CHAPTER 1.3

The Executive Opinion Survey: An Indispensable Tool in the Assessment of National Competitiveness

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The Global Competitiveness Report remains the most respected assessment of national competitiveness, providing a useful portrait of a nation's economic environment and its ability to achieve sustained levels of prosperity and growth. For a portrayal that represents reality as accurately as possible, the World Economic Forum draws its data from two sources: international organizations and national sources, and its own Executive Opinion Survey (Survey). The Survey is a one-of-a-kind tool for capturing vital information that is not otherwise available at a global level. The data gathered thus provide a unique source of insight and a qualitative portrait of each nation's economic and business environment, as well as an understanding of how it compares with the situation in other countries.

The World Economic Forum has conducted its annual Survey for over 30 years, modifying it over time to capture new data points essential to the Global Competitiveness Index (GCI) and other Forum indexes. It has also expanded the scope of its sample, achieving this year a record of over 15,000 surveys from 142 economies between January and June 2011.

Following the data editing process (see below), a total of 13,395 surveys were retained. This represents an average of 98 respondents per country, while the median country sample size is 89 responses. Table 1 shows key attributes of the Survey respondents for the 2011 dataset. Given the extent of the Survey's country coverage and in order to maximize its outreach, it is translated into over 20 languages.

Geographic expansion

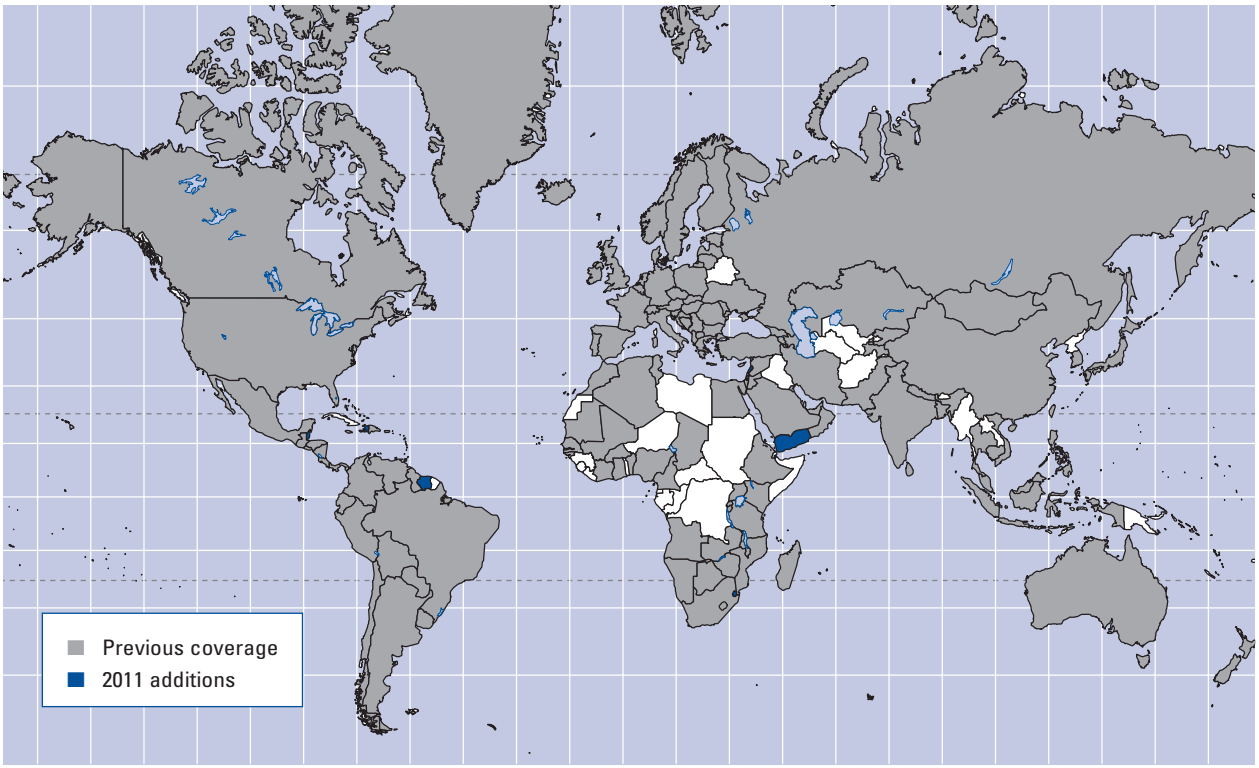
In 1979, the first competitiveness report using survey data covering just 16 European countries was launched. This year, the *Report* covers 142 economies where the Survey was administered and where a large enough sample was collected for inclusion. Together the economies covered in the *Report* account for 98 percent of the world's gross domestic product (see Figure 1). Three new economies are included in this edition: Belize, Haiti, and Yemen, while Suriname has been reinstated.[1] Libya is not covered because the ongoing political and social unrest made it impossible to carry out the Survey.

Survey structure and methodology

The Survey is divided into 13 sections:

I. About Your Company
II. Overall Perceptions of Your Economy
III. Government and Public Institutions
IV. Infrastructure
V. Innovation and Technology
VI. Financial Environment
VII. Domestic Competition
VIII. Company Operations and Strategy
IX. Education and Human Capital

Figure 1: Country/economy coverage of the Executive Opinion Survey



X. Corruption, Ethics, and Social Responsibility
XI. Travel & Tourism
XII. Environment
XIII. Health

Every year, the Survey instrument is reviewed and adapted as needed to reflect changes in the structure of the Forum indexes and to meet the need for new data. However, this year's Survey underwent almost no alteration.

Most questions in the Survey ask respondents to evaluate, on a scale of 1 to 7, one particular aspect of their operating environment. At one end of the scale, 1 represents the worst possible situation; at the other end of the scale, 7 represents the best (see Box 1 for an example).

The Forum's Centre for Global Competitiveness and Performance works closely with a network of over 150 Partner Institutes that administer the Executive Opinion Survey in their respective countries. They are selected because of their capacity to reach out to leading business executives as well as their understanding of the national business environment and their commitment to the Forum's research on competitiveness. The Partner Institutes are, for the most part, recognized economics departments of national universities, independent research institutes, or business organizations.[2] The full list of Partner Institutes can be found at the beginning of the *Report*. This valuable collaboration helps to ensure that the Survey is conducted according to the sampling guidelines and therefore in a consistent manner across the globe during the same time of the year.

The guidelines underwent a stringent review in 2008, with the consultation of an internationally renowned survey consultancy. The improved sampling guidelines have now been adopted in all countries for the last four years of the Survey administration process, implementing a best practice procedure and thus

Box 1: Example of a typical Survey question

To what extent is the judiciary in your country independent from influences of members of government, citizens, or firms?

Heavily influenced < 1 2 3 4 5 6 7 > Entirely independent

Circling 1... means you agree completely with the answer on the left-hand side

Circling 2... means you largely agree with the left-hand side

Circling 3... means you somewhat agree with the left-hand side

Circling 4... means your opinion is indifferent between the two answers

Circling 5... means you somewhat agree with the right-hand side

Circling 6... means you largely agree with the right-hand side

Circling 7... means you agree completely with the answer on the right-hand side

ensuring greater data accuracy and allowing for more robust comparison across economies.

The Survey sampling follows a dual stratification procedure based on the size of the company and the sector of activity.[3] Specifically, the Survey sampling guidelines ask the Partner Institutes to carry out the following steps:

1. Prepare a "sample frame," or large list of potential respondents, which includes firms representing the main sectors of the economy (agriculture, manufacturing industry, non-manufacturing industry, and services).
2. Separate the frame into two lists: one that includes only large firms, and a second list that includes all other firms (both lists representing the various economic sectors).[4]
3. Based on these lists, and in view of reducing survey bias, choose a random selection of these firms to receive the Survey.[5]

Furthermore, the sampling guidelines specify that the Partner Institute should aim to collect a combination of random respondents with some repeat respondents for further comparative analysis.

The administration of the Survey may take a variety of forms. These include face-to-face interviews with business executives, mailed or telephone interviews, and a version administered online as an alternative. Deciding which of these differing methodologies to use may be based on the particular country's infrastructure, distances between cities, cultural preferences, and other such issues.

For energy, time, and cost considerations, the Forum encourages the use of the online Survey, which was available this year in 20 languages. The share of online participation has significantly increased over the years and now represents almost 36 percent of all responses, up from 30 percent last year and 27 percent in 2009. Online responses account for more than 50 percent of the sample in 52 countries and for 90 percent or more in 29 countries. Indeed, 13 countries use the online system exclusively (see Table 1).

The Partner Institutes also take an active and essential part in disseminating the findings of the various reports published by the Centre for Global Competitiveness and Performance by holding press events and workshops to explain the results at the national level.

Where else is the Executive Opinion Survey used?

The Survey data used for the calculation of the GCI is also used as a prime data source for the Forum's other industry-specific projects, including *The Global Information Technology Report, The Travel & Tourism Competitiveness Report, The Global Enabling Trade Report, The Gender Gap Report,* and *The Financial Development Report*. The data are also used for regional studies.

Furthermore, the Executive Opinion Survey data have long served a number of international and national organizations, government bodies, academia, and private-sector companies for their policy or strategy review. For example, the data are used for the elaboration of the renowned *Corruption Perceptions Index* and the *International Bribe Payers Index* published by Transparency International as well as a number of academic publications.

Finally, an increasing number of national competitiveness reports make use of or refer to the Survey data.

Data treatment and score computation

This section details the process whereby individual survey responses are edited and aggregated in order to produce country scores. These results, together with other indicators obtained from other sources, feed into the Global Competitiveness Index (GCI) and other projects.[6]

Data editing

The collected respondent-level data are subjected to a careful editing process. The first editing rule consists of excluding those surveys with a completion rate inferior to 50 percent.[7] This is because partially completed surveys likely demonstrate a lack of sufficient focus on the part of the respondent. In a second step, a multivariate outlier analysis is applied to the data using the Mahalanobis distance technique. This test assesses whether each individual survey is representative, given the overall sample of survey responses in the specific country, and allows for the deletion of clear outliers.

More specifically, the Mahalonobis distance measure estimates the likelihood that one particular point of N dimensions belongs to a set of such points. One single survey made up of N answers can be viewed as the point of N dimensions, while a particular country sample c is the set of points. The Mahalanobis distance is used to compute the probability that any survey i does not belong to the sample c. If the probability is high enough—we use 99.9 percent as the threshold—we conclude that a survey is a clear outlier and does not "belong" to the sample. The implementation of this test requires that the number of responses in a country be greater than the number of answers, N, used in the test. The test uses 66 questions, selected by their relevance and placement in the Survey instrument. Based on this test, a total of 184 surveys are excluded this year.

A univariate test is then applied at the county level for each question of each survey. We use the standardized score—or "z-score"— method, which indicates by how many standard deviations any one individual answer deviates from the mean of the country sample.

Table 1: Distribution of respondents to the Executive Opinion Survey 2011 by country and firm size

	Sample size		Respondents by firm size as a share (%) of country sample						
Country/Economy	Count	Online (%)	<101	101–500	501–1,000	1,001–5,000	5,001–20,000	>20,000	No response
Albania	79	0	65	30	4	1	0	0	0
Algeria	39	0	77	8	3	5	0	0	8
Angola	31	23	61	19	10	10	0	0	0
Argentina	86	99	30	29	10	17	12	1	0
Armenia	83	12	64	28	4	4	0	0	1
Australia	72	76	46	29	7	11	6	1	0
Austria	46	30	46	4	7	33	9	2	0
Azerbaijan	96	1	80	15	1	3	0	0	1
Bahrain	80	99	46	31	13	9	1	0	0
Bangladesh	69	0	19	19	16	35	3	6	3
Barbados	37	27	59	19	16	3	0	0	3
Belgium	68	100	46	19	7	19	4	4	0
Belize	30	100	63	33	0	0	3	0	0
Benin	105	0	88	9	1	1	0	0	2
Bolivia	79	100	92	5	1	0	0	0	1
Bosnia and Herzegovina*	100	0	66	24	3	5	1	0	1
Botswana	114	42	70	17	4	6	1	0	2
Brazil	185	81	22	14	9	27	21	6	1
Brunei Darussalam	91	58	71	24	2	1	0	0	1
Bulgaria	126	0	43	45	6	6	1	0	0
Burkina Faso	40	0	65	28	5	3	0	0	0
Burundi	77	0	81	17	1	0	0	0	1
Côte d'Ivoire	132	0	77	14	3	2	4	0	1
Cambodia	100	0	51	23	13	10	1	0	2
Cameroon	83	0	51	30	8	8	0	0	2
Canada	98	97	34	16	9	21	12	5	2
Cape Verde	83	28	77	18	4	0	0	0	1
Chad	113	0	88	4	1	1	0	0	6
Chile	75	48	23	17	11	27	15	4	4
China	370	1	29	20	13	18	12	8	0
Colombia	137	52	49	39	6	4	1	0	1
Costa Rica	99	90	47	33	9	8	2	0	0
Croatia	97	5	38	38	7	14	1	1	0
Cyprus	99	0	63	30	3	1	1	0	2
Czech Republic	153	100	57	27	7	7	1	1	1
Denmark	33	82	36	18	9	27	9	0	0
Dominican Republic	54	11	26	44	11	9	6	2	2
Ecuador	134	49	35	37	13	10	4	0	1
Egypt	121	0	17	32	21	23	2	4	2
El Salvador	90	100	46	37	6	11	1	0	0
Estonia	93	100	66	30	0	4	0	0	0
Ethiopia	100	0	59	31	2	7	0	0	1
Finland	33	100	48	24	9	15	3	0	0
France	109	1	19	24	5	19	13	19	1
Gambia, The	91	0	87	9	0	0	0	0	4
Georgia	95	100	82	11	4	2	1	0	0
Germany	95	91	33	13	14	21	4	16	0
Ghana	84	98	55	27	8	7	0	1	1
Greece	85	59	40	19	15	15	6	4	1
Guatemala	78	0	42	27	14	13	3	1	0
Guyana	84	0	81	12	4	1	0	0	2
Haiti	146	0	69	27	1	1	0	0	1
Honduras	85	18	48	29	5	13	4	1	0
Hong Kong SAR	51	71	45	8	8	22	14	4	0
Hungary	50	38	26	36	26	8	2	2	0
Iceland	81	100	68	27	4	1	0	0	0
India	248	34	29	25	9	19	11	5	4
Indonesia	86	3	35	23	17	14	1	8	1
Iran, Islamic Rep.	328	73	52	32	7	6	1	0	2
Ireland	49	98	49	22	8	12	4	4	0
Israel	47	100	36	38	13	9	4	0	0
Italy	92	4	37	18	16	14	8	7	0
Jamaica	53	0	55	17	11	17	0	0	0
Japan	105	5	11	15	27	33	10	4	0
Jordan	96	74	56	24	14	4	0	0	2
Kazakhstan*	122	0	42	43	7	7	0	1	0
Kenya	104	0	54	31	4	4	5	1	2
Korea, Rep.	112	0	49	13	13	17	6	1	0
Kuwait	49	37	43	33	6	14	2	0	2
Kyrgyz Republic	99	0	75	19	3	3	0	0	0
Latvia	176	98	50	39	6	5	0	0	0
Lebanon	48	96	38	31	15	15	2	0	0

(Cont'd.)

Table 1: Distribution of respondents to the Executive Opinion Survey 2011 by country and firm size *(cont'd.)*

	Sample size		Respondents by firm size as a share (%) of country sample						
Country/Economy	Count	Online (%)	<101	101–500	501–1,000	1,001–5,000	5,001–20,000	>20,000	No response
Lesotho	79	3	53	29	9	6	0	1	1
Lithuania	178	79	44	40	6	7	1	0	2
Luxembourg	35	94	37	29	11	20	3	0	0
Macedonia, FYR	115	9	65	30	3	0	0	0	1
Madagascar	86	0	49	38	8	5	0	0	0
Malawi	64	23	58	25	5	8	3	0	2
Malaysia	87	39	41	25	7	15	8	2	1
Mali	129	0	76	16	4	1	0	0	3
Malta	52	60	69	21	6	0	2	2	0
Mauritania	71	0	70	11	0	0	0	0	18
Mauritius	95	57	40	33	7	19	1	0	0
Mexico	354	67	38	16	7	18	10	8	1
Moldova	108	0	43	29	16	10	2	0	1
Mongolia	84	0	52	33	13	0	1	0	0
Montenegro	78	0	73	13	1	1	0	0	12
Morocco*	94	0	76	11	5	3	5	0	0
Mozambique	112	3	64	22	8	4	0	0	2
Namibia	75	0	59	24	11	4	1	0	1
Nepal	102	3	49	35	11	5	0	0	0
Netherlands	87	99	24	31	14	18	8	5	0
New Zealand	51	88	24	24	20	20	10	4	0
Nicaragua	93	57	59	26	4	11	0	0	0
Nigeria	110	0	71	16	4	4	0	2	4
Norway	47	96	15	53	2	13	13	2	2
Oman	70	20	29	41	6	23	0	1	0
Pakistan	130	22	45	31	12	10	2	0	1
Panama	134	45	66	19	4	7	2	0	1
Paraguay	94	41	48	38	9	5	0	0	0
Peru	88	0	16	44	19	18	2	0	0
Philippines	93	1	44	23	17	10	4	1	1
Poland	198	96	26	28	21	19	1	4	2
Portugal	136	35	33	26	13	18	9	1	0
Puerto Rico	63	100	63	16	11	6	3	0	0
Qatar*	75	9	28	33	13	8	8	4	5
Romania	94	0	88	4	2	2	2	1	0
Russian Federation	377	2	33	28	24	11	2	2	0
Rwanda	40	0	45	38	5	5	0	0	8
Saudi Arabia*	152	1	59	14	9	13	5	1	0
Senegal	90	0	76	19	6	0	0	0	0
Serbia	81	0	46	43	6	5	0	0	0
Singapore	152	57	17	39	18	20	5	0	1
Slovak Republic	78	81	56	27	10	5	1	0	0
Slovenia*	101	0	46	27	16	9	1	0	2
South Africa	57	54	23	7	0	30	12	28	0
Spain	103	80	32	23	6	22	12	5	0
Sri Lanka	105	0	41	33	7	15	2	0	2
Suriname	34	9	79	15	3	3	0	0	0
Swaziland	40	53	60	33	3	5	0	0	0
Sweden	32	94	9	16	22	38	16	0	0
Switzerland	90	96	43	17	7	11	9	13	0
Syria	85	4	67	25	4	2	0	0	2
Taiwan, China	68	65	4	21	15	40	16	4	0
Tajikistan	101	0	88	9	1	2	0	0	0
Tanzania	92	0	78	18	1	1	0	0	1
Thailand	55	2	27	25	15	27	2	4	0
Timor-Leste	31	0	84	6	0	0	0	0	10
Trinidad and Tobago	116	48	50	27	9	12	0	1	2
Tunisia	101	57	53	31	6	8	1	0	1
Turkey	79	4	8	24	25	34	8	1	0
Uganda	94	0	60	26	9	4	0	0	2
Ukraine	104	0	41	34	12	13	1	0	0
United Arab Emirates	108	12	33	16	23	18	7	2	1
United Kingdom	93	99	49	9	4	11	6	20	0
United States	422	98	41	19	8	13	9	9	1
Uruguay	82	0	56	30	9	2	0	0	2
Venezuela	45	100	44	24	7	18	4	0	2
Vietnam	96	1	54	28	7	7	2	0	1
Yemen	52	0	71	13	10	4	0	0	2
Zambia	88	0	74	19	3	2	0	1	0
Zimbabwe	56	38	11	25	27	30	7	0	0
GRAND TOTAL	**14,039**	**36**	**49**	**25**	**9**	**11**	**4**	**2**	**1**

* Statistics are from the 2010 edition of the Executive Opinion Survey. See text for details.

Formally, this is calculated as follows:

$$z_{i,q,c} = \frac{x_{i,q,c} - \bar{x}_{q,c}}{\sigma_{q,c}},$$

where $x_{i,q,c}$ is respondent i's answer to question q in country c; and $\bar{x}_{q,c}$ and $\sigma_{q,c}$ are the average and standard deviation, respectively, of individual answers to question q within country c's sample.

Individual answers with an absolute value for $z_{i,q,c}$ greater than 3 are dropped.

Data weighting: Sector-weighted country averages

Once the data have been edited, individual answers are aggregated at the country level. We compute sector-weighted country averages to obtain a more representative average that takes into account the structure of a country's economy. The structure is defined by the estimated contributions to a country's gross domestic product of each of the four main economic sectors: agriculture, manufacturing industry, nonmanufacturing industry, and services (see Table 2).[8]

An additional step is taken to prevent individual responses within a sample from receiving an excessive weight when the structure of the sample and the underlying economy differ greatly. As an extreme example, imagine the case of a country where just 3 percent of responses come from the services sector, but that sector actually represents 90 percent of the country's economy. By applying the above sector-weighting scheme, we would be giving a very heavy weight to a very few surveys. This is avoided by trimming the sector weights. When for a country the ratio of the weight of one sector in the economy to the percentage of surveys from that sector in the country sample exceeds 5, the sector weight used for the weighted average is capped to five times the percentage of surveys from that sector in the sample. The weights of the other sectors are then adjusted proportionally to their weight in the country's GDP.

Formally, the sector-weighted country average of a Survey indicator, $\bar{q}_c$, is computed as follows:

$$\bar{q}_c = \sum_{s}^{S} w_{s,c} \times q_{s,c}$$

with

$$q_c = \sum_{j}^{N_{s,c}} \frac{q_{j,s,c}}{N_{s,c}},$$

where $w_{s,c}$ is sector s's contribution to the economy of country c, and $q_{s,c}$ is the mean of the responses from sector s in country c ($q_{j,s,c}$ is response j from sector s and country c, and $N_{s,c}$ is the number of responses from sector s in country c).

When, for a given country, the sample size is too small or the sectoral representation of the sample is too different from the actual structure in the economy, the mechanism described above might not be sufficient to prevent an individual response from receiving a disproportionate weight. In such a case the economic sector stratification average is abandoned and a simple average of the surveys is applied, where all individual responses contribute equally to the country score regardless of the sector of activity of the respondents' companies. In 2011, this was the case for seven countries: Angola, Burkina Faso, Israel, Kuwait, Swaziland, Turkey, and Venezuela. Going forward, we will work closely with our Partner Institutes to increase the sample size and improve the sector representation in these countries.

Data weighting: Moving average

As a final step, the sector-weighted country averages for 2011 are combined with the 2010 averages to produce the country scores that are used for the computation of the GCI 2010–2011 and for other projects.[9]

This moving average technique, introduced in 2007, consists of taking a weighted average of the most recent year's Survey results together with a discounted average of the previous year. There are several reasons for doing this. First, it makes results less sensitive to the specific point in time when the Survey is administered. Second, it increases the amount of available information by providing a larger sample size. Additionally, because the Survey is carried out during the first quarter of the year, the average of the responses in the first quarter of 2010 and the first quarter of 2011 better aligns the Survey data with many of the data indicators from sources other than the Forum, which are often year-average data. For newly introduced questions, for which no time series exists, the final country score simply corresponds to the country score in 2011.

To calculate the moving average, we use a weighting scheme composed of two overlapping elements. On one hand, we want to give each response an equal weight and, therefore, place more weight on the year with the larger sample size. At the same time, we want to give more weight to the most recent responses because they contain more updated information. That is, we also "discount the past." Box 2 details the methodology and provides a clarifying example.

Inter-year robustness test

The two tests described above addresses variability issues among individual responses in a country. Yet they were not designed to track the evolution of country scores across time. Therefore, we introduce an additional test this year that assesses the reliability and consistency of the Survey data. The inter-quartile range test, or IQR test, is used to identify large swings—positive and negative—in the country scores. More specifically, for each country we compute c as the average difference in country scores across all the Survey questions. We then compute the inter-quartile range (i.e., the difference between the 25th percentile

Table 2: Sectoral value-added as a share (%) of GDP

Country/Economy	Agriculture	Manufacturing industry	Non-manufacturing industry	Services
Albania	21	12	8	59
Algeria	12	6	48	34
Angola*	10	6	53	31
Argentina	8	21	11	61
Armenia	21	16	19	45
Australia	3	10	19	68
Austria	2	19	11	69
Azerbaijan	8	4	56	32
Bahrain	0	12	51	36
Bangladesh	19	18	11	53
Barbados	4	7	11	78
Belgium	1	14	8	78
Belize	12	14	8	65
Benin	32	8	6	54
Bolivia	14	14	22	50
Bosnia and Herzegovina	8	13	15	64
Botswana	3	4	35	57
Brazil	6	16	10	69
Brunei Darussalam	1	10	61	28
Bulgaria	6	15	15	64
Burkina Faso*	33	14	9	44
Burundi	35	9	11	45
Cambodia	35	15	8	42
Cameroon	19	17	14	50
Canada	2	14	18	67
Cape Verde	9	7	13	71
Chad	14	7	42	38
Chile	3	13	29	55
China	10	34	12	43
Colombia	7	14	20	58
Costa Rica	7	19	8	66
Côte d'Ivoire	24	18	7	50
Croatia	7	16	11	66
Cyprus	2	8	12	78
Czech Republic	2	23	14	60
Denmark	1	13	9	77
Dominican Republic	6	24	8	61
Ecuador	6	10	13	71
Egypt	14	16	21	49
El Salvador	12	21	6	60
Estonia	3	17	12	68
Ethiopia	51	4	7	39
Finland	3	18	10	69
France	2	11	8	79
Gambia, The	27	5	10	57
Georgia	10	12	10	69
Germany	1	19	7	73
Ghana	32	7	12	49
Greece	3	10	7	79
Guatemala	12	20	9	59
Guyana	21	8	27	45
Haiti	25	16†	—	59
Honduras	12	19	9	60
Hong Kong SAR	0	2	6	92
Hungary	4	22	8	66
Iceland	6	13	14	66
India	18	15	12	55
Indonesia	16	27	22	35
Iran, Islamic Rep.	10	11	34	45
Ireland	1	24	8	68
Israel*	3	22	10	63
Italy	2	16	9	73
Jamaica	6	9	13	72
Japan	1	20	8	71
Jordan	3	20	12	65
Kazakhstan	6	11	29	53
Kenya	23	9	7	62
Korea, Rep.	3	28	9	61
Kuwait*	0	2	49	49
Kyrgyz Republic	29	13	7	51
Latvia	3	10	11	77
Lebanon	5	9	8	78
Lesotho	8	17	17	58
Lithuania	4	18	14	64
Luxembourg	0	7	7	86
Macedonia, FYR	11	23	13	52
Madagascar	29	14	2	55
Malawi	31	10	6	53
Malaysia	10	25	19	46
Mali	37	3	21	39
Malta	2	14	19	65
Mauritania	21	4	31	45
Mauritius	4	19	10	67
Mexico	4	17	18	61
Moldova	10	12	0	77
Mongolia	24	5	28	44
Montenegro	10	6	14	70
Morocco	16	16	13	55
Mozambique	31	14	10	45
Namibia	9	15	18	58
Nepal	34	7	9	50
Netherlands	2	13	11	74
New Zealand	6	15	10	69
Nicaragua	19	20	10	51
Nigeria	33	3	38	27
Norway	1	10	31	59
Oman	2	8	47	43
Pakistan	22	17	7	54
Panama	6	6	11	77
Paraguay	19	13	8	59
Peru	7	14	20	59
Philippines	15	20	10	55
Poland	4	16	14	66
Portugal	2	13	10	75
Puerto Rico	1	40	3	56
Qatar	0	8	64	29
Romania	7	22	4	67
Russian Federation	5	15	18	62
Rwanda	34	6	8	51
Saudi Arabia	3	10	40	46
Senegal	17	13	9	62
Serbia	13	25	3	59
Singapore	0	19	7	74
Slovak Republic	3	19	15	63
Slovenia	2	22	12	64
South Africa	3	15	16	66
Spain	3	13	13	71
Sri Lanka	13	18	12	58
Suriname	5	21	19	55
Swaziland*	7	44	5	43
Sweden	2	16	9	73
Switzerland	1	19	8	72
Syria	21	13	20	45
Taiwan, China	2	25	3	70
Tajikistan	22	11	13	54
Tanzania	29	10	15	47
Thailand	12	34	9	45
Timor-Leste	9	3	21	68
Trinidad and Tobago	0	6	46	47
Tunisia	8	16	13	62
Turkey*	9	17	9	65
Uganda	25	8	18	50
Ukraine	8	18	11	62
United Arab Emirates	2	12	48	38
United Kingdom	1	11	10	78
United States	1	13	8	77
Uruguay	10	16	10	64
Venezuela*	4	16	41	38
Vietnam	21	20	20	39
Yemen	14	5	36	45
Zambia	22	10	24	44
Zimbabwe	18	17	12	53

(Cont'd.)

Sources: World Bank, *Data Catalog* (accessed April 17, 2011); Central Information Agency, *World Factbook* (accessed June 3, 2011); national sources.
* Countries for which a simple average was used for computing 2011 scores. See text for details.
† Combined share of manufacturing and non-manufacturing industries.

Box 2: Country score calculation

This box presents the method applied to compute the country scores for the vast majority of economies included in *The Global Competitiveness Report 2011–2012*.

For any given Survey question q_i, country c's score, $q_{i,c}^{10-11}$, is given by:

$$q_{i,c}^{10-11} = w_c^{2010} \times q_{i,c}^{-2010} + w_c^{2011} \times q_{i,c}^{-2011} \quad (1)$$

where

$q_{i,c}^{-t}$ is country c's score on question q_i in year t, with t = 2010, 2011, as computed following the approach described in the text;

$q_{i,n,c}^{t}$ is respondent n's response (on a 1–7 scale) to question q_i in year t;

N_c^t is the sample size (i.e., the number of respondents) for country c in year t; and

w_c^t is the weight applied to country c's score in year t (see below).

The weights for each year are determined as follows:

$$w_c^{2010} = \frac{(1-\alpha) + \dfrac{N_c^{2010}}{N_c^{2010} + N_c^{2011}}}{2} \quad (2a)$$

and

$$w_c^{2011} = \frac{\alpha + \dfrac{N_c^{2011}}{N_c^{2010} + N_c^{2011}}}{2}. \quad (2b)$$

Plugging equations (2a) and (2b) into (1) and rearranging yields:

$$q_{i,c}^{10-11} = \frac{1}{2} \times \underbrace{\left[(1-\alpha) \times q_{i,c}^{-2010} + \alpha \times q_{i,c}^{-2011}\right]}_{\text{discounted-past weighted average}} + \frac{1}{2} \times \underbrace{\left[\frac{N_c^{2010}}{N_c^{2010} + N_c^{2011}} \times q_{i,c}^{-2010} + \frac{N_c^{2011}}{N_c^{2010} + N_c^{2011}} \times q_{i,c}^{-2011}\right]}_{\text{sample-size weighted average}}. \quad (3)$$

In equation (3), the first component of the weighting scheme is the discounted-past weighted average. The second component is the sample-size weighted average. The two components are given half-weight each. The value for α is 0.6, which corresponds to a discount factor of 2/3. That is, the 2010 score of country c is given 2/3 of the weight given to its 2011 score. One additional property of this approach is that it prevents a country sample that is much larger in one year from overwhelming the smaller sample from the other year.

Note that in the case of a newly introduced Survey question and newly included countries—where, by definition, no past data exist—the weight applied is $w_c^{2010} = 0$ and $w_c^{2011} = 1$. Equation (1) then becomes $q_{i,c}^{10-11} = q_{i,c}^{-2011}$. In the case of countries that failed the inter-year robustness check described in the text, the weight applied is $w_c^{2010} = 0$ and $w_c^{2011} = 1$. Equation (1) then becomes $q_{i,c}^{10-11} = q_{i,c}^{-2010}$.

The formula is easily generalized. For any two consecutive editions t_1 and t_2 of the Survey, country c's score on question i is computed as follows:

$$q_{i,c}^{t_1-t_2} = \frac{1}{2} \times \left[(1-\alpha) \times q_{i,c}^{-t_1} + \alpha \times q_{i,c}^{-t_2}\right] + \frac{1}{2} \times \left[\frac{N_c^{t_1}}{N_c^{t_1} + N_c^{t_2}} \times q_{i,c}^{-t_1} + \frac{N_c^{t_2}}{N_c^{t_1} + N_c^{t_2}} \times q_{i,c}^{-t_2}\right]. \quad (4)$$

Example

We compute the score of Trinidad and Tobago on indicator 7.01 on the nature of relations between employers and employees. Trinidad and Tobago's score was 3.73 in 2010 and 3.24 in 2011. The weighting scheme described above indicates how the two scores are combined.

(Cont'd.)

Box 2: Country score calculation *(cont'd.)*

In Trinidad and Tobago, the size of the sample was 94 in 2010 and 116 in 2011. Using $\alpha = 0.6$ and applying formulas (2a) and (2b) yields weights of 42.4 percent for 2010 and 57.6 percent for 2011. The final country score for this question is given by formula (1):

$$\underbrace{0.424 \times 3.73}_{2010} + \underbrace{0.576 \times 3.24}_{2011} = 3.45\,.$$

This is the final score used in the computation of the GCI and reported in Table 7.01. Although numbers are rounded to two decimal places in this example and to one decimal place in the data tables, exact figures are used in all calculations.

and the 75th percentile), denoted *iq,* of the sample of 142 economies. Any value *c* lying outside the range bounded by the 25th percentile minus 1.5 times *iq* and the 75th percentile plus 1.5 times *iq* is identified as a potential outlier. Formally, we have:

$$\begin{cases} \text{lower bound} = Q1 - 1.5 \times IQM \\ \text{upper bound} = Q3 - 1.5 \times IQM \end{cases},$$

where Q1 and Q3 correspond to the 25th and 75th percentiles of the sample, respectively, and *IQM* is the difference between these two values.

This test is complemented by an analysis of the evolution in the results over the past five editions of the *Report* and by a comparison with the evolution in the data used in the GCI that are not derived from the Survey. In addition, we examine the latest developments in all the countries identified as outliers by the tests that might help to explain such large swings.

Based on this analysis, the 2010–2011 Survey data collected in Bosnia and Herzegovina, Kazakhstan, Morocco, Qatar, Saudi Arabia, and Slovenia are identified as significantly deviating from the 2009–2010 results. This departure is not accompanied by a similar trend in GCI indicators derived from sources other than the Survey. For these six countries, only the 2010 Survey data are used for the computation of this year's GCI. This remains a remedial measure to address, in the short term, large unexplained swings; going forward we will investigate the situation in an effort to understand what is driving such high volatility in the Survey data in these countries.

Conclusion

The Executive Opinion Survey remains the largest poll of its kind, this year collecting the insight of more than 15,000 executives into their business operating environment. This scale could not be achieved without the tremendous efforts of the Forum's network of over 150 Partner Institutes in carrying out the Survey at a national level. It gathers valuable information on a broad range of variables for which data sources are scarce or nonexistent. For this reason, and for the integrity of our publication and related research, sampling and comparability across the globe remains an essential and ongoing endeavor of the Centre for Global Competitiveness and Performance.

Notes

1 For all four of these countries, only 2011 Survey data are used.

2 The World Economic Forum's Centre for Global Competitiveness and Performance would like to acknowledge e-Rewards Market Research for carrying out the Executive Opinion Survey 2011 in the United States, collecting over 450 surveys following the detailed sampling guidelines.

3 The Survey sampling guidelines each year emphasize the need to have a sample with a sufficient presence of large companies because these companies tend to have better knowledge about the overall economy and the relative quality of the business environment. The size stratification of the sample helps to better achieve this goal.

4 *Company size* is defined as the number of employees of the firm in the country of the Survey respondent. The company size value used for delineating the large and small company sample frames varies across countries. The size value tracks closely with the overall size of the economy. Adjustments were made to the value based on searches in company directories and data gathered through the administration of the Survey in past years.

5 In order to reach the required number of surveys in each country (80 for most economies and 300 for the BRIC countries and the United States), a Partner Institute uses the response rate from previous years.

6 The *results* are the *scores* obtained by each country in the various questions of the Survey. The two terms are used interchangeably throughout the text.

7 The completion *rate* is the proportion of unanswered questions among the 120 core questions in the Survey instrument.

8 In a few cases, the respondent has not answered the question relative to their company's activity. In order to include the surveys with missing sector information in the country averages, the average response values for the surveys without sector information are apportioned to the other sectors according to the sample sizes in those other sectors. This has the effect of including these surveys on a one-for-one basis as they occur in the sample—that is, with no adjustment for sector.

9 For details about the 2010 Survey dataset, please refer to Browne and Geiger 2010.

Reference

Browne, C. and T. Geiger. 2010. "The Executive Opinion Survey: The Business Executives' Insight into their Operating Environment." *The Global Competitiveness Report 2010–2011*. Geneva: World Economic Forum.