The Executive Opinion Survey: The Voice of the Business Community

For almost 40 years, the Executive Opinion Survey (the Survey) has been a key ingredient of the *Global Competitiveness Report* series. The Survey provides a yearly evaluation of critical aspects of competitiveness for which statistical data is missing because it is either impossible or extremely difficult to measure on a global scale. The aim of the Survey is to capture reality as best as possible, and business leaders are arguably the best positioned to assess these aspects.

The indicators derived from the Survey are used in the calculation of the Global Competitiveness Index 4.0 (GCI), as well as a number of other World Economic Forum indexes, such as the Networked Readiness Index, the Enabling Trade Index, the Travel & Tourism Competitiveness Index, the Gender Gap Index, and the Human Capital Index, as well as several other reports, including *The Inclusive Economic Growth and Development Report, The Global Risks Report* and a number of regional competitiveness studies. A truly unique source of data, the Survey has also long been used by a number of international and nongovernmental organizations, think tanks and academia for empirical and policy work.
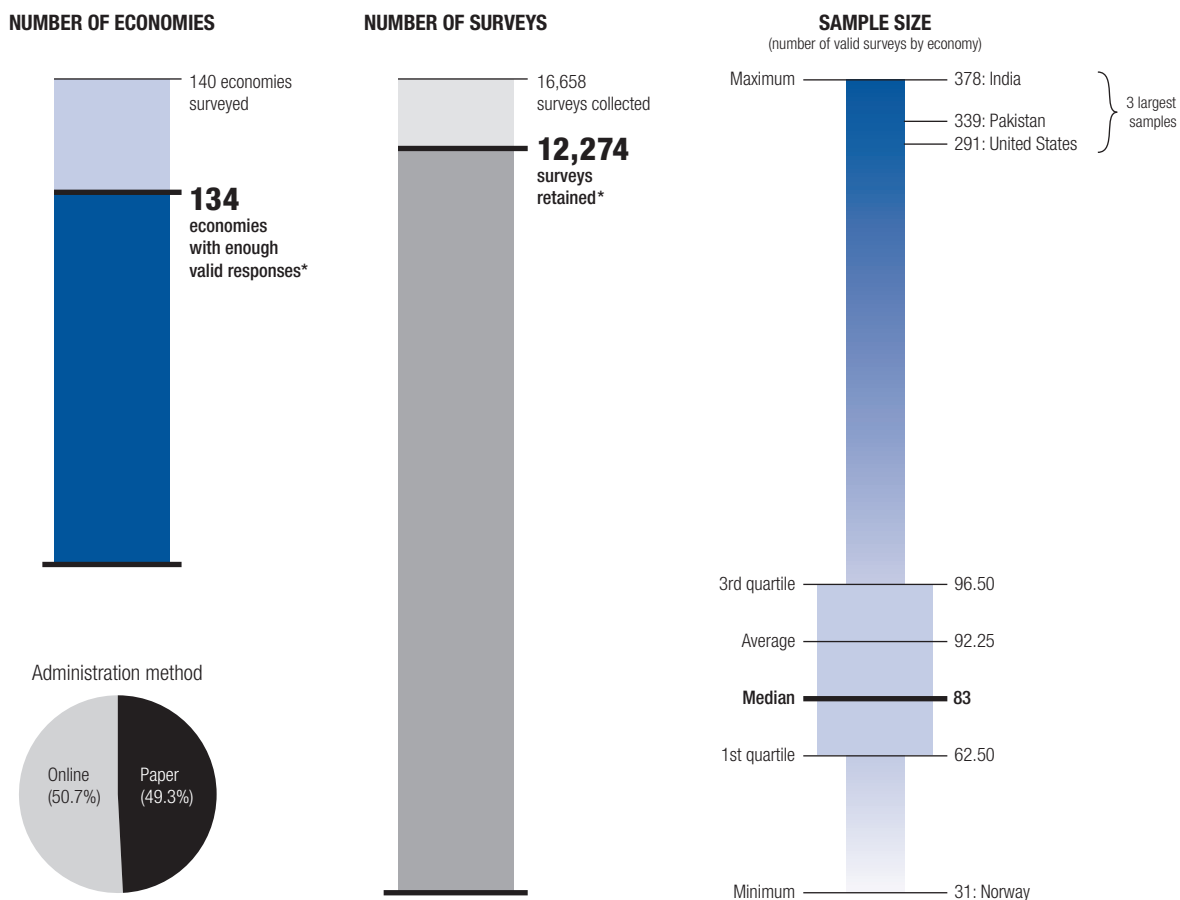
THE SURVEY 2018 IN NUMBERS

The 2018 edition captured the views of 16,658 business executives in 140 economies between January and April 2018. Following the data editing process described below, a total of 12,274 responses were retained. This year half of the retained surveys (50.7%) were completed online. In 52 economies over 90% of respondents complete the Survey online, while in a further 21 economies, at least 50% of respondents completed the Survey online (see Figure 1). The 2018 edition of the Survey was made available in 42 languages (see Table 1).

SURVEY STRUCTURE, ADMINISTRATION AND METHODOLOGY

The Survey comprises 148 questions divided into 15 sections. Most questions ask respondents to evaluate on a scale of 1 (considered among the worst in the world) to 7 (considered among the best in the world) specific aspects of the business environment in the country where the respondent operates. The 2018 edition of the Survey instrument is available in the Downloads section of the *Global Competitiveness Report's* page at http://gcr.weforum.org/.

The administration of the Survey is supervised by the World Economic Forum and conducted at the national level by the Forum's network of Partner Institutes. Partner Institutes are typically universities or other research organizations, business associations, competitiveness councils, or survey companies. These organizations have the private sector network for reaching out to leading

Figure 1: Descriptive statistics of the Executive Opinion Survey 2018

NUMBER OF ECONOMIES

140 economies
surveyed

134
economies
with enough
valid responses*

Administration method

Online
(50.7%)

Paper
(49.3%)

NUMBER OF SURVEYS

16,658
surveys collected

12,274
surveys
retained*

SAMPLE SIZE
(number of valid surveys by economy)

Maximum — 378: India
— 339: Pakistan — 3 largest samples
— 291: United States

3rd quartile — 96.50

Average — 92.25

Median — **83**

1st quartile — 62.50

Minimum — 31: Norway

Source: World Economic Forum, Executive Opinion Survey, 2018 edition.
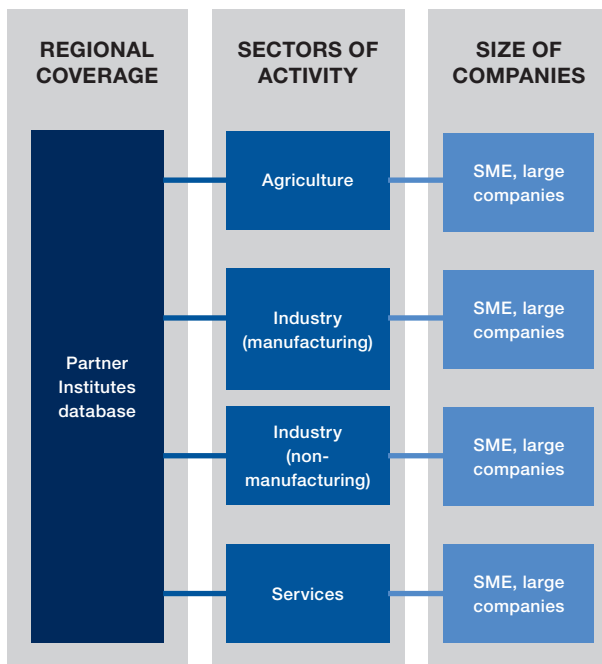**Note:** Not all charts are drawn to scale.
* Following data treatment. See text for details.

Table 1: Available languages in 2018

Albanian	Czech	Icelandic	Mongolian	Spanish
Arabic	Danish	Indonesian	Montenegrin	Tajik
Armenian	English	Italian	Polish	Thai
Azeri	Estonian	Khmer	Portuguese	Turkish
Bosnian	Farsi	Korean	Romanian	Urdu
Bulgarian	French	Lao	Russian	Vietnamese
Chinese	German	Latvian	Serbian	
Chinese (traditional)	Greek	Lithuanian	Slovak	
Croatian	Hungarian	Macedonian	Slovenian	

Figure 2: Sample frame requirements

- Ensuring the representation of both large- (more than 250 employees) and small-sized companies (249 employees or fewer), again reflecting each sector. At least one-third of companies are large and one-third are small, and the remaining one-third are determined by the structure of the economy in proportion to the share of GDP by company size.

- Ensuring the chosen companies also have a sufficiently wide geographical coverage.

The Survey is administered in a variety of formats, including face-to-face or telephone interviews with business executives, mailed paper forms and online surveys. For energy, time and cost considerations, the Forum encourages the use of a dedicated online Survey tool.

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

business executives and a firm commitment to improving the competitiveness of their respective economies (for the full list, see the Contributors and Acknowledgments section of this report).[1]

In administering the Survey and in order to gather the strongest dataset, Partner Institutes are asked to follow detailed sampling guidelines and collect the data in a specific timeframe. The collection process is based on best practices in the field of Survey administration and on discussions with survey experts. It is put in place to ensure that the sample of respondents is the most representative possible and comparable across the globe.

The sampling guidelines specify that the Partner Institutes create a sample frame (Figure 2) that is a large list of potential business executives from companies of various sizes and from the various sectors of activity, as detailed below. The Partner Institutes separate the frame into two lists: one that includes only large firms, and a second that includes all other firms (both lists representing the various economic sectors). To reduce bias, Partner Institutes randomly select firms from each list to receive the Survey.

The sample frame should reflect the structure of the country/economy:

- In proportion to the share of GDP by sector: agriculture, manufacturing industry, non-manufacturing industry (mining and quarrying, electricity, gas and water supply, construction), and services.

DATA TREATMENT AND SCORE COMPUTATION

This section details the process whereby individual responses are edited and aggregated in order to produce the Survey question scores of each economy. These are the results that then feed into the GCI other indices and projects listed above.

Data editing

Prior to aggregation, the respondent-level data are subjected to a careful editing process. The following observations are excluded from the dataset: Surveys where the respondent gives the same answer to at least 80% of the questions; Surveys with a completion rate inferior to 50%; respondents who are not based in the same country as the Partner Institute; respondents who are not in a leadership position within their firm; and finally, duplicate Surveys—which can occur, for example, when a Survey is both completed online and mailed in.

In a second step, a multivariate test is applied to the data using the Mahalanobis distance method. This test estimates the probability that an individual Survey in a specific country "belongs" to the sample of that country by comparing the pattern of answers of that Survey against the average pattern of answers in the country sample.

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

Table 2: Executive Opinion Survey: Descriptive statistics and weightings

Economy	Period 1			Period 2			
	Survey edition	No. of respondents	Weight (%)*	Survey edition	No. of respondents	Weight (%)*	Online (%)[†]
Albania	2017	71	41.5	2018	94	58.5	—
Algeria	2017	130	50.0	2018	87	50.0	—
Angola	2017 data not available			2018	120	100.0	100.0
Argentina	2017	99	47.0	2018	84	53.0	100.0
Armenia	2017	76	47.3	2018	63	52.7	100.0
Australia	2017	78	46.5	2018	69	53.5	98.6
Austria	2017	98	41.7	2018	128	58.3	59.4
Azerbaijan	2016	77	42.8	2017	92	57.2	—
Bahrain	2015	50	38.0	2016	89	62.0	—
Bangladesh	2017	81	43.4	2018	92	56.6	—
Belgium	2017	99	51.9	2018	56	48.1	100.0
Benin	2017	78	45.0	2018	78	55.0	—
Bolivia	2017 data not available			2018	54	100.0	90.7
Bosnia and Herzegovina	2017	76	43.3	2018	87	56.7	100.0
Botswana	2017	110	47.4	2018	91	52.6	—
Brazil	2017	103	43.3	2018	118	56.7	100.0
Brunei Darussalam	2017	77	47.9	2018	61	52.1	67.2
Bulgaria	2017	104	46.1	2018	95	53.9	—
Burkina Faso	2017 data not available			2018	73	100.0	—
Burundi	2016	96	47.1	2017	81	52.9	—
Cambodia	2017	69	47.2	2018	58	52.8	—
Cameroon	2017	81	46.3	2018	73	53.7	—
Canada	2017	79	39.9	2018	119	60.1	100.0
Cape Verde	2017	71	46.7	2018	62	53.3	75.8
Chad	2017	73	43.5	2018	82	56.5	—
Chile	2017	140	39.1	2018	227	60.9	100.0
China	2016	355	43.6	2017	396	56.4	—
Colombia	2017	134	47.1	2018	113	52.9	81.4
Congo, Dem. Rep.	2017	126	46.7	2018	110	53.3	12.7
Costa Rica	2017	69	43.6	2018	77	56.4	84.4
Cote d'Ivoire	2017 data not available			2018	120	100.0	—
Croatia	2017	81	44.8	2018	82	55.2	100.0
Cyprus	2017	73	44.7	2018	75	55.3	10.7
Czech Republic	2017	84	43.5	2018	95	56.5	100.0
Denmark	2017	85	48.7	2018	63	51.3	100.0
Dominican Republic	2017	54	43.9	2018	59	56.1	88.1
Ecuador	2017	99	44.9	2018	100	55.1	26.0
Egypt	2017	99	45.6	2018	94	54.4	—
El Salvador	2017	41	39.9	2018	62	60.1	98.4
Estonia	2017	77	46.7	2018	67	53.3	100.0
Eswatini	2017	50	46.3	2018	45	53.7	33.3
Ethiopia	2016	89	46.5	2017	79	53.5	—
Finland	2017	50	47.2	2018	42	52.8	100.0
France	2017	81	48.3	2018	62	51.7	100.0
Gambia, The	2017	74	43.0	2018	87	57.0	—
Georgia	2017	44	46.2	2018	40	53.8	100.0
Germany	2017	112	49.3	2018	79	50.7	93.7
Ghana	2017	80	43.5	2018	90	56.5	—
Greece	2017	78	44.2	2018	83	55.8	97.6
Guatemala	2017	93	45.3	2018	91	54.7	—
Guinea	2017 data not available			2018	66	100.0	—
Haiti	2017	52	40.8	2018	73	59.2	—
Honduras	2017	90	44.6	2018	93	55.4	—
Hong Kong SAR	2017	93	46.1	2018	85	53.9	67.1
Hungary	2017	83	44.1	2018	89	55.9	18.0
Iceland	2017	70	43.0	2018	82	57.0	100.0
India	2017	201	37.4	2018	378	62.6	57.4
Indonesia	2017	94	46.1	2018	86	53.9	—
Iran, Islamic Rep.	2017	200	49.2	2018	143	50.8	100.0
Ireland	2017	105	53.0	2018	54	47.0	100.0
Israel	2017	82	44.6	2018	85	55.4	100.0
Italy	2017	98	46.2	2018	89	53.8	—
Jamaica	2017	71	50.1	2018	47	49.9	97.9
Japan	2017	63	46.9	2018	54	53.1	29.6
Jordan	2017	154	50.4	2018	99	49.6	2.0
Kazakhstan	2017	86	40.5	2018	124	59.5	16.9
Kenya	2017	113	44.9	2018	114	55.1	—
Korea, Rep.	2017	100	45.0	2018	100	55.0	—
Kuwait	2017	68	42.2	2018	85	57.8	35.3
Kyrgyz Republic	2017	97	44.3	2018	103	55.8	—
Lao PDR	2017	87	49.8	2018	59	50.2	6.8

(Cont'd.)

Table 2: Executive Opinion Survey: Descriptive statistics and weightings *(cont'd.)*

Economy	Period 1			Period 2			
	Survey edition	No. of respondents	Weight (%)*	Survey edition	No. of respondents	Weight (%)*	Online (%)[†]
Latvia	2017	55	43.5	2018	62	56.5	56.5
Lebanon	2017	78	44.7	2018	80	55.3	100.0
Lesotho	2017	92	44.5	2018	96	55.5	—
Liberia	2017	55	42.2	2018	69	57.8	—
Lithuania	2017	116	46.5	2018	103	53.5	64.1
Luxembourg	2017	43	46.2	2018	39	53.8	100.0
Macedonia, FYR	2017 data not available			2018	58	100.0	98.3
Malawi	2017	75	42.6	2018	91	57.4	20.9
Malaysia	2017	96	47.6	2018	78	52.4	—
Mali	2017	65	43.2	2018	75	56.8	—
Malta	2017	58	47.4	2018	48	52.6	100.0
Mauritania	2017	118	48.1	2018	92	51.9	—
Mauritius	2017	61	50.8	2018	38	49.2	97.4
Mexico	2017	291	49.2	2018	208	50.8	77.4
Moldova	2017	132	50.3	2018	86	49.7	—
Mongolia	2017	82	45.3	2018	80	54.7	67.5
Montenegro	2017	80	45.2	2018	79	54.8	—
Morocco	2017	89	50.5	2018	57	49.5	100.0
Mozambique	2017	95	46.5	2018	84	53.5	1.2
Namibia	2017	74	45.3	2018	72	54.7	—
Nepal	2017	91	45.3	2018	89	54.7	7.9
Netherlands	2017	78	45.0	2018	78	55.0	100.0
New Zealand	2017	32	36.3	2018	66	63.7	100.0
Nicaragua	2017	47	42.2	2018	59	57.8	86.4
Nigeria	2017	85	42.4	2018	105	57.6	—
Norway	2017	39	47.9	2018	31	52.1	100.0
Oman	2017	86	46.1	2018	79	53.9	26.6
Pakistan	2017	290	43.1	2018	339	56.9	5.6
Panama	2017	89	43.9	2018	97	56.1	74.2
Paraguay	2017	111	47.2	2018	93	52.8	100.0
Peru	2017	90	43.9	2018	98	56.1	90.8
Philippines	2017	55	44.1	2018	59	55.9	66.1
Poland	2017	204	44.9	2018	205	55.1	98.5
Portugal	2017	140	43.0	2018	165	57.0	99.4
Qatar	2017	97	44.9	2018	98	55.1	6.1
Romania	2017	103	45.4	2018	100	54.6	22.0
Russian Federation	2017	268	43.8	2018	296	56.2	—
Rwanda	2017	92	46.6	2018	81	53.4	—
Saudi Arabia	2017	164	50.9	2018	101	49.1	64.4
Senegal	2017	80	44.5	2018	83	55.5	—
Serbia	2017	98	43.9	2018	107	56.1	100.0
Seychelles	2017	47	42.8	2018	56	57.2	—
Sierra Leone	2017	79	50.6	2018	50	49.4	—
Singapore	2017	148	47.4	2018	122	52.6	100.0
Slovak Republic	2017	110	56.2	2018	42	43.8	100.0
Slovenia	2017	89	46.3	2018	80	53.7	86.3
South Africa	2017	170	47.0	2018	145	53.0	100.0
Spain	2017	75	44.2	2018	80	55.8	90.0
Sri Lanka	2017	75	44.4	2018	79	55.6	100.0
Sweden	2017	71	46.7	2018	62	53.3	100.0
Switzerland	2017	52	43.2	2018	60	56.8	100.0
Taiwan, China	2017	121	45.7	2018	114	54.3	69.3
Tajikistan	2017	89	44.1	2018	96	55.9	6.3
Tanzania	2017	80	43.5	2018	90	56.5	—
Thailand	2017	115	47.4	2018	95	52.6	95.8
Trinidad and Tobago	2017	70	46.5	2018	62	53.5	75.8
Tunisia	2017	102	47.1	2018	86	52.9	62.8
Turkey	2017	84	45.6	2018	80	54.4	23.8
Uganda	2017	86	43.6	2018	96	56.4	26.0
Ukraine	2017	99	45.0	2018	99	55.0	—
United Arab Emirates	2017	85	46.1	2018	78	53.9	73.1
United Kingdom	2017	83	49.9	2018	56	50.1	100.0
United States	2017	249	43.1	2018	291	56.9	100.0
Uruguay	2017	71	43.8	2018	78	56.2	100.0
Venezuela	2017	47	48.3	2018	36	51.7	100.0
Vietnam	2017	90	46.8	2018	78	53.2	33.3
Yemen	2017	65	46.4	2018	58	53.6	13.8
Zambia	2017	61	42.1	2018	77	57.9	—
Zimbabwe	2017	43	41.9	2018	55	58.1	90.9

Note: All statistics are computed following the editing of the data; see text for details. "—" indicates that there was no online administration of the Survey.

* Weight applied to the country score in that edition of the Survey. See Box 1 for an example of a calculation.

[†] Share of surveys completed online (2018 only).

sample. Individual answers with a standardized score greater than 3 are dropped.[2]

Aggregation and computation of country averages

We use a simple average to compute scores at the economy level. As the sample frame aims to replicate an economy's sectoral composition and includes companies of different sizes, the country-level score of each Executive Opinion Survey question is the arithmetic mean of all answers in each country. That is, for a given question, all individual answers carry the same weight.

Formally, the average of a Survey indicator i for country c, $q_{i,c}$, is computed as follows:

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

where

$q_{i,c,j}$ is the answer to question i in country c from respondent j; and

$N_{i,c}$ is the number of respondents to question i in country c.

Once responses have been aggregated at the country level, a test to detect statistical outliers is run. We leverage the strong relationship between the indicators derived from the Survey and some 50 statistical indicators included in the GCI: countries doing well on these indicators tend to do well in the Survey. A univariate linear regression is used to predict the expected average score of Survey indicators based on the average performance in the other indicators. Average Survey scores that lie outside the 90% confidence interval around the predicted values are considered "outliers". The scores of individual Survey indicators are systematically corrected by a factor corresponding to the distance between the observed average Survey score and the predicted Survey average at the limit of the confidence interval.

In addition, an analysis to assess the reliability and consistency of the Survey data over time is carried out. As part of this analysis, an inter-quartile range (IQR) test is performed to identify large swings—positive and negative— between two editions. For each country, we compute the year-on-year difference, d, in the average score of a core set of 66 Survey questions. We then compute the inter-quartile range (i.e. the difference between the 25th percentile and the 75th percentile). Any value d outside the range bounded by the 25th percentile minus 1.5 times the IQR and the 75th percentile plus 1.5 times the IQR is identified as a potential "outlier". This test is complemented by a series of additional empirical tests, including an analysis of five-year trends and a comparison of changes in the Survey results with changes in other indicators capturing similar concepts. We interview local experts and consider the latest developments in a country in order to assess the plausibility of the Survey results. Based on the result of this test and the complementary qualitative analysis, the data collected in 2018 for Azerbaijan, Bahrain, Burundi, China, Ethiopia and Guinea were not used. Instead, Survey results from the previous editions were used (for details see Table 2).

Moving average and computation of country scores

We then proceed to compute moving averages of country scores. The moving average technique 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 2017 and the first quarter of 2018 better aligns the Survey data with many of the data indicators from sources other than the Survey, which are often annual-averages data.

To calculate the moving average, we use a weighting scheme composed of two overlapping elements. We place more weight on the year with the larger sample size to attribute equal weight to each response. At the same time, we attribute greater weight to the most recent sample because it contains most up to date information. That is, we also "discount the past." Table 2 reports the exact weights used in the computation of the scores of each country.

Economy score calculation

The details of the method applied to compute the country scores for the vast majority of economies included in *The Global Competitiveness Report 2018* are as follows.

For any given Survey question i, country c's final score, $q_{i,c}^{2017-18}$, is given by:

$$q_{i,c}^{2017-18} = w_c^{2017} \times q_{i,c}^{2017} + w_c^{2018} \times q_{i,c}^{2018} \qquad (1)$$

where

$q_{i,c}^{t}$ is country c's score on question i in year t, with t = 2017, 2018, as computed following the approach described in the text; and

w_c^{t} is the weight applied to country c's score in year t.

The weights for each year are determined as follows:

$$w_c^{2017} = \frac{(1-\alpha) + \dfrac{N_c^{2017}}{N_c^{2017} + N_c^{2018}}}{2} \qquad (2a)$$

and

$$w_c^{2018} = \frac{\alpha + \dfrac{N_c^{2018}}{N_c^{2017} + N_c^{2018}}}{2} \quad (2b)$$

where N_c^t is the sample size (i.e. the number of respondents) for country c in year t, with $t = 2017, 2018$. α is the discount factor that accounts for temporality set at 0.6.

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

$$q_{i,c}^{2017-18} = \frac{1}{2} \times \underbrace{\left[(1-\alpha) \times q_{i,c}^{2017} + \alpha \times q_{i,c}^{2018} \right]}_{\text{discounted-past weighted average}} + \frac{1}{2} \times$$

$$\underbrace{\left[\frac{N_c^{2017}}{N_c^{2017} + N_c^{2018}} \times q_{i,c}^{2017} + \frac{N_c^{2018}}{N_c^{2017} + N_c^{2018}} \times q_{i,c}^{2018} \right]}_{\text{sample-size weighted average}} \quad (3)$$

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. 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.

In the case of Survey questions that were introduced in 2018 for which, by definition, no past data exist, full weight is given to the 2018 score. For newly covered economies, this treatment is applied to all questions. For countries whose 2018 data were discarded, the results from the previous editions of the report are used instead. Box 1 provides a clarifying example of the methodology.

NOTES

1 The World Economic Forum's Centre for the New Economy and Society acknowledges Research Now for carrying out the Executive Opinion Survey 2018 in the United States, Germany, Denmark, India, Japan, New Zealand, South Africa, Sweden and the United Kingdom following the detailed sampling guidelines. The World Economic Forum also acknowledges IPSOS for carrying out the Executive Opinion Survey 2018 following the detailed sampling guidelines in Norway.

2 For a more detailed formal description of the various tests presented here, see Browne and Geiger, 2009.

REFERENCES

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Box 1: Example of score computation

For this example, we compute the score of Denmark for the indicator Hiring and firing practices, which is included in the Global Competitiveness Index (indicator 8.02) and derived from the following Survey question: "In your country, to what extent do regulations allow for the flexible hiring and firing of workers? (1 = not at all, 7 = to a great extent)." This question is not a new Survey question and therefore the normal treatment applies, using Equation (1). Denmark's Survey score was 4.93 in 2017 and 5.15 in 2018. The weighting scheme described above indicates how the two scores are combined. In Denmark, the size of the sample was 63 in 2017 and 85 in 2018. Using a = 0.6 and applying Equations (2a) and (2b) yields weights of 48.7% for 2017 and 51.3% for 2018 (see Table 2). The final country score for this question is therefore:

$$\underbrace{0.487 \times 4.93}_{2017} + \underbrace{0.513 \times 5.15}_{2018} = 5.04.$$

This is the final score used in the computation of the GCI. Although numbers are rounded to two decimal places in this example and to one decimal place in the Denmark country profile, exact figures are used in all calculations.