

The Doing Business Indicators, Economic Growth and Regulatory Reform

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Abstract

Improving the investment climate is among the top priorities in development. The World Bank Group's Doing Business reports have become an important guide and benchmark to inform regulatory reforms aimed at unleashing the potential of the private sector. This paper discusses the potential role of the *Doing Business Indicators* in the reform process. Generally, the Doing Business studies are constrained in their prescriptive power for policy making. However, governments that

nonetheless choose to use the Doing Business reports for guidance in the reform process can aim to improve their *Doing Business* ranking to enhance the visibility of their general reform efforts; or they can aim at maximizing the impact of reform on economic growth. In this case, the evidence suggests that focusing on indicators relating to credit and the enforcement of contracts is the most important. Indicators related to cost have the largest potential for fostering growth.

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The Doing Business Indicators, Economic Growth and Regulatory Reform

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1. Introduction

Promoting private sector-led growth is at the heart of the development agenda. Many developing countries have come to the conclusion that jobs and prosperity are best created by unleashing the potential of the private sector. Central government bodies, such as advisory councils to the head of government or divisions within ministries of finance or trade have been established to focus on making the private sector flourish. The World Bank has a specially-dedicated Vice-Presidency focusing on Finance and Private Sector Development and many other development organizations have equivalents. Creating an ‘enabling environment’ for businesses to thrive has become a new mantra in international development.

However, as countries try to make their regulatory environments leaner and more efficient, what guidance is there for them to determine priorities? Should licensing procedures be streamlined? Is tax administration too laborious? How easy is it for small and medium sized enterprises (SMEs) to obtain credit? These are important questions that government officials as well as advisors in the donor community have to grapple with.

The World Bank Group’s *Doing Business Indicators* (DBIs) currently capture the quality of business environments in more than 180 countries. Although the number of individual indicators fluctuates slightly, there were nine such indicators rating countries on the ease of doing business given the regulatory regime in place, with a tenth one introduced in the last *Doing Business (DB)* report of 2012. The rankings have some clout: they can instill a sense of competition among governments as countries with the greatest reform effort are singled out in the annual DB publications; the results are published online and widely reported in the media. It appears that some countries have engaged in a race to become the annual top-reformer.

However, although the word ‘reform’ generally resonates well, what is the true potential of DB-inspired regulatory form to improve real quantities, in particular economic performance? This is the question this paper aims to answer. It will especially focus on the effect of individual rankings on economic growth. The results are interesting academically – but in particular they provide suggestions that can guide practitioners in prioritizing regulatory reforms. The paper draws on the author’s experience in DB-inspired investment climate reform, as well as an empirical analysis linking individual DB indicators and sub-indicators to economic growth.

The argument will proceed as follows. The next section will explain DB in more detail and propose different ways of thinking about regulatory reform guided by the DB studies. It will then proceed to an empirical analysis of the DB ranking and its subcomponents: section three will introduce the data and explain the statistical methods; section four will present the empirical results. The last section concludes.

2. The Doing Business Indicators

The DB reports have been published since 2004, jointly by the World Bank and the International Finance Corporation. One key initiator was Simeon Djankov, then Chief Economist in the Finance and Private Sector Development Vice-Presidency of the World Bank. He believed that “what gets measured gets done” (the motto of the 2007 Doing Business Report). Accordingly, the DB reports have a prescriptive

dimension: where the regulatory framework is not competitive with other countries, reforms should be undertaken. The DB studies can help governments to identify reform areas based on their countries' performance as compared to other countries. Table 1 lists the nine core indicators and their constituent components.

Table 1: The Doing Business Indicators

1. Starting a Business	Procedures (number)	4. Getting Credit	Legal Rights Index	7. Trading Across Borders	Documents for export (number)
	Time (days)		Depth of Credit Information Index		Time for export (days)
	Cost (% of income per capita)		Public registry coverage*		Cost to export (US\$ /container)
	Min. capital (% of income per capita)		Credit bureau coverage*		Documents for import (number)
2. Dealing with Licenses	Procedures (number)	5. Protecting Investors	Disclosure Index	8. Enforcing Contracts	Time for import (days)
	Time (days)		Director Liability Index		Cost to import (US\$ / container)
	Cost (% of income per capita)		Shareholder Suits Index	Procedures (number)	
3. Registering Property	Procedures (number)	6. Paying Taxes	Payments (number)	9. Closing a Business	Time (days)
	Time (days)		Time (hours)		Cost (% of debt)
	Cost (% of property value)		Total tax rate (% profit)	Time (years)	
					Cost (% of estate)
					Recovery rate (cents on \$US)

* These sub-indicators only indirectly influence the overall DB ranking.

Source: World Bank (2011)

Table 1 illustrates that the indicators represent all stages of a business's life cycle: from its incorporation through its operation, to its closure. Countries are then ranked based on their performance on these nine indicators. In addition there are two indicators that do not persistently form part of the ranking. The first one measured the quality of labor market regulation where regulation was assumed to be better if it was easier for businesses to lay off workers. This indicator proved controversial as labor protection could also be construed as a country's advantage (e.g. Berg and Cazes, 2007). Indeed, this reason is in line with Hall and Soskice (2001) who argue that labor protection can determine the quality of labor and in return of a country's exports. Accordingly, this indicator has been taken out of the ranking since the 2011 DB report (published in 2010). The other indicator measures the ease of getting electricity. It was included in the 2011 report as a pilot indicator and was included in the 2012 DB rankings.

Although DB captures a rather comprehensive set of factors influencing regulatory quality it still only captures a fraction of it. The 2011 DB report (World Bank 2011:13) comments on this as follows:

“Doing Business functions as a kind of cholesterol test for the regulatory environment for domestic businesses. A cholesterol test does not tell us everything about the state of our health. But it does measure something important for our health. And it puts us on watch to change behaviors in ways that will improve not only our cholesterol rating but also our overall health.”

The DB reports thus help governments gauge the ‘health’ of their regulatory regime and provide them with a starting point for reform. Yet it is important to bear in mind that the indicators are only a partial, bird-eye representation of the regulatory system: they do not capture it fully. They are like a sample of regulations, selected to make inferences about the quality of the entire system.

This is an important insight for reformers: measures specifically targeted at improving individual indicators invalidate the sample, as it will no longer be ‘randomly drawn’ from the population (where the population is the whole set of national business regulations). Thus, by only addressing individual indicators, without taking into account the regulatory system as a whole, the ‘enabling environment’ may only be marginally improved. To illustrate this, it helps to focus on an important part of the business environment that is not fully captured by the DB reports but an important part of the investment climate, especially in many African countries: land. If land legislation limits access to land by, for example, prohibiting expansions of cities or land ownership by foreigners, a country can be first in the DB ranking but will not experience as many start-ups or expansions as it could if it took into account the availability of commercial land. Another example is operational cost which may be a significant constraint to doing business but is not captured by the DB studies.

Indeed, in some areas, the relative importance of specific components of the indicators is contested. Letting the emphasis of reform be determined by the DB ranking can curtail reform efforts in areas that are not captured by the DB reports but may be more important to businesses. Arruñada (2007), for example, provides examples from Peru where the emphasis on reducing the initial cost of incorporation – captured by the ‘Starting a Business’ DBI – shifts attention away from the importance of business registers as an important source of reliable information. This, he argues, can eventually be detrimental to the economy as a whole. It is important to bear in mind that the prescriptive power of the DB reports for policy reform is thus limited.

For policy-makers that do choose to use the DB studies as the basis for reform, there is little to determine which specific DBIs to address when trying to improve the investment climate. The World Bank has established a DB Reform Team which helps governments that request assistance to identify and implement reforms that can improve the DB ranking. This team complements the DB Team which is tasked with constructing these indicators by sending out surveys to a number of experts in the countries whose individual evaluations the DB rankings will eventually be based on.¹ Yet there are ‘Chinese Walls’ between the DB Team and DB Reform Team. Indeed, as addressing individual indicators distorts the ‘sample quality’ of the DB ranking this strict separation is not unreasonable. However, in terms of practicality for governments there is a missing link between ranking and reforms: given limited time and resources, which reforms should a government prioritize? This paper proposes three ways of thinking about DB-related regulatory reform, based on the following:

- 1) Feasibility
- 2) Visibility
- 3) Impact

¹ The names and contact details of the DBI contributors in each country are listed on the DBI website.

Feasibility relates to the political economy of reform. Generally, one can think about feasibility both in terms of cost and political will. Regarding the former, the indicator ‘Enforcing Contracts’ provides a good example. To reduce the time and cost it takes to settle a legal dispute in court, capacity of the judicial system must be enhanced. This often requires hiring additional judges and constructing or expanding court buildings – both associated with immense costs. A government with a strained national budget, as is the case in most developing (and even developed) countries, will have limited ability to address this indicator with the resources available. It would be significantly more cost-effective to address another indicator instead. For example, the ‘Starting a Business’ indicator could simply be improved by removing red tape that delays the incorporation of businesses. In many cases this merely requires new and more efficient ministerial regulations.

Political will is another important determinant of the feasibility of reform. In most cases, leaner legislation means a reduced role for government. This is most obvious in the case of business tax rates under the ‘Paying Taxes’ indicators where lower revenue immediately translates into smaller government.² But the lack of political will can obstruct regulatory reform in many more areas and need not always be monetary. At least since Niskanen’s (1968) seminal work on the incentives of bureaucrats, it has been appreciated that government officials try to maximize their power. And power can manifest itself in monetary terms but also in less tangible forms like authority. Improving conditions to obtain business in addressing the ‘Dealing with Licenses’ indicator, for example, can have an impact on the revenue and authority of the responsible ministries (generally the Ministry of Trade or its equivalent), as bureaucrats lose their power to collect license fees and pre-screen, monitor, or supervise businesses. This can result in significant government-internal forces to block reform efforts.

Yet while a disciplined government may be able to deal effectively with internal conflict, some of the issues captured by the DB studies transcend borders and are thus beyond the full control of individual governments. The ‘Trading Across Borders’ indicator can only be fully addressed if governments from neighboring countries cooperate. To the extent that borders are politically sensitive as they relate to a country’s core interests like sovereignty, national security, and other foreign policy matters, this indicator may be difficult for governments to address if their neighbors do not share an interest in improving the conditions for cross-border trade. The feasibility of reform is thus a crucial factor to consider for governments that aim to improve their DB rankings.

Assuming that several reforms are feasible, governments may still want to prioritize some reforms over others, given limited public resources. Visibility and impact are the two factors that can help government in deciding on the reforms to embark on.

Visibility refers to the impact the DB ranking, and in particular reform efforts, will have on perceptions. The DBIs attract considerable attention in the media and countries that are most committed to reform are singled out in the annual DB reports. In 2010, Rwanda was the top reformer, and Rwanda remained a strong performer in 2011 – when Kazakhstan improved its DB ranking the most. To countries that are eager to improve their image as a business-friendly location the DB rankings can be an excellent publicity tool.

Governments may wish to improve their image for several reasons. For one, an improved DBI ranking may result in larger Foreign Direct Investment (FDI) inflows. FDI can have spill-over effects and increase the productivity of domestic industries and hence economic growth (Rodriguez-Clare, 1996; Markusen

² At the same time, it could be argued that reducing tax rates constitutes a cost to government if the definition of ‘cost’ entails forgone revenue.

and Venables, 1999; Javorcik, 2004). It should be borne in mind that a significant portion of FDI flows to large multinational corporations. These companies are less likely to take an interest in the DBIs, since the DBIs specifically focus on SMEs which may face different regulatory hurdles than large companies. For example, large companies often have a legal team in place that can readily deal with legal issues, such as incorporation of subsidiaries or court representation to enforce contracts – SMEs would have to hire lawyers and the associated expenses can be considerable. Larger companies will thus be more interested in a sister-project to the DB reports, the World Bank's Group's 'Indicators of Foreign Direct Investment Regulation.'

However, SMEs still play an important role in attracting FDI, in particular through joint ventures (Fujita 1994). Improving the investment climate can thus open opportunities for new business initiatives, as well as portfolio investment into existing companies expanding their operations. In this light, the DBIs constitute an important source of information on business opportunities to international investors, potentially resulting in more foreign investment and accelerated growth.

Secondly, the DB studies can be used as reform benchmarks that the incumbent government's performance can be evaluated against. Since the DBI's more or less objectively measure the regulatory environment, governments can legitimately claim credit for an improvement on individual DB components.³ The DBIs are thus popular amongst development partners and are frequently used as benchmarks for financial aid, such as the International Monetary Fund's Extended Credit Facility or the European Union's General Budget support. But, perhaps more importantly, the DB ranking can also underpin electoral promises which may eventually help governments at the polls – and, conversely, these objective benchmarks may force governments to make structural reforms if there is popular demand for improving the investment climate. The DB ranking can thus serve both as a carrot and stick for driving the regulatory reform process.

The DBs rankings are well publicized and are of interest to international investors, donors, and voters alike. They signal a government's resolve to improve opportunities for business at home. If visibility is the goal, governments should focus on reforms that will give them the largest gains on their overall ranking.⁴

Impact, on the other hand, refers to the effect of DB-related reform on economic performance. This can be linked to visibility to the extent that visible improvements in the business environment can lead to a larger volume of FDI inflows which can eventually stimulate the economy. But more broadly, impact refers to a direct link between the DBIs and economic growth. The difference between maximizing visibility and maximizing impact is that the goal for the former is the highest possible absolute improvement on the DB ranking; for the latter it is to improve indicators irrespective of the absolute improvement but with the highest potential for enhancing economic activity.

There are two ways of identifying reforms that maximize impact. A more indirect way is to survey perspectives of the business community on what they identify as key constraints to doing business. The DBIs are 'neutral' in that they aim to objectively compare the quality of regulatory systems across countries. Accordingly, they do not weight particular areas of the business environment according to priorities. Indeed, such priorities are bound to vary across countries. For example, a country that does

³ Claiming credit for improvements in overall rankings can be more controversial as such rankings are relative and thus strongly influenced by reforms in other countries.

⁴ The DB website offers a *DBI Reform Simulator* which can be used to calculate the effect of reforms in particular areas on a country's DBI ranking: <http://www.doingbusiness.org/reforms/reform-simulator>.

not have a stock market may not be particularly concerned about the 'Protecting Investors Index' which measures the strength of legal protection of minor shareholders. Accordingly, it is important to bear in mind that a country's ranking on a specific indicator may be worse compared to other countries because the issues it captures do not rank particularly high among the priorities of the business community.

To provide a more 'subjective' dimension to its more objective DB reports, the World Bank Group conducts large-scale surveys, the 'Enterprise Surveys', to identify country-specific obstacles to doing business.⁵ These surveys are conducted irregularly, often two to four years apart, and ask business people to evaluate the serenity of obstacles resulting from: the tax system (tax rates and administration), business licenses, and customs and trade regulations, access to land and finance, labor (regulation of the labor market and education of the work force), corruption, crime, theft and disorder, and the judicial system.

The Enterprise Surveys are not a perfect complement to the DB reports. For example, there is no DBI that captures the degree of corruption or crime; on the other hand, the Enterprise Surveys have no close equivalent to the DB's 'Protecting Investors' indicator. However, even though these surveys are conducted irregularly and do not always directly correspond to the DBIs, looking at the priorities of the local business community can help governments identify key reform areas. Thus unleashing the potential of the private sector is then likely to translate into increased economic activity and more jobs.

A more direct, but less country-specific, way of identifying reforms that maximize impact is to conduct a statistical analysis of the DBIs on key economic performance indicators. Djankov *et al.* (2006) put the DBIs to the test by examining the effect of countries' DB rankings on economic performance.⁶ They show that, indeed, a better investment climate results in stronger economic growth.⁷

Whilst this provides evidence that an 'enabling environment' indeed promotes economic performance, the results as such have limited practicality for governments that want to engage in regulatory reform. Firstly, whilst there is evidence that a better investment climate is associated with higher growth, there are nine individual DBIs with overall 32 components, and not all of them may have an equal impact on economic performance. This paper will thus expand on Djankov *et al.* (2006) by examining the individual impact of these individual measures on economic growth.

Secondly, Djankov *et al.* (2006) show that a better investment climate fosters economic growth; yet their analysis does not show that *improving* the investment climate increases growth figures. This is an important thought drawing on Aghion *et al.* (2010). These scholars show that over-regulation is not an arbitrary nuisance but the reflection of a country's more general anatomy: distrust fuels the demand for regulation, increasing corruption and consequently reinforcing distrust. There is just a vicious cycle around distrust and regulation. It is questionable whether reforming parts of the regulatory system can break through the vicious cycle and foster a more virtuous cycle that will result in a generally improved business climate.

This echoes the discussion above: the DBIs are only a sample of business regulations. Ameliorating the quality of the sample in a few areas does not necessarily make a decisive difference to the whole

⁵ Empirical evidence suggests that there is a strong link between subjective and objective business climate measures (Aterido and Hallward-Driemeier 2007).

⁶ For more recent and more fine-grained studies see also Servén and Loayza (2010) and chapters therein.

⁷ There is considerable scope for criticism of cross-country studies at the macro-level, see e.g. Dethier *et al.* (2010). However, firm-level studies support the core finding that a better regulatory business climate supports economic activity (Carlin *et al.* 2006; Gelb *et al.* 2007)

system. This paper will thus also examine whether *improvements* in a country's DB rankings enhance economic performance.

3. Data and Methods

Variable selection for the analysis below generally follows Djankov *et al.* (2006), yet the data are drawn for a more recent time period, from 2003 to 2009, and a number of additional variables will be used. The dependent variable to be used in the analysis is annual per capita growth in real Gross Domestic Product (GDP), averaged over 5 and 15 years. These averages will be calculated over the previous years (i.e. time t to $t-5$ and t to $t-10$). To estimate the effect of DBI reform on growth, averages will be calculated for the subsequent four years (i.e. t to $t+4$). Only four years can be included in the average due to data availability. GDP data were obtained from the World Bank's *World Development Indicators*.

The key independent variables are all based on the DBI rankings, with data obtained from the *Doing Business* website. The following variables will be used (c/f table 1): the annual aggregate DBI ranking based on the nine individual DB rankings from 'Starting a Business' to 'Closing a Business'; the individual indicator rankings themselves; and annual changes in the subcomponents of the individual rankings (including procedure, time, cost, and legal strengths). All rankings are based on the percentile positions of each individual country. In accordance with the *Doing Business* methodology all rankings will be normalized to vary between zero and one, using the formula $[(R_i - R_{min}) / (R_{max} - R_{min})]$, for ranking R and country i .

Where individual indicators are aggregated, simple averages will be used, thus replicating the DB rankings (however, the analysis departs from the published rankings by consistently excluding the 'Employing Workers' indicator).

Annual changes in the subcomponents of the individual indicators are calculated in accordance with the *Doing Business* 'change scores' (World Bank, 2011:112): first absolute annual changes on each subcomponent are calculated and these changes are, again, normalized to vary between zero and one. Then, the indicators are rescaled, such that a higher value always corresponds to an improvement in the investment climate.⁸ The indicators are rescaled once more to ensure that a value of zero indicates that no change was made, whilst negative values indicate a worsening and positive values an improving regulatory environment.

The DBIs are developed from surveys which are sent out to experts and lawyers in each country included in the ranking around April of each year. The results are then summarized in *Doing Business Reports* in the next year. Thus, for example, data for the *Doing Business Report 2011* were obtained in 2010. Accordingly, for the analysis all DB data are matched with the years they were collected in.

The choice of control variables is based on Djankov *et al.* (2006) but with a view to maximize country coverage. Key controls will thus include: the deviation from the average GDP deflator and initial log GDP per capita (this follows Djankov *et al.*, 2006 who in turn build on Barro, 1991). These data were obtained from the *World Development Indicators*. In addition, a variable for civil conflict will be included. Data are

⁸ For example, increasing the number of procedures to start a business is associated with a *worse* investment climate whilst larger credit bureau coverage is associated with a *better* investment climate. The normalized index is adjusted in a way that a larger value always implies an improvement.

based on Gleditsch *et al.* (2002) and drawn from version 4 of the *UCDP/PRIO Armed Conflict Dataset*, hosted within the Uppsala Conflict Data Program.⁹

Whilst these variables constitute the key controls for the analysis, other variables will be controlled for to test the robustness of the results. Following Djankov *et al.* (2006), additional controls include general government consumption as a percentage of GDP and regional dummies for Africa, Latin America, and East Asia.¹⁰ Overall, the dataset will cover the period from 2004 to 2009. Since this largely coincides with the global financial and economic crisis, two additional variables are included to capture countries' exposure to it: exports and FDI inflows, both as a percentage of GDP. Government consumption, exports, and FDI data were obtained from the *World Development Indicators*.

The empirical specification follows Djankov *et al.* (2006) and the model to be estimated is expressed as follows:

$$PERFORM = \alpha + \beta RANKING + \sum \gamma' X + \varepsilon,$$

where *PERFORM* represents the three measures of economic performance; α is the intercept, β and γ are variable coefficients, *RANKING* represents the individual DBI measures, *X* is a vector of control variables, and ε is the error term. Statistical estimation will be based on Ordinary Least Squares (OLS).¹¹ All analyses will use robust standard errors to account for heteroskedasticity.

Generally, the results for the 10-year average are stronger. This is consistent with the findings of Djankov *et al.* (2006). The magnitude of the coefficient estimates also compares closely to Djankov *et al.* (2006); in the case of table 2, the difference between 5-year and 10-year average growth is most likely explained by the financial and economic crisis which has generally lowered GDP growth during 2007 through 2009. The coefficients are consistently positively signed, indicating that a better investment climate is associated with higher economic growth. Except for model 1, which only controls for initial log GDP per capita, the DBI coefficient is statistically significant at the 1% level of higher. The results are robust to controlling for initial GDP per capita, the initial deviation from the GDP deflator, to civil war, FDI, and exports.

⁹ Civil conflict, as in Djankov *et al.* (2006), is defined as internal conflict with more than 1,000 casualties.

¹⁰ Data were also obtained for primary school enrollment and secondary school enrollment. As in Djankov *et al.* (2006), these variables are consistently insignificant – they do, however, significantly reduce the sample size. They will thus be omitted from the analysis presented here.

¹¹ Djankov *et al.* (2006) also use an instrumental variable approach to test the robustness of their results. Generally, their results uphold with slightly larger coefficients and larger standard errors. Thus, endogeneity bias seems to be relatively negligible. To test the robustness of the results in this paper, the same instruments were obtained, including a country's legal origin, its principal religion, the percentage of its English speaking population, and its absolute latitude. As in Djankov *et al.* (2006), the results generally uphold. This paper will thus focus on the presentation of the OLS findings.

4. Results

Table 2 presents the results for an OLS regression of average GDP per capita growth on the aggregate, normalized Doing Business index and a number of control variables for the year 2009. The table reports results for five-year and 10-year average growth respectively. Data availability restricts the sample size to 175 countries at its maximum to 166 when controlling for FDI and exports.

Table 2: GDP per capita growth – the Doing Business ranking (1)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Variable	Average GDP per capita growth							
# Years	5	10	5	10	5	10	5	10
DBI	2.685 (2.010)	5.195*** (1.769)	3.635** (1.752)	5.513*** (1.728)	3.593** (1.764)	5.502*** (1.736)	3.406* (1.796)	4.573** (1.980)
initial log GDP/cap	-0.350 (0.272)	-0.658*** (0.225)	-0.276 (0.247)	-0.637*** (0.226)	-0.253 (0.253)	-0.615*** (0.232)	-0.419 (0.260)	-0.651*** (0.228)
initial deviation fr. GDP deflator			0.153*** -0.04	0.008* -0.005	0.151*** -0.041	0.008* -0.005	0.151*** (0.0375)	0.007 -0.004
Civil war					0.858 (0.697)	0.409 (0.606)	1.080* (0.635)	0.652 (0.587)
FDI (%GDP)							-0.005 -0.007	-0.001 -0.005
Exports (%GDP)							0.026*** -0.001	0.025* -0.013
Constant	5.345*** (1.428)	5.591*** (1.102)	4.343*** (1.365)	5.279*** (1.126)	4.139*** (1.420)	5.075*** (1.218)	4.440*** (1.478)	4.769*** (1.301)
Observations	175	172	175	171	175	171	166	166
R-squared	0.017	0.083	0.130	0.111	0.134	0.112	0.187	0.145

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 3 repeats the analysis but includes additional controls. Models 9 and 10 add general government consumption as a percentage of GDP. Whilst this reduces the sample size to 164 countries, the results still uphold. Adding dummy variables for Africa, East Asia, and Latin America reduces the magnitude of the DBI coefficient and renders it insignificant. This is an interesting finding. To explore it further, the analyses was repeated for poor countries and rich countries separately (the sample was divided on median log GDP per capita). Models 13 to 16 show that the DB effect on economic growth is generally associated with developing countries. The DBI coefficient is insignificant for the developed country sample, both for 5-year and 10-year growth. It is large and significant at the 1% level for developing countries. This effect remains when removing the regional dummies. The analysis thus clearly shows that it is particularly developing countries that can benefit from DB-inspired reform.

Table 3: GDP per capita growth – the Doing Business ranking (2)

Model	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Dep. Variable	Average GDP per capita growth							
# Years	5	10	5	10	5	10	5	10
Sample	All	All	All	All	Rich	Poor	Rich	Poor

DBI	3.833** (1.812)	4.753** (1.951)	1.680 (1.702)	2.936* (1.743)	-2.769 (2.048)	8.029*** (2.790)	0.852 (2.136)	6.798*** (1.835)
initial log GDP/cap	-0.424 (0.265)	-0.562** (0.249)	-0.642** (0.311)	-0.683** (0.305)	-0.603 (0.450)	0.128 (0.465)	-0.968** (0.428)	-0.245 (0.456)
initial deviation fr. GDP deflator	0.119*** (0.040)	0.004 (0.008)	0.116*** (0.036)	0.002 (0.007)	0.067* (0.035)	0.074 (0.046)	0.041 (0.027)	0.001 (0.006)
Civil war	0.941 (0.689)	0.413 (0.598)	0.464 (0.771)	0.290 (0.612)	1.085* (0.650)	0.915 (1.256)	-1.651 (1.355)	0.249 (0.788)
FDI (%GDP)	-0.003 (0.007)	-0.000 (0.005)	-0.004 (0.007)	-0.000 (0.005)	-0.008 (0.005)	0.120** (0.055)	0.000 (0.004)	0.196 (0.141)
Exports (%GDP)	0.0201** (0.009)	0.0200 (0.0124)	0.0202** (0.008)	0.0197* (0.0118)	0.022*** (0.006)	0.014 (0.023)	0.020** (0.008)	-0.004 (0.090)
Gov. cons (%GDP)	-0.063 (0.054)	-0.102** (0.047)	-0.056 (0.055)	-0.095* (0.053)	-0.063 (0.068)	-0.069 (0.048)	-0.117 (0.096)	-0.097*** (0.037)
Africa			-2.705*** (0.615)	-1.968*** (0.656)	-1.053 (0.941)	-2.000*** (0.662)	-0.329 (1.406)	-1.996*** (0.728)
Latin America			-1.134** (0.546)	-1.011** (0.429)	-0.971 (0.670)	-2.344*** (0.878)	-1.221** (0.589)	-2.049*** (0.721)
East Asia			0.937 (1.271)	0.487 (1.295)	0.443 (0.531)	1.635 (2.359)	0.155 (0.905)	1.624 (2.324)
Constant	5.503*** (1.556)	5.838*** (1.259)	9.049*** (1.910)	8.249*** (1.638)	11.13*** (2.974)	1.786 (2.712)	12.85*** (2.326)	4.225 (2.896)

Observations	162	162	162	162	85	77	85	77
R-squared	0.157	0.173	0.265	0.238	0.349	0.476	0.351	0.453

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Yet what reforms should governments focus on if they try to maximize the impact of reforms on economic performance? To answer this question, the analysis of model 6 in table 2 was repeated for each individual one of the nine indicators.¹² The specification of model 6 was chosen with a view to maximize country coverage. Generally, however, the results uphold including other controls, much in line with the gist of tables 2 and 3.

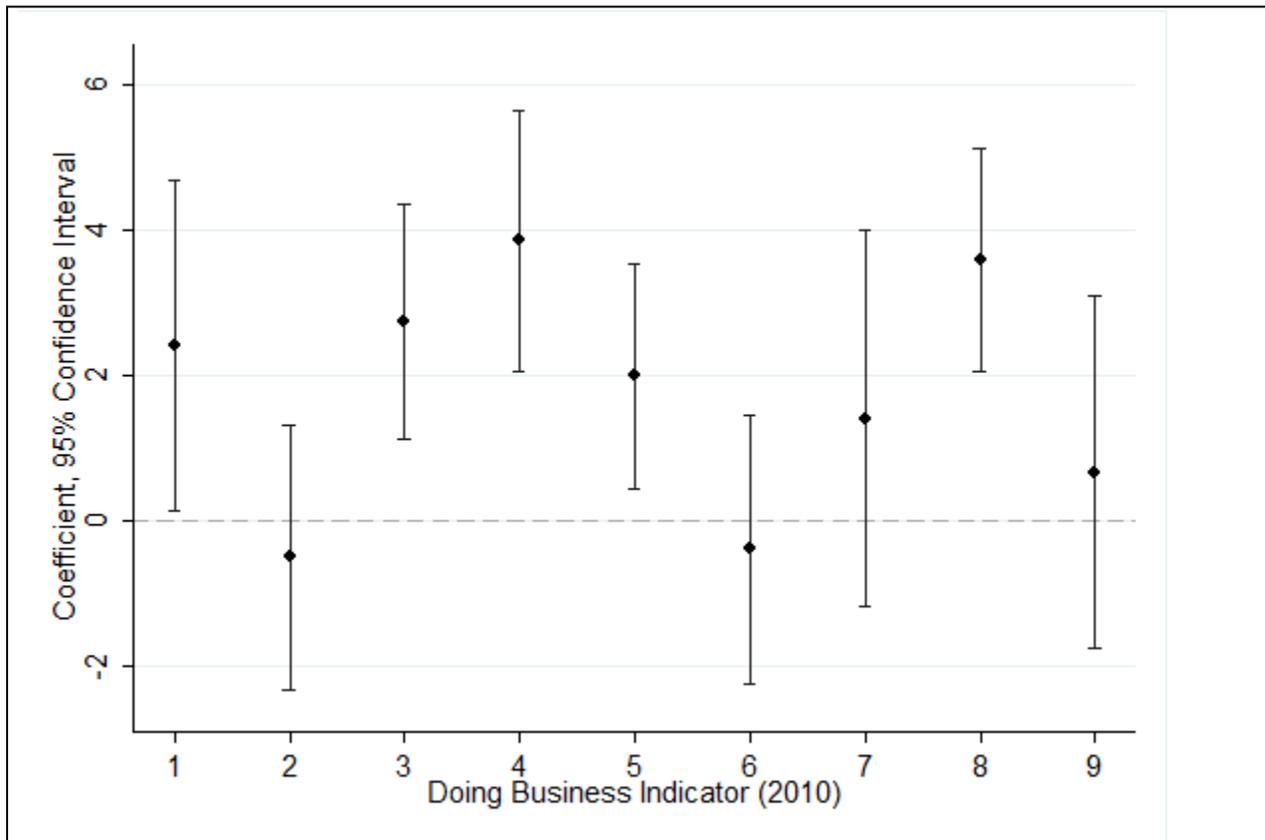
To simplify the presentation, the results from the analyses are represented graphically in figure 1. Diamonds represent the coefficient estimate whilst the horizontal lines indicate 95% confidence intervals around the coefficients. The numbers on the x-axis correspond to the indicators listed below

¹² In other words, 10-year average GDP per capita growth was regressed on each of the 9 indicators from 'Starting a Business' to 'Closing a Business' (c/f table 1), as well as initial GDP per capita, the deviation from the initial GDP deflator and the civil war dummy.

the table. The asterisks next to the indicator names represent statistical significance in the statistical analysis of each indicator.

Figure 1 provides a telling story. The most important DBI for economic performance is ‘Getting Credit’. This finding is not surprising since it has long been established that access to finance is a key determinant of economic growth (e.g. Ross 1997, 1999; Aterido and Hallward-Driemeier 2007). The second most important DBI is ‘Enforcing Contracts’ – another not altogether surprising finding, given that it is now widely believed that the rule of law is a key ingredient to fostering economic growth (e.g. Scully 1988, Barro 1991, Dollar *et al.* 2005). In a way related to the rule of law is also the ‘Protecting Investors’ index, which too is significant at the 5% level, however not as high in magnitude compared to the other two indices related to credit and enforcing contracts.

Figure 1: Doing Business Indicators: individual effect on average GDP growth



Notes: Diamonds indicate estimated coefficients for individual indicators in a regression of ten-year average GDP per capita growth on each indicator, initial log GDP per capita, the initial deviation from the GDP deflator and the civil war dummy. Vertical lines indicate 95% confidence intervals. Numbers on x-axis correspond to the following indicators:

- | | | |
|----------------------------|---------------------------|---------------------------|
| 1: Starting a Business** | 4: Getting Credit*** | 7: Trading Across Borders |
| 2: Dealing with Licenses | 5: Protecting Investors** | 8: Enforcing Contracts*** |
| 3: Registering Property*** | 6: Paying Taxes | 9: Closing a Business |

*** significant at 0.1 level; ** significant at 5% level; * significant at 10% level.

What is not immediately intuitive from the academic literature is that the indicator ‘Registering Property’ is the third most important indicator, based on this empirical analysis. Its coefficient at 2.3 is considerable and it is significant at the 1% level. On the other hand, two indicators that economic theory would have suggested to be important are insignificant: ‘Paying Taxes’ and ‘Trading Across Borders’. It should be borne in mind, however, that the statistical effect of these indicators depends crucially on the way they are measured. The fact that these indicators are not significant does not mean that tax regime and international trade are not important determinants of growth – it only means that the particular factors encompassed in the DB measurement do not have a statistically significant effect on growth.

Indeed, the 95% confidence interval for ‘Trading Across Borders’ is very large, suggesting that the effect of this particular indicator can vary from -1.9 to +3.1. In this case, policy-advice based on the analysis cannot easily be given. It will depend on careful, country-specific research to gauge whether improving this particular index is likely to stimulate economic activity. From this aggregate analysis, the effect is not unambiguous.

The remaining indicator with a large, positive coefficient is ‘Starting a Business’. This result is important as it clearly shows that for economic activity to accelerate, start-ups should be encouraged. ‘Closing a Business’, on the other hand, is positively signed but not statistically significant. From this analysis, to maximize the impact of regulatory reform on economic growth, it is more important to focus on the beginning rather than the end of the life cycle of a business.

Figure 1 provides a good indication of which ones of the nine DBIs are generally the most important for fostering economic growth. However, the individual indicators are themselves aggregates of subcomponents (see table 1). Generally, these subcomponents relate to the number of procedures, the number of time, the cost, and the legal strength associated with a business operation. Which of these are the most important for economic growth?

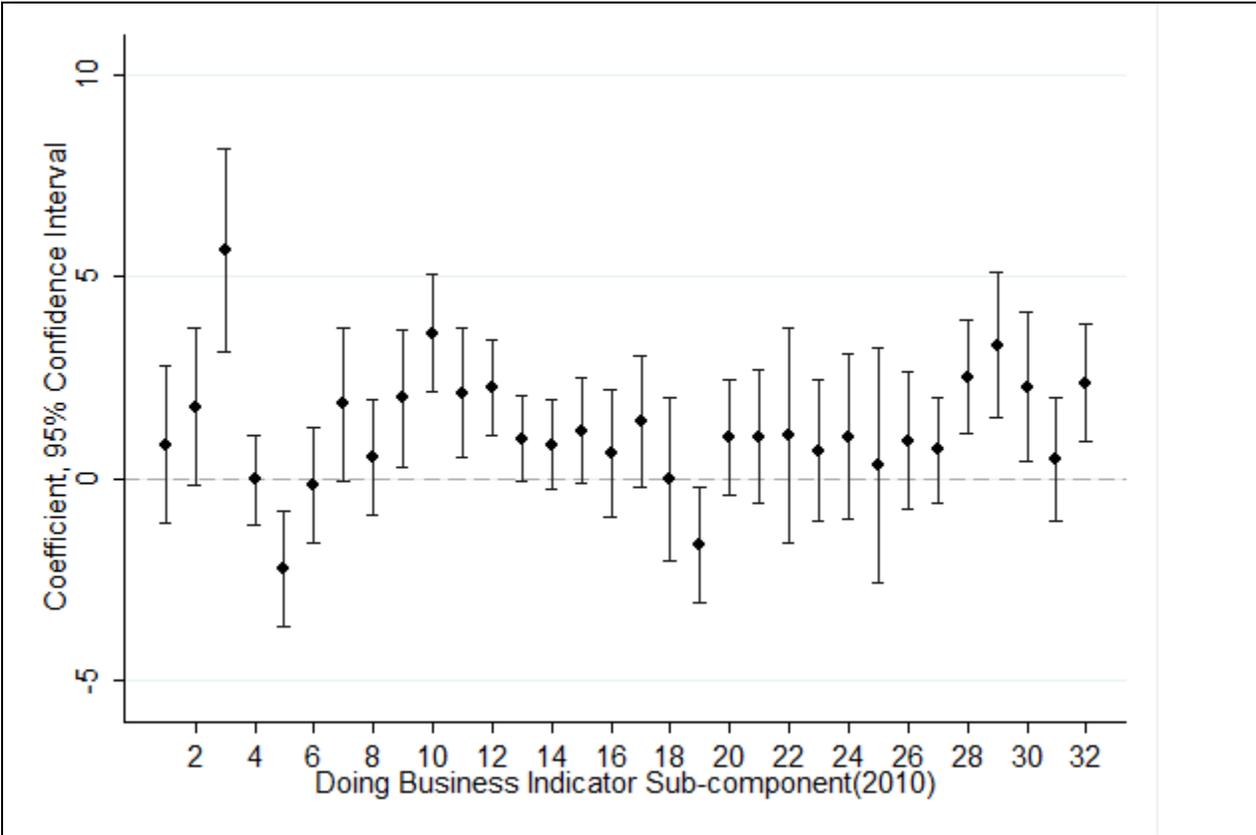
Finally, the DBI performing worst in the analysis is ‘Dealing with Licenses’. The coefficient estimate is close to zero and statistically insignificant, suggesting that this DBI has no effect on economic growth.

Figure 2 provides an indication, in a similar fashion as for figure 1. The figure is based on the same empirical model, except that this time the DBI sub-components are used as independent variables. Again, these sub-components are listed at the bottom of figure 2 with asterisk indicating their significant in the regression analysis.

The results are striking. There is a significant amount of variance of the effect of these sub-components, even within their respective DBIs. The cost component of ‘Starting a Business’ stands out remarkably with the highest coefficient estimate overall. All other sub-components of this indicator, i.e. procedures, time, and minimum capital required, are statistically insignificant.¹³ This finding is interesting and consistently replicated across all other indicators: cost has the highest effect on economic growth. It stands out for four indicators: ‘Starting a Business’; ‘Dealing with Licenses’ (weakly, and as the only significant subcomponent of that indicator); ‘Registering Property’; ‘Enforcing Contracts’; and ‘Closing a Business’. The second most important factor appears to be time; however, it is inconsistently and often weakly significant statistically.

¹³ These results contrast with van Stel, Storey and Thurik (2007) who find that, among these indicators, only minimum capital requirements have an impact on business start-ups. However, these scholars do not consider the effect this will have on growth.

Figure2: Doing Business Indicator sub-components: individual effect on average GDP growth



Notes: Diamonds indicate estimated coefficients for individual indicators in a regression of ten-year average GDP per capita growth on each indicator, initial log GDP per capita, the initial deviation from the GDP deflator and the civil war dummy. Vertical lines indicate 95% confidence intervals. Numbers on x-axis correspond to the following DBI components:

Starting a Business

- 1: Procedures
- 2: Time*
- 3: Cost***
- 4: Min. capital

Getting Credit

- 11: Legal Rights Index***
- 12: Credit Information Index***
- 13: Public Registry Coverage*
- 14: Credit Bureau Coverage

Trading Across Borders

- 21: Documents for export
- 22: Time for export
- 23: Cost to export
- 24: Documents to import
- 25: Time for import
- 26: Time for import

Dealing with Licenses

- 5: Procedures (negative)***
- 6: Time
- 7: Cost*

Protecting Investors

- 15: Disclosure Index*
- 16: Director Liability Index
- 17: Shareholder Suits Index*

Enforcing Contracts

- 27: Procedures
- 28: Time***
- 29: Cost***

Registering Property

- 8: Procedures
- 9: Time**
- 10: Cost***

Paying Taxes

- 18: Payments
- 19: Time** (negative)
- 20: Total tax rate

Closing A Business

- 30: Recovery rate**
- 31: Time
- 32: Cost***

*** significant at 0.1 level; ** significant at 5% level; * significant at 10% level.

See table 1 for more details.

Table 4: Impact of changes in DBI components on GDP per capita growth

Model	(17)	(18)	(19)	(20)	(21)	(22)	(23)
Dep. Variable	Four-year log GDP per capita growth (2006-2009)						

initial log GDP/cap	-0.116 (0.139)	-0.104 (0.131)	- 0.618*** (0.215)	-0.198 (0.132)	-0.090 (0.149)	-0.178 (0.152)	-0.354* (0.208)
initial deviation fr. GDP deflator	0.127*** (0.043)	0.150*** (0.042)	0.107** (0.0419)	0.134*** (0.043)	0.145*** (0.0428)	0.149*** (0.0448)	0.133*** (0.0427)
Civil war	-0.641 (1.864)	-0.197 (1.717)	-0.907 (1.688)	-0.639 (1.765)	-1.090 (1.621)	-0.576 (1.740)	-0.792 (1.645)

Starting a business

Number of payments (improvement)	-1.790 (1.350)						
Number of payments (initial value)	-1.517 (0.948)						
Time (improvement)		6.996* (3.733)					
Time (initial value)		-0.384 (0.844)					
Cost (improvement)			9.330*** (0.754)				
Cost (initial value)			2.326* (1.213)				
Min. capital (improvement)				2.557 (4.043)			
Min. capital (initial value)				0.306 (0.722)			

Enforcing contracts

Procedures (improvement)					0.788 (0.626)		
Procedures (initial value)					-1.357* (0.808)		
Time (improvement)						2.150 (2.640)	
Time (initial value)						-0.034 (1.006)	
Cost (improvement)							6.205*** (0.565)
Cost (initial value)							1.556 (1.157)
Constant	4.188*** (1.155)	3.084*** (1.138)	6.043*** (1.301)	3.691*** (1.132)	3.786*** (1.109)	3.764*** (1.105)	4.302*** (1.326)

Observations	151	151	151	151	150	150	150
R-squared	0.119	0.192	0.165	0.105	0.122	0.106	0.146

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Changes in DBI sub-components from 2005 to 2006. See table 1 for more details.

For 'Getting Credit', as the most important DBI for economic growth overall, it appears that the Legal Rights Index, followed by the Credit Information Index are the most important. Citizen coverage under a public registry or a credit bureau is only marginally or not at all significant. Finally, the two marginally significant sub-components for the 'Protecting Investors' index are the Disclosure Index and the Shareholder Suits Index.

With these results, policy advice can be given as follows: the most important DBI to focus on is 'Getting Credit', closely followed by 'Enforcing Contracts'. As a general rule, DB-inspired reforms are more likely to have an effect on economic growth when they focus on reducing the cost aspect of the regulatory environment.

But does reform really bring about economic growth? Table 4 aims to answer this question by focusing on the sub-components of two indicators: 'Starting a Business' and 'Enforcing Contracts'. This analysis is limited by the availability of data. The DBIs were first published in 2004 with fewer countries than more recently, and with less data coverage. Focusing on the change of these two indicators between 2005 and 2006 allows for substantial data coverage. They are also among the most important indicators for economic growth, as shown by figure 1.

Data availability allows for calculating average growth over 4 years from 2006. The same control variables are included as in the analyses for figures 1 and 2, but in addition, the initial value of the respective DBI sub-components in 2006 will be included as controls as well. 151 countries can be included for the 'Starting a Business' components and 150 countries can be included for the 'Enforcing Contracts' component.

The table suggests that, indeed, DBI reform can stimulate economic growth. The general gist of figure 2 is upheld: DBI reform has a particular impact on economic growth when focusing on reducing the cost of doing business, followed by the time required for dealing with regulatory requirements. The strength of the results is striking. The coefficients for the variables denoting changes in the cost of 'Starting a Business' and 'Enforcing Contracts' are large (9.3 and 6.2 respectively) and statistically significant at the 1% level. This clearly shows that DBI reform can enhance economic growth.

5. Conclusion

DB-inspired reform is controversial, and justifiably so, given the considerable limitations in the DB Reports' prescriptive power. Yet many governments across the world do use the DB studies to guide their reform efforts. Acknowledging this reality, this paper has aimed to provide some suggestions on how to use the DB studies in a way that can leverage their potential for the benefit of the economy, helping countries in fostering private sector-led growth. Based on the discussion, the following policy advice is suggested:

- 1) Investment climate reform should be feasible. It is feasible if the political economy in specific policy areas is conducive to reform, i.e. when the financial and political costs of reform are outweighed by the benefits and if they can be borne by the policymaker.

- 2) Investment climate reform can aim both at visibility and impact. If visibility is the goal, reforms should be undertaken that will result in the largest gains on the overall DB ranking. If impact is the goal, the following additional advice can be given:
 - a. The DBIs with the largest impact on economic growth are 'Getting Credit' and 'Enforcing Contracts'.
 - b. Other DBIs with a statistically detectable impact on economic growth are 'Starting a Business', 'Registering Property', and 'Protecting Investors'.
 - c. Sub-indicators focusing on cost, and to an extent time, have the largest impact on economic growth across all nine DBIs examined.

It should be borne in mind that some of this advice is based on the statistical analysis of a large cross-section of countries. Naturally, this paints an aggregate picture at the expense of country-specific detail. The results from the analysis do not provide a magic wand for fostering economic growth. They only provide additional guidance which should always complement an in-depth analysis of the situation on the ground (which should involve information from the domestic business community through, for example, the 'Enterprise Surveys') in each country embarking on investment climate reform.

Whilst the analysis is comprehensive and includes recent data in the study of the business climate and economic growth, there is scope for further investigation. The results in this paper are based on a time period that was overshadowed by the most dramatic financial and economic crisis since the 1930s. Future research should investigate the robustness of these results in a post-crisis world. Moreover, the DBIs are constantly updated, with the 'Getting Electricity' indicator included in the latest DB Report. Its mettle should be tested empirically, as should any other indicator that may be added to the current battery of DBIs.

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