

# A DISAGGREGATED APPROACH TO PRIORITIZING STRUCTURAL REFORMS FOR GROWTH AND EMPLOYMENT

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## A Granular Approach to Reform

Achieving sustained growth is no simple feat, given that it involves important policy choices and tradeoffs. Chapter 7 shows that designing structural reform packages can be difficult. But the challenges run even deeper. Details matter when complicated institutional changes are required, and details can get overlooked beyond the general statement that labor and product markets require reform. And the process of choosing and implementing reforms—from fiscal outlays to the need to adapt legal and institutional frameworks and dealing with complications posed by political economy considerations—is not costless. Were it not for these costs, most countries would likely have implemented most reforms a long time ago.

This chapter takes a disaggregated look at reform options and uses a simple model to illustrate and weigh their benefits and costs. Despite a plethora of available structural indicators and databases, policy recommendations sometimes lack specificity. Focusing on the EU-27 countries,<sup>1</sup> this chapter first assesses the cross-country impact on growth of a large number of institutional indicators and then develops a simple framework for prioritizing them, based on their impact on growth, but also taking into account the relative costs of reforming them. Based on both, a reform efficiency variable is constructed that can help rank reform options. The analysis expands on the methodology developed by Tavares (2004) for Portugal to include a broader set of institutional determinants of growth, covering a longer period (1960–2010), a broader set of countries, and, most important, a richer set of reform cost specifications.<sup>2</sup>

The results suggest that a more detailed analysis can be helpful. First, taking a disaggregated approach allows policymakers to focus on those aspects of a measure for which improvements would have the largest relative impact on growth. Second, explicitly taking into account the costs of reforms can change the priority assigned to different actions. For example, one measure may have a large growth impact but could be very costly to implement, whereas another with more moderate growth effects may be more cost efficient. However, the way costs are calculated matters greatly for

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<sup>1</sup> EU-27 countries are Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, the Slovak Republic, Slovenia, Spain, Sweden, and the United Kingdom.

<sup>2</sup> See also Cavalcanti, Magalhaes, and Tavares (2008), who use this methodology for Brazil.

the results, and policymakers will have to make case-specific assessments of the benefits and costs associated with an available set of policy options.

## Empirical Analysis

The empirical analysis starts with the identification of a broad range of cross-country structural indicators. Drawn from a variety of sources, these variables cover the labor market, product and service markets, the business environment, the judicial system, credit and finance, corporate governance, research and development, trade, infrastructure, education, and measures of corruption.<sup>3</sup> GDP data were taken from the IMF World Economic Outlook database and, where missing, from the Angus Maddison database. No political or other very general or subjective indicators were included, and those that duplicated information were dropped. In all, close to 350 indicators were initially considered.

The next step is to estimate the correlation of each structural indicator with long-term growth. In line with Tavares (2004), a cross-sectional empirical analysis was conducted for 194 countries, following the standard neoclassical growth model.<sup>4</sup> Average yearly growth in the period 1960–2010 was regressed on initial GDP per capita and, one-by-one, each structural indicator. Because institutions change slowly and the focus of the study is on long-term growth, average yearly growth for 1960–2010 was used as the dependent variable.<sup>5</sup> The approach stresses transparency and robustness, while omitting potentially endogenous explanatory variables such as investment rates, and employs a standard linear regression model. The analysis does not aim to establish causality, but rather to identify potential structural indicators that appear to be correlated with growth. More specifically, for each structural indicator the model took the following form:

$$GDPgrowth_{1960-2010} = \alpha_0 + \alpha_1 \ln GDP_{1960} + \alpha_2 InstitutionalVariable. \quad (8.1)$$

A large number of potentially relevant structural indicators were selected. Specifically, 121 variables were identified as significant (see Appendices 8A and 8C),<sup>6</sup> including all indicators related to corruption, research and development, corporate governance, and infrastructure, regardless of definition or source. Other indicators also showed a significant correlation with growth, in particular

<sup>3</sup> Sources include the Bertelsmann Transformation Index; Economic Freedom of the World (Gwartney, Lawson, and Hall, 2012); Freedom House; the Organization for Economic Cooperation and Development (OECD); the PRS International Country Risk Guide; Transparency International; the World Bank's Doing Business Report; the World Bank's Worldwide Governance Indicators; and the World Economic Forum databases; and a number of academic papers, in particular, Botero and others (2003); Djankov and others (2002a, 2002b); La Porta and others (2003); Knack and Kugler (2002); Treisman (2007); Evans and Rauch (1999); and Feld and Voigt (2003).

<sup>4</sup> Ordinary least squares regressions were run, with standard errors corrected for heteroskedasticity. Not all indicators were available for all countries for the period specified, and in some cases a smaller sample was used.

<sup>5</sup> The initial level of GDP per capita serves as a proxy for the convergence effect because countries with higher initial levels of income will tend to grow more slowly than countries that are still catching up. For a literature review on convergence, see Caselli, Esquivel, and Lefort (1996) and Li and Zhou (2011).

<sup>6</sup> Significance was selected at the 10 percent confidence level. Regressions were run with different time periods. Results were broadly robust, although significance diminishes as the period is shortened.

those for education, trade, credit and finance, the legal system, and business regulation. In line with the existing literature, product and service market characteristics played a role, even though the results were hampered by smaller sample sizes; significant correlations between labor market characteristics and growth were somewhat more difficult to find (for example, only 16 of 65 labor market indicators turned out to be statistically significant) (DeFreitas and Marshall, 1998; Nickell and Layard, 1999; Becker and Gordon, 2008).

## Reform Areas and Priorities: A Cost-Benefit Analysis

### Reforms and Growth

Drawing on Tavares (2004), the indicators are used to compare different approaches to structural reform (see Appendix 8B). This approach aims to determine which structural areas could potentially bring particularly large growth dividends under the assumption that the correlations identified earlier allow for the structural indicators to drive growth to some extent. A later second step discusses how costs could be brought into the assessment of reform priorities. At this stage, two indices are calculated that (1) capture how far a country would have to go to reach best practice in a given reform area, and (2) yield the potential growth impact of such a move. These indices are examined for the EU-27 in aggregate, for selected subregions, and for individual countries.

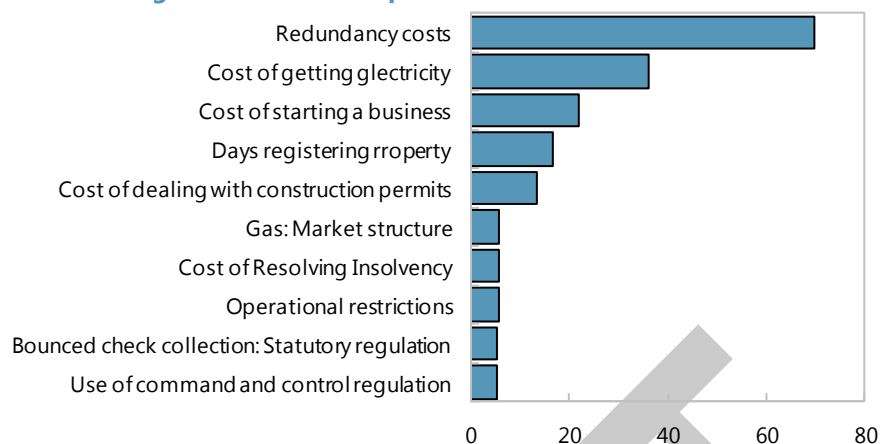
- The *relative distance from best practice* is estimated as the difference between the structural index for each European Union (EU) country and the average of the world's top five countries in each category (taking into account whether a higher index reflects better or worse performance), divided by the index for best practice:<sup>7</sup>

$$Rel\ Distance = \frac{|Index_{Country} - Index_{Best}|}{Index_{Best}} \quad (8.2)$$

This indicator helps to identify and rank structural gaps at the price of some simplification. In particular, for transparency and uniformity of treatment, it abstracts from the fact that, depending on the area and definition of the indices applied, having a minimal level of regulation might be optimal.

- The *impact on growth* is calculated as the product of the reform-specific regression coefficient estimated in the cross-country regressions and the country-specific difference between the structural index for each EU country and the index for the top five. This calculation provides an indication of the magnitude of the maximum growth impact a specific structural reform could achieve if it moved an individual EU country to best practice in that area (implicitly assuming that the growth impact is linear in the absolute distance). Thus,

<sup>7</sup> Note that unlike in Tavares (2004), where best practice is defined as the EU average, this study takes the best five countries in the world as a proxy for best practice for each area analyzed. In many cases, this turns out to be the more ambitious benchmark.

**Figure 8.1. EU-27: Top 10 Indicators: Relative Distance**

$$\text{Growth impact} = \alpha \times (\text{Index}_{\text{Country}} - \text{Index}_{\text{Best}}). \quad (8.3)$$

These estimates should be treated as broad gauges of the relative importance of particular indicators for growth and not be interpreted as precise point estimates.

### **Distance to benchmark**

Based on the distance-to-benchmark metric, the EU-27, as a group, has large opportunities for reform in labor markets, business regulation, product markets, and legal structures (Figure 8.1). Employment protection in the EU, as measured by high redundancy costs, appears to have the largest measured distance to best practice, next to a number of indicators of ease of doing business, including the cost of getting electricity, starting up a business, and getting a construction permit, as well as the time to register property. Product and service market regulation and the market structure for gas were also far from best practice, as were legal indicators such as the cost of resolving insolvency and bounced check collection.

Based on this approach, Southern and Eastern European countries show relatively large reform gaps. For this analysis the EU-27 are split into five groups: Core (Austria, Belgium, France, Germany, Luxembourg, and the Netherlands), South (Cyprus, Greece, Italy, Portugal, and Spain),<sup>8</sup> North (Denmark, Finland, and Sweden), UK-Ireland, and East (Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia). There are clear geographical distinctions between these groups with regard to performance on the reform measures (Table 8.1), with the South faring relatively worse on indicators of labor market redundancy costs and starting a business, among others.<sup>9</sup> For the East countries, the cost of electricity and registering property, among others, are relatively farthest from best practice. The North countries lag most on

<sup>8</sup> Malta is not included in the summary tables given limited data coverage.

<sup>9</sup> The aggregate UK-Ireland also features relatively high redundancy costs, although labor market regulations vary between the two countries.

**Table 8.1. Relative Distance from Best Practice by Country Group**

	Core	South	North	UK- Ireland	East	Euro Area
Redundancy costs	77.3	125.0	43.0	49.0	57.0	84.6
Cost of getting electricity	14.5	35.9	12.9	18.6	59.7	27.0
Cost of starting a business	16.7	52.1	2.1	1.5	20.5	23.6
Days to register property	19.4	10.4	5.9	17.6	21.3	17.0
Cost of dealing with construction permits	11.9	13.7	16.5	11.3	14.1	11.4
Gas: Market structure	4.3	4.7	6.2	4.8	7.9	5.6
Cost of resolving insolvency	5.0	7.3	2.5	3.7	6.4	5.6
Operational restrictions	8.2	6.7	7.2	4.7	2.2	6.1
Bounced check collection: Statutory regulation of evidence	4.8	7.4	3.2	1.5	6.5	5.7
Use of command and control regulation	6.1	7.6	2.8	3.7	4.8	5.4
Barriers to foreign direct investment	4.5	6.0	4.5	1.8	6.7	5.2
Tenant eviction: Statutory regulation of evidence	4.4	7.0	3.2	1.3	5.9	5.4
Administrative burdens for sole proprietor firms	3.9	6.7	3.4	0.4	6.8	4.8
Barriers to trade and investment	4.0	5.4	3.6	0.7	7.4	4.9
Days for dealing with construction permits	4.0	8.4	1.5	2.7	4.8	5.4
Days to start a business	4.4	5.9	3.7	4.2	5.0	4.2
Electricity: Public ownership	3.3	3.3	4.5	3.0	4.5	3.8
Protection of existing firms	3.5	3.6	5.0	3.0	1.5	3.2

Source: IMF staff calculations.

Note: See text for composition of groups. The table shows the top 10 areas for relative distance to best practice for each group of countries. Red = values higher than 10; green = values between 5 and 10; and yellow = values lower than 5.

costs of construction permits and protection of existing firms, with the latter also highly relevant for the Core (covered under *operational restrictions*).

For most European countries, business regulation and labor market indicators top the list for largest relative distance to best practice (Table 8.2). Out of 29 indicators that fell in the top 10 areas farthest from best practice for at least one country, 15 relate to reforms of product and services markets. Redundancy costs in the labor market were also relevant for 18 countries (Figure 8.2). With some exceptions, many European countries also appear to fall short of best practice as judged by business regulation indicators.

### **Impact on growth**

Turning from the size of reform gaps to their possible impact on growth, the EU-27 as a group appears to benefit most from addressing areas such as research and development (R&D), access to finance, legal institutions, and infrastructure (Figure 8.3). A high ranking reflects the combination of large reform potential in these areas—that is, a large relative distance to the benchmark—and

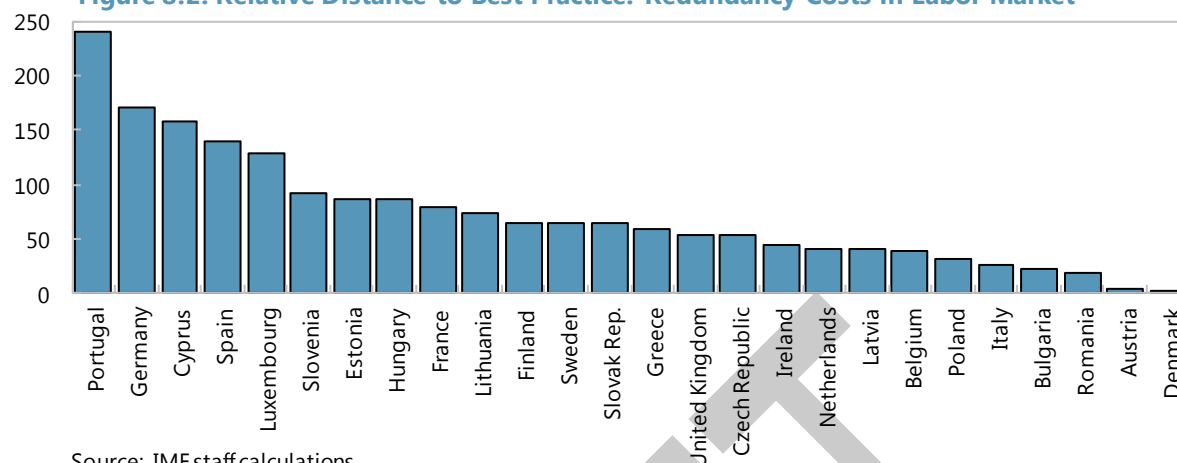
**Table 8.2. Ranking of Relative Distance from Best Practice**  
(Ranked 1–10, 1 being the furthest from best practice)

	Austria	Belgium	France	Germany	Luxembourg	Netherlands	Cyprus	Greece	Italy	Portugal	Spain	Denmark	Finland	Sweden	United Kingdom	Ireland	Bulgaria	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovak Republic	Slovenia
Cost of getting electricity	1	4	5	5	3	4	4	5	2	2	2	1	6		2	2	1	2	2	3	1	2	3	1	2	3
Redundancy costs		1	1	1	1	1	1	2	4	1	1		1	1	1	1	3	1	1	1	2	1	4	2	1	1
Days to register property	5	2	2	2	2		3	8	5			4	5		4	3	4	4	4	5	4		1	4	8	2
Cost of dealing with construction permits	3	6		4		2	6		3	3	5	2	2	2	3	4	2				0	7	6	3		4
Cost of starting a business	2	3		3	9	3	2	1	1	4	3						6	3	5	2	3	3	2	5	0	
Cost of resolving insolvency (% of estate)	6		9		8		7		6					8	8	0	7	5		6	5	8		9	5	
Gas: Market structure		9			1	8		7		5		8	4	5	0	5		7	3				0		6	9
Bounced check collection: Index, statutory regulation of evidence	1			7	7		1	1		6	6						8	0	7		6	4		7	5	
Tenant eviction: Index, statutory regulation of evidence	0			6	6		9	9		9	7						9		8		7	6		6	6	
Operational restrictions	8	7	3	9	4	6	8				1	0	3	3		6	8									
Days to start a business	7										4		0	6	7		5	9			8	5	7			
Days dealing with construction permits			1			7	5		1	9	8										9	9		8	9	
Barriers to trade and investment	4			8				4	0			6					8						8		3	
Barriers to foreign direct investment			8	1				7				8	3										5		4	
Administrative burdens for sole proprietor firms					5				7	8		7								4			9		1	
Use of command and control regulation		5	4					3				9			5				6	8					0	
Explicit barriers	9							6	8					9				6							7	
Protection of existing firms		8	6									5	9			7										
Electricity: Public ownership						5						7		4		6										
Electricity indicator						1								7		9										
Licensing: Engineers										1	0								9	9						
Procedures to start a business															9							1	0			
Years to resolve insolvency																	1	0						1	0	
Duration of specialized education for accountants						9						1	0													
Duration of specialized education for architects			7																						7	
Duration of specialized education for engineers														1	0										8	
Licensing: Architects																			1	1						
Sector-specific administrative burdens										9									0	0						
Involvement in business operation		1	0																		7					

Source: IMF staff calculations.

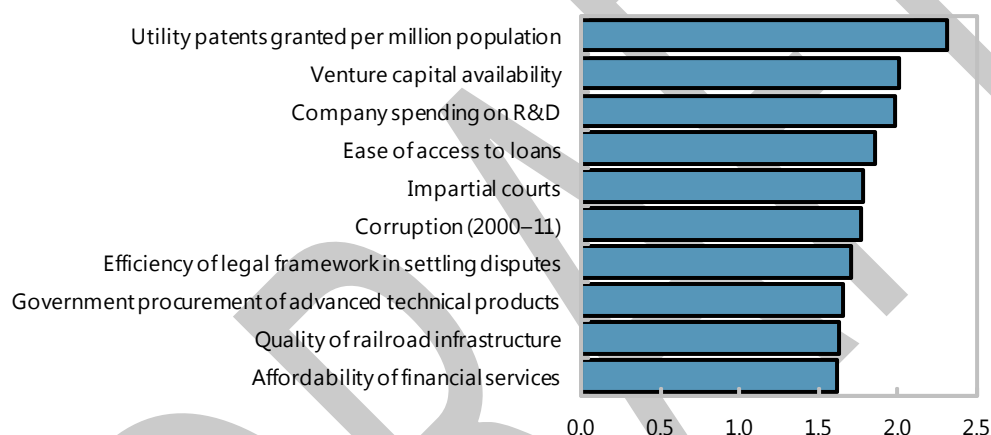
Note: Red = ranks of 3 and lower; yellow = ranks between 4 and 6; and green = ranks of 7 and higher.

**Figure 8.2. Relative Distance to Best Practice: Redundancy Costs in Labor Market**



Source: IMF staff calculations.

**Figure 8.3. EU-27: Top 10 Indicators: Impact on Growth**



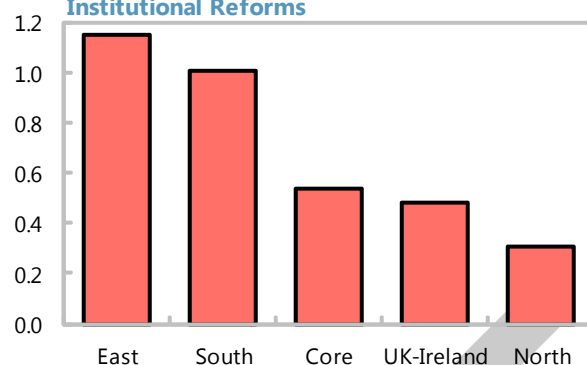
Source: IMF staff calculations.

Note: The x-axis represents the percent increase in growth for EU-27 as whole if each country moves to best practice in corresponding indicator.

relatively large estimated growth impacts ( $\alpha$  from the equations). Thus, for example, despite the large gap in employment protection legislation, addressing this area does not appear among the ones with a relatively high growth impact for the EU-27. Similarly, improving the ease of doing business does not appear to have a large effect on growth in Europe. By contrast, dealing with corruption and improving the legal framework are shown to strongly influence growth in the EU. Moreover, even if not identified among the areas lagging most relative to best practice, spending on R&D and fostering innovation through patenting policies are important to driving growth in Europe. Finally, in line with the literature, improving the affordability of financial services through increased competition would beneficially affect growth (Levine, 2004; Rajan and Zingales, 1998; Rioja and Valev, 2004).

The average growth impact of closing identified reform gaps would appear to be the largest for the South and East groups of countries (Figure 8.4). For these two groups, the average estimated growth

**Figure 8.4. Average Growth Effect from Institutional Reforms**



Source: IMF staff calculations.

Note: The y-axis represents the average growth increase across all types of indicators.

dividends from structural reforms are double those of the Core, and close to three times as high as those for the North. There is, however, some heterogeneity among country groups (Table 8.3): for the North, the largest growth dividends come from labor market reforms helping to link pay with productivity, from stimulating R&D through patenting policies, and from corporate reforms protecting investors by facilitating disclosure. For the UK-Ireland, in addition to patents, the availability of venture capital, access to loans, and strengthening government procurement of high-tech products appear relatively more important for growth. And for the South, patenting policies and spending on R&D, together with the availability of corporate finance, including venture capital, and judicial reforms appear to be growth enhancing.

At the country level, the estimated potential growth impact of closing the reform gaps in all areas is largest in Bulgaria, Romania, and Greece (Figure 8.5). At the other end of the spectrum, Denmark, Finland, and Sweden appear to gain relatively little from institutional reforms, mostly because they are already close to the reform benchmarks. At the same time, the countries vary significantly with regard to the individual reforms that would have relatively larger growth impacts.

Focusing on the area with the largest growth dividend in each of the EU-27 countries, *facilitating patenting* and *ensuring impartiality of courts* appear most frequently. In line with a growing literature, patent policies appear to spur innovation and to be one of the areas most beneficial to growth in several EU-27 countries (see, among others, Josheski and Koteski, 2011). Judicial reforms to increase the efficiency and impartiality of courts also appear important in some countries.

### The Role of Reform Costs

If structural reforms could be implemented at no cost, chances are that most reform gaps would be closed quickly. But in practice, the process of choosing and implementing reforms can be complicated and requires significant effort. Real-world decisions take place under uncertainty, even if there is a road map for reform. Moreover, fiscal outlays may need to be considered—for example, it can be costly to adapt legal and institutional frameworks, and the political economy of structural



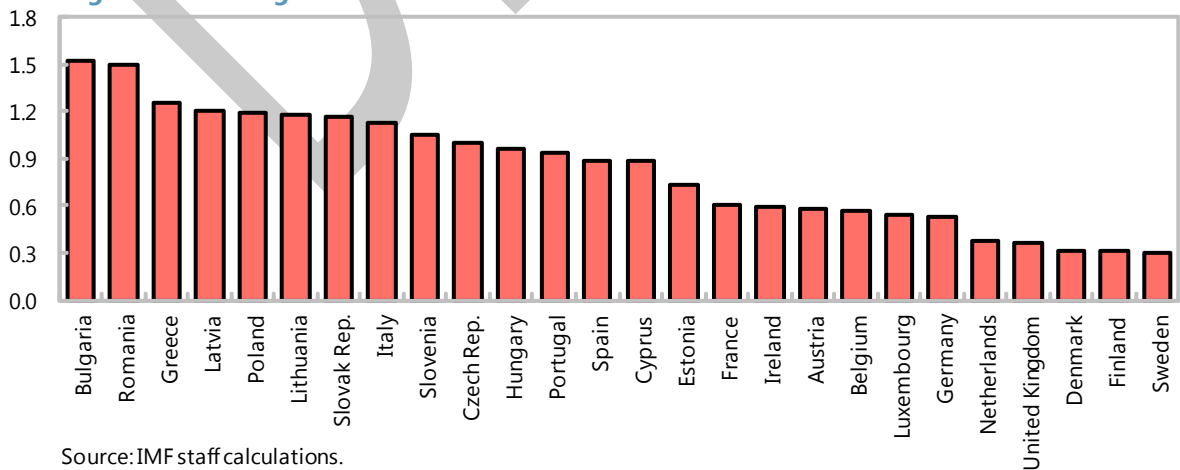
**Table 8.3. Impact on Growth by Country Group**  
(Cumulative percent change)

	Core	South	North	UK-Ireland	East	Euro area
Utility patents granted	1.85	2.71	1.11	2.15	2.75	2.25
Venture capital availability	1.41	2.43	0.76	2.16	2.51	1.93
Company spending on R&D	1.05	2.72	0.22	1.29	2.75	1.89
Ease of access to loans	1.32	2.29	0.66	2.53	2.31	1.79
Impartial courts	0.74	2.44	0.17	0.93	2.74	1.61
Corruption	1.20	2.19	0.13	0.77	2.58	1.63
Efficiency of legal framework in settling disputes	0.88	2.37	0.15	0.93	2.52	1.62
Government procurement of advanced technology products	1.14	1.94	0.84	1.78	2.12	1.55
Quality of railroad infrastructure	0.55	1.65	0.72	1.38	2.02	1.58
Affordability of financial services	0.67	1.90	0.65	1.42	2.42	1.40
Intellectual property protection	0.65	2.17	0.23	0.56	2.48	1.34
Efficiency of legal framework in challenging regulations	0.60	2.13	0.03	0.84	2.36	1.38
Protection of minority shareholders' interests	1.09	1.64	0.01	1.18	2.31	1.42
University-industry collaboration in R&D	0.74	2.11	0.28	0.35	2.10	1.43
Control of corruption	0.55	1.66	0.02	0.66	2.46	1.22
Quality of roads	0.40	1.04	0.44	1.11	2.49	1.06
Availability of scientists and engineers	1.15	1.39	0.32	0.87	1.95	1.35
Strength of auditing and reporting standards	0.75	1.79	0.30	1.45	1.72	1.25
Average years of schooling	1.09	1.77	0.46	1.00	1.00	1.57
Strength of investor protection index	1.45	1.38	1.07	0.31	1.26	1.30
Legal enforcement of contracts	0.67	1.57	0.91	1.08	1.21	1.27
Pay and productivity	1.17	1.78	1.14	0.72	0.90	1.25
Regulation of credit, labor, and business	1.03	1.60	0.78	1.02	0.96	1.20
Internet access in schools	0.88	1.88	0.08	1.24	1.08	1.12
Electricity: Public ownership	0.57	0.58	0.79	0.52	0.79	0.66
Protection of existing firms	0.57	0.59	0.81	0.49	0.16	0.52

Source: IMF staff calculations.

Note: R&D = research and development. See text for composition of groups. The table shows the top 10 areas that affect the growth of each group of countries. Numbers represent percent increase in growth if the country group moves to best practice in the corresponding indicator. Red = values higher than 1.5; green = values between 1 and 1.5; and yellow = values lower than 1.

**Figure 8.5. Average Growth Effect from Institutional Reforms**



Source: IMF staff calculations.

Note: The y-axis represents the average growth increase across all types of indicators.

reforms can be involved, requiring policymakers to invest scarce political capital and wrestle with strong vested interests.

Against this background, policymakers will often need to select reforms by weighing their benefits against the costs. A given reform may have a very large growth impact, but may also be costly to implement. Making this tradeoff explicit requires formalizing the notion of costs—something inherently difficult and further complicated by distributional and intergenerational concerns. Those who pay the cost of reforms may not necessarily be the same groups that benefit most from them—reform costs are incurred in the short term, while the benefits accumulate over the medium to long term. An exploratory step in this direction builds on the concept of reform gaps by assuming that the larger the distance from best practice, the larger the cost, or effort, required to get to best practice.<sup>10</sup> For simplicity and ease of comparison, reform cost functions are also assumed to be identical across all reforms and countries.<sup>11</sup> These general features notwithstanding, the shape of the cost function matters—for example, on the way from zero to best practice, the largest barriers might be at the beginning, the middle, or the end. Given the lack of empirical or theoretical priors regarding the shape of such cost functions, this chapter considers two functions with opposite shapes—one concave and one convex—to illustrate the possible differences in reform ranks. More specifically,

- *Reform costs are convex in the reform gap.* This specification follows Tavares (2004), who calculated the cost of reform as the relative position of each EU country compared with best practice for each indicator, divided by the current level of the indicator in each EU country. This approach can be interpreted as the percent change required to move from the status quo to best practice. In both cost specifications, the closer a country's position to the benchmark, the lower the cost of bridging the remaining distance. But the convex shape of this specification suggests that the costs decline relatively strongly early on, at lower levels of the index. Formally,

$$Cost(convex) = \frac{|Index_{Country} - Index_{Best}|}{Index_{Country}} \quad (8.4)$$

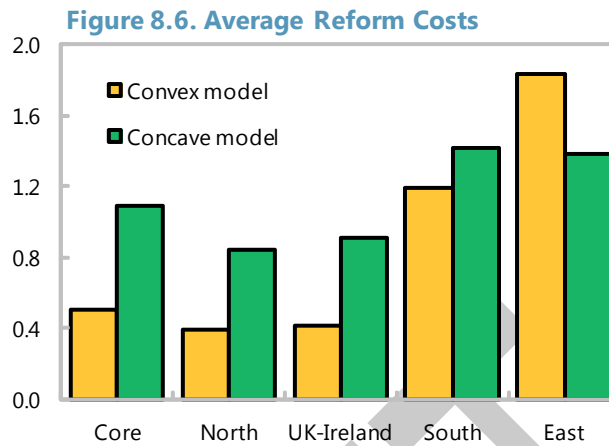
- *Reform costs are concave in the reform gap.* As an alternative, a second cost formulation is considered, defined as the natural logarithm of the relative distance to best practice. This method yields a concave cost function, suggesting that the reform cost declines more substantially only when nearer the benchmark. That is,<sup>12</sup>

$$Cost(concave) = \ln(|Index_{Country} - Index_{Best}| + 1). \quad (8.5)$$

<sup>10</sup> A more general specification would consider the "optimal" level of the reform index for which the marginal growth impact is equal to the marginal cost. For simplicity, and in line with what has been assumed in the calculation of growth impact, we only consider a discrete choice between staying at the current level or going all the way to best practice.

<sup>11</sup> For example, one would probably not expect that reducing the relative distance of "Documents to Import" to the benchmark would have the same cost associated with it as moving the same distance on a broader area such as "Regulatory Trade Barriers." For tractability, this distinction is not reflected in either cost calculation.

<sup>12</sup> We add 1 to the absolute value of the reform gap to avoid negative cost values and to make sure that the expression is well defined for countries that have reform gaps of zero.



Source: IMF staff calculations.

Based on these illustrative cost functions, a *reform efficiency index* can be calculated as the impact on growth relative to the reform cost, or “bang for the buck.” Thus, if a country is found to be equally far away from best practice in several areas, decision makers can be thought to prioritize reforms on the basis of their growth dividends relative to the costs (as noted earlier, this abstracts from distributional implications of costs and benefits). Given the different shapes of the two cost functions, the resulting efficiency indices also have different shapes and will, in general, give rise to different reform rankings. The reform efficiency indices are calculated as follows:

$$Efficiency (convex) = \frac{\alpha \times (Index_{Country} - Index_{Best})}{\frac{|Index_{Country} - Index_{Best}|}{Index_{Country}}} = \alpha \times Index_{Country} \quad (8.6)$$

and

$$Efficiency (concave) = \frac{\alpha \times (Index_{Country} - Index_{Best})}{\ln(|Index_{Country} - Index_{Best}| + 1)} \quad (8.7)$$

The different European regions have distinctly different reform cost structures, reflecting their relative reform gaps. Overall, reforms are most costly in the East and South groups of European countries (Figure 8.6).<sup>13</sup> They also exhibit distinctly different cost rankings (Table 8.4). Twelve reforms fall in the top 10 for at least two country groups under each of the two cost specifications. Only unemployment benefit reform makes the top 10 under both cost functions and appears to be among the least costly for the East, South, and Core groups under concave costs, and for the UK-Ireland group under convex costs. Legal reforms are also among the least costly for the South and East (under both cost specifications) and for the Core group under concave costs. Trade reforms, however, are least costly for the Core and UK-Ireland under convex costs, while reforming professional services costs relatively less for the North and the UK-Ireland under concave costs.

<sup>13</sup> The high level of average reform costs under a convex specification is due to the large relative distance from best practice of this group on a few indicators (including corruption, regulatory quality, and patents granted).

**Table 8.4. Required Costs by Country Group (lowest cost)**  
(Ranked 1–10, 1 being the least costly)

	Core	South	North	UK-Ireland	East	Euro area
	(Convex function)					
Regulatory trade barriers	3			2	8	1
Compliance cost of importing and exporting	1	6	4	1	5	2
Integrity of the legal system	6	1	6			3
Nontariff trade barriers				7		4
Credit market regulations					1	5
Strength of auditing and reporting standards	10					6
Quality of air transport infrastructure	2			4		7
Prevalence of trade barriers				5		8
Effectiveness of antimonopoly policy	7	8				9
Internet access in schools		5			7	10
Judicial independence		2	5			
Unemployment benefits index				3	3	
Protection of property rights	4	7				
Legal structure and security of property rights	9	4				
Quality of roads	5			10		
Depth of credit information index				9	9	
	(Concave function)					
Tenant eviction: Statutory regulation of evidence	1	3		10	2	1
Civil rights index		7			7	2
Bounced check collection: Index, mandatory time limits	4	2			4	3
Bounced check collection: Statutory regulation of evidence	2	5			3	4
Unemployment benefits index	3	1	10		1	5
Barriers to entrepreneurship	8	4			9	6
Barriers to trade and investment	5	6		9	6	7
Dismissal procedures index		9			5	8
Product market regulation		10		8	10	9
Bounced check collection: Index, professionals vs. laymen	10					10
Duration of compulsory practice for engineers		8	1	1		
Duration of specialized education for architects			3	2		
Regulatory quality	6		9			

Source: IMF staff calculations.

Note: Red = ranks of 3 and lower; green = ranks between 4 and 6; and yellow = ranks of 7 and higher.

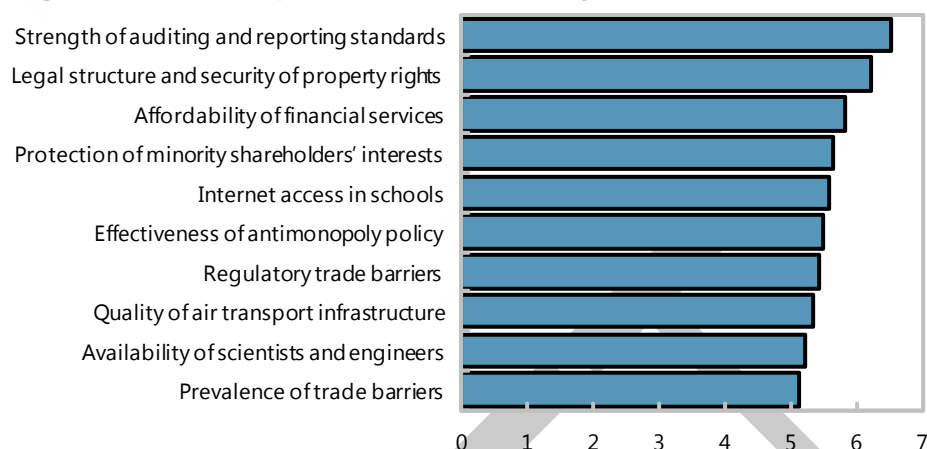
Finally, improving infrastructure has relatively low costs for the Core group under a convex cost specification, and improving credit market regulations is least costly for the East.

The two reform efficiency indices have different implications for reform rankings in the EU-27. As expected, in most cases the differences in the shapes of the assumed cost functions also translate into different shapes for the efficiency indices and, therefore, can lead to different reform prioritizations (Figures 8.7 and 8.8, and Table 8.5).<sup>14</sup> This suggests that caution is needed when moving from this conceptual framework to policymaking.

However, some reform areas do make the top 10 lists under both specifications. For example, irrespective of cost function specification, reforms to ensure the affordability of financial services by increasing competition in the banking sector and those to protect minority shareholder interests

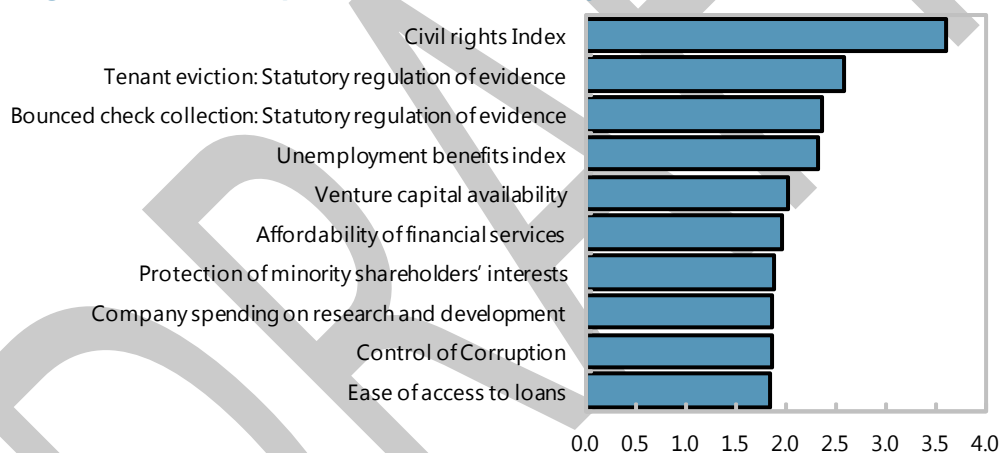
<sup>14</sup> For example, the convex specification indicates that the ratio of benefits to costs (efficiency) will be highest around the center of the range of reform levels; by contrast, the concave function suggests that efficiency at the tail-ends will be higher at more intermediate values.

**Figure 8.7. EU-27: Top 10 Indicators: Efficiency of Reform (convex model)**



Source: IMF staff calculations.

**Figure 8.8. EU-27: Top 10 Indicators: Efficiency of Reform (concave model)**



Source: IMF staff calculations.

appear particularly efficient in Europe. This result could be an indication that some efficiency-based reform indicators are more robust to the uncertainty regarding the appropriate modeling of the underlying cost function than others. This result is not driven by a particularly high growth impact, because neither example appears among the reform areas with the highest growth impact in most economies. Looking across countries, 13 reforms fall in the top 10 least costly reforms for at least one EU-27 country under both convex and concave cost specifications. These include reforms to improve technology, infrastructure (airports and roads), trade (customs procedures), competition, education, financial services, and corporate governance and reporting, and to reduce corruption.

**Table 8.5. Efficiency of Reform by Country Group**  
(Ranked 1–10, 1 being the most efficient)

	Core	South	North	UK-Ireland	East	Euro area
(Convex function)						
Strength of auditing and reporting standards	1	1	2	2	1	1
Legal structure and security of property rights	2	3	1	1	3	2
Affordability of financial services	3	2	4	5	5	3
Protection of minority shareholders' interests	6	4	3	6	6	4
Effectiveness of anti-monopoly policy	5	9	5	3	8	5
Quality of air transport infrastructure	4	5	9	8		6
Regulatory trade barriers	7	6		10	4	7
Internet access in schools	8	10	6		2	8
Availability of scientists and engineers		7	8	9	9	9
Prevalence of trade barriers		8			7	10
University-industry collaboration in R&D	10		10	4		
Irregular payments and bribes	9		7	7		
(Concave function)						
Civil Rights Index	1	1	1	1	1	1
Tenant eviction: statutory regulation of evidence	2	2	2		2	2
Unemployment benefits index	4	3	4	2		3
Check collection: statutory regulation of evidence	3		3	3	3	4
Venture capital availability	5	4	8	5	6	5
Affordability of financial services		6	7	7	4	6
Protection of minority shareholders' interests	6			9	7	7
Company spending on R&D		5		10	8	8
Ease of access to loans	10	8		4	10	9
Government procurement of advanced tech prod.	8		9	6		10
Strength of auditing and reporting standards		7	10	8		
Dismissal procedures index	7		5			
Effectiveness of anti-monopoly policy		10			9	

Source: IMF staff calculations.

Note: Red = ranks of 3 and lower; green = ranks between 4 and 6; and yellow = ranks of 7 and higher.

## Conclusion

This chapter presents a highly stylized framework that, in principle, can help prioritize structural reforms. Building on the methodology of Tavares (2004), potential reform priorities are considered based on a large number of indicators for the EU-27. The approach highlights the importance of combining the identification of granular reform gaps—the relative distance to best practice—with an assessment of the economic impact of such reforms. To make informed decisions, policymakers must also take the cost of reforms into account, and the chapter proposes a simple framework for doing both.

The results point toward some potential reform areas important for growth. Structural reforms that appear to have the largest growth benefit in the EU-27 countries include those boosting innovation and R&D, financial sector reforms facilitating the private sector's access to finance, strengthening legal institutions, and improving infrastructure. Within Europe, structural reforms are particularly important for the South and East European countries, where the growth dividends can be substantially larger than elsewhere in Europe.

This chapter also highlights the need for further research into the benefits and costs of structural reforms. The examination of the growth effect of reforms would benefit from a more in-depth econometric analysis, which could include additional dependent variables, including the effects of interactions among variables, various timeframes, and other model-selection techniques. Moreover, although taking costs into account when prioritizing reforms makes good economic sense, the relationship between reform efforts and costs could take many forms. And there are strong indications that the particular assumptions made about this relationship matter for the resulting reform rankings. Indeed, reform cost specifications, together with other indirect reform costs, nonlinearities, distributional and intertemporal concerns, sociopolitical considerations—including the need to protect vulnerable groups, address inequality, boost employment, address intergenerational concerns, and so on—and other country-specific circumstances would also need to be further investigated and carefully considered by policymakers in developing their structural reform priorities.

## Appendix 8A. Dependent Variable: Growth of Real per Capita GDP 1960–2010

Variable	Initial Income	Indicator	Number of Observations	$R^2$
<b>Legal system</b>				
Bounced check collection: Formalism index	-0.782 *** 0.127	-0.321 ** 0.149	98	0.31
Bounced check collection: Index, mandatory time limits	-0.803 *** 0.128	-1.228 ** 0.611	98	0.30
Bounced check collection: Index, professionals vs. laymen	-0.778 *** 0.128	-0.945 * 0.563	99	0.29
Bounced check collection: Index, statutory regulation of evidence	-0.821 *** 0.129	-2.095 ** 0.970	99	0.31
Cost of enforcing contracts (% of claim)	-0.919 *** 0.105	-0.037 *** 0.005	163	0.36
Cost of resolving insolvency (% of estate)	-0.668 *** 0.107	-0.047 *** 0.012	152	0.23
Efficiency of legal framework in challenging regulations	-0.734 *** 0.097	0.964 *** 0.143	135	0.40
Efficiency of legal framework in settling disputes	-0.725 *** 0.096	0.889 *** 0.132	135	0.40
Impartial courts	-0.658 *** 0.109	0.450 *** 0.184	135	0.22
Integrity of the legal system	-0.847 *** 0.112	0.451 *** 0.068	120	0.38
Judicial independence	-0.661 *** 0.108	0.138 ** 0.056	163	0.20
Legal enforcement of contracts	-0.812 *** 0.118	0.480 *** 0.088	134	0.29

Variable	Initial Income	Indicator	Number of Observations	R <sup>2</sup>
Legal structure and security of property rights	-1.077 *** 0.095	0.882 *** 0.078	137	0.55
Procedures for enforcing contracts	-0.682 *** 0.109	-0.052 ** 0.022	163	0.20
Protection of property rights	-0.895 *** 0.089	0.672 *** 0.065	124	0.57
Recovery rate of resolving insolvency (cents on the dollar)	-0.938 *** 0.105	0.039 *** 0.005	163	0.37
Tenant eviction: Index, statutory regulation of evidence	-0.826 *** 0.132	-2.147 ** 1.033	99	0.29
Years to resolve insolvency	-0.668 *** 0.103	-0.454 ** 0.091	152	0.27
<b>Corporate governance</b>				
Ease of shareholder suits index	-0.008 *** 0.192	0.189 * 0.106	146	0.02
Extent of disclosure index	-0.661 *** 0.108	0.138 ** 0.056	163	0.20
Prevalence of foreign ownership	-0.721 *** 0.102	0.846 *** 0.157	135	0.34
Protection of minority shareholders' interests	-0.708 *** 0.094	1.234 *** 0.170	135	0.42
Strength of auditing and reporting standards	-0.942 *** 0.099	1.247 *** 0.156	135	0.45
Strength of investor protection index	-0.734 *** 0.108	0.368 *** 0.094	163	0.25
<b>Business regulations</b>				
Administrative burdens on startups	-1.434 *** 0.179	-0.360 ** 0.164	40	0.67
Administrative requirements	-0.605 *** 0.115	0.299 ** 0.135	124	0.22
Barriers to entrepreneurship	-1.529 *** 0.165	-1.117 *** 0.328	40	0.71
Barriers to foreign direct investment	-1.349 *** 0.148	-0.508 *** 0.178	40	0.69
Burden of government regulation	-0.610 *** 0.109	0.375 * 0.209	135	0.21
Bureaucracy costs	-1.128 *** 0.102	-0.774 *** 0.080	124	0.54
Business regulations	-0.685 *** 0.110	0.764 *** 0.150	136	0.27
Cost of dealing with construction permits	-0.780 *** 0.104	-0.001 *** 0.000	162	0.31
Cost of getting electricity	-0.927 *** 0.106	0.000 *** 0.000	163	0.35
Cost of starting a business	-0.879 *** 0.106	-0.013 *** 0.002	163	0.33



Variable	Initial Income	Indicator	Number of Observations	R <sup>2</sup>
Cost of tax compliance	-0.560 *** 0.116	0.145 ** 0.071	134	0.16
Days dealing with construction permits	-0.680 *** 0.107	-0.003 *** 0.001	162	0.23
Days registering property	-0.691 *** 0.107	-0.008 *** 0.002	163	0.23
Days to start a business	-0.662 *** 0.111	-0.013 ** 0.006	133	0.22
Licensing restrictions	-0.721 *** 0.107	0.398 *** 0.065	134	0.32
Procedures to start a business	-0.656 *** 0.112	-0.073 * 0.043	133	0.21
Regulation of credit, labor, and business	-0.686 *** 0.116	0.635 *** 0.163	137	0.22
Regulatory quality	-1.060 *** 0.095	1.224 *** 0.127	168	0.48
Regulatory restrictions on the sale of real property	-0.627 *** 0.122	0.214 ** 0.088	134	0.17
<b>Infrastructure</b>				
Government involvement in infrastructure sector	-1.315 *** 0.156	-0.308 * 0.154	40	0.66
Quality of air transport infrastructure	-0.942 *** 0.093	1.004 *** 0.109	135	0.50
Quality of port infrastructure	-0.887 *** 0.096	0.894 *** 0.111	135	0.46
Quality of railroad infrastructure	-0.942 *** 0.121	0.702 *** 0.099	117	0.41
Quality of roads	-0.890 *** 0.092	0.855 *** 0.095	135	0.50
<b>Labor</b>				
Civil rights index	-0.576 *** 0.145	-3.106 ** 1.209	83	0.22
Cooperation in labor-employer relations	-0.741 *** 0.106	0.961 *** 0.206	135	0.44
Dismissal procedures index	-0.577 *** 0.147	-1.354 ** 0.652	83	0.20
Flexibility of wage determination	-0.610 *** 0.109	-0.301 * 0.171	135	0.21
Hiring and firing regulations, minimum wage	-0.538 *** 0.112	0.145 *** 0.051	134	0.18
Pay and productivity	-0.757 *** 0.111	0.851 *** 0.217	135	0.27
Redundancy costs	-0.674 *** 0.114	-0.006 ** 0.003	131	0.22
Unemployment benefits index	-1.012 ***	2.052 ***	83	0.27

Variable	Initial Income	Indicator	Number of Observations	R <sup>2</sup>
	0.187	0.592		
<b>Credit and finance</b>				
Affordability of financial services	-0.887 *** 0.094	1.260 *** 0.147	135	0.48
Capital controls	-0.626 *** 0.119	0.136 ** 0.053	136	0.17
Credit market regulations	-0.632 *** 0.116	0.352 *** 0.117	137	0.19
Depth of credit information index (0–6)	-0.781 *** 0.113	0.239 ** 0.067	163	0.23
Ease of access to loans	-0.842 *** 0.103	1.079 *** 0.168	135	0.38
Financing through local equity market	-0.672 *** 0.098	0.805 *** 0.136	135	0.36
Foreign ownership or investment restrictions	-0.819 *** 0.109	0.606 *** 0.105	124	0.36
Getting credit: Strength of legal rights index (0–10)	-0.658 *** 0.108	0.130 ** 0.060	163	0.20
International capital market controls	-0.690 *** 0.116	0.276 *** 0.070	137	0.22
Venture capital availability	-0.874 *** 0.103	1.192 *** 0.178	135	0.39
<b>Corruption</b>				
Control of corruption	-1.089 *** 0.092	1.227 *** 0.118	168	0.51
Corruption (2000–11)	-0.995 *** 0.099	0.545 *** 0.064	164	0.43
Favoritism in decisions of government officials	-0.771 *** 0.103	0.826 *** 0.145	135	0.35
Irregular payments and bribes	-1.031 ***	0.962 ***	135	0.51
<b>Product and services markets</b>				
Administrative burdens for sole proprietor firms	-1.453 *** 0.168	-0.352 *** 0.129	40	0.69
Airlines	-1.477 *** 0.145	-0.438 *** 0.109	40	0.74
Airlines: Public ownership	-1.358 *** 0.150	-0.191 *** 0.068	40	0.69
Barriers to entry in services	-1.237 *** 0.146	0.288 ** 0.135	40	0.66
Duration of compulsory practice for engineers	-1.175 *** 0.158	-0.182 * 0.099	37	0.69
Duration of specialized education for accountants	-1.188 *** 0.158	-0.175 * 0.101	37	0.68
Duration of specialized education for architects	-1.328 ***	-0.120 *	37	0.69

Variable	Initial Income	Indicator	Number of Observations	R <sup>2</sup>
	0.153	0.062		
Duration of specialized education for engineers	-1.265 **	-0.119 *	37	0.69
	0.150	0.062		
Effectiveness of antimonopoly policy	-0.778 ***	1.206 ***	135	0.42
	0.096	0.167		
Electricity indicator	-1.342 ***	-0.206 *	40	0.66
	0.165	0.110		
Electricity: Public ownership	-1.237 ***	-0.175 **	40	0.67
	0.145	0.079		
Explicit barriers	-1.557 ***	-0.981 ***	40	0.78
	0.138	0.195		
Gas: Market structure	-1.469 ***	-0.144 **	37	0.76
	0.150	0.071		
Involvement in business operation	-1.434 ***	-0.448 ***	40	0.71
	0.154	0.139		
Licensing: Architects	-1.581 ***	-0.099 *	36	0.76
	0.160	0.057		
Licensing: Engineers	-1.584 ***	-0.118 **	36	0.77
	0.149	0.049		
Operational restrictions	-1.418 ***	0.212 **	37	0.78
	0.148	0.098		
Price controls	-0.631 ***	0.188 **	130	0.18
	0.123	0.074		
Product market regulation	-1.588 ***	-1.106 ***	40	0.76
	0.148	0.238		
Protection of existing firms	-1.195 ***	0.218 ***	40	0.71
	0.134	0.065		
Public ownership	-1.350 ***	-0.396 **	40	0.67
	0.156	0.168		
Rail: Public ownership	-1.228 ***	-0.234 *	40	0.65
	0.149	0.136		
Requirements in education for engineers	-1.242 ***	-0.178 **	37	0.69
	0.149	0.086		
Restrictions to competition in seven industries	-1.502 ***	-0.620 **	40	0.68
	0.187	0.250		
Scope of public enterprise sector	-1.370 ***	-0.381 ***	40	0.69
	0.152	0.137		
Sector-specific administrative burdens	-1.384 ***	-0.284 *	40	0.65
	0.182	0.165		
State control	-1.459 ***	-0.577 ***	40	0.71
	0.154	0.171		
Telecommunications: Market structure	-1.604 ***	-0.368 ***	38	0.78
	0.145	0.125		
Use of command and control regulation	-1.408 ***	-0.331 ***	40	0.71
	0.150	0.102		

Variable	Initial Income	Indicator	Number of Observations	R <sup>2</sup>
<b>Trade</b>				
Barriers to trade and investment	-1.460 *** 0.141	-0.841 *** 0.203	40	0.74
Burden of customs procedures	-0.828 *** 0.100	1.046 *** 0.156	135	0.40
Compliance cost of importing and exporting	-0.877 *** 0.103	0.513 *** 0.061	134	0.43
Cost to export (US\$ per container)	-0.745 *** 0.102	-0.001 *** 0.000	163	0.32
Cost to import (US\$ per container)	-0.773 *** 0.104	-0.001 *** 0.000	163	0.30
Days to export	-0.853 *** 0.097	-0.066 *** 0.008	163	0.41
Days to import	-0.876 *** 0.098	-0.055 *** 0.007	163	0.40
Documents to export (number)	-0.901 *** 0.103	-0.481 *** 0.069	163	0.36
Documents to import (number)	-0.909 *** 0.098	-0.471 *** 0.057	163	0.42
Nontariff trade barriers	-0.832 *** 0.117	0.555 *** 0.121	137	0.31
Prevalence of trade barriers	-0.849 *** 0.112	0.985 *** 0.202	135	0.31
Regulatory trade barriers	-0.916 *** 0.105	0.695 *** 0.084	136	0.42
<b>Research and development</b>				
Availability of scientists and engineers	-0.831 *** 0.101	1.146 *** 0.175	135	0.39
Company spending on R&D	-0.831 *** 0.098	1.046 *** 0.143	135	0.42
Government procurement of advanced technology products	-0.730 *** 0.100	1.137 *** 0.190	135	0.36
Intellectual property protection	-0.960 *** 0.095	0.972 *** 0.109	135	0.50
Quality of scientific research institutions	-0.933 *** 0.101	0.934 *** 0.124	135	0.43
University-industry collaboration in R&D	-0.911 *** 0.097	1.128 *** 0.139	135	0.46
Utility patents granted per million population	-0.740 *** 0.102	0.011 *** 0.002	135	0.34
<b>Education</b>				
Average years of schooling	-1.245 *** 0.133	0.402 *** 0.063	96	0.49
Internet access in schools	-1.212 ***	1.034 ***	135	0.54

Variable	Initial Income	Indicator	Number of Observations	R <sup>2</sup>
	0.102	0.103		
Quality of the educational system	-0.792 ***	0.777 ***	135	0.32
	0.106	0.151		

Note: \*, \*\*, \*\*\* indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

## Appendix 8B. EU-27: Impact on Growth, Required Reform Effort, and Efficiency of Reform

Indicator	Significance	(1) Index EU-27	(2) Best Five in World	(3) (2)-(1) Difference	(4) Coefficient	(5) (4) × (3) Impact on Growth	(6) (3) / (1) Required Reform Effort (convex)	(7) (5) / (6) Efficiency of Reform (convex)	(8) (3) / (2) Relative Distance to Best Five	(9) ln (3) Required Reform Effort (concave)	(10) (5) / (9) Efficiency of Reform (concave)
<b>Labor market</b>											
Cooperation in labor-employer relations	*	4.5	6.0	1.4	<b>0.961</b>	1.4	0.3	4.3	0.2	0.9	1.5
Pay and productivity	*	4.0	5.4	1.3	<b>0.851</b>	1.1	0.3	3.4	0.3	0.9	1.3
Civil rights index	*	0.6	0.3	-0.3	<b>-3.106</b>	1.0	0.5	1.9	1.2	0.3	3.6
Hiring and firing regulations	*	5.7	10.0	4.3	<b>0.145</b>	0.6	0.7	0.8	0.4	1.7	0.4
Unemployment benefits index	*	0.7	1.0	0.3	<b>2.052</b>	0.6	0.4	1.4	0.3	0.2	2.3
Dismissal procedures index	*	0.4	0.0	-0.4	<b>-1.354</b>	0.5	1.0	0.5	0.4	0.3	1.6
Redundancy costs	*	28.3	0.4	-27.9	<b>-0.006</b>	0.2	1.0	0.2	69.7	3.4	0.0
<b>Product and services markets</b>											
Effectiveness of antimonopoly policy	*	4.6	5.6	1.0	<b>1.206</b>	1.3	0.2	5.5	0.2	0.7	1.8
Electricity: Public ownership	*	3.7	0.0	-3.7	<b>-0.175</b>	0.6	1.0	0.6	3.7	1.6	0.4
Airlines	*	1.4	0.0	-1.4	<b>-0.438</b>	0.6	1.0	0.6	1.4	0.9	0.7
Price controls	*	5.7	8.8	3.1	<b>0.188</b>	0.6	0.6	1.1	0.4	1.4	0.4
State control	*	2.2	1.2	-1.0	<b>-0.577</b>	0.6	0.5	1.3	0.9	0.7	0.8
Public ownership	*	3.1	1.7	-1.4	<b>-0.396</b>	0.5	0.4	1.2	0.8	0.9	0.6
Scope of public enterprise sector	*	3.2	1.8	-1.4	<b>-0.381</b>	0.5	0.4	1.2	0.8	0.9	0.6
Telecommunications: Market structure	*	2.9	1.4	-1.4	<b>-0.368</b>	0.5	0.5	1.1	1.0	0.9	0.6
Administrative burdens for sole proprietor firms	*	1.8	0.3	-1.5	<b>-0.352</b>	0.5	0.8	0.6	4.8	0.9	0.6
Gas: Market structure	*	4.1	0.6	-3.5	<b>-0.144</b>	0.5	0.9	0.6	5.9	1.5	0.3
Explicit barriers	*	0.7	0.1	-0.5	<b>-0.981</b>	0.5	0.8	0.6	3.9	0.4	1.2

Indicator	Significance	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Index EU-27	Best Five in World	(2)-(1) Difference	Coefficient	(4) × (3) Impact on Growth	(3) / (1) Required Reform Effort (convex)	(5) / (6) Efficiency of Reform (convex)	(3) / (2) Relative Distance to Best Five	In (3) Required Reform Effort (concave)	(5) / (9) Efficiency of Reform (concave)
Use of command and control regulation	*	1.8	0.3	-1.5	<b>-0.331</b>	0.5	0.8	0.6	5.2	0.9	0.5
Product market regulation	*	1.3	0.9	-0.5	<b>-1.106</b>	0.5	0.3	1.5	0.5	0.4	1.3
Protection of existing firms	*	2.9	0.0	-2.9	<b>-0.163</b>	0.5	1.0	0.5	2.9	1.3	0.3
Restrictions to competition in seven industries	*	2.0	1.3	-0.7	<b>-0.620</b>	0.5	0.4	1.2	0.6	0.6	0.8
Rail: Public ownership	*	3.9	2.0	-1.9	<b>-0.234</b>	0.5	0.5	0.9	1.0	1.1	0.4
Duration of specialized education for architects	*	3.7	0.0	-3.7	<b>-0.120</b>	0.4	1.0	0.4	3.7	1.6	0.3
Licensing: Engineers	*	3.6	0.0	-3.6	<b>-0.118</b>	0.4	1.0	0.4	3.6	1.5	0.3
Duration of specialized education for engineers	*	3.5	0.0	-3.5	<b>-0.119</b>	0.4	1.0	0.4	3.5	1.5	0.3
Involvement in business operation	*	1.3	0.4	-0.9	<b>-0.448</b>	0.4	0.7	0.6	2.4	0.6	0.6
Requirements in education for engineers	*	2.1	0.0	-2.1	<b>-0.178</b>	0.4	1.0	0.4	2.1	1.1	0.3
Licensing: Architects	*	3.8	0.0	-3.8	<b>-0.099</b>	0.4	1.0	0.4	3.8	1.6	0.2
Airlines: Public ownership	*	1.9	0.0	-1.9	<b>-0.191</b>	0.4	1.0	0.4	1.9	1.1	0.3
Sector-specific administrative burdens	*	1.5	0.3	-1.2	<b>-0.284</b>	0.3	0.8	0.4	3.9	0.8	0.4
Duration of specialized education for accountants	*	4.3	1.2	-3.1	<b>-0.099</b>	0.3	0.7	0.4	2.6	1.4	0.2
Electricity indicator	*	1.5	0.4	-1.1	<b>-0.206</b>	0.2	0.7	0.3	2.5	0.7	0.3
Duration of compulsory practice for engineers	*	1.1	0.0	-1.1	<b>-0.182</b>	0.2	1.0	0.2	1.1	0.7	0.3
Business regulations											
Bureaucracy costs	*	3.0	1.4	-1.6	<b>-0.774</b>	1.3	0.5	2.3	1.2	1.0	1.3
Business regulations	*	6.2	7.8	1.6	<b>0.764</b>	1.3	0.3	4.7	0.2	1.0	1.3
Regulation of credit, labor, and business	*	7.1	8.8	1.7	<b>0.635</b>	1.1	0.2	4.5	0.2	1.0	1.1
Licensing restrictions	*	7.4	9.9	2.4	<b>0.398</b>	1.0	0.3	3.0	0.2	1.2	0.8
Administrative requirements	*	3.5	6.6	3.0	<b>0.299</b>	0.9	0.9	1.1	0.5	1.4	0.7
Regulatory quality	*	1.3	1.9	0.6	<b>1.224</b>	0.8	0.5	1.5	0.3	0.5	1.6
Burden of government regulation	*	3.1	5.1	2.0	<b>0.375</b>	0.8	0.7	1.2	0.4	1.1	0.7

## A DISAGGREGATED APPROACH TO PRIORITIZING STRUCTURAL REFORMS FOR GROWTH AND EMPLOYMENT

Indicator	Significance	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Index EU-27	Best Five in World	(2)-(1) Difference	Coefficient	(4) × (3) Impact on Growth	(3) / (1) Required Reform Effort (convex)	(5) / (6) Efficiency of Reform (convex)	(3) / (2) Relative Distance to Best Five	In (3) Required Reform Effort (concave)	(5) / (9) Efficiency of Reform (concave)
Days dealing with construction permits	*	189.1	32.8	-156.3	<b>-0.003</b>	0.5	0.8	0.7	4.8	5.1	0.1
Barriers to foreign direct investment	*	1.2	0.2	-1.0	<b>-0.508</b>	0.5	0.8	0.6	5.1	0.7	0.7
Regulatory restrictions on the sale of real property	*	7.5	9.8	2.3	<b>0.214</b>	0.5	0.3	1.6	0.2	1.2	0.4
Barriers to entrepreneurship	*	1.3	1.0	-0.4	<b>-1.117</b>	0.4	0.3	1.5	0.4	0.3	1.3
Administrative burdens on startups	*	1.6	0.5	-1.1	<b>-0.360</b>	0.4	0.7	0.6	2.1	0.7	0.5
Cost of tax compliance	*	7.2	9.5	2.3	<b>0.145</b>	0.3	0.3	1.0	0.2	1.2	0.3
Procedures to start a business	*	5.7	1.6	-4.1	<b>-0.073</b>	0.3	0.7	0.4	2.5	1.6	0.2
Days registering property	*	31.8	1.8	-30.0	<b>-0.008</b>	0.2	0.9	0.3	16.6	3.4	0.1
Days to start a business	*	14.0	2.5	-11.5	<b>-0.013</b>	0.2	0.8	0.2	4.6	2.5	0.1
Cost of starting a business	*	5.0	0.2	-4.8	<b>-0.013</b>	0.1	1.0	0.1	21.9	1.8	0.0
Cost of dealing with construction permits	*	57.5	3.9	-53.5	<b>-0.001</b>	0.1	0.9	0.1	13.6	4.0	0.0
Cost of getting electricity	*	154.5	4.2	-150.3	<b>0.000</b>	0.0	1.0	0.0	36.1	5.0	0.0
Research and development											
Utility patents granted per million population	*	46.6	264.4	217.7	<b>0.011</b>	2.3	4.7	0.5	0.8	5.4	0.4
Company spending on R&D	*	3.9	5.8	1.9	<b>1.046</b>	2.0	0.5	4.0	0.3	1.1	1.9
Government procurement of advanced technology products	*	3.8	5.2	1.5	<b>1.137</b>	1.7	0.4	4.3	0.3	0.9	1.8
Intellectual property protection	*	4.6	6.3	1.6	<b>0.972</b>	1.6	0.4	4.5	0.3	1.0	1.6
University-industry collaboration in R&D	*	4.4	5.7	1.3	<b>1.128</b>	1.5	0.3	4.9	0.2	0.8	1.8
Availability of scientists and engineers	*	4.6	5.8	1.2	<b>1.146</b>	1.4	0.3	5.2	0.2	0.8	1.8
Quality of scientific research institutions	*	4.7	6.1	1.4	<b>0.934</b>	1.3	0.3	4.4	0.2	0.9	1.5
Trade											
Burden of customs procedures	*	4.7	6.0	1.3	<b>1.046</b>	1.3	0.3	4.9	0.2	0.8	1.6
Prevalence of trade barriers	*	5.2	6.4	1.1	<b>0.985</b>	1.1	0.2	5.1	0.2	0.8	1.5
Documents to	*	5.2	3.0	-2.2	<b>-0.471</b>	1.1	0.4	2.5	0.7	1.2	0.9

Indicator	Significance	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Index EU-27	Best Five in World	(2)-(1) Difference	Coefficient	(4) × (3) Impact on Growth	(3) / (1) Required Reform Effort (convex)	(5) / (6) Efficiency of Reform (convex)	(3) / (2) Relative Distance to Best Five	In (3) Required Reform Effort (concave)	(5) / (9) Efficiency of Reform (concave)
import (number)	*										
Nontariff trade barriers	*	7.2	8.8	1.5	<b>0.555</b>	0.9	0.2	4.0	0.2	0.9	0.9
Documents to export (number)	*	4.5	2.8	-1.7	<b>-0.481</b>	0.8	0.4	2.2	0.6	1.0	0.8
Regulatory trade barriers	*	7.8	9.0	1.1	<b>0.695</b>	0.8	0.1	5.4	0.1	0.8	1.0
Compliance cost of importing and exporting	*	8.1	9.4	1.3	<b>0.513</b>	0.7	0.2	4.2	0.1	0.8	0.8
Cost to export (US\$ per container)	*	1,024.4	504.2	-520.2	<b>-0.001</b>	0.4	0.5	0.9	1.0	6.3	0.1
Days to export	*	11.2	5.2	-6.0	<b>-0.066</b>	0.4	0.5	0.7	1.1	1.9	0.2
Days to import	*	11.4	4.8	-6.6	<b>-0.055</b>	0.4	0.6	0.6	1.4	2.0	0.2
Cost to import (US\$ per container)	*	1,092.0	505.8	-586.2	<b>-0.001</b>	0.3	0.5	0.6	1.2	6.4	0.1
Barriers to trade and investment	*	0.4	0.1	-0.4	<b>-0.841</b>	0.3	0.8	0.4	4.8	0.3	1.0
Legal system											
Impartial courts	*	5.1	7.9	2.8	<b>0.627</b>	1.8	0.6	3.2	0.4	1.3	1.3
Efficiency of legal framework in settling disputes	*	4.0	5.9	1.9	<b>0.889</b>	1.7	0.5	3.5	0.3	1.1	1.6
Efficiency of legal framework in challenging regulations	*	4.0	5.6	1.6	<b>0.964</b>	1.5	0.4	3.8	0.3	1.0	1.6
Legal structure and security of property rights	*	7.0	8.6	1.6	<b>0.882</b>	1.4	0.2	6.2	0.2	1.0	1.5
Judicial independence	*	4.8	6.5	1.7	<b>0.787</b>	1.4	0.4	3.8	0.3	1.0	1.4
Protection of property rights	*	6.9	8.9	2.0	<b>0.672</b>	1.3	0.3	4.7	0.2	1.1	1.2
Legal enforcement of contracts	*	5.2	7.7	2.5	<b>0.480</b>	1.2	0.5	2.5	0.3	1.3	1.0
Recovery rate of resolving insolvency	*	60.6	90.9	30.3	<b>0.039</b>	1.2	0.5	2.3	0.3	3.4	0.3
Integrity of the legal system	*	8.2	10.0	1.8	<b>0.451</b>	0.8	0.2	3.7	0.2	1.0	0.8
Bounced check collection: Formalism index	*	3.6	1.4	-2.2	<b>-0.321</b>	0.7	0.6	1.2	1.5	1.2	0.6
Tenant eviction: Statutory regulation of evidence	*	0.3	0.1	-0.3	<b>-2.315</b>	0.6	0.8	0.7	5.1	0.2	2.6
Bounced check collection: Statutory regulation of evidence	*	0.3	0.1	-0.3	<b>-2.095</b>	0.6	0.8	0.7	5.4	0.2	2.4
Years resolving insolvency	*	1.9	0.7	-1.2	<b>-0.454</b>	0.6	0.6	0.9	1.8	0.8	0.7



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Indicator	Significance	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Index EU-27	Best Five in World	(2)-(1) Difference	Coefficient	(4) × (3) Impact on Growth	(3) / (1) Required Reform Effort (convex)	(5) / (6) Efficiency of Reform (convex)	(3) / (2) Relative Distance to Best Five	In (3) Required Reform Effort (concave)	(5) / (9) Efficiency of Reform (concave)
Bounced check collection: Index professionals vs. laymen	*	0.6	0.0	-0.6	<b>-0.945</b>	0.5	1.0	0.5	0.6	0.4	1.2
Cost of enforcing contracts (% of claim)	*	20.6	7.6	-13.0	<b>-0.037</b>	0.5	0.6	0.8	1.7	2.6	0.2
Procedures for enforcing contracts	*	31.8	23.4	-8.4	<b>-0.052</b>	0.4	0.3	1.7	0.4	2.2	0.2
Cost of resolving insolvency (% of estate)	*	10.5	1.6	-8.9	<b>-0.047</b>	0.4	0.8	0.5	5.6	2.3	0.2
Bounced check collection: Index mandatory time limits	*	0.3	0.0	-0.3	<b>-1.228</b>	0.4	1.0	0.4	0.3	0.3	1.4
<b>Credit and Finance</b>											
Venture capital availability	*	2.9	4.6	1.7	<b>1.192</b>	2.0	0.6	3.5	0.4	1.0	2.0
Ease of access to loans	*	3.1	4.8	1.7	<b>1.079</b>	1.9	0.6	3.3	0.4	1.0	1.9
Affordability of financial services	*	4.6	5.9	1.3	<b>1.260</b>	1.6	0.3	5.8	0.2	0.8	2.0
Financing through local equity market	*	3.7	5.2	1.6	<b>0.805</b>	1.3	0.4	2.9	0.3	0.9	1.3
Foreign ownership and investment restrictions	*	6.9	8.5	1.6	<b>0.606</b>	1.0	0.2	4.2	0.2	0.9	1.0
International capital market controls	*	6.1	8.4	2.3	<b>0.276</b>	0.6	0.4	1.7	0.3	1.2	0.5
Capital controls	*	5.4	9.2	3.8	<b>0.136</b>	0.5	0.7	0.7	0.4	1.6	0.3
Credit market regulations	*	8.5	10.0	1.4	<b>0.352</b>	0.5	0.2	3.0	0.1	0.9	0.6
Getting credit: Strength of legal rights index	*	7.0	10.0	3.0	<b>0.130</b>	0.4	0.4	0.9	0.3	1.4	0.3
Depth of credit information index	*	4.5	6.0	1.5	<b>0.239</b>	0.4	0.3	1.1	0.3	0.9	0.4
<b>Corporate Governance</b>											
Protection of minority shareholders' interests	*	4.6	5.8	1.2	<b>1.234</b>	1.5	0.3	5.6	0.2	0.8	1.9
Strength of auditing and reporting standards	*	5.2	6.3	1.0	<b>1.247</b>	1.3	0.2	6.5	0.2	0.7	1.8
Strength of investor protection index	*	5.7	9.0	3.3	<b>0.368</b>	1.2	0.6	2.1	0.4	1.5	0.8
Prevalence of foreign ownership	*	5.1	6.3	1.2	<b>0.846</b>	1.0	0.2	4.3	0.2	0.8	1.3
Extent of disclosure index	*	6.2	10.0	3.8	<b>0.138</b>	0.5	0.6	0.9	0.4	1.6	0.3

Indicator	Significance	(1) Index EU-27	(2) Best Five in World	(3) (2)-(1) Differ- ence	(4) <b>Coeffi- cient</b>	(5) (4) × (3) Impact on Growth	(6) (3) / (1) Re- quired Reform Effort (con- vex)	(7) (5) / (6) Effici- ency of Reform (con- vex)	(8) (3) / (2) Rela- tive Dis- tance to Best Five	(9) ln (3) Re- quired Reform Effort (con- cave)	(10) (5) / (9) Effici- ency of Reform (con- cave)
Ease of shareholder suits index	*	6.4	9.4	3.0	<b>0.128</b>	0.4	0.5	0.8	0.3	1.4	0.3
<b>Infrastructure</b>											
Quality of railroad infrastructure	*	4.1	6.4	2.3	<b>0.702</b>	1.6	0.6	2.9	0.4	1.2	1.4
Quality of roads	*	4.8	6.4	1.7	<b>0.855</b>	1.4	0.4	4.1	0.3	1.0	1.5
Quality of port infrastructure	*	5.1	6.6	1.5	<b>0.894</b>	1.4	0.3	4.5	0.2	0.9	1.5
Quality of air transport infrastructure	*	5.3	6.6	1.3	<b>1.004</b>	1.3	0.2	5.3	0.2	0.8	1.6
Government involvement in infrastructure sector	*	3.1	1.3	-1.8	<b>-0.308</b>	0.6	0.6	1.0	1.4	1.0	0.5
<b>Education</b>											
Average years of schooling	*	8.5	11.7	3.2	<b>0.402</b>	1.3	0.4	3.4	0.3	1.4	0.9
Quality of the educational system	*	4.2	5.8	1.6	<b>0.777</b>	1.2	0.4	3.3	0.3	0.9	1.3
Internet access in schools	*	5.4	6.4	1.0	<b>1.034</b>	1.1	0.2	5.6	0.2	0.7	1.5
<b>Corruption</b>											
Corruption (2000-11)	*	6.1	9.3	3.2	<b>0.545</b>	1.8	0.5	3.3	0.3	1.4	1.2
Favoritism in decisions of government officials	*	3.6	5.5	1.9	<b>0.826</b>	1.6	0.5	3.0	0.3	1.1	1.5
Control of corruption	*	1.1	2.3	1.2	<b>1.227</b>	1.5	1.1	1.4	0.5	0.8	1.9
Irregular payments and bribes	*	5.1	6.6	1.5	<b>0.962</b>	1.5	0.3	4.9	0.2	0.9	1.6

Source: IMF staff calculations.

## Appendix 8C. Data Description and Sources

Variable	Description
<b>Labor</b>	
Civil rights index	Measures the degree of protection of vulnerable groups against employment discrimination as the average of the five following variables: Labor discrimination on grounds of race is expressly prohibited by law; Labor discrimination on grounds of gender is expressly prohibited by law; Statutory duration of maternity leave with 100 percent earnings; Minimum working age; Mandatory minimum wage. Source: Botero and others (2003).

Variable	Description
Cooperation in labor-employer relations	“How would you characterize labor-employer relations in your country?” [1 = generally confrontational; 7 = generally cooperative], 2010–11 weighted average. Source: World Economic Forum database.
Dismissal procedures index	Measures worker protection granted by law or mandatory collective agreements against dismissal. It is the average of the following seven dummy variables, each of which equals 1 (1) if the employer must notify a third party before dismissing more than one worker, (2) if the employer needs the approval of a third party before dismissing more than one worker, (3) if the employer must notify a third party before dismissing one redundant worker, (4) if the employer needs the approval of a third party to dismiss one redundant worker, (5) if the employer must provide relocation or retraining alternatives for redundant employees before dismissal, (6) if there are priority rules applying to dismissal or layoffs, and (7) if there are priority rules applying to reemployment. Source: Botero and others (2003).
Flexibility of wage determination	“How are wages generally set in your country?” [1 = by a centralized bargaining process; 7 = up to each individual company], 2010–11 weighted average. Source: World Economic Forum database.
Hiring and firing regulations	This subcomponent is based on the World Bank’s Doing Business Difficulty of Hiring Index, which is described as follows: “The difficulty of hiring index measures (1) whether fixed-term contracts are prohibited for permanent tasks; (2) the maximum cumulative duration of fixed-term contracts; and (3) the ratio of the minimum wage for a trainee or first-time employee to the average value added per worker. An economy is assigned a score of 1 if fixed-term contracts are prohibited for permanent tasks and a score of 0 if they can be used for any task. A score of 1 is assigned if the maximum cumulative duration of fixed-term contracts is less than 3 years; 0.5 if it is 3 years or more but less than 5 years; and 0 if fixed-term contracts can last 5 years or more. Finally, a score of 1 is assigned if the ratio of the minimum wage to the average value added per worker is 0.75 or more; 0.67 for a ratio of 0.50 or more but less than 0.75; 0.33 for a ratio of 0.25 or more but less than 0.50; and 0 for a ratio of less than 0.25.” Countries with higher difficulty of hiring are given lower ratings. Sources: Economic Freedom of the World; World Bank, <i>Doing Business</i> .
Pay and productivity	“To what extent is pay in your country related to productivity?” [1 = not related to worker productivity; 7 = strongly related to worker productivity], 2010–11 weighted average. Source: World Economic Forum database.
Redundancy costs	Redundancy costs in weeks of salary, 2009. The lower the value the better. Source: World Bank, <i>Doing Business</i> .
Unemployment benefits index	Measures the level of unemployment benefits as the average of months of contributions or employment for unemployment benefits, percentage of salary deducted for unemployment benefits, waiting period for unemployment benefits, and unemployment benefits net replacement rate. Source: Botero and others (2003).
<b>Product and services markets</b>	
Administrative burdens for sole proprietor firms	Measures the administrative burdens on the creation of sole proprietor firms. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or

Variable	Description
	regulations. Source: OECD database.
Airlines	The air transportation indicator is constructed based on the indicators for entry regulation and public ownership; and it covers passenger transport, international and domestic routes. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Airlines: Public ownership	Public ownership in air transport is covered by reporting the percentage shares owned by the government in the largest company. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Barriers to entry in services	Entry regulations cover provisions that either raise the cost of accessing retail markets or create explicit barriers for certain types of outlets. The indicator includes information on two regulations that potentially increase costs, registration requirements and licensing requirements, and three regulations that impose barriers, restrictions on the range of products that can be sold, restrictions on the range of services that can be supplied, and restrictions on the establishment of large outlets. The indicator also includes information on the extent to which incumbents are protected from new entry, either because they are granted legal monopoly rights or because they are involved in decisions concerning new licenses. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Duration of compulsory practice for engineers	This indicator is constructed based on the duration of compulsory practice necessary to become a full member of the engineering profession. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Duration of specialized education for accountants	The index is based on three components: duration of specialized education, university, or other higher degree; the duration of compulsory practice necessary to become a full member of the profession; and the professional exams that must be passed to become a full member of the profession. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Duration of specialized education for architects	The index is based on three components: duration of specialized education, university, or other higher degree; the duration of compulsory practice necessary to become a full member of the profession; and the professional exams that must be passed to become a full member of the profession. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Duration of specialized education for engineers	The index is based on three components: duration of specialized education, university, or other higher degree; the duration of compulsory practice necessary to become a full member of the profession; and the professional exams that must be passed to become a full member of the profession. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.

Variable	Description
Effectiveness of antimonopoly policy	“To what extent does antimonopoly policy promote competition in your country?” [1 = does not promote competition; 7 = effectively promotes competition], 2010–11 weighted average. Source: World Economic Forum database.
Electricity indicator	The electricity indicator is constructed based on the indicators for entry regulation, public ownership, vertical integration, and market structure. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database..
Electricity: Public ownership	Indicators for public ownership record the prevailing ownership structure in the various segments of the electricity, ranging from fully private to fully public. The scoring allows for mixed ownership arrangements in which the natural monopoly segments remain in public hands. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Explicit barriers	Explicit barriers comprise ownership barriers, tariffs, and discriminatory provisions. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Gas: Market structure	This index measures the market share of the largest company in the gas production and import industry; the gas transmission industry; and the gas supply industry. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Involvement in business operation	Involvement in business operation measures state control in setting prices in road freight, air transport, retail distribution, and some telecommunications services; and the use of command and control regulation. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Licensing: Accounting	This indicator measures how many services the accounting profession has an exclusive or shared exclusive right to provide. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions/regulations. Source: OECD database.
Licensing: Engineers	This indicator measures how many services the engineering profession has an exclusive or shared exclusive right to provide. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Operational restrictions	This indicator is based on the protection of existing firms and the regulations concerning shop opening hours. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.

Variable	Description
Price controls	The more widespread the use of price controls, the lower the rating. The survey data of the International Institute for Management Development's World Competitiveness Yearbook (various editions) were used to rate the countries (mostly developed economies) covered by the report. Other sources were used to categorize other countries. Countries were given a rating of 10 if no price controls or marketing boards were present. If price controls were limited to industries for which economies of scale may reduce the effectiveness of competition (e.g., power generation), a country was given a rating of 8. If price controls were applied in only a few other industries, such as agriculture, a country was given a rating of 6. If price controls were levied on energy, agriculture, and many other staple products that are widely purchased by households, a rating of 4 was given. If price controls applied to a significant number of products in both agriculture and manufacturing, the rating was 2. A rating of zero was given if there was widespread use of price controls throughout various sectors of the economy. Source: Economic Freedom of the World.
Product market regulation	The product market regulation (PMR) indicator covers formal regulations in the following areas: state control of business enterprises, legal and administrative barriers to entrepreneurship, and barriers to international trade and investment. The PMR indicators are based primarily on explicit policy settings and only account for formal government regulation. Thus, the indicators only record "objective" data about rules and regulations, as opposed to "subjective" assessments of market participants in indicators based on opinion surveys. This isolates the indicators from context-specific assessments and makes them comparable across countries, but also results in some limitations. "Informal" regulatory practices, such as administrative guidance or self-disciplinary measures of professional associations, are only captured to a very limited extent in the PMR indicators system. The scale of indicators is 0–6 from least to most restrictive. Source: OECD database.
Protection of existing firms	Are professional bodies or representatives of trade and commercial interests involved in licenses or permits needed to engage in commercial activity (not related to outlet sitting); licenses or permits needed for outlet sitting (in addition to compliance with general urban planning provisions); or compliance with regulation especially designed for large-outlet licensing decisions? Are there products that can only be sold in outlets operating under a local or national legal monopoly (franchise)? The index ranges from 0 to 6, 6 being more protective and 0 having no protection. Source: OECD database.
Public ownership	This indicator measures the percentage of shares in the largest companies owned by national, state, or provincial authorities, with ownership ranging from fully private to fully public. The scoring allows for mixed ownership arrangements in which the natural monopoly segments remain in public hands. The index ranges from 0 to 6, with 6 being the highest public share and 0 the lowest. Source: OECD database.
Rail: Public ownership	This indicator is based on the percentage of shares owned by government in operation of the infrastructure sector, the passenger transport sector, and the freight transport sector. The index ranges from 0 to 6, with 6 being the highest public share and 0 the lowest. Source: OECD database.

Variable	Description
Requirements in education for engineers	This indicator is constructed based on three measures: the duration of the university degree or other higher degree program; the duration of compulsory practice necessary to become a full member of the profession; and the exams that must be passed to become a full member of the engineering profession. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Restrictions to competition in seven industries	This indicator measures restrictions to competition in seven industries: electricity, gas, air passenger transport, rail transport, road freight, postal services, and telecommunications. The indicators cover transmission, distribution, and supply in electricity and gas; infrastructure as well as passenger and freight services in rail transport; domestic and international routes in air passenger transport; basic letter, parcel, and courier services in post; and trunk, long distance, and mobile services in telecommunications. In each industry, the indicators include the following low-level indicators: barriers to entry in all sectors; public ownership in all sectors except road freight; vertical integration in electricity, gas, and rail transport; market structure in rail transport, gas, and telecommunications; and price controls in road freight. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Scope of public enterprise sector	This indicator measures the pervasiveness of state ownership across business sectors as the proportion of sectors in which the state has an equity stake in at least one firm. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Sector-specific administrative burdens	This indicator reflects administrative burdens in the road transport and retail distribution sectors. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
State control	This indicator is based on the percentage of shares in the largest companies owned by state, as well as the state involvement in business operation. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Telecommunications: Market structure	The indicator for market structure in telecommunications is based on the market share of new entrants in each of the telecommunications services covered by the indicator to gauge the extent to which existing regulations actually succeed in promoting competition. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Use of command and control regulation	Use of command and control regulation indicates the extent to which government uses coercive (as opposed to incentives-based) regulation in general and in specific services sectors. The latest available data are for 2008. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.

Variable	Description
<b>Business regulations</b>	
Administrative burdens on start-ups	Measures the minimum number of mandatory procedures required to register a public limited company, the minimum number of services (number of public and private bodies to contact to register a public limited company), the minimum direct and indirect costs, and the number of working days required to complete all mandatory procedures for registering a public limited company. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Administrative requirements	This subcomponent is based on the Global Competitiveness Report question: “Complying with administrative requirements (permits, regulations, reporting) issued by the government in your country is (1 = burdensome, 7 = not burdensome).” Source: Economic Freedom of the World.
Barriers to entrepreneurship	Comprises detailed indicators of (1) the features of the licensing and permit system; (2) the communication and simplification of rules and procedures; (3) economy-wide administrative burdens on start-ups of corporate firms; (4) economy-wide administrative burdens on the start-up of sole-proprietor firms; (5) industry-specific administrative burdens on start-ups of retail distribution and road freight companies; (6) the scope of legal barriers to entry (in 24 manufacturing and services industries); and (7) the existence of antitrust exemptions for public enterprises or government-mandated behavior. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Barriers to foreign direct investment	The foreign direct investment index focuses on four types of measures: equity restrictions, screening and approval requirements, restrictions on foreign key personnel, and other operational restrictions (such as limits on purchase of land or on repatriation of profits and capital). The discriminatory nature of measures is the central criterion for deciding whether a measure should be scored. Nevertheless, nondiscriminatory measures are also covered when they are burdensome for foreign investors. This is the case, in particular, for rules regarding nationality of key personnel and directors. The index covers 22 sectors, the scores for which are averaged to obtain a country score. The scale of indicators is 0–6 from least to most restrictive. Source: OECD database.
Burden of government regulation	“How burdensome is it for businesses in your country to comply with governmental administrative requirements (e.g., permits, regulations, reporting)?” [1 = extremely burdensome; 7 = not burdensome at all], 2010–11 weighted average. Source: World Economic Forum.
Bureaucracy costs	This subcomponent is based on the Global Competitiveness Report question: “Standards on product and service quality, energy and other regulations (outside environmental regulations) in your country are: (1 = Lax or nonexistent, 7 = among the world’s most stringent).” Source: Economic Freedom of the World.



Variable	Description
Business regulations	The more widespread the use of price controls, the lower the rating. The survey data of the International Institute for Management Development's World Competitiveness Yearbook (various editions) were used to rate the countries (mostly developed economies) covered by the report. Other sources were used to categorize other countries. Countries were given a rating of 10 if no price controls or marketing boards were present. If price controls were limited to industries in which economies of scale may reduce the effectiveness of competition (e.g., power generation), a country was given a rating of 8. If price controls were applied in only a few other industries, such as agriculture, a country was given a rating of 6. If price controls were levied on energy, agriculture, and many other staple products that are widely purchased by households, a rating of 4 was given. If price controls applied to a significant number of products in both agriculture and manufacturing, the rating was 2. A rating of zero was given if there was widespread use of price controls throughout various sectors of the economy. Source: Economic Freedom of the World.
Cost of dealing with construction permits	Cost is recorded as a percentage of the economy's income per capita. Only official costs are recorded. All the fees associated with completing the procedures to legally build a warehouse are recorded, including those associated with obtaining land use approvals and preconstruction design clearances; receiving inspections before, during, and after construction; getting utility connections; and registering the warehouse property. Nonrecurring taxes required for the completion of the warehouse project are also recorded. The building code, information from local experts, and specific regulations and fee schedules are used as sources for costs. If several local partners provide different estimates, the median reported value is used. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .
Cost of getting electricity	Cost is recorded as a percentage of the economy's income per capita. Costs are recorded exclusive of value-added tax. All the fees and costs associated with completing the procedures to connect a warehouse to electricity are recorded, including those related to obtaining clearances from government agencies, applying for the connection, receiving inspections of both the site and the internal wiring, purchasing material, getting the actual connection works, and paying a security deposit. Information from local experts and specific regulations and fee schedules are used as sources for costs. If several local partners provide different estimates, the median reported value is used. In all cases the costs exclude bribes. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .
Cost of starting a business	Cost is recorded as a percentage of the economy's income per capita. It includes all official fees and fees for legal or professional services if such services are required by law. Fees for purchasing and legalizing company books are included if these transactions are required by law. The company law, the commercial code, and specific regulations and fee schedules are used as sources for calculating costs. In the absence of fee schedules, a government officer's estimate is taken as an official source. In the absence of a government officer's estimate, estimates of incorporation lawyers are used. If several incorporation lawyers provide different estimates, the median reported value is applied. In all cases the costs exclude bribes. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .

Variable	Description
Cost of tax compliance	This subcomponent is based on the World Bank's Doing Business data on the time required per year for a business to prepare, file, and pay taxes on corporate income, value added or sales taxes, and taxes on labor. Source: Economic Freedom of the World..
Days dealing with construction permits	This measure captures the median duration that local experts indicate is necessary to complete a procedure in practice. It is assumed that the minimum time required for each procedure is one day. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .
Days registering property	This measure captures the median duration that property lawyers, notaries, or registry officials indicate is necessary to complete a procedure. It is assumed that the minimum time required for each procedure is one day. Although procedures may take place simultaneously, they cannot start on the same day. It is assumed that the buyer does not waste time and commits to completing each remaining procedure without delay. If a procedure can be accelerated for an additional cost, the fastest legal procedure available and used by the majority of property owners is chosen. If procedures can be undertaken simultaneously, it is assumed that they are. It is assumed that the parties involved are aware of all requirements and their sequence from the beginning. Time spent gathering information is not considered. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .
Days to start a business	Number of days required to start a business, 2010. Source: World Bank, <i>Doing Business</i> .
Licensing restrictions	This subcomponent is based on the World Bank's Doing Business data on the time in days and monetary costs required to obtain a license to construct a standard warehouse. Zero-to-10 ratings were constructed for (1) the time cost (measured in number of calendar days required to obtain a license) and (2) the monetary cost of obtaining the license (measured as a share of per capita income). These two ratings were then averaged to arrive at the final rating for this subcomponent. Source: Economic Freedom of the World.
Procedures to start a business	Number of procedures required to start a business, 2010. A higher value means more procedures. Source: World Bank, <i>Doing Business</i> .
Regulation of credit, labor, and business	This index is composed of three categories: credit market regulations, labor market regulations, and business regulations. The credit market component is an average of the following subcomponents: ownership of banks, foreign bank competition, private sector credit, and interest rate controls or negative real interest rates. Source: Economic Freedom of the World.
Regulatory quality	Regulatory quality measures the incidence of market-unfriendly policies such as price controls or inadequate bank supervision, as well as perceptions of the burdens imposed by excessive regulation in areas such as foreign trade and business development. Source: World Bank, <i>Governance Indicators</i> database.
Regulatory restrictions on the sale of real property	This subcomponent is based on the World Bank's Doing Business data on the time measured in days and monetary costs required to transfer ownership of property that includes land and a warehouse. Zero-to-10 ratings were constructed for (1) the time cost (measured in number of calendar days required to transfer ownership) and (2) the monetary cost of transferring ownership (measured as a percentage of

Variable	Description
	the property value). These two ratings were then averaged to arrive at the final rating for this subcomponent. Source: Economic Freedom of the World.
<b>Trade</b>	
Barriers to trade and investment	The barriers to international trade and investment indicator is based on explicit barriers such as barriers to foreign direct investment, discriminatory barriers and tariffs, and regulatory barriers. This domain includes detailed indicators of (1) barriers to share-ownership for nonresident operators (economy-wide and in the telecommunications and air travel industries); (2) discriminatory procedures in international trade and competition policies; (3) regulatory barriers to trade; and (4) average (production-weighted) tariffs. The index ranges from 0 to 6, 6 being more restrictive and 0 having no restrictions or regulations. Source: OECD database.
Burden of customs procedures	“How would you rate the level of efficiency of customs procedures (related to the entry and exit of merchandise) in your country?” [1 = extremely inefficient; 7 = extremely efficient], 2010–11 weighted average. Source: World Economic Forum.
Compliance cost of importing and exporting	This subcomponent is based on the World Bank’s Doing Business data on the time cost (i.e., nonmoney) of procedures required to export or import a full 20-foot container of dry goods that contains no hazardous or military items. Countries in which it takes longer to export or import are given lower ratings. Zero-to-10 ratings were constructed for (1) the time cost to export a good (measured in number of calendar days required) and (2) the time cost to import a good (measured in number of calendar days required). These two ratings were then averaged to arrive at the final rating for this subcomponent. Source: Economic Freedom of the World.
Cost to export (US\$ per container)	Cost measures the fees levied on a 20-foot container in U.S. dollars. All the fees associated with completing the procedures to export the goods are included. These include costs for documents, administrative fees for customs clearance and technical control, customs broker fees, terminal handling charges, and inland transport. The cost does not include customs tariffs and duties or costs related to ocean transport. Only official costs are recorded. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .
Cost to import (US\$ per container)	Cost measures the fees levied on a 20-foot container in U.S. dollars. All the fees associated with completing the procedures to import the goods are included. These include costs for documents, administrative fees for customs clearance and technical control, customs broker fees, terminal handling charges, and inland transport. The cost does not include customs tariffs and duties or costs related to ocean transport. Only official costs are recorded. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .

Variable	Description
Days to export	<p>The time for exporting is recorded in calendar days. The time calculation for a procedure starts from the moment it is initiated and runs until it is completed. If a procedure can be accelerated for an additional cost and is available to all trading companies, the fastest legal procedure is chosen. Fast-track procedures applying to firms located in an export processing zone are not taken into account because they are not available to all trading companies. Ocean transport time is not included. It is assumed that neither the exporter nor the importer wastes time and that each commits to completing each remaining procedure without delay. Procedures that can be completed in parallel are measured as simultaneous. The waiting time between procedures—for example, during unloading of the cargo—is included in the measure. Data are as of 2011. Source: World Bank, <i>Doing Business</i>.</p>
Days to import	<p>The time for importing is recorded in calendar days. The time calculation for a procedure starts from the moment it is initiated and runs until it is completed. If a procedure can be accelerated for an additional cost and is available to all trading companies, the fastest legal procedure is chosen. Fast-track procedures applying to firms located in an export processing zone are not taken into account because they are not available to all trading companies. Ocean transport time is not included. It is assumed that neither the exporter nor the importer wastes time and that each commits to completing each remaining procedure without delay. Procedures that can be completed in parallel are measured as simultaneous. The waiting time between procedures—for example, during unloading of the cargo—is included in the measure. Data are as of 2011. Source: World Bank, <i>Doing Business</i>.</p>
Documents to export (number)	<p>All documents (such as customs clearance, port and terminal handling, bank, and transportation) required per shipment to export the goods are recorded. It is assumed that the contract has already been agreed upon and signed by both parties. Documents required for clearance by government ministries, customs authorities, port and container terminal authorities, health and technical control agencies, and banks are taken into account. Since payment is by letter of credit, all documents required by banks for the issuance or securing of a letter of credit are also taken into account. Documents that are renewed annually and that do not require renewal per shipment (for example, an annual tax clearance certificate) are not included. Data are as of 2011. Source: World Bank, <i>Doing Business</i>.</p>
Documents to import (number)	<p>All documents (such as customs clearance, port and terminal handling, bank, and transportation) required per shipment to import the goods are recorded. It is assumed that the contract has already been agreed upon and signed by both parties. Documents required for clearance by government ministries, customs authorities, port and container terminal authorities, health and technical control agencies, and banks are taken into account. Since payment is by letter of credit, all documents required by banks for the issuance or securing of a letter of credit are also taken into account. Documents that are renewed annually and that do not require renewal per shipment (for example, an annual tax clearance certificate) are not included. Data are as of 2011. Source: World Bank, <i>Doing Business</i>.</p>

Variable	Description
Nontariff trade barriers	This subcomponent is based on the Global Competitiveness Report survey question “In your country, tariff and non-tariff barriers significantly reduce the ability of imported goods to compete in the domestic market.” The question’s wording has varied slightly over the years. Source: Economic Freedom of the World.
Prevalence of trade barriers	“In your country, to what extent do tariff and non-tariff barriers limit the ability of imported goods to compete in the domestic market?” [1 = strongly limit; 7 = do not limit], 2010–11 weighted average. Source: World Economic Forum.
Regulatory trade barriers	This variable is composed of two main elements: nontariff trade barriers and compliance cost of importing and exporting. Source: Economic Freedom of the World.
<b>Legal system</b>	
Bounced check collection: Formalism index	This index measures substantive and procedural statutory intervention in judicial cases at lower-level civil trial courts, and is formed by adding up the following indices: (1) professionals vs. laymen, (2) written vs. oral elements, (3) legal justification, (4) statutory regulation of evidence, (5) control of superior review, (6) engagement formalities, and (7) independent procedural actions. The index ranges from 0 to 7, where 7 means a higher level of control or intervention in the judicial process. Source: Djankov and others (2002a).
Bounced check collection: Index, mandatory time limits	This indicator measures the presence of mandatory time limits in the procedure. The index is calculated as the average of (1) term for admission, (2) term to present evidence, (3) term to present defense, (4) term for judgment, (5) term for compliance, (6) term for notification of judgment. The index ranges from 0 to 1, where higher values mean more mandatory deadlines. Source: Djankov and others (2002a).
Bounced check collection: Index, professionals vs. laymen	This index measures whether the resolution of the case relies on the work of professional judges and attorneys, as opposed to other types of adjudicators and lay people. The index is the normalized sum of (1) general jurisdiction court, (2) professional vs. nonprofessional judge, and (3) whether legal representation is mandatory. The index ranges from 0 to 1, where higher values mean more participation by professionals. Source: Djankov and others (2002a).
Bounced check collection: Index, statutory regulation of evidence	This index measures the level of statutory control or intervention of the administration, admissibility, evaluation, and recording of evidence. The index is formed by the normalized sum of the following variables: (1) judge cannot introduce evidence, (2) judge cannot reject irrelevant evidence, (3) out-of-court statements are inadmissible, (4) mandatory prequalification of questions, (5) oral interrogation only by judge, (6) only original documents and certified copies are admissible, (7) authenticity and weight of evidence defined by law, and (8) mandatory recording of evidence. The index ranges from 0 to 1, where higher values mean higher statutory control or intervention. Source: Djankov and others (2002a).

Variable	Description
Cost of enforcing contracts (% of claim)	Cost is recorded as a percentage of the claim, assumed to be equivalent to 200 percent of income per capita. No bribes are recorded. Three types of costs are recorded: court costs, enforcement costs, and average attorney fees. Court costs include all court costs and expert fees that Seller (plaintiff) must advance to the court, regardless of the final cost to Seller. Expert fees, if required by law or commonly used in practice, are included in court costs. Enforcement costs are all costs that Seller (plaintiff) must advance to enforce the judgment through a public sale of Buyer's movable assets, regardless of the final cost to Seller. Average attorney fees are the fees that Seller (plaintiff) must advance to a local attorney to represent Seller in the standardized case. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .
Cost of resolving insolvency (% of estate)	The cost of the proceedings is recorded as a percentage of the value of the debtor's estate. The cost is calculated on the basis of questionnaire responses and includes court fees and government levies; fees of insolvency administrators, auctioneers, assessors, and lawyers; and all other fees and costs. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .
Efficiency of legal framework in challenging regulations	"How efficient is the legal framework in your country for private businesses in challenging the legality of government actions and/or regulations?" [1 = extremely inefficient; 7 = highly efficient], 2010–11 weighted average. Source: World Economic Forum.
Efficiency of legal framework in settling disputes	"How efficient is the legal framework in your country for private businesses in settling disputes?" [1 = extremely inefficient; 7 = highly efficient], 2010–11 weighted average. Source: World Economic Forum.
Impartial courts	This component is from the Global Competitiveness Report question, "The legal framework in your country for private businesses to settle disputes and challenge the legality of government actions and/or regulations is inefficient and subject to manipulation (= 1) or is efficient and follows a clear, neutral process (= 7)." The question's wording has varied slightly over the years. Source: Economic Freedom of the World.
Integrity of the legal system	This component is based on the International Country Risk Guide, Political Risk Component I., for Law and Order: "Two measures comprising one risk component. Each sub-component equals half of the total. The 'law' sub-component assesses the strength and impartiality of the legal system, and the 'order' sub-component assesses popular observance of the law." Source: PRS Group, International Country Risk Guide (various years).
Judicial independence	"To what extent is the judiciary in your country independent from influences of members of government, citizens, or firms?" [1 = heavily influenced; 7 = entirely independent], 2010–2011 weighted average. Source: World Economic Forum.
Legal enforcement of contracts	This component is based on estimates of the time and money required to collect a clear-cut debt. The debt is assumed to equal 200 percent of the country's per capita income if the plaintiff has complied with the contract and judicial judgment is rendered in his favor. Zero-to-10 ratings were constructed for (1) the time cost (measured in number of calendar days required from the moment the lawsuit is filed until payment) and (2) the monetary cost of the case (measured as a

Variable	Description
	percentage of the debt). These two ratings were then averaged to arrive at the final rating for this subcomponent. Source: World Bank, <i>Doing Business</i> .
Legal structure and security of property rights	This index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 10, with higher scores indicating that collateral and bankruptcy laws are better designed to expand access to credit, 2011. Source: Economic Freedom of the World.
Procedures for enforcing contracts	A procedure is defined as any interaction, required by law or commonly used in practice, between the parties or between them and the judge or court officer. This includes steps to file and serve the case, steps for trial and judgment, and steps necessary to enforce the judgment. Data are as of 2011. The number of procedures range from 0 to 55. Source: World Bank, <i>Doing Business</i> .
Protection of property rights	This component is from the Global Competitiveness Report question “Property rights, including over financial assets, are poorly defined and not protected by law (= 1) or are clearly defined and well protected by law (= 7).” Source: Economic Freedom of the World.
Recovery rate of resolving insolvency (cents on the dollar)	The recovery rate is recorded as cents on the dollar recouped by creditors through reorganization, liquidation, or debt enforcement (foreclosure) proceedings. The calculation takes into account the outcome: whether the business emerges from the proceedings as a going concern or the assets are sold piecemeal. Then the costs of the proceedings are deducted (1 cent for each percentage point of the value of the debtor’s estate). Finally, the value lost as a result of the time the money remains tied up in insolvency proceedings is taken into account, including the loss of value due to depreciation of the furniture. Consistent with international accounting practice, the annual depreciation rate for furniture is taken to be 20%. The furniture is assumed to account for a quarter of the total value of assets. The recovery rate is the present value of the remaining proceeds, based on end-2010 lending rates from the International Monetary Fund’s International Financial Statistics, supplemented with data from central banks and the Economist Intelligence Unit. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .
Tenant eviction: Index of statutory regulation of evidence	This index measures the level of statutory control or intervention of the administration, admissibility, evaluation, and recording of evidence. The index is formed by the normalized sum of the following variables: (1) judge cannot introduce evidence, (2) judge cannot reject irrelevant evidence, (3) out-of-court statements are inadmissible, (5) mandatory prequalification of questions, (5) oral interrogation only by judge, (6) only original documents and certified copies are admissible, (7) authenticity and weight of evidence defined by law, and (8) mandatory recording of evidence. The index ranges from 0 to 1, where higher values mean a higher statutory control or intervention. Source: Djankov and others (2002a).
Years resolving insolvency	Time for creditors to recover their credit is recorded in calendar years. The period of time measured by <i>Doing Business</i> is from the company’s default until the payment of some or all of the money owed to the bank. Potential delay tactics by the parties, such as the filing of dilatory appeals or requests for extension, are taken into consideration. The longer it takes to resolve insolvency, the higher the

Variable	Description
	values. Data are as of 2011. Source: World Bank, <i>Doing Business</i>
<b>Education</b>	
Average years of schooling	Average years of schooling of population older than 25 in 2000 or last year available (1990 for Estonia, Kazakhstan, Latvia, Lithuania, and Vietnam, and 1980 for St. Vincent) from Barro and Lee database.
Internet access in schools	“How would you rate the level of access to the Internet in schools in your country?” [1 = very limited; 7 = extensive], 2010–11 weighted average. Source: World Economic Forum database.
Quality of the educational system	“How well does the educational system in your country meet the needs of a competitive economy?” [1 = not well at all; 7 = very well], 2010–11 weighted average. Source: World Economic Forum database.
<b>Credit and finance</b>	
Affordability of financial services	“To what extent does competition among providers of financial services in your country ensure the provision of financial services at affordable prices?” [1 = not at all; 7 = extremely well], 2010–11 weighted average. Source: World Economic Forum database.
Capital controls	The International Monetary Fund reports on up to 13 types of international capital controls. The zero-to-10 (better) rating is the percentage of capital controls not levied as a share of the total number of capital controls listed, multiplied by 10. Source: Economic Freedom of the World database.
Credit market regulations	This component is an average of the following subcomponents: ownership of banks, foreign bank competition, private sector credit, and interest rate controls or negative real interest rates. A higher value indicates less regulation. Source: Economic Freedom of the World database.
Depth-of-credit-information index	The depth-of-credit-information index measures rules and practices affecting the coverage, scope, and accessibility of credit information available through either a public credit registry or a private credit bureau. The index ranges from 0 to 6, with higher values indicating the availability of more credit information, from either a public credit registry or a private credit bureau, to facilitate lending decisions. If the credit registry or bureau is not operational or has coverage of less than 0.1 percent of the adult population, the score on the depth of credit information index is 0. Data are as of 2011. Source: World Bank, <i>Doing Business</i>
Ease of access to loans	“How easy is it to obtain a bank loan in your country with only a good business plan and no collateral?” [1 = very difficult; 7 = very easy], 2010–11 weighted average. Source: World Economic Forum database.
Financing through local equity market	“How easy is it to raise money by issuing shares on the stock market in your country?” [1 = very difficult; 7 = very easy], 2010–11 weighted average. Source: World Economic Forum database.
Foreign ownership or investment restrictions	This subcomponent is based on the following two Global Competitiveness Report questions: “How prevalent is foreign ownership of companies in your country? 1 = Very rare, 7 = Highly prevalent”; and “How restrictive are regulations in your country relating to international capital flows? 1 = Highly restrictive, 7 = Not restrictive at all.” Source: Economic Freedom of the World.



Variable	Description
Getting credit: Strength of legal rights index	The strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 10, with higher scores indicating that collateral and bankruptcy laws are better designed to expand access to credit. Data are as of 2011. Source: World Bank, <i>Doing Business</i>
International capital market controls	This index is composed of two parts: foreign ownership or investment restrictions and capital controls. A higher value means less-restrictive capital controls. Source: Economic Freedom of the World.
Venture capital availability	“In your country, how easy is it for entrepreneurs with innovative but risky projects to find venture capital?” [1 = very difficult; 7 = very easy], 2010–11 weighted average. Source: World Economic Forum database.
<b>Research and development (R&amp;D)</b>	
Availability of scientists and engineers	“To what extent are scientists and engineers available in your country?” [1 = not at all; 7 = widely available], 2010–11 weighted average. Source: World Economic Forum database.
Company spending on R&D	“To what extent do companies in your country spend on R&D?” [1 = do not spend on R&D; 7 = spend heavily on R&D], 2010–11 weighted average. Source: World Economic Forum database.
Government procurement of advanced technology products	“Do government procurement decisions foster technological innovation in your country?” [1 = no, not at all; 7 = yes, extremely effectively], 2010–11 weighted average. Source: World Economic Forum database.
Intellectual property protection	“How would you rate intellectual property protection, including anticounterfeiting measures, in your country?” [1 = very weak; 7 = very strong], 2010–11 weighted average. Source: World Economic Forum database.
Quality of scientific research institutions	“How would you assess the quality of scientific research institutions in your country?” [1 = very poor; 7 = the best in their field internationally], 2010–11 weighted average. Source: World Economic Forum database.
University-industry collaboration in R&D	“To what extent do business and universities collaborate on research and development (R&D) in your country?” [1 = do not collaborate at all; 7 = collaborate extensively], 2010–11 weighted average. Source: World Economic Forum database.
Utility patents granted per million population	Number of utility patents (i.e., patents for invention) granted in 2010, per million population, 2010. Source: United States Patent and Trademark Office; United Nations Population Fund.

Variable	Description
<b>Corporate governance</b>	
Ease of shareholder suits index	The ease of shareholder suits index has six components: what range of documents is available to the shareholder plaintiff from the defendant and witnesses during trial; whether the plaintiff can directly examine the defendant and witnesses during trial; whether the plaintiff can obtain categories of relevant documents from the defendant without identifying each document specifically; whether shareholders owning 10 percent or less of the company's share capital can request that a government inspector investigate the buyer-seller transaction without filing suit in court; whether shareholders owning 10 percent or less of the company's share capital have the right to inspect the transaction documents before filing suit; and whether the standard of proof for civil suits is lower than that for a criminal case. The index ranges from 0 to 10, with higher values indicating greater powers of shareholders to challenge the transaction. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .
Extent of disclosure index	The extent of disclosure index has five components: which corporate body can provide legally sufficient approval for the transaction; whether immediate disclosure of the transaction to the public, the regulator, or the shareholders is required; whether disclosure in the annual report is required; whether disclosure by Mr. X to the board of directors is required; whether it is required that an external body, for example, an external auditor, review the transaction before it takes place. A score of 0 is assigned if no disclosure on the transaction is required. The index ranges from 0 to 10, with higher values indicating greater powers of shareholders to challenge the transaction. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .
Prevalence of foreign ownership	"How prevalent is foreign ownership of companies in your country?" [1 = very rare; 7 = highly prevalent], 2010–11 weighted average. Source: World Economic Forum database.
Protection of minority shareholders' interests	"In your country, to what extent are the interests of minority shareholders protected by the legal system?" [1 = not protected at all; 7 = fully protected], 2010–11 weighted average. Source: World Economic Forum database.
Strength of auditing and reporting standards	"In your country, how would you assess financial auditing and reporting standards regarding company financial performance?" [1 = extremely weak; 7 = extremely strong], 2010–11 weighted average. Source: World Economic Forum database.
Strength of investor protection index	The strength of investor protection index is the average of the extent of disclosure index, the extent of director liability index, and the ease of shareholder suits index. The index ranges from 0 to 10, with higher values indicating more investor protection. Data are as of 2011. Source: World Bank, <i>Doing Business</i> .
<b>Infrastructure</b>	
Government involvement in infrastructure sector	This indicator measures the percentage of shares in the infrastructure companies owned by national, state, or provincial authorities. The index ranges from 0 to 6, with 6 being the highest public share and 0 the lowest. Source: OECD database.
Quality of air transport infrastructure	"How would you assess passenger air transport infrastructure in your country?" [1 = extremely underdeveloped; 7 = extensive and efficient by international standards], 2010–11 weighted average. Source: World Economic Forum database.

Variable	Description
Quality of port infrastructure	“How would you assess port facilities in your country?” [1 = extremely underdeveloped; 7 = well developed and efficient by international standards]. For landlocked countries, the question is as follows: “How accessible are port facilities?” [1 = extremely inaccessible; 7 = extremely accessible], 2010–11 weighted average. Source: World Economic Forum database.
Quality of railroad infrastructure	“How would you assess the railroad system in your country?” [1 = extremely underdeveloped; 7 = extensive and efficient by international standards], 2010–11 weighted average. Source: World Economic Forum database.
Quality of roads	“How would you assess roads in your country?” [1 = extremely underdeveloped; 7 = extensive and efficient by international standards], 2010–11 weighted average. Source: World Economic Forum database.
<b>Corruption</b>	
Corruption (2000–11)	The average score of the Transparency International index of corruption perception between 2000 and 2011. The index provides a measure of the extent to which corruption is perceived to exist in the public and political sectors. The index focuses on corruption in the public sector and defines corruption as the abuse of public office for private gain. It is based on assessments by experts and opinion surveys. The index ranges between 0 (highly corrupt) and 10 (highly clean).
Control of corruption	“Control of corruption” measures perceptions of corruption, conventionally defined as the exercise of public power for private gain. The particular aspects of corruption measured by the various sources differ somewhat, ranging from the frequency of “additional payments to get things done,” to the effects of corruption on the business environment, to measuring “grand corruption” in the political arena or in the tendency of elite forms to engage in “state capture.” A higher number means a country has more control of corruption. Source: World Bank, <i>Governance Indicators</i> database.
Favoritism in decisions of government officials	“To what extent do government officials in your country show favoritism to well-connected firms and individuals when deciding upon policies and contracts?” [1 = always show favoritism; 7 = never show favoritism], 2010–11 weighted average. Source: World Economic Forum database.
Irregular payments and bribes	Average score across the five components of the following Executive Opinion Survey question: “In your country, how common is it for firms to make undocumented extra payments or bribes connected with (a) imports and exports; (b) public utilities; (c) annual tax payments; (d) awarding of public contracts and licenses; (e) obtaining favorable judicial decisions.” In each case, the answer ranges from 1 (very common) to 7 (never occurs), 2010–11 weighted average. Source: World Economic Forum database.

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