CHAPTER 1.3

The Executive Opinion Survey: The Voice of the Business Community

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The Global Competitiveness Report continues to be a highly respected assessment of national competitiveness. To conduct this work, the World Economic Forum relies on a large set of data sourced from various international organizations and from its own annual Executive Opinion Survey (the Survey).

The Survey, administered each year in over 140 economies, captures valuable information on a broad range of factors that are critical for a country's competitiveness and sustainable development, and for which data sources are scarce or, frequently, nonexistent on a global scale. Among several examples of otherwise-unavailable data are the quality of the educational system, indicators measuring business sophistication, and labor market variables such as flexibility in wage determination.

The Survey results are used in the calculation of the Global Competitiveness Index (GCI) and other Forum indexes, including the Networked Readiness Index, the Enabling Trade Index, the Travel & Tourism Competitiveness Index, the Financial Development Index, and the Gender Gap Index, as well as in regional studies.[1] A truly unique source of information, the Survey data have also long served a number of international and national organizations, government bodies, and academia as well as the private sector to inform policy work, strategies, and investment decisions. For example, Transparency International uses the Survey data for the elaboration of their Corruption Perceptions Index and the Bribe Payers Index. Institutions such as the Organisation for Economic Co-operation and Development, the World Bank, and the International Monetary Fund also refer to these data in their publications, as do a number of academic publications. Finally, an increasing number of national competitiveness reports also draw on or refer to the Survey data.

THE SURVEY IN NUMBERS

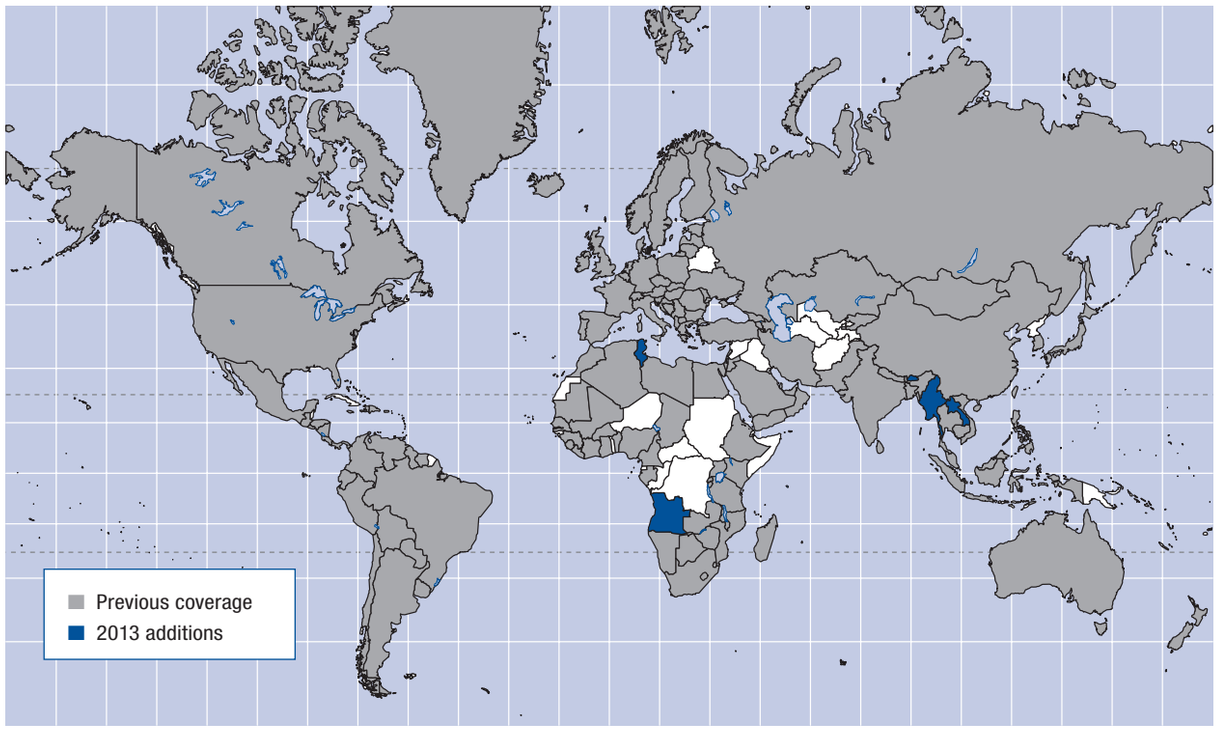
The World Economic Forum has conducted its annual Survey for over 30 years, making it the longest-running and most extensive survey of its kind. This year's Survey captured the opinions of over 13,000 business leaders in 148 economies between January and May 2013.

Following the data-editing process (see below), a total of 13,638 surveys were retained for 144 countries.[2] This represents an average of 94.7 respondents per country, while the median country sample size is 85.5 responses. Given the extent of the Survey's country coverage and in order to maximize its outreach, it is available in 41 languages.[3]

Geographic expansion

Since the first edition of the World Economic Forum report on competitiveness in 1979, country coverage has expanded from 16 European countries to 148 economies worldwide for this edition, together accounting for over

Figure 1: Country/economy coverage of the Executive Opinion Survey 2013



Box 1: Example of a typical Survey question

In your country, how strong is the protection of intellectual property, including anti-counterfeiting measures?

Extremely weak < 1 2 3 4 5 6 7 > Extremely strong

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

99 percent of the world's gross domestic product (GDP; see Figure 1). In the 2013 edition, three additional economies are included: Bhutan, Lao PDR, and Myanmar. Furthermore, Angola and Tunisia have been reinstated following a year of non-inclusion. Tajikistan and Syria, however, are not included in this year's edition owing to the inability to conduct a survey in these two countries.[4] The Forum's Global Competitiveness and Benchmarking Network continues its efforts to increase country coverage year on year.

SURVEY STRUCTURE, ADMINISTRATION, AND METHODOLOGY

The Survey is divided into 14 sections:

I. About Your Company
II. Overall Perceptions of Your Economy
III. Infrastructure
IV. Innovation and Technology Infrastructure
V. Financial Environment
VI. Foreign Trade and Investment
VII. Domestic Competition
VIII. Company Operations and Strategy
IX. Government and Public Institutions
X. Education and Human Capital
XI. Corruption, Ethics and Social Responsibility
XII. Travel & Tourism
XIII. Environment
XIV. Health

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 administration of the Survey could not be carried out without the network of over 160 Partner Institutes worldwide. Partner Institutes are recognized research or academic institutes, business organizations, national competitiveness councils, or other renowned professional entities and, in some cases, survey consultancies (for the full list, see the Partner Institutes section at the beginning of the *Report*).[5] They are selected on the basis of their capacity to reach out to the business community, their reputation, and their commitment to the issue of competitiveness.

In administering the Survey, Partner Institutes are asked to follow detailed sampling guidelines to ensure that the sample of respondents is the most representative and comparable across the globe and in a specific timeframe. The sampling guidelines have evolved over time and are based on best practices in the field of survey administration and on discussion with survey experts. The Survey sampling guidelines specify that the Partner Institute should build a "sample frame"—that is, a list of potential business executives from small- and medium-sized enterprises and large companies—from the various sectors of activity as stated below. It then applies a dual stratification procedure based on these two criteria of company size and sector. More specifically, the Partner Institutes are asked 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).[6]

3. Based on these lists, and in view of reducing survey bias, choose a random selection of these firms from both lists to receive the Survey.

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.[7] Partner Institutes are asked to collect between 80 and 100 surveys, although generally accepted practice in sampling as well as recommendations received from Gallup has led to a cut-off of a minimum of 30 surveys per country. We are working closely with the Partner Institutes to increase the sample size for countries that have collected a number of surveys just above the cut-off. The administration of the Survey may take a variety of formats, including face-to-face interviews with business executives and mailed or telephone interviews, with an online survey option as an alternative.

For energy, time, and cost considerations, the Forum encourages the use of the online survey tool, which was available this year in 20 languages. The share of online participation has significantly increased over the years and has now reached almost 40 percent of all responses, up by 10 percent in just two years. This year, the Survey was administered entirely via the online tool in 19 economies (Argentina, Barbados, Belgium, Bolivia, the Czech Republic, El Salvador, Estonia, Finland, Georgia, Iceland, Iran, Ireland, Israel, Latvia, Malta, Norway, Puerto Rico, Switzerland, and Venezuela), while the use of the online tool exceeded 90 percent in 18 further economies (see Table 1).

The Partner Institutes also take an active and essential role in disseminating the findings of *The Global Competitiveness Report* and other reports published by The Global Competitiveness and Benchmarking Network by holding press events and workshops to highlight the results at the national level to the business community, the public sector, and other stakeholders.

Following an initial external audit by a team of survey experts from Gallup in 2008, a second review was conducted by Gallup in 2012, during which the Survey instrument, the sampling guidelines, and the administration process underwent a thorough inspection. After five years of implementing the recommendations from the first audit, it was time to take a further twofold approach by analyzing the recommendations and their impact on the process as well as keeping up to date on best practices in the field of surveying.

Overall, the outcome of the review regarding the implementation of the 2008 recommendations was commended. The audit determined that the Executive Opinion Survey process follows best practices and has made the recommended improvements to the Survey tool and translations, as well as to the sampling quality. The 2012 audit addressed an important aspect related to the impact of national culture—the so-called cultural bias—that may impact interviewee responses. The Global Competitiveness and Benchmarking Network recognizes this as a possibility; nonetheless, following international best practices and upon Gallup's recommendation, it was decided not to re-weight the data using anchoring mechanisms because of the limited effectiveness of such a procedure and to prevent adding further noise to the data. However, and as a step to follow best practices to help minimize possible language-based biases found in data collected via a single language survey, the number of languages for the Executive Opinion Survey is ever increasing, reaching 41 for this edition.

Table 1: Executive Opinion Survey: Descriptive statistics and weightings

	First component*			Second component: 2013 edition*		
Country/Economy	Survey edition	No. of respondents	Weight (%)*	No. of respondents	Online (%)	Weight (%)*
Albania	2012	81	45.0	81	0.0	55.0
Algeria	2012	33	36.8	65	0.0	63.2
Angola‡‡§	—	—	—	35	40.0	100.0
Argentina	2012	99	42.4	122	100.0	57.6
Armenia	2012	80	45.6	76	1.3	54.4
Australia	2012	68	47.2	57	50.9	52.8
Austria	2012	105	45.7	99	47.5	54.3
Azerbaijan	2012	95	46.4	85	1.2	53.6
Bahrain	2012	65	50.7	41	97.6	49.3
Bangladesh	2012	86	47.4	71	0.0	52.6
Barbados	2012	72	49.3	51	100.0	50.7
Belgium	2012	83	44.6	86	100.0	55.4
Benin	2012	90	43.6	101	0.0	56.4
Bhutan‡‡	—	—	—	85	0.0	100.0
Bolivia	2012	72	44.7	74	100.0	55.3
Bosnia and Herzegovina‡	2012	100	100.0	—	—	—
Botswana	2012	80	44.0	87	41.4	56.0
Brazil	2012	143	49.7	98	82.7	50.3
Brunei Darussalam	2012	44	48.2	34	94.1	51.8
Bulgaria	2012	120	49.9	81	0.0	50.1
Burkina Faso	2012	41	40.9	57	0.0	59.1
Burundi	2012	92	42.8	110	0.0	57.2
Cambodia	2012	77	42.6	93	0.0	57.4
Cameroon	2012	62	41.7	81	0.0	58.3
Canada	2012	103	41.8	133	97.0	58.2
Cape Verde	2012	108	48.7	80	13.8	51.3
Chad	2012	105	45.4	102	0.0	54.6
Chile	2012	78	38.8	130	58.5	61.3
China	2012	371	45.2	364	0.0	54.8
Colombia	2012	286	49.2	204	57.8	50.8
Costa Rica	2012	94	43.0	110	97.3	57.0
Côte d'Ivoire	2012	92	46.6	81	0.0	53.4
Croatia	2012	107	48.6	80	28.8	51.4
Cyprus	2012	79	47.8	63	0.0	52.2
Czech Republic	2012	163	58.3	50	100.0	41.7
Denmark	2012	128	41.3	173	0.0	58.7
Dominican Republic	2012	91	51.0	56	5.4	49.0
Ecuador†	2011	134	46.6	118	72.9	53.4
Egypt	2012	73	47.4	60	0.0	52.6
El Salvador	2012	34	41.8	44	100.0	58.2
Estonia	2012	85	44.0	92	100.0	56.0
Ethiopia	2012	60	39.0	98	0.0	61.0
Finland	2012	36	43.7	40	100.0	56.3
France	2012	129	50.9	80	3.8	49.1
Gabon	2012	48	42.4	59	0.0	57.6
Gambia, The	2012	87	46.7	76	0.0	53.3
Georgia†	2011	95	48.1	74	100.0	51.9
Germany	2012	127	41.4	170	85.9	58.6
Ghana	2012	79	46.5	70	4.3	53.5
Greece	2012	83	43.9	91	90.1	56.1
Guatemala	2012	83	44.6	86	1.2	55.4
Guinea	2012	60	45.9	56	0.0	54.1
Guyana	2012	89	44.6	92	0.0	55.4
Haiti	2012	67	38.2	117	0.0	61.8
Honduras	2012	86	50.5	55	0.0	49.5
Hong Kong SAR	2012	69	46.7	60	63.3	53.3
Hungary	2012	103	47.0	88	63.6	53.0
Iceland	2012	93	45.3	91	100.0	54.7
India	2012	122	49.5	85	90.6	50.5
Indonesia	2012	88	45.1	87	0.0	54.9
Iran, Islamic Rep.	2012	585	61.4	121	100.0	38.6
Ireland	2012	62	46.5	55	100.0	53.5
Israel	2012	51	43.0	60	100.0	57.0
Italy	2012	87	45.3	85	4.7	54.7
Jamaica	2012	75	47.6	61	0.0	52.4
Japan	2012	111	44.6	115	6.1	55.4
Jordan‡	2012	156	100.0	—	—	—
Kazakhstan	2012	103	44.5	107	0.0	55.5
Kenya	2012	112	46.4	100	0.0	53.6
Korea, Rep.	2012	98	47.4	81	0.0	52.6
Kuwait§	2012	38	45.7	36	47.2	54.3
Kyrgyz Republic	2012	99	44.8	101	0.0	55.3
Lao PDR‡‡	—	—	—	62	0.0	100.0
Latvia	2012	98	45.1	97	100.0	54.9
Lebanon§	2012	38	44.7	39	94.9	55.3

(Cont'd.)

Table 1: Executive Opinion Survey: Descriptive statistics and weightings *(cont'd.)*

	First component*			Second component: 2013 edition*		
Country/Economy	Survey edition	No. of respondents	Weight (%)*	No. of respondents	Online (%)	Weight (%)*
Lesotho	2012	89	43.9	97	0.0	56.1
Liberia	2012	85	43.0	100	0.0	57.0
Libya	2012	72	46.7	63	23.8	53.3
Lithuania	2012	153	46.0	141	62.4	54.0
Luxembourg	2012	45	42.1	57	98.2	57.9
Macedonia, FYR	2012	89	46.0	82	0.0	54.0
Madagascar	2012	92	38.5	157	0.0	61.5
Malawi	2012	61	46.3	55	10.9	53.7
Malaysia	2012	79	41.4	106	38.7	58.6
Mali	2012	102	46.0	94	0.0	54.0
Malta	2012	58	49.0	42	100.0	51.0
Mauritania	2012	82	44.1	88	0.0	55.9
Mauritius	2012	91	47.1	77	90.9	52.9
Mexico	2012	278	43.2	320	87.8	56.8
Moldova	2012	112	43.9	122	0.0	56.1
Mongolia	2012	85	44.9	86	0.0	55.1
Montenegro	2012	76	44.7	78	0.0	55.3
Morocco	2012	40	36.4	82	1.2	63.6
Mozambique	2012	91	45.6	87	1.1	54.4
Myanmar‡‡	—	—	—	79	0.0	100.0
Namibia	2012	82	45.5	79	0.0	54.5
Nepal	2012	93	45.0	93	4.3	55.0
Netherlands	2012	82	44.3	87	96.6	55.7
New Zealand§	2012	55	49.9	37	100.0	50.1
Nicaragua	2012	77	46.4	69	98.6	53.6
Nigeria	2012	104	44.4	109	1.8	55.6
Norway	2012	75	46.2	68	100.0	53.8
Oman‡	2012	78	100.0	—	—	—
Pakistan	2012	110	42.9	130	14.6	57.1
Panama	2012	133	45.3	130	72.3	54.7
Paraguay	2012	80	49.0	58	0.0	51.0
Peru	2012	83	45.6	79	22.8	54.4
Philippines	2012	132	49.1	95	1.1	50.9
Poland	2012	206	44.9	208	99.0	55.1
Portugal	2012	115	46.7	100	60.0	53.3
Puerto Rico	2012	71	47.7	57	100.0	52.3
Qatar	2012	123	46.9	106	6.6	53.1
Romania	2012	98	44.4	103	0.0	55.6
Russian Federation	2012	414	49.2	294	4.8	50.8
Rwanda†	2011	40	36.5	81	0.0	63.5
Saudi Arabia	2012	95	40.3	139	59.0	59.7
Senegal	2012	94	44.5	98	0.0	55.5
Serbia	2012	99	44.9	100	0.0	55.1
Seychelles§	2012	32	45.4	31	0.0	54.6
Sierra Leone	2012	99	45.0	99	0.0	55.0
Singapore	2012	178	47.1	150	63.3	52.9
Slovak Republic	2012	68	38.7	114	78.1	61.3
Slovenia	2012	110	46.4	98	0.0	53.6
South Africa	2012	45	44.5	47	85.1	55.5
Spain	2012	91	46.0	84	69.0	54.0
Sri Lanka†	2011	105	45.6	100	0.0	54.4
Suriname	2012	37	41.3	50	0.0	58.7
Swaziland§	2012	51	50.7	32	34.4	49.3
Sweden	2012	77	51.6	45	95.6	48.4
Switzerland	2012	79	46.3	71	100.0	53.7
Taiwan, China	2012	70	44.8	71	59.2	55.2
Tanzania	2012	99	45.9	92	0.0	54.1
Thailand	2012	75	43.3	86	97.7	56.7
Timor-Leste§	2012	35	45.4	34	0.0	54.6
Trinidad and Tobago	2012	151	46.7	132	92.4	53.3
Tunisia	2012	83	44.9	84	38.1	55.1
Turkey	2012	85	43.7	94	39.4	56.3
Uganda	2012	90	44.6	93	0.0	55.4
Ukraine	2012	109	45.1	108	2.8	54.9
United Arab Emirates‡	2012	169	100.0	—	—	—
United Kingdom	2012	102	43.2	118	98.3	56.8
United States	2012	397	39.9	598	99.3	60.1
Uruguay	2012	81	43.4	92	42.4	56.6
Venezuela	2012	39	41.0	54	100.0	59.0
Vietnam	2012	96	43.4	109	0.0	56.6
Yemen	2012	53	41.2	72	0.0	58.8
Zambia	2012	94	46.3	85	0.0	53.7
Zimbabwe	2012	64	46.4	57	42.1	53.6
Grand total/Average				13,638	39.1	

Note: All statistics were computed following the editing process. See text for details. * The table reports the information about the two Survey editions used in the computation of the two-year weighted average score. See Box 2 for explanation. § For these countries, we are working closely with Partner Institutes to increase the sample size. Survey edition(s) used for the computation of country scores are as follows: † 2011 and 2013; ‡ 2012; ‡‡ 2013. See Box 2 for details about exceptions.

With the aim of continually improving the Survey tool and processes, and following expert recommendations, the Survey was made shorter and the terminology simplified. An Executive Opinion Survey administration manual is also being developed for the Partner Institutes.

With such ongoing efforts in the realm of survey administration best practice, The Global Competitiveness and Benchmarking Network team continues to improve processes to achieve greater data quality and heightened comparability across economies.

DATA TREATMENT AND SCORE COMPUTATION

This section details the process whereby individual responses are edited and aggregated in order to produce the scores of each economy on each individual question of the Survey. These results, together with other indicators obtained from other sources, feed into the GCI and other projects.[8]

Data editing

Prior to aggregation, the 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.[9] This is because a partially completed survey probably demonstrates 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 test 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 the 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 65 questions, selected by their relevance and placement in the Survey instrument.

A univariate outlier test is then applied at the country 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. Individual answers with a standardized score $Z_{i,q,c}$ 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 GDP of each of the four main economic sectors: agriculture, manufacturing industry, non-manufacturing industry, and services (see Table 2).[10]

An additional step is taken to prevent individual responses within a sample from receiving 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 high weight to a very few surveys. This is avoided by "trimming" the sector weights. When, for a particular 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 average of a Survey indicator *i* for country *c,* denoted $q_{i,c}$, is computed as follows:

$$q_{i,c} = \sum_{s}^{S} w_{s,c} \times q_{i,s,c}$$

with

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

where

- $w_{s,c}$ is sector *s*'s contribution to the economy of country *c*;
- $q_{i,s,c}$ is the mean of the answers to question *i* from sector *s* in country *c*;
- $q_{i,j,s,c}$ is the answer to question *i* from respondent *j* in sector *s* in 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.[11] 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

Table 2: Sectoral value-added as a share (%) of GDP, most recent year available

Country/Economy	Agriculture	Manufacturing industry	Non-manufacturing industry	Services
Albania	20	19*		61
Algeria	7	7	56	31
Angola	10	6	54	30
Argentina	9	18	9	65
Armenia	21	11	27	42
Australia	2	9	10	78
Austria	2	19	10	69
Azerbaijan	6	6	61	27
Bahrain	0	15	30	54
Bangladesh	18	18	10	53
Barbados	3	7	16	74
Belgium	1	14	8	78
Benin	32	8	6	54
Bhutan	16	9	35	40
Bolivia	12	13	21	54
Bosnia and Herzegovina†	8	13	16	63
Botswana	2	4	43	51
Brazil	5	15	13	67
Brunei Darussalam	1	12	55	32
Bulgaria	5	17	14	63
Burkina Faso	33	14	9	44
Burundi	35	10	9	46
Cambodia	36	16	8	41
Cameroon	19	17	14	50
Canada	2	12	20	66
Cape Verde	10	9	9	72
Chad	14	7	42	38
Chile	3	12	27	57
China	10	30	17	43
Colombia	7	15	17	62
Costa Rica	7	18	9	66
Côte d'Ivoire	24	21	9	45
Croatia	5	18	9	67
Cyprus	2	8	12	78
Czech Republic	2	31	8	60
Denmark	1	12	10	77
Dominican Republic	6	25	8	61
Ecuador	7	11	30	52
Egypt	14	15	22	49
El Salvador	13	20	7	60
Estonia	4	18	12	65
Ethiopia	42	5	8	46
Finland	3	19	10	68
France	2	11	8	79
Gabon	4	3	58	36
Gambia, The	30	4	7	58
Georgia	7	10	8	75
Germany	1	21	7	71
Ghana	27	6	19	47
Greece	6	10	6	79
Guatemala	41	20	10	30
Guinea	13	5	42	39
Guyana	21	4	29	46
Haiti	26	8	11	55
Honduras	12	18	8	61
Hong Kong SAR	0	2	6	93
Hungary	4	23	8	65
Iceland	7	15	10	68
India	17	14	13	56
Indonesia	17	11	34	38
Iran, Islamic Rep.	10	11	34	45
Ireland	1	24	8	67
Israel	3	22	9	67
Italy	2	17	9	73
Jamaica	6	9	12	73
Japan	1	19	8	71
Jordan†	3	19	11	66
Kazakhstan	5	13	32	50
Kenya	23	11	8	58
Korea, Rep.	3	31	9	58
Kuwait	0	2	49	49
Kyrgyz Republic	20	18	11	51
Lao PDR	31	8	27	35
Latvia	4	12	10	74
Lebanon	6	8	13	72
Lesotho	8	12	22	59
Liberia	77	5*		18
Libya	2	4	74	20
Lithuania	4	23	5	68
Luxembourg	0	7	6	86
Macedonia, FYR	11	18	10	61
Madagascar	29	14	2	55
Malawi	31	10	6	53
Malaysia	11	26	18	45
Mali	37	3	21	39
Malta	2	13	19	65
Mauritania	16	4	43	37
Mauritius	4	18	9	70
Mexico	4	18	16	62
Moldova	13	12	0	74
Mongolia	15	8	28	48
Montenegro	10	6	14	70
Morocco	15	15	14	55
Mozambique	32	13	12	44
Myanmar	48	12	5	35
Namibia	7	8	12	73
Nepal	38	6	9	47
Netherlands	2	13	11	74
New Zealand	6	15	10	70
Nicaragua	21	20	11	47
Nigeria	33	4	36	27
Norway	2	9	31	58
Oman†	2	8	47	43
Pakistan	22	15	11	53
Panama	4	6	11	79
Paraguay	22	11	8	59
Peru	8	16	17	58
Philippines	13	19	11	57
Poland	4	18	13	65
Portugal	2	13	10	75
Puerto Rico	1	46	4	49
Qatar	0	4	71	25
Romania	7	21	4	68
Russian Federation	4	16	20	59
Rwanda	32	7	8	53
Saudi Arabia	2	10	50	38
Senegal	18	14	10	58
Serbia	9	16	11	64
Seychelles	2	11	7	80
Sierra Leone	44	4	15	37
Singapore	0	21	6	73
Slovak Republic	4	21	14	61
Slovenia	2	21	11	66
South Africa	2	13	17	67
Spain	3	13	13	71
Sri Lanka	14	17	11	58
Suriname	11	23	15	51
Swaziland	8	41	5	46
Sweden	2	16	10	72
Switzerland	1	19	8	72
Taiwan, China	1	32	4	62
Tanzania	27	10	17	46
Thailand	12	39	5	44
Timor-Leste	27	3	15	56
Trinidad and Tobago	1	5	47	47
Tunisia	8	18	16	58
Turkey	9	18	9	64
Uganda	23	8	17	51
Ukraine	8	18	14	60
United Arab Emirates†	2	12	48	38
United Kingdom	1	11	10	78
United States	1	13	7	79
Uruguay	10	13	12	65
Venezuela	4	15	40	42
Vietnam	20	19	22	40
Yemen	8	6	23	63
Zambia	21	9	28	42
Zimbabwe	13	11	12	64

Sources: World Bank, *World Development Indicators* (accessed December 12, 2012); Economist Intelligence Unit, *CountryData database* (accessed December 13, 2012); US Central Intelligence Agency, *The World Factbook* (accessed December 13, 2012)

* Combined share of manufacturing and non-manufacturing sectors.

† Figures were collected in December 2011 used for the computation of the 2012 Survey results.

Box 2: Country score calculation

This box presents the method applied to compute the country scores in *The Global Competitiveness Report 2013–2014*.

For any given Survey question i, country c's final score, $q_{i,c}^{2012–13}$, is given by:

$$q_{i,c}^{2012–13} = w_c^{2012} \times q_{i,c}^{2012} + w_c^{2013} \times q_{i,c}^{2013} \quad (1)$$

where

$q_{i,c}^{t}$ is country c's score on question i in year t, with t = 2012, 2013, as computed following the approach described in the text;

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

$$w_c^{2012} = \frac{(1-\alpha) + \frac{N_c^{2012}}{N_c^{2012}+N_c^{2013}}}{2} \quad (2a) \qquad \text{and} \qquad w_c^{2013} = \frac{\alpha + \frac{N_c^{2013}}{N_c^{2012}+N_c^{2013}}}{2} \quad (2b)$$

where N_c^{t} is the sample size (i.e., the number of respondents) for country c in year t, with t = 2012, 2013.

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

$$q_{i,c}^{2012–13} = \frac{1}{2} \times \underbrace{\left[(1-\alpha) \times q_{i,c}^{2012} + \alpha \times q_{i,c}^{2013}\right]}_{\text{discounted-past weighted average}} + \frac{1}{2} \times \underbrace{\left[\frac{N_c^{2012}}{N_c^{2012}+N_c^{2013}} \times q_{i,c}^{2012} + \frac{N_c^{2013}}{N_c^{2012}+N_c^{2013}} \times q_{i,c}^{2013}\right]}_{\text{sample-size weighted average}}. \quad (3)$$

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 2012 score of country c is given 2/3 of the weight given to the 2013 score. One additional characteristic 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.

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

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

Exceptions

As described in the text, there are a number of exceptions to the approach described above. In describing them below, we use actual years—rather than letters—in equations for the sake of concreteness.

In the case of Survey questions that were introduced in 2013, where, by definition, no past data exist, the weight applied is $w_c^{2012} = 0$ and $w_c^{2013} = 1$. Equation (1) simply is $q_{i,c}^{2012–13} = q_{i,c}^{2013}$. The same is true for those countries that are newly covered (Bhutan, Lao PDF, and Myanmar) and reinstated (Angola and Tunisia) in 2013. For these countries too we use $q_{i,c}^{2012–13} = q_{i,c}^{2013}$.

In the case of countries that failed the inter-year robustness check, the weight applied is $w_c^{2012} = 1$ and $w_c^{2013} = 0$, so that Equation (1) simply becomes $q_{i,c}^{2012–13} = q_{i,c}^{2012}$. In the case of countries that failed the inter-year robustness check last year and for which the 2012 data were discarded, we use the Survey data from 2011 instead, and combine them with those of 2013 to compute the scores. Equation (1) then becomes $q_{i,c}^{2011,2013} = w_c^{2011} \times q_{i,c}^{2011} + w_c^{2013} \times q_{i,c}^{2013}$.

Example

For this example, we compute the score of Panama for indicator 7.03 *Hiring and firing practices*, which is derived from the following Survey question: "In your country, how would you characterize the hiring and firing of workers? [1 = heavily impeded by regulations; 7 = extremely flexible]." This question is *not* a new question, and Panama did not fail the inter-year robustness test either this year or last year. Therefore, the general case of Equation (1) applies. Panama's score was 3.57 in 2012 and 3.82 in 2013. The weighting scheme described above indicates how the two scores are combined. In Panama, the size of the sample was 133 in 2012 and 130 in 2013. Using α = 0.6 and applying Equations (2a) and (2b) yields weights of 45.3 percent for 2012 and 54.7 percent for 2013 (see Table 1). The final country score for this question is given by Equation (1):

(Cont'd.)

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

$$\underbrace{0.453 \times 3.57}_{2012} + \underbrace{0.547 \times 3.82}_{2013} = 3.71.$$

This is the final score used in the computation of the GCI and reported in Table 7.03 (see page 490). 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.

regardless of the sector of activity of the respondents' companies. In 2013, this was the case for seven countries: Angola, Bahrain, El Salvador, Finland, Kuwait, Seychelles, and Venezuela.

Data weighting: Moving average

As a final step, the sector-weighted country averages for 2013 are combined with the 2012 averages to produce the country scores that are used for the computation of the GCI 2013–2014 and for other projects.

This moving average technique, introduced in 2008, 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 2012 and first quarter of 2013 better aligns the Survey data with many of the data indicators from sources other than the Survey, which are often year-average data.

For newly introduced questions, for which no time series exists, the final country score corresponds to the country score in 2013. This year, this is the case for indicators 6.04 *Effect of taxation on incentives to invest,* 7.05 *Effect of taxation on the incentive to work,* 7.08 *Country capacity to retain talent,* and 7.09 *Country capacity to attract talent,* which are derived from four Survey questions introduced in 2013 to replace two double-barreled questions on the capacity to attract and retain talent and on the effect of taxation on incentives to invest and work, respectively.

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 would like to give more weight to the most recent responses because they contain more updated information. That is, we also "discount the past." Table 1 reports the exact weights used in the computation of the scores of each country, while Box 2 details the methodology and provides a clarifying example.

Inter-year robustness test and trend analysis

The two tests described above address variability issues among individual responses in a country. Yet they were not designed to track the evolution of country scores across time. We therefore carry out an analysis to assess the reliability and consistency of the Survey data over time. As part of this analysis, we run an inter-quartile range test, or IQR test, 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 and the 75th percentile), denoted *iq,* of the sample of 148 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:

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

where

$Q1$ and $Q3$ correspond to the 25th and 75th percentiles of the sample, respectively, and

IQR is the difference between these two values.

In addition to this test, we conduct an analysis of the evolution in the results over the past five editions and also consider the latest developments in all countries displaying large swings.

Based on this quantitative and qualitative analyses, the 2013 Survey data collected in Bosnia and Herzegovina, Jordan, Oman, and the United Arab Emirates appear to deviate significantly from the historical trends, and recent developments in these countries do not seem to provide enough justification for the large swings observed. For these four countries, therefore, we use only the 2012 Survey data in the computation of this year's GCI. Although this remains

a remedial measure, we will continue to investigate the situation over the coming months in an effort to improve the representativeness of the Survey data in these countries. Last year, the same analysis resulted in the Survey data of four countries—Ecuador, Georgia, Rwanda, and Sri Lanka—being removed. This year, as an intermediate step toward the re-establishment of the standard computation method, we used a weighted average of the Survey data of 2011 for these countries—that is, the edition preceding the problematic one—and 2013.

CONCLUSION

The World Economic Forum's Executive Opinion Survey remains the largest poll of its kind, capturing the insight of more than 13,000 executives into critical drivers of their respective countries' development. This scale could not be achieved without the tremendous efforts of the Forum's network of over 160 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 remain an essential and ongoing endeavor of The Global Competitiveness and Benchmarking Network.

NOTES

1 For Forum competitiveness publications, please see http://www.weforum.org/content/pages/competitiveness-library.

2 For a number of countries, 2013 data were not used. Please see the data-editing section for further details.

3 The Executive Opinion Survey 2013 is available in the following 41 languages—13 more than last year: Albanian, Arabic, Armenian, Azeri, Bosnian, Brazilian Portuguese, Bulgarian, Burmese, Chinese, Croatian, Czech, Danish, Estonian, English, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Khmer, Korean, Lao, Latvian, Lithuanian, Macedonian, Mongolian, Montenegrin, Persian, Polish, Portuguese, Romanian, Russian, Serbian, Slovak, Slovenian, Spanish, Turkish, Urdu, and Vietnamese.

4 In the case of Tajikistan, the Survey was not conducted because of a lack of clearance for its administration.

5 The World Economic Forum's Global Competitiveness and Benchmarking Network would like to acknowledge e-Rewards Market Research for carrying out the Executive Opinion Survey 2013 in the United States, collecting over 670 surveys following the detailed sampling guidelines. Furthermore, e-Rewards supplemented a sample of 128 in Germany as well as 71 in India.

6 *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.

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

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

9 The *completion rate* is the proportion of answered questions among the 131 questions in the survey instrument used in the computation of the indexes.

10 In some cases, the information about the company's sector of activity is missing. In these cases, for any given country when the sample includes at least one survey without sector information, the average response values across the surveys 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.

11 Following the computation of the sector-weighted country scores, for each country we compute the weight of each individual response in the sample. For any given country, if the individual weight of a response exceeds 10 percent, we abandon the sector-weighted approach and apply a simple average across all responses.