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# What's the cost of e-Access to Legal Information? A composite indicator

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## Abstract

There is a shared belief that e-government policies can help turning regulatory compliance less costly, thus improving the regulatory environment that surrounds economic growth. While there is a growing volume of literature assessing the economic, political, and social benefits of a good regulatory environment, the effects of online access to legal information on both governance and the business environment have been so far unexplored. On one hand, the *Doing Business* indicators are produced under the assumption of full availability of information on the procedures needed to set up a business. On the other, despite the cost of regulatory information discovery looms large for businesses, institutional economics literature has not yet provided a model for these specific costs of information discovery.

Therefore, the design and implementation of measures for online access to legal and regulatory information proves much needed to gain insights into the costs of information discovery and their effects on the regulatory environment for policy reform that are simply unavailable to us using current methods.

This paper makes two main contributions. First, it provides a model for the costs of discovery of legal information and an empirical test of the relationship between governmental online presence and legal publication, on one hand, and the quality of the regulatory environment, on the other. Second, it shows that current measures of access to legal information are in need of improvement and presents a composite indicator to measure the costs of online access to legal information.

## 1 Introduction

One of the premises of the World Bank's *Doing Business* project is that economic activity requires a business-friendly regulatory environment, with rules that clarify “property rights, reduce the cost of resolving disputes, increase the predictability of economic interactions and rules that provide contractual partners with core protections against abuse”(WB and IFC, 2012). It is

acknowledged that government regulation of business “is an important determinant of growth” (Djankov et al., 2006).

The *Doing Business* indicators thus focus on offering quantitative measures of some components of this regulatory environment, “to provide an objective basis for understanding and improving the regulatory environment for business” (WB and IFC, 2012). As regulations should be designed to be simple and efficient in implementation and accessible to all who need to use them, the 2012 *Doing Business* report included research on how businesses can access information for regulatory compliance on these components (e.g. fee schedules).

As Internet-based e-government initiatives have grown, so too has the role of online access to public-sector information and regulations in fostering transparency and accountability of public processes. In general, transparency has been a major issue in the research agenda for governance, development, and democracy. The basic model states that transparency makes institutions more effective, improves regulatory quality and enforcement, fosters economic growth, and increases the capacity of citizens to make political officials accountable.

In this new framework, it is often said that even as e-government policies make governments more efficient and less corrupt, they can also reduce the costs of regulatory compliance and thus improve the regulatory environment that accompanies economic growth. However, while the empirical assessment of the benefits of a good regulatory environment on governance and economic growth has a solid tradition (e.g., Djankov et al., 2002), the effects of online access to regulatory information on both governance and the ease of doing business remain largely unexplored. On one hand, despite the costs of discovery of rules and regulations are considered relevant for business (Deloitte (2004)), the *Doing Business* indicators do not include them in measurement. On the other, the lack of both cross-sectional and longitudinal data on e-government policies has limited, up to now, the scope of the research in the field either to case studies with little generalization power, or analyses with larger samples of countries but focused only on just one aspect of governance such as corruption.

We believe that better measures for online access to legal and regulatory information (what we refer to e-Access to Legal Information) are both feasible and useful. Moreover, the UN *e-Government Survey* (UNDESA, 2010) offers now the possibility of using cross-sectional data on a large number of countries to empirically assess the impact of current online access to public information and regulations indicators on governance (Kaufmann et al., 2010b) and the ease of doing business (WB and IFC, 2012).

Research based on these current data shows that while UN e-Government indicators are positively related to both the World Bank Governance Indicators (WBGI) and the ease of doing business rank (EoDB), the relationship between the more narrowly targeted *online service index* of the e-Government indicators with ease of doing business presents a series of anomalies. It would appear that the UN’s measure of online services of governments has a positive effect on the business regulatory environment. However, this measure is based on a description of an evolutionary process in the provision of online services by governments that obscures more than it illuminates. Thus, it is not possible, with the current indicators, to know which is the *relevant* type of information that, when online, could increase the country’s performance, especially in

developing countries.

This work's key idea is that online access to legal and regulatory information is key to providing a better regulatory environment for doing business. Access to legal and regulatory information is essential to assess the regulatory environment in context, as "information has become one of the primary inputs in economic processes" (Furuholt and Matotay, 2010). However, current e-Government or Rule of Law indicators do not include separate indices to empirically assess the online availability of legal and regulatory information, or its quality or the ease with which it may be accessed. To bridge this gap, we design a set of empirically-driven indicators to build a composite indicator of e-Access to Legal Information.

We proceed in three steps. First, we present a model of the costs of legal and regulatory information. In particular, section 2 will first explore the theoretical relationship between access to legal and regulatory information and economic performance, to then provide a formal model for the costs of access to legal and regulatory information. Our second stage will start with the effects of online access to public data. To do so, section 3 will first outline the main theoretical approaches to the effects of e-government policies on various aspects of governance; secondly, we test the relationship between different stages of public online presence and both governance and doing business indicators.

On the other hand, in section 4 we test the relationship between access to legal and regulatory information (using an empirical proxy to this concept), and the ease of doing business. In particular, we show how the interaction between e-government policies *and* high levels of legal publishing is relevant to the improvement of the environment for doing business. We thus underscore the need to have specific indicators of e-access to regulatory information. Finally, in the third stage of this paper, sections 5 and 6 are devoted to discuss, design and present a composite indicator of e-access to legal and regulatory information.

## 2 Regulatory information and governance

### 2.1 Information and transaction costs

Despite the general agreement among institutional economists on the role of institutions in providing structure to decision-making (Simon, 1957a) and exchange processes (North, 1990), and on the need to account for transaction costs, a widely shared (1) operational definition of transaction costs and (2) method to measure them is still lacking (Wallis and North, 1986; Wang, 2003; Furubotn and Richter, 2005). In an important effort to operationalize and measure the evolution of transaction costs accross time, Wallis and North (1986) distinguished two categories of economic activity: the transaction function, and the transformation function. Each of these functions have associated costs.

Transformation costs are those incurred when transforming inputs into outputs (i.e., the transformation function). Transaction costs are those "associated with making exchanges"—i.e., "the labor, land, capital, and entrepenurial skill used in making exchanges" (Wallis and North, 1986). In other words, transaction costs are "the comparative costs of planning, adapting, and

monitoring task completion” (Williamson, 1981), thus “the costs of processing and conveying information, coordinating, purchasing, marketing, advertising, selling, handling legal matters, shipping, and managing and supervising” (Polksi, 2001).

While these are general definitions often aimed at easing the process of categorization previous to the measurement of transaction costs (e.g., Wallis and North (1986) for the American economy over time), they also provide a measure of the specialization of transaction costs literature so far. On one hand, Williamson (1985) originated a whole research branch that is primarily focused on “a contracting orientation [that] maintains that any issue that can be formulated as a contracting problem can be investigated to advantage in transaction cost economizing terms”, and thus sees transaction costs mainly as costs of negotiation and enforcement that take place *within* the firm and that are likely to change under different governance structures (Williamson, 1981; Ménard, 1997). On the other hand, other approaches focus more on the nature of the environment of exchange as a source of transaction costs. For instance, Barzel (2002) has developed a full-fledged theory on the origin and role of the state and social institutions in the costs of transferring, capturing, enforcing, and protecting (property) rights. In this line of research, the institutional environment of exchange is a set of rules that facilitates the role of the state as a policing (but also capturing) agent (Barzel, 1997).

Yet, the institutional environment has also been analyzed as a measure of the barriers to carry out economic activity. In this sense, de Soto (1989) carried out a detailed case study on the costs of meeting all the formal (e.g., legal fees) and informal (e.g., personal exchanges) requirements to set up and run any business activity in Peru—i.e., to get into the institutional structure of production (Coase, 2008) or of exchange (North, 1990).

The World Bank’s *Doing Business* Indicators descend from this line of research and in particular from the studies devoted to the identification and measurement of the formal barriers of entry. These include legal and regulatory barriers such as “starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency” (WB and IFC, 2012), but also the time and money required to comply with them (Djankov et al., 2002).

The World Bank’s *Doing Business* project rests upon the assumption that economic activity requires a business-friendly regulatory environment, with rules that clarify “property rights, reduce the cost of resolving disputes, increase the predictability of economic interactions and rules that provide contractual partners with core protections against abuse” (WB and IFC, 2012). In this framework it is even stated that government regulation of business “is an important determinant of growth” (Djankov et al., 2006). Therefore, the *Doing Business* indicators quantify some components of this regulatory environment, and are a good measure of the transaction costs related to the *costs of entry* involved in setting up a business. Yet, they are not a measure of the costs involved in the process of *accessing* the regulations that provide information on these barriers of entry. Indeed, this line of research has left systematically aside the measurement of the costs of *access* to legal and regulatory information.

Despite the need to take these costs into account has been stressed out (Deloitte, 2004),<sup>1</sup> the *Doing Business* indicators assume “that business has full information on what is required and does not waste time when completing procedures” (WB and IFC, 2012), or that “the information is readily available and that all governmental bodies function efficiently and without corruption” (Djankov et al., 2002). Thus, the costs of regulatory information discovery are not included in current indicators. In the following sections we provide a model for these costs.

## 2.2 A model of the costs of access to regulatory information

Knowing the content and keeping track of the myriad of regulations affecting all kinds of products and services is like accessing “a weather report for the business climate” (Bruce, 2012). However, the acquisition of relevant legal and regulatory information is costly. Actually, the first notion of transaction costs accounted for the costs of discovery of (always incomplete) information. In this sense, Coase (1937) emphasized the existence of costs of information related to the discovery of the pricing mechanism, as well as others have considered search and information costs as a natural part of transaction costs (Dahlman, 1979). Moreover, in his theory Barzel (2002) avoids the assumption that knowledge is freely available, committing to the notion that “what one knows is always costly”, and that “the more difficult it is to collect information about a state, the more difficult it is to come to terms with it”.

Despite the central role of the costs of information in the conceptual apparatus of the theories of transaction costs, an effort to measure search costs, and in particular those costs related to the search of legal or regulatory information is still lacking. Here we particularize the notion of the cost of legal knowledge to the cost of discovery of legal information, which includes legal and regulatory information. The next section introduces the notion of costs of access to legal information, while section 2.2.2 outlines a simple model of it.

### 2.2.1 The costs of discovery

The *Doing Business* indicators reflect part of the costs imposed by the institutional structure of the economy in a particular country. The higher the costs of doing business, the higher the transaction costs of “greasing the wheel of trade” (van Dalen and van Vuuren, 2005) within a particular institutional structure, which in turn will “alter relative prices and the technology employed” (North, 1990). Since “growth is a function of productive technology, the quality of inputs, and the institutional structure of the economy” (Wallis and North, 1986), the *Doing Business* indicators provide a common empirical ground to assess the costs of implementing institutional structures and thence growth opportunities across countries (Policy Support Unit, 2011; Wang, 2003; den Butten, 2012).

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<sup>1</sup>“The costs that government rules and regulations impose on citizens and businesses generally fall into three categories: (1) **Finding** which rules and regulations are needed for compliance; (2) **understanding** what the regulations mean and figuring out how to comply with them; (3) **complying** with rules and regulations (typically the biggest cost driver for citizens and businesses)” (Deloitte, 2004).

However, countries not only impose a set of barriers in the form of fees, licenses and time to be spent before the business can be finally set up. Also importantly, they impose gates to the knowledge about those barriers and indeed about every single aspect of the economic activity to be carried out within their territory. More importantly, there are sharp differences in the availability of this valuable knowledge among countries.

Our model of the costs of access to legal information starts with the assumption that access to regulations is a continuous process of information discovery in the maze of legislative and regulatory production. It involves basically two kinds of process. On one hand, since the regulatory system “represents the largest contact surface between government and the governed” in most countries (Casellas et al., 2011), they affect most aspects of any economic enterprise. Therefore organizations must find the regulations relevant (i.e., applicable) to their economic activity. This involves not only discovering the fee schedule as well as the time and money required for setting up their business (i.e., what the *Doing Business* indicators measure), but also determining the specific regulations that affect both the regulated status of their own products (allowed sizes, materials, labeling, etc.) and key aspects of the economic activity itself such as regulations about labor, environmental protection, and so forth.

On the other hand, as the core of governmental policy agenda, the corpus of rules and regulations is in permanent variation, both within regulatory entities (e.g., the pace of regulatory change among regulatory entities may not be uniform (Kerwin, 2003)), and regarding rules and regulations themselves according to the priorities of the governmental policy agenda. Therefore, apart from identifying the relevant regulations to their business, firms must also keep track of regulatory change, which depends greatly on the way regulatory information is produced, published, and updated. For instance, the United States Code (USC) compiles the permanent U.S. federal legislation,<sup>2</sup> while federal regulations are compiled in the Code of Federal Regulations (CFR), “an annual codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government”.<sup>3</sup>

The CFR is divided in 50 titles that represent broad areas subject to Federal regulation: agriculture, food and drugs, judicial administration, energy, etc., and it follows a permanent and paced updating process once per year and on a quarterly basis: Titles 1-16 are updated as of January 1st; Titles 17-27 are updated as of April 1st; Titles 28-41 are updated as of July 1st; Titles 42-50 are updated as of October 1st. At the same time, the Office of the Federal Register publishes daily (Monday to Friday) rules, proposed rules, and notices of Federal agencies and organizations, together with executive orders and presidential documents in the Federal Register. This official publication, created in 1935, “remains not only the daily compendium of almost all activities of the executive branch agencies, but also a principal mechanism for permitting citizens to know about and participate in agency decision making in a timely, uniform manner”(Feinberg, 2001).

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<sup>2</sup><http://uscode.house.gov/>, but see also <http://www.law.cornell.edu/uscode/text>

<sup>3</sup><http://www.archives.gov/federal-register/cfr/about.html>. Our description of the CFR here draws upon what we presented in (Casellas et al., 2011).

Regulations are compiled in the CFR according to their subject matter, in a similar manner as the non-positive law titles of the U.S. Code (USC). “Each title is divided into chapters, which usually bear the name of the issuing agency. Each chapter is further subdivided into parts that cover specific regulatory areas. Large parts may be subdivided into subparts. All parts are organized in sections, and most citations in the CFR are provided at the section level”.<sup>4</sup> Each of these divisions is identified by a heading that specifies generally the content of the text immediately below it. Therefore, the ability to keep track of change within this particular regulatory environment is a technological problem dealing with search within structured if complex material, for which solutions have been proposed (Casellas et al., 2011; Cheng et al., 2008a,b; Lau et al., 2005). While several other countries (especially from the Civil Law legal tradition) may have similar legislative codifications, the U.S. federal regulatory process serves here as a rarity. In most countries regulatory information is not even compiled in the first place, which makes search and retrieval of substantially and timely relevant rules and regulations extremely costly.

### 2.2.2 The model

Due to their nature, the costs of legal information might be considered just another type of transaction costs. These would be typically nonmarketed costs that raise within the firm, which involve assessing the regulatory environment in context by “the processing and conveying of information, a task carried on primarily by clerical workers” or legal professionals (Wallis and North, 1986), as do other kinds of transaction costs. They look like the “resources necessary to measure both the legal and physical attributes being exchanged” often attributed to transaction costs (North, 1990).

However, the costs of legal information can also be conceptualized beyond the transaction function and affecting the whole cost function. These are a function of the *difficulty* of access to the rules and regulations that affect the costs of labor, capital *and* transaction should the business be set up in a particular location and moment. They are part of the “institutional framework [that] will affect both transformation and transaction costs” (North, 1990): the higher the costs of access to legal information, the higher the amount of resources the firm will have to devote to the process of getting to guess what costs are likely to apply in the near future, either in the transaction or the transformation function. In a sense, then, they are *meta-costs* that will have a discount effect on both costs functions.

As in the case of barriers of entry or other transaction costs, institutions establish how costly is to navigate through the maze of regulations affecting business and keeping track of regulatory change. For this reason, the costs of access will be a measure of the complexity of the regulatory environment to which firms must adapt (Simon, 1957b, 1996). We may model the decision for an organization to set up a business in a particular (location within a) country depending on a number of factors associated to both expected benefits and costs. Following the literature

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<sup>4</sup>As described in: <http://www.gpoaccess.gov/cfr/about.html>. See also 1 CFR §8.1-8.9, (Feinberg, 2001).



(Coase, 1937; Demsetz, 1967; Cheung, 1983; Wallis and North, 1986; North, 1990; Ménard and Shirley, 2008) we would conceptualize costs distinguishing between the transformation or production function and the transaction function. Following this simple model the decision may be modeled and represented as a standard utility function:

$$U_i = B - (F + T) \quad (1)$$

where  $B$  is the expected benefit of setting up the business and all the factors within the parentheses are transformation costs ( $F$ ), and transaction costs ( $T$ ) associated to “measuring the valuable attributes of what is being exchanged and the costs of protecting rights and policing and enforcing agreements” (North, 1990). According to the basic function, a firm will set up a business whenever the value of the expected benefits is greater than the sum of costs involved:  $B > (F + T)$ .

As argued above, we do not conceptualize the costs of access to legal information simply as a kind of transaction cost, and thus they are not to be simply added linearly to the regular costs represented in the right-hand part of expression 1. Instead, firms will incur in costs of information regarding the specific regulations on every single aspect of their activity, whether it is part of the transaction or the transformation functions.<sup>5</sup> Therefore, in order for the costs of access to regulatory information to have a multiplicative effect on the whole costs they can be better formalized as a factor of discount. To that effect, we represent the utility function of a firm ( $U_i$ ) that incorporates the costs of regulatory information as outlined in equation 2.

$$U_i = B - \left( \frac{1}{(1 - \delta)} (F + T) \right) \quad (2)$$

where  $\delta$  is the cost of access to legal and regulatory information. Note that conceptually the value of  $\delta$  cannot be negative, and empirically it should be standardized to lie between 0 and 1.

Let us illustrate the discount effect of  $\delta$  in two opposite scenarios. In the first one, a firm intends to set up a business in country A, where legal and regulatory information is fully available, for instance it would be openly, freely published and regularly updated. This implies that, regardless of the technology used, access to rules and regulations is practically costless, and thus  $\delta$  is very small, very close to zero. In this scenario, the firm that intends to carry out economic activity in that country will incur no extra costs for setting up a business than  $(F + T)$ .

On the contrary, an opposed case would be country B, where the access to regulatory information is gated, locked up. Typically, in country B rules and regulations will be only available at high cost: they may be poorly published and the update process may be obscure. In such extreme case, the value of  $\delta$  would be close to 1, and then the firm would incur in infinitely high extra costs for setting up the business. In particular, if  $\delta = 1$ , then  $U_i = B - \left( \frac{1}{0} (F + T) \right)$ , and therefore  $U_i = -\infty$ .

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<sup>5</sup>There will be regulations on applicable taxes, regulations on labor market, regulations on capital exchange, and regulations on the protection of property rights and contract enforcement.

When would  $\delta$  be too high for a firm to be able to set up a business? Following up equation 2 we can obtain a critical point for  $\delta$  ( $\delta^*$ ) where the costs of regulatory information will make the costs higher than the expected benefits. According to this, for firm  $i$  to set up a business, the utility function must satisfy  $U_i > 0$ , which can also be expressed as in equation 3:

$$(U_i =) B - \left( \frac{1}{(1 - \delta)} (F + T) \right) > 0 \quad (3)$$

Using some algebra we can solve the inequality for  $\delta$  obtaining the critical value for the costs of regulatory information ( $\delta^*$ ):

$$\delta^* < 1 - \left( \frac{F + T}{B} \right) \quad (4)$$

which means that the critical  $\delta$  ( $\delta^*$ ) must be smaller than one minus the ratio between costs ( $F + T$ ) and expected benefits ( $B$ ). This is obvious since equation 4 implies that if the costs of setting up a business ( $F + T$ ) were higher than the expected benefits *regardless* the cost of regulatory information, the value of  $\delta^*$  would be negative, which is impossible. Therefore, high costs of access to regulatory information will only be accepted if regular costs ( $F + T$ ) are tiny and smaller than benefits.

### 3 e-Government and the environment for Doing Business

The expansion of the Internet and e-government policies has emphasized the role of online access to public information and data in fostering transparency and accountability of public processes. In this new framework, a common statement is that while e-government policies can make governments more efficient and less corrupt, they can also improve citizen empowerment through wider and better participation (G8 and UNDESA, 2002).

In May 2002, the Italian Presidency of the G-8 and the U.N. issued an Action Plan titled *e-Government for Development* (G8 and UNDESA, 2002) in which e-government policies were presented as key factors for the future advancement of economic growth, social development, and governance. The document aimed at “providing guidelines and a platform [...] to support building the required capacity of the public service to become more efficient and effective”, expecting these guidelines to enable “governments and other development actors to use [them] as a means to enhance governance, address poverty and foster democracy and development”.

The predicted effects of e-government on governance included greater accountability and transparency in public administration, better coordination and cooperation between government agencies, alliances and partnerships with private sector and non-governmental organizations, improved communications and public relations, increased awareness of rights of civil society and obligations of government, greater public participation in governments’ affairs, streamlined government structure and business processes, enabling legal infrastructure and policy and

regulatory frameworks, promotion, protection and compliance of human rights, regional integration, and enhanced capacity to coordinate and cooperate at international level.

These items capture some shared beliefs on the ways e-government may help improve the quality of institutions and the way government is carried out. Moreover, they also capture questions that have driven most research on the political effects of e-government. Does e-government have such positive effects in all these dimensions of governance? Does e-government affect each dimension of governance in the same way in different kinds of political regimes? To these questions we should add whether e-government policies increase access to legal and regulatory information.

The research carried out on the effects of the spread, implementation, and evaluation of e-government policies has been so far quantitatively vast and methodologically rich (Heeks and Bailur, 2007), with three broad areas of general focus. A first group of research deals with the effect of e-government policies on the quality of government itself or government output. The main argument is that the implementation of e-government policies (such as e-administration) can make public services both more efficient and effective by reducing transaction costs between citizens/organizations and administrations (Lipovsek and Bojnec, 2007), making administrations less wasteful (Angelopoulos et al., 2010), or increasing the quality of the delivery of key public services (Papadopoulos et al., 2010).

A second area of research focuses on the effect of e-government on the quality of the institutions within which public and private actors interact, with two main arguments. First, governments can effectively reduce corrupt practices within public administration, with the elimination of personal contact between public officials and the public (Shim and Eom, 2008; Aldashev, 2009; Djankov et al., 2002). Second, e-government tools can be powerful informational mechanisms that enable citizens to gather relevant information to hold public officials accountable (e.g., reducing incentives to incur in corrupt practices) (Andersen, 2009; Bertot et al., 2010; Kim et al., 2009).

Intensely related to the previous thread, a third area of interest focuses on the effect of e-government on increasing transparency and accountability as core requisites for democracy. The main argument here is that high levels of transparency and accountability improve the quality of the democratic context such as the selection processes leading to political offices, higher levels of basic freedoms, and smoother relationships between public institutions and citizens (Farina et al., 2010; Kolsaker and Lee-Kelley, 2006; Jaeger, 2005; Johnson and Kolko, 2010; Lollar, 2006; McHenry and Borisov, 2006).

### **3.1 e-Government and access to regulatory information**

The UN has been measuring e-government through the e-Government index composite indicator at an irregular pace (2003, 2004, 2005, 2008, 2010, 2012). The U.N. e-Government index assesses e-government performance through the analysis of three subindices:

- The *telecommunication infrastructure index*, with data from the International Telecommu-

nication Union, is a composite of five indicators: the number of personal computers per 100 persons, the number of Internet users per 100 persons, the number of telephone lines per 100 persons, the number of mobile cellular subscriptions per 100 persons and the number of fixed broadband subscribers per 100 persons.

- The *human capital index* is a composite of two indicators from the United Nations Educational Scientific and Cultural Organization and the 2009 UNDP Human Development Report: adult literacy rate and the combined primary, secondary, and tertiary gross enrollment ratio.
- Finally, the *online service index* attempts to capture a country's government online performance "in a single internationally-comparable value using a four-stage model of online service maturity". This index assumes a four-stage model based on the fact that "countries typically begin with an emerging online presence with simple websites, progress to an enhanced state with deployment of multimedia content and two-way interaction, advance to a transactional level with many services provided online and governments' soliciting citizen input on matters of public policy, and finally to a connected web of integrated functions, widespread data sharing, and routine consultation with citizens using social networking and related tools" (UNDESA, 2010).

In order to evaluate the effect of e-government services (UN *e-Government Survey*, UNDESA (2010)) on the regulatory environment for doing business (WB and IFC, 2012), first we briefly assess, as a starting point, the relationship between e-government and the quality of government using data on government effectiveness and control of corruption. All the data analyzed correspond to 2012 (or the latest available) from a set of 181 countries for which regular data exist. Government effectiveness and control of corruption data are part of the *Worldwide Governance Indicators* developed by the World Bank (Kaufmann et al., 2010b).<sup>6</sup>

As stated above, it is generally affirmed that there is a positive relationship between governance and regulatory environment, and that the quality of governance increases when e-government policies are implemented. As shown in the first two columns of Table 1 and in figures 1a and 1b below, e-government seems to be a key factor in reducing corruption and increasing government effectiveness. As expected, even when controlling for wealth and democracy, the level of e-government development is associated with high levels of government effectiveness and control of corruption, the relationship being stronger in the former case.

The results also show a positive relationship between e-government policies and good regulatory environment. In particular, each unit of increase in the e-Government index will

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<sup>6</sup>The linear models fitted and discussed throughout this section include two fixed control variables in order to account for both economic and political development: income per capita and level of democracy. We use available data on GDP per capita (from the *World Bank Data Portal*) as a proxy for income, and a binary transformation of the type of regime from Polity IV (Marshall and Jaggers, 2010), as a proxy for level of democracy. Since Polity IV does not provide data on countries with population below 1 million, we adapt the scores provided by Freedom House for smaller countries, <http://www.freedomhouse.org>.

**Table 1:** Results of OLS models on the relationship between the UN e-Government index and three dimensions of governance: government effectiveness (left), and control of corruption (center), and Ease of Doing Business rank (right).

	Effectiveness	Corruption control	EoDB rank
(Intercept)	-0.21*	-0.48*	6.17*
	(0.06)	(0.09)	(0.37)
UN e-Government Index	0.56*	0.33*	-3.32*
	(0.09)	(0.13)	(0.51)
GDP capita (log)	0.05*	0.08*	-0.04
	(0.01)	(0.02)	(0.07)
Type of regime (ref. democracy)	0.06*	0.08*	0.06
	(0.02)	(0.03)	(0.10)
<i>N</i>	181	181	174
<i>R</i> <sup>2</sup>	0.77	0.63	0.60
Resid. sd	0.10	0.15	0.59

Standard errors in parentheses

\* indicates significance at  $p < 0.1$

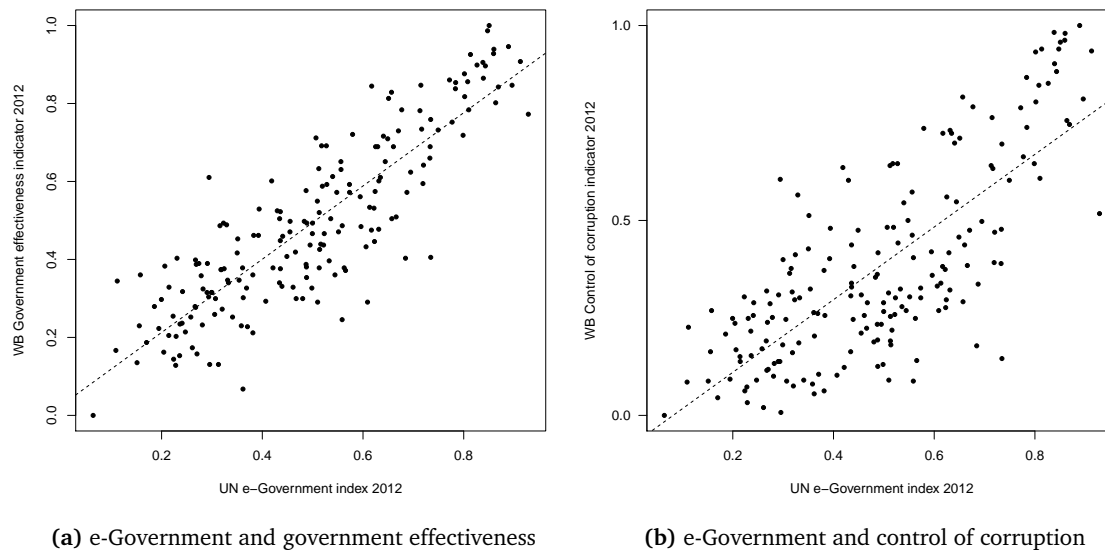
result on average in an improvement of 3.6% in the Ease of Doing Business ranking even controlling for income and level of democracy.<sup>7</sup> In spite of the sign of the coefficient, throughout this work we speak of a “positive relationship” because a lower position in the rank means a *better* business regulatory environment. To ease interpretation, graphics representing the ease of doing business rank have their y-axis flipped so that *higher* positions in the rank (i.e., closer to 1) appear also higher in the axis. The panels in Figure 2 are the first examples.

As stated before, the UN e-government indicator is not limited to information on the online presence of governments; it is also combined with a country’s level of education and literacy, and its telecommunications infrastructure. If we separate the composite index into its three components, and examine them separately, noteworthy patterns arise. Regarding telecommunication infrastructures, Figure 2a shows that countries with a higher *telecommunication infrastructure index* present, on average, a better environment for doing business. In particular, a one-unit increase in the telecommunications index implies an average improvement of 11.3% in the EoDB ranking.

Figure 2b shows that the same kind of relationship exists between the *human capital index* (HCI) and ease of doing business. However, the relationship has no statistical significance when controlled for income per capita and a democratic institutional environment (see Table 2).<sup>8</sup> Finally, if we analyze the relationship between the EoDB rankings with the *online service index*

<sup>7</sup> $\exp(-3.32) = 0.036$

<sup>8</sup>This may be explained by the fact that the median of the HCI is very high (0.79). Therefore, since a very large number of countries have high levels of literacy and education as measured by HCI, their score in this index makes no relevant difference to their position in the EoDB ranking. The HCI would thus seem to have some kind of nonlinear gating effect: while a certain level of HCI is necessary for a good regulatory environment, further increases in HCI beyond that threshold have little effect on the regulatory environment.



**Figure 1:** Two different examples of the relationship between e-government and governance [Data sources: WBGI 2012; UN e-Government Survey, 2012.]

(OSI) taken as a whole, we can observe the same positive tendency, as showed in Figure 2c. According to the results, a better level of OSI will, in average, result in a better position in the ease of doing business ranking.

This finding is not only consistent with previous findings on the relationship between both governance and e-government indices and the EoDB ranking, but suggests that the relationship between online presence and EoDB is linear and stronger than with the other components of the UN e-Government index. In particular, when controlling for GDP per capita and level of democracy, an increase of one unit in online presence (OSI) is associated with an average increase of 12.5% in the EoDB ranking.

### 3.2 Online Presence and Ease of Doing Business Rank

According to the UN documentation, the online presence of a government (the UN *online service index*) is assumed to evolve through four benchmarks or stages. The first stage, *emerging presence*, evaluates a country's provision of basic information online, "a formal but limited web presence is established through a few independent government websites which provide users with static organizational or political information. Sites may include contact information (i.e telephone numbers and addresses of public officials)." (UNDESA, 2002). The second stage of online development, *enhanced presence stage*, evaluates the use of multimedia technology by

**Table 2:** Results of OLS models regarding the relationship between the components of the UN e-Government index separately and the Ease of Doing Business ranking. The components are the level of telecommunications infrastructure (left), human capital (center), and online services (right).

	EoDB rank (log)	EoDB rank (log)	EoDB rank (log)
(Intercept)	5.98*	7.87*	6.79*
	(0.45)	(0.29)	(0.29)
Telecom. infrastructure	-2.18*		
	(0.42)		
Human capital		-0.06	
		(0.41)	
Online Services Index (OSI)			-2.08*
			(0.29)
GDP capita (log)	-0.12	-0.42*	-0.19*
	(0.07)	(0.05)	(0.05)
Type of regime	0.01	-0.08	-0.06
	(0.10)	(0.11)	(0.10)
<i>N</i>	176	176	173
<i>R</i> <sup>2</sup>	0.57	0.50	0.62
Resid. sd	0.61	0.66	0.58

Standard errors in parentheses

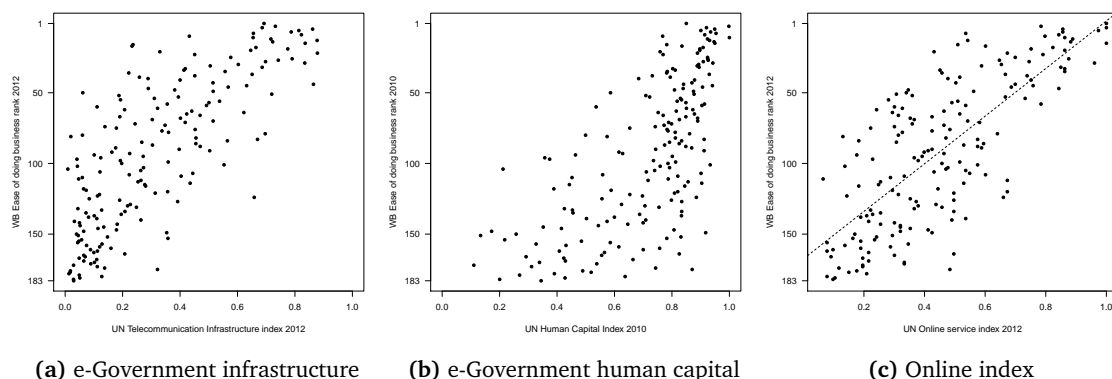
\* indicates significance at  $p < 0.1$

the national government and the promotion of two-way exchanges with citizens. This stage is painted with a very broad brush, and includes an extremely wide range of government institutions and services. Among the many listed are access to dynamic and specialized, frequently updated information; availability of government publications, legislation, newsletters, search features, and downloadable forms. Interaction services are also included and may, in turn, range from the availability of e-mail addresses to more sophisticated interactions between citizens and service providers. The following two stages, *transactional* and *connected* presence, are focused on advanced government use of the Internet for the delivery or connection of public services, and on the solicitation of occasional or routine input on matters of public interest.

It would thus seem that legal and regulatory information must arrive online during the *enhanced* stage, since, on one hand, the *emerging* presence only accounts for very basic governmental information, and the last two benchmarks are based upon the delivery of very advanced services through the Internet. We therefore focused on the analysis of the *enhanced* stage.

We should expect that those countries that present higher levels of *enhanced* presence are also better positioned in the EoDB ranking, and vice versa. In order to assess that statement, in Figure 3 we distinguish countries with high and low levels of *enhanced* presence and plot them against the same graph used in Figure 2c representing the relationship between the *online service index* and the ease of doing business ranking.<sup>9</sup>

<sup>9</sup>The threshold between high and low levels of *enhanced* presence has been established at the value of the median level of enhanced presence (62).

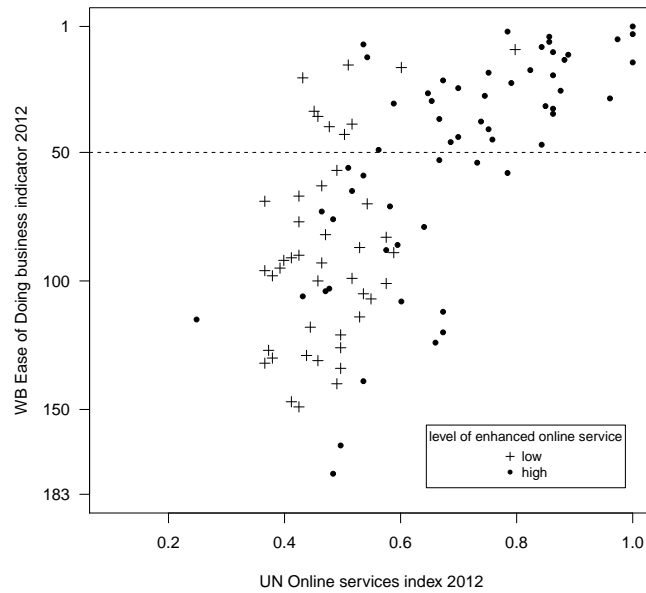


**Figure 2:** Relationship between the UN Telecommunications Infrastructure, Human Capital, and Online Services indices with the ease of doing business rank (1=highest; 183=lowest). [Data sources: WB Doing Business 2012; UN e-Government Survey, 2012.]

The results in Figure 3 display those countries with lower levels of *enhanced* presence with cross symbols, and those with higher levels with solid dots. In contrast to what we expected, apart from the first 50 highest ranked countries in the ease of doing business (those above the dotted line), countries with different levels of *enhanced* online presence do not seem to present relevant differences regarding the ease of doing business rank—those countries with higher levels of *enhanced* presence do not appear to be better positioned in the rank. In fact, countries that have high *enhanced* online services can appear among the lower positions of the ranking, while countries that have low *enhanced* online services can appear in better positions.

That may be due to the fact that the *enhanced* presence sub-index assesses a too-wide generic variety of information regarding public websites and services. We believe that a better understanding of what does make a difference between those countries in terms of online services and access to information could be highly relevant to improvements in the ease of doing business. The methods now in use are flawed and inaccurate. In particular, all-encompassing indicators, such as *enhanced* trends include too many features to capture fundamental data that could determine which actions, policies, or improvements in online-services provision are most likely to produce the greatest positive effects on the business climate. Currently, this indicator includes a wide variety of government services and it is unclear which are exactly those services, and in what amount are they accounted for in each country. These services include the number of official websites; whether dynamic and specialized information is frequently or regularly updated; the links to other official pages; the availability of government publications, legislation, newsletters, etc.; whether search features and e-mail addresses are available; the access to a wide range of government institutions and services; whether formal interactions between citizens and service providers are available; and the capacity to search specialized databases





**Figure 3:** Relationship between e-government *online service index* and ease of doing business rank (1=highest; 183=lowest). Cross symbols indicate low levels of *enhanced* online presence; black dots indicate high level of *enhanced* online presence. The horizontal dotted line marks the 50th country in the EoDB rank. [Data sources: UN e-Government Survey 2012; WB Doing Business 2012.]

and download or submit forms and applications. Also, as it is already mentioned in the UN *e-Government Survey 2010* (UNDESA, 2010), “most of the statistics are derived from supply side indicators and often by website assessments alone. Little information is yet available on the demand side of e-government. Few surveys exist that would indicate ‘how’ citizens use these services and ‘what’ they see as maximizing public value”.

Therefore, there is a need to discover which is the relevant public information required to improve the regulatory environment. Our hypothesis is that *access to regulatory, procedural, and legal information is what makes this difference*.

#### 4 Approximation to the access to legal and regulatory information

To our knowledge there are no indicators or sets of indicators to measure the access, quality, availability of legal, regulatory and procedural information available to the public. To support our hypothesis, we use an existing, although limited, approximation to this idea that can be found within the Rule of Law Index elaborated by the World Justice Project (Agrast et al.,

2011).<sup>10</sup> This Index is a composite indicator that combines nine dimensions of the rule of law: (1) limited government powers; (2) absence of corruption; (3) order and security; (4) fundamental rights; (5) open government; (6) effective regulatory enforcement; (7) access to civil justice; (8) effective criminal justice; and (9) informal justice.

Of these nine dimensions, the Open Government dimension takes into account the publication of laws, “the extent to which the society has clear, publicized, and stable laws; whether administrative proceedings are open to public participation; and whether official information, including drafts of laws and regulations, is available to the public” (Agrast et al., 2012), since “[t]his factor includes at its core the opportunity to know what the law is and what conduct is permitted and prohibited. This requires that the law be comprehensible and its meaning sufficiently clear, publicized, and explained to the general public in plain language, for them to be able to abide by it” (Agrast et al., 2011). Originally this Open Government subindex consisted of 36 variables combined in six sub-factors: (1) “the laws are comprehensible to the public; (2) the laws are publicized and widely accessible; (3) the laws are stable; (4) the right to petition the government and public participation is effectively guaranteed; (5) official drafts of laws and regulations are available to the public; (6) official information is available on request” (Agrast et al., 2011).<sup>11</sup>

The World Justice Project provided data on 97 countries for 2012. In order to test our main hypothesis we proceed in two steps. First, we will test whether the open availability of rules and regulations (represented by the World Justice’s Open Government indicator (OGRoL)) makes a difference in the position countries have in the EoDB ranking. Second, we will test whether it is the combination of online presence and open access to rules and regulations what makes a difference in the EoDB ranking position.

To perform the first test we regress the position of countries in the EoDB ranking on their level of open government according to the OGRoL indicator through an OLS regression model, including the same control variables that we have included in all the previous models. The results are in the first column of Table 3, that show that countries that have higher OGRoL index (i.e., countries with higher levels of legal and regulatory access) tend to attain higher levels of ease of doing business rank, even when controlling for income per capita and level of democracy. Yet, is there a relationship between having higher legal access and more online presence? And, is precisely the combination between these two variables what makes a difference?

First, Figure 4 provides a visual test. The figure superimposes the level of the OGRoL index for the 97 countries available for 2012 onto the general relationship between the UN *online service index* and the rank of ease of doing business (represented by grey dots). The level of Open Government of the Rule of Law Index has been converted into a categorical variable with only two values: *high* level of OGRoL (blue) means having a level above the median value

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<sup>10</sup><http://worldjusticeproject.org/>

<sup>11</sup>In the 2012 version of the World Justice Index of Rule of Law (Agrast et al., 2012), the Open Government sub-index has been reduced to 4 sub-factors (by merging the previous 1 and 2, and 5 and 6 into two sub-factors), but the sub-index yields the same conceptual idea.

**Table 3:** Results of OLS model on the relationship between World Justice’s Open Government sub-factor and the Ease of Doing Business ranking, for 2012.

	EoDB rank (log)			
	Model 1	Model 2	Model 3	Model 4
(Intercept)	6.79*	6.62*	5.73*	5.94*
	(0.29)	(0.41)	(0.69)	(0.52)
Online Services Index (OSI)	-2.08*	-2.09*	-0.30	-0.91
	(0.29)	(0.51)	(1.22)	(0.79)
GDP per capita (log)	-0.19*	0.04	-0.00	-0.13
	(0.05)	(0.08)	(0.08)	(0.08)
Type of regime (democracy)	-0.06	0.30*	0.27	0.14
	(0.10)	(0.14)	(0.14)	(0.15)
OGRoL		-3.76*	-1.31	
		(0.65)	(1.65)	
OSI x OGRoL			-3.20	
			(1.98)	
OGRoL (dichotomic)				1.08*
				(0.42)
OSI x OGRoL (dichotomic) (high)				-2.66*
				(0.77)
<i>N</i>	173	95	95	95
<i>R</i> <sup>2</sup>	0.62	0.72	0.72	0.66
Resid. sd	0.58	0.56	0.56	0.61

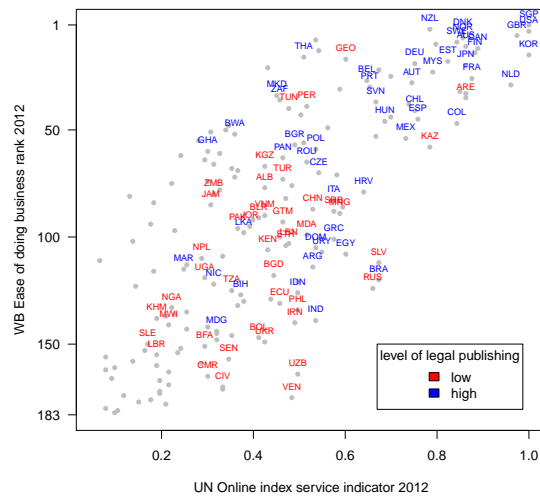
Standard errors in parentheses

\* indicates significance at  $p < 0.1$

(0.48), and *low* level (red) means an OGRoL index below the median value.<sup>12</sup> The figure shows that, for the countries available, having a high level of OGRoL is relevant to the position of the countries in the rank of ease of doing business. Results in the second column of Table 3 show that controlling for wealth and democracy, both the online service index (OSI) and the level of OGRoL have significant effects on the rank of ease of doing business. When we add an interaction term between the level of OGRoL and the level of *online service index* in order to test whether it is the combination of these two elements that makes the difference, interesting patterns arise.

First, in the third column of Table 3 the coefficient of the constitutive term of the online services index (-0.30) indicates that when there is no availability of rules and regulations (OGRoL is zero), the level of online presence has an improving (though not statistically significant) effect on the ease of doing business. However, even if the coefficient were significant, this would of very little use for the analysis since there are no countries in the sample with zero availability of legal publications (OGRoL = 0). If instead of the continuous version of the OGRoL variable, we use the dichotomic transformation of the variable with just two values (high and low) with

<sup>12</sup>In the new dichotomic variable measuring OGRoL, countries with high level of OGRoL take value 1, and those with low level take value 0.

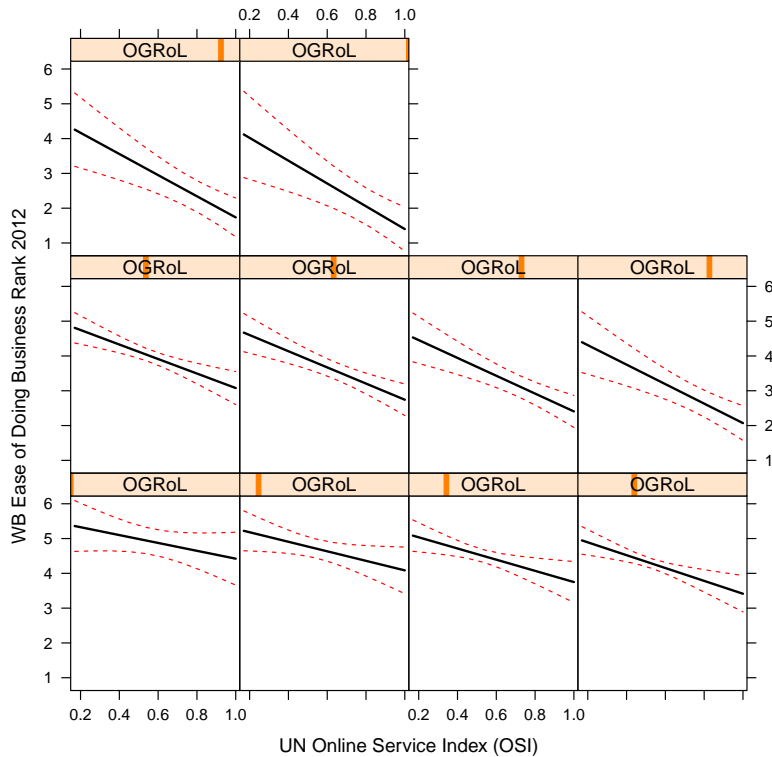


**Figure 4:** Relationship between the online services index, ease of doing business rank (1=highest; 183=lowest), and level of legal publishing. [Data sources: UN e-Government Survey 2012; WB Doing Business 2012; The World Justice Project 2012]

respect to the median value—that we used in Figure 4—the results are clearer. The fourth column in Table 3 shows that when combined with high levels of legal publications ( $OGRoL = 1$ ), the level of the online service index has an improving and significant effect in the ease of doing business rank. However, when either the online presence or the level of legal publications are present alone, their effects are either depressive (1.08) or non significant on the EODB ranking. Figure 5 graphically illustrates this interaction: how the marginal effect of the level of online presence (OSI) on the ease of doing business rank (EoDB) changes across the continuous range of the original variable measuring legal publishing ( $OGRoL$ ).

The panels of the figure should be read bottom-up and left to right. This way, for instance, the lower first-to-the-left panel shows the marginal effect of online presence on the ease of doing business ranking *when the  $OGRoL$  is lowest*. At this low level of legal access the model predicts that having high levels of online presence may make very little difference in a country’s position in the EoDB ranking (the slope of the effect line is smaller). On the contrary, the mid- and upper-left panels show that *at medium to high levels of legal publishing*, also having high levels of online presence has a significant reducing effect on a country’s position on the EoDB ranking, i.e., an improvement of its business environment (the line is steeper).

In conclusion, when the level of legal publishing increases those countries that have low levels of legal information publishing tend to occupy lower ranks in the EoDB ranking (they lose positions in the ranking). Therefore, if we compare these results (Figure 4) with the ones obtained when we took into account the *enhanced* service index (Figure 3), we may conclude



**Figure 5:** Effects of the interaction between the online presence and the level of legal publishing on the ease of doing business rank.

that (1) having availability and access to legal information (2) combined with moderate online presence *does* have an impact on the regulatory environment. This analysis of the impact of OGRoL indicator focused on the publicity of laws shows a promising direction and stresses the need of having better measures of the online access to legal and regulatory information for providing a better regulatory environment. In the next section we propose such a measurement instrument.

## 5 eALI: composite indicator of e-Access to Legal Information

There are numerous projects that involve the construction and analysis of indicators regarding a great variety of aspects of democracy (Boix, 2003; Norris, 2008; Cheibub et al., 2010; Marshall and Jaggers, 2010),<sup>13</sup> economic growth (Acemoglu, 2009),<sup>14</sup> governance (Kaufmann et al.,

<sup>13</sup>See e.g., [www.freedomhouse.org](http://www.freedomhouse.org) and <http://www.systemicpeace.org/polity/polity4.htm>

<sup>14</sup>See e.g., [data.worldbank.org](http://data.worldbank.org)

2010a),<sup>15</sup> the rule of law (Nardulli et al., 2013), and openness of information and data.<sup>16</sup> Moreover, projects around the Free Access to Law movement<sup>17</sup> such as the Canadian “Free Access to Law: Is Here to Stay?”<sup>18</sup> have focused more on how can Free Access to Law initiatives be sustainable than on comparing the specific effects of free access to law in varied scenarios. However, although some of these projects do involve building indicators regarding the rule of law, transparency, and accountability, there is a clear lack of comparable indicators that account for any of the potentially relevant aspects of the costs of discovery of legal information. In particular, to our knowledge there is no single indicator (1) that focuses specifically on legal information, (2) that distinguishes between different types of legal information available, and (3) that accounts for some measure of the quality of the legal information that countries make accessible. We propose a composite indicator of e-access to legal information that meets these features.

### 5.1 Dimensions of the indicator of e-Access to Legal Information

The objective of the indicator of *e-Access to legal information (eALI)* is to *measure the difficulty of online access to legal information* as a way to assess the costs of access to legal information. E-access to legal information is here observed through a wide lens: we are not only interested in the features of the legal information available in each country, but also in the *actual* capacity of that country and its people to access legal information online. In other words, access to legal information may be limited not only by disfunctions in the system of provision of legal information itself, but also by constrains that originate at the policy level (e.g., open access policy, commitment to freedom of information) and at the basic level of educational and infrastructural capacities. Therefore, we believe that an effective measure of e-access to legal information must not only account for the extent to which people are *free* to access legal information, but also to what extent they are able to *exercise* that access (Sen, 1999; Przeworski, 2003).

To this end, our notion of e-access to legal information has been divided into four theoretical dimensions, each of which representing a different contribution to our notion of e-access to legal information: capabilities (*C*), policy (*P*), availability (*A*), and quality (*Q*). Each component of this four-fold structure is measured through a number of indicators, which we comment and discuss in the following sections. The first two dimensions can be measured with already available data, while as argued above no systematic data exist so far to measure the availability and quality of legal information. We present an instrument to measure the availability and

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<sup>15</sup>See also <http://governancejournal.net/>, and <http://www.moibrahimfoundation.org/en/section/the-ibrahim-index>

<sup>16</sup>See e.g., the Open Economics Working Group, ([openeconomics.net](http://openeconomics.net)), the Open Knowledge Foundation's open-government e-mail list, and catalogues on open data such as <http://wiki.okfn.org/Wg/government> and <http://opengovernmentdata.org/data/catalogues/>.

<sup>17</sup><http://www.worldlii.org/worldlii/declaration/>

<sup>18</sup><http://blog.law.cornell.edu/voxpath/2009/07/15/is-free-access-to-law-here-to-stay/>

quality of legal information that we shall combine with the already existing data to constitute a composite indicator.

### 5.1.1 Capabilities

The first dimension deals with the *capabilities* regarding online access in general. This dimension is at the core of any composite indicator that wants not only to capture the formal existence or potential enjoyment of access to information but the basis for an autonomous (Sen, 1999) and effective (Przeworski, 2003) exercise of it. To this end, the Capabilities dimension ( $C$ ) captures the capacity of a country to access information, following standardized guidelines for the construction of composite indicators (OECD and EC, 2008), and includes two basic indicators.

On one hand, we produce an indicator to measure the ability of the population to access and process information: the educational capability indicator ( $C_e$ ). Cross-sectional data on educational attainment are publicly available and widely used in numerous composite indicators, such as the UN Human Development Index,<sup>19</sup> as well as very well tested and documented (Barro and Lee, 2010). We adopt here the education component of the UN Human Development Index, which combines the average number of years of schooling for adults aged 25 years, and the expected years of schooling for children of school entering age.

The second indicator for the Capabilities dimension captures the capacity of a country in terms of telecommunications infrastructure for online access to be effectively carried out. To create the indicator of telecommunications capability ( $C_t$ ) we use the UN's *Telecommunication infrastructure index*, which is “an arithmetic average composite of five indicators: estimated internet users per 100 inhabitants, number of main fixed telephone lines per 100 inhabitants, number of mobile subscribers per 100 inhabitants, number of fixed internet subscriptions per 100 inhabitants, and number of fixed broadband facilities per 100 inhabitants” (UNDESA, 2012).

The formal definition of the Capabilities sub-index  $C$  is outlined in equation 5.

$$C_i = \sum_{z=1}^Z C_{zi} \quad (5)$$

where  $z$  are the normalized values for each  $C$  individual component of the Capabilities dimension for each country  $i$ :  $C_e$  for educational attainment and  $C_t$  for telecommunication infrastructure. The  $Z$  weights are calculated so that the  $C$  sub-index will have an empirical value range  $[0,1]$ .

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<sup>19</sup><http://hdr.undp.org/en/statistics/hdi/>

### 5.1.2 Policy

The second dimension deals with a country's general *online policy* ( $P$ ). To measure it we approach online policies through two different indicators. The first one ( $P_j$ ) measures the formal aspect of online policy, what Gavelin et al. (2009) call the *de jure* infrastructure of open government, and it captures the extent to which governments make an effort to build a credible legal/institutional framework that facilitates the access to public information. A promising and well documented data on the framework for online policy could have been OECD's "Transparency in Governance" for the composite government performance indicator (OECD, 2011). Unfortunately, data still lack continuity, a uniform composition and accessibility, and tend to only apply to OECD member states. Instead, the World Bank's "Voice and Accountability" indicator can be used to approximate the institutional framework for public access to information (Kaufmann et al., 2010a).

The second policy-related indicator measures the government's actual online presence, its e-government readiness ( $P_r$ ). To do so we draw upon part of the most recent development of the United Nations' *online service index*. As discussed in section 3.1 the UN's *online service index* corresponds to a four-stage vision of e-government development (UNDESA, 2012): emerging, enhanced, transactional, and connected presence. It thus captures the extent to which information online is offered. However, there is a good chance that the more advanced stages of online readiness (especially the enhanced stage) include the provision of different kinds of legal information online, which would make the inclusion of the whole *online service index* in our indicator least advisable. In order to avoid collinearity, then, we will here use a lightweight measure of online presence, corresponding to the first component of the UN's *online service index*: emerging presence, which measures the extent to which governments make a minimum effort to provide very basic online services.

The formal definition of the Policy sub-index  $P$  is outlined in equation 6.

$$P_i = \sum_{z=1}^Z P_{zi} \quad (6)$$

where  $z$  are the normalized values for each  $P$  individual component of the Policy dimension for each country  $i$ :  $P_j$  for the legal/institutional framework of open information, and  $P_r$  for the country's online emerging presence. The  $Z$  weights are calculated so that the  $P$  sub-index will have an empirical value range [0,1].

### 5.1.3 Availability

Access to legal information is a complex concept. Firms must seek information on the legal status of their products and their activities. This information is usually legal information, but it not only includes laws and statutes. Rather, it mostly implies searching rules and regulations that are not typically issued by legislative bodies but governmental agencies or ministries (Kerwin, 2003, 2008). Under some legal systems, useful legal information may also be found in



judicial material such as judgments or other judicial decisions that may affect the interpretation on the application of particular rules and regulations. Since systematic data regarding online access to legal information does not exist, to capture the different dimensions of access to legal and regulatory information a questionnaire has been designed. The questionnaire captures (1) the extent to which legislative, executive and judicial information is available to the public, and (2) the quality of that access to information.

The design of the questionnaire has involved several rounds of expert discussion from both the legal domain (e.g., UAB's Institute of Law and Technology)<sup>20</sup> and free legal information providers (e.g., Cornell's Legal Information Institute (LII)).<sup>21</sup> We finally achieved a measurement instrument that, on one hand, is sufficiently granular and comprehensive so that it gives substantive weight to both the availability of legal information (59 questions) and its quality of access (49 questions), and on the other, gathers all the information separately for the most relevant kinds of legal information. Therefore, it comprises legal information from the legislative, executive, and judicial branches. Regarding judicial information, in turn, we separate the information from High Courts, Courts of Appeal and Lower Courts. The first version of the questionnaire is administered online, and it may be consulted upon request.

The first dimension of access (availability) constitutes the third sub-index of our composite indicator of e-access to legal information, which deals with the *type* of legal information available online and *how* is it available. In particular, it intends to capture (1) what kind of information is published, (2) who publishes it, (3) under what conditions it is published, (4) the regularity of publication, and (5) its contextualization. In order to capture these features in some detail, the 59 first questions of the questionnaire serve to build a sub-index of legal information Availability (A) that comprises the following 11 different separate indicators (corresponding questions in the questionnaire are in parentheses):

1. **Publication** ( $A_p$ ): whether or not at least some portion of each type of legal information (legislative, executive, judicial) is available online
2. **Completeness** ( $A_c$ ): whether legal information available online includes only final documents (acts, rules, etc.) or it also includes deliberative documents such as drafts or committee discussions
3. **Accompanying documentation** ( $A_d$ ): whether any other documentation that can help understanding legal information (e.g., glossaries, guidelines) is available online
4. **Volume** ( $A_v$ ): how much of each type of legal information is available online
5. **Source** ( $A_s$ ): whether legal information online is available from public or private official sources

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<sup>20</sup><http://idt.uab.es/>

<sup>21</sup><http://www.law.cornell.edu/>

6. **Source status** ( $A_{ss}$ ): when legal information is available through non-official sources, whether they are commercial or non-profit; whether they are national or foreign
7. **Cost** ( $A_x$ ): whether legal information is available for free or not
8. **Time** ( $A_t$ ): whether legal information is available in a timely manner
9. **Enforceability** ( $A_e$ ): difficulty to assess whether a piece of legal information is in force; only applicable to legislative and executive legal information
10. **History** ( $A_h$ ): difficulty to keep track of the history of a piece of legal information
11. **Amendment** ( $A_m$ ): difficulty to assess whether a piece of legal information is in the process of being amended; only applicable to legislative and executive legal information

Equation 7 presents the formal definition of the Availability sub-index  $A$ .

$$A_i = \sum_{z=1}^Z A_{zi} \quad (7)$$

where  $z$  are the normalized values for each  $A$  individual component of the Availability dimension for each country  $i$ :  $A_p$  (publication),  $A_c$  (completeness),  $A_d$  (accompanying documentation),  $A_v$  (volume),  $A_s$  (source),  $A_{ss}$  (source status),  $A_x$  (cost),  $A_t$  (time),  $A_e$  (enforceability),  $A_h$  (history), and  $A_m$  (amendment). The  $Z$  weights are calculated so that the  $A$  sub-index will have an empirical value range  $[0,1]$ .

#### 5.1.4 Quality

Finally, the fourth dimension of e-access to legal information deals with *the quality of access to legal information* published online through official channels. Since the assessment of web-based functionalities of non-official sources of legal information would be completely out of the scope of this work, we narrow the focus down to official sources of legal information. For those cases in which legal information is available through official sources (either public or private), we build a sub-index of legal information quality ( $Q$ ) to capture the extent to which published legal information is easily navigable and reused, according to the following indicators (questions in parentheses):

- **Navigation** ( $Q_n$ ): the difficulty to navigate from legislations to its related regulations, from legislations to related judicial decisions, from regulations to their enacted law, from judicial decisions to related legislation
- **Citation** ( $Q_c$ ): whether there is a *unique identifier* for each piece of legal information; whether the unique identifier is *media neutral*

- **Formats** ( $Q_f$ ): the *formats* in which each type of legal information is published
- **Centralization** ( $Q_n$ ): whether each type of legal information is available *centralized* in a single online portal
- **Search** ( $Q_s$ ): whether the online application to access each type of legal information provides functionality for *simple* search, for search by *date*, by *citation*, by *keywords*, and by *topics* or *areas of interest*

The formal definition of the Quality sub-index  $Q$  is outlined in equation 8.

$$Q_i = \sum_{z=1}^Z Q_{zi} \quad (8)$$

where  $z$  are the normalized values for each  $Q$  individual component of the Quality dimension for each country  $i$ :  $Q_n$  (navigation),  $Q_c$  (citation),  $Q_f$  (formats),  $Q_n$  (centralization), and  $Q_s$  (search). The  $Z$  weights are calculated so that the  $Q$  sub-index will have an empirical value range  $[0,1]$ .

### 5.1.5 The multidimensional indicator

Combining all the above dimensions, the *eALI* composite indicator may be now formally described as a weighted linear aggregation of its components, as in equation 9.

$$eALI_i = \sum_{z=1}^Z eALI_{zi} \quad (9)$$

where  $z$  are the normalized values for each *eALI* individual component of the *eALI* composite indicator for each country  $i$ , where these components are  $C$  for capabilities,  $P$  for policy,  $A$  for availability, and  $Q$  for quality. Table 4 presents each dimension's subindices and the data sources for the indicators.

Dimensions	Subdimensions	Indicators	Data sources
<i>Capacities</i>	Education	average number of years of schooling for adults aged 25 years; the expected years of schooling for children of school entering age	United Nations' HDI (Barro and Lee, 2010)
	Infrastructure	internet users per 100 inhabitants; number of main fixed telephone lines per 100 inhabitants; number of mobile subscribers per 100 inhabitants; number of fixed internet subscriptions per 100 inhabitants; number of fixed broadband facilities per 100 inhabitants	Telecommunication Infrastructure Index, U.N. e-Government Survey (UNDESA, 2012)
<i>Policy</i>	Online presence	emerging presence	Online Service Index, U.N. e-Government survey (UNDESA, 2012)
	Freedom of information policy	extent to which citizens are able to participate in selecting their government, public access to information, freedom of expression, freedom of association, and a free media	Voice and Accountability, World Bank Governance Indicators (Kaufmann et al., 2010a)
<i>Availability</i>	Legislative legal information	publication; completeness; accompanying documentation; volume; source; source status; cost; time; enforceable; history; amendment	Questionnaire
	Executive legal information	publication; completeness; accompanying documentation; volume; source; source status; cost; time; enforceable; history; amendment	Questionnaire
	Judicial legal information (High Courts, Courts of Appeal, Lower Courts)	publication; completeness; accompanying documentation; volume; source; source status; cost; time; history	Questionnaire
<i>Quality</i>	Quality of legal information available through official status only	navigation, citation, formats, centralization, search	Questionnaire

**Table 4:** Dimensions and subdimensions of the e-access to legal information

**Table 5:** Descriptive statistics of the composite indicator of e-Access to Legal Information. The  $N$  for the two first components is larger because data were collected from official sources.

	Min.	Max.	Mean	Median	St. Dev.	N
Capabilities	0.067	0.866	0.434	0.421	0.183	185
Policy	0.083	1.000	0.746	0.770	0.172	106
Availability	0.501	0.781	0.670	0.689	0.101	6
Quality	0.239	0.689	0.472	0.455	0.163	6
e-Access to Legal Information	0.564	0.776	0.680	0.698	0.08	6

## 6 Test results

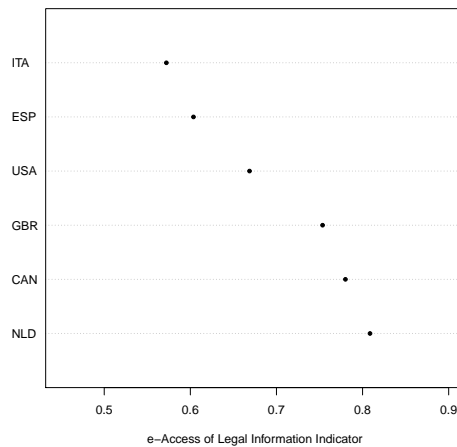
Following the design presented in the section above, data were collected to measure the composite indicator of e-Access to Legal Information, as well as each of its components independently. Due to the varied nature of the first two components, on one hand, and the complete novelty of the last two components, the scope of these test data is modest.

Regarding the Capacities and the Policy components of the composite indicator, data were collected from open data available from original sources (UN and World Bank), reaching 185 and 106 countries respectively (see Table 5). Data for the Availability and Quality components of our indicator, on the other hand, depend exclusively on our questionnaire, which requires highly specialized expertise on the provision of legal and regulatory information by public and private sources. In our first attempt to collect test data from our questionnaire and evaluate our composite indicator, a total of 29 renowned legal experts in legal information from 12 different countries were asked to respond to the questionnaire. Of these, 10 legal experts responded (response rate of 34.5%), giving data for 6 different countries (50% of our intended sample).<sup>22</sup>

The first thing worth pointing out is that despite the small sample and the relative homogeneity of the countries available (all are rich, Western, OECD democracies), a notable level of variation has been obtained in the measurement of the indicator and its components. Figure 6 shows the results of measuring the e-Access to Legal Information indicator for the six countries with full data. The country with higher score in access to legal information is the Netherlands, with a level just above 0.8, followed by Canada, and the United Kingdom, with scores above 0.7, while Italy and Spain are below 0.6. The United States scores 0.65, which is very close to the average value of the indicator (0.698).

These differences among countries are the result of the variation in the scores of the indicator components. Basic descriptive information is presented in Table 5, and differences are also perceived in Figure 7, where we see that while all the countries present fairly high levels of online policy levels, sharper differences exist in the quality of the information available in each country. On the other hand, Figure 8 underscores the need to measure access to legal information through a multidimensional concept, and the potential benefits of comparing

<sup>22</sup>The average time of response to the questionnaire was 28 minutes.

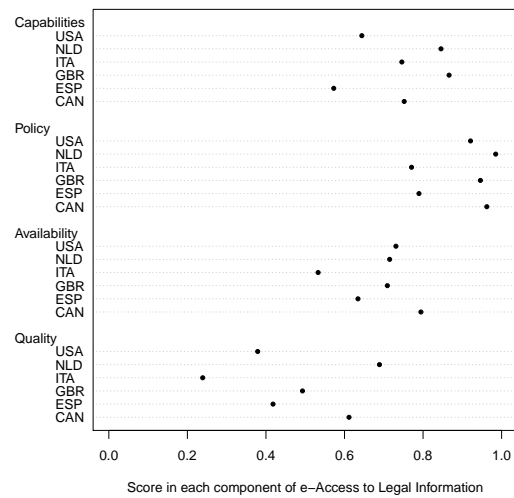


**Figure 6:** Score in e-Access to Legal Information for a sample of 6 countries.

each country's scores through the different components of the indicator for future policy purposes. For instance, the plot shows that both the Netherlands and Canada present a quite balanced position in all four basic components of e-access to legal information, reaching almost maximum values in the institutional framework for free access (Policy), the Availability of legal and regulatory information (Canada), and the Quality of the information offered (Netherlands). However, results show that Canada needs to improve the actual capacity of the country to access information (Capabilities).

On the other hand, while Great Britain presents the highest score in Capabilities (showing good educational and infrastructural ground), the country still has room to improve its performance in the availability and quality of the legal and regulatory information offered online. At the lower end, Spain and Italy present highly unbalanced profiles. In fact, Italy only scores higher than other countries in the actual capacity of the country to access information—i.e., it has the potential education level and the infrastructure to do so. Yet, the country's indicators of Quality, Availability, and Policy are at the minimum compared to the other five countries of the sample. Results show that a similar situation takes place in Spain, which is the country with a lower level of Availability of legal information.

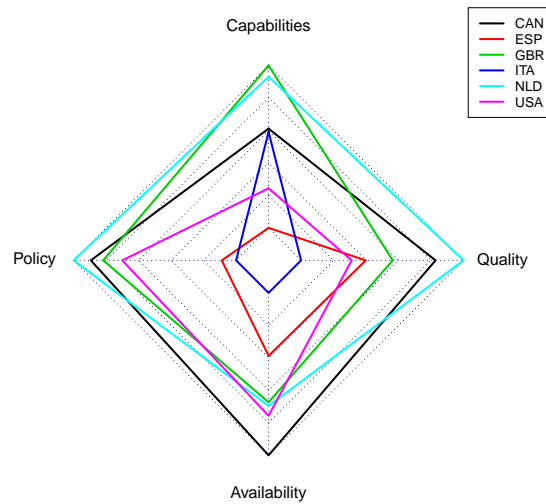
As noted above, Availability is a quite demanding concept, since it encompasses not only the amount of information is available, but also what kind of information is published, who publishes it, under what conditions it is published, the regularity of publication, and its contextualization. Results show that Spain is still in the first stages of development in making legal information fully available. However, low scores in both Policy and Capabilities indicators suggest that the country would need major changes not only at the legal and formal institutional framework (Policy), but also in terms of online infrastructures and education (Capabilities). Improvements



**Figure 7:** Distribution of the scores of each country in the components of the indicator of e-Access to Legal Information.

in Capabilities should also be done in the U.S., which is a rather structural indicator. While the actual capacity of access—strongly dependent upon education and infrastructure—is highly correlated with the level of income of a country, the Policy indicator should be more sensitive to decisions made at the political level.

Finally, Figure 9 shows the relationship between the components of access to legal information and the environment for doing business, and Table 6 presents the linear regression results. Again, caution is advised here when interpreting the results, which should only be focused on Capabilities and the Policy components (used here with full availability). Results show that both components of our indicator are quite strongly related to the positions of countries in the Ease of Doing Business ranking. In particular, an increase of one unit in either of the two components would imply, on average, an improvement above 20% in the position of a country in the Doing Business ranking. This also holds for the Availability and the Quality components of the indicator, results suggesting that those countries with better performance in these components are also better positioned in the Doing Business ranking. Due to the small sample in the latter components, though, any discussion of statistical results here is out of the question. This tendency can be also observed in Figure 10 for the overall effect of the score in the e-Access to Legal Information indicator on the Ease of Doing Business.



**Figure 8:** Combination of the scores of each country in the components of the indicator of e-Access to Legal Information.

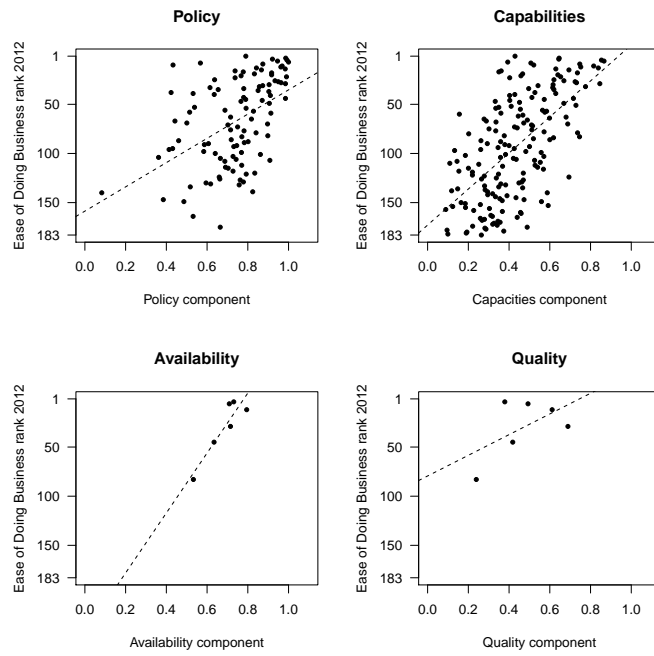
## 7 Conclusions and further work

This work's main idea is that online access to legal and regulatory information is key to providing a better regulatory environment for doing business. There is a shared belief that e-government policies can help turning governments more efficient, less corrupt, and less costly in terms of regulatory compliance, thus improving the regulatory environment that accompanies economic growth. While the economic, social and political benefits of a good regulatory environment have been tested, the effects of online access to legal information on both governance and the business environment have been so far unexplored.

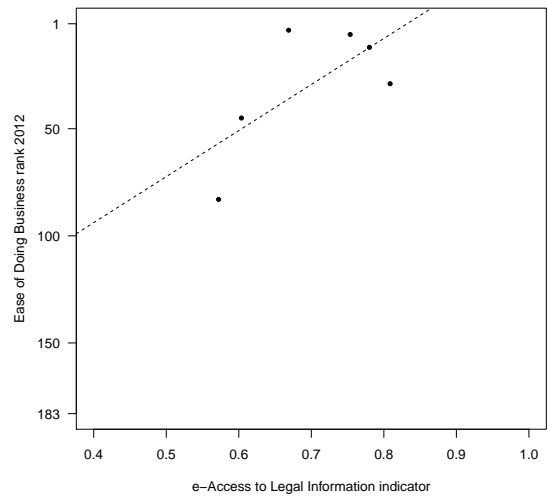
On one hand, the *Doing Business* indicators are built and measured under the assumption of full availability and understanding of information (WB and IFC, 2012) on the procedures required to set up business, thus excluding the costs of discovery of legal and regulatory information from the measurement process. On the other, although the cost of regulatory information discovery looms large, and is still larger when business is conducted across border, the main institutional economics literature has failed to provide a specific model for these particular costs of information discovery.

Therefore, the design and implementation of measures for online access to legal and regulatory information proves much needed to gain insights into the costs of information





**Figure 9:** Relationship between the components of the indicator of e-Access to Legal Information and the Ease of Doing Business rank.



**Figure 10:** Relationship between the e-Access to Legal Information and the Ease of Doing Business rank.

**Table 6:** Results of the OLS regression models of the Ease of Doing Business rank on the components and the whole e-Access to Legal Information indicator.

	EoDB rank (log)				
	Model 1	Model 2	Model 3	Model 4	Model 5
(Intercept)	5.22*	5.21*	9.08*	3.73	9.20
	(0.37)	(0.14)	(2.41)	(1.74)	(3.58)
Policy	-1.45*				
	(0.63)				
Capacities		-1.29*			
		(0.37)			
Availability			-9.26		
			(3.56)		
Quality				-1.82	
				(3.52)	
e-Access to Legal Information					-9.30
					(5.23)
GDP capita (log)	-0.00*	-0.00*			
	(0.00)	(0.00)			
Type of regime	0.24	-0.12			
	(0.22)	(0.11)			
<i>N</i>	101	169	6	6	6
<i>R</i> <sup>2</sup>	0.42	0.52	0.63	0.06	0.44
Resid. sd	0.78	0.66	0.81	1.28	0.99

Standard errors in parentheses

\* indicates significance at  $p < 0.05$

discovery and their effects on the regulatory environment for policy reform that are simply unavailable to us using current methods.

In order to fill in these gaps, this paper makes two main contributions. First, we provide a formal model for the costs of discovery of legal information. Second, we present a measurement instrument to gather the data necessary to assess these costs. To do so, we have proceeded in three steps. First, we have elaborated a model of the costs of access to regulatory information. Second, we have provided an empirical assessment of the relationship between both e-government readiness and legal publicity and governance, specially the environment for doing business. Finally, we have discussed, presented and measured the multidimensional concept of e-Access to Legal Information, and tested its effect on the Ease of Doing Business.

Our model starts with the assumption that access to regulations is a continuous process of information discovery that comprises two basic activities. On one hand, since the regulatory system affects most aspects of any economic activity, companies must find the regulations relevant (i.e., applicable) to their economic activity. On the other hand, as rules and regulations constitute the core of governmental policy agenda, they are in constant change, both within regulatory agencies and within the regulatory corpus. Therefore, costs of discovery of legal information are affected both by the identification of the relevant regulations, and by keeping

track of regulatory change. Both aspects of these costs are highly dependent on the way rules and regulations are produced, published, and updated.

We have conceptualized the costs of regulatory information as a function of the *difficulty* of access to the rules and regulations that will affect a business' costs of labor, capital *and* transaction. Institutions establish how costly is to access this knowledge. The higher the costs of access to regulatory information, the higher the amount of resources the firm will have to devote to the process of getting to guess what costs are likely to apply in the near future. In this sense, our model presents the costs of access to legal information as having a discount effect on both transaction and transformation costs functions.

The second part of the paper has dealt with the effects of online access to public information. To do so, we first showed that while standard UN e-Government indicators are positively related to both the World Bank Governance Indicators (WBGI) and the ease of doing business rank (EoDB), the relationship between the more narrowly targeted *online service index* of the e-Government indicators with the ease of doing business presents a series of drawbacks. In other words, although the UN's measure of online services of governments has a positive effect on the business regulatory environment, the measure is vague. In particular, we showed that the indicators surrounding a more advanced online presence stage of online-service provision fail to explain the specific features of access to public information that are most valuable for doing business.

In order to shed some light on this problem, we have tested the relationship between access to legal and regulatory information (using an indicator of legal dissemination as a close empirical proxy), and the ease of doing business. First results presented a positive relationship between the dissemination of laws and the environment for doing business, a particularly relevant finding when the interaction between different levels of e-government readiness *and* of legal publishing points to the fact that access to legal and regulatory information may be essential to assess the regulatory environment in context. However, as argued, current e-Government or legal dissemination indicators have so far failed to provide separate measures of the online availability of legal and regulatory information, or its quality or the ease with which it may be accessed. Neither have they provided insights into the relevant type of information that, when online, might help increase a country's economic performance.

To bridge this gap, in the third part of the paper we have designed, discussed, and presented a composite indicator of e-Access to Legal and regulatory Information (eALI). The objective of the indicator of *e-Access to legal information (eALI)* is to *measure the difficulty of online access to legal information*. These costs of access to legal information must include both the features of the legal information available in each country, and also the *actual* capacity of a country and its people to access legal information online. This distinction, on one hand, is in accordance with the basic assumptions upon which our model rests, and on the other helps the resulting composite indicator to be a valid comparable, weighted measure among different countries (OECD and EC, 2008).

The first dimension of the eALI indicator (Capabilities, C) measures the extent to which countries are capable of accessing information online, and it takes into account both the people's

ability to process complex information (i.e., their educational level) and the country's readiness in telecommunications infrastructure. The second dimension measures the extent to which governments make an effort to provide online information to their citizens. To measure this, the second dimension (Policy, *P*) accounts, on one hand, for the formal aspect of online policy, the extent to which governments make an effort to build a credible legal/institutional framework that facilitates the access to public information, and on the other hand, for the government's actual online presence, its e-government readiness.

The third and fourth dimensions of our composite indicator intend to measure two different aspects of access to legal information. First, access must account for the main features of the legal information available. In this sense, the third dimension of the indicator of e-access to legal information deals specifically with the availability of legal information online (Availability, *A*). To do so, it focuses not only on the extent to which legal information is published online, but also whether it is complete, enriched by accompanying documentation, public or private, official or non-official, available for free, published in time, and easily contextualized in terms of its status (enforceability, history and amendment).

Finally, access must also account for some measure of its quality beyond what is contained in the information itself. In particular, the fourth dimension of e-access to legal information deals with *the quality of the access to legal information* published online through official channels (Quality, *Q*). It captures the extent to which different published official legal information is easily connected through inter-document navigation, whether it is correctly identified, whether access is centralized in one single portal, and whether legal information can be searched using different search strategies such as keywords, dates, citation, and topics.

Data have been collected for all four dimensions, but to a different degree. While the first two components are built and measured through official and mostly available data, the latter two must be gathered for the first time through our questionnaire, which requires highly specialized expertise in legal information.

Even at this stage of data completeness, results are promising for a number of reasons. First, results tend to give ground our hypothesis that access to legal and regulatory information is key to a good environment to carry out business. Second, even for a small sample of greatly homogeneous countries, the components of the indicator present sufficient variation so as to identify strengths and weaknesses in their provision of free legal information online. And third, the multidimensionality of the concept that the indicator measures is captured by the relative independence among components (countries may score high in one component and low in another).

We envision that thus measured the e-Access to Legal Information indicator (eALI) can offer valuable insights towards the measurement of the costs of information discovery for doing business and guide policy reform, that cannot be assessed nowadays with regards to the context of the regulatory environment.

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