III.

Measurement, Methods, and More

The accurate measurement of the performance of governments depends upon the devising of appropriate indicators capable of capturing from the bottom up what citizens regularly look to their nation-state, provincial, municipal, and village polities to provide. We have rigorously attempted to do such measurement in this Index, building upon the explanatory papers that were published prior to the first Index. In addition to the five categories, fourteen sub-categories, and this year fifty-seven sub-sub-categories ("SSCs" or "indicators") that we are using to measure performance and governance in the 2008 Index, more variables could doubtless provide further calibrations and refinements. But we think that the 2008 Index, and the numbers arrayed in it, present sufficient complexity to capture and display the attainments of and the differences between governments at any level, anywhere (not just in Africa).

Measuring what political or organizational entities do is not new. Benchmarking and preparing report cards on various kinds of performance is well-established. Indeed, in recent years, with regard to national governments, indices and ranking systems have proliferated. There are happiness, global peace, global integrity, economic freedom, competition, corruption, political freedom, and many other index offerings. There are a variety of national, regional, and international attitudinal surveys, some extremely ambitious. But what makes this 2008 Index of African Governance unique (and the 2007 Index as well) is its attempt to be comprehensive across a broad range of data for all forty-eight sub-Saharan African countries. Among projects that seek to measure governance comprehensively, only the World Bank's Worldwide Governance Indicators is as complete in its coverage of countries. Other projects with similarly complete country coverage—such as Transparency International's Corruption Perceptions Index; the UNDP's *Human Development Report*; and Freedom House's Freedom in the World Report—are designed to measure only *components* of governance (here corruption, human development, and political rights and civil liberties, respectively). Among other broader projects on governance, the United Nations Economic Commission for Africa's *African Governance Report* (AGR), for instance, provided data on twenty-six sub-Saharan countries in its first report in 2005. The second AGR, slated for publication in 2008, will cover an additional nine countries. The latest round of Afrobarometer surveys conducted during 2008 will cover twenty countries. The most recent phase (2005–2007) of the World Governance Assessment conducted by the Overseas Development Institute (ODI) covers six sub-Saharan African countries.

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National Sources

The availability of good data drive each of these efforts, not least our own. In preparing the first Index of African Governance (and this year's version), we found numbers for many indicators much harder to obtain than we expected. Although some figure for some year for most countries is generally available for most of the SSCs, obtaining data for every appropriate year from international sources is especially difficult. In order to supplement internationally available sources (such as the World Bank's World Development Indicators, UNESCO, WHO, and so on) this year we attempted to collect good numbers for approximately twenty SSCs from national sources in each of sub-Saharan Africa's forty-eight countries. In-country researchers and research institutes, employed and directed by the Index staff, sought to gather such information from the national statistical offices and from ministries of justice, health, agriculture, and so on. This massive effort was mostly successful; in this year's Index we provide measures that are fuller and stronger than in 2007 because of the deployment of locally derived numbers. Nevertheless, despite mining the international sources used in 2007 and new ones available for the first time in 2008, some missing numbers still remain for a few SSCs for a handful of countries. Each of those gaps is mentioned in the notes to the individual SSCs.

With data arriving directly from individual countries, there is the added challenge of assessing data comparability across countries. For this reason, we have not been able to use in this year's Index all of the numbers that our researchers ably collected. For instance, we use estimates on maternal mortality compiled only by WHO, UNICEF, UNFPA, and the World Bank, not those of our researchers. As statistics on maternal mortality published in UNICEF's *The State of the World's Children 2008* report illustrate, there are often major differences between country-reported and "adjusted" figures on the maternal mortality ratio. (The adjustments are performed by WHO, UNICEF, UNFPA, and the World Bank based on complicated algorithms.) In Guinea-Bissau's case, for instance, the reported figure is 410 deaths per 100,000 live births and the adjusted figure is 1100. A related problem with the data, often noted by experts, is that official statistics themselves may be collected in a faulty manner or may not capture well what they purport to assess. This problem is worse in some countries than in others, and this reality must always be taken into account.

The interpretation of official national and international crime statistics poses a particular challenge. Variation in official crime rates may reflect not only variation in the actual number of crimes committed, but also variation in record-keeping and reporting—itself a measure of public faith or lack of faith in a national criminal justice system. Higher official crime rates might thus reflect both a negative and a positive governance outcome.

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We do not have solutions to these and similar data problems, but we will remain attentive to them as we continue to develop more sophisticated methods of data collection, both internationally and locally, through our research teams on the ground in Africa.

The Latest Numbers

Another important point about the numbers used in our Index is that in accord with the best international practices, they are fully updated in each year—both for the latest year *and* retrospectively for previous years. Data used in the 2008 Index of African Governance reflect the best available numbers as of approximately mid to late July 2008. Exact dates on which our sources were last accessed are noted in the descriptions for each indicator. Although not all indices submit to this rigorous standard, we do so in order to take advantage of the best available data, while producing an Index from which meaningful comparisons can be made over time. Data sources improve continuously due to new information, better estimation techniques, and corrections to simple errors. Standard international sources are regularly revised for previous years. This is true even for basic indicators like the inflation estimates released by the IMF, or GDP per capita figures released by the World Bank. In several cases, we have employed new data sources that measure specific SSCs more completely than our previous sources.

This retrospective revision—compelled by international data reassessments—means that numbers used in the 2008 Index of African Governance may be different in some cases from those used in our 2007 Index. In other words, a country's rank in the 2007 Index expressed our assessment, based on the best information available at that time, of its governmental performance relative to other countries in that year. If better information became available in 2008, that earlier assessment was adjusted. Such revisions do imply some changes in previous years' overall rankings, but, in general, we find few radical changes overall. In terms of comparisons year to year, therefore, the most meaningful comparisons are made using the data published in each year's Index. Naturally, many casual users of the Index will draw comparisons between a country's 2007 Index ranking and its 2008 Index ranking. For precise calibrations, however, researchers, as always, should follow standard research protocol and use the latest data release in their work.

Normalizing the Data

This Index avoids being prescriptive in terms of policies, letting the numbers tell the performance story. Those interested may review the raw data for each of the fifty-seven SSCs in order to develop a full, nuanced picture of performance in each country. But, the

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makers of the Index also agreed that a single composite score for each country—and, based on that, a ranking of all countries—was important for broad comparisons.
In calculating this composite score, we have had to make several key decisions. The first was how to normalize the raw data, putting it on a common scale so that the many different measures included in the Index could be compared and combined to calculate a single overall score. Such calculations can be done in numerous ways, three of which are essential for this Index. Most methods produce similar results in terms of the best and worst performers. But the manner in which the data are normalized and re-scaled does affect year-to-year comparisons and the ease of determining whether a nation-state in sub-Saharan Africa is improving its performance or regressing.

Among the three key methods, the first permits viewers to see at a glance whether a country is being governed more effectively this year compared to a previous year. A second method shows whether a country's rank has increased or decreased compared to the other forty-seven African nation-states, but is based on specific single year measurements and thus cannot show intrinsic year-to-year changes. A third method benchmarks each country's results for 2000 or some later year and carries increases or decreases forward ever afterward by displaying increments or slippages more or less than the benchmark.

Each of these methods has advantages and serious disadvantages, which are not immediately obvious. Those tradeoffs are explained succinctly below, together with a discussion of the method that is being used for the 2008 Index to calculate the final rankings. Readers need to be aware, further, that the rankings aggregate fifty-seven SSC measurements that are organized under fourteen sub-categories, and then gathered as scores under five defining categories. By any method, too, the overall rankings of countries by category are based on averages of scores by sub-category (and in turn by SSC). For ease of comparison, we have assigned a rank value (1 to 48) to each country by arraying these overall scores from highest to lowest. Both ranks and scores, however, are needed fully to understand a country's performance: the differences between some country scores are considerable, while those between others are not statistically significant.[1]

There is no single standard method of calculating an index.[2] Deciding among methods depends upon various considerations, including the type of comparisons that the analyst seeks to emphasize, the characteristics of the underlying data, and the theoretical value of

[1] Indeed, in a few cases numbers need to be taken to multiple decimal places to explain the ranking.
[2] For a useful summary of methods, see Michela Nardo, Michaela Saisana, Andrea Saltelli, Stefano Tarantola, Anders Hoffman, and Enrico Giovannini, "Handbook on Constructing Composite Indicators: Methodology and User Guider," OECD Statistics Working Paper, (Paris, 2005).

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placing emphasis on "outliers." It was critical in both the first Index of African Governance and this second one to emphasize relative simplicity as compared to other methods (i.e., the ease with which the results could be understood by non-statisticians).[3] The makers of the Index also seek to ensure that the real data themselves—rather than targets or reference points set arbitrarily—governed the scaling of the data.[4] Doing so was considered important for the Index because of the theoretical difficulties and potentially random nature of selecting constant reference points for all fifty-seven SSCs. Additionally, we sought a method that would not "discard" information, when available, about variation among countries. For instance, although some of the SSCs contain just three possible values (such as "not at all," "partially," and "fully"), others have a value from 0 to 100. Because the additional variation when available is useful in distinguishing among countries (even if not available for all SSCs), we refrain from normalizing the SSC data by grouping values into three (or five, or ten) categories.[5]

I. The Preferred Method: Year-to-Year Improvement Comparisons:

According to this method, for each SSC, the raw data are re-scaled such that the minimum value across all years of the Index (2000, 2002, 2005, and 2006) receives a score of "0" and the maximum value across all years of the Index, a score of "100." For each SSC in each country in each year, the score is calculated as follows:

$SSC_c^t = 100 \times \left(\frac{x_c^t - MIN(X)}{MAX(X) - MIN(X)} \right)$, where x_c^t is the raw value for that SSC for country *c* in year *t* and *X* describes all raw values across all countries for that SSC across all years 2000, 2002, 2005, and 2006.

(Note that for this method and the other two, because high values may indicate good performance for some SSCs and low values good performance for others, we subtract this sum from 100, as appropriate, so that the best performers always receive the highest values and the worst performers the lowest values. Details about scaling particular SSCs can be found in the descriptive notes to each and in the introductory notes to the various categories.)

Key Benefits:

- Scores for each country can be compared over time for 2000, 2002, 2005, and 2006, as well as relative to other countries within the same year. Using this

[3] This was one reason that z-scores were not used.
[4] This was one reason that "distance from a reference (or target)" methods were not used.
[5] This was one reason that methods employing rankings only or categorical scales were not used.

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method, South Africa ranks at 7th in 2002 and 5th in 2005 and 2006, with scores of 70.9, 70.9, and 71.5 for 2002, 2005, and 2006, respectively. Although South Africa's rank improved between 2002 and 2005 (from 7th to 5th), South Africa's scores suggest relative stability in the quality of governance from 2002 to 2005 (scores in both years were 70.9). The numbers thus imply that governmental performance remained relatively stable in South Africa, but other countries showed declines in governmental performance.

- The real data for each SSC determine the minimum and maximum values. Doing so is useful for SSCs such as "battle-deaths," where it is difficult to make predictions about the maximum possible values. An argument can also be made about its use for other SSCs for which the possible range of values is more predictable, such as the literacy rate. For instance, for the literacy rate SSC, one might set the minimum possible value at 0 percent and the maximum possible value at 100 percent. However, because the real data occupy a smaller range for this SSC (17.1 to 91.8 percent), arbitrarily setting the scale at 0 to 100 percent will mean that country values for this SSC will be lower than for other SSCs that do not have this characteristic. That fact might critically affect sub-category, category, and overall scores adversely; therefore, we refrain from scaling in that manner.

Key Weakness:

- If this method is used in each year, the scores of the Index of African Governance will change in each year—both for the latest year and previous years—due to changes in the real minimum and maximum values in various SSCs.

II. The Single Year, Country-to-Country, Relative Comparisons Method:

For each SSC, the raw data are re-scaled in each year such that the minimum value in that year receives a score of "0" and the maximum value in that year receives a score of "100." In other words, for each SSC in each country in each year, a value is calculated as follows:

$$SSC_c^t = 100 \times \left(\frac{x_c^t - MIN(X^t)}{MAX\left(X^t\right) - MIN\left(X^t\right)} \right)$$, where x_c^t is the raw value for that SSC for country *c* in year *t* and X^t describes the raw values across all countries for that SSC in year *t.*

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Key Benefits:

- Countries can be easily compared against each other in each year.
- Scores remain stable year to year on a simple 0–100 scale.
- Abnormally high or low values in particular years (which may be due to various shocks) only affect scores in that year.

Key Weakness:

- Scores for each country cannot be compared meaningfully year to year, but may unfortunately be interpreted in that way by those who do not fully understand the Index methodology. Using this method, suppose the Seychelles ranked at #2 in 2005, with a score of 82.4. That the Seychelles' score in 2000 was 84.6 and rank #1 would not necessarily suggest, however, that the quality of governance declined from 2000 to 2005. We are only able to say that government performance in the Seychelles has slightly declined relative to other countries between 2000 (when it ranked #1) and 2005 (when it ranked #2). The quality of governance in the Seychelles in fact would have improved; its decline in the rankings is because other countries improved more. But this nuance would be lost on some of the readers of the Index, who may then draw incorrect inferences.

III. The Benchmarking Method:

Data are scaled similarly to Method II, but using 2000 (or another year) as the base year. The minimum and maximum values in 2000 are used to calculate the score for future years, thus allowing scores after 2000 to be below 0 and above 100.

Key Benefits:

- Scores for each country can be compared over time, as well as relative to other countries within the same year (as in Method I).
- Scores for previous years do not change with the addition of new data—i.e., 2005 scores will be constant when 2006 data are added.

Key Weaknesses:

- The scale is arguably less intuitive than in Methods I and II, ranging above 100 and below 0.
- This method potentially allows raw data outliers to skew the overall results: The underlying data used to calculate the Index of African Governance vary significantly, some SSCs having high variation and some, low variation. Thus, in 2002, 2005, 2006, and future years, scores for some SSCs can be expected to jump considerably above 100 (or below 0), while the scores for other SSCs will

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continue to occupy a narrower range. Major outlier values for even one SSC would have an unfortunately large and misleading effect on the overall Index results. The multimodal nature of the data argues strongly statistically against using this method.

Conclusion:

For the 2007 and 2008 Indexes of African Governance, the makers have chosen to display the category and overall rankings according to Method I, despite its conceivable drawbacks and despite the fact that future editions of the Index will require some retrospective revisions to the numbers collected each year. Method II is simpler, but misleading. Method III is superficially appealing, but much less reliable over time than the other two. The 2008 Index of African Governance employs this first enduring method so as to combine the best features of all three standard methods, without their accompanying disadvantages.

Weights and Weighting

A second key decision in the calculation of a single composite score involves weighting. Within the main categories (Safety and Security, Human Development, and so on) we have had to decide how to weight the sub-categories—i.e., whether the sub-categories were to be counted equally or by some other method to arrive at a total score for each country for each category. We have also had to decide the weighting of the SSCs within each sub-category. In every case but one, Safety and Security, we weighted each of the sub-categories equally, arriving at a score and a rank order for that category, and we did the same for the weighting of SSCs within each sub-category. Doing so seemed fair, but it meant determining—this year and last year—that for, say, Human Development, all of the educational measures (SSCs) should be the equivalent to all of the slightly fewer health measures. For Sustainable Economic Opportunity, we also decided on grounds of fairness and parsimony that all three sub-categories—Wealth Creation, Financial Integrity, and Corruption—were equal, and should be counted that way in summing the overall score for that category. For Safety and Security, we would ideally have counted the two sub-categories of that category equally, as both National Security and Public Safety are key components of that political good. But, after reflecting at length on the quality of missing data (explained in the introduction to Safety and Security) for crime, we decided that it was more fair and more accurate to weight National Security (where the data were comparatively robust) twice as much as Public Safety, thus weighting the first two-thirds and the second one-third.

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For the final overall rankings we chose to weight each category equally in developing a country score instead of over-weighting one or more of the five categories. There are good arguments for using either method. The Index's Advisory Council, comprised of distinguished African scholars and practitioners, urged us to weight each category equally on fairness grounds, although one or more of its members favored over-weighting Safety and Security and/or Sustainable Economic Opportunity and Human Development. One of the makers of the Index long assumed that Safety and Security should be over-weighted in any final result because positive governmental performance is impossible without a large measure of security. Some of the trustees of the Mo Ibrahim Foundation originally favored giving more weight to Sustainable Economic Opportunity than to other categories.

In the final analysis, we chose to weight all categories equally—a decision not to over-weight or favor any category over others. As a check we also ran the numbers in a variety of other ways, over-weighting Safety and Security, Sustainable Economic Opportunity, and Human Development separately. An inspection of all of the different category weighting methods done for the 2007 Index shows that our chosen method produced strong results. Although there were naturally some variations among middle-ranking countries, the best and worst performers are similar across all methods. For that reason, and because—theoretically—we are persuaded that weighting each category equally is fair, and not challengeable on theoretical or epistemological grounds, the ultimate ranking scores that we present are not weighted to favor any category over any other.

Missing Values

A final, related issue that we addressed concerns missing values for specific indicators for specific countries or years. In almost all cases, we include estimates for missing values, as described in the descriptive notes to each indicator, and we use these estimates to calculate the Index as described above. In several instances (particularly in the category of Human Development), even rough estimates were unavailable for some indicators for some countries in some years. In these instances, we have calculated the sub-category, category, and overall Index scores without these missing data points, averaging based on the other available data. This method should yield reliable results if the real values for these missing data points are similar to those for other indicators in the same category relative to other countries. However, if there is significant variation in a country's performance across indicators in some sub-categories this method means that a country's sub-category, category, and overall scores will differ from what they should be—either lower or higher, depending on the case. In the absence of better information about these

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instances of missing data, however, this method reflects our best overall assessment at this time.

Data Currency

When we began to obtain the international and national data that composes the backbone of this first Index of African Governance, we assumed that data labeled for example 2005, 2006, 2007, or 2008 would necessarily supply data for such years. Not so. We gradually became aware that many of the standard and many of the new and appealing international sources of data— for Africa and elsewhere—set out numbers in any given year that might (as we learned through careful sleuthing) be from the year in question, a recent year, or even ten years or more before. Since so many of the international data compilations regurgitate numbers from other datasets without indicating that some or many of the data are, in fact, from earlier years, we have tried in this Index to be transparent about all of our data, and the Index's methods more generally.

A broader problem is the international community's reliance on long out-of-date numbers for all kinds of decision-making. This problem of currency is particularly acute in the health area, but also in education. Road and rail numbers often are also extremely dated, even in standard fact books. Inequality and poverty numbers are sometimes ancient. Caveat emptor is the rule, and this Index has attempted to make those problems explicit, rather than obscure (as some do). The notes for each SSC provide information about the sources and dates of all our figures.

We have also attempted to remedy this last problem of out of date statistics by collecting numbers nationally, as suggested above. Thus we have improved upon some of the internationally available road and poverty numbers, for example, by collecting them ourselves in national capitals. Our successes and failures are detailed in the notes to each SSC.

In general, we have found a two year lag on the release of most of the data we use from international sources, and even for data collected directly in countries. For this reason, the most recent year covered in our 2008 Index of African Governance is 2006.

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Statistical Quality

In general, the quality of statistics available for countries and the countries' quality of governance as ranked in the Index go together. Thus, the exact country scores at the low end of the Index should be regarded with caution, although relative positions are informative. The fact that so little information is available about some countries is perhaps not surprising: Yet it is unclear how a government can govern effectively if it is unable or unwilling to collect and make public basic information about the well-being of its citizens. If it does not even collect the sort of information used in this Index, on what basis does it monitor the effects of its policies or draw up strategic plans?

Among countries with the most incomplete statistics, Somalia stands out. Other countries with generally less complete statistics for 2005 and 2006 include Cape Verde, the Central African Republic, Chad, the Comoros, Congo, the Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Guinea-Bissau, Liberia, and Sierra Leone. The "quality" of the available statistics, however, is another matter that we do not evaluate fully here.

Somalia and Somaliland

A methodological challenge that we will seek to address more fully in future years has to do with variation in governmental performance within countries. In some cases, such variation can be extreme. For example, the difference in governance and performance between Somalia (a collapsed state with older, if out-of-date borders) and Somaliland (a largely unrecognized but functioning state confined to the territory of pre-1960 British Somaliland) cannot be parsed in this Index this year. Few international sources present data that recognize this meaningful distinction. For this second 2008 edition of the Index, we were forced to rely on those existing sources. Hence, this Index does not disaggregate Somaliland from Somalia. More generally, in regionally or ethnically divided countries (for instance, the Sudan) the quality of governance has clearly differed markedly across (ethno-) regions, and recent national-level statistics may be based on censuses or surveys conducted in only one region. Such variation is similarly masked in most projects that rely on national-level data.

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