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Author(s)	Hashimoto, Tsutomu; Oda, Kazumasa; Qi, Yuan
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On Well-being, Sustainability and Wealth Indices beyond GDP : A guide using cross-country comparisons of Japan, China, South Korea

Tsutomu Hashimoto · Kazumasa Oda · Yuan Qi

0. Introduction

To what degree can money buy happiness? To what degree is money important to our lives? R. Easterlin [1973] found no clear relationship between income and happiness (subjective sense of well-being) in cross-country comparisons. Easterlin also found self-reported measures of happiness declined in the U.S. between 1957 and 1970, despite overall increases in real income levels. Hence, at least based on survey data using self-anchoring scales, an increase in income does not necessarily correlate with an associated increase in happiness.

Recent studies suggest a more nuanced relationship between income and happiness. For instance, Halpern [2010: 19-20] reports that both within and across nations, the relationship is curvilinear—i.e. at lower levels of income increases in income are indeed likely to lead to increases in self-reported measures of happiness, while at higher levels of income, increases in income have considerably less impact on self-reported happiness.

There are multiple other paradoxical issues involving the relationship between income and overall quality of life. For example, in Russia, although GDP per capita has risen over the period 2000 to 2013, life expectancy has concurrently declined, from 1998 to 2003. Meanwhile, in the United States, while overall GDP per capita rose over the period 1999 to 2008, median income (adjusted for inflation) has simultaneously fallen [Stiglitz *et al.* 2010]. Given these conflicting signals from various “life satisfaction” indicators, is it possible to determine an objective measure or a set of measures—aside from GDP—for policy-makers to best pursue?

This is an important question to consider. For decades, policy-makers in most governments have nearly all focused exclusively on the pace of economic growth as shown by the growth of GNP (Gross National Product) and GDP (Gross Domestic Product)¹⁾. As E. J. Mishan pointed out in 1977, “[a]s a criterion by which the nation’s overall performance is judged, and by which the current worths of nations are compared, the index of economic growth has achieved international recognition as the common standard of virtue” [Mishan 1977: 26].

However, as numerous economists have pointed out, there are some crucial difficulties in relying on GDP alone:

First, GDP does not capture the change of international division of labor.

1) GNP has once regarded as the most useful indicator, but since it includes remuneration from overseas production activities through foreign investment, it gradually fell into disuse since the 1980s and replaced by a similar alternative measure, GDP. For details regarding the methodology of measuring GDP, see Landefeld *et al.* [2008].

- Second, GDP does not take into consideration intangibles such as social capital, cultural capital, human capital or capabilities.
- Third, GDP does not reflect the qualitative nature of goods and services. For example, GDP does not take into account differences in the quality of services provided by doctors, or the artistic value of the works of musicians.
- Fourth, GDP does not measure the contribution of the unremunerated labor performed by individuals, such as the domestic labor of homemakers.
- Fifth, GDP disregards the sustainability of our planet or environment, and does not count for population change, climate change and depletion of resources.
- Sixth, while GDP includes goods in its measurement, it does not subtract out or account for negative impacts that are associated with the production or distribution of these goods, such as traffic jams.
- Seventh, GDP provides only a measure of total income and not the distribution of that income throughout society's members; nor does it incorporate social issues related to poverty.
- Eighth, GDP incorporates military expenditure as one of the components of domestic wealth [Mishan 1986: 116].
- Ninth, GDP fails to capture output accruing from the informal sectors of the economy, e.g. voluntary work, such as writing and checking documents on Wikipedia.
- Tenth, GDP does not take into consideration potential benefits attributed to the degree of diversity and complexity of goods and their distribution.

The above represents only a non-extant account of the limitations of GDP as a primary measure of national wealth and well-being. Hence, we seek to address the question of what kind of alternative index could more adequately measure national welfare. As D. Coyle points out, while we currently have no consistently-accepted alternative to GDP, GDP has become increasingly inadequate in accurately measuring national welfare [Coyle 2014: Ch.6]. As such it is important to find an acceptable and cogent alternative to GDP that can be used to assist with construction of appropriate and effective economic and social policies.

We have researched existing literature and collected 24 indices proffered as alternatives to GDP in measuring national wealth or well-being. Below, we present the indices and examine their components and background. For illustrative purposes, with each index we construct cross-country comparisons for China, Hong Kong, Taiwan, South Korea and Japan. While we do not make any normative evaluations of these indices, we do seek to provide an overview of these indices and lay the groundwork for discussing which index can serve as the most plausible alternative for measuring national wealth and well-being.

1. GDP per capita

We first provide a brief overview of GDP per capita or gross domestic product per capita and compare the GDP per capita of several Asian and other countries. A given country's GDP per capita is calculated by dividing its GDP by the country's average (or mid-year) population. GDP is the sum

of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data here are presented in current U.S. dollars [World Bank 2017]²⁾.

China became the second largest country in terms of nominal GDP in 2010. However, the GDP per capita in China is still lower than that in South Korea or in Japan. Meanwhile, Hong Kong's GDP per capita is higher than that of Japan in 2016 (Table 1 and Figure 1).

For GDP per capita, there has been no relative change in terms of comparative rankings between Japan, China and Korea since 1990. From 2009 to 2013, Japan and Korea have seen its GDP per capita consistently improve. However, Japan's GDP per capita dropped considerably for three consecutive years, from 2013 to 2015, only improving in 2016 (Table 2 and Figure 2).

2. Happy Planet Index

The Happy Planet Index (HPI) was designed to take into consideration earth's environmental sustainability. It seeks to show how efficiently residents of different countries are using natural resources to achieve their well-being. The HPI uses the following formula to calculate each country's HPI value:

$$\text{Happy Planet Index} \approx ((\text{Life expectancy} \times \text{Experienced well-being}) \times \text{Inequality of outcomes}) / (\text{Ecological Footprint})$$

Table 1 GDP per Capita (current US\$), 2016, Selected Countries³⁾

Country \ Year	2016
China	8123.1809
Japan	38894.468
South Korea	27538.806
Hong Kong	43681.141
Luxembourg	102831.32
United States	57466.787

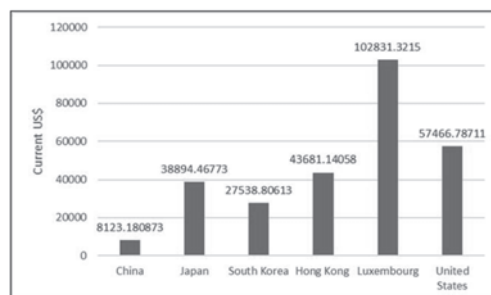


Figure 1 GDP per Capita (current US\$), 2016

Table 2 Consistent Time Series of GDP per Capita, 1990, 2000, 2006-2016⁴⁾

	China	Japan	South Korea	Hong Kong	Luxembourg	United States
1990	317.8852	25417.2794	6516.30576	13485.5449	34645.1432	23954.4794
2000	959.3721	38532.0409	11947.5791	25756.6638	48735.9955	36449.8551
2006	2099.23	35433.989	20888.3802	28224.2151	89739.7117	46437.0671
2007	2695.366	35275.2284	23060.7079	30594.0178	106018.493	48061.5377
2008	3471.248	39339.2976	20430.6395	31515.6628	114293.843	48401.4273
2009	3838.434	40855.1756	18291.9196	30697.3404	103198.669	47001.5553
2010	4560.512	44507.6764	22086.9529	32549.9982	104965.306	48373.8788
2011	5633.796	48167.9973	24079.7885	35142.4879	115761.508	49790.6655
2012	6337.883	48603.4766	24358.7822	36707.7742	106749.014	51450.1223
2013	7077.771	40454.4475	25890.0187	38357.8268	113751.8	52787.0269
2014	7683.502	38096.2115	27811.3664	40247.3669	119172.742	54598.5507
2015	8069.212	34474.1374	27105.0762	42351.0246	101909.822	56207.0367
2016	8123.181	38894.4677	27538.8061	43681.1406	102831.321	57466.7871

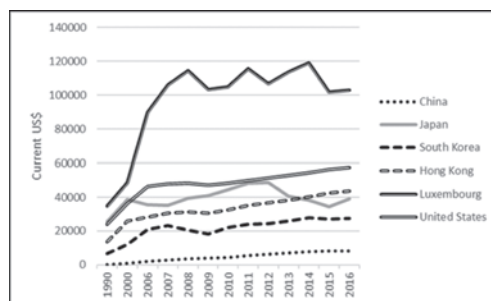


Figure 2 Consistent Time Series of GDP per Capita, 1990, 2000, 2006-2016

2) For more detail on the definition of GDP, see Coyle [2014: 24-32].

3) World Bank national accounts data, and OECD National Accounts data files [World Bank 2017].

4) *ibid.* As a note of interest, GNP in Luxembourg is about two thirds of its GDP, and about one third of the income obtained in the country flows overseas.

The Happy Planet Index aims to show that it is possible to live good lives without costing the Earth [NEF 2016a: 1]. The HPI index is calculated by multiplying a country's mean life expectancy by the mean value of well-being in that country based on data collected as part of the Gallup survey, and adjusts the results to reflect inequalities in the distribution of experienced well-being and life expectancy. The average inequality-adjusted life expectancy based on the country's "happy life expectancy"⁵⁾ is then divided by that country's Ecological Footprint⁶⁾ per capita in order to derive the average number of inequality-adjusted Happy Life Years produced per unit of demand on the natural environment from that country's residents [NEF 2016b].

The Happy Planet Index was introduced by the New Economics Foundation (NEF) in 2006. New Economics Foundation (NEF) is the leading think tank in UK promoting social, economic and environmental justice [NEF 2017b]. One of the representatives of the NEF is David Boyle⁷⁾ (1958-), a British author and journalist, who writes about history and new ideas in economy and culture. He is a co-director of the mutual think-tank, New Weather Institute [Boyle 2018; New Weather Institute 2018a]. Another representative is Andrew Simms⁸⁾, who is also a co-director of the New Weather Institute. Simms obtained his master's degree in development and international political economy at the London School of Economics, and has written a number of reports on climate change, globalization and localization, development issues, conventional and ecological debt, finance and banking, corporate accountability, genetic engineering and food security. Simms proposed the idea of "ecological debt" and uses it to measure the degree to which economies operate beyond their sustainable environmental thresholds, and estimates the annual marking of the day when the world enters into the "red" [New Weather Institute 2018b; Simms 2009].

Cross-country comparisons: The Happy Planet Index scores each country and then ranks them in 9 overall groupings from 1 to 9, where 1 is the best and 9 is the worst. Japan, China, and South Korea all fall in the 6th rank (obtaining scores from 24.8 to 28.6). Japan ranks ahead of China, which in turn ranks ahead of South Korea. Although all scores except on ecological footprint in South Korea are higher than that in China, China has got a better ranking than that of South Korea (**Table 3** and **Figures 3 to 7**).

In the Scores of Well-being based on the Gallup survey in 2012 (**Figure 5**), Japan and South Korea both scored 6.0, while Hong Kong scored 5.5 and China scored 5.1. China's score is about 1.0 point lower than that of Japan and South Korea.

5) Happy life expectancy is defined as self-reported happiness combined with estimates of life-expectancy.

6) This index is estimated by the average amount of land needed, per head of population, to sustain a country's typical consumption pattern. It includes the land required to provide the renewable resources people use (most importantly food and wood products), the area occupied by infrastructure and the area required to absorb CO₂ emissions. Crucially, it is a measure of consumption, not production. This means that, for example, the CO₂ associated with the manufacture of a mobile phone made in China but bought by someone living in Chile, will count toward Chile's Ecological Footprint, not China's. Ecological Footprint is expressed using a standardized unit: global hectares. A global hectare (gha) is a biologically productive hectare with world average productivity in a given year [NEF 2016b: 2, Box A].

7) See also Boyle and Simms [2009].

8) See also *ibid.*, and Simms [2005].

According to a domestic survey of family happiness in China, the average value of happiness is 6.6 in the 2015 survey, 6.83 in the 2014 survey, 6.22 in the 2013 survey, 8.38 in the 2011 survey⁹⁾.

It is interesting to note that Bhutan, known for its promotion of Gross National Happiness Index, has an average happiness level of 5.6 in the Gallup survey of 2012. The average degree of happiness in Bhutan from the Gallup survey was 6.88 in 2015, out of a scale of 1-10. This score is higher than the average value in the Gallup survey but is not among the best [Center for Bhutan Studies & GNH Research 2016: 257, Fig. 112].

Table 3 Scores of Happy Planet Index and Each Component, 2016¹⁰⁾

HPI Rank	Country	Happy Planet Index	Life Expectancy (years)	Well-Being (0-10)	Inequality of outcomes (%)	Ecological Footprint (gha/capita)
72	China	25.7	75.4	5.1	17%	3.4
58	Japan	28.3	83.2	6.0	9%	5.0
80	South Korea	24.8	81.3	6.0	11%	5.7
123	Hong Kong	16.8	83.6	5.5	10%	8.8
1	Costa Rica	44.7	79.1	7.3	15%	2.8

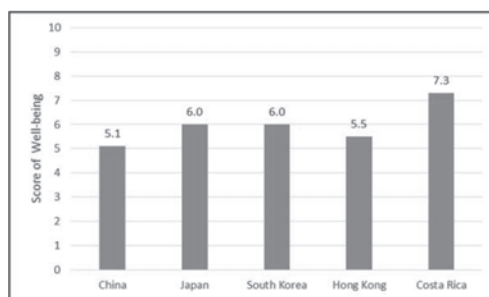


Figure 5 Scores of Well-being, 2016

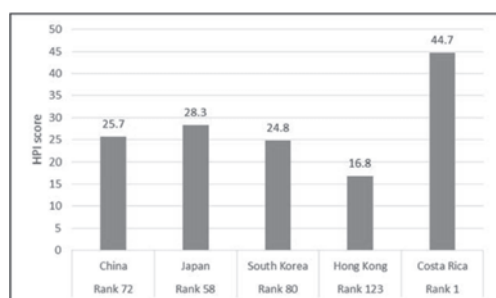


Figure 3 Scores of Happy Planet Index, 2016

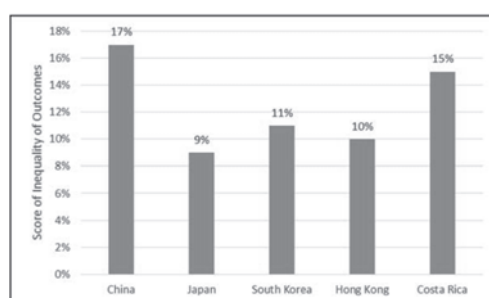


Figure 6 Scores of Inequality of Outcomes, 2016

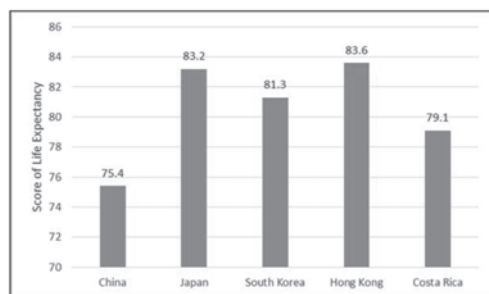


Figure 4 Scores of Life Expectancy, 2016

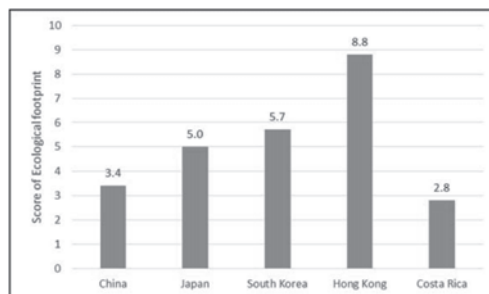


Figure 7 Scores of Ecological Footprint, 2016

9) China Population Communication Network [2011-2015].

10) the Happy Planet Index 2016 dataset [NEF 2017a]. "Inequalities of Outcomes" is "the inequalities between people within a country, in terms of how long they live, and how happy they feel, based on the distribution in each country's life expectancy and wellbeing data. Inequality of outcomes is expressed as a percentage."

3. Human Development Index

The first Human Development Report (HDR) was published 1990 by the United Nations Development Programme (UNDP). Developed by Mahbub Ul Haq, it introduced a new approach to measuring human well-being, anchored in Amartya Sen's work on human capabilities¹¹⁾.

The HDI focuses on three issues: first, the improvement of the people's lives; second, people's freedom to live their lives according to their personal values, i.e., individuals' abilities and their chances to use them; and third, human choice based on the recognition that human development is fundamentally about the matter of more choice. The HDI index seems to have become a dominant alternative to GDP and is seen as a useful tool to articulate the objectives of development and improving people's well-being toward the 2030 agenda of UNDP [UNDP 2017b]. The HDI uses the following three categories to measure human development: (1) Life expectancy at birth (intended to reflect an individual's potential for a long and healthy life), (2) Mean years of schooling and expected years of schooling (intended to reflect an individual's potential ability to acquire knowledge), and (3) gross national income per capita (intended to reflect an individual's ability to obtain a sufficient standard of living).

To measure human development more comprehensively, the Human Development Report also presents four additional related indices: (1) The Inequality-adjusted HDI—this index discounts the HDI according to the extent of a country's inequality, (2) The Gender Development Index—this index compares female and male HDI values, (3) The Gender Inequality Index—this index highlights women's empowerment and (4) the Multidimensional Poverty Index—this index measures non-income dimensions of poverty¹²⁾ [UNDP 2017a: 3, Box2].

Human Development Reports (HDRs) have been released since 1990 by the Human Development Report Office (HDRO), which has editorial independence mandated by the United Nation's General Assembly [UNDP 2017b]. The findings, analysis and policy recommendations of the Reports are those of HDRO alone and are not attributed to UNDP or to its Executive Board. The current leading author of the reports is Selim Jahan¹³⁾, who is the director of Poverty Division in UNDP.

Cross-country comparisons: During the time period from 1990 to 2015, Japan ranked ahead of South Korea in overall HDI, which in turn ranked ahead of China. Note also that following 2010, HDI scores for South Korea are relatively similar to those of Japan's (**Table 4** and **Figures 8 and 9**). Cross-country comparison of several components of HDI is shown in **Table 5** and **Figures 10 to 12**.

11) See also Haq [1996].

12) The Multidimensional Poverty Index is calculated for 102 developing countries. Based on 10 indicators such as nutrition, child's mortality, years of schooling, cooking fuel, water, and so on, this index identifies households that are acutely deprived by their health, education and standard of living. Almost 1.5 billion people in the developing countries for which the MPI is calculated live in multidimensional poverty.

13) See also Jahan [2013]. Before joining UNDP in 1992, Selim Jahan taught at University of Dhaka, Bangladesh and McGill University, Canada and was a Visiting Fellow at School of Public Policy, University of Maryland, USA. He also served as an Adviser to the Planning Commission, Government of Bangladesh, ILO, UNDP, and the World Bank. He was the Secretary General of the Bangladesh Economics Association (1991-1992). He holds a Ph.D. in Economics from McGill University, Montreal, Canada [University Press Limited 2017].

Table 4 Human Development Index Trends, 1990-2015¹⁴⁾

2015 HDI Rank	Country	Human Development Index (HDI)							
		Value							
		1990	2000	2010	2011	2012	2013	2014	2015
90	China	0.499	0.592	0.700	0.703	0.713	0.723	0.734	0.738
17	Japan	0.814	0.856	0.884	0.889	0.894	0.899	0.902	0.903
18	South Korea	0.731	0.820	0.884	0.889	0.891	0.896	0.899	0.901
12	Hong Kong	0.781	0.825	0.898	0.905	0.907	0.913	0.916	0.917
1	Norway	0.849	0.917	0.939	0.941	0.942	0.945	0.948	0.949

Table 5 Human Development Index and Its Several Components, 2015¹⁵⁾¹⁶⁾

Country	Life expectancy at birth (years)	Expected years of schooling (years)	Mean years of schooling (years)	Gross national income (GNI) per capita (2011 PPP \$)
China	76.0	13.5	7.6	13,345
Japan	83.7	15.3	12.5	37,268
South Korea	82.1	16.6	12.2	34,541
Hong Kong	84.2	15.7	11.6	54,265

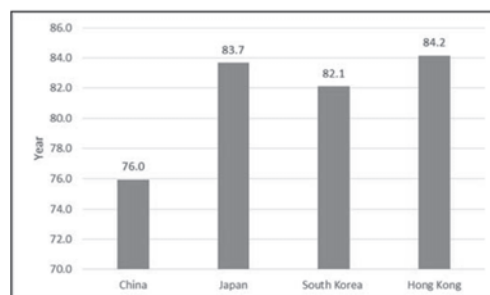


Figure 10 Life Expectancy at Birth, 2015

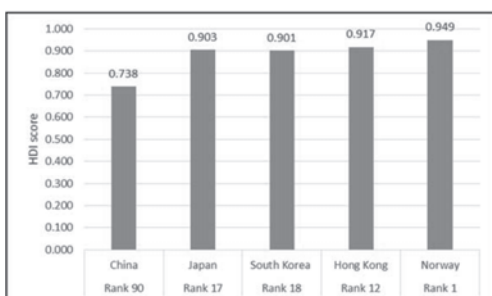


Figure 8 Scores of Human Development Index, 2015

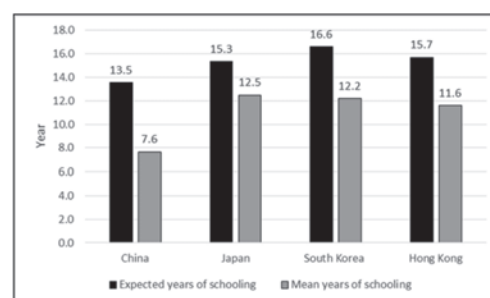


Figure 11 Expected Years of Schooling and Mean Years of Schooling, 2015

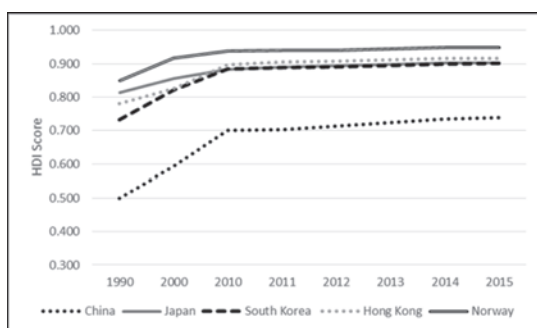


Figure 9 Human Development Index Trends, 1990-2015

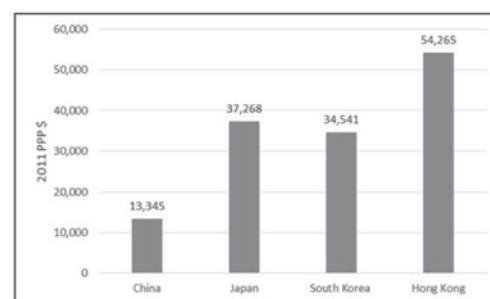


Figure 12 Gross National Income (GNI) per Capita, 2015

14) UNDP [2017b].

15) *ibid.* "Mean years of education" means the average number of years of education received by people ages 25 and older, converted from education attainment levels using official durations of each level.

16) The Gross National Income (GNI) is the total domestic and foreign output claimed by residents of a country, consisting of GDP plus factor incomes earned by foreign residents, minus domestic income earned by nonresidents.

4. Satisfaction with Life Index

The Satisfaction with Life (SWL) Index represents an attempt to directly measure happiness, combined with the Happy Planet Index. It incorporates survey results obtained from directly asking individuals “how they feel”, along with data on aspects of social and economic development, including data on access to schooling from UNESCO, GDP per capita from the CIA, the New Economics Foundation, life expectancy from the WHO, the Veenhoven Database, the Latinbarometer, the Afrobarometer, and the United Nation’s Human Development Report. While results from surveys on subjective well-being might not be seen as scientific, the SWL index seeks to apply objective/reliable standards in predicting health and welfare [University of Leicester 2006].

The SWL index was developed by Adrian G. White, a professor of the University of Leicester in the UK. White notes that the US Declaration of Independence clearly points out certain inalienable rights that, among these, are life, liberty and the pursuit of happiness [Technovelgy 2017], and as Jeremy Bentham pointed out in the eighteenth century, the purpose of politics is to bring the greatest happiness to the greatest number of people. A survey in the UK found that 81% of the UK people surveyed agreed that the government’s primary objective should be the creation of happiness rather than wealth [Easton 2006]. The SWL index represents an effort to provide a contemporary tool to reflect this utilitarian idea, and create an index of happiness in place of GDP.

Cross-country comparison: The SWL index only contains the data for 2006. For that year, the SWL had China ranked ahead of Japan, which ranked ahead of South Korea. By way of comparison, the 2006 “Happy Planet Index” (the results of which were incorporated in SWL index), the scores for China, Japan and South Korea were 55.99, 41.7, and 41.11 respectively, with China scoring the highest among the three (Table 6 and Figure 13).

5. World Happiness Report

The World Happiness Report (WHR) is a global survey of the state of happiness published by the United Nations since 2012. The World Happiness Report 2017 ranks 155 countries by their happiness level. The report is released annually at an event celebrating the International Day of Happiness and continues to gain global recognition in influencing governments’ policy-making decisions. Each annual report is now available on the World Happiness Report website [SDSN 2017].

The WHR takes the following elements into consideration in ranking the countries: the real GDP per capita, social support, healthy life expectancy, freedom to make life choices, generosity, and perceptions

Table 6 Satisfaction with Life Index, 2006¹⁷⁾

Rank	Country	SWLS Score
82	China	210
90	Japan	207
102	South Korea	193
1	Denmark	273

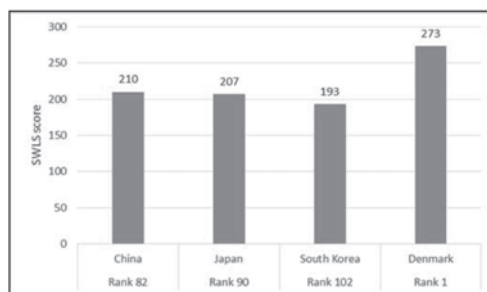


Figure 13 Satisfaction with Life Index, 2006

17) White [2007].

of corruption. To score a country based on its social support, WHR looks at the national average of the binary responses (either 0 or 1) to the Gallup World Poll (GWP) question “If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?” To score a country based on the freedom to make life choices, WHR looks at the national average of binary responses to the Gallup World Poll question: “Are you satisfied or dissatisfied with your freedom to choose what you do with your life?” For the generosity measure, WHR runs a statistical procedure, known as a bivariate regression, on two variables, (i) the national average of GWP responses to the question: “Have you donated money to a charity in the past month?” and (ii) GDP per capita. The resulting residual scores generated from regression the procedure are used as the country scores. For perceptions of corruption, WHR looks at the average of binary answers to two GWP questions: “Is corruption widespread throughout the government or not?” and “Is corruption widespread within businesses or not?” Each country is also compared against a hypothetical nation called “dystopia,” which represents the lowest national average for each element and is used as a regression benchmark along with residual error [Helliwell *et al.* eds. 2017:17].

The WHR is edited by three editors. John F. Helliwell¹⁸⁾ is a Senior Fellow of the Canadian Institute for Advanced Research (CIFAR) and Co-Director of the CIFAR Programme on Social Interactions, Identity, and Well-Being, and a Board Director of the International Positive Psychology Association, and Professor Emeritus of Economics at the University of British Columbia [University of British Columbia 2018]. Richard Layard¹⁹⁾ is a British labor economist, currently working as programme director of the Centre for Economic Performance at the London School of Economics. His work on mental health, including publishing *The Depression Report* in 2006, led to the establishment of the UK Improving Access to Psychological Therapies (IAPT) [LSE 2018]. The third editor is Jeffrey D. Sachs²⁰⁾, an American economist and the director of the Earth Institute at Columbia University, where he holds the title of University Professor [Columbia University 2018].

Cross-country comparison: In the 2017 WHR, Japan is ranked 51st, South Korea ranked 55th and China ranked 79th. Scores of these three countries are all within the band of 5.0~6.0. Taiwan is ranked 33rd, higher than Japan, China and South Korea, at 6.422. Specifically, China scored 5.273, falling behind Taiwan by more than 1 point. Japan and South Korea scored 5.9 and 5.8 respectively. Overall, the happiness score of East Asia’s five countries and regions as listed in Table 7 are all at the medium level. As a note of interest, the happiness score of Bhutan, a country well-known its proposal of the Gross National Happiness, is only 5.011, ranked 98th among 155 countries (Table 7 and Figures 14 and 15).

Table 7 World Happiness Report 2017: Happiness Score and Each Variable Score²¹⁾

Rank	Country	Happiness score	GDP per capita	Social support	Healthy life expectancy	Freedom to make life	Generosity	Perceptions of corruption	Dystopia (1.85) + residual
79	China	5.273	1.081	1.161	0.741	0.473	0.029	0.023	1.765
51	Japan	5.920	1.417	1.436	0.913	0.506	0.121	0.164	1.363
55	South Korea	5.838	1.402	1.128	0.900	0.258	0.207	0.063	1.880
33	Taiwan	6.422	1.434	1.385	0.794	0.361	0.258	0.064	2.127
71	Hong Kong	5.472	1.552	1.263	0.943	0.491	0.374	0.294	0.555
1	Norway	7.537	1.616	1.534	0.797	0.635	0.362	0.316	2.277

18) See also Helliwell [2006], Helliwell and Putnam [2004], Diener *et al.* [2009], and Diener *et al.* [2010].

19) See also Layard [2006, 2011].

20) See also Sachs [2008, 2015].

21) SDSN [2017].

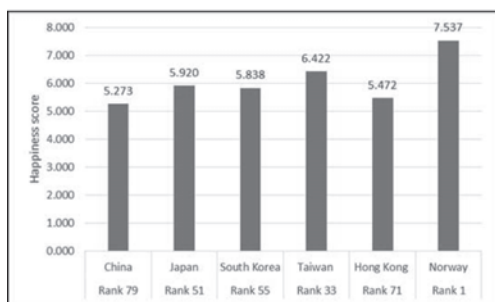


Figure 14 World Happiness Report 2017: Happiness Score

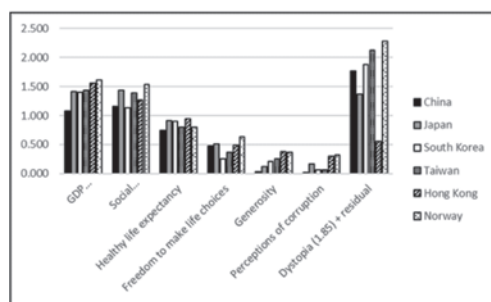


Figure 15 World Happiness Report 2017: Each Variable Score

6. Global Youth Well-being Index

The Global Youth Well-being Index combines a set of youth-related data to evaluate and compare the state of young people's (i.e. people aged between 15 and 29) well-being around the world. The Index is designed to highlight youth needs and opportunities and encourage youth participation in national and global agendas. The 2017 Global Youth Well-being Index includes individual country analyses to assist national-level decision-makers in identifying where investments should be made and resources allocated.

The 2017 Global Youth Well-being Index includes 29 countries and includes seven domains: gender equality, economic opportunity, education, health, citizen participation, safety and security, and information and communication technology. Data were gathered from international sources and through a direct survey of young people [IYF 2017a]. Scores for countries are on a scale of 0 to 1, with 1 being the highest. Scores are given across seven domains comprised of a total of 35 indicators²²⁾, and six of the seven domains include a youth perception indicator²³⁾.

Details on the seven domains are: (1) Gender Equality Indicators²⁴⁾: the indicators look at a number of factors, including restricted civil liberties for women, female youth marriage rate, women's fear of walking alone, youth perception of gender quality. (2) Economic Opportunity Indicators²⁵⁾: this looks at GDP per capita, global competitiveness of the country, the number of youth "not in education, employment, or training" (NEETs), youth unemployment, early-stage entrepreneurial activity, youth borrowing, youth expectation for future standard of living. (3) Education Indicators²⁶⁾: this looks at youth literacy level, public spending on education, secondary school enrollment rate, and secondary

22) Several changes have been made to the Index since its first publication. In total, 11 indicators were removed and 7 indicators were added. In the majority of cases, indicators were removed because no data became unavailable. There were a few instances where indicators were replaced because more appropriate indicators became available [IYF 2017b: 6]. For details, see Table A2.1 and 2.2 of "2017 The Global Youth Wellbeing Index" [*ibid.*: 140-144].

23) The youth perception indicators is youth perception of gender quality, youth expectation for future standard of living, youth satisfaction with education, youth perception of health, youth perception of violence, and youth perception of government.

24) See IYF [2017b: 6, Table 2.1].

25) *ibid.*[18, Table 3.1].

26) *ibid.*[30, Table 4.1].

school completion rate. (4) Health Indicators²⁷⁾: this includes adolescent fertility rate, youth self-harm fatalities, youth stress, youth perception of health, youth tobacco use. (5) Safety and Security Indicators²⁸⁾: this includes youth road fatalities, internal peace, youth interpersonal violence, human trafficking, youth perception of violence, youth satisfaction with education. (6) Citizen Participation Indicators²⁹⁾: this includes democracy, youth volunteering, youth policy, age for office, youth perception of government. (7) Information and Communication Technology (ICT) Indicators³⁰⁾: this includes ICT development, youth internet access at home, internet usage, mobile phone subscriptions [IYF 2017a].

The data used in this index are gathered from internationally recognized sources including the World Bank, the United Nations, and the World Health Organization (WHO). Additional proprietary data for the 2017 Index comes from the Gallup World Poll, the Institute for Health Metrics and Evaluation's Global Burden of Disease, and the International Telecommunications Union's ICT for Development Index [IYF 2017b: xv]. An interactive data set is available at www.youthindex.org.

Nicole Goldin was one of the directors of the Global Youth Well-being Index in 2014 and director of the Youth, Prosperity, and Security Initiative at the Center for Strategic and International Studies (CSIS), in partnership with the International Youth Foundation (IYF)³¹⁾. Until 2012, she served as senior adviser for policy at the U.S. Agency for International Development (USAID), where she led the creation of USAID's first youth in development policy [CSIS and IYF 2014: 27].

The Center for Strategic and International Studies (CSIS) is a nonprofit organization in Washington, D.C. This Center has 220 full-time staff and large network of affiliated scholars. Since 1962, CSIS has become one of the world's preeminent institutions on defense and security; regional stability; and transnational challenges ranging from energy and climate to global health and economic integration. The International Youth Foundation (IYF) is a non-governmental and non-profit organization founded in 1990 in Australia and invests in young people. IYF developed a worldwide community of businesses, governments, and civil-society organizations committed to empowering youth to be healthy, productive, and engaged citizens. The Global Youth Well-being Index is useful as a tool to direct future investments and policies for young people [*ibid.*: ii].

The 2017 Global Youth Well-being Index includes 29 countries and covers seven domains: gender equality, economic opportunity, education, health, citizen participation, safety and security, and information and communication technology. These data are gathered from international sources and through a direct survey of young people [IYF 2017a].

Cross-country comparison: In this index, Japan is ranked 7th, Korea 8th and China 9th. The overall rankings of the three countries are similar. However, looking at individual factors, China has significantly lower scores in Information and Communication Technology (ICT) and Safety and Security Indicators than South Korea and Japan (**Table 8** and **Figures 16 and 17**).

27) *ibid.*[42, Table 5.1].

28) *ibid.*[52, Table 6.1].

29) *ibid.*[62, Table 7.1].

30) *ibid.*[72, Table 8.1].

31) Principal Author of World Youth Well-being in 2017 is Ritu Sharma.

Table 8 2017 The Global Youth Well-being Index³²⁾

Overall Score Rank	Country	Overall Score	Citizen Participation	Economic Opportunity	Education	Health	ICT	Safety and Security	Gender Equality
9	China	0.629	0.495	0.492	0.760	0.747	0.539	0.595	0.796
7	Japan	0.716	0.628	0.694	0.757	0.570	0.866	0.882	0.636
8	South Korea	0.702	0.640	0.488	0.704	0.606	0.883	0.869	0.807
1	Sweden	0.829	0.782	0.787	0.902	0.679	0.926	0.922	0.835

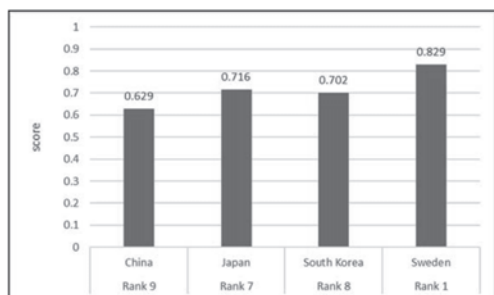


Figure 16 Overall Score: 2017 The Global Youth Well-being Index

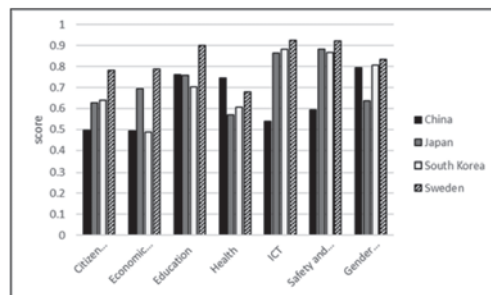


Figure 17 Scores of Each Domain: 2017 The Global Youth Well-being Index

7. OECD Well-being indicators

The OECD Well-being Indicators were designed in 2014 to complement the “OECD Better Life Index³³⁾”. They are now released as an annual report titled “How Was Life?” and aims to present systematic evidence on long-term trends in global well-being from the year 1820 on for 25 major countries and 8 regions in the world, covering more than 80% of the world’s population. This report is the best sources currently available from a historical perspective in this field [OECD 2017b].

“How was Life?” report is the product of collaboration between the OECD, the OECD Development Centre and the CLIO-INFRA project³⁴⁾. It represents the culmination of work by a group of economic historians to chart long-term changes in the dimensions of global well-being and inequality, making use of the most recent research carried out within the discipline. The historical evidence reviewed in this report is organized around the following 9 variables [Clio infra 2017] : (1) GDP per capita, (2) Real wages, (3) Height, (4) Life expectancy, (5) Average years of education, (6) Income Inequality, (7) Polity, (8) Mean species abundance, (9) Homicide rate [Van Zanden *et al.* eds. 2014: 257, Table 13.1]. The World Countries Homicide rate dataset comprises information on the numbers of deaths classified as homicide per 100,000 inhabitants for each country for the period 1800-2000. The Gini of the spread of education in the total population aged 15 years and older is given annually for the period 1850-2010 (the time period varies by country) [Clio infra 2017].

Cross-country comparison: In the 2000 index of Composite Measure of Well-being (CMW), Japan

32) IYF [2017a].

33) OECD Better Life Index is available from: OECD [2017a]. This index has three domains: (1) material living conditions, (2) quality of life and (3) sustainability. The first domain is composed of income and wealth, jobs and earnings, and housing. The second domain is composed of health status, work and

was ranked 17th, South Korea 23rd, and China 96th. From 2000 to 2010, Japan's homicide rate was consistently lower than that of Korea and China. With respect to the index of Educational Inequality Gini Coefficient, Japan ranks the highest among the three countries, showing a higher level of equality, while Korea showed a decline in equality in education after 2008 (Tables 9 to 12, Figures 18 to 21).

Table 9 Scores of Composite Measure of Well-being, 2000

Rank	Country	2000
96	China	1.447087
17	Japan	2.939916
23	South Korea	2.697074
1	Denmark	3.626467

Table 10 Consistent Time Series of CMW Sores from 1820-2000

	China	Japan	South Korea	Denmark
1820	-0.353639709	-0.495623732	-0.094179705	-0.318161109
1830	-0.27784067	-0.32780012	0.06768267	-0.41763516
1840	-0.243970009	-0.367286563	0.110105027	-0.288708468
1850	-0.488488127	-0.405575102	0.0407859	0.010733082
1860	-0.517735117	-0.43636251	-0.026183513	0.105501393
1870	-0.48970129	-0.50012844	-0.4460781	0.37812776
1880	-0.52034334	-0.5635839	-0.50945685	0.47994693
1890	-0.480288402	-0.470115868	-0.463518689	0.574855242
1900	-0.53965275	-0.36658131	-0.70228033	0.78352389
1910	-0.470439097	-0.211484362	-0.658777715	0.947110494
1920	-0.474276618	0.003465675	-0.548684974	1.19035677
1930	-0.486807153	0.287187229	-0.405927322	1.3202129
1940	-0.380164678	0.452599887	-0.210718309	1.352738524
1950	-0.196260521	0.953145491	0.145850528	1.72073303
1960	0.07663499	1.45401226	0.51886063	2.10357913
1970	0.48467419	1.923954424	0.964644762	2.466351221
1980	0.80038951	2.30988283	1.58582927	2.80285871
1990	1.036689506	2.680810875	2.24740414	3.034875607
2000	1.44708716	2.93991552	2.69707406	3.62646743

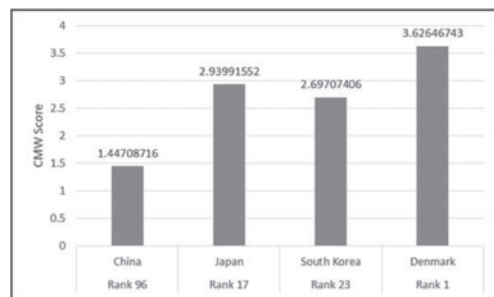


Figure 18 Scores of Composite Measure of Well-being, 2000

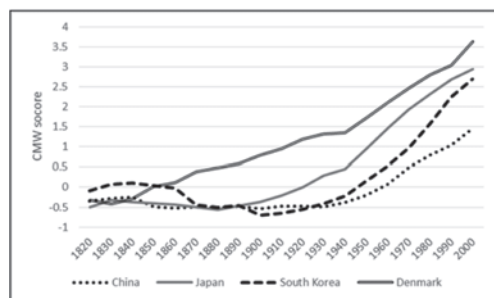


Figure 19 Consistent Time Series of CMW Sores from 1820-2000

life balance, education and skills, civic engagement and governance, social connections, environmental quality, personal security, and subjective well-being. The third domain is, however, substantially excluded due to the unavailability of relevant data. Thus OECD Better Life Index is in substance composed of two domains and 11 indicators, and examines 36 countries [OECD 2011: 18-21]. The weight among these 11 indicators is open to users' interpretation [OECD 2017a] and there is no official ranking among the 36 countries.

Since 2014, OECD Well-being Indicators have been published as a report titled *How was life?* [Van Zanden *et al.* 2014]. "The report examines 10 individual dimensions of well-being, tracking them over time and space, then pulls them together in a new composite indicator. The dimensions covered reflect a broad range of material and non-material aspects of well-being: per capita GDP, real wages, educational attainment, life expectancy, height, personal security, political institutions, environmental quality, income inequality and gender inequality" [*ibid.*: 19, see also Ch.13].

The report "*How was Life?*" provides historical dimension to the report, "*How's Life?*" These two indices share the same theoretical framework and cover 193 countries and regions [*ibid.*, Ch.13; Clio *infra* 2017].

- 34) In 2010, the Netherlands Organization for Scientific Research subsidized the Clio *Infra* project hosted by the International Institute of Social History (IISH). Clio *Infra* has set up a number of databases on social, economic, and institutional indicators for the past five centuries, especially for the past 200 years [Clio *infra* 2017].

Table 11 Homicide Rates, 2000-2010 ³⁵⁾

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
China			2	1.9	1.9	1.6	1.4	1.2	1.1		
Japan	0.61	0.58	0.58	0.56	0.52	0.48	0.46	0.41	0.43	0.4	
South Korea	1.7	1.59	1.67	1.73	1.82	1.78	1.62	1.46	2.3	2.9	2.6

Table 12 Educational Inequality Gini Coefficient, 2000-2010 ³⁶⁾

	China	Japan	South Korea
2000	18.83658	9.639369	18.630399
2001	19.7915	9.441836	18.582579
2002	19.26078	9.240991	18.56827
2003	18.3876	9.051663	18.487288
2004	14.63047	9.340545	19.239908
2005	13.75443	9.148288	19.015502
2006	15.57976	8.967172	18.727212
2007	16.47469	8.787811	18.385097
2008	16.53223	8.615744	18.082602
2009	14.4604	8.824645	18.47354
2010	14.4604	8.667411	18.215776

8. Inclusive Wealth Index

The Inclusive Wealth Index (IWI) was launched in 2012 at the Rio+20 United Nations Conference on Sustainable Development. The Conference called for a paradigm shift in measuring development and growth, and proposed to use a set of Sustainable Development Goals (SDGs). The IWI is a response to this request. The IWI provides a tool to measure progress in more inclusive and sustainable ways, and seeks to promote sustainable development as a policy paradigm [UNU-IHDP and UNEP 2014: 1-2].

IWI seeks to measure a country's wealth in terms of progress, well-being and long-term sustainability across generation³⁷⁾. It focuses on a country's capacity or capital to create and maintain human well-being over time. One of the main questions this index asks is whether our current level of well-being is sustainable or not.

IWI looks at the following three factors: (1) Manufactured Capital: including Investment, Depreciation rate, Assets lifetime, Output growth, Population, Productivity, (2) Natural Capital: including Fossil fuels, Minerals, Forest resources, Agricultural land, Fisheries, (3) Human Capital: including a country's Population by age and gender, Mortality probability by age and gender, Discount rate, Employment, Educational attainment, Employment compensation, Labor force by age and gender.

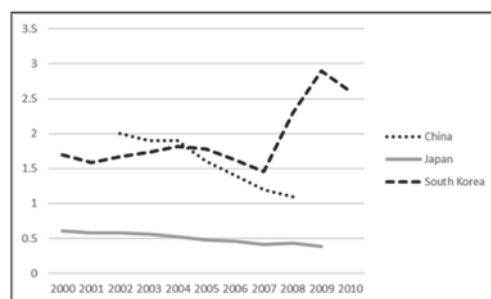


Figure 20 Homicide Rates, 2000-2010

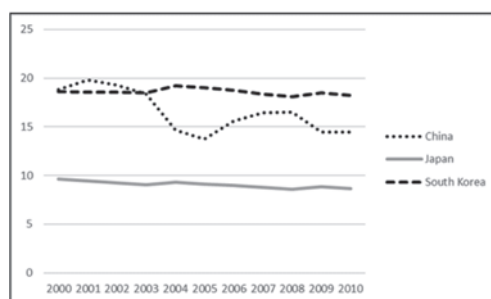


Figure 21 Educational Inequality Gini Coefficient, 2000-2010

35), 36) Clio infra [2017].

37) International Human Dimensions Programme on Global Environmental Change [2014].

IWI supplements the Human Development Index (HDI) by providing an environmental dimension. HDI does not address the natural ecosystems within which human development throughout generations. IWI tries to fill this gap.

The inclusive wealth index project was founded by a group of researchers and economists as a joint initiative of the United Nations University International Human Dimensions Programme (UNU-IHDP) and the United Nations Environment Programme (UNEP) in collaboration with the United Nations Educational, Scientific and Cultural Organization (UNESCO). The chair of its science advisory group is Partha Dasgupta³⁸⁾, a professor of University of Cambridge, in UK.

Through the dialogue on “the post-2015 global development agenda,” we have recognized the deficiencies of the present development agenda, as well as the limitations in GDP as an index for progress [United Nations 2012, UNU-IHDP and UNEP 2012].

The 2012 global summit, the Rio+20 United Nations Conference on Sustainable Development, called for a paradigm shift in measuring development and growth, and proposed to use a set of Sustainable Development Goals (SDGs). The inclusive wealth index is a response to these requests. The Inclusive Wealth Index (IWI) would be crucial in measuring progress toward the Sustainable Development Goals, and in the evaluation of sustainable development as a policy paradigm. For example, the Inclusive Well-being Report in 2012 found that 19 of 20 countries were reducing natural capital while they fail to invest in rebuilding it [UNU-IHDP and UNEP 2014:1-2, 5-6].

Cross-country comparison: Among Japan, South Korea and China, Japan is ranked the highest in items of its human capital per capita and produced capital per capita. However, Japan is ranked the last in terms of natural capital per capita (Tables 13 to 17 and Figures 22 to 28).

Table 13 Inclusive Wealth in Millions of Constant 2005 US\$, 2010³⁹⁾

Rank	Coutry	2010
4	China	31,969,803
2	Japan	54,693,320
14	South Korea	9,397,391
1	United States	143,824,201

Table 14 Inclusive Wealth in Millions of Constant 2005 US\$, 1990-2010⁴⁰⁾

	1990	1995	2000	2005	2010
China	18,571,020	20,600,640	23,025,303	26,122,801	31,969,803
Japan	44,161,278	48,711,574	51,895,150	53,747,667	54,693,320
South Korea	5,268,564	6,413,398	7,439,254	8,444,159	9,397,391

Table 15 Inclusive Wealth per Capita in Millions of Constant 2005 US\$, 2010⁴¹⁾

Rank	Coutry	2010
95	China	23,834
16	Japan	432,236
34	South Korea	195,033
1	Iceland	758,631

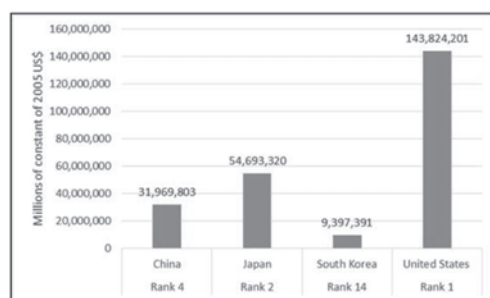


Figure 22 Inclusive Wealth in Millions of Constant 2005 US\$, 2010

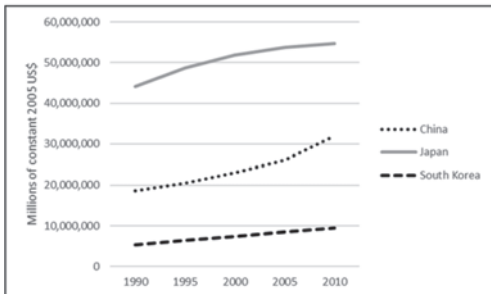
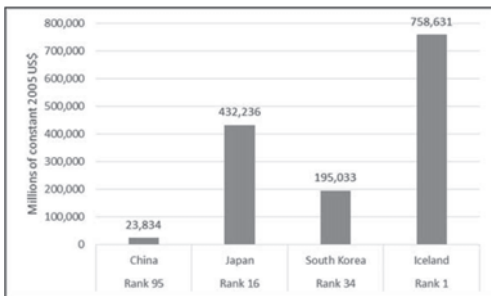
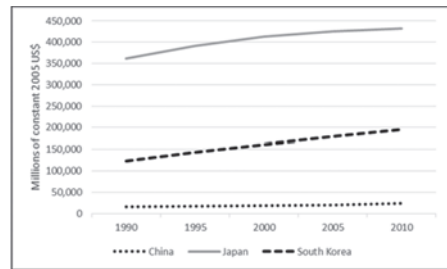
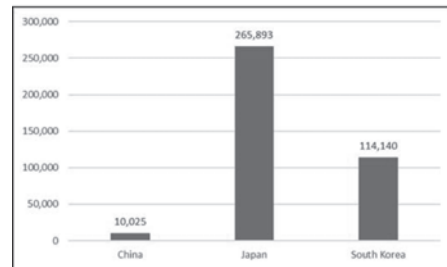
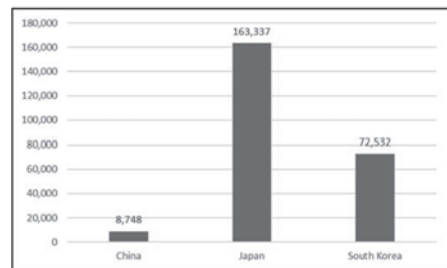
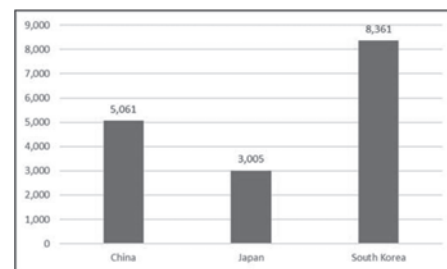
38), 39), 40), 41) See also Dasgupta [2004].

Table 16 Inclusive Wealth per Capita in Millions of Constant 2005 US\$, 1990-2010⁽⁴²⁾

	1990	1995	2000	2005	2010
China	16,216	16,969	18,143	19,978	23,834
Japan	361,234	391,299	412,783	425,243	432,236
South Korea	122,581	143,598	161,766	179,494	195,033

Table 17 Human Capital per Capita, Produced Capital per Capita and Natural Capital per Capita in Millions of Constant 2005 US\$, 2010⁽⁴³⁾

	Human capital per capita	Produced capital per capita	Natural capital per capita
China	10,025	8,748	5,061
Japan	265,893	163,337	3,005
South Korea	114,140	72,532	8,361

**Figure 23 Inclusive Wealth in Millions of Constant 2005 US\$, 1999-2010****Figure 24 Inclusive Wealth per Capita in Millions of Constant 2005 US\$, 2010****Figure 25 Inclusive Wealth per Capita in Millions of Constant 2005 US\$, 1990-2010****Figure 26 Human Capital per Capita in Millions of Constant 2005 US\$, 2010****Figure 27 Produced Capital⁽⁴⁴⁾ per Capita in Millions of Constant 2005 US\$, 2010****Figure 28 Natural Capital per Capita in Millions of Constant 2005 US\$, 2010**

42) UNU-IHDP and UNEP [2014: 220-227].

43) *ibid.*[228-251]. According to the "Inclusive Wealth Report 2012, in terms of "inclusive wealth per capita" in 2008, Japan is ranked number one ahead of the United States [UNU-IHDP and UNEP 2012: 291ff. Data annex]. Fukushima [2016] argues that Japan has the world's highest quality of living based on this result. The "Inclusive Wealth Report 2014", however, changed the calculation method and the target countries were expanded from 20 to 140. Because of the change in method, it is not possible to simply compare the data from the 2012 report to the data in the 2014 report.

44) Produced capital is the capital produced through the construction of equipment, machinery, roads and others.

9. East Asian Social Survey⁴⁵⁾

East Asian Social Survey (EASS) is a biennial social survey project launched in 2003, focusing on East Asian countries. EASS has been dedicated to promoting comparative studies on diverse aspects of social lives in East Asia [EASS 2017]. The constituent teams that launched the EASS were the JGSS team; Taiwanese team, which has been conducting a survey modeled after the GSS for many years (the Institute of Sociology, Academia Sinica); and Korean team, who started in 2003 (the Survey Research Center (SRC), Sungkyunkwan University). Chinese team, which started in 2003 (Hong Kong University of Science and Technology, and Renmin University of China) has participated the EASS later [JGSS Research Center 2018]. One of the most important methodological features of EASS is that, rather than conducted as an independent survey, its topical modules are integrated into a preexisting survey framework of each country, i.e., CGSS (China General Social Survey), JGSS (Japan General Social Survey), KGSS (Korea General Social Survey), and TSCS (Taiwan Social Change Survey), just like the way ISSP module surveys are conducted by its member countries. We believe that such a method greatly widens the scope of data collection and analysis both within and across the East Asian boundaries [EASS 2017].

As of 2017, the EASS has conducted six module surveys in 2006, 2008, 2010, 2012, 2014, and 2016. The theme for the first EASS was “Family in East Asia,” the second was “Globalization and Culture in East Asia,” the third was “Health in East Asia,” the fourth was “Network Social Capital in East Asia,” and the fifth survey was “Work.” Currently, the first EASS module “Family,” is being replicated so that scholars can understand the continuity and changes of familial attitudes in these countries. The harmonized data is expected to be released in the spring of 2018.

The team members of EASS include: (1) Bian, Yanjie⁴⁶⁾, a professor at University of Minnesota, Dean, School of Humanities and Social Science, Xi'an Jiaotong University, who also acted as the EASS Secretariat for 2010-2011 (EASS 2012 Convener) and an international representative and a member of the advisory committee of CGSS (China General Social Survey), (2) Li, Lulu⁴⁷⁾, a professor at Renmin University of China, and (3) Noriko, Iwai⁴⁸⁾, a director of JGSS Research Center, and a professor at Osaka University of Commerce.

Cross-country comparison: In 2010, among Japan, Korea, China and Taiwan, the percentage of those surveyed who answered “very happy” to the question “In general, are you happy?” was almost the same⁴⁹⁾. When we add the proportion of people who answered “happy” and “very happy,” Taiwan ranks higher than Japan. In Korea, the proportion of people who answered that they are neither “happy” nor “unhappy” is the highest in comparison to other countries (Table 18 and Figure 29). Comparing the survey results of 2010 and 2012, the change in China is of interest as a significant increase (by about 5%) in the number of respondents answered “very happy” or “happy”. In China, the combined

45) The list of articles based on EASS data is available from: JGSS Research Center [2018].

46) See also Bain [2013], Liu *et al.* [2017], and Bain and Li [2008].

47) See also Li [2002], [2000].

48) See also Iwai [2002], Tanioka *et al.* eds.[2008].

49) JGSS Research Center [2012: 237].

percentage of those surveyed who answered “very happy” and “happy” is roughly the same as that in Taiwan. Meanwhile, in South Korea, the there is a significant increase in the percentage of those surveyed who answered “very happy” (by over 10%). A much smaller percentage answered “unhappy” in Japan (Table 19 and Figure 30).

Table 18 General Happiness, East Asian Social Survey 2010⁵⁰⁾

	China	Japan	South Korea	Taiwan
Very happy, 1	14.7	18.5	12.4	17.5
2	55.9	40.2	33.6	63.8
3	19.5	32.7	43.0	8.5
4	7.6	7.3	7.9	7.4
very unhappy, 5	2.2	1.0	2.3	2.4
DK, refused	0.1	0.4	0.8	0.4
(N)	3,866	2,496	1,576	1,135

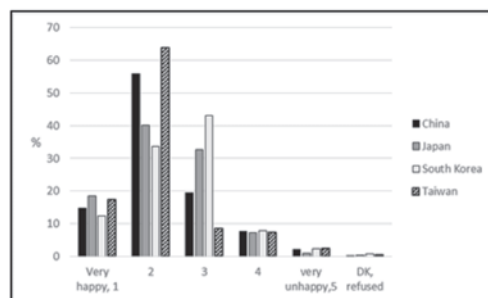


Figure 29 General Happiness, East Asian Social Survey 2010

Table 19 General Happiness, East Asian Social Survey 2012⁵¹⁾

	China	Japan	South Korea	Taiwan
Very happy, 1	16.8	19.4	25.4	16.6
2	59.1	42.6	40.2	59.0
3	15.4	30.9	27.1	12.2
4	6.8	5.4	5.5	8.6
very unhappy, 5	1.6	1.2	1.9	3.3
DK, refused	0.4	0.5	0.0	0.2
(N)	5,820	2,334	1,397	2,134

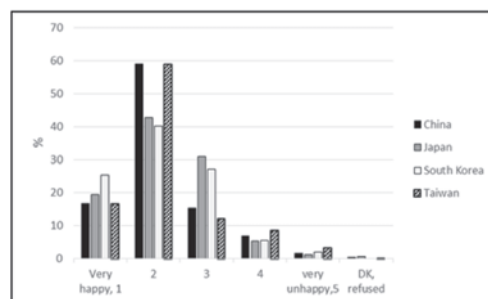


Figure 30 General Happiness, East Asian Social Survey 2012

10. World Values Survey⁵²⁾

The World Values Survey (WVS) was first launched in 1981, by a global network of social scientists led by the WVS Association and WVS Secretariat headquartered in Vienna, Austria. The WVS is one of the largest surveys and consists of nationally representative surveys conducted in almost 100 countries. The data is analyzed in various fields of study such as economic development, democratization, religion, gender equality, social capital, and subjective well-being [WVSA 2017a].

WVS started out as the European Values Study (EVS), first conducted in 1981, under the support of Jan Kerkhofs⁵³⁾ and Ruud de Moor⁵⁴⁾ and it continues to be based in the Netherlands at the Tilburg University. Ronald Inglehart⁵⁵⁾ of the University of Michigan subsequently played a leading role in

50) Iwai *et al.* [2010:38].

51) Li *et al.* [2012:35].

52) More information is available from WVSA [2018]. On a research based on this index in Japan, see Nakazato [2016].

53) Jan Kerkhofs (1924-2015) was a Belgian Jesuit and religious sociologist [Elisabeth 2018].

54) Ruud de Moor Ruud (1928-2001) was a Dutch professor of sociology linked to the University of Tilburg and the Open University in the Netherlands. With Jan Kerkhofs he started the European Values Study which later became the World Values Survey. The Ruud de Moor centrum (RdMC) of the Open University in the Netherlands was named after him in honor of his influence on reform of higher education in the Netherlands [Van de Kaa 2003:39-48; Stijnen and Gerrichhauzen eds. 2006: 10].

55) Ronald F. Inglehart (1934-) is a political scientist at the University of Michigan. He is director of the World Values Survey. Since 2010 Inglehart has been co-director of the Laboratory for Comparative

expanding it to be carried out worldwide. The database of the WVS is available on the internet with free access. The official archives of the World Values Survey are located at ASEP/JDS, Madrid, Spain [WVSA 2017b].

Two questions asked in the WVS are of particular interest here: (1) one question asks people whether they are happy, “ [t]aking all things together”; (2) a second question asks “ [a]ll things considered, how satisfied are you with your life as a whole these days?” and asks the surveyees to rank from a scale of 1-10, with one meaning “completely dissatisfied” and 10 meaning “completely satisfied” [WVSA 2012: 2-3].

Cross-country comparison: The percentage of those surveyed who answered “very happy” is 32.3% in Japan, 15.7% in China, and 15.2% in South Korea. The proportion of those who responded “rather happy” is remarkably high in South Korea, with about 75% answering “rather happy” (Table 20 and Figure 31). In South Korea, the proportion of those who answered middle (stage 5) is remarkably high (19.6%) among those four countries and regions. In Korea, the percentage of people who replied “completely satisfied” is the lowest (4.3%). This percentage is less than half of the highest in Taiwan (11.2%). On the other hand, in Taiwan, the proportion of people who answered “completely dissatisfied” is 2.5%, which is remarkably higher than in other countries and regions. The average percentage of people who replied “completely dissatisfied” in 60 countries is 3.2% (Table 21 and Figure 32). The values of “mean values of satisfaction with your life” are almost the same in Japan, China,

Table 20 Feeling of Happiness, World Values Survey Wave 6: 2010-2014⁵⁶⁾

	China	Japan	South Korea	Taiwan	Hong Kong
Very happy	15.7%	32.3%	15.2%	26.0%	23.4%
Rather happy	68.8%	54.2%	74.8%	63.9%	65.7%
Not very happy	13.3%	9.4%	9.2%	7.8%	9.3%
Not at all happy	1.1%	1.0%	0.7%	1.3%	1.4%
No answer	0.5%	0.0%	0.1%	0.2%	0.2%
Don't know	0.7%	3.2%	0.0%	0.8%	0.0%
(N)	2,300	2,443	1,200	1,238	1,000

Selected samples: China 2012, Japan 2010, South Korea 2010, Taiwan 2012, Hong Kong 2013

Table 21 Satisfaction with Your Life, World Values Survey Wave 6: 2010-2014⁵⁷⁾

	China	Japan	South Korea	Taiwan	Hong Kong
Completely dissatisfied	1.1%	1.3%	1.1%	2.5%	1.5%
2	1.8%	1.1%	0.3%	1.1%	1.0%
3	3.3%	3.5%	4.4%	3.4%	1.9%
4	5.9%	5.8%	5.5%	2.2%	4.2%
5	11.8%	12.1%	19.6%	14.1%	14.3%
6	13.1%	11.0%	14.5%	14.6%	13.9%
7	18.3%	18.4%	21.8%	17.6%	23.8%
8	24.7%	25.4%	19.0%	23.8%	23.7%
9	10.3%	11.1%	7.8%	7.9%	8.2%
Completely satisfied	7.8%	7.9%	4.3%	11.2%	7.2%
No answer; BH: Refused	1.4%	0.0%	1.6%	0.1%	0.3%
Don't know	0.4%	2.5%	0.0%	1.7%	0.0%
(N)	2,300	2,443	1,200	1,238	1,000
Mean	6.85	6.91	6.51	6.9	6.85
Standard Deviation	1.98	1.98	1.82	2.06	1.84
Base mean	2,257	2,381	1,181	1,216	997

Selected samples: China 2012, Japan 2010, South Korea 2010, Taiwan 2012, Hong Kong 2013

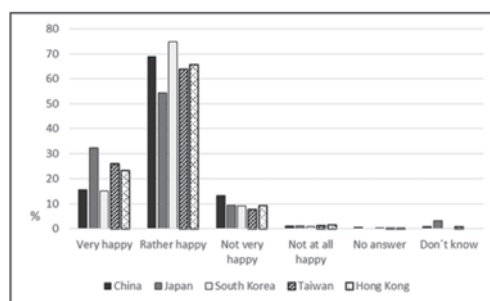


Figure 31 Feeling of Happiness, World Values Survey Wave 6: 2010-2014

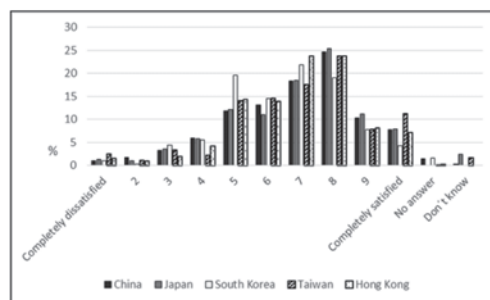


Figure 32 Satisfaction with Your Life, World Values Survey Wave 6: 2010-2014

Social Research at the National Research University, Higher School of Economics in Moscow and St Petersburg. This laboratory carries out surveys in Russia and eight ex-Soviet countries and trains Ph.D.-level students in quantitative cross-national research methods [University of Michigan 2018; National Research University Higher School of Economics 2018]. See also Diener *et al.* [2013] and Inglehart *et al.* [2008].

56), 57) World Values Survey Wave 6 [WVSA 2017c].

Taiwan and Hong Kong. In contrast, the value in South Korea is 6.51 and the rank of South Korea is remarkably low (41st among 60). Among the 60 countries and regions surveyed, Mexico has the highest value of 8.51, and Egypt has the lowest value of 4.85 (**Figure 33**). South Korea has greatly increased the mean values of satisfaction during the period from wave 1 (year 1981 to 1984) to wave 2 (1990-1994). China and South Korea showed lowered mean values during the period from wave 2 (1990-1994) to wave 4 (1999-2004). Especially in China, the degree of decline is significant. In the period from Wave 4 (1999-2004) to Wave 6 (2010-2014), the mean values of satisfaction in Japan, China and South Korea as a whole increased. However, the mean value during the period from wave 5 (2005-2009) to wave 6 (2010-2014) decreased slightly (**Tables 22 and 23 and Figures 33 and 34**).

Table 22 Comparison of Mean Values of Satisfaction with Your Life, World Values Survey Wave 6: 2010-2014

Rank	Country	Mean
33	China	6.85
31	Japan	6.91
41	South Korea	6.51
32	Taiwan	6.9
34	Hong Kong	6.85
1	Mexico	8.51
60	Egypt	4.85

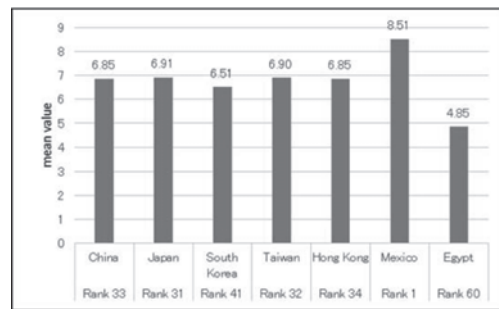


Figure 33 Comparison of Mean Values of Satisfaction with Your Life, World Values Survey Wave 6⁵⁸⁾:2010-2014

Table 23 Mean Values of Satisfaction with Your Life, Wave 1-6⁵⁹⁾

	China	Japan	South Korea
wave 1 1981-1984		6.59	5.33
wave 2 1990-1994	7.29	6.53	6.69
wave 3 1995-1998	6.83	6.56	6.61
wave 4 1999-2004	6.53	6.48	6.21
wave 5 2005-2009	6.76	6.99	6.35
wave 6 2010-2014	6.85	6.91	6.51

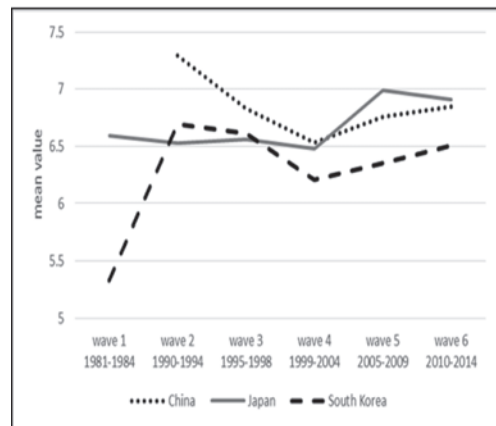


Figure 34 Mean Values of Satisfaction with Your Life, Wave 1-6

11. Global Youth Development Index

Global Youth Development Index (YDI) is a composite index of 18 indicators that measure multi-dimensional progress on youth development in 183 countries. Originally planned in 1998, this index was finally developed in 2012 by the Commonwealth Secretariat, an intergovernmental agency which has observer status in the United Nations General Assembly, located at Marlborough House in London, the United Kingdom [Commonwealth Secretariat 2018; cf. Commonwealth Secretariat 2017b]. Youth is defined in YDI as people between the ages of 15 and 29 [Commonwealth Secretariat 2017a]. The

58) The wave 6 data are gathered from 60 countries and regions.

59) World Values Survey Wave 6 [WVSA 2017c].

stated goal of this index is to help drive the Commonwealth Plan of Action for Youth Empowerment (PAYE) by providing a reliable and informative tool. In 2012, the Institute for Economics and Peace (IEP) developed the methodology for the first Youth Development Index. Youth development is defined to mean: “enhancing the status of young people, empowering them to build on their competencies and capabilities for life. It will enable them to contribute and benefit from a politically stable, economically viable, and legally supportive environment, ensuring their full participation as active citizens in their countries” [Commonwealth Secretariat 2013: 12; cf. Commonwealth Secretariat 2016: 8-9].

The theoretical framework of the YDI is derived from A. Sen and M. Nussbaum’s work on capability⁶⁰. It measures five domains: Education, Health and Well-being, Employment and Opportunity, Political Participation and Civic Participation. It uses 18 indicators in total selected on the basis of their importance to the development of young people [*ibid*:8, 12]⁶¹.

There are two leading figures of the YDI index project: The first is Dr. Joseph Muscat (1974-), a Maltese politician who has served as Prime Minister of Malta since 2013, and Leader of the Partit Laburista (PL) since June 2008. He identifies himself as a progressive and liberal politician, with pro-business leanings, and has been associated with both economically liberal and socially liberal policies [Times of Malta 2008, 2013; Malta Independent 2017; Diacono 2017]. The second is Patricia Scotland (1955-), a British barrister who served in junior ministerial positions within the UK Government, most notably as the Attorney General for England and Wales and Advocate General for Northern Ireland. She was elected the 6th Secretary-General of the Commonwealth of Nations in 2016, the first woman to hold the post. She has a dual citizenship of the United Kingdom and Dominica [Sansone 2015; Nicholls 2015]. The YDI score is a number between 0 and 1 (1 is the highest and 0 is the lowest)⁶².

Cross-country comparison: Among the five countries and regions in East Asia, the rank of China is remarkably low and its score is less than 0.6. The scores of Japan, South Korea and Hong Kong are similar to each other (**Table 24** and **Figure 35**). In terms of “Health & Well-being,” there is no significant difference in value among China, Japan, South Korea and Hong Kong, while, the value for Taiwan is lower. With respect to “Education,” the values for Japan, South Korea and Hong Kong are all 0.95 or more, while the values for China and Taiwan are below 0.8. In the domain of “Employment & Opportunity,” Japan ranks high as the third best out of the 183 countries surveyed. The other four countries and regions lag behind. In the domain of “Civic Participation,” South Korea and Hong Kong rank relatively high, at 47th for South Korea and 39th for Hong Kong of the 183 countries surveyed.

60) See Sen [1985, 1999] and Nussbaum [2000, 2003].

61) See Commonwealth Secretariat [2016: 14, Table 1.2, 145, Table A 2.8].

62) The YDI developers suggest this scoring system is the same as the one that underpins the HDI. “Education is a crucial resource, which is strongly correlated with occupational entry, levels of pay and security, and life satisfaction, although there are large and persistent inequalities associated with educational performance and progression [Shavit and Blossfield 1993]. Physical and mental health and behaviors that have an impact on health, such as smoking and drinking alcohol, are also clearly related to socio-economic status and some of the habits and practices that become established in youth will subsequently affect patterns of mortality [West 2009]. Patterns of participation are also related to socio-economic status: having an interest in politics and participating in elections are more common among young people from more affluent families and those who are better educated [Henn *et al.* 2005]” [Commonwealth Secretariat 2016: 12-13].

Table 24 YDI Ranks and Scores, 2016⁽⁶³⁾

Rank	State	YDI Overall Score
118	China	0.578
10	Japan	0.815
18	South Korea	0.797
51	Taiwan	0.684
27	Hong Kong	0.753
1	Germany	0.894

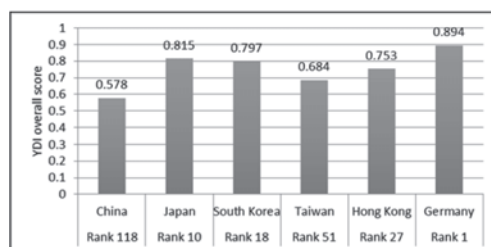


Figure 35 YDI Ranks and Scores, 2016

Table 25 Scores of Each Domain, 2016⁽⁶⁴⁾

Country \ Domain	China	Japan	South Korea	Taiwan	Hong Kong	Germany
Health & Well-being	0.757	0.801	0.782	0.773	0.624	0.817
Education	0.791	0.982	0.976	0.763	0.955	0.981
Employment & Opportunity	0.699	0.889	0.699	0.657	0.737	0.899
Civic Participation	0.166	0.236	0.656	0.510	0.690	0.692
Political Participation		0.825	0.780	0.568	0.696	1

Table 26 Ranks of Each Domain, 2016⁽⁶⁵⁾

Country \ Domain	Health & Well-being	Education	Employment & Opportunity	Civic Participation	Political Participation
China	59	73	40	179	183
Japan	35	7	3	163	27
South Korea	45	12	40	47	36
Taiwan	47	85	50	91	100
Hong Kong	114	25	28	39	57
Germany	28	8	2	37	1

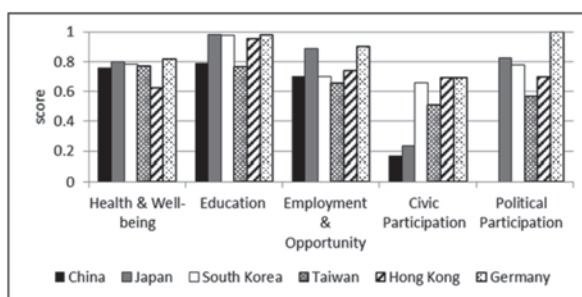


Figure 36 Scores of Each Domain, 2016

China and Japan rank relatively low, at 179th for China and 163rd for Japan of the 183 countries surveyed. In the domain of “Political Participation,” the data for China was missing and therefore China is ranked as the 183rd. Taiwan ranks lower at 100th, compared to the other four countries and regions (Tables 25 and 26 and Figure 36).

12. Environmental Sustainability Index

The Environmental Sustainability Index (ESI) was launched as a complement to the Millennium Development Goals (MDGs) and an alternative to gross domestic product (GDP). ESI reports were published from 1999 to 2005, tracking 21 domains and using 76 datasets analyzing environmental sustainability including natural resource endowments, past and present pollution levels, environmental management efforts, contributions to protection of the global commons, and a society's capacity to

63) Global Youth Development Index and Report 2016 [Commonwealth Secretariat 2016].

64), 65) *ibid.*

improve its environmental performance over time [Emerson *et al.* 2012:11]. The ESI score represents an equally weighted average of scores from the 21 domains. The ESI contains the following five broad categories: (1) Environmental Systems, (2) Reducing Environmental Stresses, (3) Reducing Human Vulnerability to Environmental Stresses, (4) Societal and Institutional Capacity to Respond to Environmental Challenges, and (5) Global Stewardship [Esty *et al.* 2005: 11, Table 9]⁶⁶⁾.

ESI was developed by Yale University's Center for Environmental Law and Policy (YCELP) in collaboration with Columbia University's Center for International Earth Science Information Network (CIESIN) and the World Economic Forum. Subsequently, a new index, the Environmental Performance Index (EPI) was developed from the ESI, as discussed in the next section [Emerson *et al.* 2012:11].

The director of the ESI project is Daniel C. Esty⁶⁷⁾ (1959-), a professor of Yale Center for Environmental Law & Policy, Yale University.

Cross-country comparisons: Among the five countries under consideration, Japan ranked highest, at 30th in the world. The other Asian countries of China, South Korea, Hong Kong and Taiwan, all ranked lower than 100th in the world. Taiwan is ranked 145th in out of 146 countries and regions (Table 27 and Figure 37)⁶⁸⁾.

Table 27 2005 Environmental Sustainability Index – Scores and Rankings⁶⁹⁾

Rank	Country	ESI Score
133	China	38.6
30	Japan	57.3
122	South Korea	43.0
145	Taiwan	32.7
1	Finland	75.1

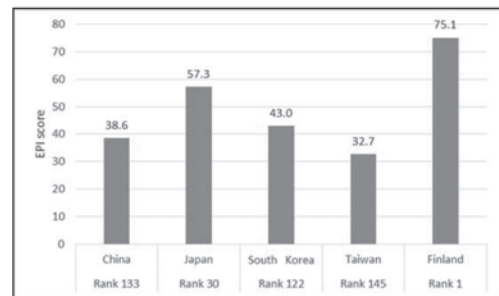


Figure 37 2005 Environmental Sustainability Index – Scores and Rankings⁷⁰⁾

66) See Esty *et al.* [2005: 14, Table 10] for the list of 21 indicators and 76 variables. The number of countries in this index is: 56 in 2000, 122 in 2001, 142 in 2002, and 146 in 2005. On the method of scoring, see *ibid.* [47f, Appendix A]. See also: EOSDIS [2017e].

67) See also Esty [2001, 2002, 2004, 2008], Esty and Porter [2005], Esty and Moffa [2014], Esty and Simmons [2011], Esty and Winston [2009] and Lubin and Esty [2010, 2014].

68) However, it is necessary to keep in mind that there are differences in variable coverage and missing variable imputed for each country due to missing data. In Japan variable coverage is 72, with 3 imputed missing variables. In Korea variable coverage is 73 and missing variable imputed is 1. In China, variable coverage is 72 and missing variable imputed is 1. In Taiwan, variable coverage is 60 and missing variable imputed is 7 [Esty *et al.* 2005: 103f, Appendix B].

69) 2005 Environmental Sustainability Index: Benchmarking National Environmental Stewardship [Esty *et al.* 2005].

70) The 2005 ESI scores are not directly comparable to the 2002 ESI Scores [*ibid.*: 2005: 9f].

13. Environmental Performance Index⁷¹⁾

The Environmental Performance Index (EPI) aims to provide quantitative metrics as an aid to achieving long-term sustainable development goals. It is produced by a consortium including the following groups: (1) Yale Center for Environmental Law and Policy (YCELP) Yale University, (2) Center for International Earth Science Information Network (CIESIN) Columbia University, in collaboration with (3) World Economic Forum (WEF), (4) Joint Research Centre European Commission (JRC), (5) the Samuel Family Foundation and (6) McCall MacBain Foundation [EOSDIS 2017a; Hsu *et al.* 2016: 2]. The Principal Investigator and Director of this project is Angel Hsu⁷²⁾, a professor at Yale-NUS College and Yale University. Daniel C. Esty, a professor at Yale Center for Environmental Law & Policy, is a co-director of the project.

The predecessor of this index is the ESI, discussed above in section 12. Compared to the ESI, the EPI is more outcome-oriented and focuses on a narrower set of environmental issues for which governments can be held accountable. The EPI was developed based on two main objectives: (1) to reduce environmental stresses on human health and (2) to promote ecosystem vitality and sound natural resource management [Emerson *et al.* 2012: 11]. These objectives are driven by five over-arching policy-related concepts: (a) a widespread recognition of the benefits of data-driven decision making, (b) ongoing pressure on governments to invest limited resources as wisely as possible, (c) growing concern over the dangers posed by poorly managed environmental risks, (d) widespread commitment to making sustainability a central operating principle of the international development agenda and (e) rapid diffusion of sustainability strategies in the corporate sector [Hsu *et al.* 2016: 22].

The 2016 Environmental Performance Index (EPI) ranks 180 countries on 20 performance indicators in the following 9 policy categories: health impacts, air quality, water and sanitation, water resources, agriculture, forests, fisheries, biodiversity and habitat, and climate and energy. These categories track performance and progress on two broad policy objectives, environmental health and ecosystem vitality [EOSDIS 2017b]⁷³⁾. Health impacts, or Environmental Risk Exposure (ERE), include the following five environmental risk factors: unsafe water, unsafe sanitation, ambient particulate matter pollution, household air pollution from solid fuels, and ambient ozone pollution [*ibid.*34]. Air Quality includes four key indicators: Air Pollution- Average Exposure to PM_{2.5} (fine particulate matter in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$); Health Risk Exposure to PM_{2.5}; PM_{2.5} Exceedance (an average of the percentage of the population exposed to PM_{2.5} levels at $10\mu\text{g}/\text{m}^3$, $15\mu\text{g}/\text{m}^3$, $25\mu\text{g}/\text{m}^3$, and $35\mu\text{g}/\text{m}^3$ — World Health Organization's (WHO) air quality guidelines and interim I, II, and III targets; Household Air Quality – Indoor Solid Fuel Usage; and Average Concentration of NO₂ (in parts per billion) [*ibid.*43]. Water & Sanitation examines the portion of a population with access to safe drinking water and sanitation infrastructure [*ibid.*52]. Water Resources tracks the proportion of wastewater

71) On EPI, See, for example, das Neves Almeida and García-Sánchez [2016], and Dietz *et al.* [2009].

72) See also Hsu [2015], Hsu *et al.* [2016:42] and Hsu and Zomer [2016].

73) See Chapter 3 of EPI report 2016 for the list of 20 indicators and their Weighting [EOSDIS 2017b].

collected and produced by households, municipalities, and industry that is treated, weighted by the population covered by the sewage network [*ibid.*56]. Agriculture tracks nitrogen use efficiency to assess how well countries match fertilizer inputs to crops by the following two indicators: nitrogen use efficiency (NUE), which measures the ratio of nitrogen inputs to outputs in crops, and nitrogen balance (NBALANCE), which measures excess nitrogen released to the environment as a result of an overuse of fertilizer application [*ibid.*64]. The Forests category consists of a single measure of Tree Cover Loss which describes the total area of tree loss from 2000 to 2014 [*ibid.*72]. Fisheries assesses the percentage of fish stocks overexploited or collapsed, weighted by the quality of reported catch data [*ibid.*78]. The Biodiversity and Habitat domain includes five indicators: two Terrestrial Protected Areas metrics (National Biome Weight and Global Biome Weight), two Species Protection indicators (National Weight and Global Stewardship Weight), and Marine Protected Areas [*ibid.*90]. Climate and Energy indicators assess trends in national efforts to reduce carbon emission intensity over time. However, Least Developed Countries (LDCs) and Small Island Developing States (SIDS) are not scored on the suite of carbon intensity indicators, but are instead given a score for Access to Electricity [*ibid.*98].

Cross-country comparison: Among the four Asian countries and regions, Japan ranks much higher than the rest of the countries, while China lags considerably behind (Table 28 and Figure 38). Taiwan's score remained flat until 2005, and increased significantly after that. Meanwhile, Japan and South Korea have maintained a gradual and consistent upward trend. China showed a flat trend, with no noticeable change in the score (Table 29 and Figure 39).

Table 28 2016 EPI Score ⁷⁴⁾

Rank	Country	EPI Score
109	China	65.1
39	Japan	80.59
80	South Kor	70.61
60	Taiwan	74.88
1	Finland	90.68

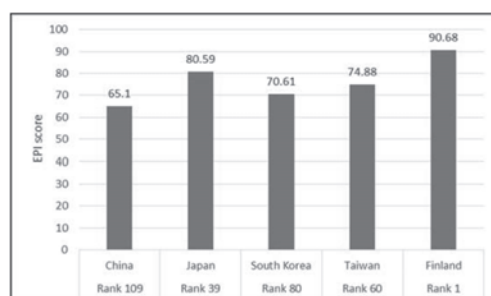


Figure 38 2016 EPI Score

Table 29 EPI Scores, 2000-2010 ⁷⁵⁾

country	China	Japan	Korea	Taiwan
year				
2000	41.2	59.7	52.2	56.3
2001	42.6	60.2	52.6	56.4
2002	43.0	62.1	53.3	56.7
2003	42.5	62.2	54.2	57.2
2004	42.0	62.5	54.7	57.1
2005	41.9	62.6	56.0	56.8
2006	41.9	63.0	56.3	57.4
2007	41.9	63.0	56.5	61.1
2008	42.1	63.3	57.2	61.8
2009	42.2	63.4	57.1	60.9
2010	42.2	63.4	57.2	62.2

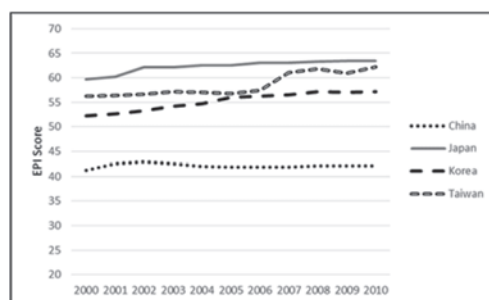


Figure 39 EPI Scores, 2000-2010

74) EPI 2016 [EOSDIS 2017c].

75) *ibid.* [2017d].

14. Adjusted Net Savings⁷⁶⁾

Adjusted Net Savings (ANS) measure the change in value of a specified set of assets, excluding capital gains, in 146 countries. The director of the ANS index project is Kirk Hamilton, a Lead Economist in the Development Research Group of The World Bank and co-author of *The Changing Wealth of Nations* [World Bank 2011] and *World Development Report 2010, Development and Climate Change*.

If a country's net savings are positive and the accounting includes a sufficiently broad range of assets, economic theory suggests that the present value of social welfare is increasing. The index of Adjusted Net Savings is calculated through the following formula: net national savings plus education expenditure and minus energy depletion, mineral depletion, net forest depletion, carbon dioxide and particulate emissions damage⁷⁷⁾. While ANS looks at an extensive list of factors, the accounting of natural resource depletion and pollution costs still has some gaps. Key estimates missing on the natural resource include the value of fossil water extracted from aquifers, net depletion of fish stocks, and depletion and degradation of soils. Important pollutants affecting human health and economic assets are excluded because no internationally comparable data are widely available on damage from ground-level ozone or sulfur oxides.

Adjusted net savings are derived from standard national accounting measures of gross savings by making the following four adjustments: (1) Estimates of fixed capital consumption of produced assets are deducted to obtain net savings. (2) Current public expenditures on education are added to net savings. (3) Estimates of the exhaustion of natural resources are deducted to reflect the decline in asset values associated with their extraction and harvest. (4) Deductions are made for damages from carbon dioxide emissions and local pollution.

Cross-country comparison: This index ranks China ahead of South Korea, and South Korea ahead of Japan. Compared to China and South Korea, the score in Japan is remarkably low. China ranks 13th out of 146 countries, showing high values. One of the reasons for Japan's low rank is that Japan's net national savings are significantly lower than those of China and South Korea (**Tables 30 and 31** and **Figures 40 and 41**). From 1996 to 2012, ANS values for China and South Korea remained relatively flat, with some fluctuations. In contrast, Japan's value decreased from about 15.7% in 1996 to 6.8% in 2015. All three countries of China, South Korea and Japan showed a rising trend after 2012 (**Table 32** and **Figure 42**).

Table 30 Adjusted Net Savings, Including Particulate Emission Damage (% of GNI), 2015⁷⁸⁾

Rank	Country	2015
13	China	22.868367
101	Japan	6.75387476
30	South Korea	18.5207709
1	Nepal	39.2120156

76) On this index, see also Barbier [2007], Ferreira and Vincent [2005], Ferreira *et al.* [2008], Hamilton and Naikal [2014], Hamilton and Hartwick [2014], Hezri and Dovers [2006], Pearce and Atkinson [1993], Pillarisetti [2005], Thiry and Cassiers [2010] and World Bank [2011].

77) Aggregation method is weighted average. See also World Bank [2018].

78) Database: World Development Indicators [World Bank 2017]. Rankings are originally constructed in this paper.

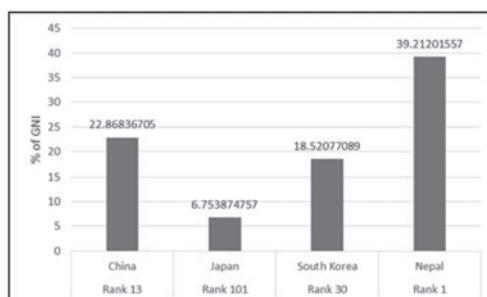
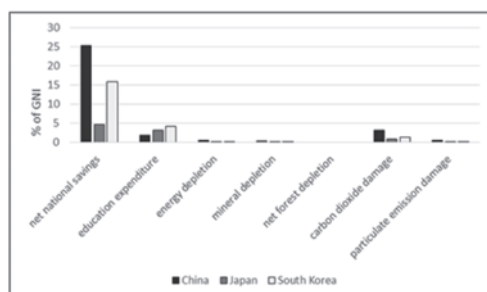
Table 31 Each Element of Adjusted Net Savings (% of GNI), 2015⁷⁹⁾

	China	Japan	South Korea
net national savings	25.29199756	4.560562734	15.88414025
education expenditure	1.79	3.126861083	4.11
energy depletion	0.428927361	0.00113872	0.000519975
mineral depletion	0.261418032	0.00275507	0.000704515
net forest depletion	0	0	0
carbon dioxide damage	3.11159161	0.830454244	1.359760678
particulate emission damage	0.411693506	0.099201026	0.11238419

*Unit: % of Gross National Income

Table 32 ANS, 1996-2015⁸⁰⁾

country	China	Japan	South Korea
1996	22.72649	15.66161	20.032441
1997	22.42152	14.9215	18.821765
1998	22.36497	13.19339	17.669537
1999	19.63951	11.56084	16.281165
2000	17.5655	12.2341	18.850296
2001	19.45961	10.71899	16.435235
2002	21.29136	9.365391	16.617155
2003	24.43797	9.85864	18.181558
2004	25.46273	10.54624	20.527367
2005	25.56773	10.487	18.615097
2006	27.16188	10.23878	18.081681
2007	28.04594	10.5143	18.639344
2008	25.31589	7.884048	17.248102
2009	27.84555	3.861711	15.958147
2010	25.85768	6.140342	19.421648
2011	21.95342	5.143801	18.977068
2012	22.72914	5.043003	17.553044
2013	21.72516	5.175299	17.586931
2014	22.44232	5.533675	17.588042
2015	22.86837	6.753875	18.520771

**Figure 40** Adjusted Net Savings, Including Particulate Emission Damage (% of GNI), 2015**Figure 41** Each Element of Adjusted Net Savings (% of GNI), 2015**Figure 42** ANS, 1996-2015

15. Legatum Prosperity Index⁸¹⁾

Legatum Prosperity Index (LPI) is produced by the Legatum Institute, an international think tank and non-profit educational center. The index looks at 149 countries. The guiding thought of the project is the idea of prosperity which implies the flourishing of humankind. The Index tries to measure both economic wealth and social well-being by examining 9 domains and 104 variables [Legatum Institute 2016b: 1-4].

The 9 domains are the following:

- (1) Economic Quality: structural policies (e.g. trade barriers), economic satisfaction and

79), 80) Database: World Development Indicators [World Bank 2017].

81) On this index, see also Bate [2009], Besley and Perrson [2011], Besley and Van Reenen eds. [2013], Graham [2012a, 2012b, 2017], and Lind [2014].

expectations (e.g. satisfaction with living standards), distribution of prosperity (e.g. relative poverty), engagement (e.g. labor force participation and financial access), and production quality and diversity (e.g. export diversity and quality).

(2) Business Environment: access (to infrastructure such as the Internet and transport, and to credit), business flexibility (the costs of starting a business and of hiring and firing), clear and fair regulation (e.g. intellectual property rights), and perceptions of meritocracy and opportunity.

(3) Governance: effective and accountable government, fair elections and political participation, the rule of law, and the level of a country's democracy.

(4) Education: access to education, quality of education, human capital, and competitiveness.

(5) Health: basic health outcomes, health infrastructure and preventative care, and physical and mental health.

(6) Safety & Security: national security, personal precariousness, and personal safety.

(7) Personal Freedom: the importance of various freedoms—of choice, expression (including press freedom), movement and belief—and tolerance of minorities and immigrants, for a country's wealth and the well-being of its citizens.

(8) Social Capital: social cohesion and engagement (bridging social capital), community and family networks (bonding social capital), and political participation and institutional trust (linking social capital).

(9) Environment: several indicators, such as use of pesticides, air quality, green areas to meet, national parks, show a significant relationship with average national well-being and material wealth [*ibid.*8-9].

Each variable is assigned a weight based on their varying significance to prosperity. Weights were determined by three factors: (a) the relevance and significance of the variable regarding the accumulation of material wealth and the enhancement of well-being as informed by the academic literature, (b) expert opinions offered by the Index's special advisors, and (c) the degree of compatibility with the Legatum Institute's view of prosperity as human flourishing. A score is determined by assigning equal weights to all nine domains for each country. The mean of the nine domains' scores yields a country's overall prosperity score [Legatum Institute 2016a: 47].

The Director of the Prosperity Index is the Danish economist Alexandra Mousavizadeh. The Prosperity Index is reviewed and critiqued by an advisory panel of academics and scholars. The Legatum Institute's International Advisory Group also contributes and assists in the Prosperity Index [*ibid.*48].

Cross-country comparison: Among the three countries of China, Japan and South Korea, Japan is ranked the highest (22nd out of 149 countries), South Korea second-highest (35th), and China third (90th) (**Table 33** and **Figure 43**). In the domain of "Governance," Japan is ranked 17th out of 149 countries with a score of 52.4, South Korea is ranked 41st with a score of 56.4 and China is ranked 123rd, with a score of 36.4. For China, the scores of "Personal Freedom" and "Environment" are lower than those in Japan and South Korea. On the other hand, the score of "Economic Quality" among the three countries are not so different (Japan is ranked 19th, China is ranked 28th and South Korea is ranked 29th out of 149 countries). As for "Social Capital," the scores of these three countries are all relatively low in a world scale (Japan is ranked 101st, South Korea is ranked 105th, and China is ranked 149th in

149 countries). In “Education,” South Korea ranks the highest (at 17th out of 149 countries, Japan the second at 20th and China ranks the third at 34th). Japan ranks particularly high in terms of “Health” and “Safety and Security,” at 4th in “Health” and 3rd in “Safety & Security” out of 149 countries (Tables 34 and 35 and Figure 44). In the period from 2007 to 2016, the scores for China, South Korea and Japan remained stable and increased slightly (Table 36 and Figure 45).

Table 33 Legatum Prosperity Index Ranks and Scores, 2016⁸²⁾

PI Rank	Country	PI Score
Rank 90	China	55.5986557
Rank 22	Japan	70.38887024
Rank 35	South Korea	65.22988129
Rank 1	New Zealand	79.28121185

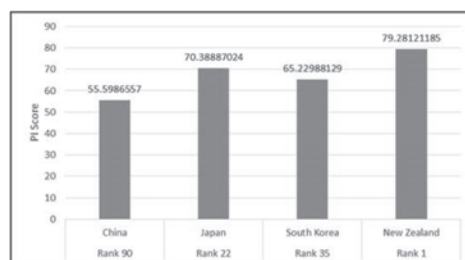


Figure 43 Legatum Prosperity Index Score, 2016

Table 34 Scores of Each Domain, 2016⁸³⁾

Pillar \ Country	China	Japan	South Korea
Economic Quality	71.62553	74.78432	71.17809296
Business Environment	55.16022	64.87589	60.08064651
Governance	36.418	72.47095	56.44175339
Education	66.06828	73.68917	74.7585144
Health	76.46849	83.596	80.75714874
Safety & Security	68.03181	85.42619	77.30861664
Personal Freedom	34.5412	65.97243	59.72179031
Social Capital	41.54545	46.98454	46.7651825
Environment	50.52892	65.70038	60.05717468

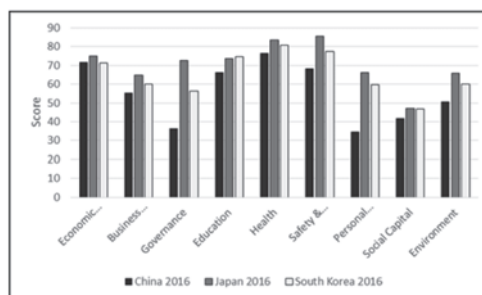


Figure 44 Scores of Each Domain, 2016

Table 35 Ranks of Each Domain, 2016

Rank \ Country	China	Japan	South Korea
Rank_PI	90	22	35
Rank_econ	28	19	29
Rank_busi	63	21	36
Rank_gove	123	17	41
Rank_educ	34	20	17
Rank_heal	40	4	19
Rank_safe	64	3	29
Rank_pers	138	49	73
Rank_soci	140	101	105
Rank_envi	134	48	91

Table 36 Time Series of PI Scores, 2007-2016⁸⁴⁾

Year \ Country	China	Japan	South Korea
2007	54.28565	69.97437	64.28057861
2008	54.56378	69.31001	63.93813324
2009	54.20918	69.85071	64.47782898
2010	55.1814	70.13007	65.6521759
2011	55.11443	70.62096	65.88790131
2012	55.45224	70.18878	66.02700043
2013	55.52346	70.56139	65.72682953
2014	55.69247	70.38718	64.55158997
2015	55.65033	70.38887	65.20320129
2016	55.59866	70.38887	65.22988129

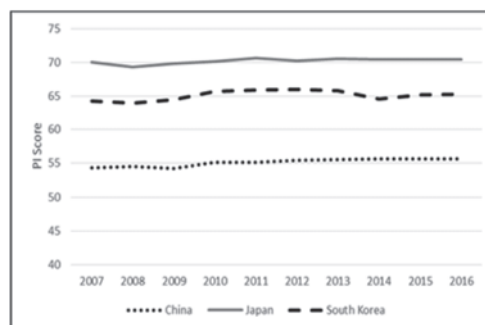


Figure 45 Time Series of PI Scores, 2007-2016

82), 83), 84) Prosperity rankings: the full 2016 dataset [Legatum Institute 2016c].

16. Human Satisfaction Measure

Human Satisfaction Measure (HSM) was proposed by T. Ohashi [Ohashi and Taniguchi 2005]. There have been seven versions of the HSM index produced, each incorporating slight changes in the construction methodology. In general, the HSM examines 6 domains: labor, health, education, gender, environment and income. (1) Labor is measured by a country's unemployment rate; (2) Health uses infant mortality rates; (3) Education is scored by enrollment rate of primary education; (4) Gender is scored by women's four-year college admission rate; (5) Environment is scored by (a) water supply penetration rate for the version 1, (b) CO₂ emissions per capita for version 3-(1), and (c) ecological footprint for the version 3-(2); (6) Income is scored by a Gini coefficient measuring the statistical dispersion of income distribution among a nation's residents [Ohashi 2005: 103-121].

The integrated score of the HSM was originally solely calculated by the method of cross entropy⁸⁵⁾. However, since this method of calculation is difficult to utilize for policy makers, in the third version of HSM, the HSM is calculated by the method of DtT (Distance to Target)⁸⁶⁾ [Ohashi 2007]. There are two kinds of the third version of HSM: the version 3-(1), which uses "CO₂ emissions" per capita for the score of environment, and the version 3-(2), which uses "ecological footprint" for the score of environment [Ohashi and Nguyen 2006; Ohashi 2007]. The version 4 adopts the method of AHP (Analytic Hierarchy Process) and presents time-series values of the version 3-1 [Ohashi 2008]. The version 5 presents the time-series values of the version 3-2 [Ohashi and Kimata 2008: 90]. The version 6 includes the value of "democracy" based on the data from World Development Report in 2008 [Ohashi 2010]. The version 6 contains the following items: (1) labor (unemployment rate), (2) health (infant mortality rate), (3) education (primary school enrollment rate), (4) gender (women's 4-year college admission rate), (5) environment (ecological footprint), (6) income (Gini coefficient) and (7) democracy [Ohashi 2010: 33-34, 2011b: 175-176]. The latest version 7 is developed in Ohashi [2012] which includes values of both poverty and unemployment rates of 15 to 24 years old. However, the data for the latest version 7 of the HSM Index are currently not publically available. Hence, below, we present only data for versions 1, 2 (1), 2 (2), 3 (1), 3 (2), and 6.

Cross-country comparison: In version 1 of HSM (which uses water supply penetration rates as the environmental indicator), the score of China is remarkably low. In China, infant mortality rate is high and water supply penetration rate is low. Conversely, the score for Japan is relatively high (**Table 37** and **Figure 46**). HSM Version 2-(1), which uses per capita CO₂ emissions for the environmental indicator, there is no major change in the ranking of Japan, China, and South Korea (**Table 38** and **Figure 47**). In HSM Version 2-(2), which uses the ecological footprint as the environmental indicator, Japan, China, and South Korea are lower in the HSM score. In particular, Japan has dropped from 4th in version 2-(1) to 11th in version 2-(2). Similarly South Korea has dropped from 9th in version 2-(1) to 14th in version 2-(2) (**Table 39** and **Figure 48**).

In HSM version 3-(1), where the calculation method was revised from the cross entropy method to the DtT method, in comparison with HSM version 2-(2), China's ranking rose from 15th to 14th, Japan's

85) Ohashi [2005: 108, 2009: 22].

86) The score of DtT is calculated through the following three elements: (1) the value of each policy target, (2) the present status of each situation, and (3) weight for each target.

ranking rose from 11th to 8th, and South Korea's ranking rose from 14th to 11th (Table 40 and Figure 49). In HSM version 3-(2), which uses the ecological footprint as the indicator for the environment, both Japan and South Korea relative rankings fell to, near the bottom of all countries (Table 41 and Figure 50).

Table 37 HSM Ver.1, 2002⁸⁷⁾

Rank	Country	HSM Ver.1 Score
1	Sweden	-0.846
2	Canada	-1.100
3	United States	-1.445
4	Norway	-1.558
5	Japan	-1.658
6	France	-1.726
7	Singapore	-1.798
8	United Kingdom	-1.823
9	Australia	-1.831
10	South Korea	-2.149
11	Germany	-2.204
12	Switzerland	-2.318
13	Brazil	-2.817
14	Vietnam	-3.302
15	China	-4.113

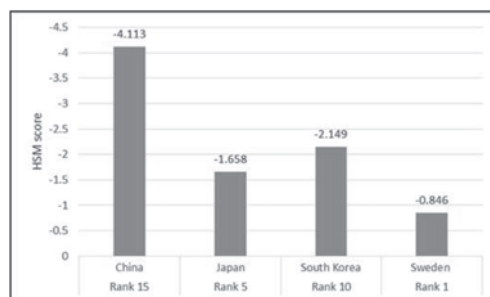


Figure 46 HSM Ver.1, 2002

Table 38 HSM Ver.2-(1), 2002⁸⁸⁾

Rank	Country	HSM Ver.2-(1) Score
1	Sweden	-1.252
2	France	-2.227
3	Norway	-2.456
4	Japan	-2.465
5	Canada	-2.624
6	United Kingdom	-2.643
7	Brazil	-2.676
8	Switzerland	-2.723
9	South Korea	-2.901
10	United States	-3.023
11	Vietnam	-3.040
12	Germany	-3.108
13	Australia	-3.460
14	Singapore	-3.686
15	China	-3.824

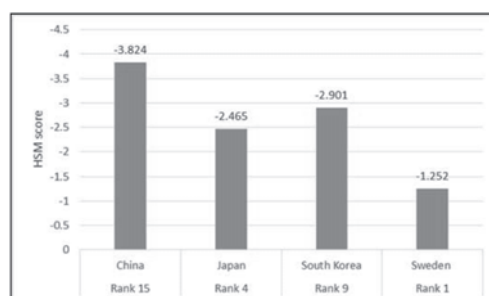


Figure 47 HSM Ver.2-(1), 2002

Table 39 HSM Ver.2-(2), 2002⁸⁹⁾

Rank	Country	HSM Ver.2-(2) Score
1	Sweden	-0.847
2	Canada	-1.098
3	Norway	-1.556
4	Australia	-1.830
5	United States	-2.107
6	France	-2.352
7	Brazil	-2.678
8	Vietnam	-3.040
9	United Kingdom	-3.103
10	Germany	-3.131
11	Japan	-3.338
12	Singapore	-3.480
13	Switzerland	-3.515
14	South Korea	-3.801
15	China	-4.454

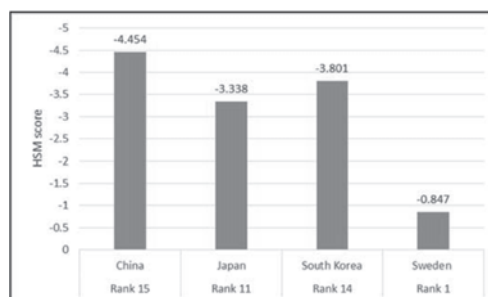


Figure 48 HSM Ver.2-(2), 2002

87) Ohashi [2005: 110, Table 3-5].

88) *ibid.* [113, Table 3-6].89) *ibid.* [120, Table 3-7].

Table 40 HSM Ver.3-(1), 2002 ⁹⁰⁾

Rank	Country	HSM Ver.3-(1) Score
1	Sweden	4.184
2	France	3.989
3	United Kingdom	3.799
4	Canada	3.783
5	Germany	3.722
6	Switzerland	3.656
7	United States	3.636
8	Japan	3.610
9	Norway	3.534
10	Australia	3.241
11	South Korea	2.802
12	Singapore	2.765
13	Brazil	2.723
14	China	2.715
15	Vietnam	1.680

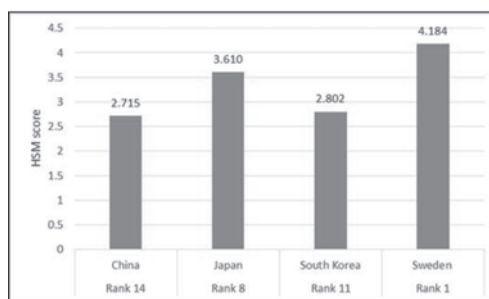


Figure 49 HSM Ver.3-(1), 2002

Table 41 HSM Ver.3-(2), 2002 ⁹¹⁾

Rank	Country	HSM Ver.3-(2) Score
1	Canada	4.639
2	Sweden	4.555
3	Australia	4.307
4	Norway	4.05
5	Brazil	3.929
6	Vietnam	3.405
7	France	3.288
8	United States	2.914
9	China	2.360
10	Germany	2.118
11	Switzerland	1.421
12	United Kingdom	1.200
13	Japan	-0.513
14	Singapore	-0.632
15	South Korea	-0.884

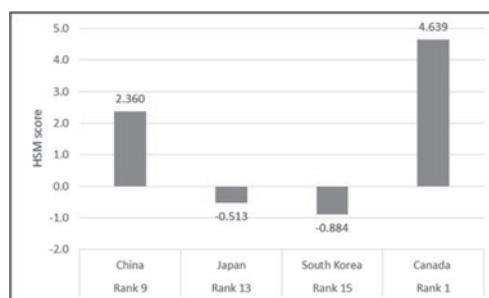


Figure 50 HSM Ver.3-(2), 2002

According to Ohashi, the ecological footprint value of Japan significantly exceeds its environmental capacity. For example, Japan's food self-sufficiency rate is 40% in 2002 on a calorie basis, which is the lowest in the world. In addition, Japan needs to import 95% of its energy sources from overseas [Ohashi 2007: 30-31]. In the HSM version 3-(1), China ranked 14th, while in HSM version 3-(2), China ranked 9th, higher than that of Japan and South Korea.

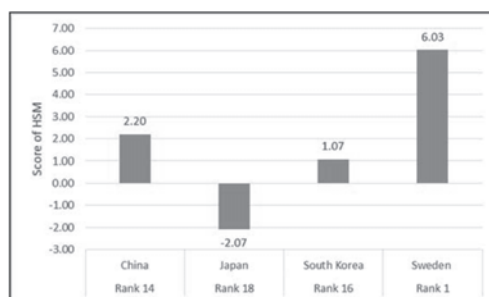
In version 6 of the HSM, we can observe that the rankings of the three East Asian countries are among the lowest of the 18 countries examined by the HSM. Japan ranked the lowest among the three East Asian countries. According to Ohashi, the major factor that explains Japan' low ranking is that the ecological footprint score of Japan significantly exceeds its environmental capacity [Ohashi 2011b: 182-183]. Among the three East Asian countries, China has the highest score in HSM version 6, although its score has exhibited gradual decline after 1990. Conversely, South Korea's score has increased from 1.83 in 1990 to 1.07 in 2007, albeit showing significant yearly fluctuations. The score for Japan was on an upward trend from 1996 to 2002, but has been on a downward trend since 2002 (Tables 42 and 43 and Figures 51 and 52).

90) Ohashi [2007: 28, Table 3].

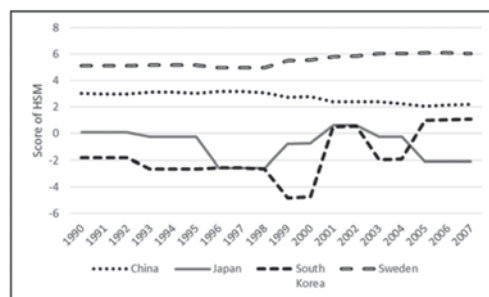
91) *ibid.*[29, Table 4].

Table 42 Human Satisfaction Measure Ver.6, 2007 ⁹²⁾

HSM 2007 Rank	Country	HSN 2007 Score
1	Sweden	6.03
2	Canada	5.93
3	Australia	5.90
4	Russia	5.82
5	Denmark	5.63
6	Norway	5.48
7	Brazil	5.10
8	France	4.58
9	United States	4.52
10	South Africa	3.80
11	Germany	3.57
12	Vietnam	2.94
13	United Kingdom	2.90
14	China	2.20
15	Switzerland	2.15
16	South Korea	1.07
17	India	-0.21
18	Japan	-2.07

**Figure 51 Human Satisfaction Measure Ver.6, 2007****Table 43 Human Satisfaction Measure Ver.6, 1990-2007** ⁹³⁾

Country	China	Japan	South Korea	Sweden	
Year	1990	3.02	0.08	-1.83	5.14
1991	3.00	0.10	-1.83	5.13	
1992	2.99	0.09	-1.83	5.11	
1993	3.15	-0.26	-2.67	5.18	
1994	3.14	-0.26	-2.67	5.18	
1995	3.05	-0.26	-2.64	5.19	
1996	3.20	-2.57	-2.55	4.97	
1997	3.16	-2.58	-2.55	4.97	
1998	3.08	-2.59	-2.63	4.99	
1999	2.75	-0.77	-4.82	5.50	
2000	2.80	-0.75	-4.74	5.54	
2001	2.40	0.61	0.50	5.79	
2002	2.40	0.62	0.55	5.87	
2003	2.39	-0.27	-1.95	6.02	
2004	2.27	-0.24	-1.93	6.03	
2005	2.08	-2.10	1.00	6.11	
2006	2.17	-2.08	1.02	6.07	
2007	2.20	-2.07	1.07	6.03	

**Figure 52 Human Satisfaction Measure Ver.6, 1990-2007**

17. Sustainable Society Index

The Sustainable Society Index (SSI) ⁹⁴⁾ is an integrated index that assesses the sustainability of a society by looking human, environmental and economic well-being. This index includes 21 indicators (Table 44). The SSI proposes the following philosophy: a sustainable society is a society that meets the needs of the present generation, that does not compromise the ability of future generations to meet their own needs, and in which each human being has the opportunity to develop itself within a well-balanced society and in harmony with its

Table 44 Framework of the SSI ⁹⁵⁾

Dimensions	Categories	Indicators
Human Well-being	I Basic Needs	1. Sufficient Food
		2. Sufficient to Drink
		3. Safe Sanitation
	II Personal Development & Health	4. Education
		5. Healthy Life
		6. Gender Equality
	III Well-balanced Society	7. Income Distribution
		8. Population Growth
		9. Good Governance
Environmental Well-being	IV Natural Resources	10. Biodiversity
		11. Renewable Water Resources
		12. Consumption
	V Climate & Energy	13. Energy Use
		14. Energy Savings
		15. Greenhouse Gases
Economic Well-being	VI Transition	16. Renewable Energy
		17. Organic Farming
	VII Economy	18. Genuine Savings
		19. GDP
		20. Employment
		21. Public Debt

92). 93) Ohashi [2011b: 180, Table 6-1].

94) See also Kaivo-oja [2014].

95) Source: Sustainable Society Foundation [2017].

surroundings. The SSI was first published in 2006 and has been updated every two years . The SSI assesses 151 countries. This index was developed by The Sustainable Society Foundation, which has been established in 2006 as a private initiative by Geurt van de Kerk and Arthur Manuel [SSF 2017].

SSI scores each country from a scale of 1-10 scale in each category [Saisana and Philippas 2012]⁹⁶⁾. However, the index does not aggregate the dimension scores into one single figure for the overall index. Following the advices from Joint Research Centre (JRC) of the European Commission in its audit of the SSI⁹⁷⁾, there is the negative correlation between Human and Environmental Well-being.

Cross-country comparison: The score of Human Well-being is composed of Basic Needs, Personal Development & Health and Well-balanced Society. Japan, South Korea and Taiwan all scored about 8, while China scored 6.4. The score for Well-balanced Society for China is 4.3, among which the value of Income Distribution and Good Governance is 2.7 and 4.1 respectively (**Figures 53 to 56** and **Tables 45 to 47**). Environmental Well-being is composed of the Natural Resources and Climate & Energy, rankings of the East Asian countries and regions are all low. All four countries and regions scored low

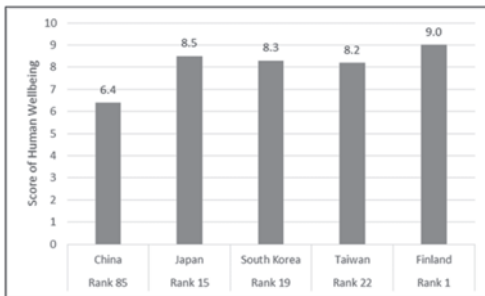


Figure 53 Scores of Human Well-being, 2016

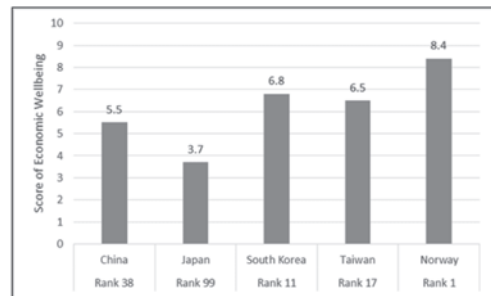


Figure 55 Scores of Economic Well-being, 2016

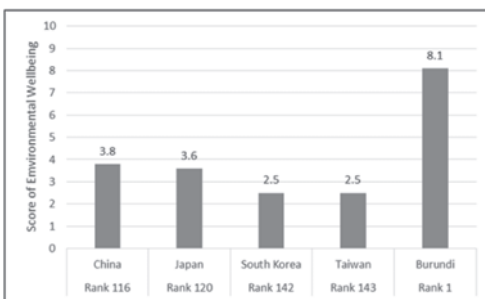


Figure 54 Scores of Environmental Well-being, 2016

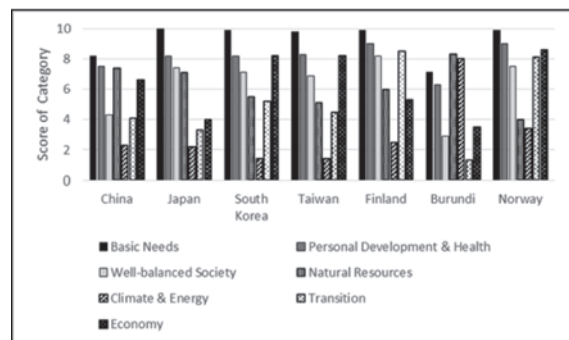


Figure 56 Scores of Categories, 2016

96) For further details on the methodology, see Saisana and Philippas [2012].

97) For this recommendation, see *ibid*, "Audit JRC" in Sustainable Society Foundation [2017].

in Climate & Energy (**Table 46**); For Renewable Energy, as an indicator of Climate & Energy, China scored 1.1, the other three countries and regions scored 1.0, all at the lowest level of the scale (**Table 47**). For Economic Well-being (which is composed of Transition and Economy), South Korea is ranked 11th and Taiwan is ranked 17th, both of which are relatively higher than either China (ranked 38th) and Japan (ranked 99th). As can be seen from Table 47, the scores for Organic Farming (1.6) and Public Debt (1.0) in Japan are extremely low.

Table 45 Sustainable Society Index 2016⁹⁸⁾

2016	Human Well-being Rank	Human Well-being Score	Environmental Well-being Rank	Environmental Well-being Score	Economic Well-being Rank	Economic Well-being Score
China	85	6.4	116	3.8	38	5.5
Japan	15	8.5	120	3.6	99	3.7
South Korea	19	8.3	142	2.5	11	6.8
Taiwan	22	8.2	143	2.5	17	6.5
Finland	1	9.0	122	3.6	20	6.4
Burundi	118	5.1	1	8.1	143	2.3
Norway	5	8.8	119	3.7	1	8.4

Table 46 Scores of Categories, 2016⁹⁹⁾

2016	Human Well-being			Environmental Well-being		Economic Well-being	
	Basic Needs	Personal Development & Health	Well-balanced Society	Natural Resources	Climate & Energy	Transition	Economy
China	8.2	7.5	4.3	7.4	2.3	4.1	6.6
Japan	10.0	8.2	7.4	7.1	2.2	3.3	4.0
South Korea	9.9	8.2	7.1	5.5	1.4	5.2	8.2
Taiwan	9.8	8.3	6.9	5.1	1.4	4.5	8.2
Finland	9.9	9.0	8.2	6.0	2.5	8.5	5.3
Burundi	7.1	6.3	2.9	8.3	8	1.3	3.5
Norway	9.9	9.0	7.5	4.0	3.4	8.1	8.6

Table 47 Scores of Indicators, 2016¹⁰⁰⁾

2016		China	Japan	South Korea	Taiwan
Human Well-being	Basic Needs	1. Sufficient Food	9.1	10.0	10.0
		2. Sufficient to Drink	9.2	10.0	9.8
		3. Safe Sanitation	6.5	10.0	10
	Personal Development & Health	4. Education	7.8	9.0	9.7
		5. Healthy Life	8.1	9.2	8.9
		6. Gender Equality	6.8	6.7	6.5
	Well-balanced Society	7. Income Distribution	2.7	6.2	7.5
		8. Population Growth	7.1	8.3	7.3
		9. Good Governance	4.1	7.8	6.5
Environmental Well-being	Natural Resources	10. Biodiversity	8.0	7.8	5.7
		11. Renewable Water Resources	7.9	8.1	5.8
		12. Consumption	6.5	5.6	4.9
	Climate & Energy	13. Energy Use	5.5	3.1	1.0
		14. Energy Savings	1.4	7.7	3.7
		15. Greenhouse Gases	3.3	1.0	1.0
		16. Renewable Energy	1.1	1.0	1.0
Economic Well-being	Transition	17. Organic Farming	1.8	1.6	3.0
		18. Genuine Savings	9.5	6.9	9.2
	Economy	19. GDP	6.4	9.3	9.2
		20. Employment	6.3	6.9	7.0
		21. Public Debt	7.3	1.0	8.4

98), 99), 100) SSF [2017].

18. Social Progress Index

The Social Progress Index, produced by the Social Progress Imperative, defines “social progress” as “the capacity of a society to meet the basic human needs of its citizens, establish the building blocks that allow citizens and communities to enhance and sustain the quality of their lives, and create the conditions for all individuals to reach their full potential” [Social Progress Imperative 2017]. This index is composed of 50 indicators of social and environmental issues. The index looks at three dimensions: basic human needs, foundations of well-being and opportunity. Each dimension has four components (**Table 48**)¹⁰¹⁾.

To measure social progress, this index tries to systematically analyze the relationship between economic development and social development. The aim of this index is to measure the outcomes, not the inputs: For example, it tries to measure a country's health, but not how much effort or how much cost is expended on health care. The Social Progress Index framework focuses on the following three questions: (1) Does a country provide for its people's most essential needs? (2) Are the building blocks in place for individuals and communities to enhance and sustain well-being? (3) Is there opportunity for all individuals to reach their full potential?¹⁰²⁾

Cross-country comparison: The score assigned to China is about 20 points lower than those for Japan and South Korea. Looking at Table 6, we can see that the score of “Opportunity” is particularly low in China (42.53). China scores low in “Personal Rights” (15.24), which is a component of “Opportunity.” The low scores in this category materially brought down China's total score in the Social Progress Index (**Table 49** and **Figures 57 and 58**). Japan and South Korea ranked lower than Denmark especially in the following elements: social progress index, opportunity, access to information and communications, personal rights, personal freedom and choice, tolerance and inclusion.

Table 48 Framework of the Social Progress Index

Dimensions	components
Basic Human Needs	Nutrition and Basic Medical Care
	Water and Sanitation
	Shelter
	Personal Safety
Foundations of Well-being	Access to Basic Knowledge
	Access to Information and Communications
	Health and Wellness
	Environmental Quality
Opportunity	Personal Rights
	Personal Freedom and Choice
	Tolerance and Inclusion
	Access to Advanced Education

Table 49 Social Progress Index, 2017¹⁰³⁾

	China	Japan	South Korea	Denmark
SPI Rank	83	17	26	1
Social Progress Index	63.72	86.44	82.08	90.57
Dimensions				
Basic Human Needs	79.98	95.92	91.74	96.79
Foundations of Well-being	68.67	87.57	83.96	90.86
Opportunity	42.53	75.83	70.54	84.06
Components				
Nutrition and Basic Medical Care	94.94	99.19	99.22	99.28
Water and Sanitation	81.80	99.58	92.44	99.87
Shelter	79.15	93.25	88.16	94.27
Personal Safety	64.01	91.66	87.13	93.75
Access to Basic Knowledge	95.48	99.86	97.25	98.49
Access to Information and Communications	53.18	86.70	86.36	95.64
Health and Wellness	68.03	79.89	72.44	77.91
Environmental Quality	58.00	83.82	79.78	91.39
Personal Rights	15.21	85.66	72.43	97.89
Personal Freedom and Choice	71.09	78.60	70.04	89.83
Tolerance and Inclusion	37.76	62.11	63.28	78.29
Access to Advanced Education	46.05	76.95	76.40	70.24

101) As for the data source and the theoretical framework of this index, see “Appendix A. Data Sources” and “Social Progress Principles” respectively [Stem *et al.* 2017]. See also Van de Kerk [2014], Van de Kerk and Manuel [2008].

102) Stem *et al.* [2017]. For further details on indicators and their sources, see *ibid.* [23-25, Appendix A].

103) Social Progress Imperative [2017] and Porter *et al.* [2017].

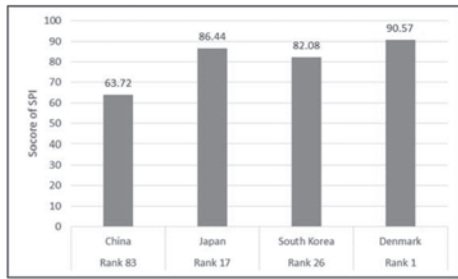


Figure 57 Social Progress Index, 2017

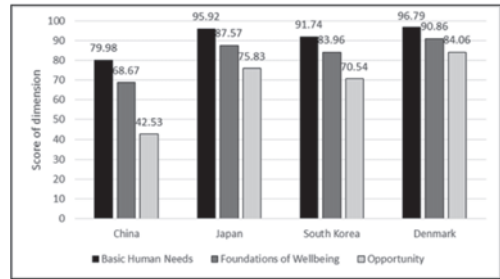


Figure 58 Scores of Each Dimension

19. AsiaBarometer

“AsiaBarometer” is a public opinion survey focusing on Asian countries. The survey was launched in 2003 under the leadership of Takashi Inoguchi [AsiaBarometer 2017]¹⁰⁴⁾. Surveys from 2003 to 2008 collected data from 29 countries in Asia and 3 neighboring countries (USA, Russia and Australia) [Inoguchi and Fujii 2012: 23, Table 2.1]. Survey participants are adults from 20 to 69 years of age in each country. Sampling methods used stratified multistage random extraction and allocation extraction methodologies to ensure the effective response rate generated sufficient samples sizes ranging from 800 to 2000 by country. Surveys were conducted using an interview method by investigators [AsiaBarometer 2017]. Specifically, two of the questions included in the survey are directly related to the concept of well-being. The first considers “the level of happiness¹⁰⁵⁾,” and the other looks at “the self-assessments of relative standard of living¹⁰⁶⁾.”

Cross-country comparison: Comparing the responses to the Self-assessment of Happiness question in Japan, South Korea and China, the proportion of people who answered “very happy” is the highest in China. The proportion of people who answered “not too happy” is the highest in South Korea. The proportion of people who answered “very unhappy” is the highest in China (Table 50 and Figure 59). Comparing the responses to the self-assessment of relative standard of living in Japan, South Korea and China, responses for all three countries display similar distributions. Conversely, in Taiwan and Hong Kong, the ratio of people responding “average” is comparatively higher than in Japan, South Korea and China (Table 51 and Figure 60).

Table 50 Self-assessments of Happiness (%)¹⁰⁷⁾

Rank	Country	Very happy	Quite happy	Neither happy nor unhappy	Not too happy	Very unhappy	PDI
14	China	18.2	44.0	31.5	4.7	1.6	55.9
15	Japan	14.9	47.1	31.4	6.0	0.7	55.3
21	South Korea	9.5	44.2	32.1	12.8	1.4	39.5
20	Taiwan	16.5	33.7	40.5	7.2	2.2	40.8
18	Hong Kong	6.6	44.0	46.1	2.2	1.0	47.4
1	Brunei	51.2	43.5	3.9	1.4	0.0	93.3

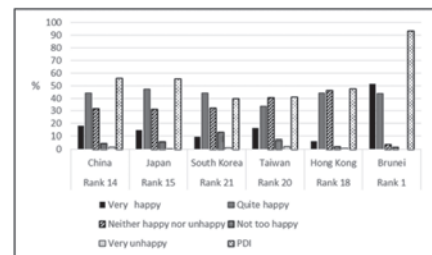


Figure 59 Self-assessments of Happiness (%)

104) List of research literature using data of AsiaBarometer (as of June 2008) is available on the following website: AsiaBarometer [2018]. Inoguchi [2014] analyzes the results of AsiaBarometer survey in 2003-2008.

105) In China, this question was not included in the 2004 survey. In the 2003 and 2004 surveys, the second answer choice was “pretty happy” [Inoguchi and Fujii 2012: 27].

106) This question seeks to obtain the degree of relative happiness [Shin and Inoguchi 2009], asking respondents to answer the question “How would you describe your standard of living?”

107) Inoguchi and Fujii [2012: 28, Table 3.1]. The question is the following. “All things considered, would you say that you are happy these days?” PDI (percentage difference index) is the value of the sum of

Table 51 Self-assessments of Relative Standard Living (%)¹⁰⁸⁾

Rank	Country	High	Relatively high	Average	Relatively low	Low	Mean	PDI
19	China	0.9	9.8	69.1	15.7	4.4	2.87	-9.3
16	Japan	1.7	10.5	66.9	16.7	4.1	2.89	-8.6
22	South Korea	0.8	10.2	66.3	19.1	3.6	2.85	-11.8
9	Taiwan	0.6	8.1	83.8	6.9	0.6	3.01	1.2
8	Hong Kong	1.0	12.3	75.4	10.3	1.0	3.02	2.0
1	India	13.9	22.8	57.0	5.0	1.3	3.43	30.3

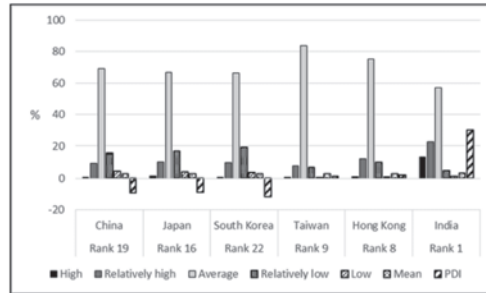


Figure 60 Self-assessments of Relative Standard Living (%)

20. Generation Z: Global Citizenship Survey

The Generation Z Global Citizenship Survey¹⁰⁹⁾ focuses on what the world's young people—defined as those born between 1995 and 2001—think and feel. This survey is conducted by the Varkey Foundation, and surveys over 20,000 young people in 20 countries around the world, including Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Israel, Italy, Japan, New Zealand, Nigeria, Russia, South Africa, South Korea, Turkey, the UK and the U.S.

Taken from Broadbent *et al.* [2017: 14], “The first part of the survey asked about young people's well-being, hopes and ambitions – from their relationships and future careers, to their physical and mental health. The second part focused on their personal, community and religious values; from their attitudes towards abortion, same sex marriage and transgender rights, to the importance of religion in their lives and whether they feel equipped to contribute to their own community. Finally, it covered issues of global citizenship; attitudes towards migrants, the factors that make young people hopeful and fearful for the future, and their views on whether the world is becoming a better or worse place.”

This survey does not have an integrated index, but rather has 9 different categories of scores generated from 22 questionnaires that relate to: (1) Net Happiness Score, (2) Warwick-Edinburgh mental well-being score, (3) emotional well-being, (4) relationship well-being, (5) physical well-being, (6) whether one's country is a good or bad place to live, (7) whether the world is becoming a better or worse place, (8) the largest cause of hope for future, and (9) the largest cause of fear for future. Among these categories, (1), (2), (3), (4) and (5) focus on well-being and are therefore relevant to our discussion. Each of these 5 categories is described in greater detail below:

1 (very happy) and 2 (quite happy) minus the sum of 4 (not too happy) and 5 (very unhappy) [*ibid.*: 28]. The data are calculated on the Surveys were conducted during the period from 2003 to 2008. For example, in the case of Japan, the surveys were conducted in 2003, 2004, 2006 and 2008. The sample size for Japan for each year is 857 in 2003, 825 in 2004, 1003 in 2006, 1012 in 2008, and total sample size is 3,697. In Japan, 14.9% of 3,697 people answered very happy [*ibid.*: 22-23].

108) *ibid.* [92, Table 5.13].

109) See Pota [2017], Dixon *et al.* eds. [2015], Broadbent *et al.* [2017], Varkey Foundation [2017a].

(1) The net happiness score is the result of the total percentage of those surveyed who answered “happy” minus the total percentage of those who answered “unhappy” to the following question; “Taking everything into consideration, to what extent are you happy or unhappy with your life at the moment?” [*ibid.*2017: 84].

(2) For the Warwick-Edinburgh mental well-being score, “respondents were presented with 14 statements, with each statement relating to an aspect of mental health and well-being. Respondents were then asked how they would describe their personal experience for each aspect using a scale ranging between ‘none of the time’ and ‘all of the time’. The well-being score is then calculated by assigning the response to each statement with a score between 1-5 and taking the sum as the total score. Overall, a higher score represents a better level of mental well-being and happiness” [Varkey Foundation 2017b: 8]. The exact question used is: “Below are some statements about feelings and thoughts. Please indicate what describes your experience of each over the last 2 weeks; 1. I’ve been feeling optimistic about the future, 2. I’ve been feeling useful, 3. I’ve been feeling relaxed, 4. I’ve been feeling interested in other people, 5. I’ve had energy to spare, 6. I’ve been dealing with problems well, 7. I’ve been thinking clearly, 8. I’ve been feeling good about myself, 9. I’ve been feeling close to other people, 10. I’ve been feeling confident, 11. I’ve been able to make up my own mind about things, 12. I’ve been feeling loved, 13. I’ve been interested in new things, 14. I’ve been feeling cheerful.”

(3) Emotional well-being is calculated from results generated from the following question: “Which, if any, of the following applies to you? 1. I tend to think about my problems too much, 2. I feel like I need more sleep, 3. I exercise regularly, 4. I balance my time well between work/study and relaxation, 5. I have a good relationship with my parents, 6. I have a strong group of friends, 7. I do not devote enough time for rest and reflection, 8. I currently feel anxious, 9. I am currently bullied, 10. I currently feel unloved, 11. I feel lonely.”

(4) The score for relationship well-being is the percentage of young people who responded positively to having good relationships with their parents and strong relationship with their friends [*ibid.*9].

(5) The score for physical well-being is the percentage of young people who reported to typically feel they get enough sleep, exercise regularly and devote enough time to rest and reflection [Broadbent *et al.* 2017: 84].

Cross-country comparison: The values of Japan (28%) and South Korea (29%) in the Net Happiness Score are very low. Japan and South Korea ranked the last and the second to the last, respectively, out of the 20 countries. In contrast, China’s value is 62%, which ranked 7th out of 20 countries (**Table 52** and **Figure 61**). In terms of “comprehensive well-being”, the score of which is calculated from answers to 14 questions concerning respondents’ feelings and thoughts over the previous two weeks, Japan ranked the lowest among the 20 countries. South Korea also ranked low at 17th. Conversely, China ranked 5th, and has a score higher than that of Japan by more than 10 points (**Table 53** and **Figure 62**). In “Relationship Well-being”, the percentage of people who answered positively about the relationship between parents and friends, China ranked second in the world with 80% positive answer. Japan and South Korea are placed in the middle rank with 60% positive answers (**Table 54** and **Figure 63**). With

respect to “Emotional Well-being”, China’s value is 36%, ranked 4th out of 20 countries. The value for South Korea is rather low at 24%, ranking 18th. Japan ranked 11th with a value of 30% (**Table 55** and **Figure 64**).

For “Physical Well-being”, while China and Japan ranked above average, South Korea ranked significantly below average. However, even in China the value of physical well-being is rather low at 20% (**Table 56** and **Figure 65**). In general, the scores for Physical Well-being seem to indicate that there are many young people with physical problems.

Note that this survey is conducted on young people. China is ranked relatively higher than Japan and South Korea in scores of subjective well-being. This is in contrast with other indices that do not show a big difference of subjective well-being between Japan, South Korea and China.

Table 52 Net Happiness Score¹¹⁰⁾

Rank	Country	Net happiness score (%)	Total % Happy	Total % Unhappy
1	Indonesia	90	92	2
2	Nigeria	78	85	7
3	Israel	73	78	5
4	India	72	80	8
5	Argentina	65	70	5
6	USA	63	73	10
7	China	62	70	9
8	Russia	60	64	4
8	Canada	60	70	10
8	Brazil	60	69	9
8	S. Africa	60	69	9
12	Germany	59	69	10
13	Italy	58	65	7
14	UK	57	68	11
14	France	57	67	10
16	Australia	56	67	11
17	N. Zealand	50	62	12
17	Turkey	50	59	9
19	South Korea	29	46	17
20	Japan	28	45	17

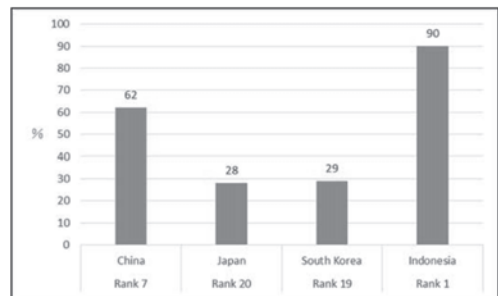


Figure 61 Net Happiness Score

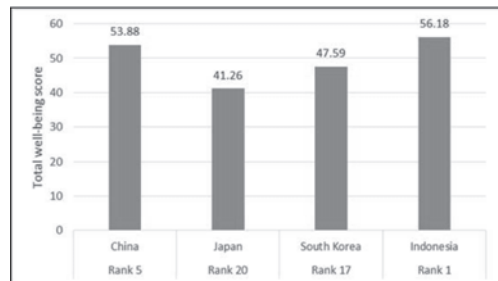


Figure 62 Warwick-Edinburgh Mental Well-being Score

Table 53 Warwick-Edinburgh Mental Well-being Score¹¹¹⁾

Rank	Country	Total well-being score
5	China	53.88
20	Japan	41.26
17	South Korea	47.59
1	Indonesia	56.18

Table 54 Relationship Well-being¹¹²⁾

Rank	Country	Relationship Well-being (%)
2	China	80
13	Japan	64
10	South Korea	65
1	Indonesia	81

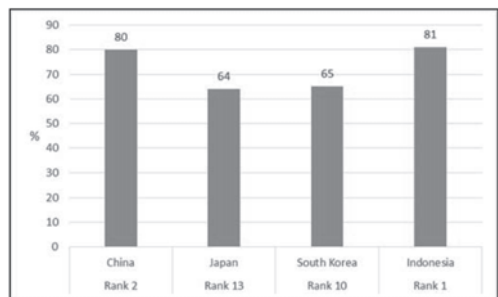


Figure 63 Relationship Well-being

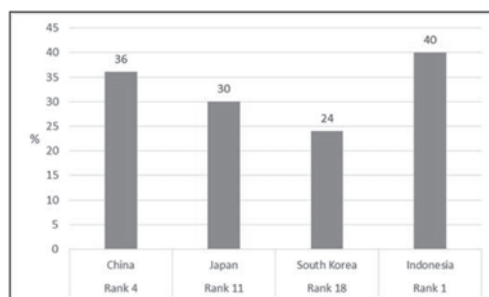
110) Varkey Foundation [2017b: 3, Fig.1].

111) *ibid.*[8, Fig.7] and Broadbent *et al.* [2017: 86-105, Country Profiles].

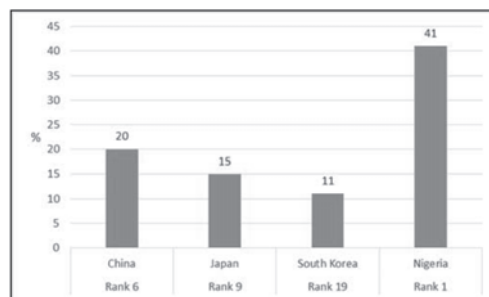
112) Varkey Foundation [2017b: 9, Fig.8].

Table 55 Emotional Well-being¹¹³⁾

Rank	Country	Emotional Well-being (%)
Rank 4	China	36
Rank 11	Japan	30
Rank 18	South Korea	24
Rank 1	Indonesia	40

**Figure 64 Emotional Well-being****Table 56 Physical Well-being**¹¹⁴⁾

Rank	Country	Physical Well-being (%)
Rank 6	China	20
Rank 9	Japan	15
Rank 19	South Korea	11
Rank 1	Nigeria	41

**Figure 65 Physical Well-being**

21. Other Indices

Below is a list of other indices developed as alternatives to GDP, and the specific reason (s) why we did not formally include them in our list of index descriptions above.

(1) Index of Sustainable Economic Welfare and Genuine Progress Indicator: In 1980s, Herman E. Daly and John B. Cobb developed the Index of Sustainable Economic Welfare (ISEW) [Daly and Cobb 1989] and this index evolved into the Genuine Progress Indicator (GPI), developed by NPO “Redefining Progress” in the United States in the late 1990s. In the 2000s, the scores in 13 countries including Japan and South Korea were calculated [Cobb *et al.* 1995; Talberth *et al.* 2006]. Makino [2008] calculated the score of GPI in Japan¹¹⁵⁾. Lawn and Clarke eds. [2008] calculated the scores of GPI in New Zealand, Japan, India, China, Thailand and Vietnam. Tran [2011] and Feeny *et al.* [2013] calculated the scores of GPI in South Korea. However, the GPI is not useful in terms of cross-country comparisons, because differing versions of the GPI were calculated according to the unique national environment for specific countries, such as economic development level, characteristics of social situation, and availability of statistical data [Makino 2008].

(2) Gross National Happiness: this is an index developed by Bhutan to measure the collective happiness across the regions of the country. The survey is unique to, and only conducted in, Bhutan.

(3) Better Life Index: This index is composed of 11 domains. However, the relative weighting of these 11 domains can be decided by the index users, and there is no established accepted measures

113), 114) Varkey Foundation [2017b: 9, Fig.8].

115) See also Yoshikawa and Nakano [2006], Ohashi [2011a], Okabe [2013] and Yamaguchi *et al.* [2016].

for the weights, and hence no ranking among nations. Instead we discuss the “OECD Well-being Indicator” in the section 7 above, which was developed from the Better Life Index.

(4) Country-specific Subjective Happiness surveys: In Japan, the government surveys its citizenry on their life preferences¹¹⁶⁾. The latest version of the survey was completed in 2011. In China, a similar survey was conducted in some cities¹¹⁷⁾. However there is no consistent methodology for such surveys across nations. Also, there is no equivalent survey conducted specifically for South Korea. However, the cross-national Gallup survey includes data on subjective happiness, which are incorporated in the World Happiness Report. We discuss the WHR above in section 5.

(5) National Accounts of Well-being¹¹⁸⁾: This survey is limited to European countries, and there are therefore no data for Japan, China or South Korea.

(6) Multi-dimensional Poverty Index¹¹⁹⁾: This index is developed by United Nations Development Programme (UNDP) but only surveys limited countries. Although there is data for China, data for Japan and South Korea do not exist.

(7) Human Poverty Index: This index was released from 1997 to 2009 in the Human Development Report. However, there are two versions for this index, neither of which is comparable to each other, making comparisons over time difficult. Further, while South Korea and China are included in version 1, only Japan is included in version 2. After 2010, this index was replaced by the Multi-dimensional Poverty Index.

(8) Index of Economic Well-Being¹²⁰⁾: This index is released by OECD. However, there is no data for Japan, China and South Korea.

(9) Measure of Economic Welfare: In 1972, W. Nordhaus and J. Tobin developed the Measure of Economic Welfare (MEW) and subsequently further developed it into a new index of Sustainable Measure of Economic Welfare (SMEW). However, we were not able to find sufficient data on this measure.

(10) Net National Welfare (NNW): In 1973, a special committee of Economic Council in Japan proposed this index. However, the GPI, discussed above, was designed as a more sophisticated index which succeeded the idea of NNW, as well as both the aforementioned SMEW and ISEW.

(11) System of Environmental Economic Accounting (SEEA): This index is also known as the “Green GDP” Index. However, we could not confirm the data for China and South Korea. Masuda [2007] examined the data of a simplified version of this index (SEEA93) for Japan, South Korea and China. The index of Green Gross Domestic Product is the same as SEEA.

(12) Gross National Well-being: This index was inspired by the Gross National Happiness philosophy introduced by the former King of Bhutan in 1972. However, we could not obtain

116) Cabinet Office, Government of Japan [2014].

117) 中国幸福市評価体系課題・中国幸福小康指数 (China's Happiness in Cities: A Systematic Evaluation and its Problem, China Happiness Well-being in Cities Index). See China Society for Public Economics [2018] and Xiaokang Index [2018].

118) NEF [2018].

119) UNDP [2018].

120) CSLS [2018].

sufficient data on this index¹²¹⁾.

(13) Indices prepared by the Japanese government: NNW (Net National Welfare)¹²²⁾, Social Index (1974-1984), New Social Index (1986-1990), People's Life Indicators (1992-1999), and Life Reform Index (2002-2005)¹²³⁾. These indices were sponsored by the National Life Bureau at Economic Planning Agency of the Japanese Government, and as such the data are limited to Japan.

(14) International Comparison of the Richness of the People: This index was released by Socio-Economic Productivity Headquarters in Japan. However, it does not contain data for China¹²⁴⁾.

(15) Gross National Happiness Index: Data on this index are not readily available.

(16) A new index by Fleurbaey and Gaulier [2009]: The index was not formally named, but it was designed to compare living standards (including non-income dimensions) across countries. However, this index does not provide data for China.

(17) Basic Capabilities Index: This index was created by Social Watch¹²⁵⁾. The Index provides data including Japan, South Korea and China for the years 2007-2011¹²⁶⁾. However, there is no significant difference in the scores for Japan, South Korea and China.

(18) The Composite Global Well-Being Index (CGWBI): This is a newly proposed index by Chaaban *et al.* [2016] and uses a similar methodology as the OECD Better Life Index and extends its methodology to developing countries. Japan is ranked 16th, South Korea is ranked 24th and China is ranked 63rd among 124 countries. However, in this paper, we did not discuss it since the components are complex.

22. Conclusion

In this paper, we examined a total of 20 indices developed to assess alternative and broader measures of well-being and welfare than the standard measure of GDP. For each of the 20 indices, we compared the outcomes of China, South Korea and Japan. As these indices are proposed as alternatives to GDP, an inevitable question arises: which index is the best indicator that could serve as a replacement to the measure of GDP? In this paper, we have reserved our assessment. At the beginning of this paper, we pointed out 10 limitations with respect to using GDP as a measure. It should be noted that none of the 20 alternative indices overcame all of the limitations we listed.

The first limitation with respect to GDP is it does not capture changes in international division of labor. None of the 20 alternative indices capture such division.

The second difficulty was that GDP does not incorporate social capital, human capital, cultural

121) For more information, see its website: GNH Institute [2018].

122) Keizai Shingikai NNW Kaihatsu Iinkai ed. [1971]. This index was calculated in 1955, 1960, 1965, and 1970.

123) Cabinet Office, Government of Japan [2018].

124) Socio-Economic Productivity Headquarters [2008].

125) Social Watch is an organization which is in the struggle to eradicate the causes of poverty "to end all forms of discrimination and racism, to ensure an equitable distribution of wealth and the realization of human rights." See Social Watch [2009].

126) The data are available from Social Watch [2018].

capital or capabilities. Some alternative indicators incorporate some of these elements. However, none of the other indices incorporates cultural capital.

The third difficulty was that GDP cannot effectively capture qualitative improvements of goods and services. However, there is no other indicator we reviewed that incorporates this element.

The fourth difficulty was that GDP does not incorporate non-remunerated labor. Although there are individual studies focusing on the scale of shadow work in certain countries, we are not aware of a comprehensive indicator that incorporates this factor¹²⁷⁾.

The fifth difficulty was that GDP does not incorporate issues on the environment. This difficulty has been overcome by many indices that incorporate environmental indicators.

The sixth difficulty was that GDP does not incorporate negative externalities, such as traffic jam. Some of these difficulties are overcome in alternative indicators¹²⁸⁾.

The seventh difficulty was that GDP does not consider income distribution. This difficulty has been overcome in some of the other indicators¹²⁹⁾.

The eighth difficulty was that GDP does not incorporate military spending. Indicators that overcome this difficulty were not examined here. While a comprehensive index on peace has been separately developed from other well-being indicators (the Global Peace Index, released by Institute for Economics and Peace), none of the other 20 indices incorporate this measure.

The ninth difficulty was that GDP does not incorporate the informal economic sector (underground economy). As for this point, for example, Italy has decided to incorporate a part of it into GDP in 1987, and it significantly raised the value of GDP in that year¹³⁰⁾. However, there is no definitive view of how much of the informal economic sector should be included in GDP. As for the international comparisons of the scale of informal economy, research has been conducted by F. Schneider¹³¹⁾. In general, informal sectors are considered to be larger in developing countries than in developed countries. However, in developed countries, work such as writing for Wikipedia has been increasingly active in recent years. It seems difficult to incorporate such work as an indicator of informal economy.

The last difficulty was that GDP does not consider the diversity and distribution of goods available throughout society. None of the alternative indicators of GDP considered overcame this difficulty.

As seen from above, most of the limitations of using GDP to measure welfare and well-being are

127) See, for example, Schneider ed. [2011].

128) For example, Social Progress Index includes the following indicators: Availability of affordable housing (Gallup World Poll), Homicide rate (UN Office on Drugs and Crime), Level of violent crime (Institute for Economics and Peace Global Peace Index), Perceived criminality (Institute for Economics and Peace Global Peace Index), Political terror scale (Institute for Economics and Peace Global Peace Index), Traffic deaths (World Health Organization), Suicide rate (Institute for Health Metrics and Evaluation), Early marriage (OECD Gender, Institutions and Development Database), Premature deaths from non-communicable diseases (Institute for Health Metrics and Evaluation). See Stem *et al.* [2017 : 23f, Appendix A].

129) For example, see Legatum Prosperity Index and Human Satisfaction Measure.

130) This change of including underground economy "increased the size of the economy by about a fifth, taking Italy past the United Kingdom to become the fifth biggest in the world, just behind France at number four." [Coyle 2014: 98-99].

131) See Schneider [2017].

not completely resolved by alternative indices. In fact, our examination finds that of the 10 limitations associated with GDP, only two difficulties have been sufficiently overcome, five difficulties have been partially overcome and three difficulties have not been overcome at all. Thus we would conclude that alternative indicators proposed as substitutes for GDP only address approximately half of the limitations arising from the use of GDP. Further, these alternative indices also need to be exposed to similar criticism as has GDP. Overall, alternative indices to GDP appear unable to overcome a majority of the limitations associated with GDP. Therefore, despite its limitations, GDP remains a useful and effective tool in many cases.

In summary, we argue that what most needs attention is not simply recognizing the limitations of GDP, but also developing an understanding of the significance and implications of such limitations. Before we are able to develop a useful metric that can replace GDP, it is incumbent upon us to make clear our normative concerns regarding the nature of measuring human welfare and well-being.

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