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Business regulations and economic growth: What can be explained?

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ABSTRACT

This paper investigates business regulations-economic growth nexus in 162 countries over the period 2007-2011. It uses ten indicators of Doing Business and a set of control variables. The results provide a robust link between regulation indices and economic growth except Trading Across Borders and Dealing with Construction Permits indices. Regulation indices and control variables don't matter in term of growth induction in Africa. This finding suggests some policy conclusions that can help poor nations to grow faster.

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1. Introduction

In the current economic climate, growth remains a key government priority. The literature on economic growth has turned to the effects of country's political, legal, economic and social institutions on wealth and long-term growth (Acemoglu et al. [1, 2], Dollar and Kraay[13], Easterly and Levine [15], Hall and Jones [17], Knack and Keefer [21], Mauro [26], Rodrik et al. [27], and many others). It is obvious that countries with better institutions grow faster. However, as noted by Rodrik et al. [20], it is difficult to identify which institutions matter and how does one acquire them. This is a question of some practical importance. In recent years, the proliferation of datasets aiming to measure a wide gamut of institutional reforms allowed economists to make progress in this area. In this context, the World Bank has been publishing a series of annual Doing Business reports since 2004 investigating regulations that enhance business activity and those that constrain it. As a result, articles focusing on the effect of business regulations on economic growth appeared (Djankov et al. [12], Haider[19], Hanusch[20] and Loayza et al. [24-25]).

The objective of this paper is to contribute to the existing literature. In line with earlier studies, our paper takes a close look at how robust is the relationship between business regulations and economic growth, but with some differences. First, the data are drawn for a more recent time period. Second, Haider[19] and Hanusch[20] included a set of regional dummy variables, whereas this paper includes only the African dummy because the results from the empirical growth literature systematically show Africa with the largest unexplained growth underperformance. Therefore, it is interesting to focus on this region. Second, the choice of control variables is generally based on Djankov et al. [12], Hanusch[20] and Loayza et al. [24-25], but with view. While authors focused on governance among the determining factor of growth, especially Loayza et al. [24-25], this paper differs in concentrating on financial development rather than wider governance issues, which enrich the analysis. Djankov et al. [12] and Hanusch[20] used an instrumental variable approach and OLS regressions to test the robustness of their results. The results generally uphold. However, from an econometric point of view, the OLS estimator is biased and inconsistent due to endogeneity of business regulations indicators, so we only use two-stage least regressions. Hanusch[20] explored his result by dividing the sample in two groups: poor countries and rich countries. Unfortunately, in our context, this will lead to a steep decline in the number of observations.

The rest of the paper is organized as follows. Section II reviews literature. Section III describes the dataset and the empirical strategy. Section IV assesses the effect of business regulations on economic growth. Section V concludes the paper and draws implications for sustainable economic policies.

2. Literature review

Numerous potential growth determinants have been identified over the years. Over the last decade, a body of literature has explored the relationship between business regulations and economic performance.

A number of studies do not deal with the effect of business regulation on economic growth directly but instead focuses on the effect of business regulation on one of the growth drivers

(labour productivity, investment, innovation, total factor productivity). Busse and Groizard[6] for example use a standard cross-country growth regression with regulation interacted with FDI inflows and other control variables. Regulation is measured by five components of the World Bank Doing Business Indicators. They find that FDI does not stimulate growth in economies with excessive business and labour regulations.

In a sample of more than 26,000 manufacturing establishments across 71 countries (both OECD and developing), Dutz et al. [14] find that the aggregate Doing Business indicator, as well as its sub-indexes, are positively correlated with product and process innovation for young firms in non-OECD countries. These findings stress the importance of business environment in stimulating incentives for competition and innovation.

Using a panel of micro-data on firms from the European Union between 2002 and 2008, Dall'Olio et al. [8] investigate whether structural or firm-specific characteristics contributed more to labor productivity growth. Results show that improvements in the Doing Business indicators are positively correlated with increased labor productivity in manufacturing and services in EU-15 and EU-12 countries, though the magnitude of this association is larger in EU-12 countries.

Other studies supply more insight on direct links between business regulation and growth. Djankov et al. [12] for example investigate the impact of business regulations on growth in 135 countries during 1993-2002. They find that business regulations index and growth are consistently and positively correlated. Countries with less burdensome business regulations grow faster. The authors examine the magnitude by including dummies for each quartile of the business regulation index in the OLS regressions. The result shows that improving from the worst (first) to the best (fourth) quartile of business regulations implies a 2.3 percentage point increase in average annual growth. The main result remains robust after the inclusion of commonly used measures of institutional quality from International Country Risk Guide and Transparency International.

Also, Hanusch[20] discuss the potential role of the Doing Business indicators in the reform process. The choice of control variables is generally based on Djankov et al. [12], yet the data are drawn for a more recent time period, from 2003 to 2009, and a number of additional variables are used. Author reports results for five-year and 10-year average growth respectively. Data availability restricts the sample size to 175 countries. The evidence shows 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. Unlike Djankov et al. [12], the analysis is also made for poor countries and rich countries separately (the sample was divided on median log GDP per capita). The doing business indicator coefficient is significant for only the developing country sample, both for 5-year and 10-year growth. The effect remains when removing the regional dummies.

In the same order of ideas, Loayza et al. [24] focus on two key measures of macroeconomic performance, namely the growth and volatility of real GDP. The sample covers 76 countries. The authors interact the regulation index with a governance proxy. In general, regulation tends to reduce growth. In most instances, better institutions help mitigate, and even eliminate, the adverse impact of regulation on macroeconomic performance.

Using a large sample of industrial and developing countries, Loayza et al. [25] suggest that a heavier regulatory burden reduces growth and increase the size of the informal sector. The negative effects of excessive regulation are aggravated in countries with poor governance.

On a related issue, Dawson [10] estimates both “direct” and “indirect” effects of business regulation on growth. The estimates of the indirect effect show that the index of business regulation is statistically significant and positively related to growth. This result suggests that countries with less business regulation experience higher long-run growth rates as a result of higher total factor productivity. For example, a one standard deviation above the mean increase in the business regulation index is a 9 percentage point increase in 20-year growth rates for a sample of 64 countries. The estimates of the indirect effect reveal that business regulations are statistically significant and negatively related to growth. The estimated impact on growth from business regulation is 16 percentage points over the 20-year sample period.

Unlike Djankov et al. [12], Hanusch [20] and Loayza et al. [24–25], Castro et al. [7] consider a specific aspect of business regulation: investor protection, which is introduced in the familiar two-period OLG model of capital accumulation. The theoretical result is that the positive effect of investor protection on growth is stronger for countries with lower restrictions on capital flows. Castro et al. [7] conduct a statistical analysis of cross-sectional data on growth, investor protection, and openness, and then explore the development experiences of South Korea and India. They find that the data provide some support for their prediction.

Also, Haidar [18] looks at how the state of investors' protections affects income level and growth in 170 countries over the period 1980–2004. The data is based on the investor protections index of doing business. It measures the strength of minority shareholder protections against directors' misuse of corporate assets for personal gain. Results show that the level of investor protection matters for cross-country differences in GDP growth: countries with stronger protections tend to grow faster than those with poor investor protections.

In a recent study, Haider [19] investigates the connection between investor protection - among 9 other business regulatory reforms - and economic growth rates in 172 countries over the period 2006–2010. A five-year dataset on business regulatory reforms from the World Bank's Doing Business reports as well as variables that capture macroeconomic dynamics are used. In contrast to previous studies, the main independent variable, Reform, is defined as the total number of reforms happening in a country during a certain period of time (2006–2010 and 2006–2008). Each individual reform is coded as a dummy variable equal to 1 if a positive reform occurred in one or more of the 10 indicators in a given year and 0 otherwise. The key empirical finding is that business regulatory reforms are good for economic growth: on average, each business regulatory reform is associated with a 0.15% increase in growth rate of GDP. The author indicates that reforms, which improved business and investment climate, may have helped to mitigate the effects of the 2008 global slump in economic growth. Countries with more business regulatory reforms enjoyed higher economic growth rates¹.

3. Data description and Methods

As is standard in the literature, economic growth is measured as the average annual rate of per capita real GDP growth². We use growth in real PPP-adjusted per-capita income from 2007 to 2011 because it more captures the standard of living across different countries and is not subject to large re-orderings in rank as a result of exchange rate fluctuations.

We use the World Bank Doing Business indicators [31] as measures of business regulations. The relative importance of Business regulatory indicators may not be contested. For example, they help governments gauge the ‘health’ of their regulatory regime through country benchmarking. They try to inform the design of reforms that will give the largest gains on the overall ranking because indicators are backed by an extensive description of regulations³.

Table 1-The Doing Business Indicators.

1- Ease of doing business: overall indicator (DB1)		
2- Starting a Business (DB2)	Procedures (number)	Payments (number per year)
	Time (days)	Time (hours per year)
	Cost (% of income per capita)	Profit tax (%)
3- Dealing with Construction Permits (DB3)	Paid-in Min. Capital (% of income per capita)	Labor tax and contributions (%)
	Procedures (number)	Other taxes (%)
	Time (days)	Total tax rate (% profit)
4- Registering Property (DB4)	Cost (% of income per capita)	8- Trading Across Borders (DB8)
	Procedures (number)	Documents to export (number)
	Time (days)	Time to export (days)
5- Getting Credit (DB5)	Cost (% of property value)	Cost to export (US\$ per container)
	Strength of legal rights index (0-10)	Documents to import (number)
	Depth of credit information index (0-6)	Time to import (days)
6- Protecting Investors (DB6)	Public registry coverage (% of adults)	9- Enforcing Contracts (DB9)
	Private bureau coverage (% of adults)	Cost to import (US\$ per container)
	Extent of disclosure index (0-10)	Time (days)
7- Paying Taxes (DB7)	Extent of director liability index (0-10)	Cost (% of claim)
	Ease of shareholder suits index (0-10)	Procedures (number)
	Strength of investor protection index (0-10)	Time (years)
		Cost (% of estate)
		Outcome (0 as piecemeal sale and 1 as going concern)
		Recovery rate (cents on the dollar)

Source: World Bank Database [31].

The “Doing Business” dataset provides 9 sets of indicators and their constituent components covering all stages of a business's life cycle: from its incorporation through its operation, to its closure (Table 1). These are combined into an overall “ease of doing business” ranking. Economies are ranked on their ease of doing business, from 1–183. A high ranking on the ease of doing business index means the

¹pp. 295.

²Unlike Loayza et al. [24], we do not consider the volatility of real GDP.

³See the World Bank Doing Business (2004) report [30] for details.

regulatory environment is more conducive to the starting and operation of a local firm. We take the simple average of country rankings in each of the ten topics in the database. We then normalize this index to vary between zero and one according to the formula: $R_i - R_{min} / R_{max} - R_{min}$, for ranking R and country i. Higher value indicate heavier regulation regulatory burden⁴.

To check the robustness of our results, we consider several additional potential determinants of growth presented in Table 2. The choice of control variables is generally based on Djankov et al. [12], Hanusch[20] and Loayza et al. [24-25], but with view⁵.

We consider the initial level of real per capita GDP to account for a conditional convergence process. We expect a significant and sizeable negative coefficient.

Government expenditure to GDP ratio is used to measure the degree of government intervention in other words the size of the public sector. The smaller the ratio, the higher is the reliance on markets. We include a measure of human capital in our specification: Primary school enrollment is the log of the percent of the cohort that is enrolled in primary school in initial period.

Debt servicing may aggravate the debt problem of the heavily indebted countries. There is a relationship between external debt servicing and economic growth. The rise in the debt servicing ratio affects economic growth negatively. The decline in the rate of growth reduces the capacity of an economy to service its debt.

As a proxy of macroeconomic instability, we use the absolute deviation from average deflator in initial period 2007.

To account for financial sector development, we consider two measures. First, the ratio of private domestic credit to GDP. It refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises. Second, Money and quasi money (M2)/GDP as a general indicator of the size of financial intermediaries relative to the size of the economy. It is average of data for available years from 2007 to 2011.

The inclusion of regional specific effects has the advantage of controlling for unobserved regional heterogeneity. African countries generally form a significant part of the cross-country samples, and the region has a special place in the literature on growth. African countries are characterized by civil conflict, mismanagement and disease and hence Africa dummy variable is included in the equation. We try to capture the characteristics of Africa countries influences on growth indirectly rather than directly.

Following Djankov et al. [12] and Loayza et al. [24], the instrumental variables, introduced to isolate the exogenous variation in the regulation indices, are the initial level of per capita GDP, binary variables that denote legal origin (British, French, German, and

Nordic), proxies for the degree of Western influence based on the fraction of the population that speaks a major European language and Absolute latitude of the country.

In the analysis, the economic and finance data were collected from several sources according to availability. Table 2 provides a definition of all variables and respective sources.

⁴We refer the interested reader to Djankov et al. [12] and Hanusch[20] for details on the construction of the business regulation indices.

⁵In this study, we do not include the quality of governance. Unlike Hanusch[20], even if the period is characterized by crisis, we do not include exports and FDI inflows to capture countries' exposure to crisis.

Table2 -Description of variables.

Variables	Description	Sources	Expected signs
Growth	Growth rate of real per capita GDP (PPP, constant 2005 international \$).		
GC	Government consumption as % of GDP (scale from 0 to 100). General government final consumption expenditure includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation. Average of the years 2007-2011.		+/-
AD	Absolute deviation from average deflator in initial period 2007.	World Bank. World Development Indicators. 2012.	-
Ln(GDP _{pc2007})	Log of GDP per capita in initial period 2007.		-
LLGDP	Money and quasi money (M2) as % of GDP		+
DCP	Domestic credit to private sector (% of GDP).		+
HKP	Primary school enrollment in initial period 2007.		+/-
TDS	Total debt service as % of GNI. Average of the years 2007-2011.		-
Africa	Dummy variable 1=Africa and 0=otherwise.		+/-
DB	Doing Business indicators	World Bank. Doing Business 2012. Washington, D.C, 2012 available at www.doingbusiness.org	+
LA	Absolute latitude of the country scaled to take the values between 0 and 1.	CIA World Factbook: Average latitude and longitude for countries around the world, Updated November 30th, 2007, available at www.maxmind.com/en/country_1_atlon	
RE	Principal religion in the country (Catholic, Muslim, Protestant, Other).	CIA World Factbook: Religion statistics for the world, available at www.religionfacts.com/religion_statistics/religion_statistics_by_country.htm	
SD	Legal origin (English, French, German, Nordic and Socialist.	CIA World Factbook (28 July 2005), available at www.nationmaster.com/graph/gov_leg_ori-government-legal-origin	
Ang	Percentage of English speaking population.	Commonwealth Nations Research Society (CNRS), available at http://cnrsociety.org/5v-f-union.html and CIA World Factbook, available at www.cia.gov/library/publications/the-world-factbook/	

Source: Authors.

The sample consists of 162 countries and for which information on the main variables is available (Table 3). We have 35 high-income countries and 127 otherwise that are classified as eligible for the World Bank, of which 47 belong to Africa, 39 to Europe, 36 to Asia, 20 to

north America, 10 to south America and 10 to Oceania. Unlike Djankov et al.[12], Hanusch[20] and Loayza et al. [24-25], the data are drawn for a recent time period, from 2007 to 2011.

Table 3 -Countries in the sample.

Albania	Ecuador	Lao PDR	Sao Tome and Principe
Algeria	Egypt, Arab Rep.	Latvia	Saudi Arabia
Angola	El Salvador	Lebanon	Senegal
Antigua and Barbuda	Equatorial Guinea	Lesotho	Serbia
Argentina	Eritrea	Lithuania	Seychelles
Armenia	Estonia	Macedonia, FYR	Sierra Leone
Australia	Ethiopia	Madagascar	Singapore
Austria	Fiji	Malawi	Slovak Republic
Azerbaijan	Finland	Malaysia	Slovenia
Bangladesh	France	Maldives	Solomon Islands
Belgium	Gabon	Mali	South Africa
Belize	Gambia, The	Mauritania	Spain
Benin	Georgia	Mauritius	Sri Lanka
Bhutan	Germany	Mexico	St. Kitts and Nevis
Bolivia	Ghana	Micronesia, Fed. Sts.	St. Lucia
Bosnia and Herzegovina	Greece	Moldova	St. Vincent and the Grenadines
Botswana	Grenada	Mongolia	Sudan
Brazil	Guatemala	Montenegro	Swaziland
Bulgaria	Guinea	Morocco	Sweden
Burkina Faso	Guinea-Bissau	Mozambique	Switzerland
Burundi	Haiti	Namibia	Tajikistan
Cambodia	Honduras	Nepal	Tanzania
Cameroon	Hong Kong SAR, China	Netherlands	Thailand
Canada	Hungary	Nicaragua	Timor-Leste
Cape Verde	Iceland	Niger	Togo
Central African Republic	India	Nigeria	Tonga
Chad	Indonesia	Norway	Trinidad and Tobago
Chile	Iraq	Oman	Tunisia
China	Ireland	Pakistan	Turkey
Colombia	Israel	Palau	Uganda
Comoros	Italy	Panama	Ukraine
Congo, Dem. Rep.	Jamaica	Papua New Guinea	United Arab Emirates
Congo, Rep.	Japan	Paraguay	United Kingdom
Costa Rica	Jordan	Peru	United States
Cote d'Ivoire	Kazakhstan	Philippines	Uruguay
Croatia	Kenya	Poland	Uzbekistan
Czech Republic	Kiribati	Portugal	Vanuatu
Denmark	Korea, Rep.	Romania	Venezuela, RB
Dominica	Kuwait	Russian Federation	Vietnam
Dominican Republic	Kyrgyz Republic	Rwanda	Yemen, Rep.
		Samoa	Zambia

Source: Authors.

The empirical specification follows Djankov et al.[12], Hanusch[20] and Loayza et al. [24].We test the relationship between business regulations and growth using the “standard” cross-country growth regression below:

$$Growth = c + \beta \ln(GDP_{pc2007}) + \alpha DB + \sum \lambda' X + \varepsilon \quad (1)$$

where, Growth is the annual average GDP per capita growth rate between 2007 and 2011, c is the intercept, $\ln(GDP_{pc2007})$ is the logarithm of GDP per capita in initial period, β , α and λ are variable coefficients, DB represents business regulations indicators, X is a set of control variable, and ε is the error term.

The OLS estimator is biased and inconsistent for α due to endogeneity of business regulations indicators, meaning that changes in business regulations indicators are associated not only with changes in Growth but also changes in the error ε . What is needed is a method to generate only exogenous variation in of business regulations indicators. Unlike Djankov et al. [12] and Loayza et al. [24], we only use two-stage least regressions. To isolate the exogenous variation in the business regulations indicators, legal origin of a country's commercial code or company law, absolute latitude, initial level of GDP per capita, religion and language are used as instrumental variables.

We check whether the model is correctly specified and whether the instruments are valid. We perform Basmann's[5] and Sargan's[28]tests

of overidentifying restrictions for our regression estimated via instrumental variables in which the number of instruments exceeds the number of regressors: that is, for an overidentified equation. These are tests of the joint null hypothesis that the excluded instruments are valid instruments, i.e., uncorrelated with the error term and correctly excluded from the estimated equation. A rejection casts doubt on the validity of the instruments. Both statistics are distributed as chi-square. A statistically significant test statistic indicates that the instruments may not be valid.

We conduct several regression estimates of equation (1). We use as explanatory variables a measure of business regulations and a set of basic control variables.

4. Regression results

Results from estimating equation (1) are reported in Table 4. Columns 1–40 report the results including each of the Business environment indices separately.

Basmann's[5] and Sargan's[28] statistics indicate that the null hypothesis that the error term is uncorrelated with the instruments is not rejected since the *P*-values are greater than the 5% level of significance. The validity of the instrumental variables of the regression is therefore confirmed and the model is correctly specified.

Table 4 -Effects of business regulations on economic growth.

	DB1				DB2				DB3			
	1	2	3	4	5	6	7	8	9	10	11	12
DB	5.577** (2.19)	4.659* (1.93)	4.132** (1.97)	3.748* (1.82)	3.662* (1.91)	3.697* (1.87)	3.205* (1.80)	3.027* (1.74)	-1.078 (-0.40)	-0.342 (-0.13)	1.640 (0.44)	1.835 (0.50)
Ln(GDP _{pc2007})	-0.735* (-1.66)	-1.139** (-2.59)	-1.164*** (-3.47)	-1.460*** (-4.29)	-0.353 (-1.00)	-0.867** (-2.28)	-0.907*** (-3.48)	-1.226*** (-4.38)	-0.015 (-0.05)	-0.605* (-1.68)	-0.751** (-2.48)	-1.159*** (-3.31)
GC	-0.036* (-1.91)	-0.041** (-2.30)	--	--	-0.032* (-1.72)	-0.039** (-2.21)	--	--	-0.020 (-1.14)	-0.029* (-1.71)	--	--
TDS	-0.156** (-2.83)	-0.169*** (-3.26)	--	--	-0.136** (-2.56)	-0.154** (-3.01)	--	--	-0.111** (-2.17)	-0.135** (-2.74)	--	--
LLGDP	--	--	0.023*** (3.19)	0.021** (3.02)	--	--	0.025*** (3.23)	0.023** (3.06)	--	--	0.021** (2.66)	0.019** (2.53)
DCP	--	--	-0.0325*** (-3.62)	-0.029*** (-3.36)	--	--	-0.031*** (-3.49)	-0.029** (-3.27)	--	--	-0.027** (-2.28)	-0.025** (-2.19)
Africa	--	-1.775** (-2.81)	--	-1.420** (-2.42)	--	-1.730** (-2.69)	--	-1.378** (-2.29)	--	-1.931** (-3.11)	--	-1.646** (-2.62)
C	16.465*** (2.71)	20.460*** (3.48)	14.133*** (3.74)	16.886*** (4.48)	11.573** (2.44)	17.314*** (3.49)	11.342*** (4.10)	14.401*** (5.04)	4.702 (0.98)	11.783*** (2.38)	9.296** (2.08)	13.414** (2.75)
Sargan Test χ^2_1	1.83742	1.41139	2.80689	2.59502	5.40243	0.130891	3.85634	2.60285	9.32154	7.13331	3.90649	3.58446
Basmann Test χ^2_1	1.71909	1.296	2.6758	2.44582	5.00764	0.120041	3.64123	2.40664	9.10627	6.66961	3.76124	3.40866
Obs.	82	82	114	114	82	83	114	114	82	82	114	114
	DB4				DB5				DB6			
	13	14	15	16	17	18	19	20	21	22	23	24
DB	4.682* (1.89)	2.729 (1.11)	5.869** (2.04)	5.717* (1.69)	5.876** (2.58)	5.337* (1.79)	4.000** (2.06)	3.381** (1.97)	4.016* (1.97)	3.821** (2.03)	3.609** (2.17)	3.427** (2.53)
Ln(GDP _{pc2007})	-0.575 (-1.36)	-0.808** (-2.08)	-1.186*** (-3.40)	-1.306*** (-4.07)	-0.939** (-2.02)	-1.251** (-2.47)	-1.060*** (-3.75)	-1.273*** (-4.71)	-0.138 (-0.45)	-0.598* (-1.73)	-0.820*** (-3.66)	-1.140*** (-4.54)
GC	-0.027 (-1.50)	-0.031* (-1.58)	--	--	-0.036* (-1.95)	-0.041** (-2.23)	--	--	-0.010 (-0.54)	-0.017 (-0.95)	--	--
TDS	-0.121** (-2.30)	-0.136** (-2.76)	--	--	-0.128** (-2.46)	-0.139** (-2.73)	--	--	-0.127** (-2.52)	-0.145** (-2.96)	--	--
LLGDP	--	--	0.027*** (3.20)	0.026** (2.93)	--	--	0.023*** (3.33)	0.021** (3.13)	--	--	0.025*** (3.44)	0.023*** (3.27)
DCP	--	--	-0.033*** (-3.45)	-0.032** (-3.06)	--	--	-0.030*** (-3.76)	-0.027** (-3.48)	--	--	-0.030*** (-3.74)	-0.028*** (-3.51)
Africa	--	-1.546** (-2.16)	--	-0.551 (-0.62)	--	-1.276* (-1.76)	--	-1.135* (-1.89)	--	-1.598** (-2.48)	--	-1.360** (-2.38)
C	13.198*** (2.45)	15.166*** (3.13)	14.900*** (3.65)	16.018*** (4.34)	17.492** (3.01)	20.810*** (3.25)	12.718*** (4.23)	14.606*** (5.44)	7.240** (1.97)	12.332** (3.08)	10.500*** (4.85)	13.578*** (5.73)
Sargan Test χ^2_1	5.14326	6.89438	1.59479	2.02948	2.29568	0.280498	3.20518	3.90822	3.0469	2.96631	3.13653	1.6821
Basmann Test χ^2_1	5.75133	6.33391	1.48973	1.88501	2.04497	0.257713	3.03754	3.62096	2.81716	2.62725	2.94235	1.55753
Obs.	82	82	114	114	82	83	114	114	82	82	114	114
	DB7				DB8				DB9			
	25	26	27	28	29	30	31	32	33	34	35	36
DB	5.920* (1.96)	4.190** (2.07)	2.386 (0.93)	4.506* (1.69)	-3.856 (-1.37)	-9.553 (-1.46)	2.420 (0.56)	-2.034 (-0.62)	4.795** (2.34)	4.256** (2.08)	2.106 (1.28)	4.091 (1.55)
Ln(GDP _{pc2007})	-0.029 (-0.09)	-0.690** (-2.02)	-0.775** (-3.04)	-1.342*** (-4.08)	0.420 (0.85)	0.449 (0.50)	-0.892* (-1.94)	-0.891** (-2.44)	-0.518 (-1.38)	-1.010** (-2.58)	-0.835*** (-3.27)	-1.352*** (-4.08)
GC	-0.030 (-1.59)	-0.037** (-2.20)	--	--	-0.005 (-0.26)	-0.008 (-0.24)	--	--	-0.030* (-1.66)	-0.037** (-2.14)	--	--
TDS	-0.184** (-2.84)	-0.189*** (-3.49)	--	--	-0.111* (-1.97)	-0.132* (-1.83)	--	--	-0.143** (-2.67)	-0.161** (-3.17)	--	--
LLGDP	--	--	0.021** (2.85)	0.020** (2.65)	--	--	0.018** (2.40)	0.019** (2.64)	--	--	0.022** (3.03)	0.022** (2.94)
DCP	--	--	-0.028** (-2.99)	-0.030** (-3.09)	--	--	-0.027** (-2.70)	-0.018** (-1.99)	--	--	-0.027*** (-3.32)	-0.029** (-3.11)
Africa	--	-2.251** (-3.56)	--	-1.952** (-2.91)	--	-2.342** (-2.42)	--	-1.714** (-2.71)	--	-1.874** (-2.97)	--	-1.464** (-2.47)
C	10.621** (2.32)	16.517*** (3.70)	9.953** (3.14)	16.753*** (4.17)	-2.83 (-0.29)	-6.402 (-0.46)	10.990* (1.70)	8.660* (1.82)	13.258*** (2.72)	18.483*** (3.56)	10.078*** (3.81)	15.974*** (4.15)
Sargan Test χ^2_1	4.86197	4.26885	4.69937	3.73191	4.16612	0.139848	2.00175	7.05268	4.01346	0.777087	5.80235	1.1595
Basmann Test χ^2_1	4.47509	3.78936	4.51446	3.41824	3.85386	0.128128	1.87667	6.59454	3.6539	0.689416	5.46998	1.10001
Obs.	82	82	114	114	82	82	114	114	82	82	114	115

In the interest of space, the body of the table do not include columns of p-values for a given chi square value, which we keep available on request.

Table 4 -Continued.

	DB10			
	37	38	39	40
DB	6.766*	5.989*	6.947*	5.640*
	(1.79)	(1.72)	(1.92)	(1.73)
Ln(GDP _{pc2007})	-0.620	-1.328***	-1.183**	-1.669***
	(-1.28)	(-2.33)	(-3.15)	(-3.66)
GC	-0.029	-0.040**	--	--
	(-1.38)	(-2.03)		
TDS	-0.129**	-0.155**	--	--
	(-2.11)	(-2.75)		
LLGDP	--	--	0.019**	0.017**
			(2.29)	(2.23)
DCP	--	--	-0.035***	-0.030**
			(-3.19)	(-3.09)
Africa	--	-2.600**	--	-2.417**
		(-3.16)		(-3.02)
C	15.189**	22.721**	15.972***	20.116***
	(2.25)	(2.98)	(3.28)	(3.56)
Sargan Test χ^2_1	0.151427	0.047925	0.461085	0.576661
Basmann Test χ^2_1	0.136906	0.043909	0.426408	0.533835
Obs.	82	83	114	114

-statistics in parentheses.

*, **, *** denote significance at 10 percent, 5 percent; and 1 percent, respectively.

1 / H0: Model is correctly specified and the instruments are valid.

Most regulation indices have the expected signs and are correlated to the average growth rate except Dealing with Construction Permits and Trading Across Borders indices that have a negative and not statically significant impact on growth (columns 9-12 and 29-32, Table 4). This finding is ambiguous. We may explain the negative effect of Trading Across Borders indices on growth by sample selection bias. Most countries in our sample are at the bottom. To shed light on these indicators, Tables 5 and 6 show where dealing with construction permits and trading across borders are easy and where not for the years 2007 and 2010, for the top 10 countries. Ranking shows that obtaining a construction permit in Africa takes longer than the actual construction (In 2007 (2011), 5 (4) of the 10 countries where it is most difficult to build legally, table 5). In 2009/2010, Sub-Saharan Africa accounted for the most reforms of the construction permitting process, followed by Eastern Europe and Central Asia.

Table 5 -Where is dealing with construction permits easy and where not?

2007	
Easiest	Most difficult
St. Vincent and the Grenadines	Guatemala
Japan	Guinea
Thailand	Iran
Belize	Burkina Faso
Marshall Islands	Egypt
Denmark	Croatia
St. Kitts and Nevis	Zimbabwe
Singapore	Tanzania
Maldives	Eritrea
St. Lucia	Timor-Leste
2011	
Easiest	Most difficult
Hong Kong SAR, China	Malawi
Singapore	Burundi
St. Vincent and the Grenadines	Serbia
Belize	India
New Zealand	Tajikistan
Marshall Islands	Ukraine
Georgia	Tanzania
St. Kitts and Nevis	China
Maldives	Russian Federation
Denmark	Eritrea

Source: Doing Business.

Trading Across Borders indices cover procedural requirements such as documentation requirements and procedures at customs and other regulatory agencies as well as at the port. It also cover trade logistics, including the time and cost of inland transport to the largest business city⁶. According to the World Bank's Logistics Performance Index (2007 and 2010)⁷, poor performance in just 1 or 2 of these areas may lead to serious repercussions for an economy's overall trade competitiveness. Countries that have burdensome documentation requirements, time-consuming customs procedures, inefficient port operations and inadequate transport infrastructure, leading to unnecessary costs and delays for traders, are not competitive globally. Therefore, it is difficult to reach international markets. That leads to less exports or import, low growth and unemployment⁸. According to the table 6, the top 10 economies on the ease of trading are European and Asian. The bottom 10 ranked nations are largely African.

A more plausible explanation is that business regulations may have a positive effect on growth by removing certain market failures and improving economic efficiency. But, business regulations may have a negative effect on economic growth by creating substantial costs, undesirable distortions,.... The impact of business regulations on growth depends on which effect is larger.

Table 6 -Where is trading across borders easy and where not?

2007	
Easiest	Most difficult
Hong Kong, china	Congo, Rep.
Finland	Mali
Denmark	Zimbabwe
Singapore	Uzbekistan
Norway	Zambia
Estonia	Burundi
Germany	Kazakhstan
Canada	Kyrgyz Republic
Sweden	Niger
United Arab Emirates	Rwanda
2011	
Easiest	Most difficult
Singapore	Niger
Hong Kong SAR, China	Burkina Faso
United Arab Emirates	Burundi
Estonia	Azerbaijan
Finland	Tajikistan
Denmark	Iraq
Sweden	Congo, Rep.
Korea, Rep.	Kazakhstan
Norway	Central African Republic
Israel	Afghanistan

Source: Doing Business.

It is important to note that, apart from the negative effect of Dealing with Construction Permits and Trading Across Borders indices on growth, our finding is important. It reinforces the conclusions from Djankov et al. [12] and Hanusch[20].

The coefficient on the African dummy is negative and statistically significant. This result suggests that regulation indices and control

⁶Doing Business 2011 Making a difference for entrepreneurs, November 4, 2010.

⁷ World Bank. Logistics Performance Index, 2007 and 2010 (<http://www.worldbank.org/lpi>).

⁸Doing Business 2011 Making a difference for entrepreneurs. November 4, 2010.

variables do not matter in terms of growth induction. This result does not support the idea that Africa's experience cannot be completely explained by the conventional factors of growth, it is plausibly accounted for by institutional explanation (Easterly and Levine [15]). However, our finding is quite plausible given that civil conflict, mismanagement and disease affect this region. We note that adding dummy variable for Africa reduces only the magnitude of the doing business indicator coefficient and keeps it statistically significant. This result contrasts with Hanusch [20]. From an econometric point of view, the author introduced several dummy variables (for Africa, East Asia, and Latin America), so the explanatory power of doing business indicator is captured by the set of dummy variables rather than by any single dummy variable.

Unlike Barro [3], the hypothesis of convergence in GDP per capita across countries is not robust. The sign on the initial GDP per capita variable is negative but generally statistically insignificant. This may be explained by the fact that we looked at the growth rate over a very short period of time.

Domestic credit to private sector (% of GDP) is not signed in a manner consistent with conventional understandings of the impact of financial development on growth (De Serres et al. [11], Levine [23], and many others). We find a negative association between Domestic credit to private sector (% of GDP) and growth. There is evidence also that Government consumption expenditure to GDP hampers growth. By contrast, raising Liquid Liabilities appears to help growth. Our findings might be partially explained by the fact that the time period is characterized by the subprime crisis. Various actions have been taken to handle the crisis and to avoid economic recession. Countries have introduced reflationary policy (increase in public spending, money creation, partial nationalization of banks and industrial) but unemployment persists and significant imbalances in the current account balances remain. Besides, according to Barro [3, 4], Grier and Tullock [16], Kormendi and Meguire [22], and many others, the impact of government size on growth depends on how the government uses its revenues. Government investment in infrastructure and education for example may increase growth and employment in the long term. However, an increase in government spending tends to crowd out private investment and reduces productivity growth if the consumption share of government expenditure is far larger than the investment share.

Overall, the results also show that debt service ratio tends to affect negatively economic growth. This finding is consistent with previous empirical evidence.

The coefficient of human capital is generally found to be positive and statistically insignificant at all conventional levels⁹. The result is consistent with the literature on cross-national growth empirics¹⁰. In fact, many studies include a measure of human capital as a determinant of economic growth. However, notable differences are found between the model specifications, the quality of the data inputs and the results obtained.

The coefficient associated to absolute deviation from average has generally not a statistically significant effect on growth¹¹.

⁹Dawson [9] discusses the insignificance of human capital when measures of government institutions are included in cross-country growth regressions.

¹⁰Wilson and Briscoe [29], present a large body of literature that attempt to specify and quantify the link between GNP and human resource.

¹¹ Results obtained are not reported in the table 4.

5. Conclusion

The aim of this paper is to contribute to the debate about the relationship between business regulations and economic performance, taking into account recent advances in empirical analysis. More precisely, we attempt to examine this issue for a sample of 162 countries over the period 2007-2011, using regressions with instrumental variables. Generally, business regulations effects are assessed in terms of the criteria for good governance, this paper focuses on financial development. The results show that most regulation indices have the expected signs and are positively correlated to the average growth rate. Results are robust to several sensitivity exercises. The results are consistent with those of Djankov et al. [12] and Hanusch [20] and support the hypothesis that "good" business regulations is associated with higher economic growth. Although generally disregarded in the previous literature, the negative impact of some indices seems to be logical. As regards the control variables, the impact of some of these variables on growth is not obvious.

Our findings draw some implications for economic policy. It suggests that reforms, which improve business environment, can help poor nations to grow faster. Reform programs should stimulate companies to change their behavior, to enhance investment and to encourage innovation. The economic policymakers should reduce business costs and risk and increase competitive pressure by improving administration and fiscal policies, access to finance, legislation and labour administration, access to information on the market,.... Each country should examine the criteria of business environment separately.

Our study may have some limitations too. We considered a large sample of countries. It is useless to embark on business regulatory reforms by making countries into a single standardized model. Moreover, it is necessary to know why some countries do not have improved their business climates. This might be due to complexities and uncertainties surrounding the cost of implementing reforms. We might say that such cost influences business regulations-growth nexus. Further research is needed to investigate this effect. Besides, the analysis included recent data and the time period was characterized by the subprime crisis. There could be further revealing results if the period is split into pre-crisis and post-crisis periods. This might be feasible since the "Doing Business" dataset is regularly updated. In addition, the latest Doing Business Report includes the 'Getting Electricity' indicator. This opens a track for a new research. We can look at whether countries that are reforming more in this area are growing faster.

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