

Appendix A: Composition of the Growth Competitiveness Index

The Growth Competitiveness Index is composed of three component indexes: the technology index, the public institutions index, and the macroeconomic environment index. These indexes are calculated on the basis of both “hard data” and “Survey data.”

As explained in the chapter, the sample of countries is divided into two groups: the core innovators and the non-core innovators. Core innovators are countries with more than 15 US utility patents registered per million population; non-core innovators are all other countries.

For the core innovators, we place extra emphasis on the role of innovation and technology. The weightings for the core innovators are as follows:

$$\begin{aligned} \text{Growth Competitiveness} \\ \text{Index for core innovators} &= 1/2 \text{ technology index} \\ &+ 1/4 \text{ public institutions index} \\ &+ 1/4 \text{ macroeconomic environment} \\ &\text{index} \end{aligned}$$

For the non-core innovators, we calculate the Growth Competitiveness Index values as a simple average of the three component indexes:

$$\begin{aligned} \text{Growth Competitiveness} \\ \text{Index for non-core} \\ \text{innovators} &= 1/3 \text{ technology index} \\ &+ 1/3 \text{ public institutions index} \\ &+ 1/3 \text{ macroeconomic environment} \\ &\text{index} \end{aligned}$$

Technology index components

The technology index is calculated for the core and non-core innovators as follows:

$$\begin{aligned} \text{technology index for} \\ \text{core innovators} &= 1/2 \text{ innovation subindex} \\ &+ 1/2 \text{ information and communication} \\ &\text{technology subindex} \end{aligned}$$

$$\begin{aligned} \text{technology index for} \\ \text{non-core innovators} &= 1/8 \text{ innovation subindex} \\ &+ 3/8 \text{ technology transfer subindex} \\ &+ 1/2 \text{ information and communication} \\ &\text{technology subindex} \end{aligned}$$

Innovation subindex

$$\begin{aligned} \text{innovation subindex} &= 1/4 \text{ Survey data} \\ &+ 3/4 \text{ hard data} \end{aligned}$$

Innovation Survey questions

- 3.01 What is your country's position in technology relative to world leaders'?
- 3.02 Are companies in your country unable/aggressive in absorbing new technology?
- 3.06 How much do companies in your country spend on R&D relative to other countries?
- 3.07 What is the extent of business collaboration in R&D with local universities?

Innovation hard data

- 3.17 US utility patents granted per million population
- 4.17 Gross tertiary enrollment rate

Technology transfer subindex

$$\begin{aligned} \text{technology transfer} \\ \text{subindex} &= \text{unweighted average of two technology} \\ &\text{transfer Survey questions} \end{aligned}$$

- 3.04 Is foreign direct investment in your country an important source of new technology?
- 3.03 Is foreign technology licensing in your country a common means of acquiring new technology?

Information and communication technology (ICT) subindex

$$\begin{aligned} \text{information and} \\ \text{communication} \\ \text{technology subindex} &= 1/3 \text{ information and communication} \\ &\text{technology Survey data} \\ &+ 2/3 \text{ information and communication} \\ &\text{technology hard data} \end{aligned}$$

Information and communication technology Survey questions

- 3.11 How extensive is Internet access in schools?
- 3.12 Is there sufficient competition among ISPs in your country to ensure high quality, infrequent interruptions and low prices?
- 3.13 Is ICT an overall priority for the government?
- 3.14 Are government programs successful in promoting the use of ICT?
- 3.15 Are laws relating to ICT (electronic commerce, digital signatures, consumer protection) well developed and enforced?

Information and communication technology hard data

- 3.18 Cellular mobile subscribers per 100 inhabitants
- 3.19 Internet users per 10,000 inhabitants
- 3.20 Internet hosts per 10,000 inhabitants
- 5.08 Main telephone lines per 100 inhabitants
- 3.21 Personal computers per 100 inhabitants

(cont'd.)

Appendix A: Composition of the Growth Competitiveness Index (cont'd.)

Public institutions index components

public institutions index = $\frac{1}{2}$ contracts and law subindex
+ $\frac{1}{2}$ corruption subindex

Contracts and law subindex

- 6.01 Is the judiciary in your country independent from political influences of members of government, citizens or firms?
- 6.03 Are financial assets and wealth clearly delineated and well protected by law?
- 6.08 Is your government neutral among bidders when deciding among public contracts?
- 6.16 Does organized crime impose significant costs on business?

Corruption subindex

- 6.19 How commonly are bribes paid in connection with import and export permits?
- 6.20 How commonly are bribes paid when getting connected with public utilities?
- 6.21 How commonly are bribes paid in connection with annual tax payments?

Macroeconomic environment index components

macroeconomic
environment index = $\frac{1}{2}$ macroeconomic stability subindex
+ $\frac{1}{4}$ country credit rating
+ $\frac{1}{4}$ government waste

Macroeconomic stability subindex

macroeconomic
stability subindex = $\frac{5}{7}$ macroeconomic stability hard data
+ $\frac{2}{7}$ macroeconomic stability Survey
data

Macroeconomic stability Survey questions

- 2.01 Is your country's economy likely to be in a recession next year?
- 2.07 Has obtaining credit for your company become easier or more difficult over the past year?

Macroeconomic stability hard data

- 2.13 Government surplus/deficit
- 2.14 National savings rate
- 2.16 Inflation
- 2.15 Real effective exchange rate
- 2.17 Lending–borrowing interest rate spread
- 2.20 Government debt

2.21 Institutional Investor country credit rating

Government waste variable

- 6.06 Is the composition of public spending in your country wasteful, or does it provide necessary goods and services not provided by the market?