

**THE DOING BUSINESS INDICATORS AND ECONOMIC
PERFORMANCE: CROSS-COUNTRY ANALYSIS**

By

Saidhonov Saidislombek

THESIS

Submitted to

KDI School of Public Policy and Management

in partial fulfilment of the requirements

for the degree of

MASTER OF PUBLIC POLICY

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ABSTRACT

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There are a number of determinants of economic growth. However, the role of investment climate cannot be underestimated. The World Bank Group's Doing Business Reports can be a good proxy to measure the business climate of each country. More and more countries have been using the Doing Business Index to conduct reforms for amendment of business environment within countries. The outcome of this paper assists in prioritizing the reforms and suggesting different views maximizing the efficiency of reforms. The empirical evidence of the paper suggests that the index has the impact in the case of developing countries and emphasizing on 'Enforcing Contract' and 'Starting Business' is more beneficial to improve the overall index. Thus, reformers should focus on the initial stages of the business cycle rather than on exit stages.

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Contents

Introduction	1
What is Ease of Doing Business?.....	2
Literature Review.....	6
Data and Methodology	10
Empirical results.....	12
Statistical tests	13
Recommendations	26
Conclusion.....	29
References	31
Appendices.....	34

List of Tables

Table 1 Ten sub-indicators of the Doing Business Index	5
Table 2 The correlation matrix.....	14
Table 3 Variance Inflation Factor	14
Table 4 The impact of DBI on GDP per capita growth.....	14
Table 5 The impact of DBI on GDP per capita growth.....	16
Table 6 GDP per capita growth rate at different quantiles	22
Table 7 OLS and Impacts at Different Quantiles	23
Table 8 Interquartile Difference Tests	25

List of Figures

Figure 1 Individual Doing Business Effects on average GDP growth per capita.....	20
Figure 2 Average GDP growth per capita over 5 years by quantiles	21
Figure 3 Average GDP growth per capita over 10 years by quantiles	21
Figure 4 The average 10-year effect on quantile distribution	24

Introduction

It is undoubtedly true to say that there are a number of determinants of economic growth. The question is why some countries develop faster while others even regress in their economic development is still under the hot debates. However, the significant impact of the private sector on economic performance is negligible. One of the important determinants of the degree of economic activity is laws and regulations, which in turn determine the level of success in the development of private sector. Flourishing private sector in a such and such economy with more and more new start-ups, with new employment opportunities as well as by developing new products and services may lead to the economic development of a country. The key player who determines the business-friendly environment in an economy is a government. With a good government, which establishes the rules that reduce the cost of disputes, protects investors, and provides credits in an easier way with lower layers of bureaucracy and others. Overall, the opportunities given to entrepreneurs to run easily new Small and Medium Enterprises (SMEs) effect positively on an economy, as SMEs are the engines of economic growth. From country to country, we can observe different laws and regulations. It is widely believed that the catalyst of economic development for developing countries lies through the SMEs. In some countries, there are many obstacles to run a business due to the high costs of running start-ups, the level of bureaucracy, the lack of access to electricity and other problems associated with retarding economic growth.

According to the World Bank, SMEs provide 90% of job opportunities in low and middle-income countries¹. More and more research outcomes conclude that in order to increase the productivity of private-sector-led economic growth, it should be emphasized

¹ World Bank 2005; Stampini and others 2011.

not only on macroeconomic determinants but also on the laws, regulations, and institutional quality. A very good proxy to measure and take into account all aforementioned factors is the *Ease of Doing Business* index. This index may reflect the quality of institutions and friendliness of business environment in 189 countries. It captures 10 sub-indicators regarding the different aspects of ease of doing business. Another beneficial fact of this index is that it accelerates and amends business environment in a country as the index promotes the competition atmosphere among economies because in the annual doing business report those countries which take leading position as well as the countries which significantly improved in that business index are mentioned and widely announced by the mass media. This phenomenon, in turn, has an encouraging impact for investors to make the injection of Foreign Direct Investment (FDI) in those distinctive economies. Thus, countries all over the world attempt to compete in order to attract international investments.

There are 10 different individual indicators which overall form one single aggregate ease of doing business index. It is hard to conduct reforms on each individual factor to boost up economic growth especially for developing countries. The main goal of this paper is to analyse the impact of individual factors on economic growth and prioritize not only its nominal effect but also the real effect considering the cost and benefit of the reforms.

What is Ease of Doing Business?

The Doing Business Report has been published annually since 2003 by the World Bank Group. The primary goal of the report is to evaluate in detail manner all the costs and obstacles to run a business all over the world and based on that evaluation of the World Bank Group, ranking for all countries all over the world are presented. The data collection

for Doing Business Index (DBI) is based on conducting a survey of 8000 experts in fields related to business (bankers, tax department workers, lawyers and the like) in 189 countries. The outcomes of the surveys are cross-checked as well as affirmed by a corresponding country before being published. Furthermore, the survey respondents are supposed to complete the survey in a written form as well as back up answers with corresponding laws, regulations, and costs by relying on common assumptions among all countries. Consequently, it helps to increase the reliability of the survey and the DBI.

As can be seen from the *Table 1*, the *index* captures 10 individual indicators: starting a business, dealing with construction permits, employing workers, registering property, getting credit, protecting investors, taxes, trading across borders, enforcing contracts, getting an electricity connection and closing a business. The first initiator who implemented the foundations of the index was Simeon Djankov. Djankov *et al.* published the paper “The regulation of Entry” in the Quarterly Journal of Economics in 2002. At that time, the index took into account only three indicators for only 85 countries. The paper concluded that countries with “red tape” entry barriers for new businesses tend to possess a higher level of corruption and larger proportion of shadow economy while more democratic countries with the fewer level of government intervention tend to have less barriers to entry.

In spite of the fact that the index takes into account a number of essential factors, which assist in describing business environment in a particular country but it should be borne in mind that there are also other regulatory determinants beyond the indicators presented in *Table 1*. The 2011 annual report on Doing Business² says:

² World Bank 2011:13

“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 behaviours in ways that will improve not only our cholesterol rating but also our overall health.”

Therefore, this index cannot represent the full picture of a legal system in a such and such country as it partially determines the regulatory system of a country. Also, reformers should keep in mind that emphasizing only on few individual sub-indicators voids the sample due to the fact that it becomes no longer random from the population which is the whole factors affecting the legal system. Hence, improving few indicators without treating the whole legal system as one, “enabling environment” can be marginally amended (Hanusch, 2012). To illustrate the point, the following example can be considered; in some countries, there are some limitations for foreigners including the ownership. It is similar to a deadlock where to own property a foreigner should have registration while to have registration he/she should have property. Even though that country may take leading position in the ease of doing business ranking but indeed it can be burdensome to run new businesses. Intellectual property regulations also can be viewed as a similar example.

Overall, all limitations of the index can be summarized in the following way: the index does not consider corruption, poverty rate, unemployment rate and other macroeconomic determinants. In addition, it does not also capture financial system of a country and the sensitivity to the global financial crisis. Hence, DBI cannot be used as a full determinant of the regulatory system of a country, but it is only a proxy of a legal system.

This study tries to fill a research gap by addressing business regulatory reforms' impact on economic growth in the case of both developing as well as developed countries. The aim of including both groups of countries is to compare the effect of reforms. Moreover, this study also reveals the most influential variables on economic growth from all variables within doing business index by conducting cross-country analysis. The paper primarily focuses on the one dependent variable: average GDP growth per capita, available from the World Bank's World Development Indicators (WDI).

Table 1 Ten sub-indicators of the Doing Business Index

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

Literature Review

Hall and Jones (1999), Acemoglu et al. (2001), Djankov et al. (2002, 2003, 2004, 2006) argue that institutions are one of the most important determinants of economic progress and long-term economic growth of countries. In other words, those economies in the world which have had relatively better both political as well as economic institutions in the past are richer today in comparison to the nations which have had weaker institutions. The relationship between laws and regulations and other factors contributing to the performance of SMEs has been the target of many researches over the last two decades. Winston (1998) revealed that business regulations have the impact only on the large and sector-specified industries. However, relatively much fewer studies tried to analyse the impact of business regulatory reforms on the economic performance of a such and such country, partly due to the data limitation.

The indirect effect of easing in doing business was revealed by a number of researchers (e.g. Klapper, Lewin and Quesada Delgado, 2009; Barseghyan, 2008). They concluded that reduction in the entry-to-business costs encourages new entrepreneurs, boosts up firms' productivity as well as reduces the corruption related to bureaucracy. Moreover, similar conclusions were made by Freund and Bolaky (2008), Change, Kaltani and Loayza (2009), Helpman, Melitz and Rubinstein (2008). Onefold process of running start-up businesses associated with a reduction in the unemployment rate. More transparent financial information sharing through financial institutions leads to higher overall commercial banks profitability and significantly reduces the default risk (Houston *et al.*, 2010). Bruhn (2008) studied the influence of regulations related to business registration on the economic activity of Mexico. By using panel data, the author found that the reform raised the number of registered businesses by 5% in eligible industries. Furthermore,

employment in corresponding eligible industries increased by 2.8%, and people who were previously unemployed or out of the labour force were more likely to be employed after the implementation of reform. Finally, the results imply that the competition from new entrants lowered the inflation rate by 0.6%.

The literature after 1980 particularly focuses on the phenomenon of "endogenous growth", which states that economic growth is determined by socio - economic factors, the development of human capital, (Arrow, 1962; Sidrauski, 1967; Romer, 1986; Lucas, 1988; etc.). However, other theories and models developed by such famous economists as Harrod, Domar, Solow and others asserted that economic growth can be achieved by appropriate level of savings, capital accumulation, labour and technical progress (Rose, 1977), considering them as "external" (exogenous) factors, the endogenous growth theory tries to explain the increase in economic growth by relying on the endogenous factors of the model. Thus, Barro said that for a given level of real GDP growth per capita, positive economic growth can be achieved through raising the level of education, decreasing the government expenditure, reducing the price level; improvement in the enforcement of law, as well as improvement in terms of foreign trade (Barro, 1996). Also, Barro concluded that the level of democracy and political freedom has an insignificant impact on GDP growth. Indeed, for the initial low level of political rights, those positive advancements have a considerable influence on economic growth, after achieving some critical point of freedom and democracy, further expansion does not have any positive impact on GDP growth and even may have a negative effect, however. According to Barro, for a given level of all these variables, the economic growth pace is negatively associated with the initial level of economic growth per capita. In other words, the lower the GDP per capita at the initial point, the higher will be its increasing rate.

Hall and Jones (1999) and Acemoglu (2008) argue that in the long-run, institutions play a determining role in economic growth. According to their conclusion, countries which have good institutions have a higher economic growth which in turn makes them more developed. They focused their analysis on a certain type of institution which is the administrative rules of business operations. In this field, Djankov, McLiesh and Ramalho (2006) claim that administrative rules have in fact a considerable influence on economic performance in different countries. Djankov *et al.* (2006) and Haidar (2009) proved in their cross-country regressions that complicated and bureaucratized business regulatory procedures have the negative correlation with economic performance.

A number of empirical studies have been conducted based on business regulation trends across countries over the last decade. Djankov *et al.* conducted several empirical researches focused on the relationship between laws and regulations on different aspects of an economy. For example, in 2002 they presented new data on the regulation of entry of start-up firms in 85 countries and concluded that those countries which have heavier regulation of entry have higher corruption and larger shadow economy, but not better quality of public or private goods. On the other hand, countries with more democratic and limited governments have lighter regulation of entry. Djankov *et al.* (2003) revealed that formalism is systematically greater in civil than in common law countries, and is associated with higher expected duration of judicial proceedings, less consistency, less honesty, less fairness in judicial decisions, and overall higher level of corruption. The conclusion according to these results can be made that legal transplantation tends to result in inefficiently high level of bureaucracy, particularly more in developing countries rather than in developed ones. Djankov *et al.* (2004) devoted their empirical analysis to learning the regulation of labour markets through employment, collective relations, and social security laws in 85

countries. They argued that heavier regulation of labour is associated with lower labour force participation in the economy and higher rate of unemployment, especially among youngsters.

Moreover, Djankov *et al.* (2010) determined that the influence of time lags on export and import. They estimated a difference gravity equation that controls for distance and revealed that each additional day that a product is postponed to the process of being shipped shrinks the international trade by more than 1%.

From the beginning of the 2000s, empirical papers dedicated to the impact of regulations on economic performance have been increasing. From the perspective of business entry regulations, Desai *et al.* (2003) found cross-country correlations between laws and regulations and firm entry rates. They also revealed the influence of the institutional factors on the nature of entrepreneurial performance across European countries. A higher level of fairness, as well as protection of property rights, lead to raising the entry rates, shrinking exit rates, and lowering the average firm size. What is more, Klapper *et al.* (2004) by employing the database of firms located in Western and Eastern Europe analysed how the business environment in particular European country correlates with the creation of new firms. Hence, they claimed that entry regulations hinder entry level, especially in those field of industries where an entry level should be high. Also, value-added per employee in naturally “high entry” industries increase with lower pace in countries with burdensome regulations on entry. Viviano (2008) employing reforms to regional entry regulations in the retail trade sector of Italy, revealed that tough entry requirements have a negative impact on employment growth and on the productivity of small enterprises. From the perspective of labour regulations, such authors as Scarpetta *et al.* (2002) by employing micro-level primary data from OECD member countries tried to analyse the process of firms’

entry and exit effect and found that relatively high and demanding product market and labour laws and regulations are negatively correlated with the entry of SMEs. Moreover, Hasan *et al.* (2007) had research by using Indian data and argued that labour demand elasticities in Indian manufacturing industries are larger in those states of India where the labour regulations are more compliant. On the contrary, Besley and Burgess (2004) asserted that Indian states where the labour regulations are very demanding and tough results in lower level of production, employment level, investment and overall productivity and it leads to increasing shadow economy.

The role of Small and Medium Enterprises in developing countries is immense. According to the World Bank (2005) and Stampini *et al.* (2011), the private sector ensures about 90% of jobs in developing countries. A number of empirical evidence argue that policy makers in order to develop the economy by having an impact on the private sector of the economy should also emphasize on the quality of laws, regulations and institutional arrangements rather than focusing only on macroeconomic determinants which are taken into account of doing business that shapes daily economic life³.

Data and Methodology

The analysis implements cross-section data for a more extended time period 2001-2015 which is obtained from the World Development Indicators of the World Bank. Generally, the methodology of this paper follows the methodology of Djankov *et al.* (2006), there are some discrepancies including in variable selection, however. The dependent variable of the analysis is GDP growth per capita while the independent variable of our interest is DBI. To

³ See, for example, Alesina and others (2005); Perotti and Volpin (2005); Fisman and Sarria-Allende (2010); Antunes and Cavalcanti (2007); Barseghyan (2008); Klapper, Lewin and Quesada Delgado (2009); Freund and Bolaky (2008); Chang, Kaltani and Loayza (2009); Helpman, Melitz and Rubinstein (2008); Klapper, Laeven and Rajan (2006); World Bank (2005); and Ardagna and Lusardi (2010)

see the strength of impact in different time periods, all regression analyses are divided into two-time period averages. In other words, GDP growth per capita is averaged over the previous 5 and 10 years (2006-2010 and 2001-2010) and DBI is averaged over the next 5 years (2011-2015). The historical data for DBI is obtained from the *Doing Business*. Also, to prioritize the significance of sub-indicators, all 10 individual constituents were included as independent variables (Table 1). In order to conduct the analysis, the DBI and its constituents are normalized and used in the form of distance to frontier (DIF). According to *Doing Business*, DIF assists in evaluating the absolute level of legal performance and it gives the picture of all countries' location relative to the "frontier"; the best country according to the relative indicator. What is more, it helps to observe the discontinuity between countries at any point in time as well as to see the absolute improvement over time. DIF can vary between 0 and 100 and the former value corresponds to the country which performs the worst while the latter value is the frontier or the best performer. The main differences of this study in comparison to all other studies are that:

- It captures more extended time period where the sub-indicator namely "Getting electricity" is included recently
- The study compares the existence of discrepancies according to quantile by conducting quantile regression
- It compares the cost and benefit of enhancing a particular significant indicator by finding the real cost
- It conducts the robustness check for statistical significance of results
- It clarifies the impact of DBI on GDP per capita growth over the different time periods.

By following the methodology of Djankov *et al.* (2006), the following empirical equations is obtained:

$$GDP\ growth\ per\ capita_i = \beta_0 + \beta_1 DBI_i + \Sigma\beta'Xi + u_i$$

Where $GDP\ growth\ per\ capita_i$ is the dependent variable, β_0 is intercept and the main independent variable of our interest is $\beta_1 DBI_i$; Doing Business Index or its constituents. $\Sigma\beta'Xi$ captures all control variables and u_i is error term.

Basically, control variables follow the Djankov *et al.* (2006) and include the initial deviation from the GDP deflator as well as initial log GDP per capita which were obtained from the *World Development Indicators*. To take into account the effect of the financial crisis, additional independent variables are included: net export, government consumption and foreign direct investment (FDI) all of them are as a percentage of GDP. Civil conflict is also included as a control variable where it equals 1 if there was any civil conflict between 2001-2010 and 2006-2010 and 0 otherwise. The data is taken from Gleditsch *et al.* (2002) version 4 of the UCDP/PRIO Armed Conflict Dataset, hosted within the Uppsala Conflict Data Program. Another dummy variable is also included to capture whether the country belongs to low and middle-income country and geography: Africa, East Asia, and Latin America.

Empirical results

As a result of OLS regressions, the following table is obtained (Table 4). Table 4 provides the outcomes for the OLS regressions where the average GDP per capita growth is taken as dependent variable while normalized DBI and a number of other control variables are also included as independent variables. The table presents the results for 5 and 10-year averages to compare and contrast the effect of independent variables on GDP growth per

capita. Due to the data availability, the sample size is restricted to 185 countries at its maximum when only DBI and initial log GDP per capita are included in the equation and the sample size is reduced to 173 countries when the other control variables are also included.

Statistical tests

In order to have reliable results, different statistical tests were conducted. To avoid the potential threat of heteroscedasticity, all regressions' standard errors are adjusted for heteroscedasticity and are based on robust standard errors. To begin with, to detect whether our regression models contain missing variables problem, Ramsey Regression Equation Specification Error Test (RESET) is conducted. So, by stating the zero hypothesis which says: "The model has no omitted variables" and the rejection of this hypothesis leads to the conclusion that a model may suffer from the endogeneity problem, more precisely, omitted variable bias. However, according to the outcome of the Ramsey RESET test, the zero hypothesis cannot be rejected at even 10% significance level due to the fact that p value is above 10%. In other words, the model does not suffer from omitted variable bias.

Ramsey RESET test using powers of the fitted values of `gdp_pc_2001_2010`

Ho: model has no omitted variables

$F(3, 163) = 1.87$

Prob > F = 0.1373

According to the results of the regressions (Table 4), in all 8 equations, DBI has the positive impact on GDP growth per capita and the results are statistically significant at 1% and 5% significance levels. As regards to the initial log GDP per capita, it has statistically significant negative impact on the dependent variable which is also in tandem with the findings of Djankov *et al.* (2006) and Hanusch (2012). However, the initial deviation from GDP deflator, FDI as a percentage of GDP and civil conflict do not have statistically

significant impact on GDP growth per capita both for 5 and 10-year cases while the net export as a percentage of GDP is statistically significant only at 10% significance level.

To check the existence of symptoms of imperfect multicollinearity the correlation matrix was created. As a rule of thumb, if a correlation between two variables is above 0.8, imperfect multicollinearity can be claimed.

Table 2 The correlation matrix

Variables	DBI	Lngdp pcap.	GDP defl.	Civil confl.	FDI	Export	Gov.cons	Africa	Lat_America	East Asia
DBI	1.00									
Lngdp per cap.	0.74	1.00								
GDP defl.	-0.16	-0.09	1.00							
Civil confl.	-0.16	-0.27	0.08	1.00						
FDI	0.08	0.13	-0.02	-0.09	1.00					
Export	0.37	0.44	-0.07	-0.24	0.58	1.00				
Gov.cons	0.08	0.13	-0.07	-0.17	-0.01	-0.03	1.00			
Africa	-0.54	-0.54	0.08	0.13	-0.03	-0.18	-0.08	1.00		
Lat_America	-0.05	0.03	0.01	-0.07	-0.07	-0.10	-0.12	-0.23	1.00	
East Asia	0.18	0.10	-0.03	-0.08	0.14	0.16	-0.05	-0.11	-0.06	1.00

Table 3 Variance Inflation Factor

Also, to be confident in the absence of imperfect multicollinearity, Variance Inflation Factor (VIF) is also calculated. If VIF is equal or greater than 5, it can be argued that imperfect multicollinearity in a model exists. However, according to the table 3, the highest VIF belongs to log of GDP per capita and accounts for only 2.49. So, there is no symptom of multicollinearity in this model.

Variable	VIF	1/VIF
Lngdp_pc	2.49	0.4008
DBI	2.31	0.4333
Export	1.95	0.5119
FDI	1.56	0.6396
Civil conflict	1.12	0.8926
GDP defl	1.03	0.9687
Mean VIF	1.75	

Table 4 The impact of DBI on GDP per capita growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
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Dependent Variable	Average GDP per capita growth							
	5-year	10-year	5-year	10-year	5-year	10-year	5-year	10-year
DB index	0.0829* **	0.0917* **	0.0808* **	0.0895* *	0.0782* *	0.0871* *	0.0790* *	0.0826* *
	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)
Initial log GDP per capita	-1.0876* **		-1.0836* **		-1.0303* **		-1.1410* **	
	(0.18)		(0.18)		(0.19)		(0.18)	
Initial log GDP per capita		-0.9737* **		-0.9539* **		-0.8997* **		-1.0681* **
		(0.19)		(0.20)		(0.19)		(0.18)
Initial deviation from GDP deflator			-0.0004		-0.0004		-0.0003	
			(0.00)		(0.00)		(0.00)	
Initial deviation from GDP deflator				-0.0010		-0.0011		-0.0010
				(0.00)		(0.00)		(0.00)
Civil conflict 2006-2010					0.7538		0.8050	
					(0.49)		(0.48)	
Civil conflict 2001-2010						0.6470		0.7670
						(0.52)		(0.52)
FDI (% of GDP)							0.0077	-0.0337
							(0.02)	(0.03)
Export (% of GDP)							0.0094	0.0232*
							(0.01)	(0.01)
Constant	6.2637* **	4.5337* **	6.3572* **	4.5027* **	5.9778* **	4.1206* **	6.3833* **	4.8498* **

	(1.04)	(0.99)	(1.04)	(1.01)	(1.09)	(1.04)	(1.12)	(1.10)
Observations	185	184	185	183	185	183	175	173
Adjusted R^2	0.167	0.151	0.163	0.148	0.167	0.151	0.173	0.184

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The next table (Table 5) provides the results by adding additional control variables. Equation 9 and 10 contain additional control variable which reflects government consumption as a % of GDP. Even though all other coefficients stay similar to *Table 4* but the effect of government consumption as a % of GDP is statistically insignificant. In all regression results, the impact of the civil conflict is statistically insignificant on per capita economic growth. In addition, equations 11 and 12 contain geographical dummy variables for Africa, East Asia, and Latin America. Consequently, adding those dummy variables reduces the significance level as well as the coefficient of DBI. It is clear from the *Table 5* that African countries have the negative values which account for -1.26 and -1.86 in equations 11 and 12, respectively. As regards to the other two dummy variables, they are statistically insignificant even at 10% significance level. The next equations (13, 14, and 15 in Table 5) control for the economic status of countries according to the World Bank classification. The findings of the 3 equations (Equation 13, 14 and 15) in Table 5 are very surprising. According to the results of regression analysis, the business friendly atmosphere is associated with economic growth only in developing countries while the impact of DBI is statistically insignificant in developed countries even at 10% significance level in the 10-year period. Overall, it can be concluded that business friendly environment may lead to economic growth in the developing countries rather than in developed ones.

Table 5 The impact of DBI on GDP per capita growth

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
	5-year	10-year	5-year	10-year	5-year	10-year	10-year	

					low & middle income	low & middle income	high income
DB index	0.0763* *	0.0813* *	0.0561* *	0.0534	0.0765** **	0.1081* **	0.0444
	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.05)
Initial log GDP per capita 2006	- 1.1077* **		- 1.2149* **		- 0.4479		
	(0.18)		(0.19)		(0.24)		
Initial deviation from GDP deflator 2006	-0.0003		-0.0004		- 0.0004		
	(0.00)		(0.00)		(0.00)		
Civil conflict 2006-2010	0.6385		0.5755		1.0055		
	(0.49)		(0.48)		(0.53)		
FDI net inflows (%ofGDP)	0.0069	-0.0336	0.0018	-0.0371	0.0053	-0.0478	0.0076
	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.05)	(0.04)
Export 2009-2015	0.0074	0.0221* *	0.0093	0.0234* *	0.0230	0.0280* *	0.0101
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Aver.gov.cons.2006-2010	0.0103		0.0141		0.0188		
	(0.03)		(0.02)		(0.03)		
Initial log GDP per capita 2001		- 1.0494* **		- 1.1926* **		- 0.7157* *	- 2.6015** *
		(0.19)		(0.20)		(0.23)	(0.43)
Initial deviation from GDP deflator 2001		-0.0011		-0.0011		-0.0009	-0.0009
		(0.00)		(0.00)		(0.00)	(0.00)
Civil conflict 2001-2010		0.6532		0.6871		1.1121	0.5371
		(0.54)		(0.52)		(0.61)	(0.62)
Aver.gov.cons.2001-2010		-0.0095		-0.0102		0.0038	-0.0823
		(0.02)		(0.02)		(0.02)	(0.12)

Dummy for Africa			-1.2588*	-1.8574**			
			(0.53)	(0.52)			
Dummy for Latin America			0.5031	-0.3600			
			(0.56)	(0.41)			
Dummy for East Asia			2.1078	1.5519			
			(1.43)	(1.20)			
Constant	6.2507**	5.0393*	8.4825*	8.3315*	0.8454	0.7921	24.1827*
	(1.13)	(1.19)	(1.40)	(1.17)	(1.71)	(1.63)	(5.13)
Observations	170	169	170	169	116	115	54
Adjusted R^2	0.157	0.171	0.199	0.234	0.059	0.166	0.514

Standard errors in parentheses
 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

As it was mentioned above, the doing business index contains ten sub-indicators. Especially for developing countries, it is hard and even sometimes it is impossible to amend some of these sub-indicators. Hence, to be able to prioritize the most influential constituents of the DBI and to answer the question which says: “Which of reforms out of the 10 constituents should be prioritized by governments if they want to increase the impact of conducting reforms on GDP growth per capita?” Also, this analysis reveals whether the newly implemented constituent namely “Getting electricity” has statistically significant impact on economic performance. The equation 6 from the table 4 is chosen by implementing ten individual indicators to analyze the 10-year average effect of those indicators. The results of the regression analysis are presented in Figure 1 in a simplified version. Rhombuses are the amount of corresponding variable’s coefficient on the horizontal axe. The different coloured lines represent three confidence intervals. The shortest line represents 90%, the longer one represents 95% and the longest line reflects 99% confidence intervals. As can be seen from

the Figure 1, the bottom of the figure contains the list of ten constituents of the DBI and some of them contain stars which represent statistical significance. One star means that particular variable is statistically significant at 10% significance level while the variables containing two stars mean that they are significant at 5% significance level and three stars mean the significance of the indicators at 1% significance level. The most important indicators of DBI are 'Enforcing Contracts' which is statistically significant at even 1% significance level and similar to the findings of Scully (1988) and Barro (1991) and Dollar *et al.* (2005) as well as 'Starting Business' which is statistically significant at 5% significance level. However, according to the findings of Hanusch (2012) the most influential indicators were found as 'Getting Credit'. So, improving the conditions: reducing the time and costs associated with solving disputes in a local court may be positively reflected in the economic performance of a country. On the other hand, 'Starting Business' indicator should be emphasized to achieve better GDP growth per capita and new businesses should be motivated to run. The next indicators according to the impact on economic performance are 'Getting Credit' which coincides with the findings of Ross (1997, 1999) and Aterido and Hallward-Driemeier (2007) and 'Protecting Minority Shareholders' and both of them are statistically significant at 1% significance level. Finally, 'Getting Electricity' and 'Registering Property' are also significant but less important in magnitude in comparison to the other aforementioned indicators. The former one is almost statistically significant at 95% confidence interval while the latter one is statistically significant at 1% significance level.

However, 'Dealing with Construction Permits', 'Paying Taxes', 'Resolving Insolvency' and 'Trading Across Borders' are statistically insignificant. To achieve better economic performance according to the business cycle it is clearly proved that focusing on the initial stage is more important rather than ending stage. However, it cannot be claimed that these

indicators do not have any impact on economic performance even though they do not have statistically significant impact on GDP growth per capita. One of the most important reason is that the measurement of these indicators may also have an impact whether they are statistically significant or not. According to economic theory, we know the importance of fiscal policy's tax regime and the high cost of running a business are negatively associated with economic performance as less new start-ups are ready to be run. Also, 'Trading across borders', in other words, the costs associated with three procedures which are the level of bureaucracy related to a documentary, border compliance and domestic transport regarding the whole process of international trade and a shipment of goods and services.

Figure 1 Individual Doing Business Effects on average GDP growth per capita



To see not only the average relationship between the DBI and per capita economic growth by implementing OLS technique but we are also interested in revealing the impact of

the DBI at different points in the conditional distribution of our dependent variable. Thus, to identify the process of entire distribution, the quantile regression is also conducted. Moreover, another advantage of conducting quantile regression is that it gives a full statistical analysis of the stochastic link between a dependent variable and its covariates. It also assists to cope with heteroscedasticity and quantile regression's outcomes are more robust against outliers in the reaction measurement. It can be clearly observed from the *Table 6, Figure 2 and Figure 3* that the bottom 5% countries have negative GDP growth per capita while the top 5% quantile of the countries have ranged between 6% and 13.63% GDP growth rate per capita. The median GDP growth per capita accounts for about 2%.

Figure 2 Average GDP growth per capita over 5 years by quantiles

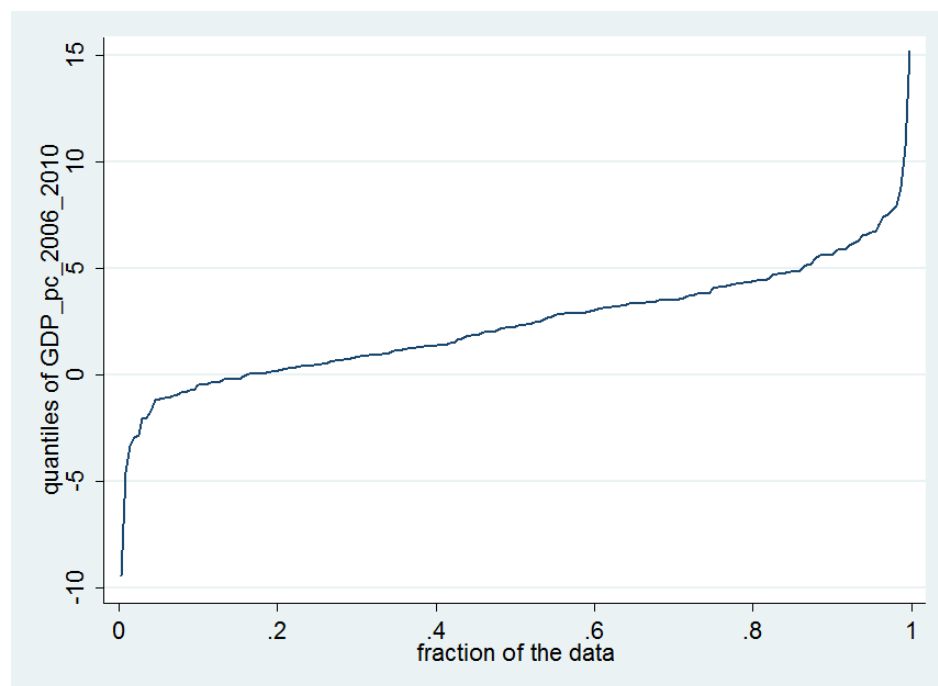


Figure 3 Average GDP growth per capita over 10 years by quantiles

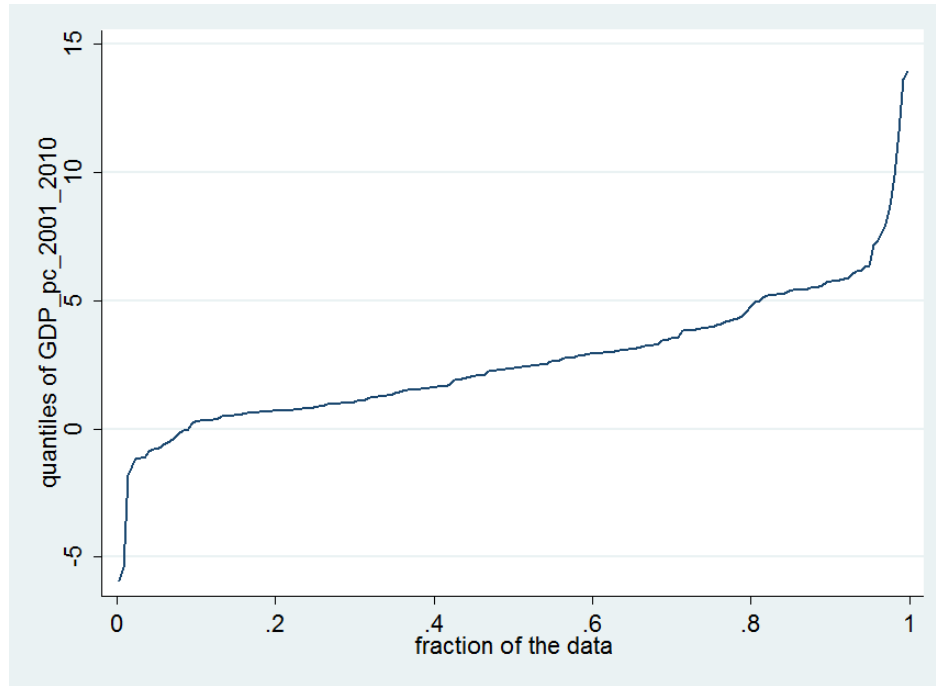


Table 6 GDP per capita growth rate at different quantiles

GDP per capita 2001-2010				
	Percentiles	Smallest		
1%	-5.4176	-5.9254		
5%	-0.7893	-5.4176		
10%	0.2630	-1.8320	Obs.	187
25%	0.8566	-1.4207	Sum of Wgt.	187
50%	2.3806		Mean	2.6598
		Largest	Std. Dev.	2.6598
75%	3.9731	9.8851		
90%	5.7615	11.6115	Variance	7.0748
95%	6.3757	13.6294	Skewness	0.9090
99%	13.6294	13.9461	Kurtosis	6.3317
GDP per capita 2006-2010				
	Percentiles	Smallest		
1%	-4.6037	-9.4528		
5%	-1.1378	-4.6037		
10%	-0.4811	-3.3754	Obs.	186
25%	0.4769	-2.9346	Sum of Wgt.	186
50%	2.2735		Mean	2.3643
		Largest	Std. Dev.	2.7835
75%	4.0611	7.9621		
90%	5.6638	8.8396	Variance	7.7477
95%	6.6803	10.7029	Skewness	0.2984
99%	10.7029	15.1834	Kurtosis	6.2178

The quantile regression is conducted to observe the impact of DBI at different quantiles as well as compare with the OLS results. (Table 8)

Table 7 OLS and Impacts at Different Quantiles

Dependent Variable	(1)	(2)	(2)	(3)	(4)	(5)
	Average GDP per capita growth					
	OLS	Q(0.1)	Q(0.25)	Q(0.50)	Q(0.75)	Q(0.9)
DBI	0.083** (2.75)	0.109*** (3.80)	0.105*** (5.86)	0.092** (3.33)	0.038 (1.75)	0.039 (0.77)
Initial log GDP per capita 2001	- 1.068*** (-6.05)	-0.683** (-2.91)	- 0.895*** (-6.13)	- 1.150*** (-5.09)	-1.262*** (-7.14)	-1.503*** (-3.63)
Initial deviation from GDP deflator 2001	-0.001 (-1.11)	-0.001 (-0.44)	-0.001 (-1.38)	0.000 (0.33)	-0.001 (-0.97)	-0.001 (-0.58)
Civil conflict 2001-2010	0.767 (1.48)	0.324 (0.49)	0.802 (1.96)	0.109 (0.17)	0.152 (0.31)	-0.295 (-0.25)
FDI net inflows (%ofGDP)	-0.034 (-1.23)	-0.008 (-0.23)	0.009 (0.42)	0.003 (0.09)	-0.048 (-1.80)	-0.052 (-0.84)
Export	0.023* (2.14)	0.012 (1.06)	0.010 (1.40)	0.009 (0.79)	0.027** (3.22)	0.027 (1.37)
_cons	4.850*** (4.42)	-1.742 (-1.30)	1.072 (1.28)	5.272*** (4.08)	10.424*** (10.31)	13.254*** (5.60)
N	173	173	173	173	173	173

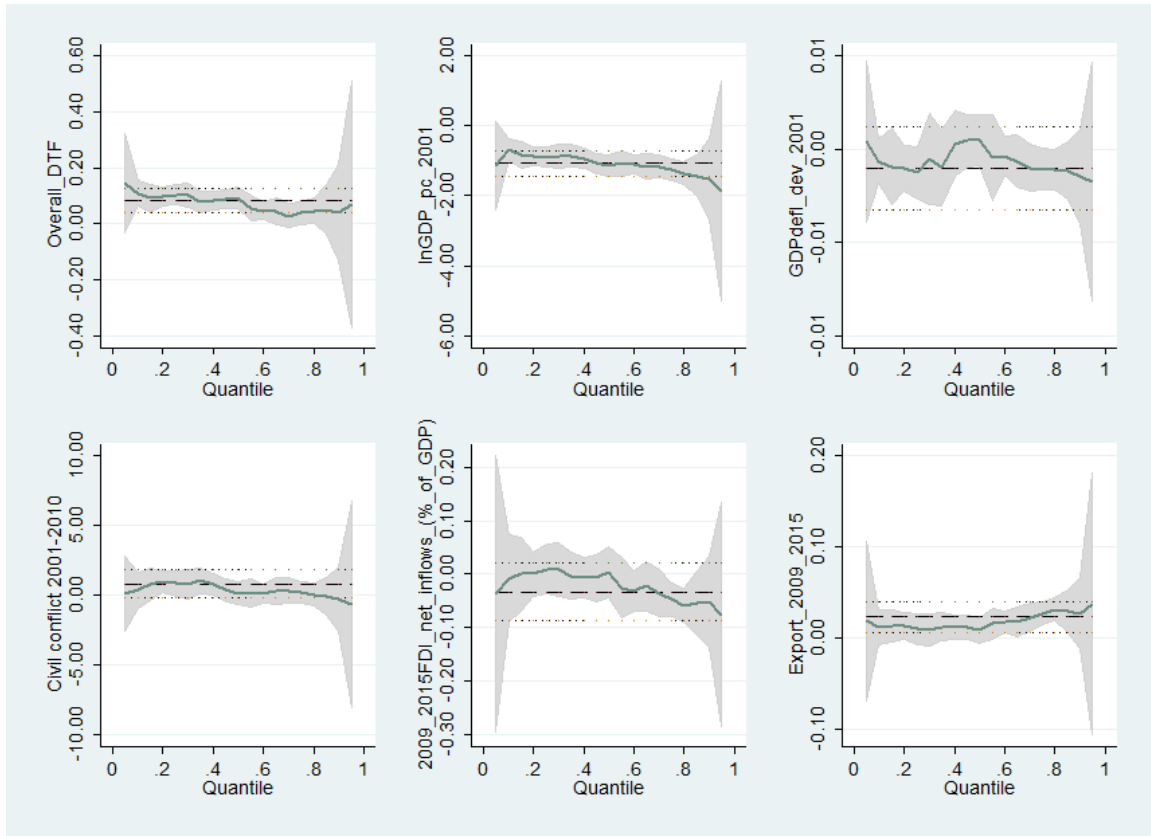
t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7 demonstrates that the impact of the DBI on GDP growth per capita is larger at lower quantiles (q 0.1, q 0.25 and q 0.50) and statistically significant. The impact of the DBI at that quantiles are similar to the effect of OLS. However, the DBI impact on the dependent variable is weaker at the higher quantiles (q 0.75 and q 0.90) and statistically insignificant.

The results of *Table 7* are graphed in Figure 4 in order to illustrate the effect on distribution. The graph clearly demonstrates whether the independent variables are significantly different from OLS results. The first line graph in Figure 4 is the figure of our interest where it can be seen that approximately at 0.1 quantile the impact of DBI is significantly different from the OLS coefficient and the countries in the lowest 0.1 quantile have more benefit from the DBI rather than average results of OLS. However, other quantiles' coefficients are not significantly different from the OLS results.

***Figure 4* The average 10-year effect on quantile distribution**



To be confident in the interquartile differences, the formal test of the equivalence of the estimates in particular quartile is conducted. The following cross-equation hypothesis is set and tested. (Table 8)

Table 8 Interquartile Difference Tests

```

. test [q10=q50]: DBI
( 1)  [q10]DBI - [q50]DBI = 0
      F( 1, 166) = 0.15
      Prob > F = 0.7005

. test [q10=q90]: DBI
( 1)  [q10]DBI - [q90]DBI = 0
      F( 1, 166) = 2.86
      Prob > F = 0.0925

. test [q10=q75]: DBI
( 1)  [q10]DBI - [q75]DBI = 0
      F( 1, 166) = 3.26
      Prob > F = 0.0727

. test [q25=q90]: DBI
( 1)  [q25]DBI - [q90]DBI = 0
      F( 1, 166) = 3.94
      Prob > F = 0.0488

```

According to the Table 8, it is obvious that there are statistically significant interquartile differences between q25 and q90 and the zero hypothesis which states there is no difference is rejected at 5% significance level. Moreover, there are also interquartile differences between q10 and q75 as well as q10 and q90 but they are significant at 10% significance level. So, it can be concluded that the effect of the DBI is different throughout different economies and quantile regression may produce more precise and detailed results to each group of the economy.

Recommendations

It is true to say that within given time and with given resources each country tries to maximize the impact of conducting reforms. The analyses conducted in this paper have determined the most influential indicators on economic performance. However, this paper proposes to think reformers not only on the importance of a particular indicator on economic growth but also with minimal resources and time spent on a realization of reforms to achieve optimal economic performance. For instance, in this analysis even though 'Enforcing Contracts' is the most promoter of economic growth among the ten constituents of DBI, in order to amend this indicator, reformers should try to decrease the

cost, as well as time spent on legal issues, occurred in court and overall ability of a legal system should be amended. Hence, to conduct this reform, many changes of a legal system in a particular country should be done. As a result, additional human capital and premises devoted to coping with such issues should be built and improved which requires a huge amount of financing which in turn increases the cost of such reforms considerably. As it was claimed above, the DBI's effect mostly associated with better economic performance in developing countries while those countries have a limited budget to cope with such issues and conduct these reforms. What this paper suggests is that each indicator's coefficient should be treated as a future value with different interest rates and present value by discounting to the cost should be found to achieve the most efficient outcome with minimal cost. To address this issue and implement in practice we can improve another indicator namely 'Starting Business' and the impact of it insignificantly lower than the former one but the cost of conducting this reform is considerably lower than 'Enforcing Contracts'. By reducing the level of bureaucracy or cutting the so-called 'red tape' which makes the process of running start-up more complicated, the amendment in overall DBI and its effect on economic performance can be achieved.

On the other hand, even though governments may wish to improve the Doing Business environment within a country but at the same time, they would not want to lose its power. In my view, 'Paying Taxes' and 'Dealing with Construction Permits' have a high correlation for a government. Collecting money through taxes as well as multistage licencing and bureaucratic stages are the main sources of money and the leverage of many governments. Amending these indicators automatically means a poorer government which in turn leads to a reduction of the scale of government and power. If aforementioned is true, governments may want to leave both indicators in the status quo.

What is more, some DBI indicators can be improved by the government of a particular country such as 'Paying Taxes' or 'Starting Business' while other indicators like 'Trading Across Borders' is beyond the control of a single government and without consensus of several countries may be impossible to amend. For example, some neighbouring countries have a hostile relationship due to political issues such as India and Pakistan or Palestine and Israel and others where the "discount rate" is huge and for these countries making any improvement in that indicator is mission impossible task as they may not want to cooperate. Therefore, before conducting any reform, governments should be aware of potential obstacles and cost to address a particular issue related to increasing the DBI.

On the other hand, especially for developing countries, the DBI is a chance to improve international image as a country with a business friendly environment, as the countries which are improved significantly in the DBI attract foreign direct investments as they are widely published by mass media. So, this phenomenon will have a spillover effect for that developing economies to develop faster and motivate them even more to create business-friendly environment.

The DBI is also can be viewed as evaluation scale of each ministry's performance. As DBI is relatively fair criteria of the legal environment of each corresponding sector. So, governments may set control and measure the performance of each ministry to which different indicators are attached. For example, the performance of Ministry of Energy can be measured whether new businesses may easily pass all procedures with a short period of time and minimum cost to obtain a permanent electricity connection or not. Any change, both positive or negative regarding this issue will be reflected in the 'Getting Electricity'

indicator. If governments want to amend the DBI efficiently they should focus on those reforms which may yield them the largest benefit on the aggregate DBI. While treating the DBI rating according to its constituents, we should be aware of heterogeneity in weights. In other words, some countries emphasize more on some indicators while they do not care much about others. 'Getting Credit' and 'Protecting Minority Investors' illustrate the point. 'Getting Credit' may be different from a country to a country. For example, in the Arabic countries, the financial system is operated under Islamic Banking system while in some African countries banking system may be underdeveloped due to the existence of shadow economy. As regards to 'Protecting Minority Investors', countries which do not have a need for stock exchange market will not try to develop this indicator but it does not mean that overall business environment is poor. So, it should be borne in mind some country-specific traits which may require weighted DBI.

Conclusion

This paper tried to illuminate different vision to promote economic growth rather than traditional classic determinants to improve economic performance. Although, there are some limitations of the DBI, still, it is a good proxy to measure the business environment in countries all over the world and to conduct reforms. Based on the DBI, this analysis illuminates the most influential indicators leading to economic growth. 'Enforcing contracts' and 'Starting Business' have the highest impact on economic performance. The next indicators influencing on GDP growth per capita according to the coefficients are as follows: 'Protecting Minority Investors', 'Getting Credit', 'Registering Property', and 'Getting Electricity'. However, before conducting any reform to amend the DBI, reformers should bear in mind that the present value of these reforms should be analysed by discounting to

the cost of the reforms rather than focusing only on the large significant coefficients. Also, as it was mentioned above, political cost should also be considered and if the advantages of conducting reforms outnumber the costs and long-run side effects only then reforms should be conducted. Nevertheless, as the analysis was conducted based on aggregate cross-section data, the results cannot ideally fit the individual country. Hence, the absence of the stock market in some countries may mean that country may not be interested in amending 'Protecting Minority Investors' indicator. Recently added new variable, 'Getting Electricity' is tested and can be claimed that it has statistically significant impact on improving economic performance.

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Appendices

	DBI	lng~2001	gdp~2001	c~1_2010	_2015f~p	exp~2015	gov_c~10	africa	lat_am~a	east_a~a
DBI	1.0000									
lngdp_p~2001	0.7435	1.0000								
gdpdefl~2001	-0.1596	-0.0905	1.0000							
civil~1_2010	-0.1574	-0.2678	0.0848	1.0000						
_2015fdi_n~p	0.0792	0.1342	-0.0204	-0.0885	1.0000					
export_~2015	0.3747	0.4354	-0.0728	-0.2353	0.5779	1.0000				
gov_cons_10	0.0780	0.1311	-0.0698	-0.1659	-0.0031	-0.0291	1.0000			
africa	-0.5424	-0.5425	0.0755	0.1310	-0.0253	-0.1847	-0.0771	1.0000		
lat_america	-0.0486	0.0349	0.0070	-0.0696	-0.0690	-0.1023	-0.1188	-0.2308	1.0000	
east_asia	0.1838	0.1032	-0.0303	-0.0795	0.1358	0.1617	-0.0458	-0.1100	-0.0640	1.0000

Variable	VIF	1/VIF
lngdp_p~2001	2.49	0.400843
DBI	2.31	0.433306
export_~2015	1.95	0.511928
_2015fdi_n~p	1.56	0.639564
civil~1_2010	1.12	0.892635
gdpdefl~2001	1.03	0.968712
Mean VIF	1.75	

GDP_pc_2001_2010

	Percentiles	Smallest		
1%	-5.417593	-5.925382		
5%	-.7892535	-5.417593		
10%	.2629592	-1.831999	Obs	187
25%	.8565872	-1.420672	Sum of Wgt.	187
50%	2.380589		Mean	2.659787
		Largest	Std. Dev.	2.659849
75%	3.973101	9.885134		
90%	5.761483	11.61146	Variance	7.074797
95%	6.375712	13.62943	Skewness	.9090447
99%	13.62943	13.94612	Kurtosis	6.331685

GDP_pc_2006_2010

	Percentiles	Smallest		
1%	-4.603665	-9.452758		
5%	-1.137766	-4.603665		
10%	-.4811398	-3.375442	Obs	186
25%	.4768586	-2.934639	Sum of Wgt.	186
50%	2.27353		Mean	2.364264
		Largest	Std. Dev.	2.78347
75%	4.06108	7.96207		
90%	5.663799	8.839563	Variance	7.747708
95%	6.680337	10.70285	Skewness	.2984455
99%	10.70285	15.18339	Kurtosis	6.217796