

APPENDIX B: HOW EQUITABLY DO THE RANKINGS REWARD REFORMS?

Each of DB's 10 indicators uses cardinal values for its subindicators: time, cost, number of procedures, and so on to create a ranking. These cardinal values are ranked according to their respective percentiles in each of the subindicator distributions. The subindicator percentiles are then averaged to come up with an indicator-level percentile; the 10 indicator percentiles are then averaged to generate the overall ease of doing business (EODB) ranking.¹

The use of several levels of ordinal rankings obscures the underlying cardinal values. That is, the magnitude of the difference between the countries ranked, say, fifty-ninth and sixtieth is not

necessarily the same as that between those ranked first and second. Figure B.1 illustrates this point by showing the frequency distribution for the total tax rate as a share of profits, a subindicator of *paying taxes*. There is a 5.1 percentage point difference between the top performer, Maldives, and the runner-up, Vanuatu. There is a 4.7 percentage point difference between the last and next-to-last countries in the distribution, Gambia and Burundi. However, the countries ranked fifty-ninth and sixtieth, Israel and Mozambique, are separated by just 0.1 of a percentage point (39.1 percent and 39.2 percent respectively), while there are 13 other countries accompanying them in the range between 37 percent and 40.3 percent.

Figure B.1: Difference between Ranks Can Vary

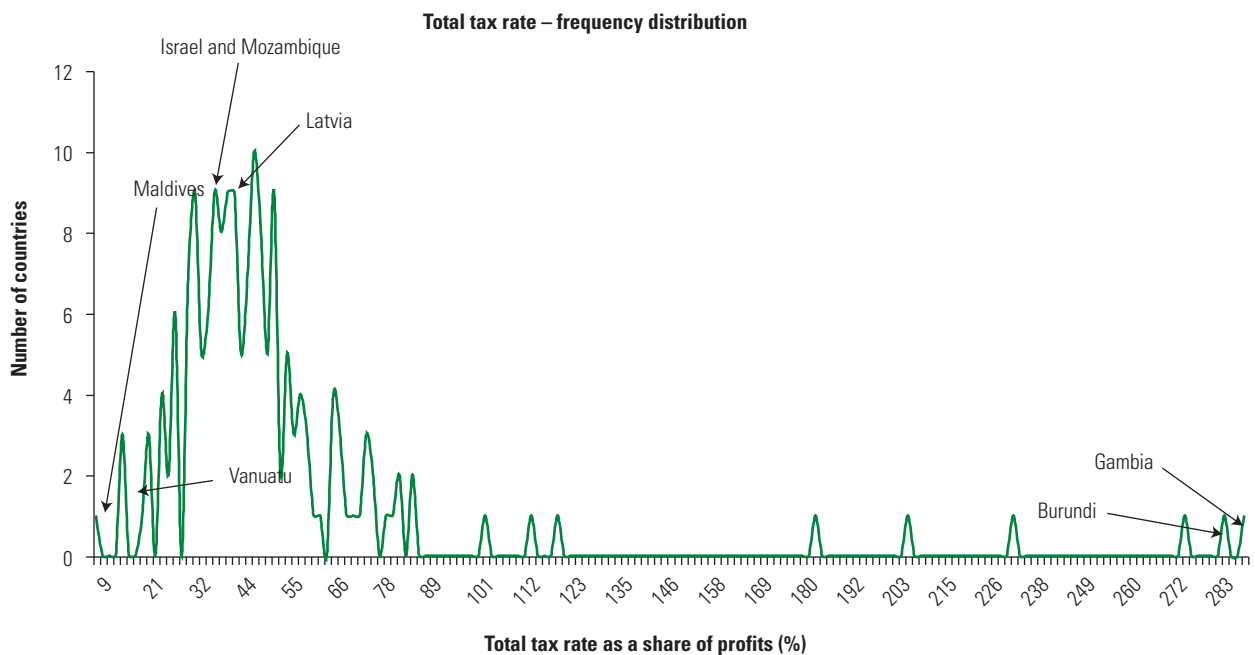


Table B.1: Countries in the Bottom Quartile on the *Paying Taxes* Indicator Need to Reduce Taxes More to Increase Rankings Relative to Countries in the 2nd and 3rd Quartiles

Country	Total tax rate 2007 (%)	Total tax rate 2008 (%)	Rank <i>paying taxes</i> 2007	Simulated rank with 2008 value	Difference in <i>paying taxes</i> rank
Latvia	43	33	52	35	17
Botswana	53	17	67	18	49
Kuwait	56	14	41	8	33
Belarus	186	144	175	175	0
Sierra Leone	277	234	138	137	1

A given change in a cardinal value, such as a reduction in the time needed for a procedure, is more likely to advance a country's rank (holding other countries' actions constant) if the country starts from a more concentrated segment of the distribution than if it starts from a more dispersed section. This arithmetic means that countries at the more dispersed parts of the distribution have to work harder to see changes in their overall rankings. Put differently, countries can make significant changes that do not improve their rankings if they are at the dispersed sections of the distribution for that indicator. The following three examples illustrate this asymmetry by simulating the change in rankings for a subindicator, holding the actions of the other countries constant.

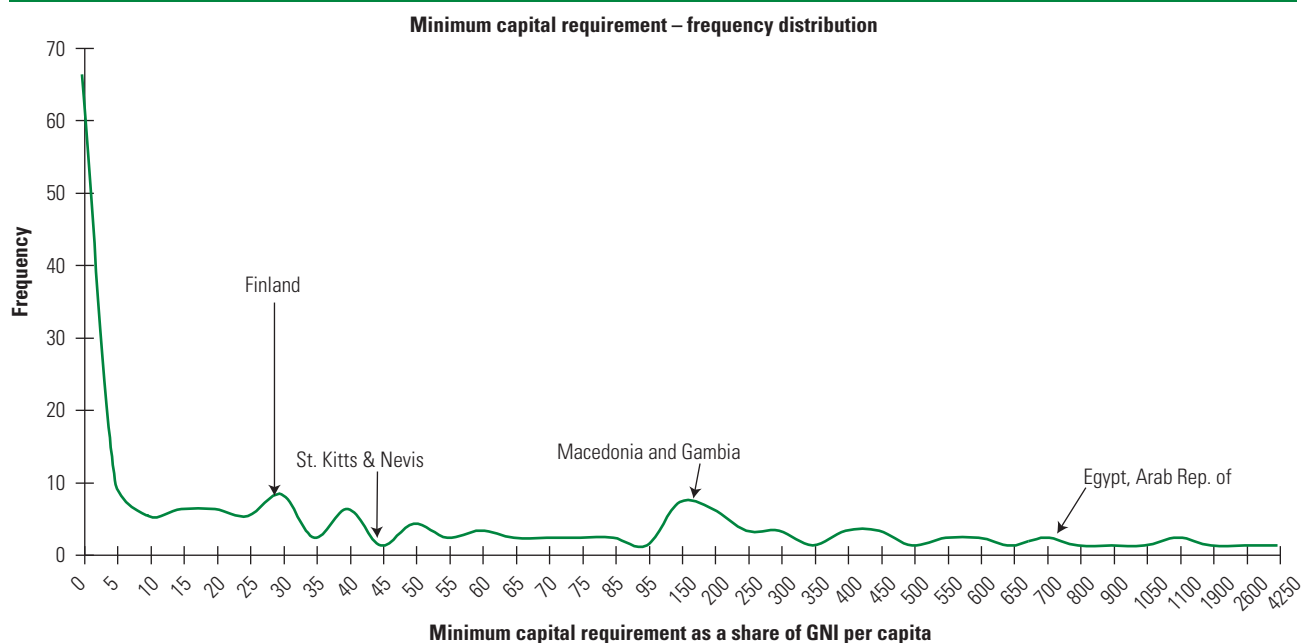
Example 1: How much does the tax rate have to fall to improve ranking on *paying taxes*? As seen in figure B.1, the frequency distribution for total tax rate as a share of profits for all countries ranges from 9.3 percent in Maldives to 291.4 percent in Gambia.

Almost all the countries (165, or 94 percent) fall within one standard deviation from the mean. Table B.1 presents the results of simulations² after improvements in the total tax rate. Sierra Leone is in the dispersed segment at the bottom of the total tax rate distribution, right before Burundi and Gambia. Despite a 43 percentage point reduction in total tax rate, the country improved only one position in the simulated ranking for *paying taxes*. Belarus's substantial tax reduction likewise did not affect the simulated ranking. Latvia, by contrast, despite only reducing the total tax rate by 10 percentage points, improved 17 positions because it is situated in the most populated segment of the distribution. Kuwait and Botswana received an even stronger boost from their tax reduction because of the same effect.

Example 2: How does reducing the minimum capital requirement affect ranking on *starting a business*? In 2008, Egypt drastically reduced its minimum capital requirement—from 695 percent of

Table B.2: Despite Egypt's Efforts In Reducing the Minimum Capital Requirement, St. Kitts and Nevis, Gambia, and Macedonia Will Gain More on DB Rankings for Lower Reductions

Country	Minimum capital requirement 2007 (%)	Minimum capital requirement 2008 (%)	Rank, <i>starting a business</i> , 2007	Simulated rank, <i>starting a business</i> , with 2008 value	Difference in <i>starting a business</i> rank
Finland	27	8	19	13	6
St. Kitts and Nevis	45	0	105	61	44
Gambia	120	0	124	70	54
Macedonia, FYR	112	0	76	27	49
Egypt	695	13	125	92	33

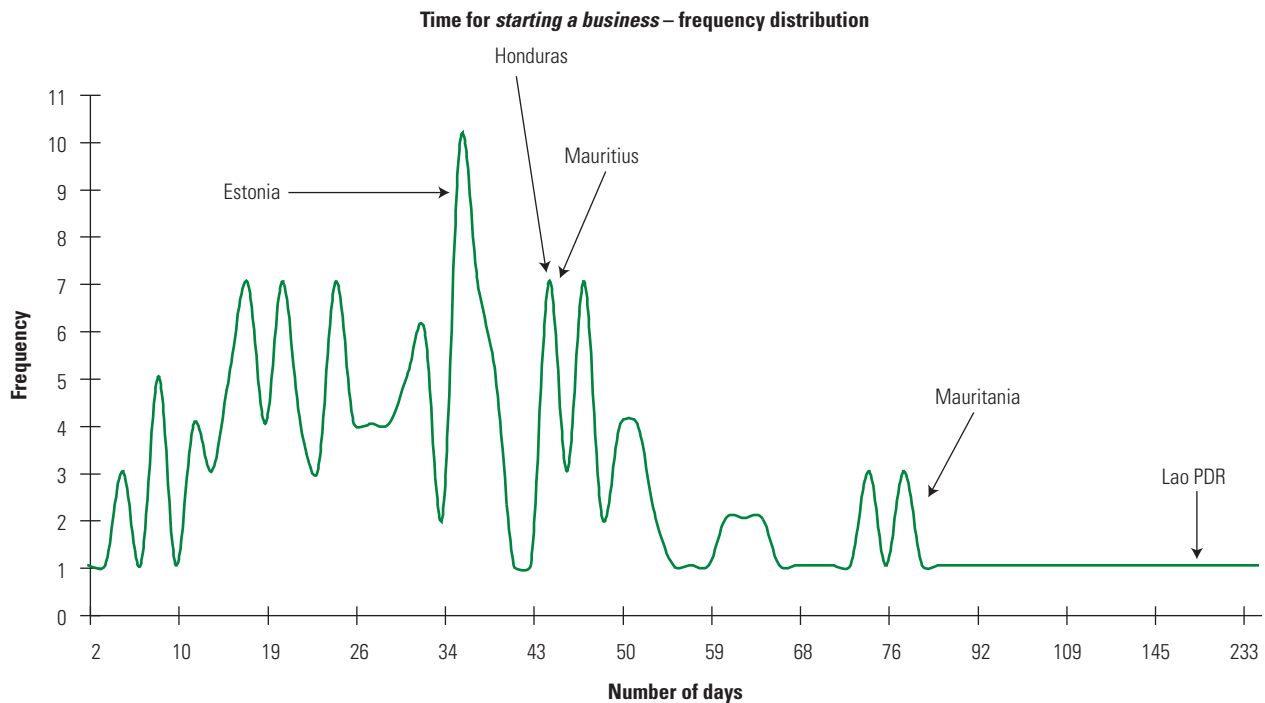
Figure B.2: Distribution of the Minimum Capital Requirement Subindicator for *Starting a Business*

income per capita to just 13 percent. Holding other countries' actions constant, it would have generated a 33-position boost in the *starting a business* ranking (see table B.2). The distribution of this subindicator, as shown in figure B.2, is concentrated around zero. More than a third of the countries (66 of them) do not have a minimum capital requirement. Although Gambia, Macedonia, and Saint Kitts and Nevis all reduced the minimum capital requirement much less than Egypt in absolute terms in 2008, they would have

boosted their rankings more than Egypt would have. By eliminating the minimum capital requirement, these three countries tied with the other 66 countries for first place in this subindicator. In turn, this substantially reduced their total average percentile for *starting a business*, improving their ranking for this indicator. Finally, a country such as Finland was also able to advance in the rankings, although less than the other countries, because of the relative lack of concentration around it in the distribution.

Table B.3: Countries in the Bottom Quartile on the Minimum Capital Requirement Subindicator Need to Do Much More to Increase Rankings Relative to Countries in the 2nd and 3rd Quartiles

Country	Time (days) 2007	Time (days) 2008	Rank, <i>starting a business</i> , 2007	Simulated rank, <i>starting a business</i> , with 2008 value	Difference in <i>starting a business</i> rank
Estonia	35	7	51	27	24
Honduras	44	21	138	121	17
Mauritius	46	7	30	10	20
Mauritania	82	65	164	164	0
Lao PDR	163	103	73	73	0

Figure B.3: Distribution of the Time to Start a Business

Example 3: How does reducing the time to open a business improve starting a business? The Republic of Lao reduced the time to start a business by 60 days in 2008, yet such a change did not affect the simulated ranking for *starting a business* (table B.3). Mauritania experienced a similar result. Mauritius, by contrast, reduced the time by 41 days, thereby advancing 20 positions on *starting a business*. Honduras and Estonia, both in the middle segment of the distribution and close to the majority of countries, also made significant progress in the ranking for *starting a business*. Lao and Mauritania are at the bottom end of the distribution and fairly isolated (see figure B.3). A change in the sparsely populated bottom end will be less likely to improve the percentile ranking of a country in that subindicator. In turn, it will have little effect on the average of the percentiles of the subindicators, which gives the indicator ranking.

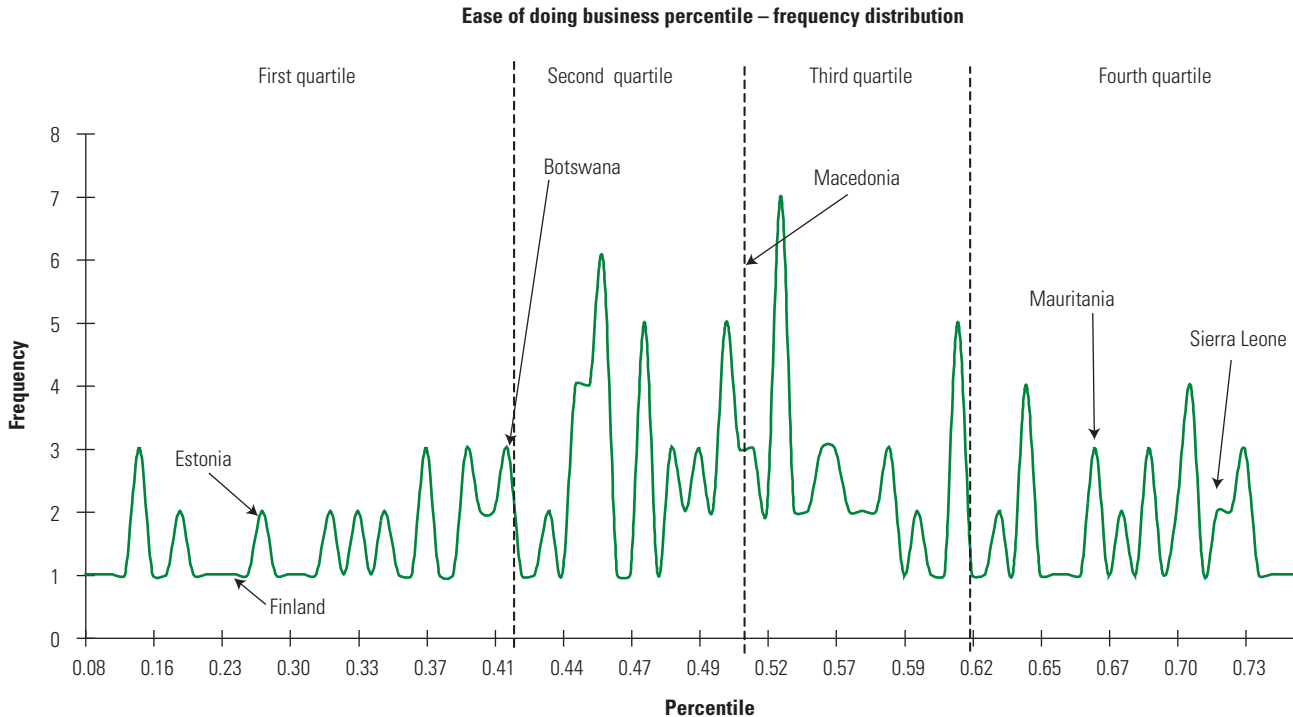
How Do Reforms Affect the EODB Distribution?

As mentioned above, the overall ranking of

EODB is calculated from the average of the percentile scores for the 10 indicators. This final percentile average, the EODB percentile, is a distribution of cardinal values ranging from 0.08 for Singapore to 0.82 for the Democratic Republic of Congo (DRC). These values are then ranked in order, with the first position belonging to Singapore and the last to DRC. Figure B.4 shows the distribution of the EODB percentiles for 2007.

The simulations presented in tables B.1–B.3, aside from causing changes in the indicator ranking, also produced changes in the EODB ranking. Table B.4 summarizes some of these changes for selected countries. Mauritania and Sierra Leone are at the most dispersed part of the distribution and did not improve in the overall ranking, despite the improvements in time to start a business and total tax rate, respectively. Finland and Estonia also show no improvement. Botswana, in contrast, improved 6 positions thanks to its tax reform, and

Figure B.4: Average Percentile of 10 DB Indicators



Macedonia improved 9 positions because of the elimination of the minimal capital requirement, because both countries are located in the more tightly distributed portions of the indicator.

Thus, a considerable improvement in the absolute value of a subindicator might not be enough to cause an improvement at the indicator level if that country is starting from a very low base. Countries in the most dispersed part of the distributions will need sizeable relative improvements in their subindicator values to catch up with the rest. This is the case for most of the countries in Africa.

Does the Ranking System Distort Reform Priorities?

It has been suggested that DB’s use of rankings might create an incentive for countries to reform the areas where they are most likely to move up in the EODB ranking for the least

reform effort. If this were the case, one would expect the highly concentrated subindicators to be associated with more reforms in a given year.³ Table B.5 ranks DB’s subindicators from most to least concentrated and shows the number of reforms associated with each of them in 2007.⁴

Table B.4: Despite Positive Changes, Countries at the Bottom and Top Quartiles Did Not Improve in Overall Rankings

Country	EODB 2007	Simulated EODB rank with 2008 reform	Difference in EODB rank
Finland	13	13	0
Estonia	17	16	1
Botswana	48	42	6
Macedonia, FYR	92	83	9
Mauritania	148	148	0
Sierra Leone	168	168	0

Table B.5: No Apparent Relationship between Tightness of Distribution and Reforms

Doing Business indicator	Subindicator	Number of countries in 1 standard deviation range	Percentage of countries in range	Frequency of reform in 2007
Paying taxes	Total tax rate	165	94	23
Starting a business	Minimum capital requirement	164	94	7
	Time	164	94	7
Employing workers	Firing costs	162	93	5
Dealing with licenses	Cost	158	90	9
Starting a business	Cost	158	90	5
Protecting investors	Time	158	90	2
Registering property	Time	150	86	6
Dealing with licenses	Procedures	149	85	12
Employing workers	Rigidity of hours	146	83	4
Starting a business	Procedures	138	79	28
Dealing with licenses	Time	135	77	3
Trading across borders	Time to export	134	77	17
Getting credit	Legal rights index	131	75	24
Enforcing contracts	Time	131	75	7
Trading across borders	Documents for export	129	74	10
Paying taxes	Payments	128	73	12
Registering property	Cost	127	73	14
	Procedures	126	72	7
Protecting investors	Disclosure index	124	71	9
Getting credit	Credit information index	123	70	13
Closing a business	Recovery rate	117	67	12
Protecting investors	Director liability index	117	67	4
	Shareholders suits index	116	66	3
Enforcing contracts	Procedures	115	66	20
Employing workers	Difficulty of firing index	113	65	1
	Difficulty of hiring index	109	62	2
Average		137	78	10
Median		131	75	7
Correlation between % of countries in range and number of reforms				0.01

The total tax rate is the third-most-frequent area of reform, and it has the tightest distribution of all the subindicators, with 94 percent of the countries' rankings within one standard deviation from the mean. But the two most popular areas for reform—number of procedures to start a business and legal rights of creditors and debtors—are not among the most

tightly distributed. The correlation between tightness of distribution and frequency of reforms is almost nonexistent (0.01), offering no support to the hypothesis that the ranking arithmetic is distorting reforms. Alternative hypotheses are that governments implement reforms that are politically or administratively easier, or the ones they think most relevant.