Do Institutions, Ownership, Exporting and Competition Explain Firm Performance? Evidence from 26 Transition Countries

Simon Commander
Jan Svejnar

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Simon Commander
*EBRD, London Business School
and IZA*

Jan Svejnar
*University of Michigan,
CERGE-EI, CEPR and IZA*

ABSTRACT

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We analyze a large stratified random sample of firms that provide us with measures of performance and each firm's top manager's perception of the severity of business environment constraints faced by his/her firm. Unlike most existing studies that rely on external and aggregated proxy measures of the business environment, defined to include legal and institutional features, we have information from each surveyed firm. Specifically, we use the 2005 and 2002 Business Environment and Enterprise Performance Survey (BEEPS) to assess the effect on performance of ownership, competition, export orientation and the business environment of the firm. We employ a variety of approaches to deal with the problem of omitted variables, errors in variables and endogeneity that plague studies in this area. We find that foreign ownership and competition have an impact on performance – measured as the level of sales controlling for inputs. Export orientation of the firm does not have an effect on performance once ownership is taken into account. When we analyze the impact of perceived constraints, we show that few retain explanatory power once they are introduced jointly rather than one at a time, or when country, industry and year fixed effects are introduced. Indeed, country fixed effects largely absorb the explanatory power of the constraints faced by individual firms. Replicating the analysis with commonly used country-level indicators of the business environment, we do not find much of a relationship between constraints and performance. Our analysis brings into question an important part of the conventional wisdom in this area. It indicates that country fixed effects, reflecting time-invariant differences in the business environment but also other factors, matter for firm performance, but that differences in the business environment observed across firms within countries do not. Moreover, the limited firm- and country-level variations in the business environment over time do not appear to affect performance either. This suggests that the effect of business environment on performance and the analysts' ability to identify this effect are more limited than has been assumed to date.

Corresponding author:

Simon Commander
London Business School
Sussex Place
Regent's Park
London NW1 4SA
United Kingdom
E-mail: scommander@london.edu

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1. Introduction

The efficiency of firms in developing countries, including the transition economies, is obviously central to explaining the performance of these economies as a whole. In many developing countries, large firms were often historically state-owned and widely regarded as inefficient. Indeed, almost all firms in the transition economies started as being state owned with their objectives set consistent with the dictates of central planning. To escape these limitations, a combination of privatisation, entry of new private firms, and fundamental changes in the legal, institutional and regulatory systems has been at the core of the development and transition process over the last two decades.

The above policies have been based on the premise that a key determinant of firm performance in developing as well as developed economies is the state of the business environment, defined broadly to include the key features of the legal, regulatory, financial, and institutional system.[2] Indeed, it has been noted that the barriers to doing business vary widely across regions and countries,[3] and it has been argued that the business environment will affect aggregate performance, as well as exert influence on the operation of financial markets.[4] A sizable empirical literature supporting various aspects of this view has appeared, using data at the country, industry and firm levels. However, the measurement of the business environment has encountered major methodological challenges that may have generated biased estimates on account of issues such as errors in variables, omitted variables and endogeneity of regressors.

First, much of the knowledge in this area derives from studies that rely on country-level proxy indicators of the business environment, such as governance (e.g.,

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[2] See for example, World Bank (2002) and EBRD (1999)
[3] World Bank (2005); World Economic Forum (2005)
[4] See Hausmann et al. (2004). For the financial market angle, see Durnev et al. (2004).

Kaufmann et al., 1999 and 2002), regulatory constraints (e.g., Djankov et al., 2002, and Botero et al. 2004), competitiveness (e.g., World Economic Forum), transparency (e.g., Transparency International), bureaucratic quality, corruption and law and order (e.g., Political Risk Services), strength of the legal system (Durnev and Kim, 2005), and the level of economic freedom in an economy (e.g., Heritage Foundation). Many of these aggregate proxies of the actual phenomena contain little or no variation over time and thus are completely or almost indistinguishable from country-, sector- or region-specific effects that may reflect other features than the business environment. Second, the aggregate studies usually estimate the association between features of business environment and macroeconomic performance rather than identify the causal effects of the environment on performance (see, for example, discussion in Levine and Zervos, 1998, and Rajan and Zingales, 1998).

Industry-level studies, such as Rajan and Zingales (1998), Klapper et al. (2004), and Micco and Pages (2006), estimate the effects of a particular feature of the business environment on industry performance. They represent an advance over country-level studies in that they can control for country and industry effects and thus suffer less from an omitted variable bias. The trade-off is that in order to identify the performance effect, these studies need to assume that one country, the United States, has an optimal value of the particular feature of business environment and that there is some technological or other reason why in all countries some industries depend more than others on this feature of the environment. While these studies attempt to account for the possible endogeneity of the business environment, the extent of their control of this issue is limited.

Finally, a number of firm-level studies have been carried out in the last few years, taking advantage of cross-firm variation in performance and in perceived or actual severity of business environment constraints. While these studies represent an important advance over the ones based on more aggregate data, they also suffer from a number of the aforementioned econometric problems. For example, using a 1995 survey of about 440 firms in Bulgaria and Russia, Pissarides et al. (2003) examine the absolute and relative severity of various constraints and how it relates to the characteristics of the manager, firm and sector of operation, but they do not address the issue of endogeneity of regressors. Johnson et al. (2002a,b) use a 1997 firm-level survey of about 1,400 firms in five transition economies to estimate the effects of property rights and access to credit on profit reinvestment, but also assume that all regressors are exogenous. Dollar et al. (2005) use surveys from eight developing countries covering nearly 6500 firms to look at the association between exporting and the investment climate. The empirical implementation relies, however, on probit estimations where perceived constraints are entered on the right hand and assumed to be exogenous. Beck et al. (2005) use the World Business Environment Survey (WBES) of more than 4,000 firms in 54 countries to examine the effect of business environment constraints on firm growth, but do not address endogeneity and in most estimations they enter the constraints one at a time rather than simultaneously. The authors also do not control for country and industry heterogeneity with country and industry fixed effects, relying instead only on country random effects and a manufacturing and a services dummy variable. Ayagari et al. (2005) examine the importance of financing constraints in explaining firm performance using the WBES data for 80 countries, relating firm growth rates to the different obstacles that the

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firms report and assuming that the regressors are exogenous. Finally, Hallward-Driemeier et al. (2006) use an investment climate survey administered in 2000 to 1,500 Chinese firms in five cities, with some constraints being measured by managerial perceptions and others by management-provided information on phenomena such as losses in sales due to power problems. The authors are concerned with endogeneity, find the instrumental variable approach infeasible, and use city-industry average values of the business climate variables, together with city information and sector dummies, to alleviate the endogeneity problem. They address the omitted variable problem by entering all the constraint variables simultaneously, but firm ownership is treated as exogenous. In short, the literature is rich and informative, but compared to most other empirical literatures it is still somewhat tentative because of the technical estimation issues discussed above.[5]

In parallel to the investigations of the effects of business environment, researchers have been analyzing the effects on firm performance of three key structural features, namely the extent of firm's export orientation, competition and ownership. The number of studies and findings is large, but the overall sense is that the performance effects of exports are found to be positive, (see Tybout, 2003, for a review), those of competition are found to be positive by Nickell (1999), but questioned as a uniform effect by Carlin et al. (2004) and Aghion et al. (2005), the effect of ownership is found to be, by and large, positive for foreign ownership but less clear cut for domestic private ownership.[6] Interestingly, while these literatures often use the same or similar dependent variables,

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[5] There are also other conceptual issues, noted for instance by Carlin et al (2006) who argue that subjective evaluations of constraints can provide important insights but need to be very carefully interpreted. For example, reported constraints for public goods - as against those relating to finance - may require different interpretation as the former may act as a common constraint on firms in a country, while the latter may vary between firms, let alone between countries.

[6] Surveys by Djankov and Murrell (2002) and Estrin et al. (2007) point to the positive effect of foreign ownership. While Djankov and Murrell (2002) also find a positive effect of domestic private ownership, Estrin et al. (2007) find this effect to be much weaker and more varied.

each of them focuses on a particular set of explanatory variables and usually does not take into account the explanatory variables deemed important in other strands of research. This raises the issue of whether existing studies generate biased estimates on account of omitted variables.

In this paper we carry out an econometric analysis of a large firm-level survey dataset that includes measures of performance, structural variables related to ownership, competition and export orientation, and each firm's top manager's perception of the business environment that his/her firm faces. Specifically, we use the 2005 and 2002 Business Environment and Enterprise Performance Survey (BEEPS), collected by the European Bank for Reconstruction and Development (EBRD) and the World Bank, to examine what robust relationships, if any, can be identified by linking firm performance in 26 transition countries to a range of explanatory variables, including the firm's business environment, ownership, export orientation, and competition. Aside from providing a large number of observations, over 4,000 firms in 2002 and 6,600 firms in 2005, the BEEPS dataset also provides us with data on firms over a six-year period, as it includes three year retrospective information for each survey round. Our objective is to assess whether the widely accepted claim that the business environment and structural features of firms are major explanatory factors behind performance is supported in our large data set under a series of econometric tests.

Given the aforementioned analytical issues, we pay attention to the likely problems of endogeneity by adopting a number of approaches, including instrumental variables (IVs), and by assessing the seriousness of the omitted variable bias. We focus on how efficiently firms generate sales revenue, taking into account inputs of capital and

labour. This is equivalent to total factor productivity but broader in that it also captures improvements in pricing, marketing and other aspects of revenue generation. The reason we use this broader measure is that the performance of different types of firms may vary for a number of reasons, including differences in, efficiencies in generating output from inputs, abilities to charge high prices due to diverse product quality or marketing, intangible assets and the cost of capital, location in highly competitive industries, efficiency of vertical integration, and extent of outsourcing. In order to capture as many of these factors as possible, we focus on the revenues of the firm as our dependent variable. Our approach explicitly allows for the efficiency of different firms to vary on account of any of these factors. We do not presume that firms are in a technical or economic steady state but rather that they are trying to improve their performance by discovering new methods of production, importing advanced technologies, launching new products, learning new managerial and marketing techniques and implementing other changes. The extent to which firms are able to succeed may, of course, also depend on the macroeconomic, legal and institutional environment. The paper focuses on this association – or its absence.

We find that foreign (but not domestic private) ownership and competition have an impact on performance – measured as the level of sales controlling for inputs. Export orientation of the firm does not have an effect on performance once ownership is taken into account. When we analyze the impact of perceived constraints, we show that few retain explanatory power once they are introduced jointly rather than one at a time, or when country and year fixed effects are introduced. Indeed, country fixed effects largely absorb the explanatory power of the constraints faced by individual firms. Replicating the

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analysis with commonly used country-level indicators of the business environment (Heritage Foundation indices and World Bank's Doing Business indicators), we do not find much of a relationship between constraints and performance. Our analysis brings into question an important part of the conventional wisdom in this area. It indicates that country fixed effects, reflecting time-invariant differences in the business environment but also other factors, matter for firm performance, but that differences in the business environment observed within countries across firms do not. Moreover, the limited firm- and country-level variations in the business environment over time do not appear to affect performance either. This suggests that the effect of business environment on performance and the analysts' ability to identify this effect are more limited than has been widely assumed to date.

The paper is organized as follows. In section 2 we discuss the relevant features of the transition economies. In Section 3 we describe the data, while in Section 4 we outline the analytical framework. We present our empirical findings in Section 5 and we conclude in Section 6.

2. The Context of Transition

At the start of transition, firms were characterised by widespread over-staffing, inefficient working practices, an inadequate emphasis on product quality and marketing, and limited access to modern technology. In addition, firms often received subsidies that allowed them to perpetuate inefficiencies and under-performance. Above all, firms were not generally motivated by the maximisation of profit. Consequently, transition has had two main aspects – the reallocation of resources from the state to the private sector, and the

restructuring of firms to raise their efficiency.[7] With the exception of a small number of countries in the Commonwealth of Independent States (CIS), there has been significant progress in reallocation of resources and restructuring across the transition countries.[8] In most transition countries, the private sector accounts for most of GDP and has been the main engine of growth. The private sector has also diversified, with new private firms entering alongside privatised enterprises, while foreign investment has also complemented domestic ownership in many countries.

Earlier research that looked into the determinants of firm performance has found that privately owned firms – especially new private firms – have generally performed better. The evidence also points to foreign participation and exposure to export markets as factors associated with strong performance, whether measured in terms of sales, labour productivity or total factor productivity (output relative to labour and capital inputs).[9] However, ownership change does not appear to have had any positive impact on performance without complementary changes in management structure, financing, the competitive environment and/or other factors specific to the firm. Further, some recent evidence has suggested that privatised domestic firms do not necessarily perform markedly better than the remaining state-owned firms. Moreover, the evidence suggests that all types of domestic firms in transition countries continue to lag behind their equivalents in advanced market economies.[10] Domestic firms tend to have lower efficiency in generating output from inputs while their scope for raising prices may be

[7] See, for example, Blanchard (1998).
[8] However, see a recent study by Mitra and Yemtsov (2006) for arguments that the transitional restructuring is not yet over.
[9] See, for example, Carlin (2000), Claessens and Djankov (1999), Frydman *et al.* (1999), and the EBRD *Transition Report* 1995 and 1999.
[10] See, for example, Sabirianova *et al.* (2005) and Hanousek *et al.* (2007).

limited by product quality, poor marketing and highly competitive markets. In addition, they tend to have fewer intangible assets, greater vertical integration and higher financing costs. Research on the determinants of firm performance has also begun to look at how factors external to the firm can also exert an influence on performance. Studies using earlier rounds of the BEEPS have suggested that a better business environment can indeed have a positive effect, although the size – and robustness - of that effect have remained open to question.[11] Our paper extends this literature by relating firm performance not only to a set of ownership variables but also to other key attributes, including perceived constraints, competition and export orientation.

3. Data description

We use the 2002 and 2005 rounds of the BEEPS. The BEEPS data are stratified random samples of firms. Concerning ownership, most firms in the samples were privatised or had always been private from the start of their operations. However, quota sampling was imposed for foreign owned companies (defined as having a foreign stake of at least 50 per cent) and state-owned companies (defined as the state owning more than 50 percent). These quotas were set at 10 per cent of the total sample for each category. The distribution of the sample between manufacturing and service sectors was determined according to these sectors' relative contribution to GDP in each country. Firms that operated in sectors subject to government price regulation and prudential supervision, such as banking, electric power, rail transport, and water were excluded from the sample.

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[11] See Carlin et al. (2001).

As regards size, firms that had 10,000 employees or more were excluded from the sample, as were firms that had started operations in 2002, 2003 or 2004. Around 90 per cent of the BEEPS sample in both years comprised small and medium enterprises. The 2002 round of the BEEPS surveyed over 6,100 firms from 26 transition countries while the 2005 round covered nearly 9,100 firms in the same countries. The summary statistics comprising the number of observations, means and standard deviations of the key variables are given in Table 1 for the 2002 and 2005 datasets. Values are expressed in US dollars.

As can be seen from Table 1, the key variables display reasonable mean values and significant variation. Panel A indicates that the average age of the firm was around 15 years. The average firm had between 105 and 145 employees in both surveys. Employment, fixed assets, sales and sales per worker had all increased between 1999 and 2002, as well as between 2002 and 2005. In the case of employment, growth over these three year periods was greater than 30%, while for sales, growth actually decelerated after 2002. The increase in sales per worker was roughly equal over both three year periods. The variation in employment, sales and capital across firms and in their growth has been substantial, as indicated by the standard deviations. Exports have constituted about 10% of sales and there has again been considerable variation around the mean in both years. In terms of ownership-related performance statistics not reported in Table 1, foreign firms have had about 40 per cent higher levels of sales per worker than state-owned firms. Privatised state firms have had around 10 per cent higher levels while new private firms have been about 20 per cent higher. Overall, the average foreign firm has produced 20 to 50 per cent more sales revenue and has had 20 to 40 per cent higher

revenue per worker than the average domestic firm. However, the difference between foreign and domestic firms could be due, in part or fully, to foreign owners acquiring better-performing firms.[12]

Panel B of Table 1 provides descriptive information concerning competition, specifically the average number of competitors reported by firms in both 2002 and 2005 disaggregated by sector. What emerges is that there is little perceived difference across regions or sectors, as well as little change over the two periods. The average number of perceived competitors falls between 2.5 and 3 in each sector, but there is considerable variation within each sector and this variation has risen over time.

Panel C of Table 1 gives some indication of the incidence of firm level changes or initiatives, broken down by the type of initiative. It can be seen that during the three years prior to either 2002 or 2005 about one-half of the firms had upgraded an existing product, while over a third had developed a new product. Around 30% of firms had introduced new technologies – a share that varies relatively little across regions – while between 20-30% of firms had either changed their main customer or supplier. There is far less evidence of firms seeking quality accreditation, joint venturing or use of outsourcing arrangements. Interestingly, no more than 10-13% of firms had developed exports to new countries. Overall, this suggests that the early phase of restructuring in many transition countries has already taken place, except possibly in some strategic industries that are under-represented in the sample. Firms have certainly invested in changing their product lines and have taken other steps to improve their performance. This in turn has likely resulted in a broad range of outcomes. However, particular attributes of firms, such as the

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[12] This finding is corroborated by other studies of individual or smaller sets of countries (see, for example, Sabirianova et al., 2005).

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type of ownership, no longer appear to give a good indication of the expected level of restructuring. Further, firms may periodically make adjustments, such as introducing a new product, but major restructuring appears not to be a widespread feature of the transition countries.

Panel D of Table 1 gives for 2002 and 2005 the mean constraint scores and the associated standard deviations for the fifteen main constraints that the top manager of each firm was asked to evaluate. Individual firm scores for each constraint to doing business range from 1 {= no obstacle} to 4 {= a major obstacle}. The panel shows considerable variation in the average value across constraints, ranging from 1.54 in both years for the presence of anti-competitive practices to 2.85 in 2002 for uncertainty about regulatory policies and 2.75 in 2005 for the constraining nature of tax rates. There is also considerable variation in the reported values of individual constraints across firms, with the standard deviation of the responses being around or exceeding 1.0 for all but one constraint (infrastructure) in each year. Averaging the reported values of all 15 constraints, the mean score in both years was 2.2 with a standard deviation of around 0.7. Further, the variation is considerable when we look for each country and year at the average value of the reported constraint at the level of 4 digit NACE industry and across firm size.

As we discuss later, we have also been able to construct a panel component of approximately 1,300 firms that participated in both the 2002 and 2005 rounds of the BEEPS. While relatively small, this panel data set is useful for a complementary analysis to the pooled cross-sectional data set.[13]

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[13] To make the matching of the panel firms between 2002 and 2005 datasets possible, the latter includes the variable 'seno2002', comprising the serial numbers of the participating firms from the former survey.

4. Analytical framework

In analyzing the determinants of the efficiency with which the firms generate sales revenue from inputs, we use an augmented Cobb Douglas revenue function

$$\ln y_{it} = \beta_0 + \sum_k \beta_k \ln x_{ikt} + \rho Z_{it} + \delta I_{it} + \theta C + \varsigma T_t + v_i + \varepsilon_{it}, \qquad (1)$$

where y_{it} represents the revenue of firm i in period t, x's represent the capital and labor inputs, Z_{it} is a vector of the business environment and structural variables (business constraints, export orientation of the firm, extent of product market competition and firm ownership), the I's, C's and T's denote a set of dummy variables for industries, countries and years, respectively, v_i is an unobserved time-invariant firm-specific effect that we control for in some estimations, and ε_{it} is an independently distributed error term. Equation (1) allows efficiency to vary across institutional and structural variables, industries, countries and time.

Equation (1) represents our basic specification. We also have access to a measure of material inputs which, however, is noisier than the measures of labour and capital. However, to check the robustness of our results, we also estimate equation (1) with the left hand side variable being the log of value added defined as the difference between revenues and the material input variable. Moreover, as we discuss below, using the panel data we are able to provide estimates of an 'initial value' equation in which we regress the rate of change of revenues between 2002 and 2005 on the 2002-05 rate of change of labour and capital and on the 2002 levels of the business environment constraints and the structural variables (ownership, competition and export orientation).

In estimating equation (1), the question that naturally arises is how best to control for the potential endogeneity/selection issues related to some of the explanatory variables. In particular, given the nature of the privatisation process, firm ownership may not be assigned at random, and there is generally a need to account for possible unobserved heterogeneity and to isolate the effect of inputs, perceived business environment and structural factors on a firm's performance from the effects of performance on these explanatory variables.[14] We use an instrumental variable (IV) approach, noting that we are fortunate that the BEEPS data contain a large number of firms as IV estimates are consistent but not unbiased. However, controlling adequately for endogeneity is not an easy task in survey data such as ours that do not come from a natural experiment. We use several complementary approaches to estimate the average effect of the explanatory variables on performance. First, for several key variables, the 2002 and 2005 samples provide information on the rate of change between 1999 and 2002, and between 2002 and 2005, so that we can use lagged three-year differences in some of these variables as potential instrumental variables for our cross sectional analysis of the 2002 and 2005 levels of variables. For each year in each firm, we also have data on the number of workers with university and secondary education and following Marschak and Andrews (1944) and Schmidt (1988), we can use the ratio of these two inputs (skill ratio) as an instrumental variable.[15] The use of a skill ratio relies on the exogeneity of the ratio of wages of the more and less educated workers at the firm-level, and on variation in this

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[14] Gupta *et al.* (2000), for instance, show that better performing firms tend to be privatised first while Sabirianova *et al.* (2005) find that foreign firms acquire better-performing domestic firms.

[15] The rationale for this instrument comes from economic optimization and an assumed exogeneity of input prices (wages). In particular, if the production function is Cobb-Douglas and the firm maximizes profit or minimizes cost, the first order conditions dictate that the ratio of inputs equal the ratio of input prices and technological parameters. If the firm is a price taker in the input market, the ratio of inputs reflects these exogenous factors.

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wage ratio across regions and countries. Since firms in our survey operate in very different regions and countries, the ratio of wages of workers with greater and lesser education is likely to vary considerably across our observations.

Given that the bias of two-stage least squares is proportional to the degree of over-identification, our approach has been to estimate the first stage regressions with as few IVs as possible, while ensuring that the IVs have adequate explanatory power and pass the over-identification tests. In particular, we start by estimating equation (1) in levels on the pooled 2002 and 2005 samples of firms and we use as IVs the age and location of the firm, the skill ratio interacted with the three main regions covered by our data,[16] the skill ratio interacted with firm age and the three regions, a three-year lagged number of full time employees, the change in fixed assets in the preceding three years, and the change in the export share over the preceding three years. We use these variables as instruments for the levels of the capital and labour inputs, categories of ownership and the export orientation of the firm. We find that these IVs are good predictors of all the potentially endogenous variables and pass the J (Sargan) over-identification test.[17] We treat the extent of competition in the firm's product market as exogenous to a given firm.

Finally, in order to assess the robustness of our results with respect to the business environment (institutional) constraints, we have estimated these effects in several ways. First, we have carried out estimations using the individual values of the constraints directly as reported by the top managers of the interviewed firms. This approach has the

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[16] The regions are (a) Central Europe and Baltics, (b) the Commonwealth of Independent States (CIS), and (c) Southeastern Europe.

[17] The summary statistics from the first stage estimates are reported in the tables with the second stage results. Complete results of the first stage regressions are available on request. Given the choice of IVs, the need to address the endogeneity issue is also indicated by the Hausman-Wu F tests and Durbin-Hausman-Wu Chi square tests that suggest that the null hypothesis of the exogeneity of the regressors is rejected in our data.

advantage that it provides a direct firm-specific measure and generates high variance in the values of these variables, but it may generate biased estimates if a manager's perception of the severity of constraints is, for instance, influenced by the performance of his/her firm.[18] Second, in order to address this potential endogeneity bias, we have carried out estimations in which we instrument the individual managers' values of constraints with the above mentioned, as well as other IVs. Third, we have used an average value of each constraint reported by other firms, where the average is based on responses either by all other firms in a given industry in each country and year, or by all other firms of a given size in a given industry in each country and year. The advantage of using the responses of other firms that are subject to the same external shocks is that the value of the constraint is not affected by the firm's own performance. It turns out that the estimates based on all the above approaches are similar, with estimates based on the average value of constraints reported by other firms of a given size in a given NACE 2 digit industry in each country and year being slightly more frequently significant than others. Since our analysis suggests that the literature has overstated the significance of the effect of business constraints on firm performance, in what follows we report the set of estimates that are most likely to generate significant estimates of the business constraints (i.e., provide the greatest support for the existing literature and go most against our thesis), namely estimates based on the average values of constraints reported each year by other firms within a given 2 digit industry and firm size category (small, medium and large) in a given country. This approach gives both a considerable variation in the values of constraints and a sufficient number of firms per cell to minimise problems associated

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[18] For example, managers of efficient firms operate near full capacity and feel constrained, while managers of poorly performing firms may have considerable unused capacity and do not find many constraints binding.

with potential measurement error. The standard errors of all estimates are clustered by year, country, industry and firm size.

Our second approach is to use the smaller panel data set that we have constructed from the 2002 and 2005 BEEPS surveys to explain the three-year rate of change in performance. For this analysis we have over 600 firms and as we discuss below, the sample is relatively representative of the larger cross section of firms. The panel data generate broadly similar estimates as the entire pooled cross sectional sample, suggesting that the panel dataset is a usable subset of the entire sample. Using the panel data we estimate an equation in which we regress the rate of change of revenues between 2002 and 2005 on the 2002-05 rate of change of labour and capital, and on the 2002 levels of the business environment constraints and structural variables. This 'initial value' regression parallels the specification used by Levine and Zervos (1998) at the macro level and allows us to ask the question of how initial (2002) conditions affect the subsequent (2002-05) rate of change of performance.[19]

As mentioned earlier, the principal variables whose performance effect we analyse include the intensity of the various constraints reported by the firms, firm ownership, the extent of competition faced by the firm, and the extent of exporting carried out by the firm. In addition, coefficients on country dummy variables provide an estimate of the effect on efficiency of the business environment at the country level. We also apply a sector fixed effect in the estimations reported below and, where possible, a year dummy.

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[19] This is about as far as we can go in estimation, however, since for most firms we have data on the percentage change in revenues between 2002 and 2005, but we lack 2002-05 rate of change observations for many of the explanatory variables. For instance, we cannot estimate equation (1) in first differences.

5. Effects of Ownership, Competition, Exports and Business Environment

5.1 Level of Efficiency

Table 2 contains our baseline IV estimates without the explanatory variables capturing the business environment (institutional) constraints. These regressions use pooled data from the entire 2002 and 2005 BEEPS and correspond to studies that have examined the efficiency effects of exporting, competition and firm ownership. The number of observations varies from 5,624 to 5,897, depending on specification, and the results are therefore based on the largest data set available to us. All regressions include country, year and sector fixed effects. State ownership serves as the reference and the coefficients on other ownership categories hence reflect the log point differential effect relative to state ownership.

Column 1 reports a base estimate where just the two factors – labour and capital – are included. The labour coefficient is relatively small and not statistically significant but, as we show presently, it is larger and significant in the more preferred models that we run. Column 2 adds in the ratio of exports to sales and this variable enters positively and significantly. Columns 3 and 4 introduce the competition variable – defined as 1 if the firm has three or more competitors and 0 otherwise. Entered alone with the inputs the coefficient is positive, but small and insignificant. This is also the case when competition is entered alongside the export share and controlling for inputs. The coefficient on the export share remains large and highly significant. Columns 5-8 introduce the ownership variables. In these specifications the labour and capital coefficients are both positive and statistically significant, and their sum approaches unity. It is of interest to note that the coefficients on both the privatised and new private firms are negative and, in the latter

case, marginally significant in two of the four specifications. By contrast, foreign ownership has a large and positive coefficient that is significant at the 1% level. The positive effect of foreign ownership is maintained but the significance of the negative effect of new private ownership disappears when the export share and competition variables are entered. Interestingly, when we control for ownership, the export share variable loses all significance. In Columns 7 and 8, where most or all the explanatory variables are entered simultaneously, we find that competition has a small, positive and significant (at 10-11% level) impact on performance with foreign ownership exerting a strong and positive impact on performance as well. Being privatised or being a new private firm remains negatively signed but insignificant relative to the reference of state-owned firms. The augmented specifications in Columns 5-8 also generate acceptable values of the J and F tests related to the selection of IVs in the first stage of estimation. Our preferred (all-encompassing) specification in Column 8 points to the importance of foreign ownership and to a lesser extent competition on performance. The corresponding value added regressions, reported in Appendix Table A1, yield qualitatively similar results except that the estimated coefficient on competition, while positive, is not statistically significant. (In what follows, we do not report additional value added regressions because they generate results that are similar to those in the revenue regressions.)

Having estimated the base performance equation, we proceed to considering directly the impact of business environment constraints on firm performance. As mentioned above, for each constraint we use the average of responses of other firms in the same 2 digit sector, firm size (small, medium and large), country and year throughout

the analysis, with the other unreported specifications yielding similar results. Entering all 15 categories of constraints invariably yields insignificant estimates and the question naturally arises as to whether collinearity across constraints induces this insignificance of results. We have examined the relationships among the various constraints and we report the key findings in Tables A2 and A3 in the Appendix. As may be seen from the correlation matrix in Table A2, most constraints are not highly correlated, although several pairs display high correlation (e.g., access to financing and cost of financing, tax rates and tax administration, uncertainty about regulatory policies and macroeconomic instability, and street crime and organized crime). This pairwise correlation is also detected in an ANOVA regression that we have run to assess the extent to which the variation in the value of any given constraint can be explained by the other constraints. In what follows, we enter only one of these pairwise correlated constraint variables, noting that it generally does not matter which of the two is entered. We also exclude the constraint related to labour regulation as it is almost completely explained by the interaction of country and year fixed effects and hence insignificant. This leaves us with nine constraints whose effects we analyze in the remainder of the paper. As may be seen from Table A3, the partial correlation coefficients among these nine constraints are relatively low and the total R squared in the reported regressions of each constraint on others is at or below 0.4 in all except one regression (corruption), where it is at 0.48. When we add country, year and sector fixed effects to the regressions in Table A3, we increase the R squared in the constraints regressions to 0.41-0.57. Finally, adding all other regressors from the IV revenue regressions raises the R squared to 0.44-0.73.

Collinearity among the constraints is hence limited but becomes somewhat more pronounced for some constraints when all the regressors are considered simultaneously.

Table 3 provides a first pass at including the nine constraints in the performance regression -- individually (Columns 1-9), as an average of all nine constraints (Column 10) and with all nine constraints entered together (Column 11). Despite the obvious omitted variable problem, we report the specifications with the constraints entered one at a time because this approach has been used frequently in the literature and much of the accepted wisdom on the effects of institutions and regulation on performance derives from these types of specifications. In line with a large part of the literature, the regressions in Table 3 are without country, year and sector fixed effects (note that this model appears to be mis-specified compared to a model that includes these fixed effects (Table 4 below) in that the labour coefficient is small and insignificant, and the p values on the J test are very small). It can be seen that when entered individually, all except one of the constraints enter negatively – as would be expected - and most are significant at 1% or 5% levels. In these specifications, we hence replicate the conventional wisdom obtained in many studies that the business/institutional environment matters. The regression with the average value of all nine constraints, proxying the overall severity of the business environment, also yields a negative and statistically significant coefficient. When all the constraints are entered simultaneously in the IV estimation in Table 3, however, the infrastructure and to a lesser extent tax rate and macro instability constraints remain negative and significant, but others lose significance or, in the case of crime, theft and disorder, become positive and significant. Hence, when we correct at least in part for the possible omitted variables problem, the negative effect of most business environment

constraints on performance disappears. As may be seen from Table A4 in the appendix, the corresponding OLS estimates are very similar for the individually entered constraints (Columns 1-10) and they differ only slightly when all the constraints are entered simultaneously (Column 11) in that 4 of the 9 constraints retain a negative coefficient.

Table 4 repeats the same exercise but includes country, year and sector fixed effects whose omission may have biased the estimates in Table 3. In this case, the significance of the coefficients on inputs, ownership, exports and competition correspond to those in the base estimations in Table 2 – foreign ownership and having three or more competitors exert a positive and significant impact, while export orientation does not and the effect of new private firms becomes negative and statistically significant in some specifications. However, the picture changes substantially with respect to the business environment constraints. While most of the constraints terms entered individually retain their negative sign, only one – corruption -- is significant. The effect of the average of all constraints, reported in Column 10, is statistically insignificant, as are all the constraint coefficients in Column 11 where all constraints are entered simultaneously. The corresponding OLS estimates in Table A5 are similar in that only one constraint – this time crime – has a significant negative coefficient when the constraints are entered individually, and only one has a significant (but positive) coefficient when all the constraints are entered simultaneously. An examination of the role played by the country, year and sector effects indicates that it is the country as well as country *cum* year fixed effects in particular that serve to knock out the significance of the individual (and in the case of OLS also the jointly entered) constraints. Hence, once we control for country-

wide differences in the 'business environment' (together with aggregate shocks and other effects), the negative effects of most constraints disappear.

We have also extended the analysis by looking at the possible impact that interactions of constraints might have on performance, in line with recent explorations in the development literature (see e.g., Aghion et al., 2005, 2006). The intuition here is that, say, corruption may or may not have a direct impact itself, but it may exert an effect through its association with other constraints related to government policies and regulations, such as the functioning of the judiciary, uncertainty about regulatory policies, labour regulations, business licensing, and tax administration and tax rates. To explore whether this is indeed the case we have augmented the base model with interactions of constraints that may be hypothesised to be related. For example, in Table 5 we report the results of interacting corruption with functioning of the judiciary, uncertainty about regulatory policies, labour regulations, business licensing, and tax administration and tax rates. As may be seen from the table, neither when the interactions are entered one at a time, nor when they are all entered simultaneously, do we find statistically significant results. The results in Table 5 are representative in that we were unable to find any robust evidence for other interactions either.

In another set of extensions, we have explored the idea of heterogeneity across regions and examined whether significant results can be obtained if we estimate the models separately within each of the three main regions covered by our data – Central Europe and the Baltics (CEB), South-eastern Europe (SEE) and the CIS. The findings from these estimations allow the slope coefficients to vary by region and they are similar to those presented for the sample as a whole. When the country, year and sector fixed

effects are excluded, few constraints are significant and a number of the signs are counter-intuitive. When the country, year and sector fixed effects are included, virtually all constraints lose significance.

One important result that we are obtaining in our analysis is that country differences, presumably in the overall business environment but also in other aspects, matter for firm performance while the within-country cross-firm differences do not. Closer inspection of the country fixed effects reveals that while not all are significant, the ranking of countries that occurs corresponds to a significant extent to what might be expected from other indicators, such as the EBRD transition indicators.[20] That is, the ranking for instance mostly confirms that firms in the Central European countries have higher average levels of efficiency than either those from SEE or the CIS. However, the rankings are not stable and have a number of unexpected features. For instance, Serbia and Macedonia consistently rank above the most economically advanced (EU accession) countries such as the Czech Republic, Hungary and Poland. This suggests that the country effects are also capturing other sources of heterogeneity, such as differences in accounting and reporting systems. For these very reasons, it is desirable to control for country effects, realizing that they capture many features of heterogeneity, rather than excluding them or attributing the cross-country heterogeneity to just a single factor, such as a particular aspect of the business environment.

5.2   Using Heritage Foundation and Doing Business Indicators

In view of our findings based on manager perceptions of the business environment, a question arises as to whether the findings are robust in that other measures of the

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[20] See EBRD Transition Reports

business/institutional environment would produce similar results. To answer this question, we have examined the effects that widely used indices of the business environment and institutions have when combined with our firm-level data.[21] In particular, we have merged our firm-level data with the 10 indices of economic freedom produced by the Heritage Foundation – trade tariffs, tax rates, government intervention, monetary policy (inflation), restrictions on foreign direct investment, banking/finance sector restrictions, wage/price controls, property rights issues, business and other regulations, and the extent of informal markets. As an alternative, we have also used 12 of the Doing Business indicators produced by the World Bank. These are, the number of procedures to register a business, time to register a business, cost of registering a business, rigidity of employment regulations, restrictions on firing workers, cost of firing a worker, number of procedures to enforce a contract payment after default, time to enforce a contract payment after default, cost of enforcing a contract payment after default, time to effectuate bankruptcy, cost of effectuating bankruptcy, and recovery rate in a bankruptcy. The Heritage Foundation indices are measured on a 1-5 scale (1 = best/most free and 5 = worst/least free), while the Doing Business indicators are on a 1-100 scale or have a natural value (days, number of procedures, etc.). The data for the Heritage Foundation relate to 2001 and 2004, while those for Doing Business were published in 2003 and 2006 (and collected mostly in 2002 and 2005).[22]

When we enter the Heritage Foundation indices of regulation one at a time into our OLS regressions without country, industry and year fixed effects, the indices all produce the expected negative effects of regulation/constraints on firm performance, as

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[21] We would like to thank John DiNardo for suggesting this analytical extension to us.
[22] "Doing Business" was first published in 2003.

does a simple average index of these 10 indices (columns 1-10 in Appendix Table A6). When the ten indices are entered simultaneously in column 11 of Table A6, five retain negative coefficients, two coefficients turn positive, and three become statistically insignificant. Our data hence reproduce the traditional result that when the Heritage indicators are entered one at a time in an OLS regression, they show a strong negative effect of regulation on performance. The effects are quite mixed, however, when the indicators are entered jointly.

A major empirical and policy issue arises from the fact that the values of the individual Heritage Foundation indicators are highly correlated over time. For the two years that we use, these indicators for our 27 countries have a correlation that ranges between 0.91 (government intervention) and 0.99 (business and other regulation). This means that the indicators are close to being indistinguishable from country fixed effects. Indeed, when we run the OLS regressions with country, industry and year fixed effects, and the Heritage Foundation indicators are entered one at a time, two of the ten indicators retain negative coefficients, one becomes positive and seven become statistically insignificant (columns 1-10 in Appendix Table A7). When all the indicators are entered simultaneously, two coefficients are negative, three are positive and five are insignificant (column 11 in Table A7).

When we use the Heritage Foundation indicators in our IV regressions, with or without country, industry and year fixed effects, the coefficients of the individual Heritage Foundation indicators all become insignificant when entered individually, and they produce three negative, one to three positive and four to six insignificant coefficients when entered simultaneously. Moreover, the coefficients that are negative are not the

same ones in the various specifications. For the sake of brevity, we report in Table 6 the results for the IV estimation with country, industry and year fixed effects, noting that the estimates in the regressions without these fixed effects are similar. In sum, specifications other than a simple OLS model with each Heritage Foundation constraint entered individually basically fail to generate the expected negative effect of regulation/constraints indicators on firm performance.[23]

As may be seen from Appendix Table A8, when we use the Doing Business indicators and enter them one at a time, the OLS regressions without country, industry and year fixed effects generate seven coefficients that are negative, three that are positive and two that are statistically insignificant. When all the business environment indicators are entered simultaneously, six coefficients are negative, five are positive and one is statistically insignificant. In these "basic" specifications, the Doing Business indicators hence generate less support for the expected negative effects of regulations/constraints on firm performance than the Heritage Foundation indices.

The Doing Business indicators are potentially more interesting than the Heritage Foundation indices for the fixed effects regressions, however, because some are less correlated over time -- the correlation coefficients range from 0.84 for time to start a business to almost 1.0 for contracts procedures. Yet, as may be seen from Appendix Table A9, when we enter the Doing Business indicators individually into the OLS regressions with country, industry and year fixed effects, four coefficients are negative,

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[23] The power of the tests is obviously low in those instances when we are exploiting the limited variation in the values of these indices over time and one might not be rejecting the null hypothesis of no effects of the constraints even when this null hypothesis is false. The point that we are making is simply that with the indicators at hand one does not generate the expected negative effect when controlling for cross-country heterogeneity.

one is positive and seven are statistically insignificant. When we enter the indicators simultaneously, three are negative and nine are insignificant. Of the three indicators that have a correlation of the 2003 and 2006 values below 0.9 (time to register a business, cost of registering a business, and restrictions on firing workers), two generate a negative effect and one a positive effect when entered individually, while one produces a negative coefficient and two produce an insignificant coefficient when entered simultaneously. The OLS results in Appendix Table A9 are hence quite mixed and do not provide much support for the hypothesis that greater regulation impedes firm performance.

When we introduce the Doing Business indicators into our IV regressions, we obtain similarly mixed results. In the specification with country, industry and year fixed effects (Table 7), only four of the twelve indicators generate the expected negative coefficients. In the IV regressions without fixed effects (not reported in tabular form here) only two of the twelve indicators have negative effects. Moreover, the indicators with the negative coefficients are not the same ones across specifications.

Overall, our results indicate that the widely used country-level indicators of business/institutional environment do not provide much evidence of a negative relationship between constraining environment and firm performance. Some of these indicators, particularly the Heritage Foundation indices, produce evidence consistent with this hypothesis in the simplest OLS specifications when the indices are entered one at a time, but not in the specifications when the indices are entered jointly or models that control for other relevant factors.

5.3 Rate of Growth of Revenues

Having looked at the effects of the constraints and the structural variables capturing ownership, export orientation and competition on the *level* of revenue efficiency, we next address the question of whether these variables have any effect on the rate of change in the revenue efficiency of firms. These "initial value" regressions are estimated on the smaller number of firms in the panel data set. We have checked the comparability of the panel to the larger data set by comparing summary statistics and we have also replicated on the panel data the same base estimations as we present for the pooled cross sectional data in Table 2. These base estimations performed on the panel data are reported in Appendix Table A10.

In Table 8 we report the results of relating the 2002-05 rate of change of real sales revenues to the lagged (2002) levels of the ownership, competition, export orientation, and constraint variables, controlling for the rate of change in labour and capital over the same period. By construction, these "initial value" regressions eliminate the possibility that the relationship between efficiency, constraints and the structural variables is brought about by contemporaneous shocks to these variables. Estimation in this instance is by OLS with country, sector and year fixed effects included. While foreign ownership enters positively and the coefficient on new private ownership tends to be negative as before, we do not find evidence for any type of ownership having a statistically significant impact on the rate of change of performance. Export orientation enters positively and is statistically insignificant, and we are unable to find any impact from competition. As to the business/institutional constraints, none of the variables generate a significant negative effect, whether entered individually or jointly and the size of the estimated coefficients

tends to be small. We hence find no evidence that the level of perceived constraints matters for subsequent rate of change of performance. In particular, the different aspects of the business environment, as measured by these reported constraints, do not affect the subsequent rate of change of efficiency with which firms generate revenue from inputs.

6. Conclusions

It has become almost fashionable in recent years to argue that the business environment plays a major role in determining the overall strength of a given economy, primarily through its impact on the performance of firms. 'Bad' business environments – commonly characterised as those in which, for example, corruption and regulation is high and where there is pervasive uncertainty with respect to taxation, business licensing or even macroeconomic policy -- are widely believed to cause poor economic performance. The evidence for such conclusions has indeed been drawn from a variety of sources, including cross-country estimations of growth but also, increasingly, from firm level surveys that have gathered subjective information on perceived constraints to activity emanating from the business environment. However, while the general thrust of the argument – that the business environment is an important determinant of economic performance – carries considerable intuitive appeal, the importance of establishing the hypothesised relationship through careful analysis of data cannot be emphasised enough. A similar reasoning applies to the relatively broadly accepted notion that private ownership of basically any kind generates superior performance to state ownership of firms. Indeed, a certain amount of the recent research in this area using aggregate and firm-level survey evidence may be misleading through its reliance on relatively simple

econometric implementation that may suffer from biases due to omitted variables, measurement error and endogeneity.

In this paper we have addressed the challenge by using firm-level information – in this case the large BEEPS dataset – to analyze the performance effects of firm's ownership, competition, export orientation and the business (institutional) environment. To that end, we have employed a variety of approaches, including instrumental variables and using average values of constraints reported by other firms with similar characteristics. We find that there is evidence that ownership and competition exert an impact on performance, but the results differ from much of the earlier literature in that foreign ownership of firms has a positive effect on performance but domestic private ownership does not. Export orientation of the firm is found to have a positive effect on performance in simple specifications but the effect disappears once firm ownership is taken into account. When we examine the impact of perceived business environment constraints, we find that few retain explanatory power, in either IV or OLS specification, once they are entered simultaneously rather than one at a time, or once country, year and sector fixed effects are introduced. Indeed, country fixed effects largely absorb the explanatory power of the constraints in all specifications. In neither the level equations nor in the "initial value" rates of change regressions can we identify any strong and robust effects of these variables. The lack of a detectable effect of the reported severity of various constraints in the business environment could reflect the fact that (a) firms can get around these constraints at a relatively low cost and the effect is hence not detectable in the data (e.g., the firms must pay a bribe to obtain a license but the cost of the bribe is small), or (b) managers who face severe constraints compensate for the presence of these

constraints and report lower severity than is actually the case (e.g., firms that need more acutely external financing "pre-save" from retained earnings in the presence of financing constraints and report lower severity of the financing constraint than is in fact the case because they pre-saved and do not need as much external financing as they would otherwise). Since we observe significant variation in reported constraints across firms, the latter phenomenon (compensating for constraints) may reduce the observed effect of constraints but should not eliminate it altogether.

In order to see if the overall results are brought about by some peculiarity of our business environment data, we have also replicated the level equations using the country-level indicators of the business environment provided by the Heritage Foundation and the World Bank. We again do not detect a systematic relationship between constraints and performance.

Overall, we show that country effects, reflecting differences in the business environment but also other factors, matter for firm performance but that differences in the business environment constraints observed across firms within countries do not. Moreover, the limited firm- and country-level variations in the business environment over time do not appear to affect performance either. A closer inspection of the country fixed effects reveals that they are to some extent correlated with the expected differences in corporate performance but that they are also likely to be capturing other sources of cross-country heterogeneity. Our analysis hence brings into question an important part of the conventional wisdom in this area. It suggests that the effect of business environment on performance and the analysts' ability to identify this effect are more limited than has been widely assumed in the analytical and policy work to date. It indicates that it is important

to control for country effects, realizing that they capture many features of heterogeneity, rather than excluding them or attributing the cross-country heterogeneity to just a single factor such as the business (institutional) environment.

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Table 1: Descriptive Statistics

	2002			2005		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Panel A: Summary Statistics						
Sales	4504	2290	10428	6665	3376	17503
Employment	6122	143	505	9097	105	364
Fixed Assets	3388	2384	33893	4637	1622	10582
Number of Competitors	6029	0.82	0.39	8479	0.82	0.39
Ownership [Privatization]	6153	0.15	0.36	9098	0.14	0.35
Ownership [New Private]	6153	0.55	0.50	9098	0.66	0.47
Ownerschip [State]	6153	0.14	0.35	9098	0.09	0.28
Ownership [Other]	6153	0.02	0.12	9098	0.01	0.09
Ownership [Foreign]	6153	0.14	0.35	9098	0.10	0.30
Exports as % of Sales	6055	11.16	25.05	9039	8.76	22.34
Workforce Ratio: University / Secondary Education	5289	1.36	4.67	6930	1.24	3.83
Company Age	6153	14.70	18.70	9090	15.55	17.46
University / Secondary Education x Age	5289	19.47	114.49	6925	22.84	124.76
Permanent Employment 3 years ago	6066	134.73	501.85	8967	101.51	405.07
Parttime Employment 3 Years ago	5872	6.96	44.21	8873	5.65	31.70
% change in Fixed Assets (3 year period)	5717	16.30	46.66	8787	11.90	32.17
% change in Exports (3 year period)	6026	5.44	33.76	9030	4.44	29.81
% change in Employment (3 year period)	6059	34.89	135.99	8967	30.30	133.53
% change in Sales (3 year period)	5832	21.69	62.74	8764	12.99	39.25
% change in Sales per Worker (3 year period)	5753	14.69	74.90	8645	12.35	89.17
Panel B: Average number of Competitors						
Construction	772	2.85	0.39	443	2.86	0.41
Manufacturing	1463	2.72	0.49	2161	2.75	0.49
Transport, Storage & Communic	474	2.72	0.52	339	2.79	0.47
Wholesale & Retail Trade	1847	2.88	0.34	949	2.84	0.40
Real Estate Renting & Business Services	637	2.82	0.41	396	2.82	0.45
Other Services	768	2.81	0.43	317	2.74	0.53
Others	68	2.53	0.63	60	2.53	0.68
Panel C: Share of companies taking initiatives						
Change main supplier	6079	0.28	0.45	9098	0.28	0.45
Change main customer	6096	0.23	0.42	9098	0.22	0.41
Export to new country	6153	0.13	0.34	9098	0.10	0.30
Develop major new product	6153	0.39	0.49	9098	0.35	0.48
Upgrading an existing product	6153	0.52	0.50	9098	0.51	0.50
Discontinued at least 1 product	6110	0.21	0.41	9098	0.16	0.37
Joint venture with foreign partner	6153	0.09	0.28	9098	0.04	0.20
New product licensing agreement	6153	0.19	0.39	9098	0.13	0.34
Outsorced a major production	6106	0.08	0.28	9098	0.08	0.27
Quality accreditation	6153	0.14	0.35	9098	0.12	0.33
None of the previous	6149	0.15	0.36	9098	0.23	0.42
Brought in-house a major production	6109	0.08	0.28	9098	0.07	0.26
Opening new plant	6110	0.14	0.35	n.a	n.a	n.a
Close existing plant	6103	0.12	0.32	n.a	n.a	n.a
Introduced a new technology	6115	0.30	0.46	n.a	n.a	n.a
Panel D: Average constraints						
Access to financing	5810	2.33	1.16	8647	2.26	1.14
Cost of financing	5864	2.53	1.13	8698	2.51	1.13
Tax rates	6060	2.76	1.11	8951	2.75	1.10
Tax administration	5953	2.54	1.14	8895	2.47	1.13
Custom/foreign trade regulations	5649	2.04	1.12	8267	1.91	1.07
Business licencing & permit	5906	2.02	1.08	8776	1.98	1.04
Labour regulations	5946	1.74	0.94	8886	1.87	0.98
Uncertainty about regulatory policies	6000	2.85	1.09	8819	2.53	1.12
Macroeconomic instability	5998	2.76	1.11	8823	2.52	1.12
Functioning of the judiciary	5728	2.06	1.08	8417	2.06	1.10
Corruption	5713	2.24	1.16	8497	2.16	1.14
Street crime theft & disorder	5857	1.96	1.07	8661	1.82	1.01
Organised crime mafia	5663	1.81	1.09	8394	1.64	0.97
Anti-competitive practices	5871	2.25	1.11	8739	2.30	1.11
Infrastructure	6122	1.54	0.70	9043	1.54	0.73
Average of all constraints	6134	2.24	0.67	9064	2.17	0.66

1 * n.a.: information not available

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Table 2: Revenue Efficiency - Baseline Regressions
(IV Estimation with Year, Country and Sector Fixed Effects)

	1	2	3	4	5	6	7	8
Log Employment	0.189	0.190	0.203	0.236	0.449	0.466	0.508	0.503
	[0.177]	[0.177]	[0.170]	[0.163]	[0.184]**	[0.200]**	[0.179]***	[0.188]***
Log Assets	0.904	0.880	0.891	0.826	0.522	0.498	0.467	0.470
	[0.190]***	[0.190]***	[0.182]***	[0.177]***	[0.192]***	[0.213]**	[0.189]**	[0.201]**
Log (1 + Export / Sales)		0.743		0.981		-0.540		-0.218
		[0.359]**		[0.392]**		[0.493]		[0.506]
More than 3 Competitors			0.040	0.066			0.072	0.075
			[0.052]	[0.050]			[0.044]*	[0.046]
Ownership [Privatized]					-0.435	-0.205	-0.222	-0.159
					[0.428]	[0.423]	[0.384]	[0.405]
Ownership [New Private]					-0.531	-0.523	-0.408	-0.424
					[0.284]*	[0.283]*	[0.258]	[0.263]
Ownership [Foreign]					1.196	1.728	1.388	1.591
					[0.367]***	[0.544]***	[0.350]***	[0.520]***
Constant	0.513	0.520	0.488	0.523	1.430	1.422	1.281	1.283
	[0.231]**	[0.231]**	[0.248]**	[0.240]**	[0.423]***	[0.439]***	[0.400]***	[0.416]***
Observations	5897	5844	5677	5624	5897	5844	5677	5624
J-Test	17.78	14.12	16.89	12.16	3.19	1.58	1.50	0.95
p-value	0.003	0.007	0.005	0.016	0.527	0.209	0.472	0.328
First stage F-tests								
Log Employment	326.02	322.82	311.13	307.83	326.02	322.82	311.13	307.83
Log Assets	135.40	134.22	125.73	124.50	135.40	134.22	125.73	124.50
Log (1 + Export / Sales)		57.07		59.51		57.07		59.51
Ownership [Privatized]					46.69	46.55	45.11	45.04
Ownership [New Private]					128.52	129.01	122.58	123.05
Ownership [Foreign]					21.48	20.37	20.86	19.73
Durbin-Wu-Hausman Test	63.55	72.73	66.95	76.99	81.08	82.18	81.38	78.31
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors, clustered by year, country, industry and firm size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: All models were estimated using IVs for log Employment, log Assets, log(1 + Export/Sales) and three Ownership Dummies. The IVs are: Firm's age, skill ratio (college/high school), skill ratio - age interaction, location (city), % change in fixed assets in previous period, % change in exports in previous period, full time employees in previous period. The skill ratio and the skill ratio - age interaction were also interacted with regional (CEB, SEE and CIS) dummies

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Table 3: Revenue Efficiency - Impact of Individual Constraints
(IV Estimation without Year, Country or Sector Fixed Effects)

	1	2	3	4	5	6	7	8	9	10	11
Log Employment	0.079	0.067	0.064	0.079	0.081	0.088	0.044	0.063	0.077	0.073	0.109
	[0.100]	[0.102]	[0.103]	[0.109]	[0.108]	[0.106]	[0.109]	[0.108]	[0.103]	[0.101]	[0.118]
Log Fixed Assets	0.941	0.963	0.97	0.947	0.945	0.953	0.965	0.968	0.942	0.948	0.899
	[0.080]***	[0.082]***	[0.081]***	[0.089]***	[0.090]***	[0.089]***	[0.090]***	[0.092]***	[0.086]***	[0.080]***	[0.102]***
Ownership [Privatized]	0.789	0.758	0.834	0.806	0.924	1.016	0.801	0.94	0.642	0.752	0.371
	[0.671]	[0.708]	[0.743]	[0.737]	[0.765]	[0.747]	[0.754]	[0.731]	[0.729]	[0.658]	[0.756]
Ownership [New Private]	0.05	0.096	0.121	0.049	0.143	0.229	0.002	0.18	0.011	0.041	-0.14
	[0.446]	[0.434]	[0.439]	[0.453]	[0.456]	[0.441]	[0.457]	[0.449]	[0.434]	[0.423]	[0.445]
Ownership [Foreign]	2.416	2.542	2.456	2.563	2.719	2.653	2.684	2.764	2.446	2.45	2.101
	[0.871]***	[0.872]***	[0.901]***	[0.853]***	[0.899]***	[0.902]***	[0.887]***	[0.913]***	[0.877]***	[0.821]***	[0.940]**
Log (1 + Export / Sales)	-1.51	-1.673	-1.632	-1.557	-1.756	-1.662	-1.737	-1.694	-1.565	-1.557	-1.37
	[0.776]*	[0.805]**	[0.820]**	[0.805]*	[0.840]**	[0.835]**	[0.852]**	[0.835]**	[0.813]*	[0.761]**	[0.880]
More than 3 Competitors	0.134	0.114	0.135	0.13	0.122	0.119	0.155	0.121	0.152	0.137	0.164
	[0.076]*	[0.076]	[0.075]*	[0.079]*	[0.077]	[0.076]	[0.079]*	[0.080]	[0.074]**	[0.074]*	[0.078]**
Cost of Financing	-0.123										-0.007
	[0.056]**										[0.060]
Infrastructure		-0.287									-0.238
		[0.090]***									[0.092]***
Tax Rates			-0.204								-0.127
			[0.062]***								[0.065]*
Customs / Foreign Trade Regulations				-0.113							0.061
				[0.060]*							[0.065]
Business Licencing & Permits					-0.137						-0.067
					[0.063]**						[0.066]
Macroeconomic Instability						-0.134					-0.11
						[0.055]**					[0.065]*
Corruption							-0.097				0.007
							[0.053]*				[0.071]
Street Crime, Theft & Disorder								0.013			0.17
								[0.064]			[0.083]**
Anti-competitive Practices									-0.15		-0.049
									[0.071]**		[0.092]
Average of all Constraints										-0.246	
										[0.092]***	
Constant	1.238	1.306	1.379	1.113	1.097	1.057	1.133	0.711	1.321	1.477	2.028
	[0.557]**	[0.550]**	[0.561]**	[0.571]*	[0.594]*	[0.605]*	[0.591]*	[0.644]	[0.529]**	[0.541]***	[0.584]***
Observations	4992	5121	5091	4741	4968	5059	4843	4938	4981	5127	4305
J-Test	4.77	5.96	4.51	4.60	5.33	4.79	5.66	3.78	7.79	5.50	5.99
p-value	0.029	0.015	0.034	0.032	0.021	0.029	0.017	0.052	0.005	0.019	0.014
First stage F-tests											
Log Employment	249.83	258.70	258.02	243.55	253.18	256.76	240.20	243.49	251.08	259.63	211.75
Log Assets	91.02	93.04	93.84	85.51	90.87	92.68	88.06	89.03	94.51	93.70	77.04
Ownership [Privatized]	40.12	40.21	40.07	37.59	39.46	40.30	39.19	39.43	39.62	40.60	35.43
Ownership [New Private]	102.85	106.78	107.99	98.06	104.78	107.93	102.33	102.91	105.91	108.86	85.77
Ownership [Foreign]	17.92	19.07	18.90	17.27	19.07	18.31	17.99	17.93	18.94	19.07	14.37
Log (1 + Export / Sales)	60.98	62.21	62.05	56.57	60.55	60.91	57.50	58.20	59.87	62.80	47.25
Durbin-Wu-Hausman Test	127.19	125.94	130.33	111.58	110.86	115.97	124.32	123.40	113.52	127.80	75.38
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors, clustered by year, country, industry and firm size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: All models were estimated using IVs for Log Employment, Log Assets, Log (1 + Export/Sales) and three Ownership Dummies. The IVs are: Firm's age, skill ratio (college/high school), skill ratio - age interaction, location (city), % change in fixed assets in previous period, % change in exports in previous period, full time employees in previous period. The skill ratio and the skill ratio - age interaction were also interacted with regional (CEB, SEE and CIS) dummies. The constraint variables at the firm level represent the average of the constraint reported by the other firms in the same year, country, 2-digit sector and firm size (small, medium, large). The average of all constraints is based on all 15 constraints in the BEEPS survey.

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Table 4: Revenue Efficiency - Impact of Individual Constraints
(IV Estimation with Year, Country and Sector Fixed Effects)

	1	2	3	4	5	6	7	8	9	10	11
Log Employment	0.586	0.59	0.608	0.604	0.541	0.512	0.54	0.605	0.585	0.592	0.458
	[0.190]***	[0.184]***	[0.177]***	[0.184]***	[0.192]***	[0.195]***	[0.201]***	[0.182]***	[0.183]***	[0.185]***	[0.221]**
Log Fixed Assets	0.369	0.367	0.349	0.361	0.422	0.462	0.397	0.341	0.368	0.365	0.511
	[0.204]*	[0.195]*	[0.187]*	[0.191]*	[0.201]**	[0.201]**	[0.216]*	[0.198]*	[0.195]*	[0.197]*	[0.228]**
Ownership [Privatized]	-0.237	-0.422	-0.411	-0.407	-0.379	-0.337	-0.414	-0.413	-0.446	-0.306	-0.327
	[0.387]	[0.426]	[0.422]	[0.440]	[0.469]	[0.486]	[0.444]	[0.406]	[0.429]	[0.375]	[0.527]
Ownership [New Private]	-0.489	-0.53	-0.518	-0.493	-0.496	-0.448	-0.597	-0.517	-0.543	-0.486	-0.478
	[0.273]*	[0.261]**	[0.256]**	[0.263]*	[0.276]*	[0.272]*	[0.275]**	[0.257]**	[0.261]**	[0.252]*	[0.306]
Ownership [Foreign]	1.765	1.577	1.56	1.479	1.514	1.504	1.644	1.591	1.556	1.699	1.508
	[0.516]***	[0.538]***	[0.526]***	[0.520]***	[0.571]***	[0.596]**	[0.545]***	[0.502]***	[0.546]***	[0.492]***	[0.636]**
Log (1 + Export / Sales)	-0.385	-0.25	-0.237	-0.146	-0.219	-0.116	-0.167	-0.103	-0.193	-0.339	-0.163
	[0.528]	[0.543]	[0.534]	[0.531]	[0.568]	[0.561]	[0.565]	[0.504]	[0.552]	[0.514]	[0.633]
More than 3 Competitors	0.091	0.092	0.094	0.09	0.096	0.099	0.117	0.092	0.096	0.09	0.118
	[0.051]*	[0.051]*	[0.050]*	[0.050]*	[0.052]*	[0.052]*	[0.055]**	[0.049]*	[0.051]*	[0.051]*	[0.059]**
Cost of Financing	0.009										0.024
	[0.032]										[0.041]
Infrastructure		-0.035									-0.024
		[0.049]									[0.066]
Tax Rates			-0.019								0.002
			[0.031]								[0.043]
Customs / Foreign Trade Regulations				-0.002							0.069
				[0.032]							[0.047]
Business Licencing & Permits					-0.056						-0.072
					[0.037]						[0.046]
Macroeconomic Instability						-0.012					0.004
						[0.037]					[0.043]
Corruption							-0.062				-0.053
							[0.035]*				[0.050]
Street Crime, Theft & Disorder								-0.053			0.015
								[0.035]			[0.059]
Anti-competitive Practices									-0.034		-0.054
									[0.041]		[0.053]
Average of all Constraints										-0.055	
										[0.055]	
Constant	1.47	1.585	1.601	1.482	1.559	1.373	1.742	1.68	1.603	1.616	1.481
	[0.436]***	[0.388]***	[0.404]***	[0.392]***	[0.402]***	[0.402]***	[0.436]***	[0.436]***	[0.374]***	[0.402]***	[0.453]***
Observations	4992	5121	5091	4741	4968	5059	4843	4938	4981	5127	4305
J-Test	0.95	0.76	0.71	0.34	0.59	0.68	0.90	0.45	0.79	0.95	0.79
p-value	0.329	0.385	0.399	0.560	0.444	0.409	0.342	0.501	0.374	0.331	0.373
First stage F-tests											
Log Employment	243.65	255.54	255.80	240.91	249.01	254.32	238.32	241.45	248.87	255.32	205.83
Log Assets	97.05	102.59	102.37	94.86	100.12	101.96	96.53	97.55	100.88	102.10	81.76
Ownership [Privatized]	41.15	41.18	40.78	38.44	40.65	40.75	40.11	40.67	40.55	41.03	34.88
Ownership [New Private]	102.02	108.34	107.96	97.56	105.65	108.08	102.84	103.78	105.44	108.19	83.88
Ownership [Foreign]	17.07	18.11	18.04	16.18	17.97	17.42	16.98	17.10	17.77	18.10	14.10
Log (1 + Export / Sales)	48.78	50.56	49.90	44.90	48.62	49.20	46.15	46.84	47.95	50.70	38.15
Durbin-Wu-Hausman Test	62.86	66.98	64.25	62.95	64.99	66.42	71.95	68.13	67.71	66.24	63.21
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors, clustered by year, country, industry and firm size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: All models were estimated using IVs for Log Employment, Log Assets, Log (1 + Export/Sales) and three Ownership Dummies. The IVs are: Firm's age, skill ratio (college/high school), skill ratio - age interaction, location (city), % change in fixed assets in previous period, % change in exports in previous period, full time employees in previous period. The skill ratio and the skill ratio - age interaction were also interacted with regional (CEB, SEE and CIS) dummies. The constraint variables at the firm level represent the average of the constraint reported by the other firms in the same year, country, 2-digit sector and firm size (small, medium, large). The average of all constraints is based on all 15 constraints in the BEEPS survey.

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Table 5: Revenue Efficiency - Interactions with Corruption
(IV Estimation with Year, Country and Sector Fixed Effects)

	1	2	3	4	5	6	7
Log Employment	0.592	0.551	0.507	0.503	0.522	0.558	0.574
	[0.178]***	[0.203]***	[0.224]**	[0.204]**	[0.215]**	[0.194]***	[0.199]***
Log Fixed Assets	0.345	0.389	0.429	0.442	0.412	0.379	0.362
	[0.194]*	[0.220]*	[0.241]*	[0.217]**	[0.232]*	[0.208]*	[0.218]*
Ownership [Privatized]	-0.546	-0.345	-0.372	-0.407	-0.411	-0.415	-0.454
	[0.430]	[0.453]	[0.464]	[0.474]	[0.469]	[0.437]	[0.472]
Ownership [New Private]	-0.605	-0.55	-0.589	-0.572	-0.631	-0.584	-0.588
	[0.267]**	[0.276]**	[0.281]**	[0.288]**	[0.289]**	[0.270]**	[0.285]**
Ownership [Foreign]	1.508	1.678	1.646	1.56	1.735	1.619	1.604
	[0.502]***	[0.537]***	[0.567]***	[0.562]***	[0.590]***	[0.528]***	[0.538]***
Log (1 + Export / Sales)	-0.007	-0.185	-0.216	-0.125	-0.294	-0.168	-0.145
	[0.525]	[0.564]	[0.579]	[0.576]	[0.610]	[0.557]	[0.563]
More than 3 Competitors	0.111	0.114	0.111	0.117	0.13	0.115	0.112
	[0.052]**	[0.053]**	[0.056]**	[0.055]**	[0.056]**	[0.054]**	[0.054]**
Corruption	-0.044	-0.012	-0.168	-0.066	-0.165	-0.202	-0.176
	[0.083]	[0.113]	[0.087]*	[0.086]	[0.108]	[0.112]*	[0.144]
Functioning of the Judiciary	0.085						0.15
	[0.088]						[0.115]
Uncertainty about Regulatory Policies		0.109					0.196
		[0.084]					[0.113]*
Labor Regulations			-0.156				-0.182
			[0.100]				[0.111]*
Business Licensing & Permits				-0.075			-0.06
				[0.101]			[0.117]
Tax Administration					-0.08		-0.048
					[0.081]		[0.114]
Tax Rates						-0.109	-0.143
						[0.081]	[0.115]
Corruption x Functioning of the Judiciary	-0.019						-0.054
	[0.034]						[0.046]
Corruption x Uncertainty about Regulatory Policies		-0.026					-0.061
		[0.037]					[0.048]
Corruption x Labor Regulation			0.061				0.074
			[0.041]				[0.046]
Corruption x Business Licensing & Permits				0.013			0.006
				[0.039]			[0.043]
Corruption x Tax Administration					0.04		0.014
					[0.036]		[0.048]
Corruption x Tax Rates						0.05	0.072
						[0.036]	[0.050]
Constant	1.689	1.436	1.991	1.767	1.968	2.06	1.929
	[0.448]***	[0.504]***	[0.431]***	[0.427]***	[0.495]***	[0.474]***	[0.475]***
Observations	4705	4790	4788	4731	4778	4816	4487
J-Test	1.10	0.69	1.05	0.69	0.97	0.97	1.23
p-value	0.294	0.407	0.306	0.405	0.325	0.325	0.267
First stage F-tests							
Log Employment	227.84	232.40	231.43	232.38	234.28	236.42	213.36
Log Assets	91.59	94.36	95.14	94.33	95.77	96.31	88.27
Ownership [Privatized]	37.70	39.02	39.50	39.73	38.94	39.41	35.45
Ownership [New Private]	97.83	99.19	100.33	100.13	100.52	101.79	90.25
Ownership [Foreign]	16.77	16.95	17.26	16.80	16.56	16.98	16.31
Log (1 + Exports / Sales)	44.12	45.02	44.96	44.59	45.28	45.33	40.93
Durbin-Wu-Hausman Test	72.53	71.60	76.01	70.35	73.38	69.64	73.11
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors, clustered by year, country, industry and size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: All models were estimated using IVs for Log Employment, Log Assets, Log (1 + Export/Sales) and three Ownership Dummies. The IVs are: Firm's age, skill ratio (college/high school), skill ratio - age interaction, location (city), % change in fixed assets in previous period, % change in exports in previous period, full time employees in previous period. The skill ratio and the skill ratio - age interaction were also interacted with regional (CEB, SEE and CIS) dummies. The constraint variables at the firm level represent the average of the constraint reported by the other firms in the same year, country, 2-digit sector and firm size (small, medium, large). The average of all constraints is based on all 15 constraints in the BEEPS survey.

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Table 6: Revenue Efficiency - Impact of Heritage Foundation Indices (IV Estimation with Year, Country and Sector Fixed Effects)

	1	2	3	4	5	6	7	8	9	10	11	12
Log Employment	0.597	0.595	0.600	0.599	0.599	0.597	0.595	0.594	0.593	0.597	0.601	0.569
	[0.168]***	[0.163]***	[0.168]***	[0.165]***	[0.167]***	[0.166]***	[0.166]***	[0.164]***	[0.169]***	[0.168]***	[0.164]***	[0.166]***
Log Fixed Assets	0.373	0.378	0.372	0.373	0.373	0.376	0.378	0.379	0.383	0.376	0.371	0.411
	[0.178]**	[0.173]**	[0.179]**	[0.176]**	[0.178]**	[0.177]**	[0.177]**	[0.174]**	[0.182]**	[0.179]**	[0.176]**	[0.178]**
Ownership [Privatized]	-0.263	-0.264	-0.268	-0.281	-0.264	-0.266	-0.291	-0.259	-0.292	-0.262	-0.274	-0.245
	[0.377]	[0.375]	[0.375]	[0.378]	[0.376]	[0.375]	[0.382]	[0.375]	[0.374]	[0.373]	[0.372]	[0.368]
Ownership [New Private]	-0.441	-0.435	-0.439	-0.439	-0.437	-0.436	-0.436	-0.432	-0.433	-0.439	-0.441	-0.397
	[0.255]*	[0.255]*	[0.255]*	[0.257]*	[0.256]*	[0.255]*	[0.255]*	[0.255]*	[0.255]*	[0.252]*	[0.254]*	[0.249]
Ownership [Foreign]	1.543	1.527	1.535	1.516	1.542	1.533	1.501	1.528	1.504	1.525	1.526	1.514
	[0.479]***	[0.480]***	[0.475]***	[0.486]***	[0.479]***	[0.477]***	[0.488]***	[0.477]***	[0.485]***	[0.478]***	[0.479]***	[0.489]***
Log (1 + Export / Sales)	-0.155	-0.147	-0.149	-0.139	-0.154	-0.143	-0.133	-0.150	-0.143	-0.136	-0.142	-0.169
	[0.480]	[0.480]	[0.477]	[0.481]	[0.481]	[0.481]	[0.482]	[0.480]	[0.480]	[0.479]	[0.478]	[0.482]
More than 3 Competitors	0.070	0.070	0.069	0.071	0.069	0.068	0.070	0.069	0.071	0.066	0.069	0.071
	[0.044]	[0.044]	[0.044]	[0.044]	[0.044]	[0.044]	[0.044]	[0.044]	[0.044]	[0.044]	[0.044]	[0.045]
Trade Policy	-0.061											-0.158
	[0.063]											[0.091]*
Fiscal Burden of Government		-0.024										-0.050
		[0.059]										[0.048]
Government Intervention in the Economy			-0.004									-0.064
			[0.032]									[0.050]
Monetary Policy				0.111								0.252
				[0.084]								[0.127]**
Capital Flows and Foreign Investment					-0.050							0.129
					[0.074]							[0.117]
Banking and Finance						-0.051						-0.124
						[0.051]						[0.070]*
Wages and Prices							-0.102					-0.055
							[0.066]					[0.080]
Property Rights								-0.095				-0.302
								[0.096]				[0.090]***
Regulation									0.381			0.551
									[0.238]			[0.313]*
Informal Market										0.142		0.238
										[0.095]		[0.111]**
Index of Economic Freedom											0.042	
											[0.224]	
Constant	1.578	1.485	1.416	0.885	1.558	1.587	1.707	1.753	-0.131	0.813	1.241	-0.636
	[0.368]***	[0.537]***	[0.427]***	[0.658]	[0.458]***	[0.450]***	[0.431]***	[0.621]***	[1.222]	[0.675]	[1.096]	[2.345]
Observations	5430	5430	5430	5430	5430	5430	5430	5430	5430	5430	5430	
J-Test	1.11	1.16	1.15	1.02	1.09	1.12	1.04	1.17	1.11	1.18	1.16	0.95
p-value	0.293	0.281	0.284	0.311	0.296	0.289	0.308	0.278	0.293	0.277	0.281	0.329
First stage F-tests												
Log Employment	290.13	291.60	290.68	290.90	291.23	291.27	290.36	292.09	291.45	290.76	290.38	288.48
Log Assets	118.74	118.64	117.93	120.18	118.34	118.54	118.44	119.26	119.12	118.22	117.87	121.86
Ownership [Privatized]	42.38	42.41	42.41	42.54	42.65	42.43	41.84	42.43	42.50	42.32	42.21	42.13
Ownership [New Private]	112.79	113.09	112.79	113.45	113.09	113.15	112.47	113.18	113.14	112.67	112.48	111.85
Ownership [Foreign]	19.02	19.00	19.12	19.04	19.04	19.10	19.03	19.02	19.02	19.03	19.10	19.17
Log (1 + Export / Sales)	58.11	58.14	58.05	58.08	58.16	58.30	58.10	58.16	58.19	58.08	58.02	57.84
Durbin-Wu-Hausman Test	72.67	72.35	73.04	72.73	73.16	74.11	72.86	72.28	72.84	72.49	73.64	75.26
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors, clustered by year, country, industry and firm size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note:All models were estimated using IVs for Log Employment, Log Assets, Log (1 + Export/Sales) and three Ownership Dummies. The IVs are: Firm's age, skill ratio (college/high school), skill ratio - age interaction, location (city), % change in fixed assets in previous period, % change in exports in previous period, full time employees in previous period. The skill ratio and the skill ratio - age interaction were also interacted with regional (CEB, SEE and CIS) dummies. The Heritage Foundation Indices measure, on the country level, institutional factors determining economic freedom on a scale from 1 to 5. The index of economic freedom is the simple average of the 10 individual indices.

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Table 7: Revenue Efficiency - Impact of Doing Business Indicators (IV Estimation with Year, Country and Sector Fixed Effects)

	1	2	3	4	5	6	7	8	9	10	11	12	13
Log Employment	0.587	0.593	0.572	0.582	0.581	0.590	0.593	0.719	0.591	0.590	0.590	0.591	0.691
	[0.178]***	[0.175]***	[0.184]***	[0.180]***	[0.181]***	[0.175]***	[0.174]***	[0.155]***	[0.177]***	[0.177]***	[0.178]***	[0.177]***	[0.155]***
Log Fixed Assets	0.396	0.391	0.411	0.401	0.402	0.393	0.389	0.252	0.391	0.393	0.392	0.391	0.285
	[0.192]**	[0.190]**	[0.199]**	[0.195]**	[0.196]**	[0.188]**	[0.188]**	[0.162]	[0.191]**	[0.191]**	[0.192]**	[0.191]**	[0.162]*
Ownership [Privatized]	-0.329	-0.354	-0.327	-0.325	-0.326	-0.357	-0.344	-0.554	-0.346	-0.354	-0.347	-0.351	-0.524
	[0.395]	[0.400]	[0.404]	[0.411]	[0.409]	[0.406]	[0.407]	[0.372]	[0.407]	[0.407]	[0.406]	[0.407]	[0.382]
Ownership [New Private]	-0.433	-0.438	-0.437	-0.428	-0.427	-0.439	-0.439	-0.493	-0.439	-0.441	-0.440	-0.441	-0.462
	[0.269]	[0.269]	[0.271]	[0.273]	[0.272]	[0.270]	[0.271]	[0.257]*	[0.271]	[0.270]	[0.271]	[0.271]	[0.255]*
Ownership [Foreign]	1.475	1.450	1.486	1.468	1.455	1.447	1.471	1.219	1.449	1.450	1.460	1.455	1.186
	[0.512]***	[0.516]***	[0.523]***	[0.521]***	[0.519]***	[0.521]***	[0.516]***	[0.450]***	[0.516]***	[0.521]***	[0.518]***	[0.521]***	[0.452]***
Log (1 + Export / Sales)	-0.066	-0.060	-0.082	-0.059	-0.051	-0.040	-0.059	0.254	-0.046	-0.045	-0.053	-0.050	0.256
	[0.523]	[0.525]	[0.533]	[0.529]	[0.528]	[0.528]	[0.526]	[0.449]	[0.525]	[0.529]	[0.527]	[0.528]	[0.445]
More than 3 Competitors	0.079	0.077	0.081	0.078	0.078	0.079	0.079	0.066	0.079	0.079	0.079	0.079	0.063
	[0.046]*	[0.046]*	[0.047]*	[0.046]*	[0.046]*	[0.046]*	[0.046]*	[0.043]	[0.046]*	[0.046]*	[0.046]*	[0.046]*	[0.043]
Registering a Business [Number of Procedures]	-0.011												-0.011
	[0.022]												[0.022]
Registering a Business [Time in Days]		-0.006											-0.004
		[0.003]*											[0.004]
Registering a Business [Cost in % GNI]			-0.013										-0.016
			[0.005]***										[0.006]***
Employing Workers [Rigidity of Employment]				0.007									0.011
				[0.005]									[0.008]
Employing Workers [Firing]					0.007								0.014
					[0.004]*								[0.009]
Employing Workers [Firing Cost in Weeks of Wages]						-0.005							-0.022
						[0.006]							[0.006]***
Enforcing a Contract [Number of Procedures]							0.023						0.049
							[0.036]						[0.047]
Enforcing a Contract [Time in Days]								-0.001					-0.002
								[0.001]*					[0.001]**
Enforcing a Contract [Cost in % of Debt]									0.020				-0.029
									[0.017]				[0.043]
Closing a Business [Time in Years]										-0.055			0.305
										[0.182]			[0.255]
Closing a Business [Cost in % of Estate]											-0.049		0.011
											[0.008]***		[0.030]
Closing a Business [100 - (Recovery Rate in Cents to de Dollar)]												-0.002	-0.028
												[0.009]	[0.014]*
Constant	1.461	1.568	1.580	0.899	0.724	1.382	0.676	1.776	1.001	1.481	3.384	1.554	1.467
	[0.567]***	[0.388]***	[0.401]***	[0.585]	[0.650]	[0.452]***	[1.252]	[0.340]***	[0.574]*	[0.643]**	[0.667]***	[0.928]*	[2.448]
Observations	5050	5050	5050	5050	5050	5050	5050	4692	5050	5050	5050	5050	4692
J-Test	1.97	1.95	1.91	1.90	1.91	1.89	1.94	5.68	1.97	1.91	1.94	1.94	5.97
p-value	0.161	0.162	0.167	0.168	0.167	0.170	0.163	0.017	0.161	0.167	0.164	0.163	0.015
First stage F-tests													
Log Employment	268.56	268.55	268.65	268.85	268.74	268.85	268.82	248.18	268.79	268.79	268.93	268.93	246.51
Log Assets	107.47	107.70	108.01	108.06	108.40	108.01	107.99	100.18	108.03	107.86	107.99	107.96	100.26
Ownership [Privatized]	37.86	37.90	37.93	37.99	37.97	37.83	37.95	37.18	37.90	38.00	37.95	37.94	36.98
Ownership [New Private]	102.54	102.88	102.84	102.93	102.97	102.96	102.97	95.90	102.97	103.13	102.99	102.97	95.65
Ownership [Foreign]	17.56	17.62	17.61	17.62	17.64	17.61	17.63	17.14	17.62	17.62	17.63	17.63	17.25
Log (1 + Export / Sales)	54.16	54.21	54.17	54.18	54.12	54.19	54.19	51.24	54.16	54.15	54.21	54.37	51.17
Durbin-Wu-Hausman Test	62.16	62.15	63.72	62.61	62.38	62.57	62.56	56.44	61.97	62.41	62.54	62.57	56.01
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors, clustered by year, country, industry and firm size [small, medium and large] in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: All models were estimated using IVs for Log Employment, Log Assets, Log (1 + Export/Sales) and three Ownership Dummies. The IVs are: Firm's age, skill ratio [college/high school], skill ratio - age interaction, location [city], % change in fixed assets in previous period, % change in exports in previous period, full time employees in previous period. The skill ratio and the skill ratio - age interaction were also interacted with regional (CEB, SEE and CIS) dummies. The Doing Business Indicators measure elements of the business climate on a country level a score indicates that the business climate is worse. All Indicators are measured defined, except for "Employing Workers [Rigidity of Employment]" and "Employing Workers [Firing]", which are measured on a scale from 0 to 100 (100 is the most rigid). The Doing Business Indicators report "Closing a Business [Recovery Rate in Cents to the Dollar]". This was recoded to "Closing a Business [100 - Recovery Rate in Cents to the Dollar]" such that, consistent with the other indicators, a higher score is associated with a worse business climate.

Table 8: Impact of 2002 Constraints on 2002 - 2005 rate of growth in revenues (OLS Estimation with Year, Country and Sector Fixed Effects)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Log Employment Growth	0.238 [0.032]***	0.242 [0.032]***	0.241 [0.032]***	0.244 [0.033]***	0.243 [0.033]***	0.245 [0.033]***	0.242 [0.033]***	0.246 [0.033]***	0.246 [0.033]***	0.245 [0.033]***	0.246 [0.033]***	0.245 [0.033]***	0.238 [0.033]***	0.244 [0.033]***	0.238 [0.033]***
Log Fixed Assets Growth	0.264 [0.092]***	0.269 [0.090]***	0.258 [0.094]***	0.263 [0.092]***	0.268 [0.093]***	0.265 [0.094]***	0.267 [0.093]***	0.263 [0.092]***	0.262 [0.092]***	0.264 [0.092]***	0.263 [0.092]***	0.260 [0.092]***	0.274 [0.097]***	0.263 [0.093]***	0.279 [0.099]***
Ownership [Privatized]		0.035 [0.062]		0.051 [0.067]	0.062 [0.068]	0.049 [0.066]	0.057 [0.067]	0.047 [0.067]	0.055 [0.068]	0.057 [0.067]	0.057 [0.068]	0.049 [0.068]	0.051 [0.067]	0.051 [0.067]	0.051 [0.070]
Ownership [New Private]		-0.032 [0.065]		-0.009 [0.069]	0.001 [0.070]	-0.006 [0.070]	-0.003 [0.069]	-0.015 [0.069]	-0.008 [0.071]	-0.005 [0.069]	-0.004 [0.070]	-0.013 [0.069]	-0.008 [0.070]	-0.009 [0.069]	-0.013 [0.073]
Ownership [Foreign]		0.021 [0.070]		0.035 [0.075]	0.043 [0.076]	0.038 [0.076]	0.041 [0.076]	0.023 [0.077]	0.036 [0.078]	0.039 [0.076]	0.042 [0.078]	0.026 [0.076]	0.050 [0.076]	0.035 [0.075]	0.038 [0.080]
Log (1 + Export / Sales)			0.137 [0.076]*	0.111 [0.078]	0.111 [0.079]	0.110 [0.077]	0.107 [0.078]	0.102 [0.081]	0.116 [0.079]	0.114 [0.078]	0.117 [0.081]	0.146 [0.075]*	0.106 [0.078]	0.111 [0.078]	0.126 [0.078]
More than 3 Competitors			-0.047 [0.034]	-0.049 [0.036]	-0.048 [0.036]	-0.050 [0.036]	-0.052 [0.036]	-0.050 [0.036]	-0.049 [0.037]	-0.050 [0.036]	-0.051 [0.037]	-0.054 [0.036]	-0.043 [0.036]	-0.049 [0.036]	-0.055 [0.037]
Cost of Financing				-0.033 [0.024]											-0.032 [0.028]
Infrastructure					-0.033 [0.040]										-0.022 [0.049]
Tax Rates						-0.024 [0.023]									-0.033 [0.026]
Customs / Foreign Trade Regulations							0.028 [0.024]								0.029 [0.025]
Business Licencing & Permits								0.015 [0.025]							0.018 [0.025]
Macroeconomic Instability									-0.001 [0.023]						0.001 [0.029]
Corruption										-0.007 [0.023]					0.000 [0.027]
Street Crime, Theft & Disorder											0.004 [0.030]				0.023 [0.040]
Anti-competitive Practices													-0.009 [0.027]		-0.013 [0.029]
Average of all Constraints														-0.002 [0.042]	
Constant	2.385 [0.378]***	2.351 [0.371]***	2.420 [0.386]***	2.380 [0.379]***	2.440 [0.380]***	2.418 [0.371]***	2.441 [0.373]***	2.317 [0.379]***	2.342 [0.371]***	2.372 [0.389]***	2.386 [0.373]***	2.382 [0.371]***	2.370 [0.396]***	2.385 [0.366]***	2.432 [0.397]***
Observations	683	683	662	662	658	662	660	657	657	660	655	655	659	662	648
R-squared	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.23

Robust standard errors, clustered by year, country, industry and firm size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: The constraint variables at the firm level represent the average of the constraint reported by the other firms in the same year, country, 2-digit sector and firm size (small, medium and large). The average of all constraints is based on all 15 constraints in the BEEPS survey.

Table A1: Value Added Efficiency - Baseline Regressions
(IV Estimation with Year, Country and Sector Fixed Effects)

	1	2	3	4	5	6	7	8
Log Employment	0.221	0.217	0.22	0.25	0.348	0.327	0.384	0.361
	[0.179]	[0.181]	[0.176]	[0.171]	[0.225]	[0.257]	[0.225]*	[0.248]
Log Assets	0.87	0.857	0.873	0.814	0.629	0.654	0.594	0.621
	[0.192]***	[0.196]***	[0.189]***	[0.186]***	[0.231]***	[0.266]**	[0.234]**	[0.259]**
Log Exports / Sales		0.528		0.872		-0.767		-0.49
		[0.388]		[0.407]**		[0.572]		[0.596]
More than 3 Competitors			0.01	0.037			0.054	0.051
			[0.053]	[0.052]			[0.051]	[0.055]
Ownership [Privatized]					-0.455	-0.062	-0.139	0.073
					[0.474]	[0.467]	[0.424]	[0.439]
Ownership [New Private]					-0.59	-0.511	-0.446	-0.412
					[0.323]*	[0.319]	[0.294]	[0.298]
Ownership [Foreign]					1.061	1.785	1.382	1.794
					[0.436]**	[0.664]***	[0.414]***	[0.626]***
Constant	-0.054	-0.044	-0.071	-0.036	0.789	0.633	0.594	0.507
	[0.236]	[0.239]	[0.258]	[0.251]	[0.466]*	[0.480]	[0.441]	[0.463]
Observations	5308	5261	5117	5070	5308	5261	5117	5070
J-Test	14.04	13.67	14.54	12.39	5.97	3.15	3.42	2.38
p-value	0.015	0.008	0.013	0.015	0.201	0.076	0.181	0.123
First stage F-tests								
Log Employment	293.91	291.24	281.35	278.59	293.91	291.24	281.35	278.59
Log Assets	124.15	123.43	115.68	114.94	124.15	123.43	115.68	114.94
Log Exports / Sales		52.71		53.13		52.71		53.13
Ownership [Privatized]					44.34	44.28	43.11	43.12
Ownership [New Private]					118.33	118.80	112.89	113.31
Ownership [Foreign]					16.99	16.45	16.34	15.73
Durbin-Wu-Hausman Test	47.62	49.61	51.06	56.43	63.53	65.18	69.67	66.87
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Robust standard errors, clustered by year, country, industry and firm size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: All models were estimated using IVs for Log Employment, Log Assets, Log (1 + Export/Sales) and three Ownership Dummies. The IVs are: Firm's age, skill ratio (college/high school), skill ratio - age interaction, location (city), % change in fixed assets in previous period, % change in exports in previous period, full time employees in previous period. The skill ratio and the skill ratio - age interaction were also interacted with regional (CEB, SEE and CIS) dummies

Table A2. Pairwise Correlation of Constraints

	More than 3 Competitors	Access to Financing	Cost of Financing	Infrastructure	Tax Rates	Tax Administration	Customs / Foreign Trade Regulations	Business Licencing & Permits	Labour Regulations	Uncertainty about Regulatory Policies	Macro-economic Instability	Functioning of the Judiciary	Corruption	Street Crime, Theft & Disorder	Organised Crime & Mafia	Anti-competitive Practices	Average of all 15 Constraints
More than 3 Competitors	1.0000																
Access to Financing	0.0533*	1.0000															
Cost of Financing	0.0664*	0.7459*	1.0000														
Infrastructure	0.0153	0.2466*	0.2670*	1.0000													
Tax Rates	0.0543*	0.4592*	0.5703*	0.3466*	1.0000												
Tax Administration	0.0157	0.3662*	0.4160*	0.3926*	0.6839*	1.0000											
Customs / Foreign Trade Regulations	0.0109	0.3181*	0.3807*	0.4132*	0.4544*	0.5327*	1.0000										
Business Licencing & Permits	0.0335*	0.3105*	0.3103*	0.4258*	0.3569*	0.4385*	0.5244*	1.0000									
Labour Regulations	0.0762*	0.3134*	0.3783*	0.2819*	0.4597*	0.3338*	0.3482*	0.3118*	1.0000								
Uncertainty about Regulatory Policies	0.0459*	0.4252*	0.5005*	0.2570*	0.5065*	0.3797*	0.3727*	0.3456*	0.3981*	1.0000							
Macro-economic Instability	0.0310*	0.4640*	0.5316*	0.3151*	0.5327*	0.4423*	0.4414*	0.3755*	0.3650*	0.7836*	1.0000						
Functioning of the Judiciary	0.0519*	0.3201*	0.4221*	0.3837*	0.3676*	0.2942*	0.3813*	0.3916*	0.4442*	0.5417*	0.5373*	1.0000					
Corruption	0.0567*	0.3190*	0.4058*	0.4213*	0.4059*	0.4428*	0.4745*	0.4857*	0.2703*	0.4576*	0.4922*	0.6410*	1.0000				
Street Crime, Theft & Disorder	0.0435*	0.2477*	0.3484*	0.3596*	0.3910*	0.3746*	0.3139*	0.3127*	0.3323*	0.5052*	0.4662*	0.5155*	0.5908*	1.0000			
Organised Crime & Mafia	0.0423*	0.2838*	0.3472*	0.3648*	0.2798*	0.3069*	0.4084*	0.3702*	0.2919*	0.4662*	0.4570*	0.5448*	0.6461*	0.7486*	1.0000		
Anti-competitive Practices	0.1011*	0.3065*	0.3996*	0.2959*	0.4155*	0.2458*	0.3200*	0.2699*	0.4069*	0.4657*	0.4446*	0.5451*	0.4986*	0.4394*	0.4458*	1.0000	
Average of all 15 Constraints	0.0691*	0.6135*	0.7035*	0.5391*	0.7289*	0.6674*	0.6555*	0.6047*	0.5839*	0.7409*	0.7630*	0.7160*	0.7400*	0.6764*	0.6727*	0.6374*	1.0000

Table A3. Partial correlation among constraints

	More than 3 Competitors	Cost of Financing	Infrastructure	Tax Rates	Customs / Foreign Trade Regulations	Business Licencing & Permits	Macroeconomic Instability	Corruption	Street Crime, Theft & Disorder	Anti-competitive Practices
More than 3 Competitors		0.011	-0.021	0.068	-0.061	-0.003	-0.036	-0.004	0.037	0.14
		[0.021]	[0.014]	[0.021]***	[0.020]***	[0.019]	[0.021]*	[0.019]	[0.019]*	[0.020]***
Cost of Financing	0.006		-0.013	0.308	0.02	0.049	0.181	0.045	0.017	0.121
	[0.011]		[0.017]	[0.028]***	[0.026]	[0.024]**	[0.025]***	[0.024]*	[0.024]	[0.026]***
Infrastructure	-0.027	-0.031		0.153	0.213	0.235	-0.052	0.152	0.194	0.063
	[0.018]	[0.041]		[0.041]***	[0.041]***	[0.037]***	[0.036]	[0.039]***	[0.045]***	[0.042]
Tax Rates	0.038	0.325	0.067		0.138	0.049	0.18	-0.031	0.083	0.089
	[0.012]***	[0.029]***	[0.019]***		[0.028]***	[0.023]**	[0.028]***	[0.025]	[0.025]***	[0.029]***
Customs / Foreign Trade Regulations	-0.035	0.022	0.095	0.14		0.289	0.152	0.101	-0.052	0.056
	[0.011]***	[0.028]	[0.019]***	[0.028]***		[0.025]***	[0.025]***	[0.025]***	[0.025]**	[0.027]**
Business Licencing & Permits	-0.002	0.061	0.123	0.059	0.338		0.062	0.154	0.016	-0.035
	[0.012]	[0.030]**	[0.019]***	[0.028]**	[0.029]***		[0.030]**	[0.028]***	[0.026]	[0.030]
Macroeconomic Instability	-0.021	0.199	-0.024	0.187	0.157	0.054		0.161	0.099	0.05
	[0.012]*	[0.028]***	[0.017]	[0.029]***	[0.025]***	[0.026]**		[0.026]***	[0.023]***	[0.027]*
Corruption	-0.002	0.055	0.078	-0.036	0.115	0.15	0.179		0.339	0.26
	[0.012]	[0.030]*	[0.020]***	[0.029]	[0.028]***	[0.028]***	[0.028]***		[0.026]***	[0.030]***
Street Crime, Theft & Disorder	0.025	0.023	0.107	0.103	-0.064	0.017	0.118	0.365		0.081
	[0.013]*	[0.031]	[0.024]***	[0.033]***	[0.030]**	[0.027]	[0.027]***	[0.027]***		[0.033]**
Anti-competitive Practices	0.077	0.126	0.027	0.088	0.054	-0.029	0.047	0.222	0.064	
	[0.011]***	[0.027]***	[0.018]	[0.029]***	[0.026]**	[0.025]	[0.025]*	[0.026]***	[0.026]**	
Constant	0.666	0.502	0.591	0.527	-0.081	0.367	0.672	-0.199	0.183	0.664
	[0.038]***	[0.081]***	[0.054]***	[0.080]***	[0.071]	[0.067]***	[0.074]***	[0.063]***	[0.091]**	[0.077]***
Observations	5602	5602	5602	5602	5602	5602	5602	5602	5602	5602
R-squared without fixed effects	0.02	0.35	0.27	0.40	0.39	0.36	0.39	0.48	0.36	0.29
R-squared with country + year+ sector fixed effects	0.06	0.47	0.41	0.56	0.50	0.46	0.52	0.57	0.54	0.41
R-squared with country + year+ sector fixed effects and other regressors	0.33	0.63	0.44	0.58	0.70	0.67	0.60	0.71	0.73	0.72

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: Regression coefficients are from a regression of the dependent variable in each column on the other constraints and the number of competitors; the R-squared values are from the reported regression as well as from regressions with the same regressors plus country, year and sector fixed effects and (in the last row) the other regressors in the TFP models; the other regressors are the fitted values (in a first stage) of Log Employment, Log Assets, Log (1 + Exports/Sales), Ownership variables; instruments omitted in the second stage are: Firm's age, skill ratio (college/high school), skill ratio - age interaction, location (city), % change in fixed assets in previous period, % change in exports in previous period, full time employees in previous period. The skill ratio and the skill ratio - age interaction were also interacted with regional (CEB, SEE and CIS) dummies

TableA4: Revenue Efficiency - Impact of Individual Constraints
(OLS Estimation without Year, Country or Sector Fixed Effects)

	1	2	3	4	5	6	7	8	9	10	11
Log Employment	0.636	0.64	0.637	0.647	0.649	0.649	0.639	0.638	0.645	0.64	0.667
	[0.018]***	[0.018]***	[0.018]***	[0.019]***	[0.018]***	[0.018]***	[0.019]***	[0.019]***	[0.018]***	[0.018]***	[0.018]***
Log Fixed Assets	0.384	0.38	0.384	0.376	0.376	0.375	0.38	0.377	0.371	0.381	0.35
	[0.013]***	[0.012]***	[0.012]***	[0.013]***	[0.012]***	[0.012]***	[0.013]***	[0.012]***	[0.013]***	[0.012]***	[0.012]***
Ownership [Privatized]	0.043	0.071	0.047	0.07	0.049	0.03	0.078	0.033	0.025	0.054	0.008
	[0.061]	[0.061]	[0.061]	[0.064]	[0.062]	[0.061]	[0.063]	[0.061]	[0.063]	[0.061]	[0.064]
Ownership [New Private]	0.305	0.33	0.312	0.336	0.332	0.308	0.343	0.295	0.27	0.327	0.289
	[0.064]***	[0.063]***	[0.063]***	[0.065]***	[0.062]***	[0.063]***	[0.066]***	[0.064]***	[0.064]***	[0.063]***	[0.063]***
Ownership [Foreign]	0.407	0.434	0.423	0.445	0.433	0.415	0.46	0.423	0.392	0.43	0.391
	[0.075]***	[0.075]***	[0.074]***	[0.075]***	[0.074]***	[0.074]***	[0.077]***	[0.075]***	[0.076]***	[0.075]***	[0.075]***
Log Exports / Sales	0.312	0.3	0.304	0.343	0.315	0.339	0.304	0.296	0.337	0.311	0.336
	[0.115]***	[0.112]***	[0.112]***	[0.115]***	[0.110]***	[0.112]***	[0.115]***	[0.116]**	[0.116]***	[0.112]***	[0.110]***
More than 3 Competitors	0.199	0.184	0.204	0.193	0.189	0.2	0.203	0.21	0.191	0.202	0.173
	[0.042]***	[0.042]***	[0.042]***	[0.044]***	[0.043]***	[0.041]***	[0.043]***	[0.043]***	[0.042]***	[0.042]***	[0.044]***
Cost of Financing	-0.083										0.013
	[0.035]**										[0.039]
Infrastructure		-0.338									-0.225
		[0.063]***									[0.063]***
Tax Rates			-0.104								0.006
			[0.042]**								[0.042]
Customs / Foreign Trade Regulations				-0.152							0.032
				[0.041]***							[0.040]
Business Licencing & Permits					-0.273						-0.185
					[0.039]***						[0.041]***
Macroeconomic Instability						-0.246					-0.248
						[0.036]***					[0.041]***
Corruption							-0.169				-0.096
							[0.036]***				[0.049]**
Street Crime, Theft & Disorder								-0.154			0
								[0.042]***			[0.054]
Anti-competitive Practices									0.122		0.33
									[0.039]***		[0.042]***
Average of all Constraints										-0.278	
										[0.061]***	
Constant	1.922	2.228	1.995	2	2.24	2.367	2.049	2.026	1.492	2.309	2.526
	[0.134]***	[0.142]***	[0.156]***	[0.131]***	[0.131]***	[0.143]***	[0.129]***	[0.128]***	[0.133]***	[0.170]***	[0.178]***
Observations	4992	5121	5091	4741	4968	5059	4843	4938	4981	5127	4305
	0.72	0.73	0.72	0.72	0.73	0.73	0.72	0.72	0.72	0.72	0.74

Robust standard errors, clustered by year, country, industry and firm size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: The constraint variables at the firm level represent the average of the constraint reported by the other firms in the same year, country, 2-digit sector and firm size (small, medium and large). The average of all constraints is based on all 15 constraints in the BEEPS survey

Table A5: Revenue Efficiency - Impact of Individual Constraints
(OLS Estimation with Year, Country and Sector Fixed Effects)

	1	2	3	4	5	6	7	8	9	10	11
Log Employment	0.903	0.904	0.904	0.901	0.902	0.903	0.9	0.9	0.906	0.904	0.896
	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.014]***
Log Fixed Assets	0.157	0.155	0.153	0.153	0.156	0.155	0.158	0.155	0.153	0.155	0.154
	[0.009]***	[0.009]***	[0.009]***	[0.010]***	[0.009]***	[0.009]***	[0.010]***	[0.009]***	[0.009]***	[0.009]***	[0.010]***
Ownership [Privatized]	0.042	0.038	0.037	0.044	0.038	0.038	0.056	0.039	0.03	0.04	0.039
	[0.043]	[0.043]	[0.043]	[0.045]	[0.044]	[0.044]	[0.044]	[0.044]	[0.044]	[0.043]	[0.046]
Ownership [New Private]	0.137	0.133	0.13	0.133	0.135	0.133	0.149	0.135	0.129	0.135	0.134
	[0.041]***	[0.042]***	[0.041]***	[0.044]***	[0.042]***	[0.042]***	[0.043]***	[0.042]***	[0.042]***	[0.042]***	[0.043]***
Ownership [Foreign]	0.308	0.307	0.316	0.302	0.304	0.307	0.316	0.316	0.3	0.31	0.314
	[0.055]***	[0.055]***	[0.054]***	[0.057]***	[0.057]***	[0.056]***	[0.056]***	[0.056]***	[0.056]***	[0.055]***	[0.056]***
Log Export / Sales	0.173	0.181	0.174	0.18	0.18	0.181	0.184	0.168	0.196	0.178	0.175
	[0.080]**	[0.079]**	[0.079]**	[0.080]**	[0.080]**	[0.079]**	[0.081]**	[0.080]**	[0.079]**	[0.079]**	[0.082]**
More than 3 competitors	-0.001	-0.004	0.001	-0.001	-0.002	-0.003	0.002	-0.001	-0.003	-0.002	0.001
	[0.031]	[0.030]	[0.030]	[0.031]	[0.031]	[0.031]	[0.031]	[0.031]	[0.031]	[0.030]	[0.032]
Cost of Financing	0.002										0.003
	[0.024]										[0.028]
Infrastructure		-0.006									0.017
		[0.033]									[0.039]
Tax Rates			-0.022								-0.031
			[0.022]								[0.027]
Customs / Foreign Trade Regulations				0.024							0.056
				[0.021]							[0.027]**
Business Licencing & Permits					-0.021						-0.044
					[0.022]						[0.029]
Macroeconomic Instability						0.017					0.028
						[0.023]					[0.028]
Corruption							-0.008				-0.009
							[0.022]				[0.030]
Street Crime, Theft & Disorder								-0.053			-0.047
								[0.025]**			[0.032]
Anti-competitive Practices									0.017		0.015
									[0.021]		[0.025]
Average of all Constraints										-0.025	
										[0.037]	
Constant	1.037	1.041	1.113	1	1.072	0.991	1.047	1.154	0.987	1.089	1.099
	[0.112]***	[0.104]***	[0.108]***	[0.102]***	[0.102]***	[0.113]***	[0.105]***	[0.103]***	[0.100]***	[0.127]***	[0.136]***
Observations	4992	5121	5091	4741	4968	5059	4843	4938	4981	5127	4305
	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85

Robust standard errors, clustered by year, country, industry and size (small medium large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: The constraint variables at the firm level represent the average of the constraint reported by the other firms in the same year, country, 2-digit sector and firm size (small, medium and large). The average of all constraints is based on all 15 constraints in the BEEPS survey.

TableA6: Revenue Efficiency - Impact of Heritage Foundation Indices (OLS Estimation without Year, Country or Sector Fixed Effects)

	1	2	3	4	5	6	7	8	9	10	11	12
Log Employment	0.649 [0.018]***	0.65 [0.018]***	0.684 [0.018]***	0.744 [0.018]***	0.683 [0.018]***	0.74 [0.019]***	0.687 [0.018]***	0.694 [0.017]***	0.727 [0.017]***	0.741 [0.016]***	0.763 [0.017]***	0.829 [0.015]***
Log Fixed Assets	0.377 [0.012]***	0.37 [0.011]***	0.332 [0.012]***	0.3 [0.012]***	0.352 [0.012]***	0.298 [0.013]***	0.343 [0.012]***	0.338 [0.012]***	0.313 [0.012]***	0.283 [0.011]***	0.279 [0.011]***	0.205 [0.010]***
Ownership [Privatized]	0.102 [0.057]*	0.058 [0.055]	0.086 [0.053]	0.075 [0.052]	0.123 [0.056]**	0.059 [0.052]	0.054 [0.054]	0.112 [0.054]**	0.119 [0.052]**	0.107 [0.052]**	0.093 [0.051]*	0.062 [0.047]
Ownership [New Private]	0.327 [0.061]***	0.3 [0.059]***	0.264 [0.055]***	0.312 [0.057]***	0.335 [0.060]***	0.278 [0.056]***	0.291 [0.057]***	0.313 [0.057]***	0.302 [0.054]***	0.295 [0.053]***	0.292 [0.055]***	0.244 [0.047]***
Ownership [Foreign]	0.42 [0.068]***	0.393 [0.067]***	0.4 [0.063]***	0.436 [0.062]***	0.421 [0.066]***	0.417 [0.062]***	0.396 [0.065]***	0.41 [0.065]***	0.426 [0.063]***	0.402 [0.062]***	0.415 [0.061]***	0.404 [0.057]***
Log Exports / Sales	0.236 [0.106]**	0.281 [0.104]***	0.289 [0.102]***	0.244 [0.098]**	0.172 [0.106]	0.179 [0.107]*	0.216 [0.097]**	0.137 [0.099]	0.041 [0.092]	0.09 [0.092]	0.09 [0.098]	0.119 [0.083]
More than 3 Competitors	0.161 [0.039]***	0.163 [0.039]***	0.128 [0.038]***	0.118 [0.037]***	0.138 [0.038]***	0.095 [0.036]***	0.144 [0.037]***	0.151 [0.037]***	0.134 [0.036]***	0.105 [0.035]***	0.09 [0.035]**	0.074 [0.033]**
Trade Policy	-0.114 [0.029]***											0.206 [0.029]***
Fiscal Burden of Government		-0.262 [0.052]***										-0.107 [0.035]***
Government Intervention in the Economy			-0.321 [0.033]***									-0.095 [0.026]***
Monetary Policy				-0.274 [0.020]***								-0.231 [0.024]***
Capital Flows and Foreign Investment					-0.272 [0.029]***							0.092 [0.044]**
Banking and Finance						-0.344 [0.039]***						-0.009 [0.043]
Wages and Prices							-0.39 [0.028]***					0.062 [0.048]
Property Rights								-0.349 [0.031]***				-0.023 [0.052]
Regulation									-0.484 [0.031]***			-0.196 [0.053]***
Informal Market										-0.587 [0.032]***		-0.477 [0.040]***
Index of Economic Freedom											-0.691 [0.038]***	
Constant	2.054 [0.121]***	2.607 [0.182]***	2.78 [0.123]***	2.68 [0.106]***	2.507 [0.117]***	2.818 [0.140]***	2.934 [0.121]***	2.909 [0.135]***	3.522 [0.140]***	4.127 [0.160]***	4.059 [0.148]***	4.935 [0.163]***
Observations	5430	5430	5430	5430	5430	5430	5430	5430	5430	5430	5430	5430
	0.74	0.74	0.76	0.77	0.75	0.77	0.76	0.76	0.77	0.78	0.78	0.81

Robust standard errors, clustered by year, country, industry and firm size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: The Heritage Foundation Indices measure, on the country level, institutional factors determining economic freedom on a scale from 1 to 5. The index of economic freedom is the simple average of the 10 individual indices.

TableA7: Revenue Efficiency - Impact of Heritage Foundation Indices (OLS Estimation with Year, Country and Sector Fixed Effects)

	1	2	3	4	5	6	7	8	9	10	11	12
Log Employment	0.904 [0.012]***	0.904 [0.012]***	0.904 [0.012]***	0.905 [0.012]***	0.904 [0.012]***	0.905 [0.012]***	0.904 [0.012]***	0.905 [0.012]***	0.904 [0.012]***	0.904 [0.012]***	0.905 [0.012]***	0.900 [0.012]***
Log Fixed Assets	0.158 [0.009]***	0.157 [0.009]***	0.158 [0.009]***	0.158 [0.009]***	0.158 [0.009]***	0.157 [0.009]***	0.158 [0.009]***	0.156 [0.009]***	0.160 [0.009]***	0.159 [0.009]***	0.156 [0.009]***	0.162 [0.009]***
Ownership [Privatized]	0.036 [0.041]	0.033 [0.041]	0.036 [0.041]	0.036 [0.041]	0.037 [0.041]	0.035 [0.041]	0.033 [0.041]	0.036 [0.041]	0.038 [0.041]	0.036 [0.041]	0.034 [0.041]	0.038 [0.041]
Ownership [New Private]	0.134 [0.040]***	0.131 [0.040]***	0.134 [0.040]***	0.134 [0.040]***	0.135 [0.040]***	0.134 [0.040]***	0.133 [0.040]***	0.134 [0.040]***	0.136 [0.040]***	0.134 [0.040]***	0.133 [0.040]***	0.136 [0.040]***
Ownership [Foreign]	0.322 [0.051]***	0.320 [0.050]***	0.321 [0.050]***	0.322 [0.051]***	0.323 [0.051]***	0.321 [0.050]***	0.321 [0.050]***	0.323 [0.051]***	0.323 [0.051]***	0.322 [0.050]***	0.320 [0.050]***	0.322 [0.050]***
Log Exports / Sales	0.097 [0.073]	0.099 [0.073]	0.097 [0.073]	0.098 [0.073]	0.095 [0.073]	0.095 [0.073]	0.097 [0.073]	0.096 [0.073]	0.096 [0.073]	0.096 [0.073]	0.098 [0.073]	0.086 [0.072]
More than 3 Competitors	-0.014 [0.029]	-0.014 [0.029]	-0.014 [0.029]	-0.015 [0.029]	-0.015 [0.029]	-0.018 [0.029]	-0.014 [0.029]	-0.016 [0.029]	-0.014 [0.029]	-0.015 [0.029]	-0.014 [0.029]	-0.015 [0.029]
Trade Policy	-0.012 [0.040]											-0.086 [0.056]
Fiscal Burden of Government		-0.056 [0.037]										-0.041 [0.040]
Government Intervention in the Economy			-0.026 [0.026]									-0.045 [0.034]
Monetary Policy				-0.008 [0.035]								0.071 [0.040]*
Capital Flows and Foreign Investment					-0.059 [0.060]							0.023 [0.069]
Banking and Finance						-0.093 [0.036]**						-0.109 [0.043]**
Wages and Prices							-0.069 [0.050]					-0.047 [0.059]
Property Rights								-0.194 [0.064]***				-0.297 [0.077]***
Regulation									0.149 [0.083]*			0.200 [0.099]**
Informal Market										0.035 [0.042]		0.083 [0.046]*
Index of Economic Freedom											-0.228 [0.109]**	
Constant	1.084 [0.139]***	1.277 [0.172]***	1.167 [0.142]***	1.086 [0.179]***	1.241 [0.216]***	1.408 [0.167]***	1.262 [0.184]***	1.812 [0.258]***	0.453 [0.336]	0.905 [0.195]***	1.928 [0.428]***	1.856 [0.671]***
Observations	5430	5430	5430	5430	5430	5430	5430	5430	5430	5430	5430	5430
	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86

Robust standard errors, clustered by year, country, industry and firm size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: The Heritage Foundation Indices measure, on the country level, institutional factors determining economic freedom on a scale from 1 to 5. The index of economic freedom is the simple average of the 10 individual indices.

TableA8: Revenue Efficiency - Impact of Doing Business Indicators (OLS Estimation without Year, Country or Sector Fixed Effects)

	1	2	3	4	5	6	7	8	9	10	11	12	13
Log Employment	0.681	0.656	0.656	0.655	0.659	0.68	0.67	0.738	0.671	0.656	0.659	0.71	0.867
	[0.017]***	[0.018]***	[0.018]***	[0.018]***	[0.018]***	[0.018]***	[0.018]***	[0.019]***	[0.017]***	[0.018]***	[0.017]***	[0.017]***	[0.015]***
Log Fixed Assets	0.337	0.349	0.365	0.365	0.369	0.36	0.349	0.355	0.316	0.346	0.366	0.327	0.199
	[0.012]***	[0.012]***	[0.012]***	[0.012]***	[0.011]***	[0.012]***	[0.012]***	[0.014]***	[0.011]***	[0.012]***	[0.012]***	[0.012]***	[0.011]***
Ownership [Privatized]	0.033	0.1	0.098	0.118	0.086	0.126	0.111	0.137	0.099	0.1	0.073	0.068	0.136
	[0.055]	[0.059]*	[0.058]*	[0.059]**	[0.058]	[0.058]**	[0.059]*	[0.057]**	[0.058]*	[0.058]*	[0.057]	[0.054]	[0.051]***
Ownership [New Private]	0.261	0.307	0.311	0.326	0.298	0.338	0.33	0.336	0.296	0.313	0.317	0.322	0.314
	[0.058]***	[0.062]***	[0.062]***	[0.062]***	[0.061]***	[0.061]***	[0.064]***	[0.061]***	[0.061]***	[0.063]***	[0.062]***	[0.060]***	[0.052]***
Ownership [Foreign]	0.355	0.4	0.406	0.416	0.39	0.404	0.401	0.472	0.4	0.403	0.4	0.42	0.459
	[0.067]***	[0.071]***	[0.070]***	[0.070]***	[0.070]***	[0.070]***	[0.070]***	[0.071]***	[0.070]***	[0.071]***	[0.069]***	[0.066]***	[0.062]***
Log Exports / Sales	0.337	0.332	0.332	0.288	0.324	0.224	0.267	0.06	0.343	0.313	0.293	0.168	-0.122
	[0.103]***	[0.105]***	[0.105]***	[0.103]***	[0.106]***	[0.102]**	[0.107]**	[0.098]	[0.105]***	[0.106]***	[0.106]	[0.106]	[0.087]
More than 3 Competitors	0.155	0.148	0.154	0.138	0.153	0.15	0.152	0.121	0.124	0.144	0.157	0.122	0.06
	[0.040]***	[0.040]***	[0.040]***	[0.041]***	[0.040]***	[0.040]***	[0.040]***	[0.038]***	[0.040]***	[0.040]***	[0.041]***	[0.039]***	[0.035]*
Registering a Business [Number of Procedures]	-0.085												-0.089
	[0.008]***												[0.012]***
Registering a Business [Time in Days]		-0.001											0.002
		[0.002]											[0.002]
Registering a Business [Cost in % GNI]			-0.008										-0.008
			[0.002]***										[0.002]***
Employing Workers [Rigidity of Employment]				0.007									0.016
				[0.002]***									[0.003]***
Employing Workers [Firing]					-0.004								-0.008
					[0.001]***								[0.002]***
Employing Workers [Firing Cost in Weeks of Wages]						0.013							0.009
						[0.002]***							[0.002]***
Enforcing a Contract [Number of Procedures]							-0.014						-0.018
							[0.004]***						[0.003]***
Enforcing a Contract [Time in Days]								0.001					0.002
								[0.000]***					[0.000]***
Enforcing a Contract [Cost in % of Debt]									-0.044				-0.015
									[0.005]***				[0.005]***
Closing a Business [Time in Years]										-0.02			0.037
										[0.017]			[0.018]**
Closing a Business [Cost in % of Estate]											-0.011		0.021
											[0.003]***		[0.003]***
Closing a Business [100 - Recovery Rate in Cents to de Dollar]												-0.025	-0.016
												[0.003]***	[0.003]***
Constant	2.69	1.851	1.924	1.482	1.973	1.48	2.221	1.28	2.452	1.863	1.958	3.594	3.035
	[0.120]***	[0.108]***	[0.097]***	[0.120]***	[0.103]***	[0.099]***	[0.146]***	[0.096]***	[0.122]***	[0.114]***	[0.102]***	[0.220]***	[0.224]***
Observations	5050	5050	5050	5050	5050	5050	5050	4692	5050	5050	5050	5050	4692
	0.76	0.74	0.75	0.74	0.74	0.75	0.75	0.77	0.75	0.74	0.75	0.76	0.82

Robust standard errors, clustered by year, country, industry and firm size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: The Doing Business Indicators measure elements of the business climate on a country level a score indicates that the business climate is worse; all Indicators are measured defined, except for "Employing Workers [Rigidity of Employment]" and "Employing Workers [Firing]", which are measured on a scale from 0 to 100 (100 is the most rigid); the Doing Business Indicators report "Closing a Business [Recovery Rate in Cents to the Dollar]; this was recoded to "Closing a Business [100 - Recovery Rate in Cents to the Dollar]" such that, consistent with the other indicators, a higher score is associated with a worse business climate.

TableA9: Revenue Efficiency - Impact of Doing Business Indicators (OLS Estimation with Year, Country and Sector Fixed Effects)

	1	2	3	4	5	6	7	8	9	10	11	12	13
Log Employment	0.904	0.904	0.904	0.905	0.904	0.905	0.905	0.909	0.905	0.905	0.905	0.905	0.905
	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***
Log Fixed Assets	0.156	0.158	0.158	0.157	0.157	0.157	0.157	0.155	0.157	0.157	0.157	0.157	0.16
	[0.009]***	[0.009]***	[0.009]***	[0.009]***	[0.009]***	[0.009]***	[0.009]***	[0.010]***	[0.009]***	[0.009]***	[0.009]***	[0.009]***	[0.010]***
Ownership [Privatized]	0.06	0.063	0.065	0.067	0.064	0.059	0.063	0.052	0.064	0.062	0.062	0.062	0.056
	[0.043]	[0.043]	[0.043]	[0.044]	[0.043]	[0.044]	[0.043]	[0.046]	[0.043]	[0.043]	[0.043]	[0.043]	[0.046]
Ownership [New Private]	0.151	0.152	0.156	0.156	0.153	0.15	0.152	0.142	0.153	0.153	0.152	0.152	0.147
	[0.042]***	[0.042]***	[0.042]***	[0.042]***	[0.042]***	[0.042]***	[0.042]***	[0.045]***	[0.042]***	[0.042]***	[0.042]***	[0.042]***	[0.045]***
Ownership [Foreign]	0.349	0.35	0.355	0.355	0.353	0.35	0.351	0.341	0.353	0.351	0.351	0.351	0.348
	[0.053]***	[0.053]***	[0.053]***	[0.053]***	[0.053]***	[0.053]***	[0.053]***	[0.056]***	[0.053]***	[0.053]***	[0.053]***	[0.053]***	[0.056]***
Log Exports / Sales	0.137	0.135	0.133	0.131	0.131	0.135	0.134	0.119	0.133	0.135	0.134	0.134	0.111
	[0.077]*	[0.077]*	[0.077]*	[0.077]*	[0.077]*	[0.077]*	[0.077]*	[0.082]	[0.077]*	[0.077]*	[0.077]*	[0.077]*	[0.081]
More than 3 Competitors	-0.003	-0.006	-0.004	-0.006	-0.005	-0.004	-0.005	-0.008	-0.005	-0.005	-0.005	-0.005	-0.009
	[0.030]	[0.030]	[0.030]	[0.030]	[0.030]	[0.030]	[0.030]	[0.031]	[0.030]	[0.030]	[0.030]	[0.030]	[0.031]
Registering a Business [Number of Procedures]	-0.03												-0.018
	[0.018]*												[0.021]
Registering a Business [Time in Days]		-0.004											-0.002
		[0.002]**											[0.003]
Registering a Business [Cost in % GNI]			-0.01										-0.011
			[0.003]***										[0.005]**
Employing Workers [Rigidity of Employment]				0.007									0.01
				[0.003]**									[0.007]
Employing Workers [Firing]					0.003								0.007
					[0.002]								[0.006]
Employing Workers [Firing Cost in Weeks of Wages]						-0.004							-0.013
						[0.004]							[0.005]***
Enforcing a Contract [Number of Procedures]							0.006						0.044
							[0.023]						[0.030]
Enforcing a Contract [Time in Days]								-0.001					-0.002
								[0.000]***					[0.001]***
Enforcing a Contract [Cost in % of Debt]									0.014				-0.009
									[0.013]				[0.035]
Closing a Business [Time in Years]										-0.111			0.15
										[0.123]			[0.149]
Closing a Business [Cost in % of Estate]											0.005		0.024
											[0.006]		[0.026]
Closing a Business [100 - Recovery Rate in Cents to de Dollar]												0	-0.016
												[0.007]	[0.012]
Constant	1.409	1.174	1.221	0.628	0.729	1.053	0.848	1.22	0.771	1.324	0.809	1.039	-0.055
	[0.255]***	[0.112]***	[0.103]***	[0.202]***	[0.216]***	[0.102]***	[0.646]	[0.125]***	[0.229]***	[0.368]***	[0.267]***	[0.639]	[1.757]
Observations	5050	5050	5050	5050	5050	5050	5050	4692	5050	5050	5050	5050	4692
	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86

Robust standard errors, clustered by year, country, industry and firm size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: The Doing Business Indicators measure elements of the business climate on a country level a score indicates that the business climate is worse; all Indicators are measured defined, except for "Employing Workers [Rigidity of Employment]" and "Employing Workers [Firing]", which are measured on a scale from 0 to 100 (100 is the most rigid); the Doing Business Indicators report "Closing a Business [Recovery Rate in Cents to the Dollar]; this was recoded to "Closing a Business [100 - Recovery Rate in Cents to the Dollar]" such that, consistent with the other indicators, a higher score is associated with a worse business climate.

Table A10: Revenue Efficiency - Baseline regressions on Panel Data
(IV Estimation with Year, Country and Sector Fixed Effects)

	1	2	3	4	5	6	7	8
Log Employment	0.389	0.457	0.402	0.489	0.755	0.731	0.735	0.710
	[0.169]**	[0.171]***	[0.174]**	[0.173]***	[0.189]***	[0.193]***	[0.193]***	[0.204]***
Log Assets	0.709	0.610	0.702	0.578	0.289	0.316	0.321	0.349
	[0.187]***	[0.200]***	[0.192]***	[0.202]***	[0.225]	[0.244]	[0.229]	[0.255]
Log (1 + Exports / Sales)		0.825		1.021		-0.005		-0.023
		[0.593]		[0.670]		[0.683]		[0.775]
More than 3 Competitors			-0.004	0.007			-0.069	-0.067
			[0.081]	[0.074]			[0.073]	[0.075]
Ownership [Privatized]					0.235	0.208	0.401	0.388
					[0.427]	[0.445]	[0.422]	[0.455]
Ownership [New Private]					0.089	0.053	0.215	0.180
					[0.317]	[0.349]	[0.314]	[0.352]
Ownership [Foreign]					1.904	1.942	1.835	1.878
					[0.473]***	[0.452]***	[0.447]***	[0.414]***
Constant	0.904	0.962	0.889	0.950	0.928	0.942	0.858	0.868
	[0.223]***	[0.221]***	[0.257]***	[0.244]***	[0.489]*	[0.555]*	[0.499]*	[0.571]
Observations	1372	1355	1322	1305	1372	1355	1322	1305
J-Test	16.75	15.34	16.94	14.76	6.55	5.01	6.70	4.98
p-value	0.005	0.004	0.005	0.005	0.162	0.025	0.035	0.026
First stage F-tests								
Log Employment	108.66	108.00	111.48	110.75	108.66	108.00	111.48	110.75
Log Assets	36.82	36.34	35.50	35.01	36.82	36.34	35.50	35.01
Log (1 + Exports / Sales)		15.20		14.17		15.20		14.17
Ownership [Privatized]					8.68	8.91	9.36	9.72
Ownership [New Private]					27.76	28.73	27.32	28.34
Ownership [Foreign]					5.24	4.95	5.60	5.29
Durbin-Wu-Hausman Test	22.17	21.04	20.50	20.55	33.65	33.19	29.88	29.68
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors, clustered by year, country, industry and firm size (small, medium and large) in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: All models were estimated using IVs for Log Employment, Log Assets, Log (1 + Export/Sales) and three Ownership Dummies. The IVs are: Firm's age, skill ratio (college/high school), skill ratio - age interaction, location (city), % change in fixed assets in previous period, % change in exports in previous period, full time employees in previous period. The skill ratio and the skill ratio - age interaction were also interacted with regional (CEB, SEE and CIS) dummies

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