0.99	4.66
$(\Pi / K)_{it-1}$	2368	0.46	0.32	-1.00	1.00
$(D / K)_{it-1}$	2368	0.61	0.62	0.00	4.84
Low-income high growth states:					
y_{it}	1234	9.02	2.34	4.39	16.03
Δy_{it}	848	0.08	0.35	-0.99	4.83
$(\Pi / K)_{it-1}$	1292	0.35	0.36	-0.96	1.00
$(D / K)_{it-1}$	1292	0.78	0.71	0.00	4.96
Low-income low-growth states:					
y_{it}	965	8.42	1.33	4.83	14.97
Δy_{it}	646	0.11	0.38	-0.91	3.98
$(\Pi / K)_{it-1}$	978	0.38	0.32	-1.00	1.00
$(D / K)_{it-1}$	978	0.58	0.54	0.00	4.39
High-income low-growth states:					
y_{it}	479	8.70	0.41	7.35	10.77
Δy_{it}	360	0.04	0.20	-0.88	1.64
$(\Pi / K)_{it-1}$	480	0.55	0.20	-0.29	1.00
$(D / K)_{it-1}$	480	0.59	0.25	0.00	4.05

Table 7. Dynamic firm growth equations: GMM-sys estimates, all businesses

Dependent variable: annual sales growth= Δy_{it}

	(1)	(2)	(3)	(4)	(5)	(6)
	All states	All states	High-income high- growth states	Low-income high-growth states	Low-income low-growth states	High-income low-growth states
y_{it-1}	0.007	-0.207	-0.060	0.009	-0.027	-0.056
	(0.40)	(1.42)	(1.39)	(0.15)	(1.07)	(2.25)*
Δy_{it-1}	-0.035	-0.013	-0.027	-0.041	0.084	0.009
	(3.04)**	(0.90)	(1.91)	(1.30)	(6.89)**	(0.80)
$(\Pi / K)_{it-1}$	-0.122	-0.113	-0.195	-0.110	-0.149	-0.129
	(2.10)*	(0.85)	(2.18)*	(2.41)*	(2.61)**	(2.81)**
$(D / K)_{it-1}$	0.017	0.079	0.042	0.248	0.044	-0.434
	(0.63)	(1.70)	(1.21)	(6.99)**	(0.83)	(7.43)**
Outage loss	-0.009		-0.011	-0.018	-0.006	0.004
	(1.61)		(0.91)	(1.10)	(0.86)	(1.56)
Constrained by labor regulation	-0.162		-0.359	-0.369	-0.045	-0.073
	(1.85)		(2.45)*	(1.37)	(0.49)	(1.84)
Constant	0.217	2.101	1.340	-0.441	0.499	0.796
	(1.03)	(2.03)*	(3.09)**	(0.60)	(1.74)	(3.57)**
Observations	2087	2089	1034	437	360	256
Number of businesses	1301	1303	609	335	244	113
Overidentification test:						
Chi-square	69.45	21.02	53	31.7	42.7	42.8
P-value	0.4	0.86	0.40	0.85	0.48	0.20
AR in first dif. error (z-stat):						
m1	-5.29	-3.66	-4.04	-2.46	-2.65	-3.36
m2	-0.58	-0.03	0.35	1.14	2.09	-1.04

Absolute value of z-statistics in parentheses All columns excpet col.2 include state, industry and year dummies

* significant at 5% level; ** significant at 1% level

Instruments: lags of growth, sales, profitabilability and indebtedness variables t-2 onwards,
one step lagged first differences of the same, state of location, year of observation
lagged business envirnoment variables, and city averages of business environment variables

Table 8.-Dynamic firm growth equations: GMM-sys estimates, by state group, only businesses reportedly constrained by corruption

Dependent variable: annual sales growth= Δy_{it}

	Constrained by corruption				Unconstrained by corruption****
	(1)	(2)	(3)	(4)	(5)
	High-income high- growth states	Low-income high-growth states	Low-income low-growth states	High-income low-growth states	High-income high- growth states
y_{it-1}	0.017	0.056	-0.089	-0.159	-0.076
	(0.46)	(1.44)	(1.78)	(4.67)**	(2.30)*
Δy_{it-1}	-0.041	0.061	-0.033	0.061	0.009
	(2.99)**	(2.01)*	(1.24)	(4.88)**	(0.82)
$(\Pi / K)_{it-1}$	-0.346	-0.424	-0.448	-0.142	0.010
	(3.70)**	(3.10)**	(3.81)**	(4.53)**	(0.09)
$(D / K)_{it-1}$	0.048	0.034	-0.066	-0.579	-0.078
	(1.25)	(0.31)	(1.30)	(19.75)**	(2.41)*
Outage loss	-0.010	-0.025	0.001	-0.012	0.005
	(1.26)	(2.08)*	(0.15)	(2.72)**	(0.49)
Constrained by labor regulation	-0.230	0.053	-0.072	-0.152	-0.168
	(1.20)	(0.33)	(0.57)	(3.62)**	(2.38)*
Constant	0.382	0.061	1.544	1.980	0.801
	(1.15)	(0.10)	(4.01)**	(6.51)**	(2.34)*
Observations	714	280	207	205	320
Number of businesses	449	233	159	93	222
Overidentification test:					
Chi-square	44.5	24.7	33.5	37.2	48.5
P-value	0.73	0.94	0.79	0.42	0.53
AR in first dif. error (z-stat):					
m1	-3.47	-1.26	-2.86	-3.12	-2.17
m2	-0.35	1.05	-0.73	-0.71	1.45

Absolute value of z-statistics in parentheses. All columns include state, industry and year dummies

* significant at 5% level; ** significant at 1% level

*** There are too few observations to estimate equations for unconstraine firms separately for each of the other three groups of states

Instruments: lags of growth, sales, profitabilability and indebtedness variables t-2 onwards, one step lagged first differences of the same, state of location, year of observation lagged business envirnoment variables, and city averages of business environment variables

Table 9.-Dynamic firm growth equations: GMM-sys estimates, all states and by assessment of corruption, labor regulation and power shortages as a constraint to growth

Dependent variable= Δy_{it}

	Labor regulation				Power shortages			
	Constrained by corruption		Unconstrained by corruption		Constrained by corruption		Unconstrained by corruption	
	Constrained by labor regulation	Unconstrained by labor regulation	Constrained by labor regulation	Unconstrained by labor regulation	Constrained by power shortages	Unconstrained by power shortages	Constrained by power shortages	Unconstrained by power shortages
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
y_{it-1}	-0.022	-0.008	-0.045	0.058	0.014	-0.041	0.039	-0.001
	(1.07)	(0.36)	(1.52)	(2.39)*	(0.82)	(2.29)*	(2.23)*	(0.04)
Δy_{it-1}	0.000	0.006	-0.082	-0.069	-0.029	0.034	-0.044	-0.017
	(0.00)	(0.55)	(7.55)**	(4.41)**	(1.56)	(2.68)**	(4.55)**	(0.87)
$(\Pi / K)_{it-1}$	-0.311	-0.051	-0.380	0.254	-0.162	-0.280	-0.110	0.151
	(4.16)**	(1.07)	(9.73)**	(2.93)**	(2.84)**	(3.98)**	(1.75)	(2.66)**
$(D / K)_{it-1}$	0.086	-0.048	-0.017	-0.065	-0.014	0.049	-0.062	-0.107
	(2.34)*	(1.41)	(0.90)	(3.20)**	(0.49)	(1.03)	(3.30)**	(2.98)**
Outage loss	0.004	-0.003	-0.033	-0.015				
	(0.75)	(1.01)	(3.12)**	(2.04)*				
Constrained by labor regulation					-0.062	0.025	-0.199	-0.273
					(0.53)	(0.35)	(3.74)**	(3.21)**
Constant	0.304	0.294	0.268	0.253	0.319	0.521	-0.408	0.639
	(1.23)	(1.19)	(0.44)	(0.71)	(1.46)	(2.12)*	(1.80)	(2.28)*
Observations	934	472	268	413	1070	336	416	265
Number of businesses	660	335	197	319	724	259	313	200
Overidentification test:								
Chi-square	62.7	43.9	45.6	53.0	70.6	51.2	50.5	58.8
P-value	0.45	0.91	0.81	0.73	0.24	0.50	0.68	0.34
AR in first dif. error (z-stat):								
m1	-2.99	-4.25	-2.70	-2.76	-3.97	-2.12	-3.05	-2.03
m2	-1.41	1.56	1.04	-0.23	-2.10	1.42	1.45	-0.33

Absolute value of z-statistics in parentheses. All columns include industry, state and year dummies.
* significant at 5% level; ** significant at 1% level
Instruments: lags of growth, sales, profitabilability and indebtedness variables t-2 onwards, one step lagged first differences of the same, state of location, year of observation lagged business envirnoment variables, and city averages of business envirnment variables.

Table 10. Oaxaca-Blinder decompostion of effect of business environment variables on growth

Only businesses unaffected by corruption

Performance indicator: Business environment variable	Combined effect $\Delta Ey\|_{X_k}$	Endowment effect $\beta_{kH}(\overline{X}_{k,H} - \overline{X}_{kL})$	Rate of return effect $\overline{X}_{kH}(\beta_{kH} - \beta_{k,L})$
	H=high income high-growth states vs. L=low-income low -growth states		
Power shortage	0.144	0.000	0.144
Labor regulation	0.019	-0.021	0.039
Actual growth gap	0.051		
	H=low income high-growth states vs. L=low-income low -growth states		
Power shortage	0.144	0.000	0.144
Labor regulation	0.094	0.000	0.094
Actual growth gap	0.052		

Figure 1:

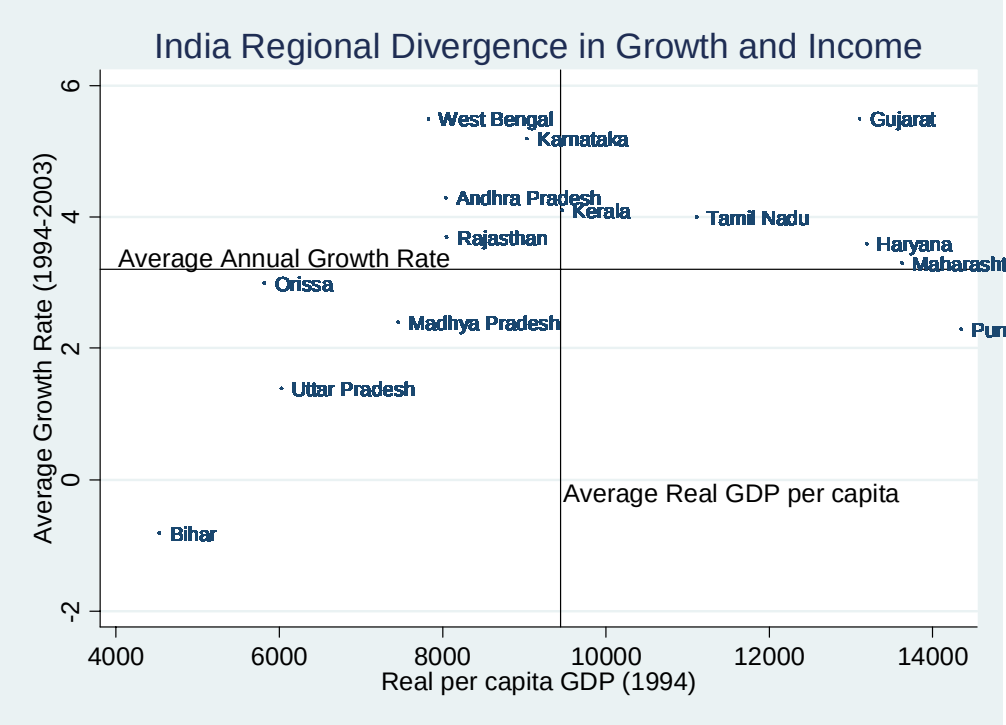


Figure 2: Manufacturing productivity by state groups

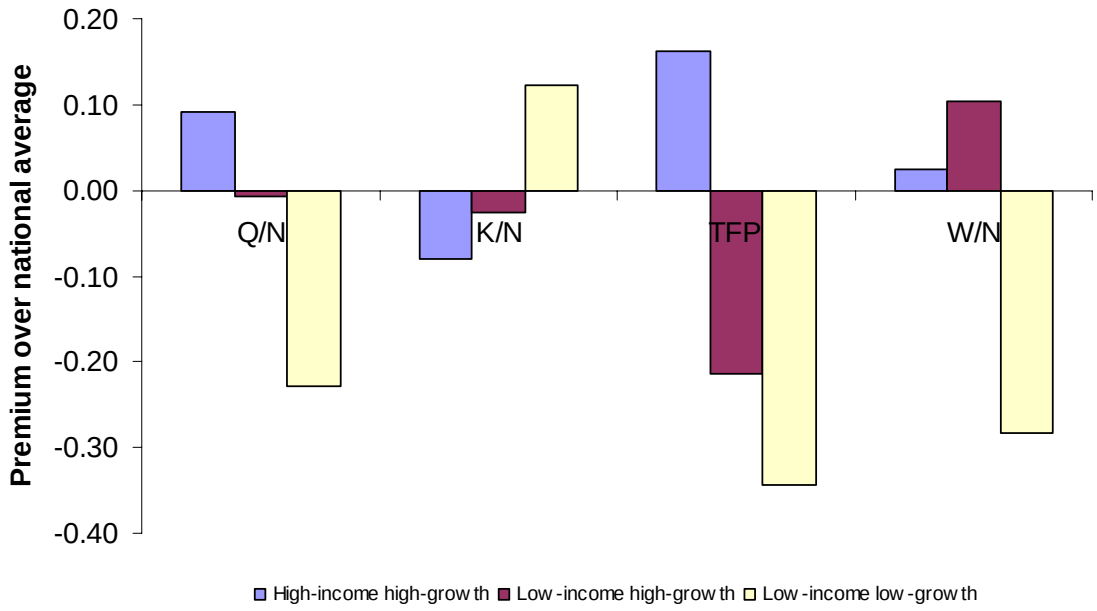


Figure 3: Annual sales growth rate

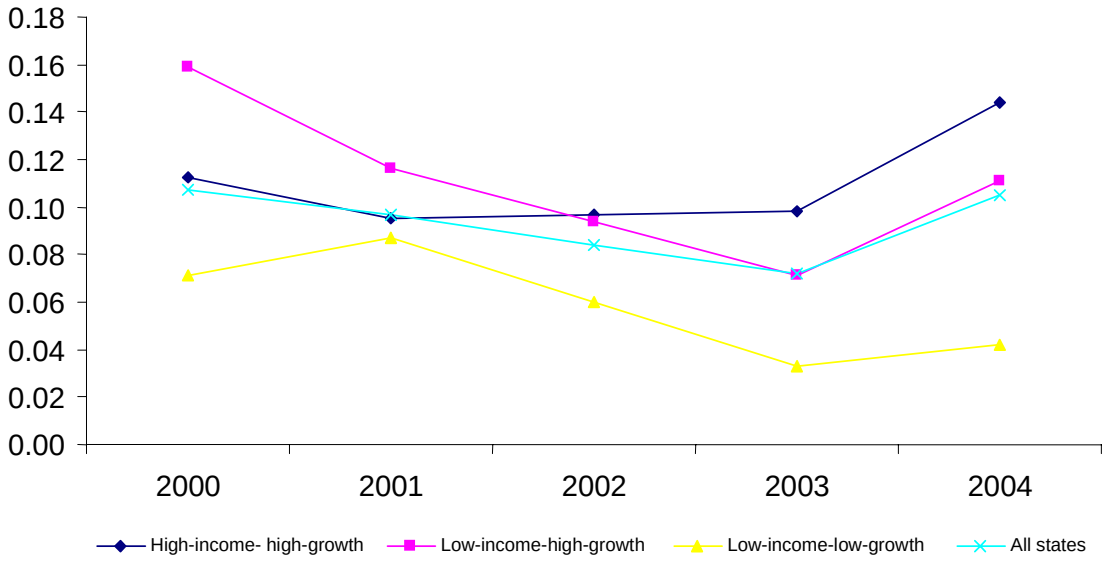


Figure 4. Percentage of firms that reported the following issues as obstacles to their activity
India

