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**EXPLAINING THE PERFORMANCE OF  
FIRMS AND COUNTRIES:  
WHAT ROLE DOES THE BUSINESS  
ENVIRONMENT PLAY?**

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It is commonly accepted that the business environment — encompassing features of the legal, regulatory, financial, and institutional system of a country — has an impact on the performance of firms. As barriers to doing business appear to vary widely across regions and countries, it has also been asserted that the business environment will affect aggregate performance. The common underlying assumption is that countries and firms facing ‘better’ business environments can be expected to perform better. This paper attempts to evaluate the robustness of these conclusions using two types of data. The first comprises a large firm level dataset — the 2002 and 2005 rounds of the Business Environment and Enterprise Performance Survey (henceforth BEEPS) — that includes measures of firm performance, variables relating to ownership, competition and export orientation as well as perceptions of the business environment. The dataset covers between 6–9,000 firms in 26 transition countries. The second — country level — dataset comprises the World Bank’s annual ‘Doing Business’ survey that covers 175 countries. While this survey has relatively few observations over time — data collection only started in 2003 — it has large country coverage and has already been widely used in cross-country analysis. In this paper, the Doing Business measures are primarily used to try and establish whether there is any link from country-level measures of the business environment to country-level performance.

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## 1. Introduction

It is commonly accepted that the business environment — encompassing features of the legal, regulatory, financial, and institutional system of a country — has an impact on the performance of firms. As barriers to doing business appear to vary widely across regions and countries, it has also been asserted that the business environment will affect aggregate performance. As such, empirical investigation of these conjectures can proceed at both firm and country levels. The collection of firm level datasets by organisations such as the EBRD has gone alongside the collection of country level information attempting to measure dimensions of the business environment; the World Bank’s annual ‘Doing Business’ survey is a case in point. Simply stated, the common underlying assumption is that countries and firms facing ‘better’ business environments can be expected to perform better<sup>1</sup>.

This paper attempts to evaluate the robustness of these conclusions using two types of data. The first comprises a large firm level dataset — the 2002 and 2005 rounds of the Business Environment and Enterprise Performance Survey (henceforth BEEPS)<sup>2</sup> — that includes measures of firm performance, variables relating to ownership, competition and export orientation as well as perceptions of the business environment. The dataset covers between 6–9,000 firms in 26 transition countries. As the two rounds of the survey provide data on firms over a six year period, they allow examination of the relationship over time between performance and a range of explanatory variables, including the business environment. They can also throw light on the links from constraints to actions, like restructuring, that have been a critical feature of the transition.

The second — country level — dataset comprises the World Bank’s annual ‘Doing Business’ survey that covers 175 countries. For this survey, a questionnaire organised around a hypothetical business case is administered to a range of expert respondents in each country. The full set of Doing Business indicators are then put together in an aggregate ranking that aims to summarise a country’s ease of doing business. While this survey has relatively few observations over time — data collection only started in 2003 — it has large country coverage and has already been widely used in cross-country analysis. In this paper, the Doing Business measures are

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<sup>1</sup> For example, Djankov et al (2006) argue that when using a simple average of country rankings from ‘Doing Business’ as an aggregate measure of the business environment, an improvement in a country’s indicators from being in the lowest quartile to the best would imply a 2.3% improvement in annual growth.

<sup>2</sup> The dataset is collected by EBRD and the World Bank and has had three rounds, 1999, 2002 and 2005. A fourth round is being implemented in 2008.

primarily used to try and establish whether there is any link from country-level measures of the business environment to country-level performance.

The paper is organised as follows. Section 1 provides an overview of the recent literature — theoretical and empirical — on the business environment. Section 2 then turns in detail to analysis of the BEEPS firm-level dataset. Section 3 moves the focus to the level of the country and asks whether the Doing Business indicators can help explain differences in performance across countries. As we find that both the firm and country level findings provide scant support for the view that the business environment exerts a strong and measurable impact on performance, Section 4 asks why this might be the case. Section 5 concludes.

## **2. Literature review**

The theoretical literature identifies differences in institutions as one of the key sources of differences in gross country income and growth rates. Most generally, Parente and Prescott (1994) argue that broadly defined institutional barriers increase the cost of technology adoption and hence reduce long-term income per capita. Other authors have focussed more on the relationship between performance and specific frictions such as, credit constraints (for example, Gertler and Rogoff, 1990, Banerjee, et. al, 1993, Aghion et. al., 2003 and 2005), contract enforceability (for example, Quintin, 2003, Acemoglu et. al. 2006), investor protection (for example, Rui et al. 2004) and entry costs (for example, Marimon and Quadrini, 2006, Aghion et. al., 2006). However, while in general this body of work holds that worse institutions should imply worse performance, the literature also suggests that such relationships are not necessarily linear and monotonic.

The links between institutions and performance have also been analysed in a large and growing empirical literature. However, the bulk of the research relies on country-level proxy indicators of the business environment, such as governance (for example, Kaufmann et al., 1999, 2002, 2006), regulatory constraints (for example, Djankov et al., 2002, and Botero et al. 2004), competitiveness (for example, the World Economic Forum's Global Competitiveness Report), transparency (for example, the country ratings produced by Transparency International), bureaucratic quality, corruption and law and order (for example, the work of Political Risk Services), strength of the legal system (Durnev and Kim, 2005), and the level of economic freedom in an economy (for example, the Heritage Foundation's Annual Report). Knack and Keefer (1995) and Hall and Jones (1999) also find a correlation between measures of property rights and GDP per capita.

A feature common in much of the country level research is that most

of the aggregate proxies used in the research contain relatively little or no variation over time and are hence largely indistinguishable from country-, sector- or region-specific effects that may reflect other features than the business environment. Moreover, these 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 (for example, Levine and Zervos, 1998; Rajan and Zingales, 1998 and others). However, Acemoglu, Johnson and Robinson (2001) try to establish a causal relationship by using mortality rates of European colonialists as an instrument for current institutions. Acemoglu and Johnson (2005) further try to separate the effect of property rights institutions from that of contracting institutions. They find that the former have a first-order effect on performance, while the latter matter only through their impact on financial intermediation.

A further body of empirical research relies primarily on industry or firm level survey data to try and look at the links between performance and constraints. Industry level studies (for example, Rajan and Zingales (1998), Klapper et al (2004)) can control for country and industry effects but have the disadvantage that they use a benchmark country where the optimal value of the business environment has to be assumed. In many developing countries, industry level evidence is lacking.

At the firm level, data collection using specifically designed surveys has been widely adopted. For example, the World Bank has implemented over 135 surveys in over 70 countries between 1999 and 2005. In most instances, these surveys ask firm respondents in considerable detail about the sort of constraints that they commonly face and the perceived intensity of those constraints. They often try to order perceptions of the strength and the relative importance of particular constraints for particular firms. These surveys also ask in detail about firm level performance over specific reference periods.

A range of studies using these firm level surveys has now claimed to find a strong link between the variation in performance and perceived constraints (for example, Beck et al (2005), Ayagari et al (2005), Hallward-Driemeier et al (2006)). Yet, looking at the links from the business environment to performance in this literature raises a number of methodological considerations concerning the possibility of biased estimates due to errors in variables, omitted variables and the endogeneity of regressors.

Common to all these studies, whether conducted at country, industry or firm level, has been the desire, first, to measure the principal constraints on a country, industry or firms' performance and then to measure the size of the effect of a constraint, whether with respect to an individual constraint or a set of constraints, on performance. Underlying this approach is

the obvious idea that understanding the type and consequences of constraints helps in the formulation of appropriate policy for addressing those constraints. Indeed, the analysis of these data series has also been linked to explicit policy conclusions (for example, World Development Report (2000)).

### 3. Firm level analysis

In what follows, the 2002 and 2005 rounds of the BEEPS are used<sup>3</sup>. The BEEPS is a stratified random sample of firms in 26 transition countries. Around 90 per cent of the BEEPS sample in both years comprised small and medium enterprises. Most firms in the samples had been privatised or were always private<sup>4</sup>. The 2002 round of the BEEPS surveyed over 6,100 firms while the 2005 round covered nearly 9,100 firms in the same countries. *Table 1* provides some simple descriptive statistics. The average age of the firms in the sample was around 15 years, while firm size in employment ranged between 105 and 143. On average, exports comprised between 9–11% of total sales. In general, the main variables show reasonable mean values and significant variation. The lower part of *Table 1* also reports the average scores and standard deviations for the constraints where 1 indicates no obstacle and 4 is a major obstacle. Each firm's top manager was asked to provide their perception of the constraints. Tax rates, uncertainty about regulatory policies and cost of financing were clearly viewed as important obstacles. Yet, not only is there large variation in mean values across perceived constraints but also the standard deviations are large in almost all instances.

To analyse the determinants of the efficiency with which the firms generate sales revenue from inputs, an augmented Cobb Douglas revenue function is used:

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

where  $y_{it}$  represents the revenue of firm  $i$  in period  $t$ ,  $x$ 's represent the capital and labour 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

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<sup>3</sup> For a more detailed analysis, see Commander and Svejnar (2008).

<sup>4</sup> Quota sampling was used for foreign owned and state-owned companies and set at 10 per cent of the total sample for each category. The distribution between manufacturing and service sectors was according to their relative contribution to GDP in each country. Firms subject to government price regulation and prudential supervision were excluded, as were firms with 10,000 employees or more were also excluded as well as firms that started operations in 2002–2004.

denote a set of dummy variables for industries, countries and years, respectively,  $v_i$  is an unobserved time-invariant firm-specific effect that is controlled for in some estimations, and  $\varepsilon_{it}$  is an independently distributed error term. Equation (1) allows efficiency to vary across institutional and structural variables, industries, countries and time.

When estimating (1), an obvious issue 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, hence, 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. To deal with this, an instrumental variables (IV) approach is used. 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 lagged three-year differences in some of these variables can be used as potential instrumental variables. For each year in each firm, there are also data on the number of workers with university and secondary education. Following Marschak and Andrews (1944) and Schmidt (1988), the ratio of these two inputs (skill ratio) is used as an instrumental variable.<sup>5</sup> 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 wage ratio across regions and countries. Since firms in the 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 observations.

The 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, equation (1) has been estimated in levels on the pooled 2002 and 2005 samples of firms and the IVs used have been the age and location of the firm, the skill ratio interacted with the three main regions covered by the data,<sup>6</sup> 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,

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<sup>5</sup> The rationale for this instrument comes from economic optimization and an assumed exogeneity of input prices (wages). 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.

<sup>6</sup> The regions are (a) Central Europe and Baltics, (b) the Commonwealth of Independent States (CIS), and (c) Southeastern Europe.

and the change in the export share over the preceding three years. These variables have been used as instruments for the levels of the capital and labour inputs, categories of ownership and the export orientation of the firm. The IVs are found to be good predictors of all the potentially endogenous variables and pass the J (Sargan) over-identification test. The extent of competition in the firm's product market is viewed as exogenous to a given firm.

Finally, in order to assess the robustness of the results with respect to the business environment, an average value of each constraint has been used. The average has been 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. This approach gives both a considerable variation in the values of constraints and a sufficient number of firms per cell to minimise problems associated with potential measurement error. The standard errors of all estimates are clustered by year, country, industry and firm size<sup>7</sup>.

*Table 2* contains the baseline IV estimates without the explanatory variables capturing the business environment constraints. These regressions use pooled data from the entire 2002 and 2005 BEEPS. The number of observations varies from 5,624 to 5,897 and all regressions include country, year and sector fixed effects. State ownership serves as the reference.

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. 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. 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 sig-

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<sup>7</sup> In Commander and Svejnar (2008) other options are also explored.

nificance of the negative effect of new private ownership disappears when the export share and competition variables are entered. Interestingly, when controlling for ownership, the export share variable loses all significance. In Columns 7 and 8, where most or all of the explanatory variables are entered simultaneously, we find that competition has a small, positive and significant (at 10% 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 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. The preferred (all-encompassing) specification in Column 8 points to the importance of foreign ownership and, to a lesser extent, competition on performance.

The next stage is to consider directly the impact of business environment constraints on firm performance. For each constraint, the average of responses of other firms in the same 2 digit sector, firm size (small, medium and large), country and year are used. Entering all 15 categories of constraints invariably yields insignificant estimates and the question naturally arises as to whether collinearity across constraints accounts for this insignificance. Most constraints are actually 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 was 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, only one of these pairwise correlated constraint variables is entered, noting that it generally does not matter which of the two is entered. The constraint related to labour regulation is excluded as it is almost completely explained by the interaction of country and year fixed effects and hence insignificant. This leaves nine constraints whose effects are now analysed.

*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 much of the literature, the regressions in *Table 3* are without country, year and sector fixed ef-

fects<sup>8</sup>. 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. These specifications appear to replicate the conventional wisdom that the business/institutional environment matters. The regression with the average value of all nine constraints also yields a negative and statistically significant coefficient. When all the constraints are entered simultaneously in the IV estimation in *Table 3*, 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, correcting — at least in part — for the possible omitted variables problem, the negative effect of most business environment constraints on performance disappears.

*Table 4* repeats the same exercise but includes country, year and sector fixed effects whose omission may have biased the estimates. In this case, the significance of the coefficients on inputs, ownership, exports and competition correspond to those in the base estimations in *Table 2*. However, the picture changes substantially with respect to the business environment constraints. While most of the constraint 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. 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 constraints. Hence, controlling for country-wide differences in the ‘business environment’ (together with aggregate shocks and other effects), the negative effects of most constraints disappear.

The analysis was extended by also looking at the possible impact that interactions of constraints might have on performance, in line with recent explorations in the development literature (see, for example, Aghion et al., 2005, 2006). The intuition here is that, say, corruption may or may not have a direct impact itself, but 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. However, neither when the interactions were entered one at a time, nor

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<sup>8</sup> Note that this model appears to be mis-specified compared to a model that includes these fixed effects in that the labour coefficient is small and insignificant, and the p values on the J test are very small.

when all were entered simultaneously, were statistically significant results found<sup>9</sup>.

One important result from the 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<sup>10</sup>. However, the rankings are not stable and have a number of unexpected features, suggesting 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 as 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.

In view of the findings based on manager perceptions of the business environment, it is interesting to ask whether other measures of the business environment produce similar results. To this end, the firm-level data were also merged with the Doing Business indicators that are used in the next section of this paper<sup>11</sup>. When entering the Doing Business indicators individually into the IV regressions in a specification with country, industry and year fixed effects, only four of the twelve indicators generated the expected negative coefficients. In the IV regressions without fixed effects, only two of the twelve indicators had negative effects. Moreover, the indicators with the negative coefficients were not the same ones across specifications. In other words, widely used country-level indicators of the business/institutional environment do not provide strong evidence of a negative relationship between the constraining environment and firm performance.

#### **4. Country level analysis**

Turning to the country level analysis, the dataset that is used is the World Bank's Doing Business survey<sup>12</sup>. Doing Business employs a tem-

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<sup>9</sup> See Commander and Svejnar (2008) for results and more extended discussion.

<sup>10</sup> See the EBRD annual 'Transition Reports'.

<sup>11</sup> 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.

<sup>12</sup> See Commander and Tinn (2008) for a fuller analysis.

plate questionnaire targeted at local professionals in a variety of fields, including lawyers, officials and consultants. The questionnaire is organised around a hypothetical business case and then administered to a range of expert respondents in each country. It has now been administered up to five times between 2003 and 2007. In 2007 over 5000 experts were contacted in 175 countries. Information on ten indicators was collected in 2007<sup>13</sup>. However, information on only five sets of indicators has been collected for all years since 2003<sup>14</sup>. The full set of Doing Business indicators are also put together in an aggregate ranking that aims to summarise a country's ease of doing business. It should be noted that each country has a unique indicator, a heroic assumption for large and diverse countries, such as Brazil or India. There area also a number of quite restrictive assumptions made about the representative firm<sup>15</sup>.

The philosophy behind Doing Business has causality running from institutions to performance. Identifying these effects will, however, raise obvious issues of endogeneity. Further, while performance can be summarised by country level growth, there is evidently a set of hypothesised relationships between the Doing Business indicators and intermediate outcomes. These are indicated in *Appendix Table 1*. Both final and intermediate outcomes will be used in the analysis below.

#### 4.1 Business environment and country performance

This section first looks at the relationship between country-level performance and the Doing Business indicators. Second, the relationship between intermediate outcomes and performance is analysed.

The country level analysis is done in the spirit of the cross-country growth analysis of Barro and Sala-i-Martin(1998). However, due to limited availability of data, only the relationship between growth over the period 2003-2005 and the Doing Business indicators available for 2003 can be explored. Equation 2 is estimated;

$$Growth = \ln(GDP_{2005} / GDP_{2003}) = \alpha + \beta \ln(GDP_{pc,2003}) + \gamma DB_{2003} + \delta X + \varepsilon , \quad (2)$$

where the growth measure is the log difference of real PPP adjusted GDP. On the right hand side of the equation, the log of PPP adjusted GDP in 2003, the Doing Business indicators available for 2003 and an additional

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<sup>13</sup> Namely, starting a business; employment regulation; enforcing contracts; getting credit; closing a business; registering property; protecting investors; dealing with licenses; paying taxes and trading across borders.

<sup>14</sup> Starting a business, employment regulation; enforcing contracts; getting credit and closing a business.

<sup>15</sup> See Commander and Tinn (2008) for more detail.

set of controls  $X$ , are included. These are secondary school enrolment and government expenditure to GDP; the latter being a measure of the size of government. The procedure is to run separate regressions that include the Doing Business variables from each of the four available categories — starting a business, employing workers, enforcing contracts and closing a business — which are entered separately (Columns 1–4) and then jointly (Column 5).

*Table 5* reports the results. No statistically significant association with the expected sign can be found. The coefficients on procedures to start and time to close a business are weakly significant but wrongly signed.

Yet, the existence of a relationship between institutions identified by Doing Business and growth cannot be completely ruled out. For a start, it is only possible to look at the growth rate over a very short period of time that could have been affected by business cycles. Second, the impact of institutions on growth is far more likely to be a longer term phenomenon and might not affect performance immediately. Third, only a subset of the Doing Business indicators was available for 2003. It is also not possible to address the issues arising from potential reverse causality due to the absence of suitable instruments. The countries that have a potential to grow faster may have more incentives to develop institutions. However, this would likely result in overestimating the strength of relationship between the Doing Business indicators and growth. As there is no association, the importance of this is unlikely to be critical.

Turning to the second component of the analysis, as the Doing Business indicators might affect growth through their impact on intermediate outcomes, similar regressions relating intermediate outcomes to the indicators are reported. The most recent available data on the intermediate indicators are related to the contemporaneous Doing Business indicators. The estimates also use as controls the log of PPP adjusted GDP, government expenditure to GDP and secondary school enrolment. These results are reported in *Table 6*. The results in the first column include only one relevant group of Doing Business indicators. The second column reports results when Doing Business indicators from all relevant categories are jointly included. Exceptions are stock market capitalisation and the stock turnover ratio where the second column gives the impact of the overall investor protection index and first column gives the impact of subcomponents of the investor protection index individually.

*Table 6* shows that there are some — but very few — statistically significant associations. Better legal rights are positively associated with private credit, capital inflows and FDI. However, these relationships are absent for private bank credit, where it might have been expected to be stronger than with the broader measure of private credit. Legal rights are

also found not to be associated with higher investment. Better private and public registry coverage appears to be positively associated with higher private credit and private registries with private bank credit when only the 'Getting Credit' indicators are included. However, the significance disappears when all potentially relevant indicators are included in the regression. The same applies for the recovery rate when closing a business and bank credit, as well as for procedures for registering property and enforcing contracts and the broader private credit measure. Better investor protection is associated with higher stock market capitalization but not with stock market liquidity as measured by the stock market turnover ratio. Note that it is hard to argue that the causality of these statistically significant relationships runs from institutions to better credit and stock market development, as the development of these markets will have naturally created a need for better regulation. Other relationships appear even weaker. For example, there are no significant and predictably signed associations with registering property indicators and construction, export and import with the trading across borders indicators, informal economy and starting business, employing workers and enforcing contracts and unemployment with employment indicators. Investment is unrelated to most Doing Business indicators, while there is a weak association with procedures to deal with licences and enforcing contracts.

## **5. Why does the business environment explain so little?**

The analysis above suggests that neither at firm nor country level do measures of the business environment appear to have significant explanatory power when relating constraints to performance. This section asks why that is the case.

Potential explanations fall into four broad categories. The first is that the various indicators may simply be mis-measured. The second is that the indicators may be incomplete and/or too specific. The third is that the underlying relationships may be more complex and the fourth is that the identification strategy is incorrect.

With respect to measurement, a starting point is to ask whether firm and country level measures of obstacles actually give broadly consistent responses. Commander and Tinn (2008) use firm level evidence from the World Bank Enterprise Surveys dataset containing over 30,000 firm level observations for at least 75 countries relating to the period from 1999–2006 and relate responses in these firm level surveys to the Doing Business indicators that are their closest match. They find that there is no tight association between firm level survey responses and the Doing Business measures. To understand why this might be the case, it is useful to look in more detail at the firm level evidence from the surveys. What emerges is that

there is large variation in responses, particularly with respect to variation *within* countries. Further, there is more variation within-industry than between-industry<sup>16</sup>, suggesting much variation in subjective responses. Given that the attributes of individual respondents' cannot be controlled for, this variation is hard to explain. Clearly, subjective evaluations raise a host of questions regarding possible bias (Bertrand and Mullainathan, 2001). What is less clear is whether one or other of the measures is superior in the measurement of constraints. At this point, all that can be said is that there are major discrepancies between the two approaches that are difficult to understand, let alone explain. Any mis-measurement might come from either source.

With respect to the country level indicators in Doing Business, the objective of looking at an average representative firm is likely to be problematic. First, there is the issue of how a representative business is defined. Second, focusing on an average firm obviously ignores heterogeneity among firms as well as sectoral specialisation in a country. The higher correlation of the Doing Business indicators observed in high income countries might suggest that the templates are best designed for a representative firm in a high income country. If firms in less developed countries are engaged in substantially different production activities, the constraints they face are likely to be very different.

Similar sample selection issues are likely to affect the responses of firms more generally. If there are many obstacles in the business environment, only agents with the best entrepreneurial and/or managerial talent may be active. Further, it is unclear what entrepreneurial or managerial talent actually means in a poor business environment. For example, it may be that these entrepreneurs have the best ability for dealing with corruption rather than being the most dynamic in other more productive areas. Nevertheless, such issues are likely to create bias in firm responses.

Both the Doing Business indicators and firm level responses are ultimately subjective. Responses can be affected by the mood and personality of the respondent as well as by respondents adapting to the business environment. While the first effect is likely to average out in the firm level surveys, it does not necessarily average out in a small number of expert opinions, as in Doing Business. To the extent that questions in Doing Business are more objective by trying to measure constraints more specifically — such as the time to enforce contracts — they may suffer from less possible bias than firm level surveys. The issue of adaptation is clearly a problem when evaluating the business environment using firm level subjective re-

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<sup>16</sup> There are no obvious patterns when controlling for the size of firm or ownership.

sponses. In this instance, it will not average out irrespective of the number of responses.

Additional explanations for the lack of explanatory power could be that the variables and indicators that are collected are too specific. Take the example of credit and enforcing contracts. The theoretical literature often models this as the probability of avoiding repayment to the creditor (for example, Hart and Moore, 1994, Marimon and Quadrini 2006, Aghion et al., 2003). There is no direct measure of this in the Doing Business indicators, while there are several proxies such as the time, procedures and cost of enforcing contracts. There are also important variables and indicators missing in both firm and country level surveys. For example, R&D and technology adoption are likely to be major sources of growth and incentives to innovate are likely to be affected by intellectual property rights (Parente and Prescott, 1994). The incompleteness of the existing measures — as with Doing Business — is likely to be a problem.

Then there is the validity of the assumption of a monotonic relationship between country level indicators and economic performance. For example, the correlation of the Doing Business indicators with GDP and with several intermediate outcomes appears to decline with income<sup>17</sup>. This result is probably not surprising. For example, investor protection is likely to be important in countries that have formal equity markets. In the absence of these markets, differences in minority shareholder protection are unlikely to affect performance. Another example concerns the substantial differences in the availability of skilled labour among countries. The technology that is appropriate in countries that are abundant in skilled labour may not be appropriate in countries that are not (Acemoglu, 2002). As a result, the constraints to productive activity in high vs. low income countries may be different depending on the availability of skilled labour. This suggests the presence of thresholds of income per capita or other indicators, such as labour force or size of equity markets, at which constraints will matter or not.

Finally, there is the issue of the identification strategy. In the context of firm level evidence, Carlin et al (2006) argue that the parameter estimates from an equation relating a measure of performance to particular constraints can be biased for several reasons. The first is that many of the measures of constraints that have been collected may in fact be more in the nature of public goods that are an input into private production. As such, the issue of the endogeneity of public good supply will exist, as better performing countries will generally have better levels of supply. Second, with respect to the demand for public goods, better performing firms will tend to

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<sup>17</sup> Commander and Tinn (2008).

demand better public goods provision. In other words, there may be a problem of reverse causality<sup>18</sup>. However, the analysis in this paper of the firm level evidence has used an instrumental variables approach in order to avoid these pitfalls and yet has been unable to find robust evidence of constraints having an impact on performance.

## 6. Conclusion

This paper addresses an important issue; the part played by the business environment in explaining the performance of firms and countries. In recent years, it has become common to attribute a great deal to the business environment where ‘bad’ business environments — as measured by the extent of regulation or corruption — are argued to have a measurably adverse impact on performance. To explore whether this is warranted, the paper has used two types of datasets. In the first place, it used a large firm survey relating to the transition countries. Secondly, it used the annual cross-country indicators contained in the World Bank’s Doing Business.

The firm level data were analysed with a view to understanding the effects on performance of a firm’s ownership, competition, export orientation and, most particularly, the business environment. To minimise problems of endogeneity, instrumental variables were used, as well the average values of perceived constraints. The impact of the business environment variables was found, however, to be very limited. Few variables retained any explanatory power once entered simultaneously rather than singly or once country, year and sector fixed effects were introduced. Similar conclusions were drawn from extending the analysis by using country level indicators from Doing Business. The analysis showed that country effects — but not business environment constraints — mattered for performance. However, these country effects are clearly capturing other sources of cross-country heterogeneity, rather than a single factor, such as the institutional environment.

The second part of the paper then turned explicitly to looking at whether country level indicators of the business environment did better in explaining performance. Again, it was not possible to find any evidence that the Doing Business indicators were robustly related to GDP growth, although there was some limited correlation between the indicators and intermediate outcomes at an aggregate level.

Finally, the paper looked at possible explanations for why neither firm nor country level measures of the business environment appeared to explain performance with any degree of precision. These included mis-

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<sup>18</sup> More generally, in firm surveys the information on performance and constraints are raised simultaneously creating obvious problems.

measurement — including bias arising from subjective evaluation — misspecification, complexity and non-linearity. Reasons were given for why each of these factors might be relevant in explaining these largely absent associations.

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