The Contribution of Published Sustainability Indexes to the Construction of Practical Useful Metrics for Comparing Strengths and Weaknesses for Achieving Sustainability Among Countries

By

Efthymios Nikolopoulos
MSc in Accounting and Finance
London School of Economics, 2005

SUBMITTED TO THE MIT SLOAN SCHOOL OF MANAGEMENT
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE IN MANAGEMENT STUDIES
AT THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

JUNE 2014

Signature redacted

Signature of Author: _____
MIT Sloan School of Management
May 9, 2014

Signature redacted

Certified By: _____
Nicholas Ashford
Professor of Technology and Policy, School of Engineering, MIT
Thesis Supervisor

Signature redacted

Read By: _____
Ralph Hall
Assistant Professor, School of Public and International Affairs, Virginia Tech
Thesis Reader

Signature redacted

Accepted By: _____
Michael A. Cusumano
SMR Distinguished Professor of Management
Program Director, M.S. in Management Studies Program
MIT Sloan School of Management

The Contribution of Published Sustainability Indexes to the Construction of Practical Useful Metrics for Comparing Strengths and Weaknesses for Achieving Sustainability Among Countries

By

Efthymios Nikolopoulos

Submitted to the MIT Sloan School of Management on May 9, 2014 in partial fulfillment of the requirements for the degree of Master of Science in Management Studies

ABSTRACT

The thesis focuses on the evaluation of available national sustainability indexes, which measure and compare the performance of countries on various elements of sustainability. The first part presents an overview of the methodology used in existing published sustainability indexes. In addition, the elements that comprise an "ideal" multi-faceted index of sustainability are identified and comparisons with the existing indexes are made. In addition, the importance of two enablers is highlighted: The Potential for Innovation, and Ethical Concerns and Governance, which affect the long-term performance of all elements of sustainable development. In addition, results from a review of components of the main categories of the index and scores for illustrative countries are presented. Finally a series of potential improvements to the existing Key Performance Indicators (KPIs) are presented in addition to proposals for future research in order to further improve the proposed sustainability index.

Thesis Supervisor: Nicholas Ashford
Title: Professor of Technology and Policy, School of Engineering, MIT

ACKNOWLEDGMENTS

I would like to thank everyone who helped me during this year.

Particularly, I would like to express my gratitude to both my supervisor Professor Ashford and my reader Professor Hall for their guidance, advice and encouragement who have given to me during my work on this thesis.

Furthermore, I would like to thank Professor Cusumano, Mr. Chanh Phan and Mrs. Julia Sargeaunt because their advice and help were crucial for my success during this year.

In addition I would like to thank both George and Marie Vergottis Foundation and the MIT Office of the Dean for the Graduate Education for the honor to offer me the George and Marie Vergottis Fellowship. Without this financial assistance it would not have been possible to study at MIT Sloan School of Management.

Moreover, I would like to particularly thank Professor Serafeim for his help and support. Without his encouragement many of my achievements would have been impossible.

Also, I would like to thank all my friends and classmates for all their support.

Last, and by no means least, I would like to thank my parents and my brothers because nothing of what I have achieved all these years would have been possible without their help, love and support.

Table of Contents

1. Introduction

1.1 Sustainable Development definition

The concept of sustainable development was defined in the beginning of 1990s; however initial discussions of sustainable development "principles" can be identified from the 1960s. Until then the prevailing opinion was that economic growth gains would outweigh any potential environmental or health costs (Ashford and Hall 2011). Carson (1962) produced the first study to identify potential dangers from the use of the pesticide DDT, which was being used by chemical companies and industrial agriculture. During subsequent years, as a result of increased public concern (Hardin, 1968) and environmental disasters (Santa Barbara oil spill and the oil fire on the Cuyahoga River), the US government passed laws for environmental, health and safety regulations (National Environmental Policy Act - NEPA). In 1972, during the UN Human Environment Conference, it was recognized for first time that an environmental policy should be established at a national level. During the 1980s developing countries started facing a paradox since: the desired economic growth they desired would damage the environment on which they relied (UNEP 1982c, Ashford and Hall 2011). This contradiction led to the concept of sustainable development – i.e., that economic growth and environmental protection can advance in unison.

There are many definitions for the meaning of sustainability and sustainable development. An interesting approach is the definition of Solow (1993) who states that sustainable development "is an obligation to conduct ourselves so that we leave to the future the option or the capacity to be as well off as we are". Moreover, important is the definition of Pronk and ul Haq (1992): "Economic Growth that provides fairness and opportunity for all the world's people, not just the privileged few, without further destroying the world's finite natural resources and carrying

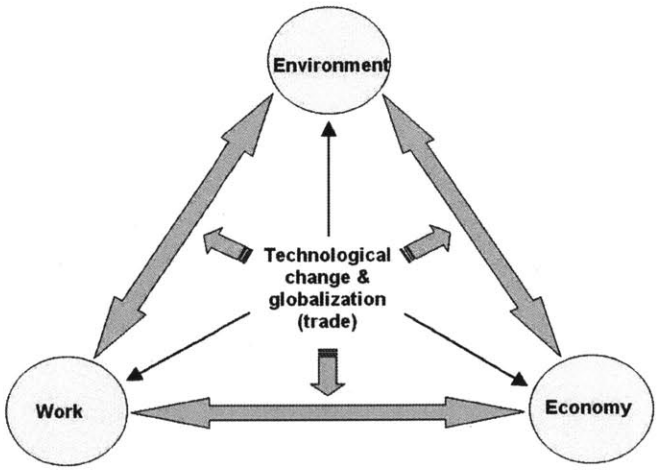
capacity". The most widely accepted definition was the one of World Commission on Environment and Development (1987, p.43): "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: a) the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and b) the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs".

It is important to identify the main social and environmental challenges that are often associated with the unsustainable industrial state (Ashford and Hall 2011). The first challenge is related with the need to provide society with adequate and essential high-quality goods and services (e.g., food, health, security, etc). The second challenge refers to the ecosystem integrity and the loss of biodiversity and the indirect effects these have on human health and well-being (Carson 1962, Solomon and Schettler 1999, Ashford and Hall 2011).The third challenge refers to the resource depletion and thc world's finite resources and energy supplies and asks the question of whether there are sufficient resources to fuel the economy in its current form (Ayres 1978, Meadows, Meadows, et al. 1972, Ashford and Hall 2011). The fourth challenge refers to the toxic pollution and on the impact that has directly on human health and on the health of other species (Ashford and Miller 1998, Baskin, Himes et al. 2001, Mc Cally 1999). The fifth challenge refers to the climate change as a result of the greenhouse gases from anthropocentric sources (International Climate Change Task Force 2005; Schmidheiny 1992). The last four challenges have consequences for environmental justice (Ashford and Hall 2011). Toxic pollution and climate change are of economic and social concern associated with employment, wages and economic inequality. It should be stated that the burden of the environmental

problems are felt unequally among nations and generations leading to concerns regarding the effectiveness of the international sustainable policy agendas and efforts. Finally additional challenges relate to meaningful employment with adequate purchasing power and to maldistributions of wealth and income.

1.2 Current vs. sustainable policy agendas

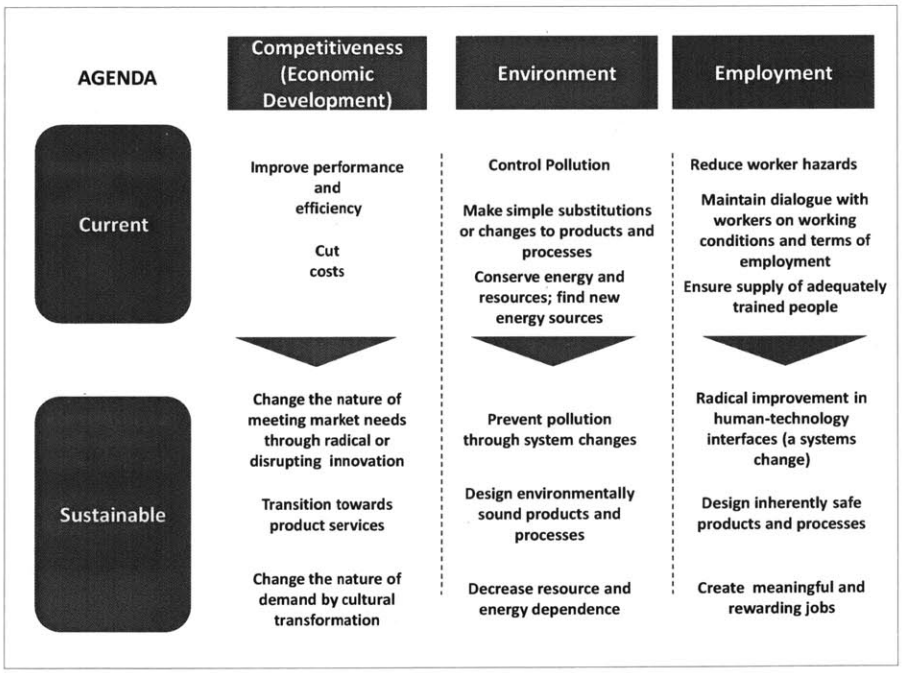
Although often sustainable development is being based on the three economic, environment and social pillars, Ashford and Hall (2011) argue that the competitiveness, the environment and employment are the operationally important dimensions of sustainability (Figure 1). Moreover they argue that these three dimensions drive sustainable development and could result in avoiding tradeoffs (e.g., between environmental improvements and jobs) which could be the case if an environmental approach alone was implemented. Finally, they highlight the importance of technological change and globalization (trade) as drivers of change within and between the three sustainability dimensions.



Source: Ashford and Hall 2011

Figure 1: Technological change and globalization as drivers of change within and between three operationally-important dimensions of Sustainability

Furthermore, it is important to compare the current agendas vs. the sustainable policy agendas which should be adopted as a policy design by the governments. The current agendas, as illustrated also in Figure 2, could be considered as: a) improve profit and market share by improving efficiency in current technologies or cutting costs, b) control pollution, make simple substitutions to products and find new energy sources, c) ensure an adequate supply of skilled labor and provide healthier workplaces. These strategies are not proactive vis-a-vis technological change and are usually not coordinated and certainly not integrated (Ashford and Hall 2011). However, in order to improve the current situation it is necessary to adopt a sustainable agenda which will focus on: a) technological changes which will change the way goods and services are provided, b) decreased use of energy and prevention of pollution through system changes, c) development of sociotechnical systems that enhance the meaningful and rewarding employment through integration (and not coordination) of policy design and implementation (Ashford and Hall 2011).

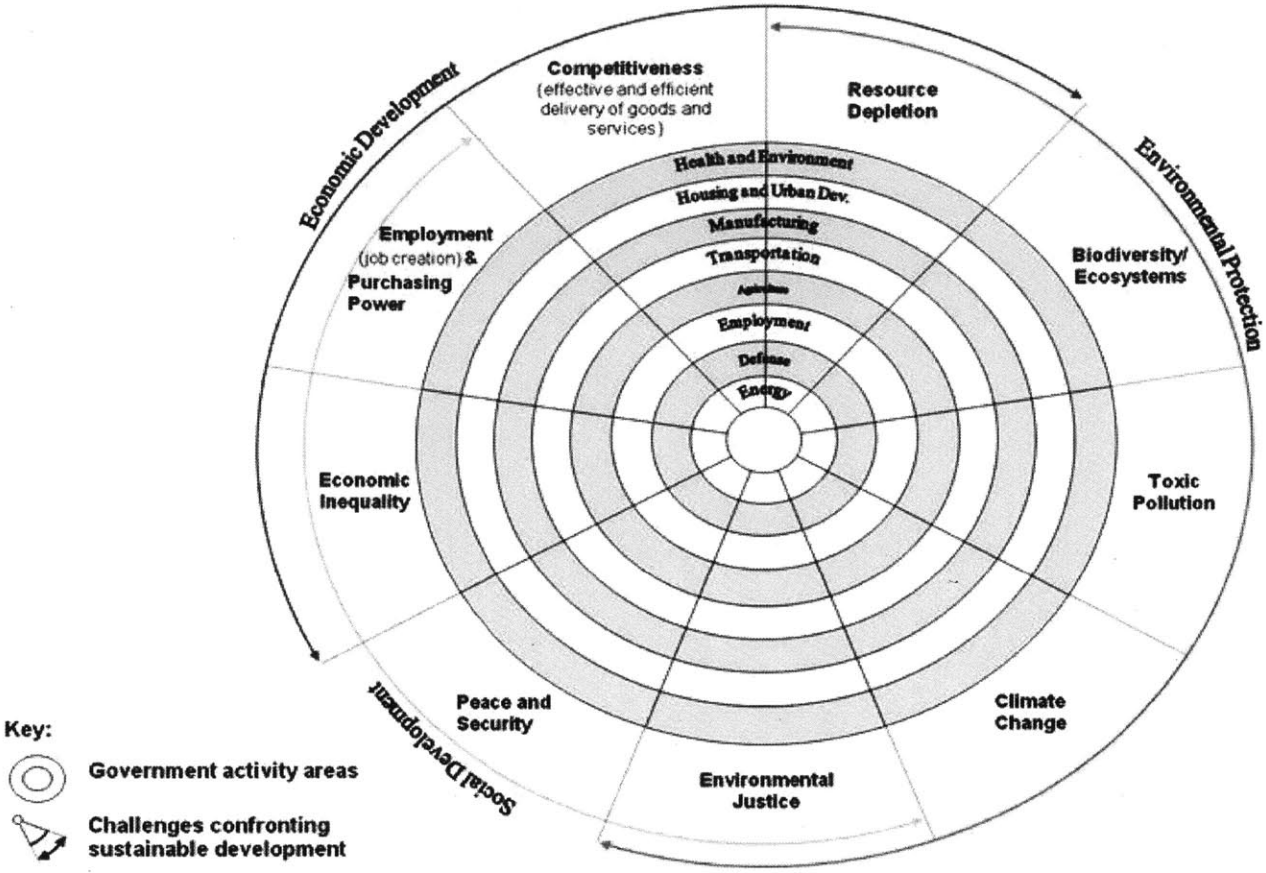


Source: Ashford and Hall 2011

Figure 2: Comparison of current and sustainable policy agendas

1.3 Government activity areas confronting sustainable development

The approach of Ashford and Hall (2011) provides a comprehensive framework (Figure 3) identifying the challenges – environmental protection, social development and economic development – confronting sustainable development. The main challenges confronting sustainable development according to Ashford and Hall (2011) are: Resource Depletion, Biodiversity, Toxic pollution, Climate change, Environmental Justice, Peace and Security, Economic Inequality Employment and Purchasing Power and Competitiveness. The arrows around the circle represent the challenges related to environmental protection, social development and economic development. The need for integrated decision making is also illustrated uniquely by the inclusion of the several US federal activity government areas in the framework of the major challenges for sustainable development. It is critical to identify that there is no hierarchy to the activity areas shown (the role of all government authorities is crucial). The framework of Ashford and Hall (2011) illustrates that single-purpose policies (e.g., only for climate change) will be ineffective since they have the risk of further worsening the problems in other areas. Thus the integration of the government decision making to address environmental, social and economic problems is required in order to move towards sustainable development. Rodrik (2007) argues that challenges for economic and social development require nations to engage in a process of "self discovery". Sustainability indexes could enhance that discovery processes if properly constructed.



Source: Ashford and Hall 2011

Figure 3: Government activity areas and challenges confronting sustainable development

2. Indexes of Sustainable Development

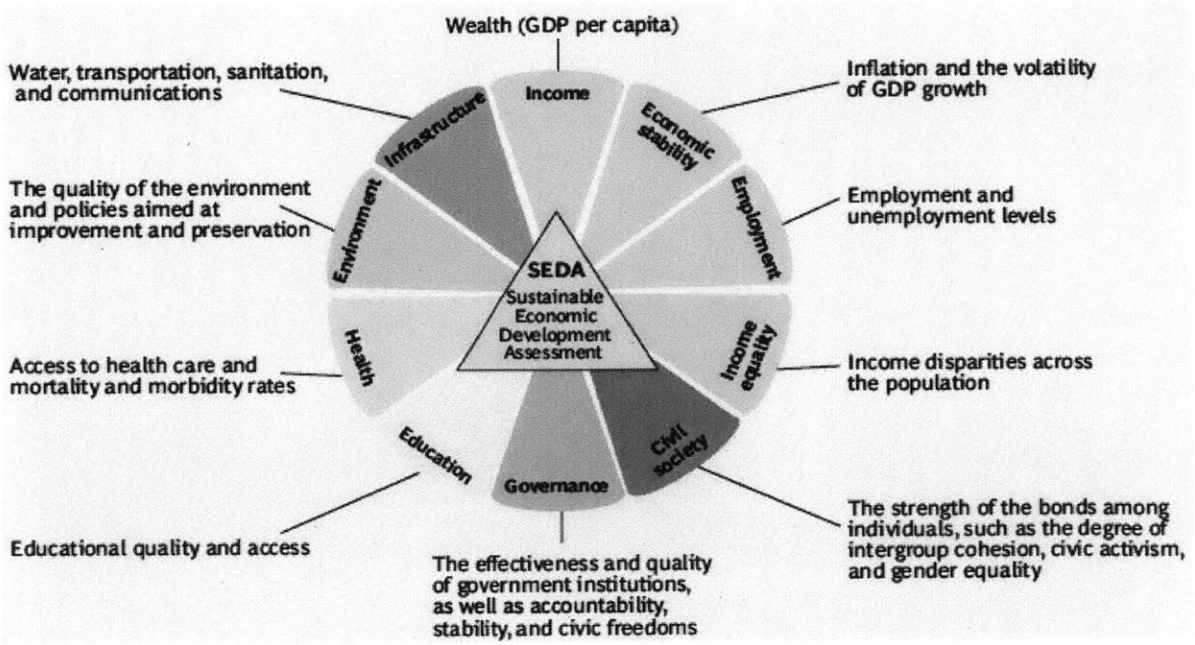
2.1 Overview

The indicators of sustainability should be developed in order to take into account the concerns of environmental protection, economic and social development and at the same time to provide to government officials a tool for policy choices and policy design. According to Cash et al. (2003), there are three criteria that need to be met (Holden 2013): a) Salience (do the indicators refer to the questions deemed relevant by the policy actor and adequately assess the policy stakes?), b) Credibility (do policy actors view the indicators as robust?) and c) Legitimacy (are the indicators configured with procedural fairness to meet political, societal and ethical standards?).Furthermore an interesting approach regarding main principles of how to measure and assess progress toward sustainable development is the one provided by the International Institute for Sustainable Development (IISD) (Hardi and Zdan 1997), known as Bellagio principles. The main areas of the Bellagio principles are: 1) Guiding vision and Goals, 2) Holistic Perspective, 3)Essential elements, 4) Adequate scope, 5) Practical focus, 6) Openness, 7) Effective communication, 8) Broad Participation, 9) Ongoing assessment and 10) Institutional Capacity. Having identified the importance of integrated government decision making, it is important to examine the available sustainable development indexes (or other main indexes including characteristics of sustainable development) which are the main tools in order to provide awareness to the people and thorough information to the government authorities in order to design a successful policy.

2.2 BCG Sustainable Economic Development Assessment (SEDA)

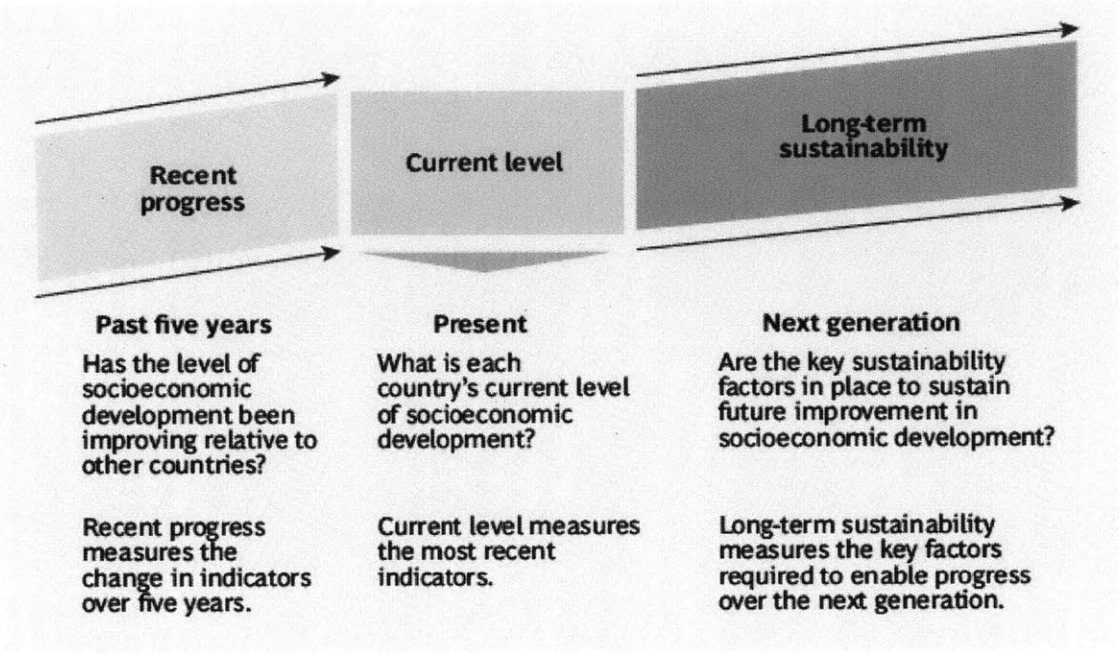
The Boston Consulting Group (BCG) launched its version of the BCG **Sustainable Economic Development Assessment (SEDA)** Framework in 2012 (Beal, Rueda-Sabater, et al. 2012) in

order to support them while providing advices to governments on successful long-term development strategies. SEDA, according to BCG, is an approach (Figure 4) to systematically assess and compare the socio-economic development or level of well-being in 150 nations. SEDA has also a time element (Figure 5) in order to identify the performance during the last five years (Recent Progress), the current performance (Current level) and also identify which nations are much better positioned in order to sustain their progress in their future (Long-term Sustainability). The initial version of the framework had 10 dimensions (Income, Economic Stability, Employment, Income Equality, Civil Society, Governance, Education, Health, Environment and Infrastructure) and 51 different indicators used in total (either for recent progress, current or long-term sustainability assessment), while 40 of them were used for the construction of the current level index. In 2014, BCG published an updated report (Beal and Rueda-Sabater, 2014) and increased the total number of indicators to 54 and respectively to 40 the indicators of the current level index.



Source: Beal, Rueda-Sabater, et al. (2012).

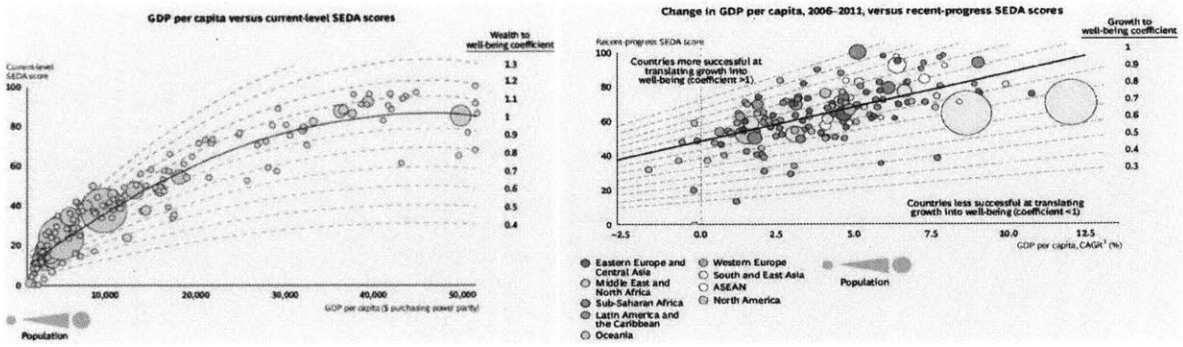
Figure 4: BCG Sustainable Economic Development Assessment Framework



Source: Beal, Rueda-Sabater, et al. (2012).

Figure 5: SEDA Assesses Development across Three Time Horizons

An interesting approach of BCG is the calculation of both the wealth to well-being coefficient (country's current level SEDA score with the score it would be expected given its per capita GDP) and the growth to well-being coefficient (country's recent progress SEDA score with the score that would be expected given the per capita GDP growth rate) (Figure 6). According to SEDA findings countries with the highest GDP are not necessarily the best in converting their wealth to well-being for their citizens. Also other countries (e.g., developing) are more successful in translating the recent GDP growth of the last years to increased well-being for their citizens (as measured by SEDA score).



Source: Beal, Rueda-Sabater, et al. (2012).

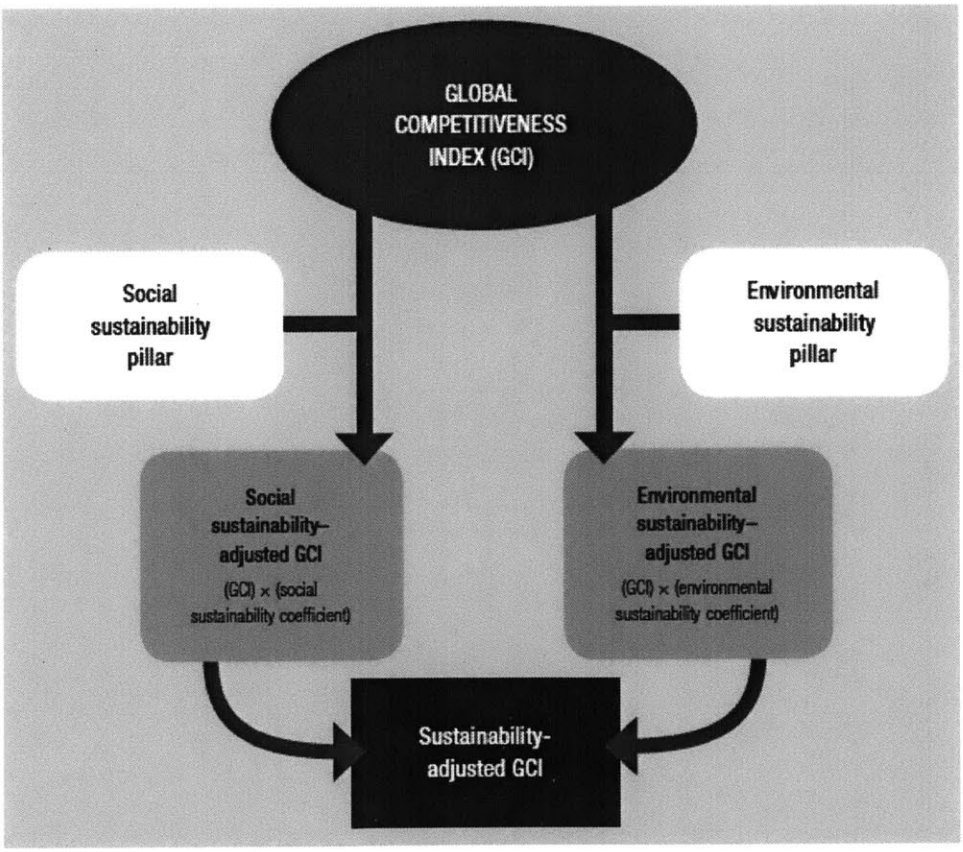
Figure 6: Wealth to well-being and Growth to well-being coefficients

2.3 Sustainability Adjusted Global Competitiveness Index

The World Economic Forum has created a framework which aims to create a "common ground to develop policies that balance economic prosperity with social inclusion and environmental stewardship" (World Economic Forum 2013, p. 61). The framework is based on the **Global Competitiveness Index** (Appendix- Figure A1) and is adjusted by social and environmental factors. The Global Competitiveness Index is based on 12 main pillars (Institutions, Infrastructure, Macroeconomic Environment, Health and Basic Education, Higher Education and Training, Goods Market Efficiency, Labor Market Efficiency, Financial Market Development, Technological Readiness, Market Size, Business Sophistication and Innovation) and covers 148 countries.

The **sustainability adjusted Global Competitiveness Index** is derived after the calculation of Social and Environmental pillars which are used as adjustment coefficients with a range from 0.8 to 1.2 (Figure 7). The adjusted index covers 121 countries (less than the 148 of GCI due to data

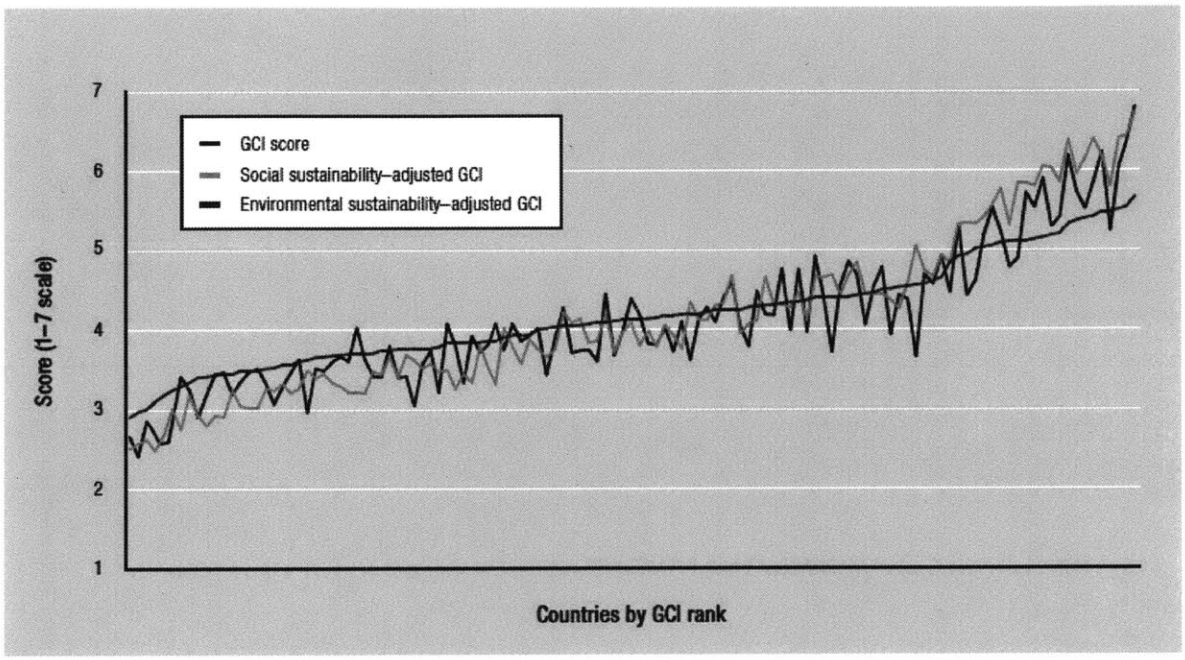
limitations) and uses 19 extra indicators (Appendix- Figure A2). Social pillar based on 9 indicators and Environmental pillar based on 10 indicators). The World Economic Forum provides scores and rankings for each pillar (social and environmental) and for total sustainability adjusted global competitiveness index in order for stakeholders to identify the area/reasons of over/underperformance.



Source: World Economic Forum (2013).

Figure 7: Sustainability Adjusted Global Competitiveness Index

Due to its methodological approach, the sustainability adjusted Global Competitiveness Index has competitiveness as its main assessment criteria (Figure 8). Thus, by definition the weights of competitiveness, social and environmental pillars are not equal which results in favoring countries with overperformance in the area of competitiveness.



Source: World Economic Forum (2013).

Figure 8: Country performance on the Global Competitiveness Index (GCI) and the components of the sustainability-adjusted GCI

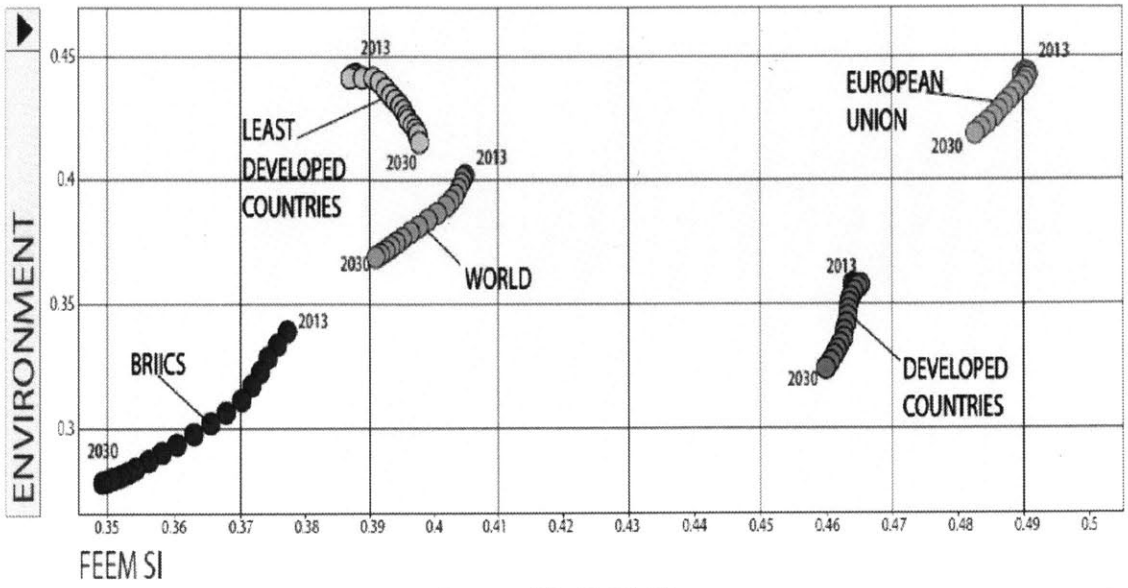
2.4 FEEM Sustainability Index Approach

Fondazione Eni Enrico Mattei (FEEM) has created the **FEEM sustainability index** in order to provide an indication of the sustainability of social, environmental and economic development. The index is comprised (Figure 9) by 23 indicators related to Economic (Growth drivers, Exposure, GDP p.c.), Society (Well Being, Transparency, Vulnerability) and Environmental (Pressure, Natural Endowment, Energy and Resources) dimensions. The weights per each

element are derived based on a questionnaire (participating experts, stakeholders and decision makers) that elicits individual preferences on the specific performance of each sustainability indicator and their coalitions. However, what is unique is that it is based on a methodology that takes into account the weighted average; in accordance with the incoherence index of each respondent's preferences. Thus, the more a respondent turns out to be incoherent in a particular node the less his preferences will be weighted with respect to the others (Eboli 2013). Based on this approach the weights for the three main pillars are determined to be: Society 0.386, Environment 0.357 and Economy 0.257.The Sustainability index of FEEM in addition to the current state of sustainable development, also has a projection (until 2030) per country about the future development (Figure 10). The scenario building of the projection is based on both exogenous (e.g., GDP, public debt, population, energy prices, water availability, etc.) and endogenous (e.g., R&D, investment, energy access/efficiency, water use, emissions, etc.) factors.

Source: Eboli (2013).

Figure 9: FEEM Sustainability Index Structure



Source: Eboli (2013).

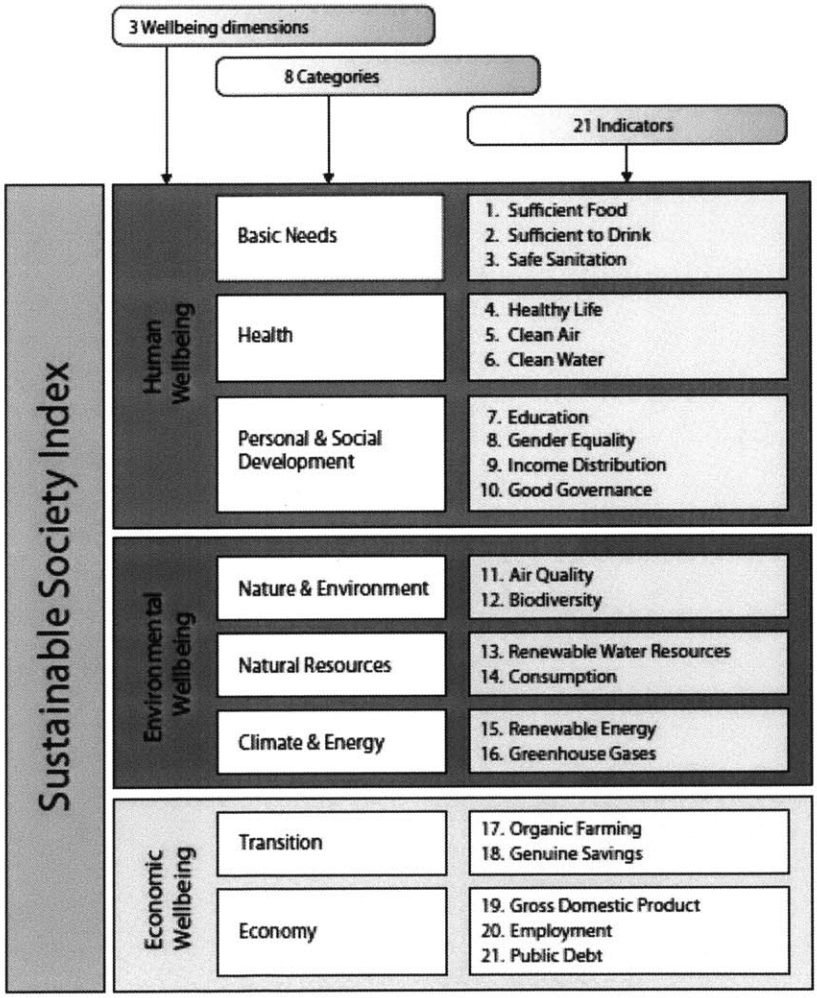
Figure 10: FEEM Reference Scenario

Although the approach of FEEM is innovative (both in terms of weights and scenario building); it should be emphasized that the focus of the projections should not be on its accuracy but rather on the awareness that can be achieved through the process of making the estimations. Also, as in all similar cases, the validity of the weights is dependent on the preferences of the evaluators. Furthermore, the methodology used might also result in further discounting the value of the opinion of outliers, thus taking even less into account the different opinions.

2.5 Sustainable Society index- SSI

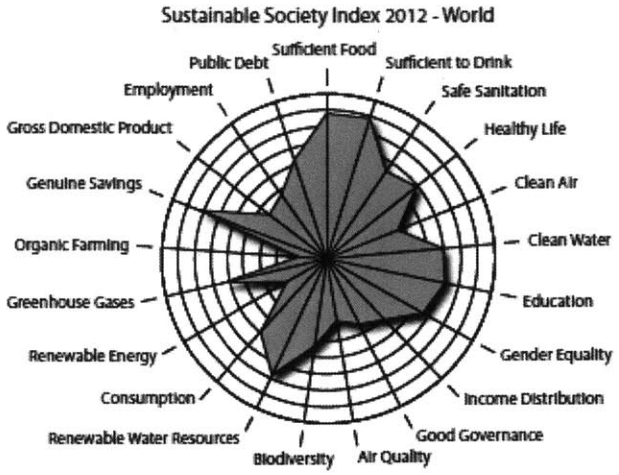
The Sustainable Society Index (SSI) was launched in 2006 and indicates whether the world is becoming more sustainable using three dimensions: human wellbeing, environmental well-being and economic well-being. The SSI comprises of 21 indicators (Figure 11) and has results for 151 countries. SSI does not use the arithmetic average; instead it uses the geometric average (in order to reduce the compensation of low scores in one indicator with high scores in another one).

Furthermore, SSI provides a world SSI Score (Figure 12), which is weighted for population size. Finally, it should be noted that according to SSI "More emphasis should be given to the scores of the three wellbeing dimensions than to the overall score SSI" (Van de Kerk and Manuel 2012, p.22).



Source: Van de Kerk and Manuel (2012).

Figure 11: Sustainable Society index (SSI) Framework

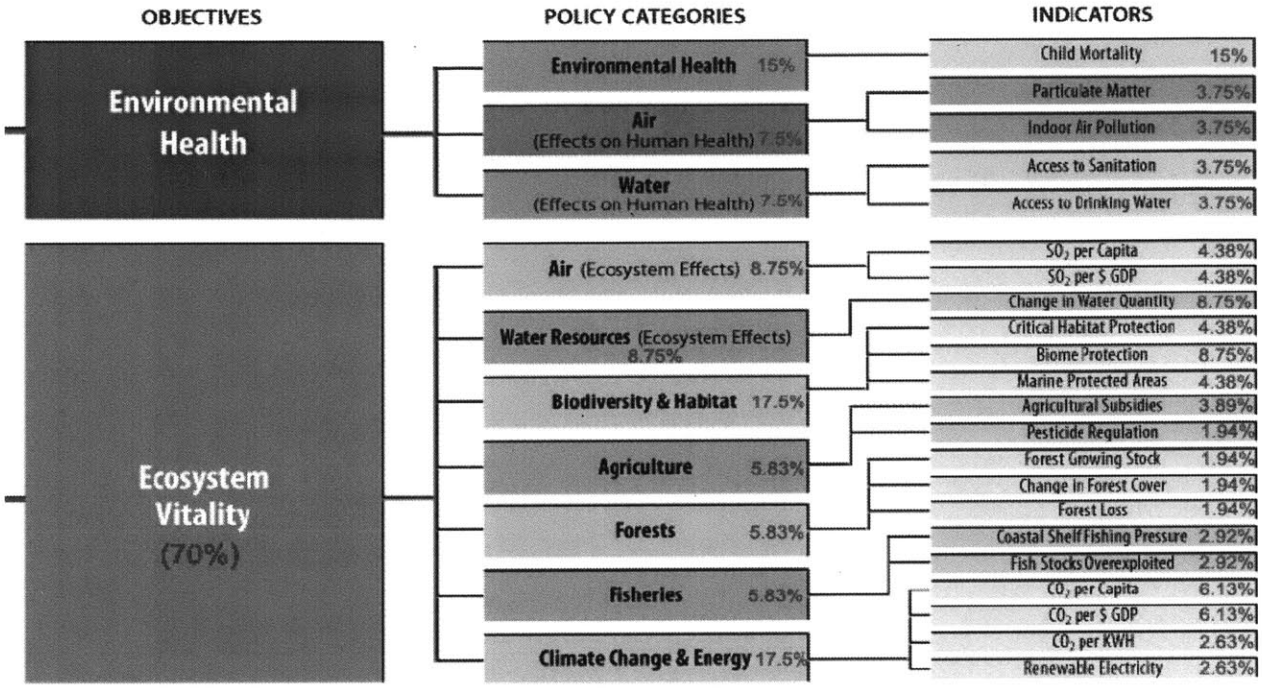


Source: Van de Kerk and Manuel (2012).

Figure 12: Sustainable Society index 2012- World Results

2.6 Environmental Performance Index (EPI)

The Environmental Performance Index (EPI) provides a way to assess the global community's performance over time with respect to established environmental policy goals. The EPI ranks 132 countries and uses ten policy categories: Environmental Health, Water, Air pollution (effects on human health, Air pollution (ecosystem effects), Water Resources (ecosystem effects), Biodiversity and Habitat, Forests, Fisheries, Agriculture and Climate change. In order to construct the results for these categories, 22 performance indicators are being used (Figure 13). In the latest version of EPI it was introduced also the **Pilot Trend Environmental Performance Index (Trend EPI)** which ranks countries on the change in their environmental performance of the last decade (EPI 2012). The Trend EPI illustrates which countries are improving their performance over time and thus makes it feasible to correlate these results with the efficacy of the government policies the respective years.



Source: EPI (2012).

Figure 13: 2012 Environmental Performance Index Framework

The Environmental Performance Index, in contrast with the previously discussed indexes, is focusing only on the environment element and does not take into account all the elements of sustainable development. Thus, although it cannot be used alone in order to measure the sustainable growth development of a country, it provides an adequate framework regarding the environmental performance.

2.7 EIRIS Country Sustainability Ratings

EIRIS is a private company, provider of research into corporate environmental, social and governance performance areas. **EIRIS Country Sustainability Ratings** cover 75 countries and provide an assessment of how well countries are addressing the various environmental, social and governance (ESG) risks they face. The target of the ratings is to enable investors to integrate

ESG issues into sovereign fixed income investments. EIRIS does not publish its rankings but sells data/ad-hock indexes to its clients. The bases of the Sustainability rankings are Environmental, Social, Governance and Ethical Screens indicators (Figure 14). The main reason that EIRIS is being included into the current review (since the Country Sustainability Rankings are not available publicly) is the fact that EIRIS highlights the ethical screens as an important element of the sustainability ratings (which is not a clear element of the other indexes examined). Furthermore, what is interesting is that EIRIS provides, according to the publicly available information, normalized data to each country's GDP in order to avoid 'rich country bias'.

Environmental	Social	Governance	Ethical screens
Biodiversity	Bribery and corruption	Bribery and corruption	Death penalty
Climate change	Civil liberties	Government effectiveness	Military expenditure
CO2 emissions (per capita and per GDP)	Child labour	Political rights	Nuclear power consumption
Deforestation	Child mortality	Political stability	Nuclear weapons
Environmental protection	Gender inequality	Rule of law	Overseas development aid
Endangered species	Health expenditure		Religious freedom
Fishing	Human Development Index		Financial secrecy
Fertilizer use	Human Rights		
Nuclear energy	Income distribution		
Pollution	Labour standards		
Recycling	Sanitation		
Waste	Unemployment		
Water (usage and quality)			
Plus ratification of relevant conventions and treaties across a broad range of ESG issues			

Source: EIRIS Country Sustainability Ratings (2012).

Figure 14: Examples of ESG and ethical indicators used to generate EIRIS Country Sustainability Ratings

2.8 Human Development Index

The **Human Development Index (HDI)** is a composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living (Human Development Report, 2013). The proxies used for these areas are life expectancy at birth, the men years of schooling, the expected years of schooling and the Gross

National Income per capita (Figure 15). Due to the fact that the Human Development Index uses only few indicators, it manages to cover 186 countries. The HDI is a simple index which provides limited information regarding government policies, when used independently, but is an important tool for global awareness in terms of progress in main areas of human development.

Region and HDI group	HDI	Life expectancy at birth (years)	Mean years of schooling (years)	Expected years of schooling (years)	Gross national income per capita (2005 PPP $)
Region					
Arab States	0.652	71.0	6.0	10.6	8,317
East Asia and the Pacific	0.683	72.7	7.2	11.8	6,874
Europe and Central Asia	0.771	71.5	10.4	13.7	12,243
Latin America and the Caribbean	0.741	74.7	7.8	13.7	10,300
South Asia	0.558	66.2	4.7	10.2	3,343
Sub-Saharan Africa	0.475	54.9	4.7	9.3	2,010
HDI group					
Very high human development	0.905	80.1	11.5	16.3	33,391
High human development	0.758	73.4	8.8	13.9	11,501
Medium human development	0.640	69.9	6.3	11.4	5,428
Low human development	0.466	59.1	4.2	8.5	1,633
World	0.694	70.1	7.5	11.6	10,184

Note: Data are weighted by population and calculated based on HDI values for 187 countries. PPP is purchasing power parity.
Source: HDRO calculations. See statistical table 1 for detailed data sources.

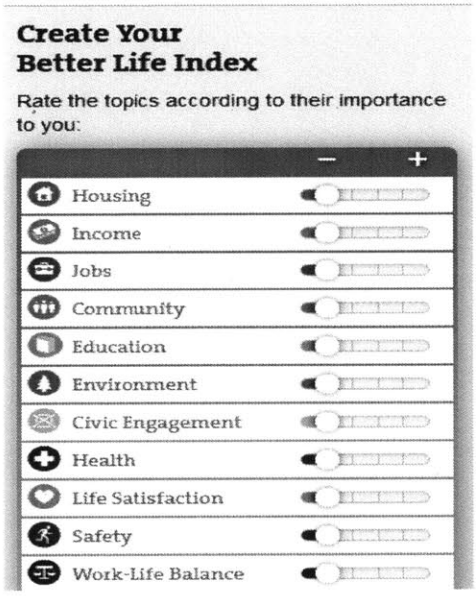
Source: Human Development Report (2013).

Figure 15: HDI and components, by region and HDI group, 2012

2.9 OECD Better Life Index

The OECD Better Life Index Tool has eleven dimensions (Health, Work-Life Balance, Education and Skills, Social Connections, Civil Engagement and Governance, Environmental Quality, Personal Security, Subjective Well-Being, Income and Wealth, Jobs and Housing) and covers 36 countries. Better Life Index is an interactive online tool (Figure 16) that allows you to the user to see how countries perform on topics that shape a better life. In contrast with the previous sustainability indexes, there is no aggregate index across 11 dimensions. Through the

online interactive tool every user can select the importance that he puts in each dimension and thus can obtain the ranking based on his personal preferences. The OECD asks the user to submit his country and his gender and collects the preferences in order to be possible in the future to build up a picture of what the citizens from across the world believe that shapes a good life.



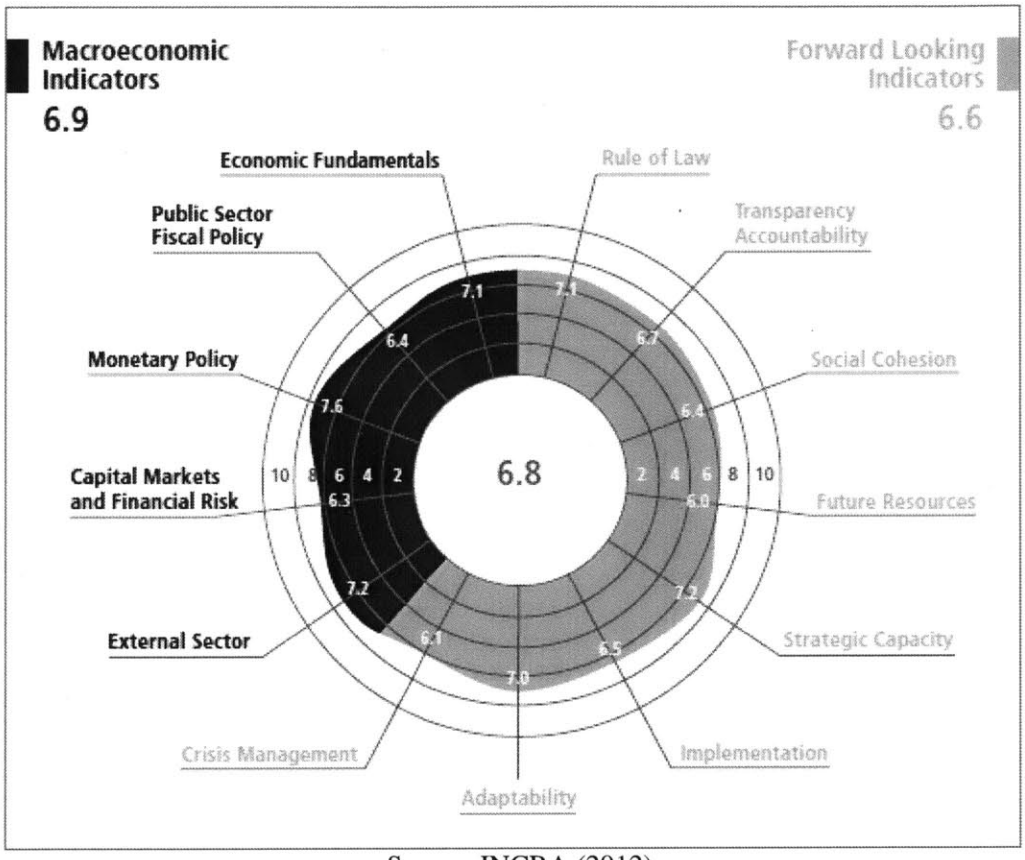
Source: http://www.oecdbetterlifeindex.org

Figure 16: Better Life Index Tool

2.10 INCRA Country Ratings

INCRA is an **International Non-Profit Credit Rating Agency** for sovereign risk. INCRA has as a target "to produce sovereign ratings that are based on a comprehensive set of macroeconomic indicators, which are quantitative by nature, as well as Forward Looking Indicators (FLIs), which mirror the socioeconomic developments within a country and are qualitative" (INCRA 2012, p.5). The INCRA (2012) report covers 5 countries (Brazil, France, Germany, Italy and Japan). The importance of INCRA and the reason for the inclusion in the current review of sustainability indexes is the fact that it is the first credit rating index that

includes, besides the typical financial KPIs, also socioeconomic indicators (Figure 17). The inclusion of socioeconomic indicators is a significant step towards the adoption of Sustainable Development indicators/indexes as main tools of monitoring progress of national development.



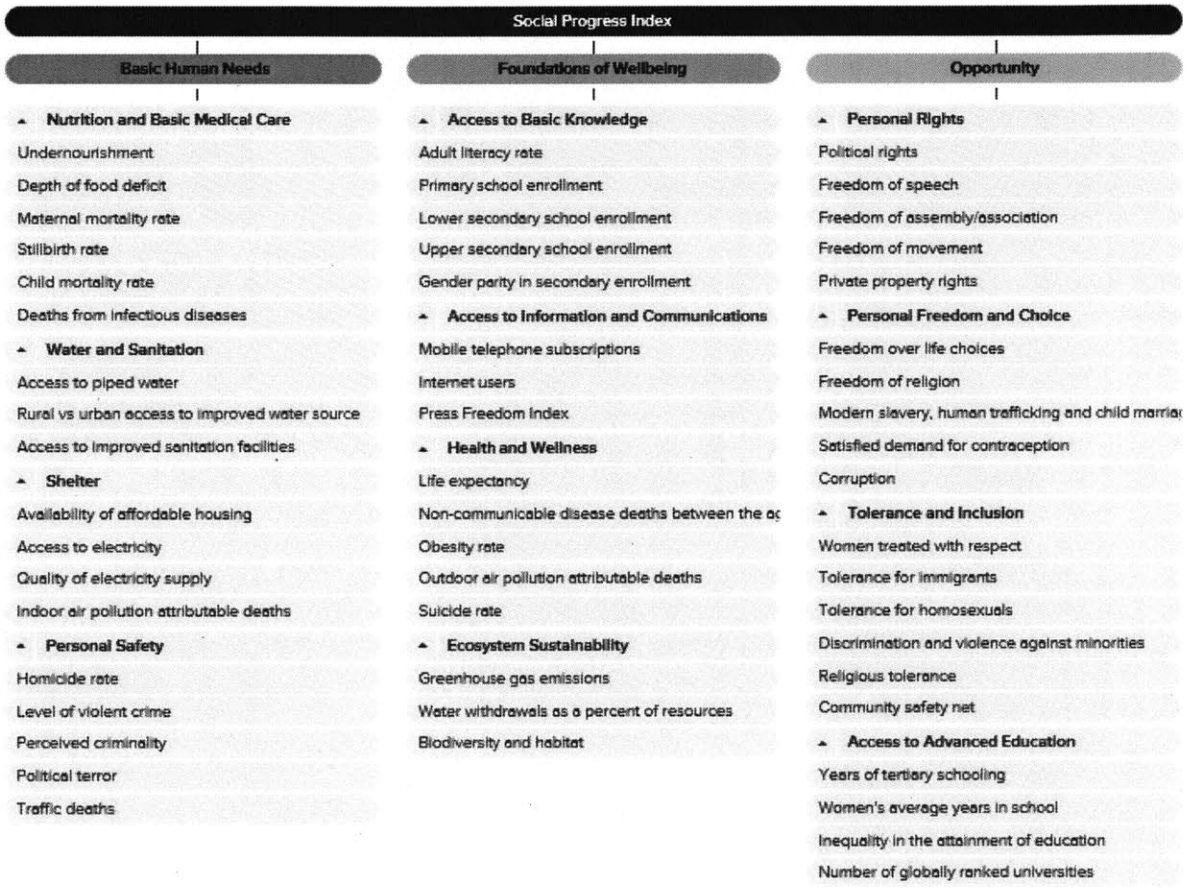
Source: INCRA (2012).

Figure 17: INCRA Country Rating Example

2.11 Social Progress Index

The Social Progress Index has as target to identify the dimensions of social and environmental performance of societies. The Framework (Figure 18) of Social Progress Index focuses on three main questions: a) Does a country provide for its people's most essential needs? b) Are the building blocks in place for individuals and communities to enhance and sustain wellbeing? c) Is there opportunity for all individuals to reach their full potential? In order to increase transparency

and replication, the Social Progress Index assessment covers 134 countries and utilizes only publicly available indicators which are offered free to the public. Social progress index is the most recent attempt to measure the social and environmental performance of societies and was created by Michael Porter[1].



Source:www.socialprogressimperative.org

Figure 18: Social Progress Index Structure

2.12 Happy Planet Index (HPI)

"**The Happy Planet Index (HPI)** is an efficiency measure which captures the degree to which long and happy lives are achieved per unit of environmental impact" (Happy Planet Index 2012,

[1]http://www.nytimes.com/2014/04/03/opinion/were-not-no-1-were-not-no-1.html?emc=eta1

p. 19). The latest report was published in 2012 (the third time the index has been published) and ranks 151 countries. As illustrated in Figure 19, the calculation of HPI is based on life expectancy, experienced well-being and ecological footprint. The life expectancy data refer to the number of years an infant is expected to live. The experienced well-being data are derived from responses to the ladder of life question in the Gallup World Poll: "Please imagine a ladder with steps numbered from zero at the bottom to 10 at the top. Suppose we say that the top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time, assuming that the higher the step the better you feel about your life, and the lower the step the worse you feel about it? Which step comes closest to the way you feel?" (Happy Planet Index 2012, p. 19). Finally for the ecological footprint are used data from the 2011 Edition of the Global Footprint Networks National Footprint accounts (Happy Planet Index 2012). It should be stated that the calculation of the HPI formula takes place in two stages in order to assure that the higher variation of Ecological Footprint does not dominate the entire index (also statistical adjustments are applied to moderate the degree of variation in the individual components) (Happy Planet Index 2012).

$$\text{Happy Planet Index} = \frac{\text{Experienced well-being x Life expectancy}}{\text{Ecological Footprint}}$$

Source: Happy Planet Index (2012).

Figure 19: Happy Planet Index Calculation Approach

3. Proposed framework for a sustainability index

The previous review of several national indexes of sustainability reveals a wide range of approaches for measuring sustainable development. Furthermore, although many of them have innovative approaches, at the same time they face significant limitations in providing insights that adequately cover all the areas that affect sustainable development. A new framework will be presented in this section that is adapted from the Ashford and Hall (2011). The framework is designed to better measuring progress towards a more sustainable development.

3.1 New Framework for Sustainable Development[2]

The proposed framework (Figure 20) identifies three main pillars (Environmental Protection, Employment and Other Social Concerns and Economic Development) and two main enablers (Ethical Concerns and Governance and Potential for innovation) as crucial factors in order to assess the current state of sustainable development. The three pillars are comprised of 12 main categories and all of them are interconnected; thus, the performance in one category of each pillar could affect directly or indirectly, positively or negatively, the performance (usually in the medium-long term) of one of the other categories (e.g., an increase in the purchasing power could result to increased resource depletion or toxic pollution).

The performance of the enablers (Potential for innovation or Ethical concerns and governance) affects the medium-long term performance of all categories and this is the reason that these should not be handled as separate categories in the pillars, but instead considered as crucial determinants of both the current and future state of sustainable development. The observations of Acemoglu and Robinson (2012) that "extractive" economics that unfairly exploit labor and/or the

[2] The reader, if he/she prefers can first review the analysis of the several investigated indexes in section 3.2 which follows

environment do not succeed to have strong economic growth partly inspired the choice of these enablers. In a nutshell, unfair nations will suffer on economic deficit.

A total sustainable development score at a national level is not provided because for each country the importance of each category might be different (taking into account the different country characteristics). Thus, an analysis per country is required in order to identify the importance of each category. Although in terms of public awareness it is useful to have a total score/ranking, this is out of scope in the current thesis. However an illustrative weighting according to author's opinion is provided for the indicators in order to assess the performance of each country and obtain rankings per category. The weighting is a rough approximation which according to the author's judgment is not far afield from what experts might accept. No attempt to verify the characterization of the current metrics by experts took place as this was beyond the scope of the thesis. Furthermore the results per indicator are provided in the Appendix and thus the results per category can easily be adjusted for a different weighting. What is important in the analysis is the general picture that this weighting provides, as a result of applying a meaningful methodology.

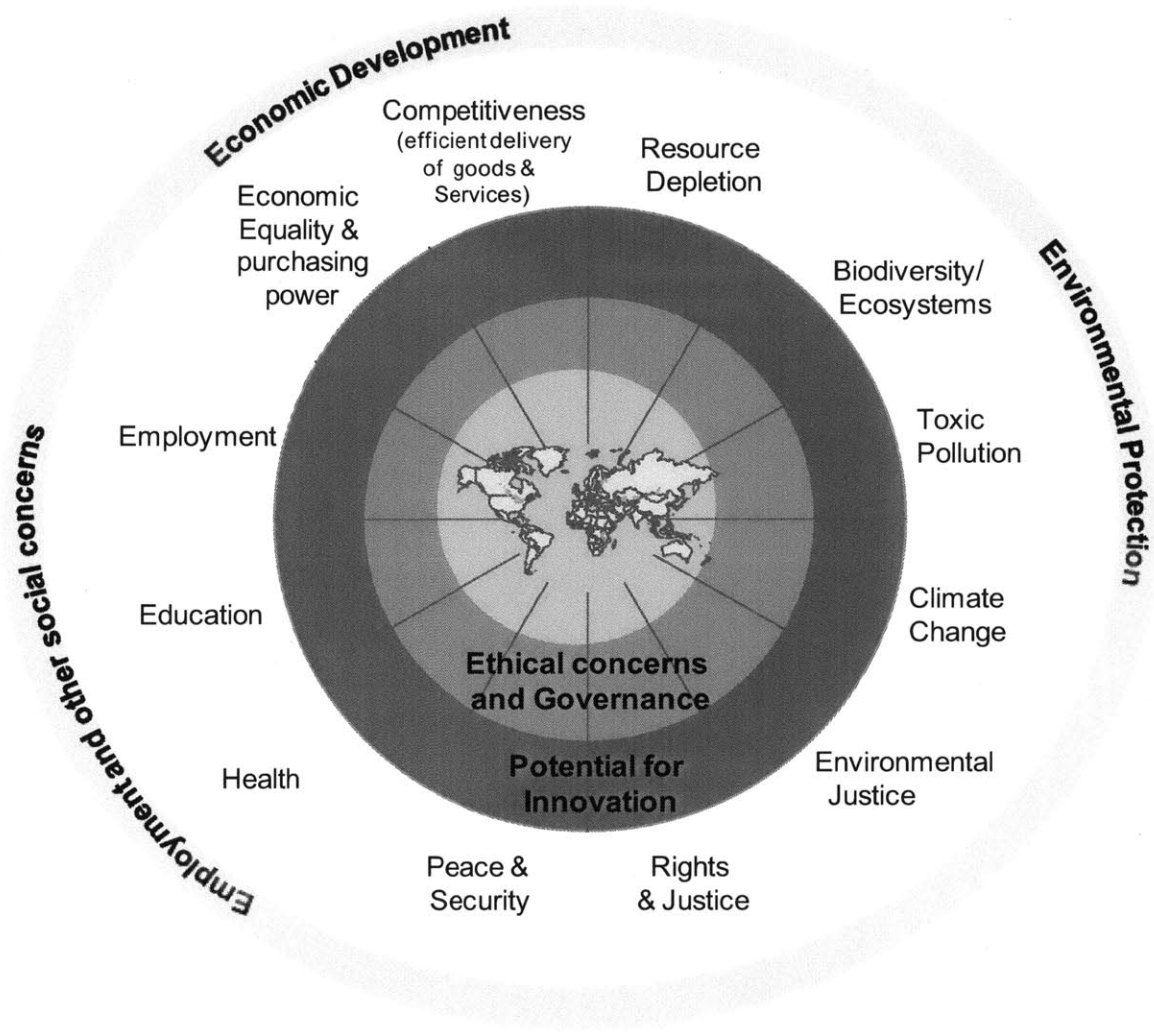


Figure 20: Proposed Framework for Sustainable Development Assessment

A detailed analysis of the sources and description of each indicator is included in the Appendix (Table A1).

The twelve categories, along with their weights and indicators, are:

Resource Depletion

- Water use intensity – 25%
- Change in Forest Cover – 25%
- Energy Use – 25%
- Paper and cardboard recycling rate – 25%

Biodiversity/Ecosystems

- Biodiversity and Habitat – 100%

Toxic Pollution

- Air pollution – 25%
- Water quality – 25%
- Access to sanitation – 25%
- Waste generation per capita – 25%

Climate Change

- CO2 Emissions – 33.33%
- Green Technologies – 33.33%
- Renewable Energy – 33.33%

Environmental Justice

- Environmental Protection –100%

Rights and Justice

- Civil Liberties – 25%
- Political Rights – 25%
- Justice – 30%
- Equal Rights – 10%
- Social Cohesion – 10%

Peace and Security

- Political Stability – 45%
- Murders –10%
- Personal Security and Private property rights – 45%

Health

- Life expectancy at birth – 25%
- Health infrastructure – 50%

- Mortality rate , under age 5 – 25%

Education

- Quality of the educational system – 40%
- University education – 30%
- Pupil-teacher ratio – 20%
- Illiteracy –10%

Employment

- Unemployment – 35%
- Youth Unemployment – 35%
- Labour Relations – 15%
- Corporate values take into account the values of employees – 15%

Economic Equality and Purchasing Power

- Gini index – 25%
- GDP Per Capita – 50%
- Income distribution (lowest 10%) – 25%

Competitiveness (Efficient delivery of Goods and Services)

- Basic infrastructure – 25%
- Total infrastructure – 25%
- Large corporations are efficient by international standards – 25%
- Small and medium-size enterprises are efficient by international standards – 25%

The weights and the indicators for the enabling dimensions are:

Ethical Concerns and Governance

- Bribery and Corruption – 30%
- Government Effectiveness – 30%
- Transparency of Government Policymaking – 30%
- Social Responsibility (Social Responsibility of Business Leaders is high) – 10%

Potential for Innovation

- Innovative capacity of firms – 40%
- Researchers and scientists – 20%
- Scientific Research legislation – 40%

3.2 Comparison of proposed framework vs. current approaches

It is important to identify which elements are being adequately captured, both by the existing and by the new proposed index, in order to be possible to select/utilize the best available framework depending on the specific area of interest of each stakeholder. Thus, it is required to have an assessment of each index in order to identify which categories are adequately covered.

In Figure 21, a qualitative assessment of each index is provided, based on whether each of the twelve categories and the two enablers are adequately covered/represented (by using indicators which are meaningful and can adequately measure the impact). The methodology for the qualitative assessment is based on a comparative assessment of the number of KPIs included per category, on whether the KPIs cover the specific category, and on the weights used per indicator/category. The assessment takes place by using Harvey balls. A fully (black) Harvey ball represents that the index fully covers the category, while an empty (white) Harvey ball represents that the category is not covered as part of the specific index.

In the assessment, all the discussed indexes are compared, except the EIRIS sustainability ratings. The reason for the exclusion of EIRIS ratings is the fact that both the full methodology and the rankings are not publicly available. Thus, a potential inclusion of EIRIS in the following assessment could be misleading and thus the specific index is not included.

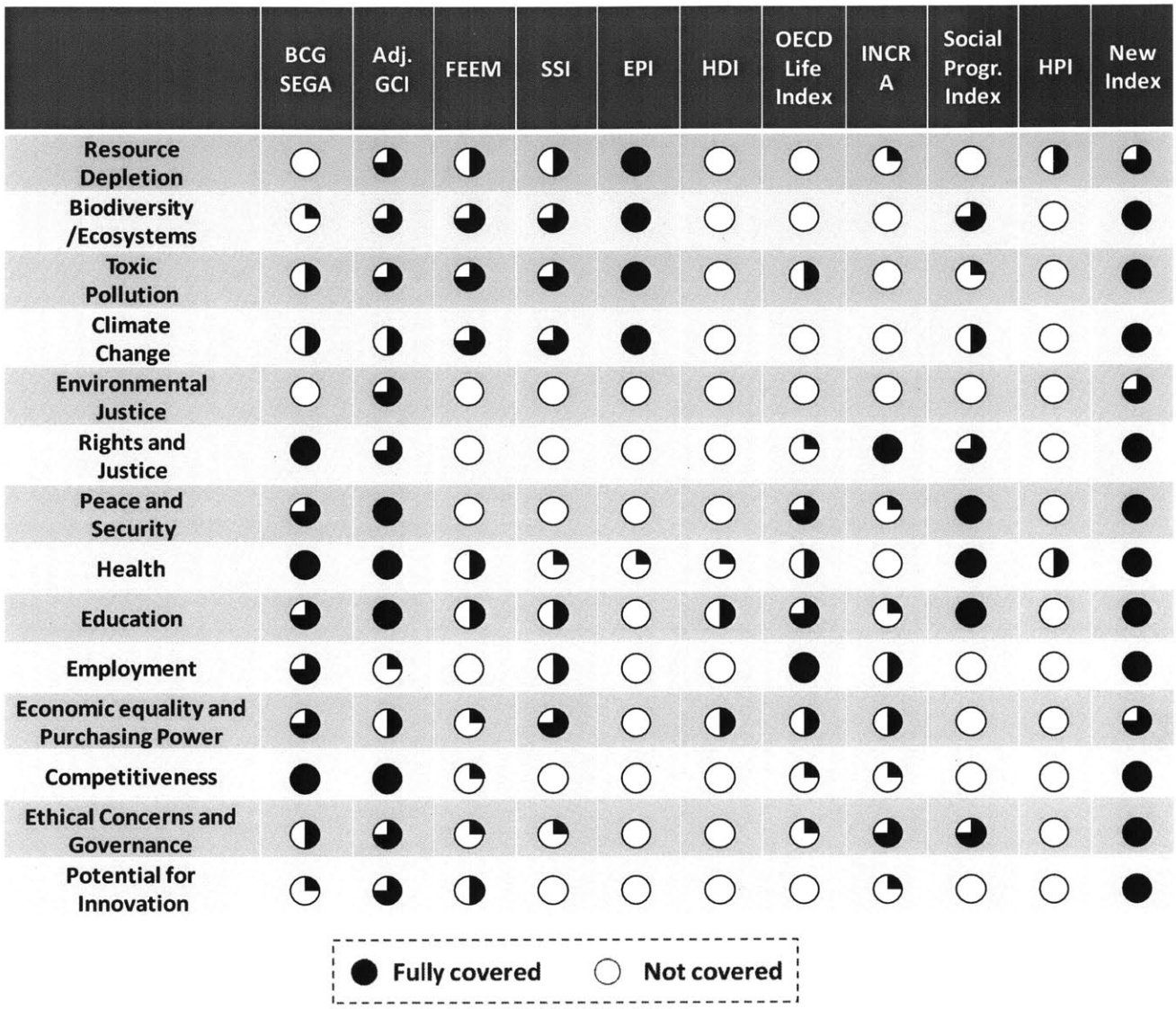


Figure 21: Qualitative Assessment of indexes per category

3.2.1 BCG Sustainable Economic Development Assessment (SEDA)

The BCG SEDA framework adequately covers many of the twelve categories, which are important in order to measure the current state of the sustainable development, but puts less emphasis on the environmental area. For the assessment of all the environmental related categories, SEDA uses in only four indicators (air pollution, carbon dioxide intensity, electricity from renewable and terrestrial protected areas), which do not cover resource depletion or

environmental justice and only partially covers biodiversity, toxic pollution and climate change. In terms of health, competitiveness, rights and justice, the SEDA framework fully captures these elements since it utilizes various indicators to assure accurate measurement of these areas. Furthermore, in terms of education, employment, economic equality and purchasing power, peace and security categories the BCG SEDA framework is a good approach, but still has room for further improvement (e.g., Education: include an assessment of the university education, Employment: Include Youth Unemployment, Economic Equality and Purchasing Power: Reduce the importance of inflation, Peace and Security: Increase importance of personal security vs. only terrorism). Finally, regarding the categories of innovation, ethical concerns and governance it should be stated that BCG SEDA uses some proxies (e.g., Average of math sciences and scores) but fails in total to illustrate the importance of these areas.

3.2.2 Sustainability Adjusted Global Competitiveness Index

The Sustainability Adjusted Global Competitiveness Index by World Economic Forum has the largest number of indicators among all reviewed indexes. The majority of the indicators are used for the construction of GCI and only 19 extra social and environmental indicators are used for the final sustainability adjusted index. However, due to the large number of indicators the majority of categories are covered. Nevertheless, it should be stated that due to the methodological approach used (which is based mainly on the GCI index), the adjustment on GCI is limited and does not reflect adequately the importance of the environmental and social elements. The environmental categories are adequately covered with room for specific improvements identified mainly in the climate change category (e.g., percentage of renewable could be added). Due to the fact that the sustainability adjusted Global Competitiveness Index is based on the GCI the categories of Competitiveness, Health, Education, Peace and Security are

fully covered. A Significant gap has been identified in the crucial element of employment which is being covered only through the youth unemployment metric; thus, significantly underestimating the importance of this category. Finally, although the innovation and ethical concerns and governance categories are covered, their importance is underestimated due to the method used to calculate the sustainability adjusted Global Competitiveness Index, which limits the impact of social and environmental categories to ±20% per category.

3.2.3 FEEM Sustainability Index Approach

The FEEM Sustainability Index only adequately covers a few categories. The categories of Employment, Peace and Security, Rights and Justice are not represented by any indicator. Moreover the FEEM index uses a specific number of financial indicators (Net Investment/Capital Stock, Trade Balance/Market Openness, etc.) and is not focusing on the equality and competitiveness elements. The Environmental Categories, in contrast with the rest, are adequately covered, with the exception of Environmental Justice which is not represented by any metric. Moreover, the innovation and ethical concerns and governance categories are not adequately represented and the framework does not highlight the importance of these enablers.

3.2.3 Sustainable Society index- SSI

The Sustainable Society Index adequately covers the majority of the environmental categories but at the same time fails to represent at least five categories: the areas of Rights and Justice, Peace and Security, Environmental Justice, Competitiveness and Potential for innovation are not represented. The areas of health, education and employment are partially covered, while in the area of ethical concerns and governance the indicators focus solely on the part of governance. The economic equality and purchasing power is adequately covered by taking into account both the income distribution and the GDP.

3.2.4 Environmental Performance Index (EPI)

The Environmental Performance Index, as it has been analyzed, deals only with environmental elements. Thus, the other categories are not represented in this index, with the exemption of health that is partially covered through child mortality. Furthermore, the Environmental Justice category is also not represented. Nevertheless, regarding the Resource Depletion, Biodiversity/Ecosystems, Toxic Pollution and Climate change the methodology used could be assessed as the most complete when compared to the other available indexes. However, it should be stated that further improvement in terms of data availability, number of countries and inclusion of new indicators is possible (e.g., impact of innovation on environment, environmental justice, etc.).

3.2.5 Human Development Index

The Human Development Index is an index based on few indicators, but is an important tool for global awareness in terms of progress in main areas of human development. However, it fails to cover many elements which are crucial for the sustainable growth of a country. Thus, the only categories which are partially covered are Health, Education and Purchasing Power.

3.2.6 OECD Better Life Index

Due to the nature of the OECD Better Life index, it deals with specific categories. Thus, it does not cover the majority of the environmental categories (with the exception of the air pollution and water quality indicators) and the potential for innovation area. The other categories are being covered partially (e.g., focusing only on purchasing power, or indirectly using a proxy to capture competitiveness). However, it should be stated that the category of employment is uniquely represented by the specific index since OECD Better Life Index does not use only the standard

unemployment metrics but also includes work-life balance indicators (e.g., Employees working very long hours).

3.2.7 INCRA Country Ratings

The INCRA Report is incorporating some sustainability data in order to create Forward Looking Indicators. As it was expected based on the nature of the index, the environmental categories are represented only through a generic proxy of environmental sustainability. Also, although the purchasing power is represented by many indicators, equality is not included in the metrics. Furthermore, it should be stated that the Rights and Justice category is greatly represented since there are many metrics used to cover this area (e.g., Independent Judiciary, Separation of Powers, Property Rights, etc.).

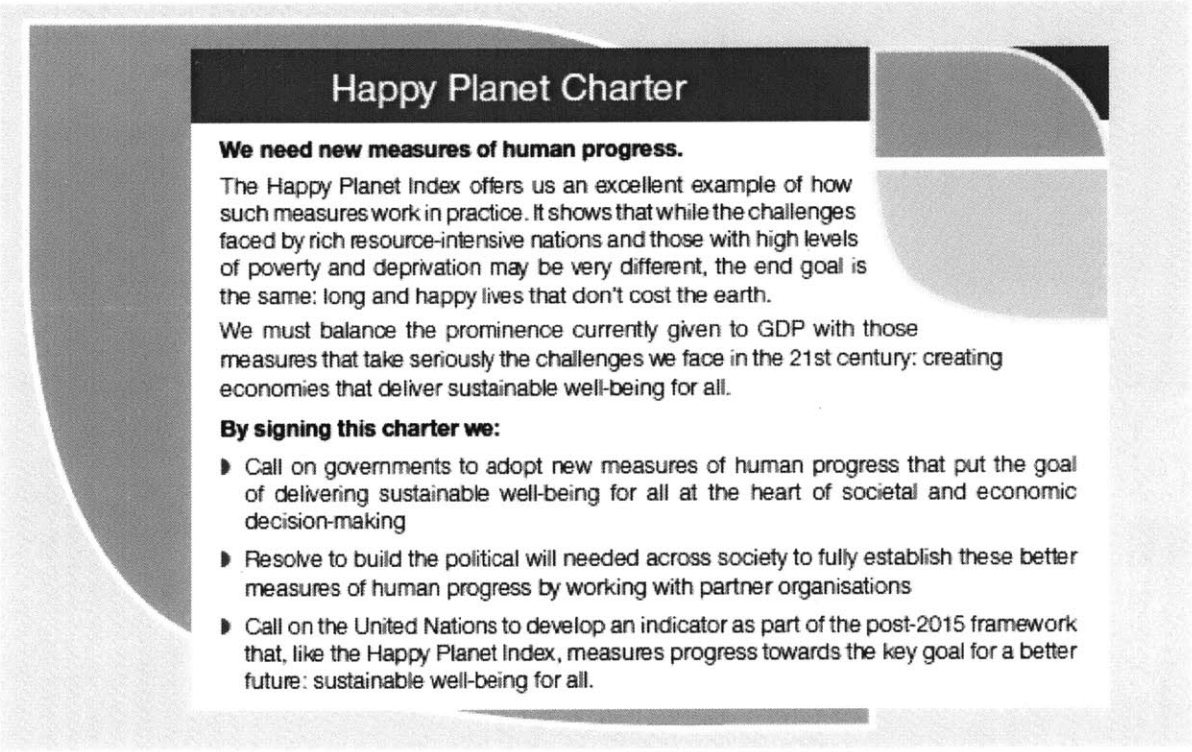
3.2.8 Social Progress Index

The Social Progress Index (SPI) has a target to identify the dimensions of social and environmental performance of societies and be used as a supplementary metric to GDP. However, by not covering at all the elements of equality, employment and potential for innovation, SPI fails in measuring significant elements of sustainable development. However, it should be stated that the social progress index fully covers the categories of Education, Health, Peace and Security by using a significant number of innovative metrics (e.g., nine metrics related to Education, 10 metrics related to Health and five metrics for Peace and Security).

3.2.9 Happy Planet Index (HPI)

HPI has as its target the provision of information regarding "how well nations are doing in terms of supporting their inhabitants to live good lives now, while ensuring that others can do the same in the future" (Happy Planet Index 2012, p. 2). HPI utilizes three indicators and is an important

tool in terms of global awareness. However, it provides limited information/data which could be utilized for potential government policies/decisions. Finally it should be stated that nef (the new economics foundation) is launching a Happy Planet Charter (Figure 22) calling the governments to adopt new measures related with sustainable well-being for all (Happy Planet Index, 2012).



Source: Happy Planet Index (2012).

Figure 22: Qualitative Assessment of indexes per category

3.2.10 The new proposed Framework

The framework proposed in this thesis utilizes the best available features of the other indexes and also highlights the importance of the potential for innovation, ethical concerns and governance as crucial enablers in order to move towards a more sustainable state. It should be stated that there are significant data limitations that could result in further improving the proposed index (e.g. poverty data, recycling data with no gaps, etc). Also, especially in the environmental categories aggregate scores were used by EPI (e.g. Biodiversity/Ecosystems) in order to limit the number of

indicators used. Furthermore, the Environmental Justice assessment was based on an evaluation of 2001, and an update is required in order to be possible to obtain conclusions which could be easily be utilized by governments. Despite these limitations, the index provides a clear improvement in terms of identifying the main areas of importance and selecting indicators which will provide useful insights to stakeholders.

4. The Proposed Framework for Sustainable Development- Category Results

As it has already been discussed, an aggregate ranking of sustainable development is thought to be an insufficient metric for comparing countries due to the different country characteristics and the importance of each category in various countries. Thus, an analysis both per category and per country is necessary in order to identify the main drivers of meaningful performance. In this section, the ranking and results per category are presented, while in Appendix the detailed rankings and results per indicator are included. The index of each category is based on a 0-10 scale, while the maximum for the indicator is dependent on each weight to the total category. As already discussed, this ranking is a comparative assessment of the countries included and does not reflect the relative performance vs. countries which are not included in the sample. A detailed analysis of the sources and description of each indicator is included in the Appendix (Table A1).

4.1 Resource Depletion

In the category of Resource Depletion the country with the highest score (Table 1) is Switzerland, while the second and the third country in the ranking are Netherlands and Portugal respectively. It should be stated that the first position for Switzerland is driven by a good performance, but not a top performance (Appendix, Tables A2-A5) in each of the relevant component indicators. Thus, Switzerland ranks 22nd in Water use intensity, 14th in Change in Forest Cover (with small difference in both cases vs. the first), 3rd in Energy Use and 5th in Recycling. USA is ranked 24th while Norway is ranked 20th and Germany 8th. It should be stated that the third ranked country is Portugal is determined mainly by the performance in the area of energy use.

Table 1: Resource Depletion- Scores and Ranking

Ranking	Resource Depletion Category	Score
1	Switzerland	9.44
2	Netherlands	9.31
3	Portugal	9.19
4	Lithuania	9.03
5	United Kingdom	8.95
6	Korea	8.93
7	Luxembourg	8.92
8	Germany	8.85
9	Slovenia	8.79
10	Poland	8.76
11	Sweden	8.73
12	Austria	8.73
13	Finland	8.71
14	Australia	8.64
15	Japan	8.62
16	Spain	8.62
17	Romania	8.58
18	New Zealand	8.55
19	Denmark	8.51
20	Norway	8.47
21	Italy	8.42
22	France	8.31
23	Slovak Republic	8.31
24	USA	8.28
25	Hungary	8.18
26	Belgium	8.06
27	Colombia	8.05
28	Czech Republic	7.97
29	Croatia	7.92
30	Turkey	7.92
31	Estonia	7.89
32	Greece	7.88
33	Brazil	7.82
34	Bulgaria	7.75

35	Malaysia	7.10
36	Mexico	6.91
37	South Africa	6.79
38	Russia	6.09
39	Kazakhstan	5.35
40	Jordan	4.33
41	Iceland	2.51

4.2 Biodiversity/Ecosystems

The ranking of Biodiversity/Ecosystems is based on the indicator of Biodiversity of the Environmental Performance Index (Appendix Table A1). The five countries with the highest score (Table 2) are Estonia, Germany, Luxemburg, Slovenia and Switzerland. USA is ranked 38th, while Norway is 23rd. The lowest-ranked categories are Kazakhstan, Jordan and Qatar. It should be highlighted that France is ranked only 46th and Spain 45th. Finally, it should be stated that Czech Republic and Latvia achieve have a high score and are being ranked 6th and 8th, respectively.

Table 2: Biodiversity/Ecosystems - Scores and Ranking

Ranking	Biodiversity/Ecosystems	Score
1	Estonia	10.00
2	Germany	10.00
3	Luxembourg	10.00
4	Slovenia	10.00
5	Switzerland	10.00
6	Czech Republic	9.82
7	UAE	9.61
8	Latvia	9.47
9	Netherlands	9.42
10	Malaysia	9.28
11	Venezuela	9.23
12	Lithuania	9.11
13	Poland	9.10
14	Austria	8.54
15	Slovakia	8.29

16	Australia	8.15
17	Iceland	8.02
18	Colombia	7.86
19	Italy	7.79
20	Indonesia	7.61
21	New Zealand	7.38
22	Japan	7.11
23	Norway	6.91
24	Taiwan	6.87
25	Croatia	6.82
26	Peru	6.76
27	Thailand	6.74
28	United Kingdom	6.73
29	Bulgaria	6.60
30	Denmark	6.48
31	Brazil	6.37
32	China	6.35
33	Greece	6.34
34	Philippines	6.14
35	Portugal	6.11
36	South Africa	6.06
37	Romania	6.01
38	United States of America	6.00
39	Sweden	5.89
40	Mexico	5.88
41	Finland	5.83
42	Chile	5.65
43	Canada	5.46
44	Belgium	5.36
45	Spain	5.25
46	France	5.02
47	Russia	4.91
48	Korea	4.58
49	Singapore	4.14
50	Argentina	3.98
51	Ukraine	3.60
52	Israel	3.37
53	India	3.36
54	Turkey	2.64

55	Hungary	2.31
56	Ireland	1.12
57	Kazakhstan	0.62
58	Jordan	0.01
59	Qatar	0.00

4.3 Toxic Pollution

In the category of Toxic Pollution (Table 3), the ranked countries number only 31 due to the data availability. Canada, Finland and Sweden have the highest aggregate scores. Canada although it has the best performance is ranked 27th in the categories of water quality and access to sanitation; however with small difference when compared with the top performers. Portugal, although ranked 4th in the toxic pollution category, it is being ranked only 30th in the indicator of water quality. The performance of Finland is influenced by Air pollution, Water Quality and Air Sanitation. It should be stated that although not included in the aggregated scores (due to lack of waste data) Australia's scores are high in the remaining three indicators of the category. USA is ranked 25th, Germany 14th and Norway 18th. Finally, China is being ranked last and the performance is influenced by the performance in Air-Pollution (lowest score), Water Quality and Access to Sanitation.

Table 3: Toxic Pollution - Scores and Ranking

Ranking	Toxic Pollution	Scores
1	Canada	8.64
2	Finland	8.57
3	Sweden	8.54
4	Portugal	8.50
5	Japan	8.45
6	Slovak Republic	8.44
7	Czech Republic	8.38
8	Iceland	8.34
9	United Kingdom	8.17

10	France	8.15
11	Spain	8.11
12	Hungary	7.79
13	Belgium	7.74
14	Germany	7.70
15	Greece	7.68
16	Austria	7.57
17	Denmark	7.51
18	Norway	7.46
19	Netherlands	7.39
20	Luxembourg	7.39
21	Switzerland	7.15
22	Ireland	6.92
23	Korea	6.89
24	Turkey	6.86
25	United States	6.63
26	Poland	6.14
27	Italy	5.89
28	Mexico	5.44
29	Russian Federation	5.39
30	South Africa	4.76
31	China	3.38

4.4 Climate Change

In the category of Climate Change (Table 4), Iceland is ranked first with significant difference from the second-place Denmark. The performance of Iceland is driven mainly by Renewable Energy (although it also has high scores in all the indicators of the category). In the Renewable Energy category, Iceland has an impressive 84% share of renewables in total energy requirements, while the second-place Brazil has a 44%. USA is ranked 37th, Germany 10th and Norway 4th. The last positions in the ranking are held by Russia, Kazakhstan and Ukraine, and are driven by the following indicators: CO2 Emissions, Renewable Energy, and Green Technologies.

Table 4: Climate Change - Scores and Ranking

Ranking	Climate Change	Score
1	Iceland	93.87
2	Denmark	73.61
3	Sweden	73.23
4	Norway	70.15
5	Portugal	66.67
6	New Zealand	66.03
7	Austria	65.15
8	Switzerland	63.32
9	Brazil	62.59
10	Germany	60.95
11	Finland	60.65
12	Spain	59.52
13	Japan	57.97
14	Canada	57.24
15	Philippines	56.37
16	Ireland	56.13
17	Italy	55.80
18	Luxembourg	54.45
19	Netherlands	54.34
20	Indonesia	54.21
21	Latvia	53.92
22	Israel	53.86
23	Belgium	53.81
24	France	53.39
25	Lithuania	52.88
26	Greece	52.74
27	Chile	51.24
28	Colombia	50.89
29	Singapore	50.65
30	UAE	50.27
31	Peru	50.23
32	Slovenia	49.31
33	United Kingdom	48.88
34	Thailand	48.43
35	Malaysia	48.34
36	Korea	47.80
37	USA	47.36
38	Mexico	47.29

39	Hong Kong	47.16
40	Turkey	46.89
41	Australia	46.75
42	Taiwan	45.89
43	Qatar	45.44
44	Poland	45.29
45	India	44.22
46	Croatia	43.94
47	Czech Republic	42.89
48	Slovak Republic	42.28
49	Hungary	39.55
50	Estonia	37.89
51	Romania	37.29
52	Jordan	35.81
53	South Africa	34.39
54	Argentina	33.91
55	China Mainland	32.17
56	Venezuela	30.43
57	Bulgaria	28.30
58	Russia	17.85
59	Kazakhstan	16.86
60	Ukraine	10.26

4.5 Environmental Justice

For the category of environmental justice (Table 5), it was difficult to obtain recent data. The most recent available data are of 2001; thus, the ranking is somewhat speculative. In this category, Finland is ranked first, and after that Sweden and Singapore, while the poorest performance is the one of Romania and Ukraine. It should be stated that available indexes of Environmental Laws (e.g., IMD World Competitiveness Yearbook: Environmental Laws indicator) exist; however the fact that they measure "whether the environmental laws and compliance do not hinder the competitiveness of businesses" (rather than promoting a more sustainable state) led us to not include them in the specific assessment.

Table 5: Environmental Protection - Scores and Ranking

Ranking	Environmental Protection	Score
1	Finland	10.00
2	Sweden	8.53
3	Singapore	8.52
4	Netherlands	8.46
5	Austria	8.16
6	Switzerland	8.13
7	Germany	7.83
8	France	7.67
9	Denmark	7.44
10	Iceland	7.36
11	New Zealand	7.21
12	Canada	7.21
13	United Kingdom	6.89
14	United States	6.89
15	Belgium	6.82
16	Australia	6.61
17	Japan	6.54
18	Norway	6.51
19	Ireland	5.12
20	Italy	4.99
21	Spain	4.82
22	Estonia	4.43
23	Hungary	4.39
24	Slovenia	4.18
25	Chile	4.09
26	Czech	3.81
27	Israel	3.66
28	Poland	3.62
29	Jordan	3.61
30	Portugal	3.53
31	South Africa	3.52
32	Latvia	3.50
33	Brazil	3.39
34	Korea	3.27
35	Malaysia	3.25
36	Lithuania	3.20
37	Slovak	3.11
38	China	2.64

39	Thailand	2.52
40	Colombia	2.45
41	Bulgaria	1.98
42	Mexico	1.93
43	Greece	1.88
44	Peru	1.60
45	Argentina	1.57
46	Indonesia	1.50
47	India	1.49
48	Russia	1.12
49	Philippines	0.79
50	Venezuela	0.61
51	Romania	0.08
52	Ukraine	0.00

4.6 Rights and Justice

In the category of Rights and Justice (Table 6), the countries with the highest scores are Norway (1st), Sweden (2nd) and Denmark (3rd) followed by Canada and Finland. Norway's score is driven (Appendix, Tables A13-A17) by the Civil Liberties, Political Rights, Justice and Equal Rights indicators in which it ranks in the top two positions. In these indicators, all the Nordic countries achieve a high score. USA is ranked 15th and Germany 16th. The worst scores in the category of Rights and Justice are those of Russia, China, and Venezuela. The underperformance of China is mainly driven by the civil liberties and political rights indicators while it also scores low in the remaining three indicators (Justice, Equal Rights and Social Cohesion).

Table 6: Rights and Justice - Scores and Ranking

Ranking	Rights and Justice	Score
1	Norway	9.66
2	Sweden	9.56
3	Denmark	9.51
4	Canada	9.44
5	Finland	9.31

6	Switzerland	9.11
7	Ireland	9.06
8	Australia	9.05
9	Netherlands	8.98
10	New Zealand	8.89
11	United Kingdom	8.89
12	Japan	8.80
13	Iceland	8.74
14	Luxembourg	8.71
15	USA	8.69
16	Germany	8.66
17	France	8.36
18	Belgium	8.35
19	Israel	8.32
20	Chile	8.31
21	Austria	8.20
22	Estonia	7.81
23	Taiwan	7.81
24	Poland	7.69
25	Lithuania	7.63
26	Czech Republic	7.31
27	Brazil	6.91
28	Spain	6.72
29	Slovenia	6.72
30	Latvia	6.68
31	Korea	6.65
32	Hungary	6.60
33	Croatia	6.59
34	Singapore	6.56
35	South Africa	6.54
36	Italy	6.52
37	India	6.45
38	Portugal	6.33
39	Romania	6.28
40	Slovak Republic	6.23
41	Greece	6.20
42	Malaysia	6.05
43	Philippines	5.94
44	Argentina	5.51
45	Mexico	5.49
46	Indonesia	5.49

47	Thailand	5.36
48	Peru	5.28
49	Bulgaria	5.04
50	Qatar	5.02
51	Turkey	5.00
52	UAE	4.87
53	Colombia	4.59
54	Kazakhstan	3.69
55	Ukraine	3.67
56	Jordan	3.52
57	Russia	2.25
58	China Mainland	2.06
59	Venezuela	1.33

4.7 Peace and Security

In the category of Peace and Security (Table 7), the countries with the highest scores are Denmark, Switzerland, and Norway. The performance of Denmark (Appendix, tables A18-A20) is mainly driven by the political stability (1st) and personal security (2nd) indicators, while in the indicator of homicides is ranked 9th. USA is ranked in the Peace and Security category 17th, while Germany is 9th. The lowest scores are those of Argentina, Ukraine, and Venezuela driven mainly by issues in terms of political stability and personal security.

Table 7: Peace and Security - Scores and Ranking

Ranking	Peace and Security	Score
1	Denmark	9.93
2	Switzerland	9.67
3	Norway	9.66
4	Finland	9.59
5	Sweden	9.43
6	Canada	9.35
7	Singapore	9.31
8	Luxembourg	9.24

9	Germany	9.22
10	United Kingdom	9.07
11	New Zealand	9.03
12	UAE	8.86
13	Ireland	8.81
14	Netherlands	8.75
15	Australia	8.72
16	Qatar	8.72
17	USA	8.66
18	Austria	8.64
19	Hong Kong	8.55
20	Chile	8.35
21	France	8.24
22	Japan	7.80
23	Taiwan	7.79
24	Israel	7.56
25	Belgium	7.52
26	Malaysia	7.38
27	Estonia	7.16
28	Spain	7.12
29	Poland	7.02
30	Turkey	7.02
31	Portugal	6.81
32	Latvia	6.72
33	Czech Republic	6.63
34	Lithuania	6.62
35	Philippines	6.59
36	Slovak Republic	6.42
37	Jordan	6.40
38	India	6.26
39	China Mainland	6.18
40	Croatia	6.08
41	Korea	6.06
42	Mexico	6.05
43	Indonesia	6.02
44	Kazakhstan	5.98
45	Iceland	5.95
46	Brazil	5.90
47	Thailand	5.50
48	Greece	5.47
49	Colombia	5.26

50	Hungary	5.18
51	Romania	5.17
52	Italy	5.11
53	Peru	4.81
54	South Africa	4.64
55	Slovenia	4.55
56	Russia	4.30
57	Bulgaria	3.49
58	Argentina	3.24
59	Ukraine	2.21
60	Venezuela	0.00

4.8 Health

In the category of Health (Table 8), the countries with the highest scores are Switzerland, Belgium and Singapore. The performance of Switzerland (Appendix, Tables A21-A23) is driven mainly by the Health Infrastructure and Life Expectancy indicators. USA is ranked 29th (30th in Health infrastructure, 30th in Life Expectancy and 37th in Mortality Rate indicators) while Germany is 8th. Japan has the highest life expectancy at birth (83.6 years) while the country with the lowest infant mortality is Hong Kong. The lowest-ranked countries in the category of Health are India and South Africa driven by the very poor performance in Life Expectancy (South Africa 53.4 years) and Mortality Rate (India 61.3 per 1000 live births).

Table 8: Health - Scores and Ranking

Ranking	Health	Score
1	Switzerland	9.69
2	Belgium	9.60
3	Singapore	9.45
4	France	9.43
5	Denmark	9.33
6	Austria	9.23
7	Netherlands	9.21
8	Germany	9.18

9	Luxembourg	9.17
10	Spain	9.17
11	Japan	9.13
12	Sweden	9.12
13	Taiwan	9.11
14	Finland	8.74
15	Hong Kong	8.74
16	Iceland	8.73
17	Norway	8.70
18	Australia	8.67
19	Canada	8.59
20	Czech Republic	8.59
21	Korea	8.55
22	Israel	8.33
23	United Kingdom	8.20
24	Portugal	8.17
25	Malaysia	8.16
26	New Zealand	8.05
27	Italy	8.02
28	UAE	8.02
29	USA	7.72
30	Qatar	7.70
31	Slovenia	7.46
32	Estonia	7.10
33	Thailand	7.09
34	Ukraine	7.04
35	Croatia	6.89
36	Greece	6.86
37	Ireland	6.84
38	Turkey	6.66
39	Poland	6.30
40	Chile	6.23
41	Jordan	6.12
42	Latvia	6.10
43	Mexico	6.04
44	Lithuania	5.97
45	Slovak Republic	5.81
46	Hungary	5.66
47	Argentina	5.43
48	China Mainland	5.20

49	Philippines	5.03
50	Indonesia	4.77
51	Colombia	4.43
52	Kazakhstan	4.35
53	Brazil	4.31
54	Russia	4.29
55	Peru	4.12
56	Bulgaria	3.98
57	Venezuela	3.88
58	Romania	3.77
59	India	2.63
60	South Africa	1.22

4.9 Education

In the category of Education (Table 9), the highest ranked countries are Switzerland, Finland, Belgium and Denmark. The high performance of Switzerland is driven (Appendix, Tables A24-A27) by the University Education, Illiteracy and Quality of Educational system indicators. USA is ranked 17th (University Education 10th, Pupil-Teacher Ratio 41st) and Germany 7th (University Education 7th, Quality of Educational System 7th). The lowest-ranked countries in the category of Education are Bulgaria, Peru, Brazil, and South Africa. It should be stated that the country with the lowest score in the category of Illiteracy is India which has an illiteracy rate of 24.8% (as a percentage of its population).

Table 9: Education - Scores and Ranking

Ranking	Education	Score
1	Switzerland	9.60
2	Finland	9.36
3	Belgium	9.05
4	Denmark	9.03
5	Canada	8.83
6	Singapore	8.81
7	Germany	8.45
8	Netherlands	8.34

9	Australia	8.20
10	Sweden	8.19
11	Qatar	8.10
12	Ireland	8.10
13	Iceland	7.82
14	Israel	7.81
15	Malaysia	7.73
16	Norway	7.70
17	USA	7.62
18	Austria	7.59
19	UAE	7.48
20	New Zealand	7.47
21	France	7.30
22	Luxembourg	7.25
23	Poland	7.07
24	United Kingdom	7.03
25	Lithuania	6.83
26	Portugal	6.65
27	Taiwan	6.63
28	Estonia	6.49
29	Czech Republic	6.26
30	Indonesia	5.95
31	Jordan	5.92
32	Greece	5.85
33	Korea	5.79
34	Italy	5.72
35	Japan	5.38
36	Spain	5.36
37	Slovenia	5.29
38	Kazakhstan	5.29
39	Hungary	5.01
40	Russia	4.86
41	Philippines	4.76
42	Ukraine	4.76
43	Turkey	4.72
44	Thailand	4.70
45	Croatia	4.53
46	Chile	4.45
47	Argentina	4.35
48	Mexico	4.27

49	China Mainland	4.21
50	Colombia	4.00
51	India	3.96
52	Slovak Republic	3.94
53	Venezuela	3.68
54	Romania	3.52
55	Bulgaria	2.94
56	Peru	2.92
57	Brazil	2.91
58	South Africa	2.34

4.10 Employment

In the category of employment (Table 10), the highest-ranked countries are Thailand, Qatar and Norway. In terms of unemployment Thailand and Qatar have a percentage less than 1%, while even in the youth unemployment they achieve to have less than 3%. USA is ranked 29th (41stin terms of Unemployment) while Germany is ranked 10th. It should be stated that Thailand although it has, as stated, an impressive performance in the indicators of unemployment, in the indicators of labor relations and corporate values is ranked only 18th and 17th respectively. The lowest ranked countries are Greece, Spain and South Africa driven by the fact that they have an unemployment rate of more than 24% and a youth unemployment rate of more than 50%. It should be stated that the unemployment rate (and youth unemployment) in Greece has further increased (Eurostat 2013) during the last year and thus a further deterioration in the ranking is expected.

Table 10: Employment - Scores and Ranking

Ranking	Employment	Score
1	Thailand	9.15
2	Qatar	9.13
3	Norway	9.08

4	Switzerland	8.83
5	Singapore	8.69
6	Malaysia	8.62
7	Japan	8.60
8	Austria	8.40
9	UAE	8.33
10	Germany	8.29
11	Hong Kong	8.25
12	Kazakhstan	8.18
13	Netherlands	8.18
14	Taiwan	8.09
15	Iceland	8.00
16	Denmark	7.86
17	Mexico	7.83
18	India	7.74
19	Canada	7.53
20	Australia	7.40
21	Sweden	7.40
22	Korea	7.39
23	Luxembourg	7.38
24	Philippines	7.32
25	Peru	7.26
26	Israel	7.26
27	Brazil	7.23
28	New Zealand	7.07
29	USA	7.06
30	Finland	6.90
31	Indonesia	6.79
32	Chile	6.69
33	United Kingdom	6.66
34	Belgium	6.54
35	Russia	6.54
36	Czech Republic	6.50
37	Turkey	6.49
38	Ukraine	6.46
39	Colombia	6.25
40	Estonia	6.21
41	Romania	5.92
42	Venezuela	5.92
43	Slovenia	5.64
44	Lithuania	5.47

45	Ireland	5.43
46	Hungary	5.37
47	France	5.33
48	Jordan	5.20
49	Latvia	4.76
50	Poland	4.54
51	Italy	4.46
52	Slovak Republic	4.45
53	Bulgaria	4.15
54	Portugal	4.10
55	Croatia	3.13
56	Greece	1.29
57	Spain	1.13
58	South Africa	1.06

4.11 Economic Equality and Purchasing Power

In the category of Economic Equality and Purchasing power (Table 11), the countries with the highest score are Luxembourg, Norway and Japan. All these countries have achieved balance both in terms of GDP per Capita but also in terms of income distribution (Appendix, Tables A32-A34). It should be stated that although it is 7th in terms of GDP per capita, the USA in the ranked aggregate category is 25th due to the poor performance in terms of Gini index (40th) and Income distribution (47th). Also highlighted is the case of Singapore which is ranked 4th in terms of GDP per capita but in the aggregate category is 19th due to the disappointing performance in the remaining indicators (Gini 45th, Income Distribution 48th). The countries with the lowest scores in the category of Economic Equality and Purchasing are Brazil, South Africa and Colombia, driven mainly by the low performance in terms of economic equality.

Table 11: Economic Equality and Purchasing Power - Scores and Ranking

Ranking	Economic equality and Purchasing Power	Score
1	Luxembourg	8.29
2	Norway	7.43
3	Japan	6.64
4	Qatar	6.63
5	Sweden	6.28
6	Finland	6.17
7	Austria	5.85
8	Czech Republic	5.82
9	Slovak Republic	5.77
10	Switzerland	5.71
11	Germany	5.70
12	Denmark	5.63
13	Belgium	5.40
14	Netherlands	5.18
15	Ireland	5.14
16	Canada	5.08
17	France	4.89
18	Slovenia	4.87
19	Singapore	4.85
20	Kazakhstan	4.72
21	Korea	4.72
22	Ukraine	4.71
23	Hungary	4.70
24	Australia	4.60
25	USA	4.43
26	Hong Kong	4.39
27	Spain	4.35
28	Poland	4.33
29	Romania	4.32
30	Croatia	4.30
31	United Kingdom	4.19
32	Italy	4.14
33	New Zealand	4.07
34	Greece	4.01
35	Estonia	3.90
36	Lithuania	3.73
37	Latvia	3.68

38	Israel	3.65
39	Russia	3.45
40	Indonesia	3.43
41	India	3.40
42	Portugal	3.33
43	Jordan	3.27
44	Bulgaria	3.15
45	Turkey	2.92
46	China Mainland	2.47
47	Venezuela	2.32
48	Philippines	2.32
49	Malaysia	2.24
50	Mexico	2.11
51	Argentina	2.05
52	Thailand	1.93
53	Chile	1.76
54	Peru	1.51
55	Brazil	0.78
56	South Africa	0.63
57	Colombia	0.36

4.12 Competitiveness

In the category of Competitiveness (Table 12), the countries with the highest scores are Switzerland, Sweden and USA. All these countries have very good performance in all the indicators related to competitiveness (Appendix Tables A35-A38). Germany is ranked 5thwhich is driven mainly by the small and medium size enterprises indicator (1st position). Furthermore, it should be highlighted that Italy is ranked 43rd in the Competitiveness category driven mainly by the poor performance in the basic infrastructure category (56th).Finally, the countries with lowest scores are Jordan, Bulgaria and Venezuela.

Table 12: Competitiveness - Scores and Ranking

Ranking	Competitiveness	Score
1	Switzerland	8.79
2	Sweden	8.71
3	USA	8.65

4	Denmark	8.40
5	Germany	8.38
6	Netherlands	7.84
7	Finland	7.47
8	Hong Kong	7.41
9	Norway	7.38
10	Canada	7.27
11	Singapore	7.16
12	Austria	7.14
13	France	7.14
14	Ireland	7.00
15	Belgium	6.92
16	Taiwan	6.89
17	Malaysia	6.69
18	UAE	6.64
19	United Kingdom	6.31
20	Israel	6.13
21	Czech Republic	5.98
22	Luxembourg	5.96
23	Iceland	5.77
24	Australia	5.61
25	Spain	5.38
26	Qatar	5.36
27	New Zealand	5.25
28	Slovak Republic	5.24
29	Lithuania	5.15
30	Japan	4.95
31	Korea	4.93
32	China Mainland	4.78
33	Portugal	4.78
34	Thailand	4.53
35	Turkey	4.52
36	Hungary	4.49
37	Mexico	4.42
38	Estonia	4.31
39	Chile	4.24
40	Latvia	4.20
41	Poland	4.13
42	Philippines	3.94
43	Italy	3.88
44	Greece	3.83

45	Ukraine	3.55
46	Slovenia	3.46
47	Kazakhstan	3.45
48	Indonesia	3.28
49	Romania	3.26
50	India	3.22
51	Colombia	3.03
52	Brazil	2.85
53	Croatia	2.82
54	Peru	2.75
55	Russia	2.50
56	South Africa	2.15
57	Argentina	1.94
58	Jordan	1.74
59	Bulgaria	1.60
60	Venezuela	0.46

4.13 Ethical Concerns and Governance

In the category of Ethical Concerns and Governance (Table 13), the countries with the highest scores are Denmark, Singapore and the UAE. Denmark has the best performance in terms of lack of Bribing and Corruption while Singapore is ranked first in terms of Government Effectiveness (Appendix, Tables A39-A42). USA is ranked 20th due to mediocre performance in almost all indicators in this category (Bribing and Corruption: 21st, Government Effectiveness: 25th, Transparency of Government Policy Making: 19th, Social Responsibility: 30th). The countries with the lowest scores are Argentina, Ukraine (holding the last position in Bribing and Corruption), and Venezuela (holding the last position in Government Effectiveness and Transparency).

Table 13: Ethical Concerns and Governance- Scores and Ranking

Ranking	Ethical Concerns and Governance	Score
1	Denmark	9.19
2	Singapore	9.04

3	UAE	8.95
4	Sweden	8.94
5	Switzerland	8.75
6	Finland	8.66
7	Norway	8.37
8	Qatar	8.35
9	New Zealand	8.03
10	Chile	7.65
11	Germany	7.64
12	Canada	7.42
13	Netherlands	7.33
14	Ireland	7.26
15	Luxembourg	7.17
16	Malaysia	6.89
17	Hong Kong	6.74
18	United Kingdom	6.70
19	Japan	6.52
20	USA	6.35
21	Estonia	6.32
22	Turkey	6.24
23	Belgium	5.94
24	Australia	5.83
25	Austria	5.81
26	Taiwan	5.49
27	France	5.43
28	Poland	5.34
29	Israel	5.08
30	Iceland	4.96
31	Korea	4.93
32	Indonesia	4.38
33	Kazakhstan	4.35
34	Philippines	4.17
35	Portugal	4.02
36	Mexico	4.00
37	Lithuania	3.94
38	Jordan	3.50
39	Thailand	3.49
40	China Mainland	3.42
41	Latvia	3.29
42	Peru	3.25
43	Colombia	3.06

44	Brazil	2.88
45	Romania	2.65
46	Czech Republic	2.64
47	Hungary	2.63
48	Spain	2.63
49	Croatia	2.58
50	South Africa	2.37
51	Greece	2.29
52	India	2.21
53	Italy	2.00
54	Slovak Republic	1.87
55	Russia	1.54
56	Bulgaria	1.49
57	Slovenia	1.39
58	Argentina	1.04
59	Ukraine	0.81
60	Venezuela	0.79

4.14 Potential for Innovation

In the category of Potential for Innovation (Table 14), the countries with the highest scores are Israel, the USA and Switzerland. Israel is ranked first in the Innovative capacity and Scientific Research Legislation indicators, while Switzerland is first in the Researchers and Scientists indicators (Appendix, Tables A43-A45). The USA in the three indicators of the category is ranked second. Germany is ranked 6th driven mainly by the Innovative Capacity and Researchers and Scientists indicators. The lowest ranked countries are Poland (the lowest in Innovative Capacity), Venezuela (the lowest in Researchers and Scientists indicator) and Bulgaria (last in Scientific Research Legislation indicator).

Table 14: Potential for Innovation- Scores and Ranking

Ranking	Potential for Innovation	Score
1	Israel	9.57
2	USA	9.33
3	Switzerland	9.22
4	Sweden	8.00

5	Denmark	8.00
6	Germany	7.87
7	Netherlands	7.72
8	Singapore	7.71
9	Canada	7.40
10	Ireland	7.33
11	United Kingdom	7.10
12	Malaysia	7.00
13	Finland	6.99
14	UAE	6.69
15	Luxembourg	6.69
16	Taiwan	6.69
17	Norway	6.68
18	Australia	6.34
19	Qatar	6.32
20	Austria	6.25
21	Japan	6.20
22	Belgium	6.15
23	France	6.04
24	Hong Kong	5.87
25	Korea	5.78
26	Iceland	5.52
27	New Zealand	5.22
28	Lithuania	5.00
29	Kazakhstan	4.66
30	Portugal	4.47
31	Indonesia	4.43
32	Czech Republic	4.39
33	Estonia	4.09
34	Turkey	3.94
35	India	3.94
36	Thailand	3.85
37	China Mainland	3.84
38	South Africa	3.84
39	Philippines	3.67
40	Italy	3.59
41	Latvia	3.36
42	Hungary	3.33
43	Greece	3.32
44	Chile	3.16
45	Slovenia	3.04

46	Brazil	3.02
47	Colombia	2.98
48	Spain	2.97
49	Jordan	2.91
50	Argentina	2.86
51	Mexico	2.77
52	Croatia	2.06
53	Ukraine	2.01
54	Russia	1.95
55	Peru	1.76
56	Romania	1.36
57	Slovak Republic	1.28
58	Poland	1.08
59	Venezuela	0.85
60	Bulgaria	0.56

5. Illustrative Scores for the countries

The ranking per country is crucial because it allows a comparative assessment of the countries. However, in order to have a more complete picture it is important to identify also the performance in each of the categories per country. Thus, a country might have a satisfactory performance in the ranking of one indicator but when compared with the performance in other categories can be underperforming. In order to identify how specific indicators for a country are performing relative to other national-level measures, a disaggregated figure was created. This disaggregated view is particularly useful and does not depend on what some observers might consider an inappropriate or arbitrary weighting of the various components in the construction of an aggregate ranking. The selection of countries was for illustrative purposes. Both countries with high performance, in terms of sustainable development, and countries which have many areas for improvement were included. Similarly with the results per indicator, any analyst could easily adapt the weights, and thus have an updated comparison, taking into account the specific characteristics of each country.

5.1 USA Scores

The USA, as is illustrated in Figure 23, has a good performance in the categories of Potential for Innovation and Competitiveness. However, it is obvious that this performance is not aligned with the environmental categories (Biodiversity/ Ecosystems, Toxic Pollution, Climate Change and Environmental Justice). Furthermore, the USA has a poor performance (compared to the other component indicators) in the category of Economic Equality and Purchasing Power, which as discussed is driven by the Economic Equality. Finally, regarding the categories of Education and Health, although, the USA seems to have a score which is satisfactory, when combined with the

country ranking (Ranked 17th and 29th, respectively) it becomes obvious that there is room for significant improvement.

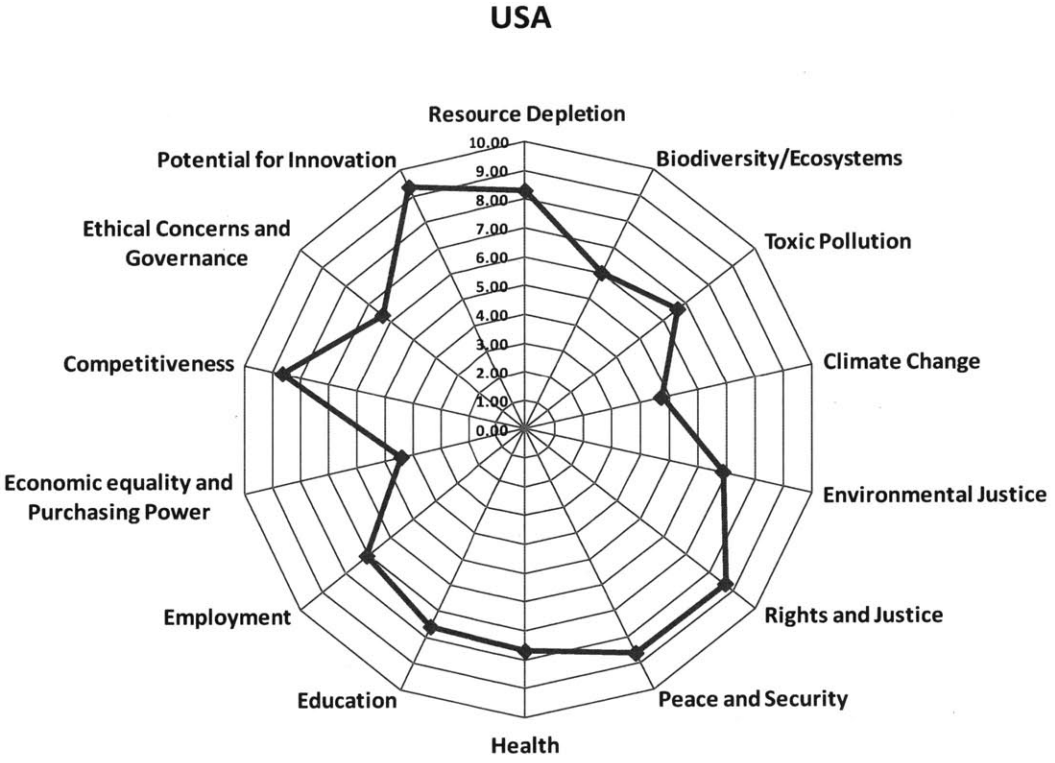


Figure 23: USA - Scores per Category

5.2 Norway Scores

Norway has a high score in the categories of Rights and Justice, Peace and Security and Employment (Figure 24). However, when compared to other categories, it underperforms in the majority of environmental categories and mainly in the areas of Biodiversity/ Ecosystems, Toxic Pollution, Climate Change and Environmental Justice. Furthermore, in the area of innovation, which is a crucial enabler for the overall long term performance, there is room for significant improvement (indicated also by the 17th position in the country ranking).

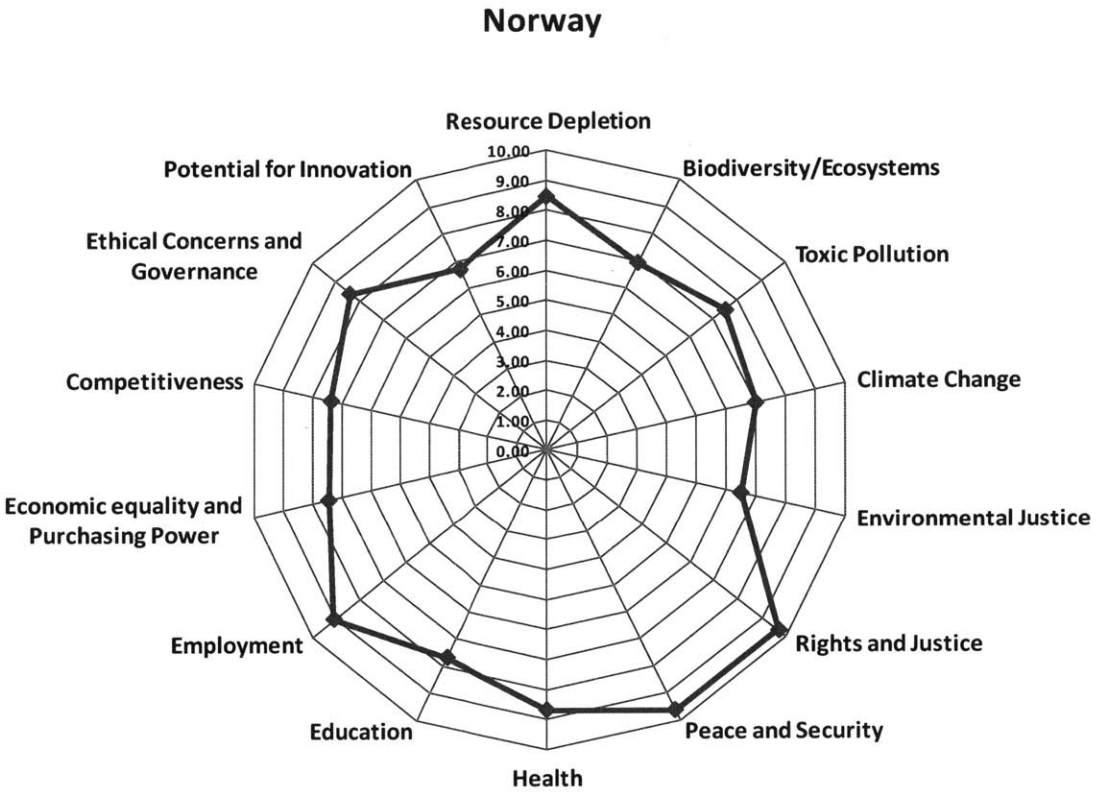


Figure 24: Norway - Scores per Category

5.3 Switzerland Scores

Switzerland has very good performance in the majority of the categories (Figure 25). The best score has been achieved in the categories of Education, Health, Peace and Security, Resource Depletion and Biodiversity/Ecosystems. Furthermore, it should be stated that Switzerland has a good performance in both enabler categories (Potential for Innovation and Ethical Concerns and Governance). However, there is significant room for improvement in the areas of Economic Equality and Purchasing Power and in some environmental categories (Toxic Pollution, Climate Change and Environmental Justice). In these categories, Switzerland is ranked in the top 10

countries; however, compared to the other scores, these are areas which are lagging in terms of more optimal performance.

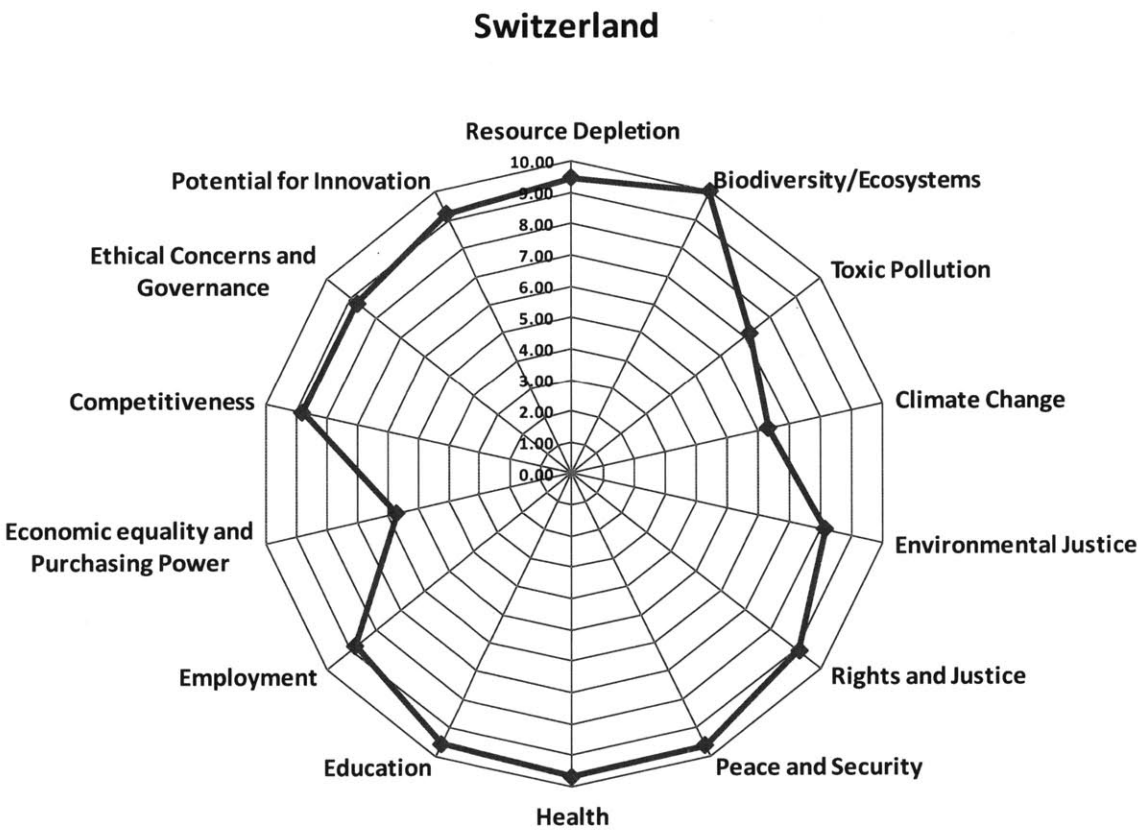


Figure 25: Switzerland - Scores per Category

5.4 Sweden Scores

Sweden (Figure 26) has a strong performance in the categories of Health, Peace and Security and Rights and Justice. Sweden is ranked in the top five positions in the areas of Economic Equality and Purchasing Power and Climate Change; however, in comparison with the remaining scores, these are areas that could be further improved.

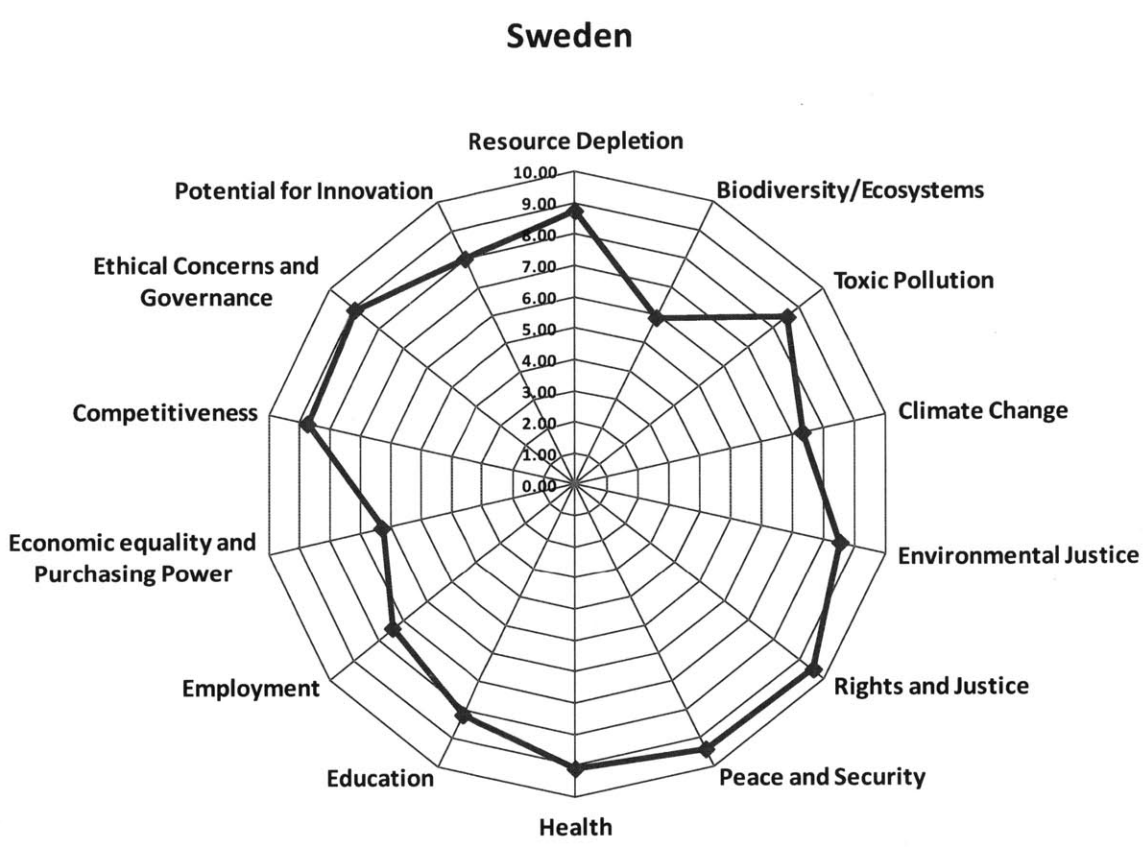


Figure 26: Sweden - Scores per Category

5.5 Germany Scores

Germany has a strong performance in the categories of Biodiversity/Ecosystems, Health, Peace and Security and Resource Depletion (Figure 27). The areas with the lowest scores are Economic Equality and Purchasing power (ranked 11th) and Climate Change (ranked 10th). Furthermore, regarding the enablers, in both categories Germany has a good performance, but this can be further improved taking into account the significance of these factors for the longer-term improvement of the sustainable development.

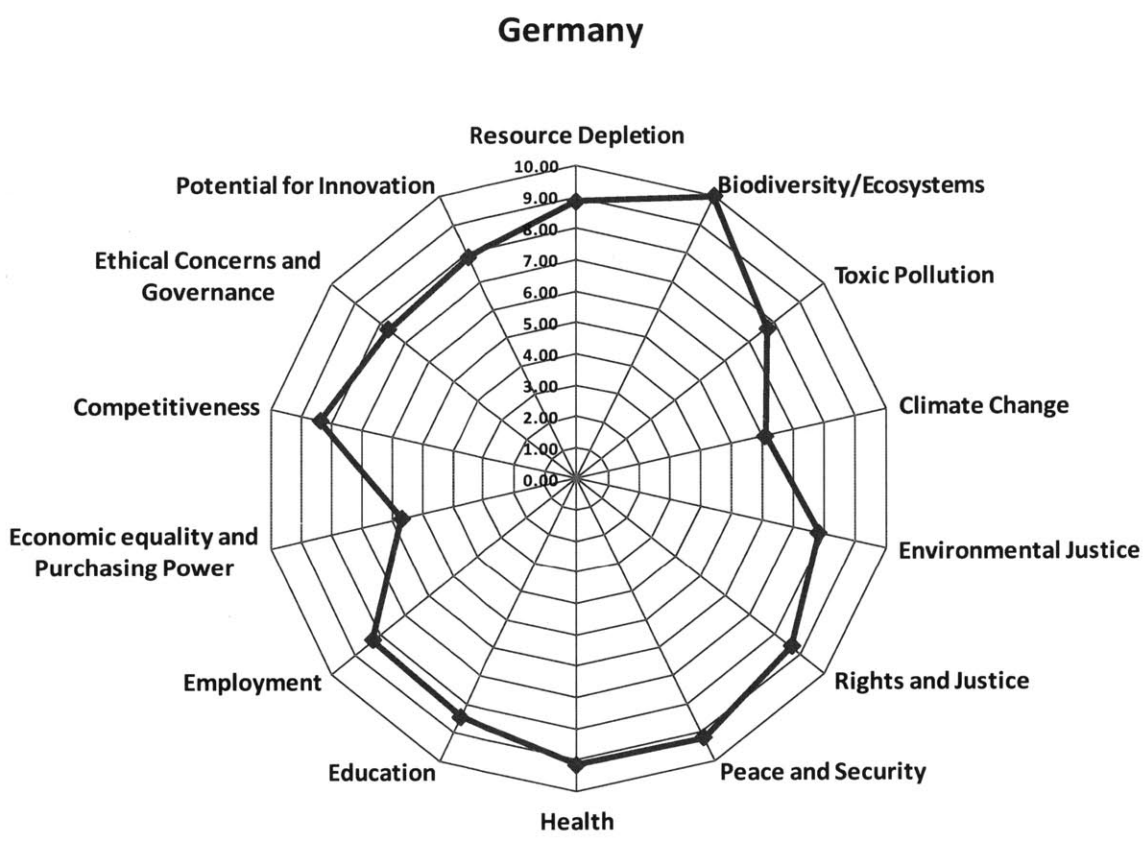


Figure 27: Germany - Scores per Category

5.6 Greece Scores

Greece has a low performance in the categories of Employment, Ethical Concerns and Governance (Figure 28). The fact that the performance in the category of Potential for Innovation is also not satisfactory creates concerns about the potential to significantly improve its performance in terms of sustainable development. The performance in the two enablers (Potential for Innovation, and Ethical Concerns and Governance) affects all the remaining categories, and if there is no significant improvement in those areas then it will not be possible to significantly improve in the long-term performance in the remaining categories.

Figure 28: Greece - Scores per Category

5.7 Poland Scores

Poland has a low score in the Potential for Innovation enabler and a relative good score in the areas of Resource Depletion, and Biodiversity and Ecosystems (Figure 29). As with the case of Greece, the improvement in the area of innovation is crucial in order to move towards a more sustainable state. However, the fact that, in terms of education, Poland scores above average (indicated also by the 23rd position in the ranking) suggests that with specific government measures, the improvement in the area of innovation would be possible to be achieved. The focus should be put also on other areas (e.g., environmental, economic equality and purchasing power, etc.) but the area of Innovation should be a priority.

Figure 29: Poland - Scores per Category

5.8 Russia Scores

Russia faces significant issues in terms of Rights and Justice, Environmental Justice, Climate Change, Ethical Concerns and Governance and Potential for Innovation (Figure 30). The economy of Russia is based on energy (Gas, Oil) and through this industry it achieves an adequate score in employment. However, this is not translated in a high score in the area of Economic Equality and Purchasing Power. It appears that there is a need to further focus on the areas of justice and governance and create the necessary conditions in order to improve also the performance on the areas of innovation and economic equality, without of course adversely affecting the environment.

Figure 30: Russia - Scores per Category

5.9 South Korea Scores

South Korea achieves an average performance in the areas of Potential for Innovation and Ethical Concerns and Governance in which it is ranked 25th and 31st, respectively (Figure 31). Also, it achieves relatively good performance in the areas of Health and Resource Depletion, while in the majority of the remaining categories it is around average - with the exception of Environmental Justice. It is obvious that South Korea has achieved an average performance but in order to move in to more sustainable development, a clear government strategy is required which will encourage innovation and will establish the necessary governance and justice framework.

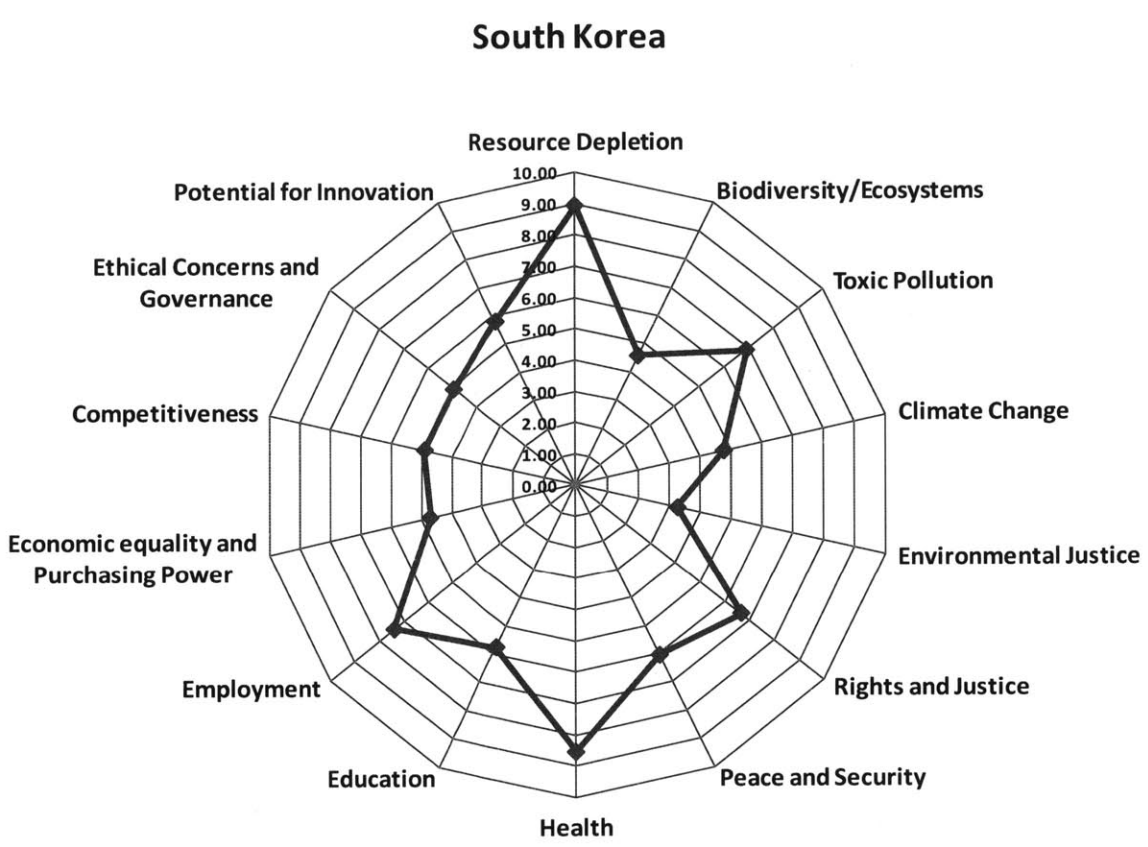


Figure 31: South Korea - Scores per Category

5.10 South Africa Scores

South Africa, in contrast with many other examined countries, has an average performance in some environmental categories (e.g., Biodiversity, Environmental Justice) and in Rights and Justice categories, but is lagging significantly in the areas of Economic Equality and Purchasing Power, Health, Employment, Education, Competitiveness and Ethical Concerns and Governance (Figure 32). Thus, it is obvious that a launch of a comprehensive government roadmap for change is needed for the case of South Africa in order to move towards a more sustainable state.

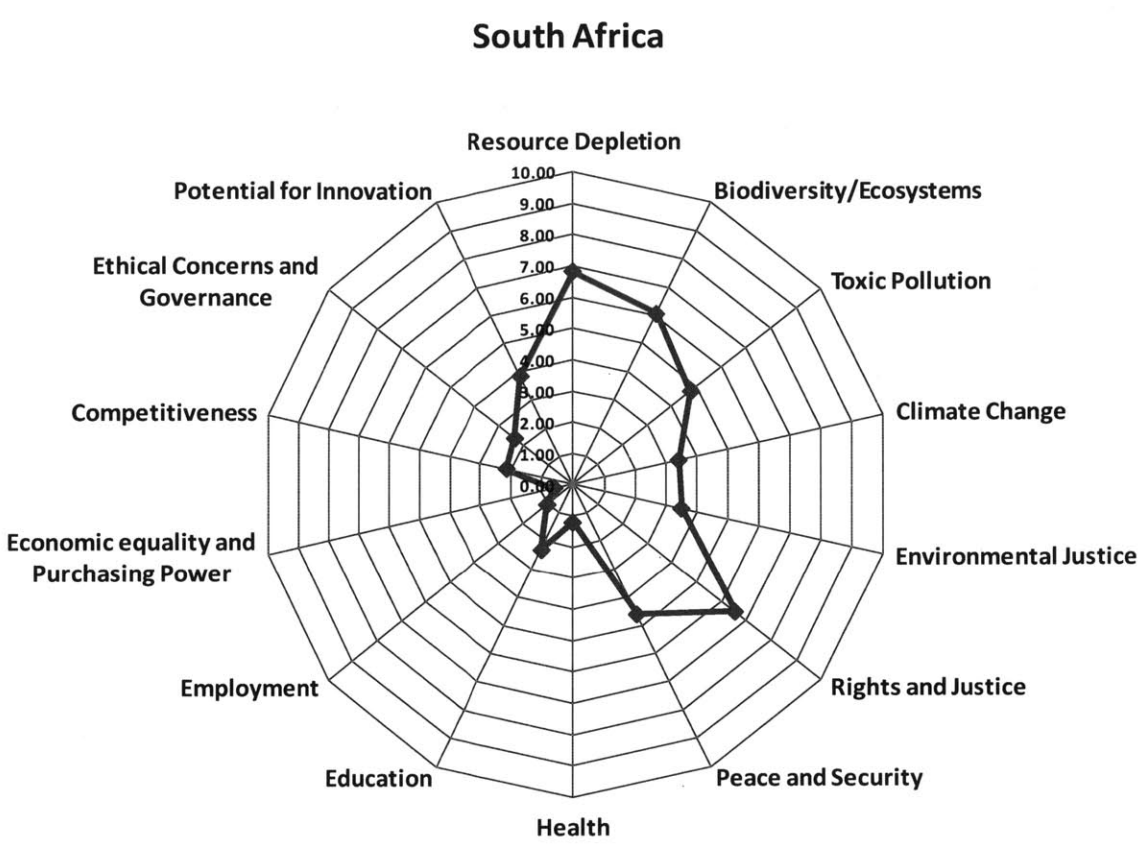


Figure 32: South Africa - Scores per Category

5.11 Priority for Innovation and Ethical Concerns and Governance

As already discussed the areas of Potential for Innovation and Ethical concerns and Governance are considered as enablers and crucial for all the other categories. What is illustrated both by the previous illustrative examples and by Figure 33 is the fact that those two enablers are correlated and thus a government strategy must put equal effort on both elements. Acemoglu and Robinson (2012), in their seminal work *Why Nations Fail*, make the point that what they call "extractive economics" - undemocratic and exploitative economies - eventually do not succeed economically. It is not possible to innovate if the country does not have a satisfactory performance in the category of ethical concerns and governance and thus it is not possible in the

long term to continue to improve all the identified categories of sustainable development. Thus, the focus of the governments, of course, should be both on the individual categories (which could be achieved through their existing specific ministries or government authorities) and on the enablers (innovation, and the ethics and governance) in order to achieve a significant sustainable improvement for the society. Of course, the potential for innovation can be viewed broadly to include technological, institutional, organizational and social innovation (Ashford and Hall, 2011). What Figure 33 shows is the dependence of innovation on ethical concerns and governance, suggesting that economic growth is mediated through innovation.

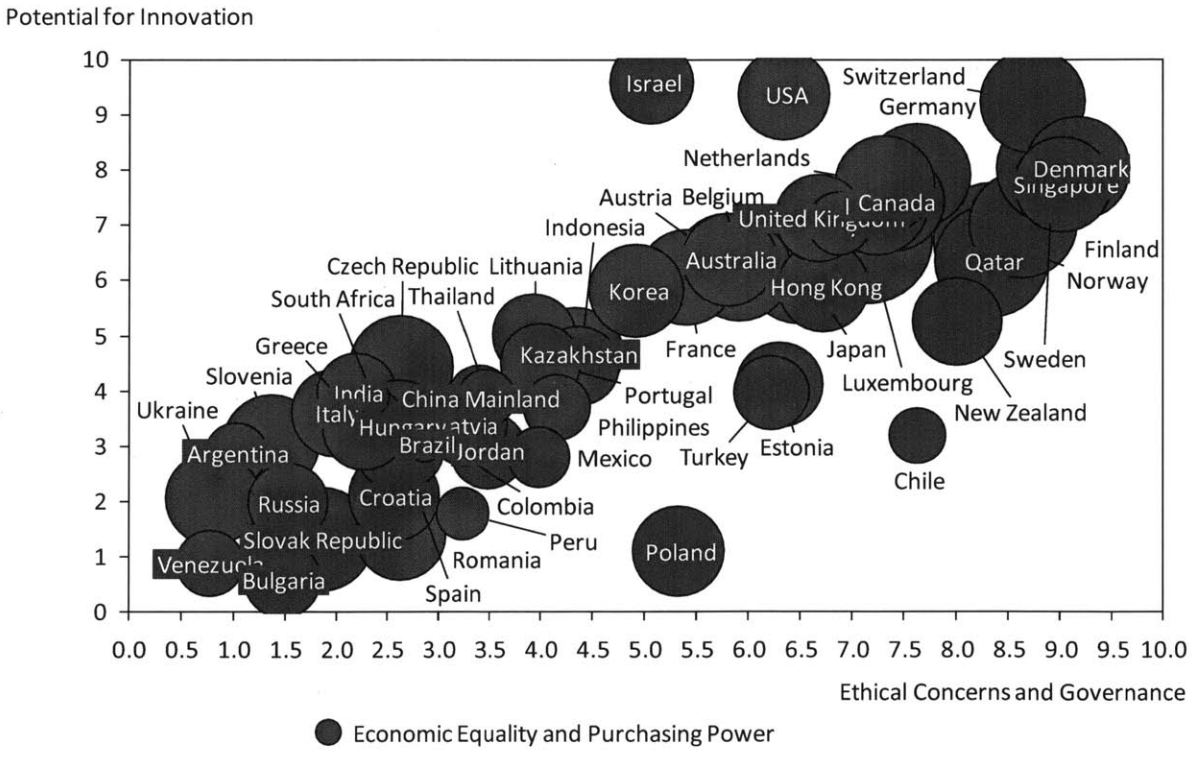


Figure 33: Potential for Innovation and Ethical Concerns and Governance

6. Conclusion

6.1 Final remarks and implications for Government policy

Currently there are various published indexes available that focuses on sustainability. Depending on the organization responsible for the publication, the majority of them have a different focus (e.g., on environment, economy and/or social elements). Based on the assessment conducted in this thesis research, there is no specific index which covers adequately all the elements of sustainable development. Thus, a proposed framework was created to add value to the existing indexes by both combining elements from the best approaches and, perhaps most importantly, by highlighting the importance of the Potential for Innovation and Ethical Concerns and Governance as enablers in order to achieve a more sustainable future state. The innovation and ethical considerations are either missing or are not adequately covered in the majority of the current approaches.

In this thesis, the proposed framework and its constituent indicators were calculated. The main difference between the proposed framework and the majority of the available indexes is the fact that no aggregate ranking (among all categories) was produced since there is to uniformly accepted way to establish specific weights that will be the same for all countries. Each country has different characteristics, values and aspirations, both in terms of economic development but also in terms of cultural landscape and social specific factors which should be taken into consideration in any country's specific assessment, from which policy initiatives might be fashioned. Rodrik (2007) suggests that each country undergo a process of "self-discovery" rather than emulate what another country is doing. Thus, although all categories are important, for specific countries the importance of each category might be different. This is the reason that the proposal emanating from this thesis is to utilize the scores and rankings in each category and

country in order to initiate country specific assessments that are needed when developing appropriate sustainability strategies/policies for each country. However, although it is recognized that the publication of the aggregate results are useful in terms of generating global awareness, this was out of scope for the specific study.

Government and public authorities could utilize both the scores and the rankings in order to create a thorough analysis which will provide significant insights for the country. Also the weights, both of the indicators and of the categories, could be adjusted in order to represent meaningful results for the country. It should be stated that this analysis should be the first step in order to identify the current state and identify the roots of policy inadequacies in order to create a policy roadmap in order to achieve sustainable development for the country.

6.2 Limitations of the study and Implications for future research

Although it was possible to conduct an assessment of the current indexes and propose a new framework, there were specific limitations. The major limitation was related with data issues. One obvious example pertains to the environmental justice category. Data only from 2001could be found. Also, for many countries, there were limited data resulting in a different number of countries being included in each final category. The publicly available data are restricted, especially when the issues covered include more qualitative factors, such as ethical concerns, innovation and other social areas. Thus a global effort in order to focus on the launch and measurement of such indicators could be useful. This effort could be ideally led by a United Nations organization assuring both the diversity of the indicators but also a significant number of countries which will participate.

Taking into account also the time limitations it was not possible to expand the study in order to adapt indicatively the weights and framework for specific countries. This, as discussed, might be the focus of the future research in order to analyze the data in more depth, identify the reasons for good or poor performance, and create a country-specific action plan. Furthermore, future research might focus on the importance of public awareness as a driver, perhaps leading to a simpler index which could be updated per quarter measuring the progress in the main elements of sustainable development.

References

Acemoglu D. and Robinson J. (2012) Chapter 15: "Understanding Prosperity and Poverty" in Why Nations Fail: The Origins of power, Prosperity and Poverty (Crown Publishing Group, New York).

Ashford N. and Hall R. (2011). "Technology, Globalization and Sustainable Development." Yale University Press.

Ashford N. A. and Miller C. S. (1998). Chemical Exposures: Low Levels and High Stakes, Van Nostrand Reinhold, New York.

Ayres R. U. (1978). "Application of physical principles to economics." Resources, Environment and Economics: Applications of the Materials/Energy Balance Principle, A. (ed), ed., Wiley, New York, 37-71.

Baskin L.S., Himes K., et al. (2001). "Hypospadias and Endocrine Disruption: Is there a Connection?" Environmental Health Perspectives 109 (11):1175-1183.

Beal D., Rueda-Sabater E., (2014), "Building Well-Being into National Strategies- The 2014 Sustainable Economic Development Assessment", The Boston Consulting Group, February 2014.

Beal D., Rueda-Sabater E., Santo T.E. (2012), "From Wealth to Well Being- Introducing the BCG Sustainable Economic Development Assessment", The Boston Consulting Group, November 2012.

Carson R. (1962). Silent Spring, Houghton Mifflin Company, New York.

Cash, D.W., Clark, W.C., Alcock, F., Dickson, N.M., Eckley, N., Guston, D.H., Jaer, J.,Mitchell, R.B., (2003). "Knowledge systems for sustainable development". Proc. Natl.Acad. Sci. 100 (14), 8086–8091.

Ebioli. F. (2013). "Envisioning future sustainability: the FEEM SI approach", International Conference on Methodologies and Indicators for Green Growth Measurement, FEEM, Milan, 12th November 2013.

EIRIS Country Sustainability Ratings (2012). "EIRIS Country Sustainability Ratings", Leaflet downloaded at www.eiris.org.

EPI (2012)."2012 EPI. Environmental Performance Index andPilot Trend Environmental Performance Index", Yale Center for Environmental Law and Policy, Yale University and Center for International Earth Science Information Network, Columbia University.

Esty D., Porter M., (2001), "Ranking National Environmental Regulation and Performance: A Leading Indicator of Future Competitiveness?" in The Global Competitiveness Report 2001 (Michael E. Porter and Jeffrey Sachs, et al.), New York: Oxford University Press (2001).

Eurostat (2013), "Eurostat News release Euroindicators- August 2013 Euro area unemployment rate at 12.0%, EU28 at 10.9%", 140/2013 - 1 October 2013.

Happy Planet Index (2012). "The Happy Planet Index: 2012 Report. A global Index of sustainable Well-Being" nef, the new economics foundation.

Hardi, P., and Zdan, T. (1997)."Assessing Sustainable Development: Principles in Practice." The International Institute for Sustainable Development (IISD), Manitoba.

Hardin, G. (1968). "Tragedy of the Commons." Science, 162, 1243-1248.

Holden Meg, (2013), "Sustainability indicator systems within urban governance: Usability analysis of sustainability indicator systems as boundary objects", Ecological indicators, 32, 2013, 89-96

IMD (2013), " IMD World Competitiveness Yearbook" Lausanne, Switzerland.

INCRA (2012). "Country Ratings Report. INCRA- An International Non-Profit Credit Rating Agency" Bertelsmann Stiftung and Bertelsmann Foundation, November 2012

International Climate Change Task Force. (2005). Meeting the Climate Change Challenge: Recommendations of the International Climate Change Taskforce. London, Institute for Public Policy Research.

McCally, M. (1999). Life Support: The Environment and Human Health, The MIT Press, Cambridge.

Meadows, D. H., Meadows, D. L., Randers, J., and Behrens, W. W. (1972).The Limits to Growth, Potomac Associates, New York.

Pronk, J., and ul Haq, M. (1992)."Sustainable Development: From Concept to Action. The Hague Report." United Nations Development Program, New York.

Rodrik Dani. (2007). Chapter 4: "Industrial Policy for the Twenty-first Century, in One Economics: Many Recipes" Princeton University Press, pp. 99-152.

Schmidheiny, S. (1992). "Changing Course: A Global Business Perspective on Development and the Environment", The MIT Press, Cambridge.

Solomon, G. M., and Schettler, T. (1999). "Environmental Endocrine Disruption." Life Support: TheEnvironment and Human Health, M. McCally, ed., The MIT Press, Cambridge, 147-162.

Solow, R. M. (1993). "Economics of the Environment: Selected Readings." R. a. D. Dorfman, N. S., ed., W. W. Norton & Company, New York, 179-187.

UNEP (1982c). The state of the Environment, 1972-1982, Nairobi, UNEP.

Van de Kerk G., Manuel A. (2012). "Sustainable Society Index 2012", Sustainable Society Foundation.

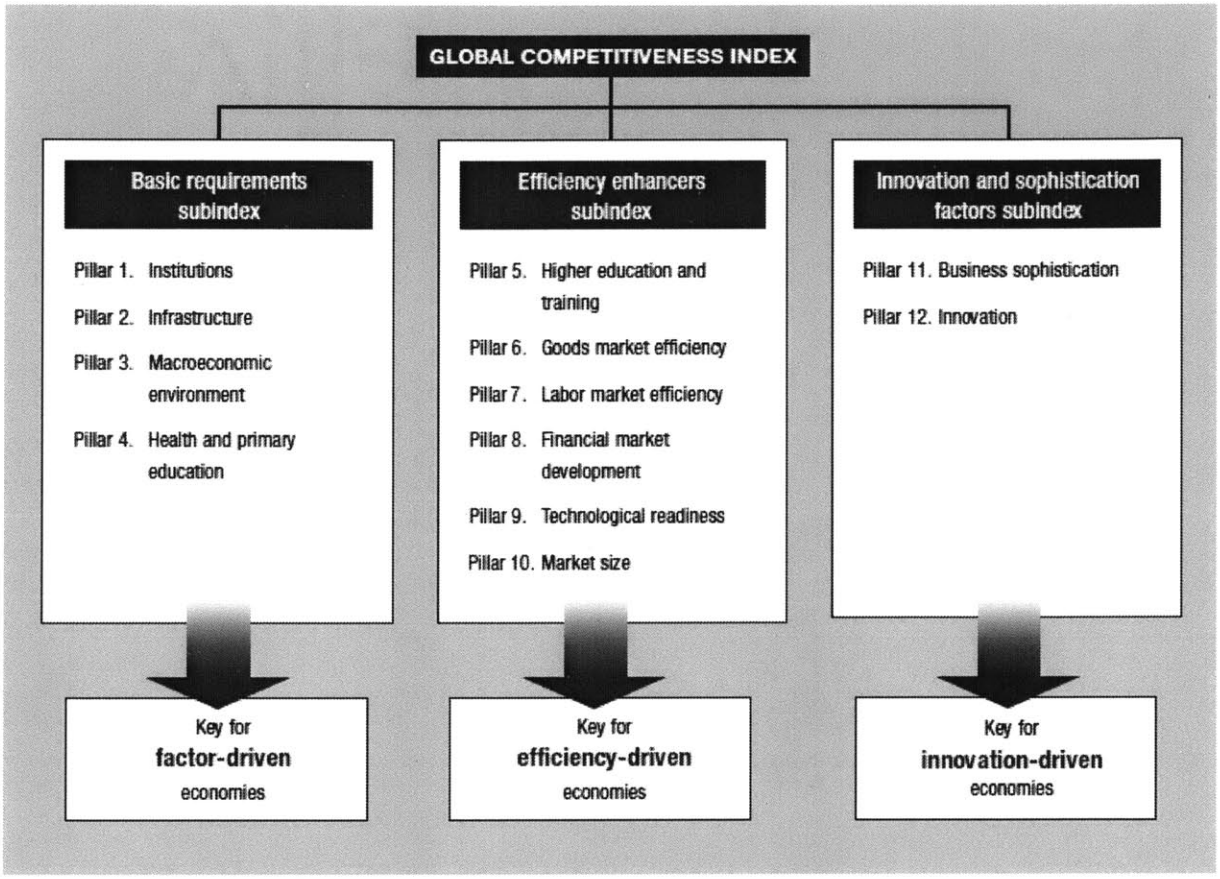
World Commission on Environment and Development (WCED).(1987). Our Common Future, Oxford, University Press, Oxford.

World Economic Forum.(2013). "The Global Competitiveness Report2013–2014", Geneva, 2013.

www.oecdbetterlifeindex.org Retrieved 4/4/2014.

www.socialprogressimperative.org Retrieved 4/4/2014.

Appendix



Source: World Economic Forum (2013).

Figure A1: Global Competitiveness Index Pillars

Social sustainability pillar

- S01 Income Gini index*
- S02 Youth unemployment*
- S03 Access to sanitation*[d](log)
- S04 Access to improved drinking water*[d]
- S05 Access to healthcare[d]
- S06 Social safety net protection
- S07 Extent of informal economy
- S08 Social mobility
- S09 Vulnerable employment*

Environmental sustainability pillar

S10 Stringency of environmental regulation[e]
S11 Enforcement of environmental regulation[e]
S12 Terrestrial biome protection*
S13 No. of ratified international environmental treaties*
S14 Agricultural water intensity*
S15 CO_2 intensity*(log)
S16 Fish stocks overexploited*(log)
S17 Forest cover change*
S18 Particulate matter (2.5) concentration*(log)
S19 Quality of the natural environment

Source: World Economic Forum (2013).

Figure A2: Social and Economic sustainability pillars

Table A1: Description and Source of indicators

Areas and Indicators	Source	Description
Economic equality and purchasing power		
Gini index	IMD World Competitiveness Yearbook	Equal distribution of income scale: 0 (absolute equality) to 100 (absolute inequ
GDP per capita	IMD World Competitiveness Yearbook	GDP PPP per capita- US$
Income distribution- Lowest 10%	IMD World Competitiveness Yearbook	Percentage of household incomes going to lowest 10% of households
Employment		
Unemployment	IMD World Competitiveness Yearbook	Percentage of labor force
Youth Unemployment	IMD World Competitiveness Yearbook	Percentage of youth labor force (under the age of 25)
Labour Relations	IMD World Competitiveness Yearbook	Labor relations are generally productive
Corporate Values	IMD World Competitiveness Yearbook	Corporate values take into account the values of employees
Competitiveness		
Basic Infrastructure	IMD World Competitiveness Yearbook	Basic Infrastructure
Total infrastructure	IMD World Competitiveness Yearbook	Total infrastructure (Basic, Technological, Scientific)
Large corporations	IMD World Competitiveness Yearbook	Large corporations are efficient by international standards
Small and medium size corporations	IMD World Competitiveness Yearbook	Small and medium-size enterprises are efficient by international standards
Education		
Quality of the educational system	IMD World Competitiveness Yearbook	The educational system meets the needs of a competitive economy
University Education	IMD World Competitiveness Yearbook	University education meets the needs of a competitive economy
Pupil-teacher ratio	IMD World Competitiveness Yearbook	Ratio of students to teaching staff - Secondary Education
Illiteracy (%)	IMD World Competitiveness Yearbook	Adult (over 15 years) illiteracy rate as a percentage of population
Health		
Life expectancy at birth	IMD World Competitiveness Yearbook	Average Estimate
Health infrastructure meets the needs of society	IMD World Competitiveness Yearbook	Health infrastructure meets the needs of society
Mortality rate, under age 5	IMD World Competitiveness Yearbook	Under five mortality rate per 1000 live births
Peace and Security		
Political stability and absence of violence/terrorism	IMD World Competitiveness Yearbook	The risk of political instability is very low
Murders	UNODC	UNODC Homicide
Personal security and private property rights	IMD World Competitiveness Yearbook	Personal security and private property rights are adequately protected
Rights and justice		
Civil liberties	Freedom House	Civil liberties
Political rights	Freedom House	Poltical Rights
Justice	IMD World Competitiveness Yearbook	Justice is fairly administered
Equal rights	IMD World Competitiveness Yearbook	Equal opportunity legislation in your economy encourages economic developm
Social cohesion	IMD World Competitiveness Yearbook	Social cohesion is improving (survey based)

Environmental Justice		
Environmental protection	Esty D. And Porter M. (2001)	Environmental Regulatory Regime Index
Climate Change		
CO2 Emissions	IMD World Competitiveness Yearbook	Per one million of GDP
Green Technologies	IMD World Competitiveness Yearbook	Renewable technologies are quickly turned into competitive advantages
Renewable Energy	IMD World Competitiveness Yearbook	Share of renewables in total energy requirements, %
Toxic Pollution		
Air pollution	Environmental Performance Index	Air Quality
Water quality	Environmental Performance Index	Access to drinking water
Access to Sanitation	Environmental Performance Index	Access to Sanitation
Waste generation per capita	OECD Factbook: Econ., Env. and Social Statistics	MSW Generation Per Capita
Biodiversity/Ecosystems		
Biodiversity	Environmental Performance Index	Biodiversity and Habitat index
Resource Depletion		
Water use intensity	UN Millenium development Goals Database	Proportion of total water resources used
Change in Forest cover	Environmental Performance Index	Change in Forest Cover
Energy use	UN Millenium development Goals Database	Energy use (kg oil equivalent) per $1000 GDP
Paper and cardboard recycling rate	IMD World Competitiveness Yearbook	Paper and cardboard recycling rate
Potential for Innovation		
Innovative capacity of firms	IMD World Competitiveness Yearbook	Innovative capacity of firms is high in your economy
Scientific research legislation	IMD World Competitiveness Yearbook	Laws relating to scientific research do encourage innovation
Researchers and scientists	IMD World Competitiveness Yearbook	Researchers and scientists are attracted to your country
Ethical concerns and governance		
Bribery and corruption	IMD World Competitiveness Yearbook	Bribing and corruption do not exist
Government effectiveness	IMD World Competitiveness Yearbook	Government decisions are effectively implemented
Transparency of government policymaking	IMD World Competitiveness Yearbook	Transparency of government policy is satisfactory
Social Responsibility	IMD World Competitiveness Yearbook	Social responsibility of business leaders is high

Table A2: Water Use Intensity- Resource Depletion Category

Ranking	Water use intensity	Score
1	Iceland	25.0
2	Colombia	25.0
3	Croatia	25.0
4	Norway	25.0
5	Brazil	25.0
6	Venezuela	25.0
7	Peru	24.9
8	Slovenia	24.9
9	Latvia	24.9
10	New Zealand	24.9
11	Russian Federation	24.9
12	Sweden	24.9
13	Malaysia	24.9
14	Luxembourg	24.9
15	Finland	24.9
16	Slovakia	24.8
17	Chile	24.8
18	Argentina	24.7

19	Romania	24.7
20	Australia	24.7
21	Austria	24.7
22	Switzerland	24.6
23	Hungary	24.6
24	Indonesia	24.6
25	Netherlands	24.3
26	United Kingdom	24.2
27	Denmark	24.2
28	Lithuania	24.2
29	Estonia	24.2
30	Portugal	24.1
31	Greece	24.1
32	Thailand	24.0
33	Czech Republic	24.0
34	Ukraine	24.0
35	France	23.9
36	United States	23.9
37	Mexico	23.8
38	Philippines	23.7
39	Kazakhstan	23.7
40	China	23.6
41	Turkey	23.5
42	Japan	23.5
43	Poland	23.5
44	Italy	23.2
45	South Africa	23.2
46	Germany	23.1
47	Bulgaria	23.0
48	India	22.6
49	Spain	22.6
50	Korea, Republic of	22.3
51	Belgium	21.9
52	Israel	18.6
53	Jordan	18.3
54	Qatar	0.0

Table A3: Change in Forest Cover- Resource Depletion Category

Ranking	Change in Forest Cover	Score
1	Australia	25.0
2	Chile	25.0
3	Hungary	25.0
4	Ireland	25.0
5	New Zealand	25.0
6	South Africa	25.0
7	Bulgaria	24.6
8	Kazakhstan	24.4
9	Croatia	24.1
10	Poland	24.0
11	Italy	23.9
12	Japan	23.9
13	Turkey	23.8
14	Switzerland	23.8
15	Taiwan	23.8
16	Czech Republic	23.6
17	Romania	23.6
18	Slovenia	23.6
19	Spain	23.6
20	United Kingdom	23.6
21	France	23.5
22	India	23.4
23	Russia	23.4
24	Korea	23.4
25	Luxembourg	23.4
26	Netherlands	23.4
27	Venezuela	23.4
28	Norway	23.3
29	Peru	23.3
30	Ukraine	23.3
31	Germany	23.3
32	Philippines	23.3
33	Colombia	23.2
34	China	23.2
35	Thailand	23.2
36	Belgium	23.1
37	Lithuania	23.1

38	Greece	23.1
39	Slovakia	23.1
40	Austria	23.0
41	Mexico	23.0
42	Denmark	23.0
43	Canada	22.9
44	Sweden	22.9
45	United States of America	22.9
46	Finland	22.8
47	Brazil	22.8
48	Estonia	22.8
49	Indonesia	22.7
50	Portugal	22.7
51	Latvia	22.6
52	Malaysia	22.6
53	Argentina	22.5
54	Iceland	0.0
55	Israel	0.0
56	Jordan	0.0
57	Qatar	0.0
58	Singapore	0.0
59	UAE	0.0

Table A4: Energy Use - Resource Depletion Category

Ranking	Energy use	Score
1	Peru	25.0
2	Colombia	24.8
3	Switzerland	24.5
4	Ireland	24.4
5	United Kingdom	23.8
6	Greece	23.6
7	Portugal	23.6
8	Spain	23.6
9	Italy	23.5
10	Denmark	23.3
11	Austria	22.9
12	Turkey	22.9
13	Israel	22.8
14	Germany	22.7

15	Croatia	22.5
16	Luxembourg	22.5
17	Philippines	22.5
18	Chile	22.4
19	Singapore	22.4
20	Japan	22.3
21	Mexico	22.3
22	Brazil	21.7
23	Lithuania	21.7
24	Netherlands	21.7
25	France	21.6
26	Slovenia	21.4
27	Norway	21.3
28	Hungary	20.8
29	Latvia	20.8
30	Romania	20.8
31	Poland	20.7
32	Sweden	20.3
33	Argentina	20.3
34	Australia	20.1
35	Slovakia	20.1
36	Belgium	19.7
37	United States	19.7
38	New Zealand	19.7
39	Czech Republic	19.3
40	Qatar	19.0
41	India	18.9
42	Malaysia	18.8
43	Korea, Republic of	18.7
44	United Arab Emirates	18.3
45	Bulgaria	17.7
46	Canada	17.4
47	Finland	17.0
48	Thailand	16.8
49	Indonesia	16.7
50	Jordan	16.5
51	Venezuela	15.6
52	Estonia	15.3
53	China	14.3

54	South Africa	13.0
55	Russian Federation	9.6
56	Kazakhstan	5.4
57	Ukraine	2.5
58	Iceland	0.0

Table A5: Paper and cardboard recycling rate - Resource Depletion Category

Ranking	Recycling	Score
1	Korea	25.0
2	Netherlands	23.8
3	Finland	22.4
4	Portugal	21.5
5	Switzerland	21.5
6	Lithuania	21.3
7	Ireland	19.8
8	Germany	19.4
9	Poland	19.4
10	Sweden	19.2
11	Luxembourg	18.4
12	Slovenia	17.9
13	United Kingdom	17.9
14	Estonia	16.7
15	Romania	16.7
16	Austria	16.6
17	Japan	16.6
18	Australia	16.6
19	Spain	16.3
20	USA	16.3
21	New Zealand	16.0
22	Taiwan	15.9
23	Belgium	15.8
24	Hong Kong	15.3
25	Slovak Republic	15.1
26	Norway	15.0
27	Denmark	14.6
28	France	14.2
29	Italy	13.5
30	Czech Republic	12.7

31	Bulgaria	12.2
32	Hungary	11.4
33	Canada	10.3
34	Turkey	9.0
35	Brazil	8.7
36	Jordan	8.5
37	Greece	8.0
38	Croatia	7.6
39	Colombia	7.6
40	South Africa	6.8
41	Malaysia	4.8
42	Russia	3.1
43	Iceland	0.1
44	Mexico	0.0
45	Kazakhstan	0.0

Table A6: Air Pollution – Toxic Pollution Category

Ranking	Air pollution	Scores
1	Argentina	25.00
2	Venezuela	24.81
3	Australia	24.60
4	Finland	24.60
5	Iceland	24.60
6	Ireland	24.60
7	New Zealand	24.60
8	Norway	24.60
9	Singapore	24.60
10	Portugal	24.48
11	Canada	24.45
12	Brazil	24.38
13	Spain	24.30
14	Sweden	24.22
15	Chile	24.12
16	United States of America	24.00
17	Latvia	23.96
18	Estonia	23.94
19	Kazakhstan	23.85
20	United Kingdom	23.82
21	Colombia	23.59

22	South Africa	23.38
23	Russia	23.37
24	Denmark	22.89
25	Malaysia	22.19
26	France	21.85
27	Mexico	21.12
28	UAE	20.93
29	Greece	20.74
30	Lithuania	20.50
31	Japan	20.41
32	Ukraine	20.40
33	Turkey	20.18
34	Peru	20.06
35	Jordan	19.70
36	Luxembourg	19.54
37	Philippines	19.40
38	Italy	19.19
39	Israel	18.79
40	Germany	18.46
41	Slovenia	18.35
42	Bulgaria	18.07
43	Qatar	17.94
44	Croatia	17.90
45	Switzerland	17.86
46	Austria	17.83
47	Taiwan	17.81
48	Netherlands	17.56
49	Indonesia	17.48
50	Czech Republic	17.07
51	Slovakia	16.80
52	Poland	16.06
53	Hungary	15.91
54	Belgium	15.77
55	Romania	15.49
56	Thailand	15.11
57	Korea	13.43
58	India	1.37
59	China	0.00

Table A7: Water Quality – Toxic Pollution Category

Ranking	Water Quality	Scores
1	Australia	25.00
2	Austria	25.00
3	Belgium	25.00
4	Denmark	25.00
5	Finland	25.00
6	France	25.00
7	Germany	25.00
8	Hungary	25.00
9	Iceland	25.00
10	Israel	25.00
11	Italy	25.00
12	Japan	25.00
13	Luxembourg	25.00
14	Netherlands	25.00
15	New Zealand	25.00
16	Norway	25.00
17	Qatar	25.00
18	Singapore	25.00
19	Slovakia	25.00
20	Sweden	25.00
21	Switzerland	25.00
22	Taiwan	25.00
23	United Kingdom	25.00
24	Spain	24.60
25	Ireland	23.78
26	Czech Republic	23.50
27	Canada	23.43
28	Greece	23.08
29	Turkey	22.94
30	Portugal	22.59
31	UAE	22.30
32	Malaysia	22.02
33	Slovenia	22.01
34	Bulgaria	21.32
35	Argentina	19.86
36	United States of America	17.85
37	Estonia	17.82

38	Croatia	17.03
39	Chile	16.84
40	Latvia	16.51
41	Poland	15.25
42	Ukraine	15.12
43	Korea	14.58
44	Brazil	13.23
45	Russia	12.76
46	Jordan	11.00
47	Thailand	10.40
48	Kazakhstan	8.84
49	Mexico	8.31
50	Colombia	6.47
51	Venezuela	6.45
52	Philippines	5.90
53	Lithuania	5.47
54	China	5.20
55	India	5.15
56	South Africa	5.02
57	Romania	2.05
58	Peru	0.54
59	Indonesia	0.00

Table A8: Access to Sanitation – Toxic Pollution Category

Ranking	Access to Sanitation	Scores
1	Australia	25.00
2	Austria	25.00
3	Belgium	25.00
4	Bulgaria	25.00
5	Denmark	25.00
6	Finland	25.00
7	France	25.00
8	Germany	25.00
9	Iceland	25.00
10	Israel	25.00
11	Japan	25.00
12	Korea	25.00
13	Luxembourg	25.00
14	Netherlands	25.00
15	Norway	25.00

16	Portugal	25.00
17	Qatar	25.00
18	Singapore	25.00
19	Slovenia	25.00
20	Sweden	25.00
21	Switzerland	25.00
22	Taiwan	25.00
23	United Kingdom	25.00
24	Hungary	25.00
25	Czech Republic	24.97
26	Spain	24.94
27	Canada	23.94
28	Slovakia	23.63
29	United States of America	22.94
30	Ireland	20.79
31	Chile	20.07
32	Greece	19.86
33	Croatia	18.86
34	Jordan	18.59
35	Estonia	18.27
36	UAE	17.57
37	Kazakhstan	17.17
38	Argentina	15.74
39	Malaysia	15.00
40	Ukraine	13.62
41	Thailand	12.93
42	Turkey	11.25
43	Venezuela	11.18
44	Poland	10.33
45	New Zealand	9.69
46	Lithuania	9.11
47	Mexico	8.34
48	Brazil	7.06
49	Latvia	6.43
50	Colombia	6.32
51	Italy	5.55
52	Philippines	5.36
53	South Africa	5.32
54	Romania	4.92

55	Peru	4.81
56	Russia	4.58
57	China	3.62
58	Indonesia	2.64
59	India	0.00

Table A9: Waste generation per capita – Toxic Pollution Category

Ranking	Waste generation per capita	Scores
1	China	25.00
2	Poland	19.71
3	Slovak Republic	18.98
4	Czech Republic	18.25
5	Mexico	16.62
6	Korea	15.88
7	Canada	14.60
8	Turkey	14.23
9	Japan	14.05
10	South Africa	13.87
11	Greece	13.14
12	Russian Federation	13.14
13	Portugal	12.96
14	Hungary	12.04
15	Belgium	11.68
16	Finland	11.13
17	Sweden	11.13
18	France	9.67
19	Italy	9.12
20	Iceland	8.76
21	Germany	8.58
22	Austria	7.85
23	United Kingdom	7.85
24	Spain	7.30
25	Netherlands	6.39
26	Luxembourg	4.38
27	Switzerland	3.65
28	Denmark	2.19
29	United States	1.46
30	Ireland	0.01
31	Norway	0.00

Table A10: CO2 Emissions – Climate Change

Ranking	CO2 Emissions	Score
1	Switzerland	33.33
2	Norway	33.08
3	Sweden	32.92
4	France	32.26
5	Denmark	32.08
6	Iceland	32.03
7	Brazil	31.53
8	Hong Kong	31.52
9	Austria	31.50
10	Ireland	31.43
11	Spain	31.31
12	Italy	31.30
13	Luxembourg	31.18
14	Japan	31.05
15	Portugal	31.01
16	Colombia	30.99
17	United Kingdom	30.95
18	New Zealand	30.85
19	Belgium	30.74
20	Germany	30.65
21	Netherlands	30.48
22	Finland	30.02
23	Singapore	29.92
24	Peru	29.90
25	Greece	29.66
26	Australia	29.29
27	Israel	29.19
28	Chile	29.05
29	Croatia	29.00
30	Slovenia	28.97
31	Canada	28.84
32	Latvia	28.77
33	Turkey	28.30
34	Lithuania	28.24
35	USA	28.16
36	Hungary	27.95
37	Philippines	27.94

38	Slovak Republic	27.60
39	Mexico	27.59
40	Romania	26.60
41	Argentina	26.57
42	Venezuela	26.46
43	Qatar	25.68
44	UAE	25.10
45	Korea	24.88
46	Czech Republic	24.51
47	Indonesia	24.45
48	Taiwan	23.53
49	Poland	23.19
50	Jordan	22.22
51	Malaysia	21.42
52	Thailand	20.90
53	Bulgaria	18.42
54	India	17.85
55	South Africa	17.77
56	Estonia	17.42
57	Russia	16.31
58	China Mainland	13.11
59	Kazakhstan	6.87
60	Ukraine	0.00

Table A11: Green Technologies – Climate Change

Ranking	Green Technologies	Score
1	Denmark	33.33
2	Iceland	28.51
3	Sweden	26.59
4	Germany	26.29
5	Portugal	26.26
6	Japan	25.57
7	UAE	25.15
8	Malaysia	24.72
9	Spain	23.44
10	Ireland	22.86
11	Austria	22.83
12	Israel	22.64
13	Korea	22.63

14	Norway	22.49
15	Netherlands	22.34
16	Switzerland	22.30
17	Luxembourg	22.00
18	Taiwan	21.87
19	Canada	21.51
20	Belgium	21.38
21	Singapore	20.48
22	Finland	20.39
23	Italy	20.21
24	Greece	19.96
25	Qatar	19.76
26	Thailand	19.60
27	New Zealand	19.43
28	Poland	19.20
29	Lithuania	18.44
30	France	17.90
31	USA	16.92
32	United Kingdom	16.58
33	Czech Republic	15.83
34	Indonesia	15.83
35	India	15.75
36	Mexico	15.73
37	Hong Kong	15.48
38	Australia	15.24
39	China Mainland	14.37
40	Slovenia	14.35
41	Estonia	14.33
42	Turkey	14.13
43	Brazil	13.33
44	Chile	13.31
45	Jordan	12.84
46	Philippines	12.35
47	South Africa	12.31
48	Slovak Republic	11.53
49	Colombia	11.39
50	Latvia	10.78
51	Peru	10.16
52	Kazakhstan	9.60
53	Croatia	9.58
54	Ukraine	9.45

55	Hungary	8.52
56	Bulgaria	6.64
57	Argentina	4.43
58	Romania	3.97
59	Russia	0.52
60	Venezuela	0.00

Table A12: Renewable Energy – Climate Change

Ranking	Renewable Energy	Score
1	Iceland	33.33
2	Brazil	17.73
3	Philippines	16.08
4	New Zealand	15.75
5	Norway	14.57
6	Latvia	14.38
7	Indonesia	13.93
8	Sweden	13.72
9	Austria	10.83
10	India	10.62
11	Finland	10.24
12	Peru	10.17
13	Portugal	9.40
14	Chile	8.88
15	Colombia	8.51
16	Denmark	8.20
17	Thailand	7.94
18	Switzerland	7.68
19	Canada	6.89
20	Romania	6.73
21	Lithuania	6.20
22	Estonia	6.14
23	Slovenia	5.99
24	Croatia	5.36
25	Spain	4.76
26	China Mainland	4.68
27	Turkey	4.47
28	South Africa	4.31
29	Italy	4.28
30	Germany	4.01
31	Venezuela	3.97

32	Mexico	3.96
33	Bulgaria	3.24
34	France	3.22
35	Slovak Republic	3.14
36	Greece	3.13
37	Hungary	3.08
38	Argentina	2.91
39	Poland	2.90
40	Czech Republic	2.54
41	USA	2.28
42	Australia	2.22
43	Malaysia	2.20
44	Israel	2.03
45	Ireland	1.84
46	Belgium	1.69
47	Netherlands	1.51
48	United Kingdom	1.35
49	Japan	1.35
50	Luxembourg	1.27
51	Russia	1.02
52	Ukraine	0.80
53	Jordan	0.75
54	Taiwan	0.49
55	Kazakhstan	0.40
56	Korea	0.28
57	Singapore	0.25
58	Hong Kong	0.16
59	UAE	0.01
60	Qatar	0.00

Table A13: Civil Liberties – Rights and Justice

Ranking	Civil liberties	Score
1	Australia	25.00
2	Austria	25.00
3	Belgium	25.00
4	Canada	25.00
5	Chile	25.00
6	Czech Republic	25.00
7	Denmark	25.00
8	Estonia	25.00
9	Finland	25.00

10	France	25.00
11	Germany	25.00
12	Iceland	25.00
13	Ireland	25.00
14	Italy	25.00
15	Japan	25.00
16	Lithuania	25.00
17	Luxembourg	25.00
18	Netherlands	25.00
19	New Zealand	25.00
20	Norway	25.00
21	Poland	25.00
22	Portugal	25.00
23	Slovakia	25.00
24	Slovenia	25.00
25	Spain	25.00
26	Sweden	25.00
27	Switzerland	25.00
28	United Kingdom	25.00
29	United States	25.00
30	Argentina	20.00
31	Brazil	20.00
32	Bulgaria	20.00
33	Croatia	20.00
34	Greece	20.00
35	Hungary	20.00
36	Israel	20.00
37	Korea	20.00
38	Latvia	20.00
39	Romania	20.00
40	South Africa	20.00
41	Taiwan	20.00
42	India	15.00
43	Mexico	15.00
44	Peru	15.00
45	Philippines	15.00
46	Ukraine	15.00
47	Colombia	10.00
48	Indonesia	10.00
49	Malaysia	10.00
50	Singapore	10.00

51	Thailand	10.00
52	Turkey	10.00
53	Jordan	5.00
54	Kazakhstan	5.00
55	Qatar	5.00
56	Russia	5.00
57	Venezuela	5.00
58	China	0.00
59	UAE	0.00

Table A14: Political Rights – Rights and Justice

Ranking	Political Rights	Score
1	Australia	25.00
2	Austria	25.00
3	Belgium	25.00
4	Canada	25.00
5	Chile	25.00
6	Croatia	25.00
7	Czech Republic	25.00
8	Denmark	25.00
9	Estonia	25.00
10	Finland	25.00
11	France	25.00
12	Germany	25.00
13	Hungary	25.00
14	Iceland	25.00
15	Ireland	25.00
16	Israel	25.00
17	Italy	25.00
18	Japan	25.00
19	Lithuania	25.00
20	Luxembourg	25.00
21	Netherlands	25.00
22	New Zealand	25.00
23	Norway	25.00
24	Poland	25.00
25	Portugal	25.00
26	Slovakia	25.00
27	Slovenia	25.00
28	Spain	25.00

29	Sweden	25.00
30	Switzerland	25.00
31	Taiwan	25.00
32	United Kingdom	25.00
33	United States	25.00
34	Argentina	20.83
35	Brazil	20.83
36	Bulgaria	20.83
37	Greece	20.83
38	India	20.83
39	Indonesia	20.83
40	Korea	20.83
41	Latvia	20.83
42	Peru	20.83
43	Romania	20.83
44	South Africa	20.83
45	Colombia	16.67
46	Mexico	16.67
47	Philippines	16.67
48	Turkey	16.67
49	Malaysia	12.50
50	Singapore	12.50
51	Thailand	12.50
52	Ukraine	12.50
53	Venezuela	8.33
54	Jordan	4.17
55	Kazakhstan	4.17
56	Qatar	4.17
57	Russia	4.17
58	UAE	4.17
59	China	0.00

Table A15: Justice – Rights and Justice

Ranking	Justice	Score
1	Denmark	30.00
2	Norway	28.60
3	Sweden	28.58
4	Finland	28.10
5	Singapore	27.29
6	Canada	27.09
7	United	27.04

	Kingdom	
8	Switzerland	26.80
9	Australia	26.80
10	Hong Kong	26.42
11	Netherlands	26.26
12	Germany	25.98
13	Ireland	25.40
14	New Zealand	25.27
15	UAE	25.15
16	Luxembourg	24.53
17	France	24.23
18	Japan	24.06
19	USA	23.62
20	Israel	23.48
21	Qatar	23.17
22	Iceland	22.54
23	Belgium	22.48
24	Austria	21.29
25	Malaysia	21.28
26	Thailand	18.78
27	South Africa	18.45
28	Chile	18.19
29	Taiwan	17.77
30	Estonia	17.44
31	Poland	16.98
32	India	16.39
33	Korea	16.07
34	Jordan	15.32
35	Latvia	14.67
36	Lithuania	13.71
37	Hungary	13.55
38	Brazil	13.31
39	Czech Republic	13.29
40	Greece	13.20
41	Romania	12.71
42	Philippines	12.44
43	Kazakhstan	12.43
44	Indonesia	12.23
45	Croatia	12.10
46	Turkey	10.81
47	China	10.03

	Mainland	
48	Mexico	9.67
49	Spain	9.18
50	Slovenia	8.38
51	Italy	8.32
52	Argentina	7.91
53	Colombia	7.53
54	Russia	6.52
55	Portugal	5.10
56	Peru	3.85
57	Slovak Republic	3.50
58	Bulgaria	3.00
59	Ukraine	1.23
60	Venezuela	0.00

Table A16: Equal Rights – Rights and Justice

Ranking	Equal rights	Score
1	Norway	10.00
2	Sweden	9.57
3	UAE	9.43
4	Canada	9.16
5	Singapore	9.02
6	Iceland	8.95
7	Finland	8.93
8	Ireland	8.90
9	Malaysia	8.70
10	Denmark	8.62
11	Qatar	8.57
12	Taiwan	8.38
13	Hong Kong	8.10
14	Israel	8.06
15	Switzerland	8.05
16	Chile	7.96
17	USA	7.89
18	Australia	7.73
19	Japan	7.70
20	Netherlands	7.69
21	New Zealand	7.63
22	Philippines	7.43
23	Kazakhstan	7.42
24	Thailand	7.36

25	United Kingdom	7.08
26	Mexico	7.05
27	Luxembourg	6.91
28	Belgium	6.85
29	Peru	6.63
30	Turkey	6.63
31	Brazil	6.59
32	Lithuania	6.55
33	India	6.49
34	Poland	6.27
35	France	6.24
36	Latvia	6.18
37	Colombia	6.07
38	Indonesia	6.06
39	Croatia	6.04
40	Spain	6.01
41	Portugal	5.93
42	Estonia	5.87
43	Germany	5.72
44	China Mainland	5.68
45	Czech Republic	5.64
46	Greece	5.63
47	Korea	5.54
48	Ukraine	5.13
49	Jordan	5.11
50	Romania	5.05
51	Austria	5.02
52	Slovenia	4.91
53	Slovak Republic	4.85
54	Argentina	4.70
55	Hungary	4.62
56	Bulgaria	4.61
57	Italy	3.92
58	Russia	3.66
59	South Africa	2.89
60	Venezuela	0.00

Table A17: Social Cohesion – Rights and Justice

Ranking	Social Cohesion	Score
1	UAE	10.00
2	Qatar	9.34
3	Brazil	8.37
4	Canada	8.10
5	Malaysia	8.04
6	Norway	8.03
7	Philippines	7.90
8	Kazakhstan	7.83
9	Sweden	7.42
10	Taiwan	6.94
11	Chile	6.93
12	Singapore	6.80
13	Israel	6.66
14	Peru	6.52
15	Denmark	6.51
16	Mexico	6.49
17	Ireland	6.28
18	Switzerland	6.28
19	Japan	6.23
20	Lithuania	6.09
21	Finland	6.06
22	New Zealand	6.02
23	Australia	6.00
24	Iceland	5.95
25	Turkey	5.89
26	Netherlands	5.86
27	India	5.75
28	Indonesia	5.74
29	Austria	5.66
30	Colombia	5.64
31	Luxembourg	5.63
32	Jordan	5.62
33	USA	5.39
34	Latvia	5.08
35	Thailand	4.99
36	Hong Kong	4.95
37	China Mainland	4.94
38	Germany	4.88

39	Estonia	4.82
40	United Kingdom	4.78
41	Romania	4.26
42	Belgium	4.18
43	Czech Republic	4.13
44	Korea	4.10
45	Slovak Republic	3.90
46	Slovenia	3.89
47	Poland	3.62
48	South Africa	3.24
49	Russia	3.14
50	France	3.09
51	Italy	2.99
52	Ukraine	2.83
53	Hungary	2.80
54	Croatia	2.71
55	Greece	2.32
56	Portugal	2.24
57	Spain	2.01
58	Bulgaria	1.94
59	Argentina	1.62
60	Venezuela	0.00

Table A18: Political Stability – Peace and Security

Ranking	Political Stability	Score
1	Denmark	45.00
2	Norway	44.77
3	Switzerland	44.47
4	Sweden	42.84
5	Luxembourg	41.81
6	Canada	41.73
7	Finland	41.34
8	New Zealand	40.46
9	Germany	40.07
10	United Kingdom	39.95
11	Austria	39.71
12	Singapore	39.45
13	Chile	39.43
14	Qatar	38.62

15	USA	38.25
16	UAE	38.09
17	Ireland	37.33
18	Mexico	37.33
19	Netherlands	36.40
20	France	35.86
21	Australia	34.69
22	Brazil	33.96
23	Hong Kong	33.63
24	China Mainland	32.25
25	Taiwan	31.67
26	Philippines	30.27
27	Turkey	30.24
28	Malaysia	29.84
29	Estonia	29.45
30	Slovak Republic	28.46
31	Japan	27.90
32	Lithuania	26.88
33	Colombia	26.78
34	Poland	26.48
35	Kazakhstan	26.37
36	Spain	26.31
37	Belgium	25.86
38	Israel	25.55
39	Peru	25.50
40	Czech Republic	25.00
41	Croatia	24.37
42	Russia	23.18
43	Latvia	22.92
44	Indonesia	22.66
45	India	22.62
46	Korea	22.49
47	Portugal	22.07
48	South Africa	20.80
49	Jordan	20.63
50	Romania	18.38
51	Hungary	17.05
52	Greece	14.93
53	Argentina	14.21
54	Thailand	12.68
55	Iceland	12.58

56	Italy	10.84
57	Bulgaria	8.84
58	Slovenia	6.16
59	Ukraine	5.32
60	Venezuela	0.00

Table A19: Murders – Peace and Security

Ranking	Homicides	Score
1	Hong Kong	10.00
2	Singapore	9.98
3	Japan	9.98
4	Switzerland	9.92
5	Indonesia	9.92
6	Luxembourg	9.88
7	Slovenia	9.88
8	Czech Republic	9.88
9	Denmark	9.88
10	Germany	9.87
11	Spain	9.87
12	UAE	9.87
13	Austria	9.87
14	Sweden	9.86
15	Netherlands	9.86
16	New Zealand	9.86
17	Italy	9.85
18	Iceland	9.85
19	Ireland	9.85
20	Qatar	9.85
21	United Kingdom (England and Wales)	9.84
22	China	9.83
23	Portugal	9.82
24	Australia	9.81
25	Croatia	9.80
26	Poland	9.79
27	France	9.79
28	Hungary	9.74
29	Canada	9.71
30	Romania	9.71
31	Greece	9.69
32	Bulgaria	9.67
33	Slovakia	9.66

34	Jordan	9.65
35	Belgium	9.64
36	Israel	9.61
37	Finland	9.57
38	Norway	9.55
39	Malaysia	9.55
40	Korea	9.47
41	Latvia	9.36
42	Taiwan	9.34
43	Turkey	9.32
44	India	9.28
45	Chile	9.23
46	United States of America	9.01
47	Thailand	8.99
48	Estonia	8.97
49	Ukraine	8.86
50	Philippines	8.85
51	Argentina	8.82
52	Lithuania	8.63
53	Kazakhstan	8.10
54	Russian Federation	7.90
55	Peru	7.75
56	Brazil	5.21
57	Mexico	4.78
58	South Africa	3.16
59	Colombia	2.66
60	Venezuela	0.00

Table A20: Personal Security – Peace and Security

Ranking	Personal Security	Score
1	Finland	45.00
2	Denmark	44.46
3	Singapore	43.69
4	Australia	42.65
5	Germany	42.31
6	Norway	42.27
7	Switzerland	42.27
8	Canada	42.06
9	Hong Kong	41.91
10	Sweden	41.62

11	Netherlands	41.19
12	United Kingdom	40.94
13	Ireland	40.94
14	Luxembourg	40.70
15	UAE	40.69
16	Israel	40.46
17	Japan	40.12
18	New Zealand	39.99
19	Belgium	39.75
20	USA	39.35
21	Qatar	38.69
22	Iceland	37.08
23	Taiwan	36.88
24	Austria	36.83
25	France	36.75
26	Portugal	36.17
27	Spain	35.00
28	Latvia	34.93
29	Chile	34.87
30	Malaysia	34.44
31	Poland	33.97
32	Jordan	33.69
33	Thailand	33.31
34	Estonia	33.17
35	Czech Republic	31.40
36	Lithuania	30.70
37	India	30.68
38	Turkey	30.61
39	Italy	30.38
40	Greece	30.09
41	Slovenia	29.51
42	Korea	28.65
43	Indonesia	27.61
44	Philippines	26.74
45	Croatia	26.61
46	Slovak Republic	26.03
47	Kazakhstan	25.35
48	Hungary	25.02
49	Romania	23.64
50	Colombia	23.16
51	South Africa	22.43

52	Brazil	19.84
53	China Mainland	19.72
54	Mexico	18.35
55	Bulgaria	16.41
56	Peru	14.82
57	Russia	11.97
58	Argentina	9.42
59	Ukraine	7.92
60	Venezuela	0.00

Table A21: Life Expectancy – Health

Ranking	Life expectancy	Score
1	Japan	25.00
2	Hong Kong	24.50
3	Switzerland	24.09
4	Australia	23.68
5	Italy	23.68
6	Iceland	23.59
7	Israel	23.59
8	France	23.43
9	Spain	23.34
10	Sweden	23.34
11	Norway	23.10
12	Singapore	23.01
13	Canada	22.93
14	Austria	22.85
15	Netherlands	22.68
16	New Zealand	22.68
17	Ireland	22.60
18	Korea	22.60
19	Germany	22.52
20	United Kingdom	22.27
21	Finland	22.10
22	Luxembourg	22.10
23	Belgium	22.02
24	Greece	22.02
25	Portugal	21.77
26	Slovenia	21.61
27	Chile	21.44
28	Taiwan	21.36

29	Denmark	21.19
30	USA	21.03
31	Qatar	20.78
32	Czech Republic	20.20
33	Mexico	19.62
34	Croatia	19.37
35	UAE	19.29
36	Poland	18.96
37	Argentina	18.79
38	Slovak Republic	18.38
39	Estonia	17.88
40	Hungary	17.55
41	Venezuela	17.55
42	Malaysia	17.47
43	Thailand	17.30
44	Peru	17.22
45	Romania	17.22
46	Turkey	17.22
47	Colombia	16.97
48	Brazil	16.89
49	China Mainland	16.80
50	Bulgaria	16.72
51	Latvia	16.72
52	Jordan	16.64
53	Lithuania	15.81
54	Indonesia	13.58
55	Russia	13.00
56	Philippines	12.91
57	Ukraine	12.75
58	Kazakhstan	11.59
59	India	10.27
60	South Africa	0.00

Table A22: Health Infrastructure – Health

Ranking	Health infrastructure	Score
1	Belgium	50.00
2	Switzerland	48.93
3	Denmark	47.93
4	France	46.83

5	Singapore	46.83
6	Taiwan	46.07
7	Austria	45.42
8	Netherlands	45.35
9	Luxembourg	45.20
10	Germany	45.17
11	Spain	44.37
12	Sweden	43.26
13	Japan	42.01
14	Czech Republic	41.54
15	Malaysia	41.12
16	Finland	40.74
17	Canada	39.60
18	Norway	39.45
19	Australia	39.18
20	Korea	39.14
21	Iceland	38.97
22	UAE	37.92
23	Hong Kong	37.86
24	Ukraine	36.12
25	United Kingdom	36.11
26	Israel	35.75
27	Portugal	35.59
28	New Zealand	34.53
29	Qatar	33.70
30	USA	33.57
31	Thailand	32.98
32	Italy	32.35
33	Turkey	30.03
34	Estonia	28.94
35	Slovenia	28.45
36	Jordan	27.47
37	Croatia	25.95
38	Greece	22.72
39	Philippines	22.35
40	Latvia	21.86
41	Indonesia	21.73
42	Ireland	21.73
43	Mexico	21.62
44	Poland	20.70
45	Lithuania	20.57

46	Chile	18.74
47	Kazakhstan	18.02
48	Slovak Republic	17.16
49	India	16.02
50	Hungary	15.95
51	Argentina	15.70
52	China Mainland	15.54
53	Russia	9.12
54	Colombia	9.00
55	Brazil	7.05
56	South Africa	6.09
57	Peru	5.84
58	Bulgaria	2.44
59	Venezuela	1.80
60	Romania	0.00

Table A23: Mortality Rate – Health

Ranking	Mortality rate	Score
1	Hong Kong	25.00
2	Iceland	24.71
3	Singapore	24.66
4	Slovenia	24.58
5	Sweden	24.58
6	Finland	24.54
7	Norway	24.45
8	Luxembourg	24.41
9	Japan	24.33
10	Portugal	24.33
11	Denmark	24.20
12	Estonia	24.20
13	Italy	24.20
14	Czech Republic	24.12
15	Germany	24.08
16	Ireland	24.08
17	Netherlands	24.08
18	France	24.03
19	Austria	23.99
20	Spain	23.99
21	Belgium	23.95

22	Israel	23.95
23	Greece	23.91
24	Switzerland	23.91
25	Australia	23.87
26	Korea	23.74
27	Taiwan	23.66
28	Croatia	23.61
29	United Kingdom	23.61
30	Canada	23.40
31	Lithuania	23.36
32	Poland	23.32
33	New Zealand	23.28
34	Hungary	23.11
35	Malaysia	23.03
36	UAE	22.98
37	USA	22.61
38	Qatar	22.52
39	Slovak Republic	22.52
40	Latvia	22.40
41	Chile	22.10
42	Ukraine	21.51
43	Russia	20.76
44	Bulgaria	20.67
45	Thailand	20.59
46	Romania	20.50
47	Argentina	19.83
48	China Mainland	19.62
49	Venezuela	19.45
50	Turkey	19.37
51	Brazil	19.20
52	Mexico	19.16
53	Colombia	18.32
54	Peru	18.15
55	Jordan	17.06
56	Philippines	15.08
57	Kazakhstan	13.87
58	Indonesia	12.40
59	South Africa	6.13
60	India	0.00

Table A24: Quality of the Educational System – Education

Ranking	Quality of the educational system	Score
1	Finland	40.00
2	Switzerland	38.81
3	Canada	36.10
4	Singapore	36.03
5	Denmark	35.38
6	Belgium	34.57
7	Germany	32.40
8	Netherlands	31.94
9	Ireland	31.83
10	Poland	31.53
11	Australia	31.37
12	Malaysia	30.47
13	New Zealand	29.85
14	Qatar	29.81
15	UAE	29.81
16	Sweden	28.61
17	Norway	28.10
18	Iceland	27.87
19	France	27.44
20	Taiwan	26.49
21	USA	25.88
22	Hong Kong	25.80
23	United Kingdom	25.28
24	Austria	25.13
25	Luxembourg	25.02
26	Israel	24.60
27	Korea	23.16
28	Lithuania	22.89
29	Philippines	22.17
30	Estonia	20.36
31	Jordan	20.28
32	Czech Republic	19.96
33	Portugal	19.92
34	Indonesia	19.82
35	Japan	18.88
36	Italy	18.25
37	India	18.25
38	Latvia	16.92

39	Greece	16.85
40	Spain	16.39
41	Turkey	16.23
42	Slovenia	16.06
43	Thailand	15.51
44	Kazakhstan	14.95
45	Colombia	14.62
46	Hungary	13.80
47	Chile	12.94
48	China Mainland	12.24
49	Ukraine	11.79
50	Russia	11.44
51	Croatia	10.88
52	Mexico	10.33
53	Slovak Republic	10.00
54	Argentina	7.97
55	Romania	6.58
56	Brazil	4.50
57	Peru	4.04
58	Bulgaria	3.00
59	Venezuela	1.64
60	South Africa	0.00

Table A25: University Education – Education

Ranking	University Education	Score
1	Switzerland	30.00
2	Singapore	29.64
3	Canada	29.20
4	Finland	28.09
5	Denmark	27.89
6	Israel	27.39
7	Belgium	27.34
8	Germany	26.09
9	Netherlands	26.03
10	USA	24.95
11	Sweden	24.92
12	Ireland	24.19
13	Qatar	24.08
14	Australia	23.89
15	Malaysia	23.62
16	Iceland	22.62

17	Hong Kong	22.35
18	Austria	22.34
19	UAE	22.34
20	United Kingdom	21.25
21	Norway	20.55
22	New Zealand	20.01
23	France	19.34
24	Luxembourg	18.64
25	Portugal	18.14
26	Philippines	16.97
27	Taiwan	16.84
28	Lithuania	16.37
29	Indonesia	16.09
30	Estonia	15.98
31	Czech Republic	15.75
32	Jordan	15.19
33	Chile	15.12
34	Turkey	14.53
35	India	14.40
36	Greece	12.73
37	Poland	12.73
38	Thailand	12.62
39	Latvia	12.54
40	Mexico	12.45
41	Korea	12.44
42	Italy	12.22
43	Colombia	12.14
44	Spain	10.16
45	South Africa	9.98
46	Russia	9.93
47	Slovenia	9.45
48	Hungary	9.35
49	Kazakhstan	9.28
50	Ukraine	9.06
51	Argentina	8.47
52	Japan	8.12
53	China Mainland	7.69
54	Venezuela	7.29
55	Peru	5.21
56	Croatia	4.95
57	Brazil	4.57

58	Romania	2.80
59	Slovak Republic	2.67
60	Bulgaria	0.00

Table A26: Pupil-Teacher ratio – Education

Ranking	Pupil-teacher ratio	Score
1	Portugal	20.00
2	Greece	19.72
3	Croatia	19.52
4	Venezuela	19.33
5	Lithuania	19.02
6	Luxembourg	18.83
7	Kazakhstan	18.65
8	Belgium	18.61
9	Estonia	18.58
10	Austria	18.46
11	Norway	18.39
12	Sweden	18.38
13	Qatar	18.22
14	Iceland	17.73
15	Latvia	17.61
16	Spain	17.58
17	Argentina	17.51
18	Slovenia	17.44
19	Russia	17.22
20	Switzerland	17.14
21	Denmark	17.07
22	Hungary	17.00
23	Czech Republic	16.92
24	Israel	16.92
25	Japan	16.79
26	Ukraine	16.71
27	Australia	16.71
28	Italy	16.71
29	Slovak Republic	16.68
30	Bulgaria	16.65
31	Jordan	16.49
32	Poland	16.49
33	UAE	16.39
34	Romania	16.36
35	Indonesia	16.27

36	France	16.21
37	Germany	16.04
38	Malaysia	15.69
39	Finland	15.46
40	Netherlands	15.44
41	USA	15.42
42	Ireland	14.95
43	New Zealand	14.87
44	Hong Kong	14.73
45	China Mainland	14.17
46	Peru	13.89
47	United Kingdom	13.78
48	Singapore	13.70
49	Taiwan	13.41
50	Brazil	13.29
51	Canada	12.97
52	Korea	12.61
53	Mexico	12.38
54	Thailand	10.92
55	Turkey	9.88
56	South Africa	7.63
57	India	6.97
58	Chile	6.60
59	Colombia	5.61
60	Philippines	0.00

Table A27: Illiteracy – Education

Ranking	Illiteracy	Score
1	Australia	10.00
2	Austria	10.00
3	Belgium	10.00
4	Canada	10.00
5	Czech Republic	10.00
6	Denmark	10.00
7	Estonia	10.00
8	Finland	10.00
9	France	10.00
10	Germany	10.00
11	Hungary	10.00
12	Iceland	10.00
13	Ireland	10.00

14	Japan	10.00
15	Kazakhstan	10.00
16	Lithuania	10.00
17	Luxembourg	10.00
18	Netherlands	10.00
19	New Zealand	10.00
20	Norway	10.00
21	Poland	10.00
22	Russia	10.00
23	Slovak Republic	10.00
24	Slovenia	10.00
25	Sweden	10.00
26	Switzerland	10.00
27	Ukraine	10.00
28	United Kingdom	10.00
29	USA	10.00
30	Italy	9.97
31	Croatia	9.93
32	Chile	9.81
33	Bulgaria	9.73
34	Korea	9.71
35	Taiwan	9.58
36	Argentina	9.50
37	Spain	9.47
38	Romania	9.44
39	Greece	9.24
40	Israel	9.20
41	Qatar	8.86
42	Singapore	8.70
43	Venezuela	8.53
44	Philippines	8.49
45	Portugal	8.39
46	China Mainland	8.01
47	Thailand	7.94
48	Colombia	7.64
49	Malaysia	7.53
50	Mexico	7.51
51	Indonesia	7.30
52	Jordan	7.29
53	Brazil	6.76

54	Turkey	6.56
55	UAE	6.24
56	Peru	6.05
57	South Africa	5.80
58	India	0.00

Table A28: Unemployment – Employment

Ranking	Unemployment	Score
1	Qatar	35.00
2	Thailand	34.77
3	Singapore	32.86
4	Malaysia	31.43
5	Korea	31.14
6	Norway	31.14
7	Hong Kong	31.00
8	Peru	30.85
9	India	30.00
10	China Mainland	29.86
11	Switzerland	29.74
12	Taiwan	29.66
13	Austria	29.57
14	Japan	29.57
15	UAE	29.39
16	Mexico	28.64
17	Luxembourg	28.43
18	Australia	28.24
19	Netherlands	28.17
20	Kazakhstan	28.14
21	Brazil	27.86
22	Germany	27.86
23	Russia	27.86
24	Iceland	27.43
25	Indonesia	26.94
26	Chile	26.43
27	Romania	26.00
28	Argentina	25.86
29	Israel	25.86
30	New Zealand	25.86
31	Czech Republic	25.75
32	Philippines	25.71
33	Canada	25.37

34	Belgium	25.29
35	Ukraine	25.00
36	Finland	24.73
37	Denmark	24.71
38	Venezuela	24.57
39	United Kingdom	24.44
40	Sweden	24.33
41	USA	24.19
42	Slovenia	22.86
43	Turkey	22.57
44	Poland	21.27
45	Estonia	21.14
46	France	21.07
47	Colombia	20.90
48	Italy	20.43
49	Hungary	20.10
50	Jordan	18.29
51	Bulgaria	18.14
52	Lithuania	16.86
53	Slovak Republic	15.86
54	Ireland	14.57
55	Latvia	14.00
56	Portugal	13.71
57	Croatia	13.33
58	Greece	1.00
59	South Africa	0.14
60	Spain	0.00

Table A29: Youth Unemployment – Employment

Ranking	Youth Unemployment	Score
1	Qatar	35.00
2	Thailand	34.56
3	Kazakhstan	33.52
4	Switzerland	32.09
5	Japan	30.78
6	Germany	30.76
7	Norway	30.46
8	Austria	30.40
9	Singapore	30.27

10	Korea	30.21
11	Hong Kong	30.01
12	Netherlands	29.89
13	Mexico	29.80
14	Malaysia	29.36
15	Iceland	29.10
16	Australia	28.44
17	India	28.25
18	Israel	28.19
19	UAE	28.19
20	Taiwan	27.82
21	Russia	27.47
22	Brazil	27.29
23	Peru	26.95
24	Denmark	26.85
25	Canada	26.77
26	Venezuela	26.30
27	USA	25.53
28	Philippines	25.52
29	Turkey	24.65
30	Luxembourg	23.95
31	Ukraine	23.95
32	New Zealand	23.72
33	Belgium	23.63
34	Finland	23.63
35	Chile	23.47
36	Czech Republic	23.37
37	Colombia	23.30
38	Indonesia	23.30
39	Estonia	23.01
40	Slovenia	22.70
41	United Kingdom	22.41
42	Romania	22.00
43	Sweden	20.70
44	France	20.58
45	Lithuania	18.88
46	Poland	18.81
47	Jordan	18.68
48	Bulgaria	17.77
49	Hungary	17.77
50	Latvia	17.58

51	Ireland	16.14
52	Slovak Republic	13.94
53	Portugal	13.41
54	Italy	13.12
55	Croatia	9.21
56	South Africa	2.91
57	Spain	1.43
58	Greece	0.00

Table A30: Labour Relations – Employment

Ranking	Labour Relations	Score
1	Japan	15.00
2	Switzerland	14.90
3	Sweden	14.81
4	Norway	14.16
5	Austria	13.85
6	Denmark	13.76
7	Singapore	13.75
8	Germany	13.48
9	UAE	13.19
10	Ireland	12.90
11	Netherlands	12.86
12	Malaysia	12.63
13	Hong Kong	12.54
14	Taiwan	12.45
15	Kazakhstan	12.25
16	Iceland	12.14
17	New Zealand	11.93
18	Thailand	11.84
19	United Kingdom	11.82
20	Philippines	11.55
21	Estonia	11.55
22	Qatar	11.20
23	Luxembourg	11.06
24	USA	10.87
25	Canada	10.73
26	Israel	10.52
27	Mexico	10.29
28	Finland	10.27
29	Czech Republic	10.21

30	Turkey	10.21
31	Chile	10.12
32	Ukraine	9.87
33	Latvia	9.73
34	Hungary	9.69
35	India	9.67
36	Lithuania	9.50
37	Jordan	9.41
38	China Mainland	9.33
39	Portugal	9.28
40	Slovak Republic	9.13
41	Colombia	8.93
42	Peru	8.21
43	Belgium	7.89
44	Indonesia	7.79
45	Brazil	7.41
46	Russia	7.39
47	Australia	7.38
48	Slovenia	7.31
49	Romania	6.96
50	Spain	6.10
51	Greece	5.43
52	Poland	5.29
53	France	5.13
54	Italy	5.09
55	Bulgaria	4.93
56	Korea	4.65
57	Croatia	3.91
58	Argentina	3.28
59	South Africa	0.08
60	Venezuela	0.00

Table A31: Corporate Values – Employment

Ranking	Corporate Values	Score
1	Norway	15.00
2	Sweden	14.15
3	Denmark	13.29
4	Malaysia	12.82
5	UAE	12.49
6	Canada	12.40

7	Switzerland	11.59
8	Iceland	11.38
9	Taiwan	10.94
10	Netherlands	10.88
11	Germany	10.79
12	Ireland	10.69
13	Japan	10.66
14	Philippines	10.45
15	Luxembourg	10.38
16	Finland	10.33
17	Thailand	10.29
18	Austria	10.16
19	Qatar	10.08
20	Singapore	10.08
21	USA	9.99
22	Australia	9.94
23	Indonesia	9.86
24	Brazil	9.76
25	Mexico	9.56
26	India	9.47
27	Lithuania	9.43
28	Colombia	9.41
29	New Zealand	9.17
30	Hong Kong	8.90
31	Belgium	8.58
32	Venezuela	8.36
33	Israel	7.98
34	United Kingdom	7.95
35	Korea	7.90
36	Kazakhstan	7.90
37	Turkey	7.48
38	South Africa	7.42
39	Chile	6.86
40	Peru	6.62
41	China Mainland	6.60
42	Greece	6.47
43	France	6.46
44	Estonia	6.45
45	Latvia	6.29
46	Hungary	6.10
47	Italy	5.97

48	Ukraine	5.74
49	Czech Republic	5.66
50	Jordan	5.66
51	Slovak Republic	5.60
52	Croatia	4.86
53	Portugal	4.55
54	Romania	4.29
55	Argentina	4.15
56	Spain	3.79
57	Slovenia	3.53
58	Russia	2.66
59	Bulgaria	0.64
60	Poland	0.00

Table A32: Gini Index – Economic Equality and Purchasing Power

Ranking	Gini	Score
1	Denmark	25.00
2	Japan	25.00
3	Sweden	25.00
4	Norway	24.41
5	Czech Republic	24.25
6	Slovak Republic	24.25
7	Ukraine	23.96
8	Finland	23.60
9	Germany	22.53
10	Kazakhstan	22.01
11	Austria	21.86
12	Luxembourg	20.67
13	Netherlands	20.52
14	Romania	20.41
15	Slovenia	20.41
16	Hungary	20.37
17	Korea	19.77
18	Canada	19.36
19	Belgium	19.03
20	France	19.03
21	Croatia	18.54
22	Switzerland	18.52
23	Indonesia	18.28

24	Poland	18.21
25	Ireland	18.08
26	Greece	18.06
27	Spain	17.76
28	Australia	17.39
29	Estonia	16.79
30	New Zealand	16.79
31	United Kingdom	16.79
32	Italy	16.76
33	Latvia	16.34
34	India	16.19
35	Lithuania	15.59
36	Jordan	15.50
37	Portugal	14.55
38	Turkey	14.55
39	Israel	14.40
40	USA	13.20
41	Qatar	12.98
42	Russia	12.11
43	China Mainland	11.94
44	Philippines	11.56
45	Singapore	11.56
46	Hong Kong	11.26
47	Venezuela	11.19
48	Argentina	10.44
49	Bulgaria	9.83
50	Malaysia	9.17
51	Peru	7.86
52	Mexico	7.61
53	Chile	4.77
54	Thailand	3.67
55	Brazil	3.43
56	South Africa	0.54
57	Colombia	0.00

Table A33: GDP Per Capita – Economic Equality and Purchasing Power

Ranking	GDP per capita	Score
1	Qatar	50.00
2	Luxembourg	45.23

3	Norway	30.74
4	Singapore	30.20
5	Switzerland	25.48
6	Hong Kong	25.18
7	USA	24.15
8	UAE	23.00
9	Australia	20.95
10	Austria	20.70
11	Netherlands	20.62
12	Sweden	20.33
13	Ireland	20.05
14	Canada	19.92
15	Denmark	19.81
16	Germany	19.27
17	Belgium	18.56
18	Taiwan	17.97
19	Finland	17.94
20	Iceland	17.70
21	France	17.54
22	United Kingdom	17.06
23	Japan	16.43
24	Italy	15.15
25	New Zealand	14.86
26	Spain	14.55
27	Korea	14.23
28	Israel	13.51
29	Slovenia	12.07
30	Czech Republic	11.90
31	Portugal	11.13
32	Slovak Republic	11.13
33	Greece	10.96
34	Estonia	10.15
35	Russia	10.11
36	Lithuania	10.10
37	Poland	9.60
38	Hungary	9.40
39	Latvia	8.78
40	Croatia	8.53
41	Chile	8.11
42	Turkey	7.18

43	Argentina	7.12
44	Mexico	7.03
45	Malaysia	6.91
46	Romania	6.57
47	Bulgaria	6.10
48	Venezuela	5.25
49	Kazakhstan	5.17
50	Brazil	4.33
51	South Africa	3.83
52	Peru	3.63
53	Colombia	3.58
54	Thailand	3.10
55	China Mainland	2.76
56	Ukraine	1.82
57	Jordan	1.11
58	Indonesia	0.52
59	Philippines	0.28
60	India	0.00

Table A34: Income Distribution – Economic Equality and Purchasing Power

Ranking	Income distribution-lowest 10	Score
1	Japan	25.00
2	Slovak Republic	22.28
3	Czech Republic	22.03
4	Ukraine	21.29
5	Finland	20.17
6	Kazakhstan	20.05
7	Norway	19.18
8	Iceland	18.19
9	India	17.82
10	Sweden	17.45
11	Hungary	17.20
12	Luxembourg	16.96
13	Belgium	16.46
14	Romania	16.21
15	Slovenia	16.21
16	Jordan	16.09
17	Austria	15.97
18	Croatia	15.90
19	Bulgaria	15.59

20	Indonesia	15.53
21	Poland	15.47
22	Germany	15.22
23	Ireland	13.30
24	Korea	13.18
25	Switzerland	13.12
26	Thailand	12.56
27	France	12.31
28	Russia	12.31
29	Estonia	12.07
30	Latvia	11.63
31	Canada	11.57
32	Lithuania	11.57
33	Denmark	11.51
34	Philippines	11.32
35	Spain	11.20
36	Greece	11.08
37	Netherlands	10.71
38	China Mainland	9.96
39	Italy	9.53
40	New Zealand	9.03
41	Israel	8.54
42	United Kingdom	8.04
43	Australia	7.67
44	Portugal	7.61
45	Hong Kong	7.49
46	Turkey	7.43
47	USA	6.93
48	Singapore	6.75
49	Venezuela	6.75
50	Mexico	6.50
51	Malaysia	6.31
52	Chile	4.77
53	Peru	3.59
54	Qatar	3.34
55	Argentina	2.97
56	South Africa	1.92
57	Brazil	0.06
58	Colombia	0.00

Table A35: Basic Infrastructure – Competitiveness

Ranking	Basic Infrastructure	Score
1	Iceland	25.00
2	Canada	20.76
3	Netherlands	20.58
4	France	20.13
5	Denmark	20.02
6	USA	19.59
7	Norway	19.51
8	China Mainland	19.07
9	Switzerland	19.02
10	Sweden	18.51
11	Qatar	18.28
12	Malaysia	18.13
13	UAE	17.75
14	Finland	17.46
15	Czech Republic	17.32
16	Singapore	16.96
17	Germany	16.72
18	Belgium	16.63
19	Taiwan	16.42
20	Austria	16.24
21	United Kingdom	16.23
22	Australia	16.06
23	Korea	15.75
24	Spain	14.74
25	Thailand	14.35
26	New Zealand	14.13
27	Japan	14.06
28	Luxembourg	13.84
29	Ireland	13.71
30	Hong Kong	13.57
31	Lithuania	12.59
32	Hungary	12.44
33	Estonia	12.35
34	Slovak Republic	12.25
35	Latvia	12.03
36	Poland	11.82
37	Greece	11.82
38	Portugal	11.80

39	Slovenia	11.43
40	Kazakhstan	11.21
41	Indonesia	11.14
42	Turkey	10.62
43	Romania	10.17
44	Russia	10.05
45	Mexico	9.84
46	Chile	9.70
47	Colombia	9.13
48	Israel	9.12
49	Croatia	8.81
50	Bulgaria	7.86
51	India	7.46
52	Ukraine	6.93
53	South Africa	6.16
54	Philippines	6.07
55	Brazil	5.87
56	Italy	5.43
57	Peru	4.89
58	Argentina	4.55
59	Venezuela	2.22
60	Jordan	0.00

Table A36: Infrastructure – Competitiveness

Ranking	Infrastructure	Score
1	USA	25.00
2	Sweden	23.34
3	Switzerland	22.84
4	Denmark	22.45
5	Finland	21.05
6	Canada	21.04
7	Germany	20.73
8	France	20.20
9	Netherlands	20.13
10	Japan	20.07
11	Norway	20.03
12	Singapore	19.96
13	Israel	19.81
14	Iceland	19.03
15	United Kingdom	18.66
16	Taiwan	18.21

17	Austria	18.06
18	Belgium	17.97
19	Korea	17.66
20	Australia	17.48
21	Hong Kong	16.99
22	Ireland	16.67
23	Luxembourg	16.42
24	New Zealand	15.05
25	Malaysia	13.60
26	China Mainland	13.55
27	Spain	13.34
28	Portugal	13.30
29	Czech Republic	13.13
30	Italy	12.35
31	Lithuania	12.15
32	Estonia	11.48
33	Slovenia	11.20
34	UAE	10.93
35	Greece	10.87
36	Poland	10.85
37	Latvia	10.30
38	Hungary	10.14
39	Russia	9.68
40	Qatar	8.52
41	Slovak Republic	8.49
42	Croatia	7.79
43	Turkey	7.09
44	Kazakhstan	6.57
45	Ukraine	6.47
46	Chile	6.05
47	Romania	5.83
48	Thailand	5.75
49	Mexico	5.07
50	Brazil	4.94
51	Bulgaria	4.55
52	Jordan	4.16
53	Argentina	3.79
54	India	3.30
55	Colombia	2.95
56	Indonesia	2.74

57	Philippines	2.08
58	South Africa	1.70
59	Venezuela	0.89
60	Peru	0.00

Table A37: Large Corporations – Competitiveness

Ranking	Large Corporations	Score
1	Sweden	25.00
2	Switzerland	23.60
3	Ireland	23.50
4	Hong Kong	23.01
5	Denmark	22.95
6	USA	21.49
7	Germany	21.35
8	UAE	21.03
9	Philippines	20.83
10	Singapore	20.51
11	France	20.38
12	Mexico	19.88
13	Netherlands	19.14
14	Malaysia	18.97
15	Thailand	18.92
16	Slovak Republic	18.84
17	Finland	18.63
18	Hungary	17.69
19	Spain	17.09
20	Norway	17.04
21	Belgium	16.79
22	Chile	16.70
23	Turkey	16.53
24	Austria	16.30
25	Taiwan	16.17
26	Portugal	15.90
27	Qatar	15.59
28	Canada	15.53
29	Israel	15.18
30	Ukraine	14.56
31	Czech Republic	14.48
32	Peru	14.23
33	Lithuania	14.15
34	United Kingdom	13.79

35	India	13.20
36	Colombia	13.17
37	Luxembourg	12.88
38	Brazil	11.74
39	Korea	10.98
40	New Zealand	9.36
41	Australia	9.27
42	Kazakhstan	9.23
43	Indonesia	8.89
44	Latvia	8.75
45	Estonia	8.27
46	Greece	7.98
47	Romania	7.32
48	Argentina	7.13
49	Italy	7.08
50	Jordan	6.72
51	Japan	5.77
52	South Africa	5.26
53	Croatia	3.93
54	Iceland	2.40
55	Russia	1.70
56	Venezuela	1.45
57	Bulgaria	0.76
58	China Mainland	0.62
59	Poland	0.62
60	Slovenia	0.00

Table A38: Small and medium size enterprises – Competitiveness

Ranking	Small and medium size enterprises	Score
1	Germany	25.00
2	Switzerland	22.47
3	Austria	20.79
4	Hong Kong	20.52
5	USA	20.45
6	Sweden	20.28
7	Netherlands	18.56
8	Denmark	18.55
9	Taiwan	18.14
10	Poland	18.02
11	Belgium	17.84
12	Finland	17.59

13	Norway	17.23
14	Israel	17.19
15	UAE	16.73
16	Luxembourg	16.45
17	Malaysia	16.20
18	Ireland	16.16
19	Canada	15.37
20	Czech Republic	14.82
21	China Mainland	14.58
22	United Kingdom	14.39
23	Singapore	14.17
24	New Zealand	14.01
25	Italy	13.90
26	Australia	13.27
27	Slovak Republic	12.82
28	Lithuania	12.58
29	Slovenia	11.93
30	Iceland	11.29
31	Qatar	11.20
32	Turkey	10.98
33	Estonia	10.98
34	Latvia	10.93
35	France	10.66
36	Philippines	10.47
37	Indonesia	9.99
38	Chile	9.94
39	Japan	9.56
40	Mexico	9.43
41	Romania	9.24
42	Spain	8.61
43	South Africa	8.42
44	Peru	8.34
45	India	8.26
46	Croatia	7.62
47	Greece	7.61
48	Ukraine	7.53
49	Kazakhstan	7.50
50	Portugal	6.77
51	Jordan	6.54
52	Thailand	6.24
53	Brazil	5.91

54	Colombia	5.07
55	Korea	4.94
56	Hungary	4.59
57	Argentina	3.89
58	Russia	3.54
59	Bulgaria	2.78
60	Venezuela	0.00

Table A39: Bribing and Corruption– Ethical Concerns and Governance

Ranking	Bribing and corruption	Score
1	Denmark	30.00
2	Finland	27.17
3	New Zealand	26.97
4	Singapore	26.11
5	Switzerland	25.42
6	Iceland	24.81
7	Sweden	24.59
8	Ireland	24.32
9	Netherlands	23.99
10	UAE	23.59
11	United Kingdom	23.39
12	Norway	23.35
13	Germany	22.90
14	Japan	22.61
15	Australia	22.55
16	Qatar	22.36
17	Canada	22.25
18	Luxembourg	21.88
19	Chile	21.77
20	Hong Kong	21.60
21	USA	20.85
22	Belgium	20.83
23	France	19.92
24	Estonia	18.88
25	Israel	16.41
26	Austria	16.31
27	Taiwan	15.50
28	Korea	14.30
29	Turkey	13.74
30	Malaysia	13.52
31	Poland	12.64

32	Portugal	12.31
33	Jordan	9.75
34	Lithuania	9.32
35	Latvia	7.48
36	Indonesia	6.69
37	Spain	6.44
38	Greece	6.15
39	Croatia	5.68
40	Italy	5.23
41	Philippines	5.16
42	Peru	5.13
43	Kazakhstan	5.07
44	Mexico	4.87
45	Romania	4.87
46	Czech Republic	4.52
47	Slovenia	4.39
48	Colombia	4.32
49	Thailand	4.10
50	Hungary	4.06
51	Brazil	3.69
52	China Mainland	3.64
53	Argentina	3.61
54	India	3.08
55	South Africa	2.46
56	Venezuela	1.49
57	Russia	1.46
58	Slovak Republic	1.32
59	Bulgaria	0.04
60	Ukraine	0.00

Table A40: Government Effectiveness – Ethical Concerns and Governance

Ranking	Government Effectiveness	Score
1	Singapore	30.00
2	UAE	29.69
3	Qatar	27.43
4	Switzerland	26.57
5	Sweden	26.51
6	Denmark	24.60
7	Turkey	24.43
8	Chile	23.97
9	Malaysia	23.16

10	Finland	23.13
11	Germany	22.98
12	Estonia	21.78
13	Norway	20.74
14	Luxembourg	20.70
15	Canada	20.28
16	Netherlands	19.71
17	New Zealand	18.44
18	Hong Kong	18.44
19	Poland	18.12
20	Austria	17.50
21	Ireland	17.09
22	Kazakhstan	16.47
23	China Mainland	15.80
24	United Kingdom	15.53
25	USA	15.47
26	Mexico	15.26
27	Indonesia	15.12
28	Korea	15.04
29	Belgium	14.80
30	Japan	14.39
31	Hungary	14.08
32	Portugal	13.91
33	Taiwan	13.74
34	Thailand	13.21
35	Israel	12.81
36	France	12.57
37	Philippines	12.15
38	Peru	11.38
39	Lithuania	11.35
40	Romania	10.13
41	Jordan	9.95
42	Colombia	9.82
43	Australia	9.76
44	Latvia	9.74
45	Brazil	8.40
46	Czech Republic	8.26
47	Spain	8.14
48	Slovak Republic	7.92
49	Iceland	7.40
50	Bulgaria	5.92

51	India	4.91
52	Russia	4.89
53	Croatia	4.70
54	Ukraine	4.69
55	Italy	3.56
56	Greece	3.26
57	Argentina	2.91
58	South Africa	2.03
59	Slovenia	1.51
60	Venezuela	0.00

Table A41: Transparency of Government Policymaking – Ethical Concerns and Governance

Ranking	Transparency of government policymaking	Score
1	Norway	30.00
2	Sweden	29.50
3	Finland	28.43
4	Singapore	28.15
5	Switzerland	28.11
6	UAE	27.91
7	Denmark	27.68
8	New Zealand	27.22
9	Qatar	26.97
10	Chile	26.67
11	Ireland	24.46
12	Germany	23.55
13	United Kingdom	23.34
14	Malaysia	23.05
15	Canada	22.97
16	Netherlands	22.75
17	Hong Kong	22.08
18	Luxembourg	21.96
19	USA	21.70
20	Poland	19.83
21	Australia	19.81
22	Estonia	18.95
23	Turkey	18.66
24	Philippines	18.36
25	Japan	18.15
26	Israel	17.90
27	Taiwan	17.65

28	Belgium	17.27
29	France	16.85
30	Korea	16.85
31	Indonesia	16.35
32	Kazakhstan	16.18
33	Austria	15.45
34	Mexico	14.81
35	Croatia	14.26
36	Lithuania	13.37
37	Latvia	12.92
38	Jordan	12.83
39	South Africa	12.67
40	Peru	12.65
41	Portugal	12.23
42	Iceland	11.18
43	Colombia	11.08
44	Brazil	11.01
45	Romania	10.74
46	India	10.31
47	Thailand	10.10
48	Spain	10.01
49	Czech Republic	9.83
50	Greece	9.67
51	China Mainland	9.34
52	Russia	9.02
53	Bulgaria	8.41
54	Italy	7.72
55	Slovak Republic	7.43
56	Hungary	6.22
57	Slovenia	5.94
58	Argentina	1.69
59	Ukraine	1.14
60	Venezuela	0.00

Table A42: Social Responsibility – Ethical Concerns and Governance

Ranking	Social Responsibility	Score
1	Japan	10.00
2	Norway	9.64
3	Denmark	9.61
4	Malaysia	9.19
5	Austria	8.84

6	Sweden	8.76
7	Canada	8.65
8	UAE	8.31
9	Taiwan	8.06
10	Finland	7.84
11	New Zealand	7.66
12	Thailand	7.47
13	Switzerland	7.43
14	Luxembourg	7.21
15	Germany	6.97
16	Netherlands	6.81
17	Qatar	6.78
18	Ireland	6.76
19	South Africa	6.55
20	Belgium	6.48
21	Venezuela	6.40
22	Iceland	6.23
23	Singapore	6.16
24	Australia	6.15
25	Philippines	6.03
26	Kazakhstan	5.82
27	Brazil	5.69
28	Indonesia	5.64
29	Turkey	5.57
30	USA	5.53
31	China Mainland	5.42
32	Lithuania	5.38
33	Colombia	5.38
34	Hong Kong	5.28
35	Mexico	5.03
36	France	4.91
37	United Kingdom	4.76
38	Chile	4.08
39	Czech Republic	3.81
40	Greece	3.78
41	India	3.78
42	Israel	3.64
43	Estonia	3.61
44	Italy	3.48
45	Peru	3.32
46	Korea	3.12

47	Latvia	2.78
48	Poland	2.77
49	Jordan	2.51
50	Ukraine	2.30
51	Argentina	2.16
52	Slovenia	2.03
53	Slovak Republic	2.01
54	Hungary	1.93
55	Portugal	1.74
56	Spain	1.68
57	Croatia	1.19
58	Romania	0.73
59	Bulgaria	0.51
60	Russia	0.00

Table A43: Innovative Capacity – Potential for Innovation

Ranking	Innovative capacity	Score
1	Israel	40.00
2	USA	34.49
3	Switzerland	33.50
4	Germany	32.84
5	Denmark	31.88
6	Sweden	31.55
7	Taiwan	28.91
8	Netherlands	28.82
9	Austria	28.55
10	Finland	27.68
11	Ireland	27.61
12	UAE	27.32
13	Malaysia	27.13
14	Japan	25.70
15	Norway	25.67
16	Canada	25.65
17	Singapore	25.56
18	United Kingdom	24.63
19	Korea	24.57
20	Luxembourg	24.55
21	Hong Kong	24.51
22	Belgium	24.00
23	France	23.79
24	Australia	21.89

25	Iceland	21.75
26	Italy	21.75
27	Lithuania	20.93
28	New Zealand	20.08
29	Indonesia	19.29
30	Qatar	19.23
31	Czech Republic	16.87
32	Estonia	16.46
33	Philippines	16.40
34	Thailand	15.33
35	Colombia	15.05
36	Portugal	15.04
37	Latvia	15.02
38	Spain	14.98
39	Kazakhstan	14.55
40	Turkey	14.55
41	Mexico	14.06
42	Greece	13.95
43	South Africa	13.89
44	India	13.56
45	Argentina	13.36
46	Brazil	13.17
47	Slovenia	13.15
48	Chile	12.87
49	Jordan	12.35
50	China Mainland	11.28
51	Ukraine	10.65
52	Peru	9.97
53	Venezuela	8.22
54	Romania	7.68
55	Hungary	6.67
56	Slovak Republic	6.31
57	Croatia	5.69
58	Russia	3.81
59	Bulgaria	1.47
60	Poland	0.00

Table A44: Scientific Research Legislation – Potential for Innovation

Ranking	Scientific research legislation	Score
1	Israel	20.00
2	USA	19.55

3	Switzerland	18.72
4	Singapore	18.28
5	Sweden	18.06
6	Denmark	17.12
7	Ireland	16.97
8	Canada	16.92
9	Finland	16.35
10	Norway	16.26
11	Luxembourg	16.25
12	Malaysia	16.00
13	Netherlands	15.94
14	United Kingdom	15.65
15	Qatar	15.39
16	Australia	15.22
17	Taiwan	14.33
18	UAE	14.03
19	Germany	14.00
20	Belgium	13.68
21	France	13.33
22	Kazakhstan	12.35
23	Iceland	12.33
24	Japan	12.16
25	New Zealand	11.85
26	Hong Kong	11.72
27	Korea	11.62
28	South Africa	11.61
29	Portugal	11.11
30	Austria	10.78
31	Lithuania	10.35
32	Turkey	9.70
33	Estonia	9.68
34	Czech Republic	9.66
35	India	9.33
36	China Mainland	8.74
37	Poland	7.85
38	Thailand	7.79
39	Indonesia	7.58
40	Latvia	7.33
41	Greece	6.88
42	Hungary	6.80
43	Philippines	6.66

44	Brazil	6.64
45	Chile	6.30
46	Jordan	6.22
47	Russia	6.21
48	Slovenia	6.13
49	Italy	5.61
50	Spain	5.40
51	Colombia	5.29
52	Mexico	5.10
53	Croatia	4.33
54	Argentina	4.11
55	Slovak Republic	3.51
56	Peru	3.14
57	Romania	1.57
58	Ukraine	1.54
59	Venezuela	0.28
60	Bulgaria	0.00

Table A45: Researchers and Scientists – Potential for Innovation

Ranking	Researchers and Scientists	Score
1	Switzerland	40.00
2	USA	39.28
3	Israel	35.70
4	Singapore	33.23
5	Netherlands	32.42
6	Germany	31.91
7	Canada	31.44
8	Denmark	30.98
9	United Kingdom	30.70
10	Sweden	30.43
11	Ireland	28.76
12	Qatar	28.54
13	Malaysia	26.83
14	Australia	26.32
15	Luxembourg	26.08
16	Finland	25.85
17	UAE	25.61
18	Norway	24.89
19	Japan	24.15
20	Belgium	23.81
21	Taiwan	23.61

22	France	23.26
23	Austria	23.14
24	Hong Kong	22.50
25	Korea	21.61
26	Iceland	21.09
27	New Zealand	20.28
28	Hungary	19.81
29	Kazakhstan	19.68
30	Lithuania	18.69
31	Portugal	18.52
32	China Mainland	18.42
33	Czech Republic	17.40
34	Indonesia	17.38
35	India	16.53
36	Thailand	15.43
37	Turkey	15.18
38	Estonia	14.72
39	Philippines	13.69
40	South Africa	12.87
41	Chile	12.44
42	Greece	12.37
43	Latvia	11.21
44	Slovenia	11.17
45	Argentina	11.10
46	Croatia	10.61
47	Jordan	10.49
48	Brazil	10.41
49	Colombia	9.50
50	Russia	9.49
51	Spain	9.36
52	Mexico	8.55
53	Italy	8.52
54	Ukraine	7.92
55	Peru	4.44
56	Romania	4.35
57	Bulgaria	4.18
58	Slovak Republic	2.97
59	Poland	2.94
60	Venezuela	0.00