## Appendix A: Structure of the Global Competitiveness Index 2009–2010

This appendix presents the structure of the Global Competitiveness Index 2009–2010 (GCI).

The numbering of the variables matches the numbering of the Data Tables. The number preceding the period indicates to which pillar the variable belongs (e.g., variable **1.**01 belongs to the 1st pillar, and variable **12.**04 belongs to the 12th pillar).

The hard data indicators used in the GCI are normalized on a 1-to-7 scale in order to align them with the Executive Opinion Survey's results.[a] The Technical Notes and Sources at the end of this *Report* provide detailed information on all the hard data indicators.

Those variables that are followed by the symbol[1/2] enter the GCI in two different places. In order to avoid double counting, we give them a half-weight in each place by dividing their value by 2 when computing the aggregate score for the two categories in which they appear.[b]

The percentage next to each category represents this category's weight within its immediate parent category. The computation of the GCI is based on successive aggregations of scores, from the variable level (i.e., the lowest level) all the way up to the overall GCI score (i.e., the highest level), using the weights reported below. For example, the score a country achieves in the 9th pillar accounts for 17 percent of this country's score in the *Efficiency enhancers* subindex. Similarly, the score achieved on the subpillar *Networks and supporting industries* accounts for 50 percent of the score of the 11th pillar. Reported percentages are rounded to the nearest integer, but exact figures are used in the calculation of the GCI.

Unlike for the lower levels of aggregation, the weight put on each of the three subindexes (Basic requirements, Efficiency enhancers, and Innovation and sophistication factors) is not fixed. It depends on each country's stage of development, as discussed in the text.[c] For instance, in the case of Dominican Republic—a country in the second stage of development—the score in the *Basic requirements* subindex accounts for 40 percent of its overall GCI score, while it represents just 20 percent of the overall GCI score of Australia, a country in the third stage of development.

Finally, note that this year the structure of the GCI has undergone two minor changes. Variable 1.09 on the efficiency of the legal framework has been split into two distinct variables. Variables 1.09 and 1.10 now measure the degree of efficiency of the legal framework in settling disputes (1.09) and in challenging regulations (1.10). The second alteration to the structure is the exclusion of the measure of non-wage labor costs (formerly variable 7.03). The variables that belong to the two pillars affected by these changes (i.e., 1st and 7th pillars) were renumbered accordingly.

Weight (%) within immediate parent category

### BASIC REQUIREMENTS

**1st pillar: Institutions** ..... **25%**

**A. Public institutions** ..... **75%**

1. Property rights ..... 20%
   - 1.01 Property rights
   - 1.02 Intellectual property protection [1/2]

2. Ethics and corruption ..... 20%
   - 1.03 Diversion of public funds
   - 1.04 Public trust of politicians

3. Undue influence ..... 20%
   - 1.05 Judicial independence
   - 1.06 Favoritism in decisions of government officials

4. Government inefficiency ..... 20%
   - 1.07 Wastefulness of government spending
   - 1.08 Burden of government regulation
   - 1.09 Efficiency of legal framework in settling disputes
   - 1.10 Efficiency of legal framework in challenging regulations
   - 1.11 Transparency of government policymaking

5. Security ..... 20%
   - 1.12 Business costs of terrorism
   - 1.13 Business costs of crime and violence
   - 1.14 Organized crime
   - 1.15 Reliability of police services

**B. Private institutions** ..... **25%**

1. Corporate ethics ..... 50%
   - 1.16 Ethical behavior of firms

2. Accountability ..... 50%
   - 1.17 Strength of auditing and reporting standards
   - 1.18 Efficacy of corporate boards
   - 1.19 Protection of minority shareholders' interests

**2nd pillar: Infrastructure** ..... **25%**

**A. General infrastructure** ..... **50%**
- 2.01 Quality of overall infrastructure

**B. Specific infrastructure** ..... **50%**
- 2.02 Quality of roads
- 2.03 Quality of railroad infrastructure
- 2.04 Quality of port infrastructure
- 2.05 Quality of air transport infrastructure
- 2.06 Available seat kilometers (hard data)
- 2.07 Quality of electricity supply
- 2.08 Telephone lines (hard data)

**3rd pillar: Macroeconomic stability** ..... **25%**
- 3.01 Government budget balance (hard data)
- 3.02 National savings rate (hard data)
- 3.03 Inflation (hard data) [d]
- 3.04 Interest rate spread (hard data)
- 3.05 Government debt (hard data)

*(Cont'd.)*

## Appendix A: Structure of the Global Competitiveness Index 2009–2010 *(cont'd.)*

### 4th pillar: Health and primary education ..... 25%

**A. Health ..... 50%**

4.01 Business impact of malaria[e]
4.02 Malaria incidence (hard data)[e]
4.03 Business impact of tuberculosis[e]
4.04 Tuberculosis incidence (hard data)[e]
4.05 Business impact of HIV/AIDS[e]
4.06 HIV prevalence (hard data)
4.07 Infant mortality (hard data)
4.08 Life expectancy (hard data)

**B. Primary education ..... 50%**

4.09 Quality of primary education
4.10 Primary enrollment (hard data)
4.11 Education expenditure (hard data)[1/2]

## EFFICIENCY ENHANCERS

### 5th pillar: Higher education and training ..... 17%

**A. Quantity of education ..... 33%**

5.01 Secondary enrollment (hard data)
5.02 Tertiary enrollment (hard data)
4.11 Education expenditure (hard data)[1/2]

**B. Quality of education ..... 33%**

5.03 Quality of the educational system
5.04 Quality of math and science education
5.05 Quality of management schools
5.06 Internet access in schools

**C. On-the-job training ..... 33%**

5.07 Local availability of specialized research and training services
5.08 Extent of staff training

### 6th pillar: Goods market efficiency ..... 17%

**A. Competition ..... 67%**

1. Domestic competition ..... variable[f]

6.01 Intensity of local competition
6.02 Extent of market dominance
6.03 Effectiveness of anti-monopoly policy
6.04 Extent and effect of taxation[1/2]
6.05 Total tax rate (hard data)[1/2]
6.06 Number of procedures required to start a business (hard data)[g]
6.07 Time required to start a business (hard data)[g]
6.08 Agricultural policy costs

2. Foreign competition ..... variable[f]

6.09 Prevalence of trade barriers
6.10 Tariff barriers (hard data)
6.11 Prevalence of foreign ownership
6.12 Business impact of rules on FDI
6.13 Burden of customs procedures
10.04 Imports as a percentage of GDP (hard data)

**B. Quality of demand conditions ..... 33%**

6.14 Degree of customer orientation
6.15 Buyer sophistication

### 7th pillar: Labor market efficiency ..... 17%

**A. Flexibility ..... 50%**

7.01 Cooperation in labor-employer relations
7.02 Flexibility of wage determination
7.03 Rigidity of employment (hard data)
7.04 Hiring and firing practices
6.04 Extent and effect of taxation[1/2]
6.05 Total tax rate (hard data)[1/2]
7.05 Firing costs (hard data)

**B. Efficient use of talent ..... 50%**

7.06 Pay and productivity
7.07 Reliance on professional management[1/2]
7.08 Brain drain
7.09 Female participation in labor force (hard data)

### 8th pillar: Financial market sophistication ..... 17%

**A. Efficiency ..... 50%**

8.01 Financial market sophistication
8.02 Financing through local equity market
8.03 Ease of access to loans
8.04 Venture capital availability
8.05 Restriction on capital flows
8.06 Strength of investor protection (hard data)

**B. Trustworthiness and confidence ..... 50%**

8.07 Soundness of banks
8.08 Regulation of securities exchanges
8.09 Legal rights index (hard data)

### 9th pillar: Technological readiness ..... 17%

9.01 Availability of latest technologies
9.02 Firm-level technology absorption
9.03 Laws relating to ICT
9.04 FDI and technology transfer
9.05 Mobile telephone subscriptions (hard data)
9.06 Internet users (hard data)
9.07 Personal computers (hard data)
9.08 Broadband Internet subscribers (hard data)

### 10th pillar: Market size ..... 17%

**A. Domestic market size ..... 75%**

10.01 Domestic market size index (hard data)[h]

**B. Foreign market size ..... 25%**

10.02 Foreign market size index (hard data)[i]

## INNOVATION AND SOPHISTICATION FACTORS

### 11th pillar: Business sophistication ..... 50%

**A. Networks and supporting industries ..... 50%**

11.01 Local supplier quantity
11.02 Local supplier quality
11.03 State of cluster development

**B. Sophistication of firms' operations and strategy 50%**

11.04 Nature of competitive advantage
11.05 Value chain breadth
11.06 Control of international distribution
11.07 Production process sophistication
11.08 Extent of marketing
11.09 Willingness to delegate authority
7.07 Reliance on professional management[1/2]

**12th pillar: Innovation.....50%**

- 12.01 Capacity for innovation
- 12.02 Quality of scientific research institutions
- 12.03 Company spending on R&D
- 12.04 University-industry collaboration in R&D
- 12.05 Government procurement of advanced technology products
- 12.06 Availability of scientists and engineers
- 12.07 Utility patents (hard data)
- 1.02 Intellectual property protection[1/2]

## Notes

a The standard formula for converting hard data is the following:

$$6 \times \frac{(\text{country score} - \text{sample minimum})}{(\text{sample maximum} - \text{sample minimum})} + 1$$

The *sample minimum* and *sample maximum* are, respectively, the lowest and highest country scores in the sample of countries covered by the GCI. In some instances, adjustments were made to account for extreme outliers. For those hard data variables for which a higher value indicates a worse outcome (e.g., disease incidence, government debt), we rely on a normalization formula that, in addition to converting the series to a 1-to-7 scale, reverses it, so that 1 and 7 still corresponds to the worst and best possible outcomes, respectively:

$$-6 \times \frac{(\text{country score} - \text{sample minimum})}{(\text{sample maximum} - \text{sample minimum})} + 7$$

b For those groups of variables that contain one or several half-weight variables, country scores for those groups are computed as follows:

$$\frac{(\text{sum of scores on full-weight variables}) + \frac{1}{2} \times (\text{sum of scores on half-weight variables})}{(\text{count of full-weight variables}) + \frac{1}{2} \times (\text{count of half-weight variables})}$$

c As described in the chapter, the weights are the following:

| Weights | Factor-driven stage (%) | Efficiency-driven stage (%) | Innovation-driven stage (%) |
|---|---|---|---|
| Basic requirements | 60 | 40 | 20 |
| Efficiency enhancers | 35 | 50 | 50 |
| Innovation and sophistication factors | 5 | 10 | 30 |

d In order to capture the idea that both high inflation and deflation are detrimental, inflation enters the model in a U-shaped manner as follows: for values of inflation between 0.5 and 2.9 percent, a country receives the highest possible score of 7. Outside this range, scores decrease linearly as they move away from these values.

e The impact of malaria, tuberculosis, and HIV/AIDS on competitiveness depends not only on their respective incidence rates, but also on how costly they are for business. Therefore, in order to estimate the impact of each of the three diseases, we combine its incidence rate with the Survey question on its perceived cost to businesses. To combine these data we first take the ratio of each country's disease incidence rate relative to the highest incidence rate in the whole sample. The inverse of this ratio is then multiplied by each country's score on the related Survey question. This product is then normalized to a 1-to-7 scale. Note that countries with zero reported incidence receive a 7, regardless their scores on the related Survey question.

f The *Competition* subpillar is the weighted average of two components: *Domestic competition* and *Foreign competition*. In both components, the included variables provide an indication of the extent to which competition is distorted. The relative importance of these distortions depends on the relative size of domestic versus foreign competition. This interaction between the domestic market and the foreign market is captured by the way we determine the weights of the two components. Domestic competition is the sum of consumption (C), investment (I), government spending (G), and exports (X), while foreign competition is equal to imports (M). Thus we assign a weight of (C+I+G+X)/(C+I+G+X+M) to *Domestic competition* and a weight of M/(C+I+G+X+M) to *Foreign competition*.

g Variables 6.06 and 6.07 combine to form one single variable.

h The size of the domestic market is constructed by taking the natural log of the sum of the gross domestic product valued at PPP plus the total value (PPP estimates) of imports of goods and services, minus the total value (PPP estimates) of exports of goods and services. Data are then normalized on a 1-to-7 scale. PPP estimates of imports and exports are obtained by taking the product of exports as a percentage of GDP and GDP valued at PPP. The underlying data are reported in the Data Tables section (see tables 10.03, 10.04, and 10.05).

i The size of the foreign market is estimated as the natural log of the total value (PPP estimates) of exports of goods and services, normalized on a 1-to-7 scale. PPP estimates of exports are obtained by taking the product of exports as a percentage of GDP and GDP valued at PPP. The underlying data are reported in the Data Tables.