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What influences firms' perceptions?

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ABSTRACT

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Perceptions-based indicators are sometimes used to measure the quality of the business environment. For instance, firms are asked about the major constraints on business operations and expansion. Little is known, however, about what shapes their responses. In this paper, using perceptions-based indicators from 38 countries (84 country-year pairs) from the World Bank Enterprise Surveys, we argue that firm responses are critically influenced by macroeconomic conditions. Paradoxically, we find that perceptions worsen during periods of high GDP growth. We also examine other indicators from the Enterprise Surveys that are objective measures of constraints, and find mixed evidence on how business constraints vary with the business cycle. Finally, we find that firms that introduce new product lines, which are likely those with the most interactions with regulatory agencies, have particularly bad perceptions of the business environment. We conclude that changes in firms' perceptions over time may not reflect changes in the business environment. *Journal of Comparative Economics* **38** (4) (2010) 419–431. Inter-American Development Bank, Labor Markets Unit, 1300 New York Ave. NW, Stop W0616, Washington, DC 20577, United States; Cornerstone Research, 353 Sacramento St, 23rd Floor, San Francisco, CA 94111, United States.

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1. Introduction

Institutions have increasingly become the focus of research in economic growth and development. Although there is no universally accepted definition of institutions, a number of groups have developed indicators that purport to measure institutional quality. Some examples include the World Bank Doing Business indicators, the World Bank Environment Survey, the World Economic Forum's Global Competitiveness Index, the Heritage Foundation's Index of Economic Freedom, the Fraser Institute's Economic Freedom of the World Report, the IMD's World Competitiveness Yearbook, and Transparency International's Corruption Perceptions Index. These indicators seek to measure various aspects of both the *de jure* and the *de facto* institutional environment such as regulation as encoded in laws and policy frameworks, judicial competence and independence, corruption, quality of enabling infrastructure, and labor force quality and availability. The indicators are often used to rank countries and to monitor changes within countries over time. They can serve to spur debate and policy reform.

The indicators rely on a mix of 'hard' and 'soft' data. Examples of hard data include the corporate tax rate, tariff burden, the number of licenses required to start a business, etc. Soft data are perceptions-based and typically drawn from surveys of managers and business leaders. For instance, the IMD's World Competitiveness Yearbook reports that it uses 131 criteria based on hard data and 77 criteria based on an annual executive opinion survey to rank countries on the basis of their competitiveness. The survey respondents are sampled from the top and middle management ranks of enterprises within

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a country. An example of a survey question is: 'Do you agree that skilled labor is readily available?' Responses are coded as varying degrees of agreement on a scale of 0–6.

Similarly, the World Bank Enterprise Surveys ask managers about their perceptions of the severity of potential obstacles to the current operations of the firm. Obstacles listed include telecom infrastructure, tax rates, tax regulations, customs and trade regulations, requirements for licensing and operating permits, skills and education of the labor force, etc. The Global Competitiveness Report also conducts an annual Executive Opinion survey. Respondents are asked to evaluate, on a scale of 1–7, the current conditions of their particular operating environment. An example of a typical survey question is "Intellectual property protection in your country is weak and not enforced," with 1 denoting strong agreement and 7 denoting strong disagreement.

Economists have traditionally preferred to work with 'hard' data. For instance, in welfare analyses, they prefer to use revealed choice measures of well being. However, [Kahneman and Krueger \(2006\)](#) survey recent developments in the use of subjective measures of well being and find a rapid growth in economics research in this field. Using data from Econlit, they find that more than 100 articles were published from 2001 to 2005 that used subjective measures. Over the period from 1991 to 1995, however, only five articles were published that used subjective measures.

Perception-based indicators are useful in capturing aspects of the institutional environment for which there are few objective measures. They are particularly useful in measuring the *de facto* environment, that is, rules and regulations as experienced by firms and not just what is on the books. For instance, a country may have strong patent protection on paper and yet weak or ineffective enforcement on the ground. Perception-based indicators can also serve as an external check against macroeconomic indicators. For instance, [Nordhaus \(1998\)](#) and [Krueger and Siskind \(1998\)](#) investigate the bias in inflation indices such as the Consumer Price Index (CPI). Nordhaus compares the self-reported change in financial condition from the survey of consumer behavior done by the Survey Research Center at the University of Michigan to the growth in median household income deflated by the CPI. He finds an inconsistency between households' perceptions of the change in financial condition and the change in inflation-adjusted household income, leading him to conclude that the CPI is biased upwards by about 1.5% points per year. Krueger and Siskind replicate Nordhaus' analysis using median income from the Panel Study on Income Dynamics and find a similar bias in the CPI. However, when they use an alternative approach—the actual fraction of households whose incomes increased or decreased—they find no bias in the CPI.

However, there are conceptual and measurement problems with perception-based indicators. The conceptual problem is the frequent lack of clarity on what is really being measured. The measurement problems are errors that may go beyond white noise; these indicators may be biased in systematic ways. [Bertrand and Mullainathan \(2001\)](#) summarize some of the large experimental literature that shows that subjective survey data can have systematic measurement errors. These errors can arise due to cognitive factors linked to the framing and wording of questions, and the order in which questions and alternative responses are presented. These errors can also arise from the social nature of the survey procedure with respondents shading their answers to what they think the surveyor wants to hear.

Another potential concern with perceptions-based indicators relates to the composition of the respondents. For instance, perceptions of a representative sample of registered firms on the restrictiveness of labor laws may not be indicative about the true social cost of such laws. Many firms may not be included in the survey because they choose to remain unregistered or small. Other potential entrepreneurs may not operate a firm at all because of these laws.

[Donchev and Ujhelyi \(2008\)](#) argue in favor of objective measures of corruption experience. They find that some of the widely used perception indices to measure corruption differ significantly from actual corruption experience. Donchev and Ujhelyi find that perceptions-based corruption indices are affected by numerous factors that are unrelated to actual corruption. [Olken \(2007\)](#) also finds systematic discrepancies between an objective measure of corruption in road building projects in Indonesia and perceived corruption as reported by villagers.

In this paper, we investigate whether macroeconomic shocks can influence perception-based indicators. Specifically, we study the association between perception-based indicators in the World Bank Enterprise Surveys and GDP growth rates. The Enterprise Surveys have a section in which managers are asked to judge the severity of potential obstacles to the operations of their firms. The listed obstacles cover areas such as infrastructure, laws, taxes, labor force, trade, corruption, crime, and macroeconomic policies, etc. Managers rate the severity on a 0–4 scale where 0 represents "No Obstacle" and 4 denotes "Severe Obstacle."

There are at least two plausible hypotheses on how overall macroeconomic conditions can influence managers' responses. During periods of high economic growth, firms tend to do well and managers are 'happy' and tend to complain less about the business climate. If so, we expect to see a negative correlation between GDP growth and the judged severity of obstacles. [Rodrik \(2004\)](#) makes this argument. Another reason for a negative correlation between GDP growth and the judged severity of obstacles is that firms could 'bump up' against some of these obstacles in bad times. Labor laws governing dismissals, for example, may become particularly binding in bad times when firms are downsizing.

On the other hand, it may be the case that firms 'bump up' against constraints in good times rather than in bad times. If so, managers may complain more about the business climate during good times and we would expect a positive correlation between GDP growth and perceived severity. For example, the manager of a fast growing firm may wish to expand production by adding a new assembly line for which he may have to apply for a permit and a new electric connection, and procure more land. All these activities may prove costly and complex depending on the prevailing regulations and existing infrastructure.

We find that perceptions of the business climate generally worsen during periods of high GDP growth rates. Could worsening perceptions reflect worsening institutional or infrastructural quality? If constraints do indeed become more binding during high-growth years, we would expect a deterioration of objective measures of the business environment. We examine

other indicators from the Enterprise Surveys that in principle should be more objective measures of the business environment. We find only limited support for worsening objective measures during high growth periods. Most objective measures of the business climate remain unchanged or actually improve during high-growth years. Although we are unable to offer a definitive explanation to reconcile shifting perceptions with stable objective measures, we believe that is plausible that more firms plan to expand during high-growth years and therefore start to experience infrastructural and institutional constraints. It is also plausible that firms perceive delays to be more costly and therefore more irksome during high-growth years.

This paper contributes to the growing literature on potential problems with subjective survey data. In particular, to the best of the authors' knowledge, it is the first to investigate how macroeconomic changes can influence managers' perceptions of institutions.

2. Related literature

There have been several recent papers that address the question of when and how to use subjective measures. Hallward-Driemeier and Reyes (2009) present evidence that subjective-based measures are indeed correlated with objective measures. In particular, they find that qualitative rankings correlate well with quantitative measures of the business environment. They also find that much of the variation in subjective responses by firm types is due to differences in the objective conditions across firm types.

The results of Hallward-Driemeier and Reyes (2009) are encouraging for the use of perceptions-based indicators because they show that these indicators are indeed correlated with what they are meant to measure. Their results do not preclude, however, that other factors may also be correlated with perceptions-based indicators. Rodrik (2004) argues that respondents are likely to give positive appraisals of institutional quality when the economy is doing well. Rodrik therefore argues that one needs to use an instrumental-variables approach when using perceptions-based indicators to assess the effects of institutions on economic conditions. Glaeser et al. (2004) note this same endogeneity problem and argue for the use of objective indicators of institutional quality.

Table 1

List of survey countries and years.

Country	Year
Albania	2002, 2005
Armenia	2002, 2005
Azerbaijan	2002, 2005
Belarus	2002, 2005
Bosnia and Herzegovina	2002, 2005
Bulgaria	2002, 2004, 2005
Chile	2004, 2006
China	2002, 2003
Croatia	2002, 2005
Czech Republic	2002, 2005
Ecuador	2003, 2006
El Salvador	2003, 2006
Estonia	2002, 2005
Georgia	2002, 2005
Guatemala	2003, , 2006
Honduras	2003, 2006
Hungary	2002, 2005
India	2002, 2006
Kazakhstan	2002, 2005
Kyrgyz Republic	2002, 2003, 2005
Latvia	2002, 2005
Lithuania	2002, 2004, 2005
Macedonia, FYR	2002, 2005
Moldova	2002, 2003, 2005
Nicaragua	2003, 2006
Peru	2002, 2006
Poland	2002, 2003, 2005
Romania	2002, 2005
Russian Federation	2002, 2005
Serbia	2002, 2003, 2005
Slovak Republic	2002, 2005
Slovenia	2002, 2005
Tajikistan	2002, 2003, 2005
Tanzania	2003, 2006
Turkey	2002, 2005
Uganda	2003, 2006
Ukraine	2002, 2005
Uzbekistan	2002, 2003, 2005

Several academic studies that have used perceptions-based indicators of institutions have addressed the endogeneity issue. In fact, many of these studies have used the same data source that we use in this paper. Beck et al. (2005) use firm-level subjective measures, instrumented by country level characteristics, to estimate the effect of financial, legal, and corruption problems on firm growth rates. Dabla-Norris et al. (2008) use firm-level subjective measures, instrumented by country level characteristics, to estimate the effect of court efficiency, taxes and regulation, and corruption on informality. Ma et al. (2009) use propensity score matching to control for endogeneity in a study of the effect of judicial quality on firm exports.

Despite the wealth of papers that discuss the potential problem of endogeneity, no paper to our knowledge has presented evidence that this endogeneity problem really exists. By showing that perceptions get worse in when GDP growth is high, our paper contributes to the above literature in two ways.

First, we present evidence that firm perceptions are affected by macroeconomic shocks. Second, we show that the conjecture in Rodrik (2004) is incorrect, at least for the sample of countries we study. Rodrik speculated that reverse causality might lead to an erroneous conclusion that good institutions lead to good economic outcomes, since good economic outcomes might positively affect perceptions of the institutions. Our estimates suggest that a simple regression of economic outcomes on perceptions of institutions may underestimate the effect of institutions on economic outcomes because good economic outcomes negatively affect perceptions of institutional quality.

Our results may be most useful for panel studies on the effects of institutional reforms on economic activity. The recent emphasis on business climate reforms is beginning to generate studies analyzing their impacts. Eifert (2009), for example, finds modest effects on aggregate investment and employment for reforms measured by the World Bank's Doing Business project. The reform variables used by Eifert, however, are not based on perceptions.

Commander and Svejnar (forthcoming), on the other hand, use time series variation in perceptions from the Enterprise Surveys to measure the impact of the business climate on firm performance, and generally find no impact. Based on the results in the current paper, it would appear that part of the reason why indicators of institutional quality might "improve" may be precisely because productivity has decreased. The lack of significant results would therefore not be surprising.

3. Data and methodology

We started with 151 Enterprise Surveys that were conducted by the World Bank between 2002 and 2006. We retained those countries that were surveyed at least twice. This restriction yielded 38 countries; 30 countries were surveyed twice and 8 were surveyed three times. Table 1 lists the survey countries and years. There are 38,605 firms in the final sample.

An example of a perception-based question in the Enterprise Survey is: "Do you think that customs and trade regulations are an obstacle to the current operations of this establishment?" Respondents could choose from one of the following: no obstacle, minor, moderate, major or very severe obstacle coded as 0–4. Table 2 displays the list of potential constraints in the questionnaire and a summary of firm-level responses. Note that these questions had a fairly high response rate with the exception of the question on legal systems and conflict resolution.

Table 3 presents the summary statistics for the variables we will use as controls in our analyses. Roughly half of the firms are small (fewer than 20 employees). Five percent of firms are newly registered (within the past 4 years) and 18% of firms export some of their goods. Forty percent of firms have initiated a new product line within the past 3 years. We will use this

Table 2

Responses on severity of potential 'obstacles' to business operations.^a

Perceived obstacle	Mean	Std. Dev.	Median	% Response
Telecommunications	0.54	0.95	0	81
Electricity	0.9	1.23	0	93
Transport	0.59	0.98	0	92
Land access	0.6	1.04	0	89
Tax rates	1.54	1.34	2	91
Tax administration	1.28	1.28	1	90
Customs and trade regulations	0.86	1.16	0	81
Labor regulations	0.85	1.11	0	87
Skills and education of available workers	0.94	1.15	0	87
Licensing and operating permits	0.86	1.12	0	89
Access to finance e.g. collateral	1.18	1.30	1	90
Cost of finance e.g. interest rates	1.59	1.30	2	72
Economic and regulatory policy uncertainty	1.41	1.31	1	91
Macroeconomic instability e.g. inflation, exchange rate	1.64	1.29	2	75
Corruption	1.26	1.37	1	89
Crime, theft, disorder	0.97	1.24	0	91
Anti-competitive/informal practices	1.19	1.29	1	91
Legal system and conflict resolution	0.91	1.19	0	73

^a The response scale was: 0 – No obstacle, 1 – Minor, 2 – Moderate, 3 – Major, and 4 – Very severe. The response rate is calculated for the 38,605 firms in the final sample.

Table 3

Summary statistics: control and conditioning variables.

Variable	Mean	Std. Dev.	% Response
Small firm (<20 employees, 0 = No, 1 = Yes)	0.48	0.50	100.00
New firm (registered < 4 years ago, 0 = No, 1 = Yes)	0.05	0.22	100.00
Exporter? (0 = No, 1 = Yes)	0.18	0.38	98.56
Foreign ownership? (0 = No, 1 = Yes)	0.11	0.32	99.75
% Growth: number of permanent workers (3 years to 1 year ago)	18.06	54.81	80.11
Initiative for a new product line in the last 3 years (0 = No, 1 = Yes)	0.40	0.49	76.80
Industry type	NA	NA	98.77
		%	
Retail and wholesale trade		18.27	
Metals and machinery		9.55	
Garments		7.95	
Food		7.87	
Construction		5.58	
Chemicals and pharmaceuticals		5.05	
Other services		4.97	
Electronics		4.05	
Textiles		3.82	
Beverages		3.30	
Other manufacturing		3.23	
Wood and furniture		3.12	
Non-metallic and plastic materials		3.06	
Hotels and restaurants		2.93	
Auto and auto components		2.86	
Transport		2.83	
Advertising and marketing		2.46	
IT services		2.29	
Real estate and rental services		1.47	
Paper		1.27	
Leather		1.17	
Agro-industry		0.79	
Accounting and finance		0.71	
Telecommunications		0.61	
Mining and quarrying		0.56	
Other transport equipment		0.21	
Other unclassified		0.03	

Table 4

Responses to select 'objective' indicators of business environment.

Indicator	Mean	Std. Dev.	% Response
<i>Infrastructure</i>			
Days of power outages/surges	23.88	101.26	66.54
Days of unavailable mainline phone services	3.93	25.67	54.63
% of average cargo value lost in transit	1.12	4.95	53.16
<i>Access to finance</i>			
% working capital from internal/retained earnings	61.33	40.37	87.37
% new investment from internal/retained earnings	60.38	43.15	56.99
% working capital from local banks	12.67	25.58	87.38
% new investment from local banks	15.44	30.81	56.99
% working capital from foreign banks	1.06	7.80	68.40
% working capital from leasing arrangements	1.16	6.91	63.43
% working capital from credit cards	0.60	4.79	63.43
% working capital from sale of stock	3.99	16.78	68.40
% new investment from sale of stock	3.19	15.82	56.18
<i>Regulatory burden</i>			
% of senior management time dealing with government regulations	9.77	15.09	90.64
<i>Tax administration</i>			
Days spent with tax officials	5.56	15.07	61.39
<i>Corruption</i>			
Unofficial payments to get things done (% sales)	1.58	4.59	65.61
Gift/informal payments requested by tax officials	1.65	0.48	64.60
<i>Crime, theft, disorder</i>			
Cost of providing security (% sales)	1.79	11.99	59.10
Losses due to theft/vandalism/arson (% sales)	0.84	4.09	73.02

Table 5

Association of perceived obstacles with lagged GDP growth.

Constraint	Coefficient on lagged GDP growth	Standard error	Obs.
Telecommunications	0.0006	[0.0101]	30,235
Electricity	0.0284***	[0.0101]	34,951
Transport	0.0323***	[0.0069]	34,498
Land access	0.0300**	[0.0132]	33,578
Tax rates	0.0890***	[0.0126]	34,056
Tax administration	0.0599***	[0.0100]	33,788
Customs and trade regulations	0.0482***	[0.0094]	30,403
Labor regulations	0.0434***	[0.0143]	32,736
Skills and education of available workers	0.0422***	[0.0088]	32,780
Licensing and operating permits	0.0548***	[0.0110]	33,608
Access to finance e.g. collateral	0.0479***	[0.0115]	33,854
Cost of finance e.g. interest rates	0.0312***	[0.0118]	26,935
Economic and regulatory policy uncertainty	0.011	[0.0117]	34,282
Macroeconomic instability e.g. inflation, exchange rate	0.0404**	[0.0178]	28,127
Corruption	0.0560***	[0.0163]	33,284
Crime, theft, disorder	0.0524***	[0.0191]	34,194
Anti-competitive/informal practices	0.0408**	[0.0186]	34,231
Legal system and conflict resolution	0.0462***	[0.0152]	27,367

Notes: These are results from Ordered Probit regressions with country, year of survey and industry fixed effects as well as controls for size, age, ownership, and exporter status of the firm. The z-statistics are reported in the parentheses and are computed from robust standard errors clustered on country. The coefficients cannot be directly interpreted as marginal effects.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

variable as an indication that a firm likely has the intention of growing. Table 3 also presents the industry distribution of the firms in our data.

Since the perception of the severity of obstacles is an ordered response, we analyze the association between lagged GDP growth and firms' perceptions using Ordered Probit regressions at the firm level for each of the potential obstacles. We posit latent perception:

$$y_{i,c,t}^* = \alpha_c + \eta_t + \beta(gdpgr)_{c,t-1} + \gamma X_{i,c,t} + \varepsilon_{i,c,t} \quad (1)$$

We allow for latent perception to vary with the country, c and the year of survey, t . At the firm level, we allow for latent perception to be influenced by the age and size of the firm, i . We also control for the industry, ownership and export status of the firm. Despite the inclusion of these controls, however, omitted variable bias may affect our analyses. The coefficient of interest is β , the coefficient on lagged GDP growth. If the firm was surveyed in 2006, the value for lagged GDP growth reflects the percent change in real GDP from 2004 to 2005. Since firms are surveyed at various times during the year, using the percent change in real GDP from 2005 to 2006 might be capturing a great deal of economic activity that occurred after the firm was surveyed.¹ The ε are assumed to be normally distributed errors. We allow errors to be correlated across firms within a country. Although we do not observe y^* , the response selected by the firm is known and the probability that the firm selects a response j conditional on the country, year of survey, and firm characteristics (Z) is given by:

$$\begin{aligned} \Pr(y_{i,c,t} = 0|Z) &= \Phi(\alpha_1 - Z\theta) \\ \Pr(y_{i,c,t} = j|Z) &= \Phi(\alpha_{j+1} - Z\theta) - \Phi(\alpha_j - Z\theta) \\ \Pr(y_{i,c,t} = 4|Z) &= 1 - \Phi(\alpha_4 - Z\theta) \end{aligned} \quad (2)$$

The α and θ (including β) are to be estimated; Φ is the cumulative standard normal distribution.

The Enterprise Survey also includes many questions that seek to objectively measure the quality of the business environment. Examples include questions on the number of days of power outage faced by the plant in the previous year, the delay (in days) in getting a new phone line, the proportion of new investment financed with bank credit, the amount of time senior management spends with government officials, and the amount of unofficial payments a firm has to make to get things done. We investigate whether worsening perceptions during high growth periods are matched by a deterioration of objective indicators of the business environment. We select 18 'objective' indicators that can be construed as counterparts to one or more of the perception-based indicators, and that have a response rate above 50%.² Table 4 lists the selected 'objective' indicators that measure the quality of infrastructure, access to finance, the burden of regulation, the burden of tax administration, the

¹ In Table A1, we report the results of estimating the main empirical models for the paper using contemporaneous GDP growth.

² Although the Enterprise Survey has a long list of 'objective' measures of the business environment, the response rates of many of those questions are rather low. It is plausible that some of the questions were not asked in some of the surveys or that there is high degree of selectivity among firms when responding to those questions.

incidence of corruption, and the incidence of crime. We run OLS regressions at the firm level analogous to the Ordered Probit regression specification in Eq. (1):

$$y_{i,c,t} = \alpha_c + \eta_t + \beta(gdpgr)_{c,t-1} + \gamma X_{i,c,t} + \varepsilon_{i,c,t} \quad (3)$$

As before, we control for firm size and age, industry, ownership status, and export status of the firm. We also include year and country fixed effects, and allow for arbitrary correlation of the error terms across firms within the same country.

It is important to keep in mind that none of our estimates can be interpreted as the causal relationship between the independent and the dependent variables. The fact that we do not employ an instrumental variables strategy implies that we are not able to estimate such a causal relationship. The correlations we estimate, however, do have important implications for the ways in which perceptions-based indicators can be used in future empirical work.

4. Results

Table 5 shows the results of estimating Eq. (1). The perceived severity of nearly all of the constraints is positively and significantly associated with lagged GDP growth. In particular, the reported severity of 16 of the 18 constraints exhibits a positive and significant correlation with GDP growth. No constraints exhibit a negative correlation and only two exhibit

Table 5a

Association of perceived obstacles and lagged GDP growth by firm size.

Firm size	Telecommunications	Electricity	Transport	Land access	Tax rates	Tax administration
Small	0.0103 [0.0113] 15,050	0.0426*** [0.0106] 17,236	0.0405*** [0.0071] 16,820	0.0440** [0.0183] 16,358	0.0941*** [0.0164] 16,906	0.0604*** [0.0126] 16,715
Medium	−0.012 [0.0125] 8499	0.0263* [0.0139] 10,167	0.0292** [0.0118] 10,135	0.0178** [0.00865] 9852	0.0879*** [0.0129] 10,099	0.0606*** [0.0105] 10,050
Large	−0.000376 [0.008] 5942	0.0282*** [0.0105] 6794	0.0327*** [0.0083] 6788	0.0314*** [0.0094] 6628	0.0933*** [0.0116] 6749	0.0666*** [0.0108] 6722
	Customs and trade regulations	Labor regulations	Skills and education of available workers	Licensing and operating permits	Access to finance	Cost of finance
Small	0.0401*** [0.0115] 13,974	0.0426** [0.0208] 15,984	0.0447*** [0.0104] 15,230	0.0565*** [0.0142] 16,649	0.0650*** [0.0133] 16,635	0.0362** [0.0163] 12,381
Medium	0.0463*** [0.0089] 9575	0.0474*** [0.0124] 9783	0.0520*** [0.0085] 10,062	0.0506*** [0.0087] 9983	0.0470*** [0.0085] 9911	0.0296*** [0.0101] 8048
Large	0.0575*** [0.0122] 6573	0.0562*** [0.0123] 6669	0.0521*** [0.0101] 6741	0.0559*** [0.0118] 6675	0.0378*** [0.0062] 6662	0.0262** [0.0116] 5775
	Economic and regulatory policy uncertainty	Macroeconomic instability	Corruption	Crime, theft, disorder	Anti-competitive practices	Legal system and conflict resolution
Small	0.0185 [0.0124] 16,725	0.0265 [0.0204] 13,380	0.0579*** [0.0153] 16,384	0.0528*** [0.0190] 16,800	0.0395* [0.0206] 16,790	0.0394** [0.0186] 12,998
Medium	0.0180* [0.0103] 10,063	0.0491*** [0.0181] 8166	0.0583*** [0.0105] 9693	0.0543*** [0.0126] 9976	0.0461*** [0.0114] 10,003	0.0416*** [0.0146] 8615
Large	0.0212** [0.0093] 6747	0.0519*** [0.0161] 5843	0.0812*** [0.0095] 6469	0.0759*** [0.0124] 6668	0.0657*** [0.0152] 6699	0.0729*** [0.0149] 5615

Notes: Coefficients on lagged GDP growth are from Ordered Probit regressions for each subsample of firms with country, year of survey and industry fixed effects as well as controls for age (i.e. new or not), ownership, and exporter status of the firm. Country and year fixed effects are included as well as a control for new firms i.e. less than or equal to 3 years since registration. Robust standard errors clustered on country are reported in parentheses. The sample size for each regression is reported below the standard errors. Firm size categories are defined by number of permanent workers: small (<20), medium (between 20 and 99), and large (>99).

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table 6

Association of “objective” indicators of business environment with lagged GDP growth.

Indicator	Coefficient	Standard error	Obs.	R ²
<i>Infrastructure</i>				
Days of power outages/surges	0.394	[0.923]	24,977	0.145
Days of unavailable mainline phone services	0.242	[0.383]	20,388	0.038
% of average cargo value lost in transit	−0.0741***	[0.0239]	19,726	0.014
<i>Access to finance</i>				
% working capital from internal/retained earnings	−0.931	[0.678]	32,905	0.193
% new investment from internal/retained earnings	−0.802	[0.732]	21,438	0.159
% working capital from local banks	0.340***	[0.125]	32,907	0.128
% new investment from local banks	0.531***	[0.158]	21,438	0.107
% working capital from foreign banks	0.0378	[0.026]	25,586	0.027
% working capital from leasing arrangements	0.104***	[0.036]	23,770	0.027
% working capital from credit cards	0.0137	[0.009]	23,770	0.024
% working capital from sale of stock	0.357***	[0.099]	25,586	0.113
% new investment from sale of stock	0.229	[0.201]	21,125	0.075
<i>Regulatory burden</i>				
% of senior management time dealing with government regulations	0.291**	[0.125]	34,037	0.127
<i>Tax administration</i>				
Days spent with tax officials	−0.119	[0.525]	22,946	0.129
<i>Corruption</i>				
Unofficial payments to get things done (% sales)	0.0625***	[0.0193]	24,872	0.063
Gift/informal payments requested by tax officials	−0.0139	[0.0085]	24,544	0.192
<i>Crime, theft, disorder</i>				
Cost of providing security (% sales)	−0.0405	[0.178]	22,267	0.03
Losses due to theft/vandalism/arson (% sales)	0.0154	[0.033]	27,714	0.027

Notes: Each row contains the result of a firm-level OLS regression with fixed effects for country, year of survey, and industry, and controls for firm size (small or not), age (new or not), ownership, and export status. Small denotes firms with less than 20 employees, while new denotes firms registered no more than 3 years ago. The *t*-statistics are reported in the parentheses and are computed from robust standard errors clustered on country.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

insignificant correlations. These results suggest that managers perceive constraints to be more severe during periods of rapid growth.³

Does firm size affect how managers perceive constraints during high growth periods? Smaller firms may have fewer connections and resources to negotiate bureaucratic hurdles to procure permits, to buy or lease more land, and to access capital. However, Table 5a shows that managers in small and big firms tend to perceive constraints similarly. In fact, the association between perceived severity and GDP growth are a bit larger and more significant for large firms. It may be that large firms are even more hamstrung by regulations than their smaller counterparts. For instance India has a stringent labor law, the Factory Act that only applies to enterprises that employ more than 10 workers. Large firms are also more visible to enforcement authorities and tend to operate in the more regulated parts of the economy.

A possible explanation for worsening perceptions during high growth periods is that the business climate really deteriorates during such periods. If so, we would expect to see a parallel deterioration in many objective measures of the business environment during high growth periods. For instance, capacity constraints in infrastructure and in the government machinery could lead to worsening performance in the face of increased demand for services from fast growing firms. Greater demand for power could lead to more outages if power generation capacity fails to keep pace. Similarly, higher profitability could lead to more firms filing tax returns which in turn could lead to a greater work burden per tax officer.

Table 6 shows the results of estimating Eq. (2). There is, in fact, some evidence that the business climate may get worse during periods of high growth. For example, we find that senior managers spend more time dealing with governmental regulations during high growth periods. Unofficial payments “to get things done” as a percentage of total sales also increase during periods of high GDP growth, which may explain why firms report that corruption is a more severe obstacle during periods of high growth.⁴

³ In Table A2, we report the results of estimating Eq. (1) using only the first and last year in which the country was surveyed. In Table A3, we report the results of estimating Eq. (1) using the log of the lag of real GDP per capita as the independent variable of interest instead of lagged GDP growth. All of the controls from Eq. (1) (fixed effects for country, year of survey, industry, firm size, age, ownership, and export status) are still included in the estimating equation. The combination of a fixed effect for each country and for each year of survey means that the interpretation of a positive coefficient for β is that perceptions have disproportionately deteriorated in countries with larger increases in GDP per capita, relative to other countries sampled in the same year. That is, a positive coefficient for β in Table A3 means that perceptions have worsened in countries that have grown faster.

⁴ In Table A4, we report the results of estimating Eq. (2) using the log of the lag of real GDP per capita as the independent variable of interest.

Table 7

Association of perceived obstacles and objective indicators with lagged GDP growth (for firms that responded to both, questions on perceived obstacles and objective indicators).

Indicator	Coefficient	Standard error	Obs.
<i>Infrastructure</i>			
Electricity (perceived as a constraint)	0.026***	[0.004]	22,827
Days of power outages/surges	0.615	[0.911]	22,827
Telecommunications (perceived as a constraint)	0.008	[0.012]	19,257
Days of unavailable mainline phone services	0.215	[0.377]	19,257
Transport (perceived as a constraint)	−0.029	[0.033]	15,835
% of average cargo value lost in transit	−0.088***	[0.019]	15,835
<i>Regulatory burden</i>			
Customs and trade regulations (perceived as a constraint)	0.049***	[0.010]	26,213
% senior management time dealing with govt regulations	0.434***	[0.087]	26,213
Labor regulations (perceived as a constraint)	0.046***	[0.016]	27,535
% senior management time dealing with govt regulations	0.338***	[0.096]	27,535
Licensing and operating permits (perceived as a constraint)	0.052***	[0.011]	28,251
% senior management time dealing with govt regulations	0.388***	[0.096]	28,251
<i>Tax administration</i>			
Tax administration (perceived as a constraint)	0.103**	[0.043]	18,815
Days spent with tax officials	−0.176	[0.459]	18,815
<i>Corruption</i>			
Corruption (perceived as an obstacle)	0.062***	[0.012]	22,221
Unofficial payments to get things done (% sales)	0.066***	[0.017]	22,221
<i>Crime, theft, disorder</i>			
Crime, theft and disorder (perceived as a constraint)	0.047***	[0.018]	20,128
Cost of providing security (% sales)	−0.014	[0.155]	20,128
Crime, theft and disorder (perceived as a constraint)	0.055***	[0.016]	24,417
Losses due to theft/vandalism/arson (% sales)	0.041*	[0.022]	24,417

Notes: These are results from regressions with country, year of survey and industry fixed effects as well as controls for size, age, ownership, and exporter status of the firm. Each pair of rows includes results from regressions for a perceived obstacle and a matching objective indicator of business climate for the subset of firms that responded to both questions. The highlighted rows contain results from Ordered Probit regressions (for perceived obstacles.) The other rows contain the results from OLS regressions (objective indicators of business climate.) Robust standard errors clustered on country are reported in parentheses.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table 6 also shows that there are other objective measures of the business environment such as the availability of power and telecom services, and of the level of crime and disorder, which do not worsen significantly during high growth periods although firms report worsening perceptions of those indicators. Finally, Table 6 also shows evidence that certain elements of the business climate may improve during periods of high GDP growth. The average percent of cargo lost in transport, for example, tends to decline during periods of high growth despite the fact that firms report that transportation is a more serious obstacle to their operations during high growth periods. Table 6 also shows that firms are more intensive users of outside sources of funding (bank loans or stock sales) in high growth periods despite the fact that firms report that access to finance is a more serious obstacle during high growth periods. It is not clear, however, whether this increased use of external sources of funding is the result of improved access to finance or due to increased demand for external finance.

Since the responses on perceptions and objective indicators do not come from an identical set of firms, it is possible that the results using objective and perceptions-based indicators are driven by the fact that the sets of firms answering the questions are different. For instance, firms that are relatively unhappy with the business climate may be more motivated to report these negative perceptions. Table 7 presents the results of a robustness check for our results. Each pair of rows includes results from regressions for a perceived obstacle and a corresponding objective indicator of the business climate for the subset of firms that responded to both questions. The sample sizes in these regressions are noticeably smaller. For instance, although 34,498 firms reported their perception on transport as an obstacle only 15,835 had responses to both the perception and the objective indicator questions on transport.⁵

In this subsample of firms, perceptions of transport infrastructure do not worsen during high-growth years. Also, losses due to theft and vandalism appear to increase significantly during high-growth years, although the result is only significant at the 10% level. Nevertheless, most of our earlier results appear robust to potential selection bias. For instance, electricity availability is perceived to worsen during high growth periods although there is no significant change in days of power

⁵ The reported sample sizes are those from the relevant regressions in Tables 5 and 7 respectively and therefore count only those firms that had non-missing observations for the control variables.

Table 8

Association of Perceived obstacles with firm growth.

	Telecommunications	Electricity	Transport	Land access	Tax rates	Tax administration
Lagged GDP growth	−0.010*	0.028***	0.028***	0.026***	0.080***	0.047***
	[0.006]	[0.005]	[0.004]	[0.010]	[0.019]	[0.015]
New product line?	0.041**	0.033	0.094***	0.122***	0.049***	0.080***
	[0.021]	[0.021]	[0.017]	[0.018]	[0.016]	[0.017]
Observations	22,526	25,323	25,232	24,414	25,193	24,997
	Customs and trade regulations	Labor regulations	Skills and education c available workers	Licensing and operating permits	Access to finance	Cost of finance
Lagged GDP growth	0.037***	0.042**	0.035***	0.043***	0.048***	0.035***
	[0.013]	[0.017]	[0.006]	[0.013]	[0.007]	[0.010]
New product line?	0.167***	0.124***	0.151***	0.105***	0.021	0.0461***
	[0.026]	[0.016]	[0.013]	[0.016]	[0.017]	[0.018]
Observations	23,711	24,446	25,088	24,825	24,574	21,574
	Economic and regulatory policy uncertainty	Macroeconomic instability	Corruption	Crime, theft, disorder	Anti-competitive/informal practices	Legal system and conflict resolution
Lagged GDP growth	0.010**	0.043***	0.060***	0.060***	0.043***	0.049***
	[0.005]	[0.017]	[0.011]	[0.012]	[0.013]	[0.013]
New product line?	0.0871**	0.078***	0.099***	0.057***	0.109***	0.115***
	[0.024]	[0.025]	[0.017]	[0.021]	[0.023]	[0.026]
Observations	24,970	21,829	24,358	24,656	24,743	23,996

Notes: These are results from Ordered Probit regressions with country, year of survey and industry fixed effects as well as controls for size, ownership, and exporter status of the firm. Firms younger than 3 years are excluded. “New Product Line?” is a dummy that indicates the launch of one or more new product lines in the last 3 years and is used as a proxy for fast growing firms. Robust standard errors clustered on country are reported in parentheses. The coefficients cannot be directly interpreted as marginal effects.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

outage in those periods. Also, as before, regulations are perceived to be more serious obstacles during high growth periods and senior management do appear to spend more time navigating bureaucracy.

To recap, we find strong evidence that firms' perceptions of the business environment worsen during high growth periods but only limited evidence that this worsening is the result of a deterioration of objectively measurable indicators of the business environment. For many indicators, worsening perceptions are not matched by a deterioration of objective indicators. A plausible explanation is that relatively more firms have expansion plans during high growth periods, and in order to expand operations, those firms have to start navigating infrastructural and institutional constraints. A firm that introduces a new product line, for example, would likely be faced with new licensing and other regulatory requirements. A related explanation could be that firms perceive the opportunity costs of delays to be higher during high-growth years as compared to low-growth years. If so, we would expect managers of fast growing firms to complain relatively more. Table 8 presents micro evidence on this subject by including a dummy variable for whether the firm has introduced a new product line within the last three years in Ordered Probit models of firm perceptions of the type described by Eq. (1). Even after controlling for the country's (lagged) GDP growth, we find that firms that have introduced new product lines within the past three years report more negative perceptions of nearly all aspects of the business climate, with significant coefficients in 16 of the 18 listed obstacles.

5. Conclusions

We present evidence that in low and middle income countries, managers' perceptions of the severity of infrastructural and institutional constraints shift systematically with changing GDP growth. Somewhat counter intuitively, managers perceive constraints as more severe during booms. This relationship suggests that firms may find constraints binding during high-growth years as they seek to expand operations. However, we find evidence of systematic

deterioration in only a few objective measures of the business environment during high-growth years. For most indicators, worsening perceptions are not matched by a deterioration of objective indicators. Further research is merited to reconcile the systematic shifts in firms' perceptions of the business environment related to changes in economic growth with the apparent underlying stability in objective measures of the business environment. It is plausible that more firms seek to expand during high growth periods and in doing so they start to encounter infrastructural and institutional constraints. We find evidence that, conditional on GDP growth, faster growing firms report worse perceptions.

Perceptions-based indicators are valuable since they can capture aspects of the institutional environment that are hard to measure objectively. They are also informative about how firms experience institutions. Our findings, however, suggest that caution has to be exercised in interpreting changes in the perceptions-based indicators over time.

The question then becomes how to use perceptions-based indicators. Glaeser et al. (2004) caution against using indicators of institutions that, at least in part, are really measures of outcomes such as growth. Our paper offers empirical support to their claim. Perceptions-based indicators are influenced by growth, making them invalid as independent variables in papers like Glaeser et al.

Although our empirical results lend support for the concerns expressed in Glaeser et al. (2004), it is important to stress that we are not arguing against the use of perceptions-based indicators. One good way to use perceptions-based indicators may be as dependent variables. Acemoglu and Johnson (2005), for example, use data from the Enterprise Surveys to show that legal formalism affects firm perceptions of the efficacy of the judicial process.

When perceptions-based indicators are used as explanatory variables, our results lend support to the arguments expressed in Rodrik (2004) that the potential for reverse causality must be addressed, possibly through instrumental variables. Since it is difficult to argue that worsening institutions would lead to slower GDP growth, we argue that the best explanation of our results is that strong GDP growth negatively affects perceptions of institutional quality. Our results therefore constitute direct evidence of this endogeneity problem.

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Appendix

See Tables A1–A4.

Table A1

Association of perceptions of constraints with contemporaneous GDP.

Constraint	Coefficient	Standard error	Obs.
Telecommunications	0.0293*	[0.0156]	30,684
Electricity	0.0192	[0.0306]	35,409
Transport	0.0447*	[0.0245]	34,956
Land access	0.021	[0.0215]	34,025
Tax rates	0.02	[0.0285]	34,509
Tax administration	0.0316	[0.0259]	34,240
Customs and trade regulations	0.0349*	[0.0212]	30,837
Labor regulations	0.0124	[0.0244]	33,187
Skills and education of available workers	0.0155	[0.0330]	33,236
Licensing and operating permits	0.0252	[0.0201]	34,056
Access to finance e.g. collateral	0.0263	[0.0228]	34,307
Cost of finance e.g. interest rates	−0.00534	[0.0133]	27,381
Economic and regulatory policy uncertainty	0.0353	[0.0288]	34,734
Macroeconomic instability e.g. inflation, exchange rate	−0.0262	[0.0225]	28,570
Corruption	0.0274	[0.0288]	33,722
Crime, theft, disorder	0.0261	[0.0339]	34,648
Anti-competitive/informal practices	0.0155	[0.0246]	34,687
Legal system and conflict resolution	−0.00681	[0.0224]	27,646

Notes: These are results from Ordered Probit regressions with country, year of survey and industry fixed effects as well as controls for size, age, ownership, and exporter status of the firm. The z-statistics are reported in the parentheses and are computed from robust standard errors clustered on country. The coefficients cannot be directly interpreted as marginal effects.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table A2

Association of perceptions of constraints with lagged GDP (using only the first and last survey for each country).

Constraint	Coefficient	Standard error	Obs.
Telecommunications	−0.0081	[0.0052]	28,998
Electricity	0.0144	[0.0092]	33,678
Transport	0.0234***	[0.0079]	33,243
Land access	0.0252	[0.0156]	32,533
Tax rates	0.0715***	[0.0202]	32,794
Tax administration	0.0436***	[0.0144]	32,543
Customs and trade regulations	0.0405***	[0.0130]	29,394
Labor regulations	0.0424***	[0.0157]	31,520
Skills and education of available workers	0.0292**	[0.0122]	31,534
Licensing and operating permits	0.0485***	[0.0138]	32,436
Access to finance e.g. collateral	0.0378***	[0.0144]	32,662
Cost of finance e.g. interest rates	0.0345***	[0.0101]	25,741
Economic and regulatory policy uncertainty	0.0009	[0.0135]	33,045
Macroeconomic instability	0.0428**	[0.0171]	26,895
Corruption	0.0451**	[0.0219]	32,610
Crime, theft, disorder	0.0435*	[0.0235]	33,005
Anti-competitive/informal practices	0.035	[0.0225]	33,044
Legal system and conflict resolution	0.0498***	[0.0135]	26,276

Notes: These are results from Ordered Probit regressions with country, year of survey and industry fixed effects as well as controls for size, age, ownership, and exporter status of the firm. The z-statistics are reported in the parentheses and are computed from robust standard errors clustered on country. The coefficients cannot be directly interpreted as marginal effects.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table A3

Association of perceptions with lagged GDP per capita.

Constraint	Coefficient	Standard error	Obs.
Telecommunications	0.275	[0.725]	30,235
Electricity	1.565	[1.240]	34,951
Transport	1.803**	[0.794]	34,498
Land access	2.363***	[0.718]	33,578
Tax rates	1.827*	[1.091]	34,056
Tax administration	0.609	[1.113]	33,788
Customs and trade regulations	1.212	[0.922]	30,403
Labor regulations	2.030*	[1.131]	32,736
Skills and education of available workers	2.867***	[0.988]	32,780
Licensing and operating permits	1.062	[0.654]	33,608
Access to finance e.g. collateral	1.897**	[0.935]	33,854
Cost of finance e.g. interest rates	−0.123	[0.522]	26,935
Economic and regulatory policy uncertainty	1.557	[1.208]	34,282
Macroeconomic instability e.g. inflation, exchange rate	−0.186	[0.831]	28,127
Corruption	2.986**	[1.359]	33,284
Crime, theft, disorder	2.846**	[1.305]	34,194
Anti-competitive/informal practices	1.684*	[0.923]	34,231
Legal system and conflict resolution	−0.055	[0.662]	27,367

Notes: These are results from Ordered Probit regressions with country, year of survey and industry fixed effects as well as controls for size, age, ownership, and exporter status of the firm. The z-statistics are reported in the parentheses and are computed from robust standard errors clustered on country. The coefficients cannot be directly interpreted as marginal effects.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table A4

Association of objective indicators with lagged GDP per capita.

Indicator	Coefficient	Standard error	Obs.	R ²
<i>Infrastructure</i>				
Days of power outages/surges	−65.17	[57.49]	24,977	0.146
Days of unavailable mainline phone services	−6.657	[16.67]	20,388	0.038
% of average cargo value lost in transit	1.606	[3.287]	19,726	0.014
<i>Access to Finance</i>				
% working capital from internal/retained earnings	−48.11**	[22.21]	32,905	0.193
% new investment from internal/retained earnings	−20.31	[29.01]	21,438	0.158
% working capital from local banks	1.325	[12.04]	32,907	0.127
% new investment from local banks	8.476	[12.51]	21,438	0.106
% working capital from foreign banks	1.515	[2.076]	25,586	0.027
% working capital from leasing arrangements	−0.694	[2.652]	23,770	0.027
% working capital from credit cards	1.197	[0.927]	23,770	0.024
% working capital from sale of stock	21.95**	[10.44]	25,586	0.113
% new investment from sale of stock	13.69	[9.246]	21,125	0.075
<i>Regulatory Burden</i>				
% of senior management time dealing with government regulations	−3.263	[11.68]	34,037	0.126
<i>Tax administration</i>				
Days spent with tax officials	−36.79***	[10.36]	22,946	0.13
<i>Corruption</i>				
Unofficial payments to get things done (% sales)	0.655	[2.085]	24,872	0.062
Gift/informal payments requested by tax officials	−0.0474	[0.455]	24,544	0.19
<i>Crime, Theft, Disorder</i>				
Cost of providing security (% sales)	9.536	[6.760]	22,267	0.03
Losses due to theft/vandalism/arson (% sales)	2.468	[2.076]	27,714	0.028

Notes: Each row contains the result of a firm-level OLS regression with fixed effects for country, year of survey, and industry, and controls for firm size (small or not), age (new or not), ownership, and export status. Small denotes firms with less than 20 employees, while new denotes firms registered no more than 3 years ago. The *t*-statistics are reported in the parentheses and are computed from robust standard errors clustered on country.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Appendix B. Supplementary material

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.jce.2010.04.001.

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