

# THE ETHICS OF PERPETUATING SERIOUSLY FLAWED COUNTRY RANKINGS

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## ABSTRACT

This paper evaluates Bergsteiner and Avery's (2012) claim that the Global Competitiveness Report (GCR) is significantly biased towards the Anglo/US business model and results in Anglo countries achieving unrealistically high competitiveness rankings, thereby reinforcing an essentially discredited business model. These authors predicted that removing the bias would result in the US, the main proponent of the Anglo/US business model, slipping in global competitiveness from among the top 10 to somewhere between 30<sup>th</sup> and 60<sup>th</sup> place out of the 139 countries included in the 2010 GCR survey, equivalent to places 20 and 40 on a 100-point scale. This paper examines the veracity of this assertion using 28 existing ranking instruments and creating a composite 100-point ranking scale to locate a selected group of 20 countries. The resulting composite ranking places the US at point 62 on a 100-point scale, scoring 41, 91 and 53 on the economic, environmental and social themes respectively.

**Keywords:** Competitiveness, ranking flaws, ideology, country rankings

## INTRODUCTION

The number of instruments for ranking countries has mushroomed in recent years, probably the most widely promoted among them is the GCR. Along with their many criticisms of this tool, Bergsteiner and Avery (2012) argue that the GCR is substantially biased in the direction of the Anglo/US business model. The result is that Anglo countries achieve unrealistically high competitiveness rankings that support a business model that has long been essentially discredited both in theory (Kennedy 2000) and practice (e.g. the global financial crisis). Bergsteiner and Avery (2012) postulate that removal of the bias would result in the US, a key protagonist of the Anglo/US business model, falling in global competitiveness ranking from among the top 10 to somewhere between 30<sup>th</sup> and 60<sup>th</sup> place out of the 139 countries included in the 2010 GCR survey.

This paper examines the veracity of this rather bold claim. We derive a composite 100-point ranking scale from 28 existing rankings to discover where on this scale a group of 20 countries is located. Before testing Bergsteiner and Avery's (2012) proposition, we address a somewhat unexpected discovery made in our study, namely that many existing rankings that we wanted to use in order to develop our composite scale are subject to a variety of flaws. We discuss some of the most common flaws next before describing our own study.

## COMMON METHODOLOGICAL AND OTHER FLAWS

Table 1 categorises 10 flaws that frequently occur in ranking instruments. These flaws fall into three categories enumerated by Moldan *et al.* (2004: p2 of 10) and others, namely whether the indices are salient, credible and legitimate. Salience means that the indicator is interesting, useful and policy-relevant, shows something "that really matters"; "policy implications should be obvious and unambiguous"; and "the indicator should be able to serve as a benchmarking instrument, to show trends in time and set targets". Credibility "deals with the scientific validity of ... data used for its construction, the methodology of aggregation, and other transformations, adequacy of presentation and similar issues". For Moldan *et al.*, legitimacy is the most difficult to define: "It touches the perception of the indicator, its methods of construction and the competence of the producer as seen from the point of view of a wide range of potential users and stakeholders whose interests, values, or beliefs might be affected by the indicator."

**Table 1: Nature of flaws identified in country ranking instruments based on Moldan *et al.* (2004)**

Statement of Flaw	Description	Moldan's Flaw Type
<i>Mixing dependent and independent variables</i>	The paper by Bergsteiner and Avery (2012) identified this as one of the key flaws of the Global Competitiveness Index (GCI). For example, of the 118 indicators examined in the 2012 GCR, only around 10% are clearly output factors (e.g. GDP, gross national savings). The rest are contextual parameters that <u>allegedly</u> facilitate or enhance competitiveness (e.g. ease of hiring and firing, prevalence of fixed telephone lines). Whilst such factors <u>may</u> improve competitiveness, causality along the line, if you do this, you will be more competitive, cannot be assumed. As Bergsteiner and Avery state, the proof is in the pudding, not the recipe. That is, contextual factors such as education or R&D budgets are nothing more than a “promise” of competitiveness. Whether this promise turns into reality is another matter entirely. Since composite rankings such as the GCI and the Global Innovation Index are prone to this problem, we avoid using composite rankings	Undermines credibility
<i>Ranking small numbers of countries</i>	Ranking small numbers of countries relative to each other rather than relative to a large pool of countries can significantly distort information, particularly if such rankings are then transformed to a common measurement scale as we have done. For example, let us imagine in a group of 100 countries we are interested in 20 specific countries. As luck would have it, 19 of these countries occupy the first 19 positions, but the 20 <sup>th</sup> country occupies the last place in the group of 100. In other words, it ranks last in the group of 100 but also last in the group of 20. The crucial difference is that in the first case there is a separation of 80 places, in the second case a separation of one. These are vastly different results that are hidden in small sample sizes. To avoid this flaw, we try and use rankings of 100 or more countries	Undermines credibility
<i>Including small countries</i>	While performance data of small countries such as Fiji, Macau, Monaco or Brunei is intrinsically interesting (especially for those countries), and may be entirely credible, the highly specialised nature of their economies (respectively tourism, gaming/tourism, gaming/banking/tourism, petroleum/gas) limits their salience as “model economies”, except, perhaps, for other small countries. Furthermore, including small countries in some lists, but excluding them in others can skew comparisons	Undermines relevance and hence salience
<i>Using ideologically contaminated questions</i>	Many rankings include or exclude measures because of ideological biases or deeply held belief systems. For example, the GCI asserts that high market capitalisation of listed companies confers innovation competitiveness on countries. The case for this is weak. One, an analysis of capitalisation scores and performance scores can yield rather paradoxical results. For example, Germany, a country that tends to rank highly on numerous economic measures, ranks low in market capitalisation (49 out of 141), whereas Zimbabwe, which ranks 132/144 overall on the 2012-2013 GCI, ranks in eighth place on market capitalisation. What might explain this paradox? In the case of Germany, strong economic performance is generally attributed to the strength of the German <i>Mittelstand</i> , which makes up 99% of all German firms, almost all of which are privately held (Federal Ministry of Economics and Technology 2014). Two, given the financial markets' counterproductive tyranny of short-termism (Barton 2011), a case could be made that market capitalisation is a mixed blessing at best and a bane at worst	Undermines credibility and/or legitimacy

**Table 1 con't: Nature of flaws identified in country ranking instruments based on Moldan *et al.* (2004)**

Statement of Flaw	Description	Moldan's Flaw Type
<i>Unnecessarily relying on naïve perceptions</i>	Some rankings are based on data derived from responses to opinion surveys, rather than drawing on available empirical research data. A perfect example of this is a question in the 2009/2010 GCR about the perceived soundness of banks. The rankings are based entirely on perceptions of essentially naïve respondents to a 2009 questionnaire survey, perceptions that the 2008/2009 Global Financial Crisis revealed to be totally out of synch with reality. The meaninglessness of this question appears to have been recognised by the World Economic Forum, which publishes the GCR, because after 2009 the question disappeared from the questionnaire	Fails the test of credibility
<i>Unequal weighting of economic, environmental &amp; social factors</i>	Composite rankings sometimes simply take an average of all rankings in a sample. This is acceptable when there is good category resemblance. When there is no category resemblance (e.g. economic, environmental and social indices), each category needs to be averaged separately and a judgment needs to be made whether there should be any weighting or not	Fails the test of credibility
<i>Not converting data to per capita measures</i>	For example, the World Intellectual Property Organisation ranks countries according to absolute numbers of patent applications. Such absolute figures are meaningless for comparative purposes. It comes as no surprise that the US with a population of around 314 million is going to do much better than Switzerland with only around 8 million in absolute terms. However, on a per capita basis, Switzerland significantly outperforms the US with respectively 4,884 versus 1,403 applications per million population	Undermines salience by its presentation
<i>Inclusion of irrelevant data</i>	Many economic rankings include irrelevant indices. For example, the GCI and the Global Innovation Index both include the percentage expenditure on research and development (R&D) as a measure of competitiveness. There is no research that establishes such a link. There is a link to systemic innovation, however, few indices that we are aware of pose the question how effective a country, or for that matter an organisation, is in systemic innovation	Undermines credibility
<i>Forgetting to invert scales</i>	Some reports with multiple rankings assign a number 1 ranking to the highest <u>number</u> irrespective of whether the high number is indicative of high or low performance. For example, the CIA's World Factbook ranks South Sudan, which has the highest number of maternal deaths per 100,000 live births, No. 1 on maternal mortality rate. In other words, it ranks in first place even though it has the worst score. This is unhelpful and potentially misleading given that the World Factbook generally uses the No. 1 ranking for best scores	Undermines credibility
<i>Transcription error</i>	Ranking scores are sometimes erroneously stated in the reverse order. For example, the World Factbook (2013) correctly states: "If income were distributed with perfect equality . . . the [GINI] index would be zero; if income were distributed with perfect inequality ... the index would be 100". A study undertaken by the Economist Intelligence Unit (EIU) on behalf of the Society for Resource Management and the Australian Human Resources Institute correctly states that the GINI score ranges from 0-100, but erroneously adds: "where 100=perfect equality" (Economist Intelligence Unit, 2012: 18). In other words, the EIU's ranking is completely back to front	Undermines credibility

In short, many rankings are subject to one or more of the above flaws and so present a sometimes grossly misleading picture of a country's relative performance. These problems can be camouflaged by another issue identified by Freedman (1985), Britt (1997) and others, namely, authors carrying out complex regression analyses based on large volumes of data rather than addressing the more urgent need to understand basic variables, processes and how clusters of variables interact in causal and associative ways. Given that many extant rankings are seriously flawed on multiple dimensions, we adopted the following research methodology to test Bergsteiner and Avery's (2012) proposition in a salient, credible and legitimate way.

## **METHODOLOGY**

In avoiding the flaws identified above, our study endeavours as far as possible to:

- Rely on rankings based on dependent variables, that is, outcome measures;
- Avoid composite rankings since many of them include independent and dependent variables;
- Avoid rankings with small sample sizes (that is, fewer than 100 countries);
- Eliminate all countries with populations of less than three million;
- Avoid ideologically biased questions;
- Rely on objective data rather than naïve perceptions;
- Give equal weighting to economic, environmental and social measures;
- Use per capita measures where applicable; and
- Avoid transcription and similar errors.

Database sizes vary. For example, the CIA typically ranks 144 countries in its World Handbook; others rank as many as 200+ countries; some fewer. This variation is partially a result of certain information not being available for some countries, a degree of arbitrariness in sample composition, and some studies including small countries whereas exclude them. After eliminating all countries with fewer than three million people from our comparison, this typically left between 100 and 130+ countries. To make the resulting ranking lists comparable, all rankings have been converted to a 100-point scale based on three indicator categories: economic, environmental and social.

### ***Sample: Choice of countries***

The rankings of a selected group of 20 countries were placed in the context of a larger pool of 100 or more countries, except in three cases where slightly fewer than 100 countries were ranked. The 20 countries specifically named in our ranking table include those in the G8 group, the BRIC countries, all Anglo countries, some high-performing European countries, Thailand, and Singapore. The inclusion of the G8 group and the BRIC countries requires no explanation given their economic and political significance. The Anglo countries are included to test the proposition implicit in Bergsteiner and Avery's (2012) paper that rankings for these countries tend to be overstated due to ideological biases and methodological flaws. Several high-performing European countries and Singapore are included for comparison purposes because they rank very highly on the GCR notwithstanding that study's flaws. Their relative performance therefore becomes all the more interesting when the flaws are removed. Thailand is included because the Sufficiency Economy Philosophy (SEP), promulgated by the king of Thailand in response to the 1997 East Asia crisis (Panyarachun 2011), stands in sharp contrast to strictures imposed by the IMF that clashed with the SEP and that Stiglitz (2002) termed "market fundamentalism". There are many other countries that could have been included in our list of 20 named countries for one reason or another (e.g. some or all of the G20 countries); however, the main purpose of this paper is to test Bergsteiner and Avery's (2012) proposition that out of a pool of 100+ countries, the ranking of the Anglo countries would slip significantly when certain ideological and methodological flaws were removed. A specific mention of all 100+ countries is not necessary for this.

## **INDICATORS**

A brief discussion of each of the economic, environmental and social indicators that make up the composite ranking scale follows.

### ***Economic indicators***

A reasonably large range of economic indicators was included because reducing country performance to one or two metrics can be misleading. For example, Sapir (2006) analyses Europe's economies on the basis of just two metrics – efficiency (i.e. sufficient incentive to work, keeps employment high) and equity (i.e. the risk of poverty is kept relatively low). Sapir concludes that the Nordic model manages to combine equity and efficiency, the

Anglo-Saxon models are efficient but not equitable and the “continentals enjoy far more equity but far less efficiency” (p.380). Our analysis does not support this conclusion but suggests that the US and the UK are neither efficient nor equitable, and that both the Nordic and the Continental models are far more equitable (see GINI Index) and perform far better economically (see average of economic indices in Table 4) than current research suggests. Indeed, even on Sapir’s solitary proxy for efficiency – unemployment – our analysis shows that the Nordic/Continental countries studied performed better or no worse than the US and UK. Most of the economic indicators draw heavily on World Bank definitions and explanations. Table 4 below includes 12 economic indicators that complied reasonably well with the above research methodology. Two indices require special mention, namely GDP and S&P’s Sovereign Credit Rating:

1. *Gross Domestic Product (GDP) per capita (pc)*: GDP is included because of its extensive use in economics, notwithstanding its many flaws (e.g. Bergh 2009). GDP is blind to inequalities and deficiencies in factors such as health care, education and life expectancy, and it ignores the informal/grey economy. On the other hand it includes: so-called defensive expenditures that do not add to wealth (e.g. prisons, cleaning up pollution, and repairing smashed cars), the production of resources that are being wasted (e.g. packaging), and products and services that are wasteful (e.g. all poor-quality goods). In other words, it takes no account of matters that diminish per-capita wealth and human well-being, or contribute little to it.
2. *Standard & Poor’s Sovereign Credit Rating*: The scale shown in Table 2 is an average of Standard & Poor’s three sub-ratings being “sovereign local currency ratings”, “sovereign foreign currency ratings” and “transfer and convertibility assessment”. These ratings are expressed in terms of letters ranging from “AAA” (best) to “D” (worst). In all, there are 26 letter combinations. For the purposes of our table with its 100-points scale, we allocated 4 positions on the scale for each letter combinations, except for “D”, which none of the countries rated anyway. In other words, the letter combinations assumed the following numerical values (Table 2).

**Table 2: Standard & Poor’s sovereign and T&C ratings**

AAA	1-4	A	21-24	BB+	41-44	B-	61-64	CC	81-84
AA+	5-8	A-	25-28	BB	45-48	CCC+	65-68	CC-	85-88
AA	9-12	BBB+	29-32	BB-	49-52	CCC	69-72	C+	89-92
AA-	13-16	BBB	33-36	B+	53-56	CCC-	73-76	C	93-96
A+	17-20	BBB-	37-40	B	57-60	CC+	77-80	C-	97-100

Note: T&C (transfer and convertibility) rates the likelihood of the sovereign restricting non-sovereign access to foreign exchange needed for debt service.

To get an average of three rankings for any particular country, say Thailand, which ranks “A-“, “BBB+” and “A” on the three components, we calculated the mean of the numerical equivalent values  $((25+29+21)/3 = 25)$ . This then provides the ranking for Thailand out of the 93 countries that remained after all countries with a population of under three million were removed from the sample. We then multiplied each ranking result by a factor of 1.075 to bring the results to a 100-point scale.

Note that nine of the 20 countries (AUS, CA, FI, FR, DE, SG, SE, CH and UK) rate “AAA” on the three sub-ratings and so the average rating is “AAA”, hence they all rank 1; China rates “AA-“ on all three sub-ratings and so ranks  $13 \times 1.075 = 14$ . The other 10 countries have mixed ratings for the three sub-sales and so we used the formula described above.

### **Environmental indicators**

Since these indicators shown in Table 5 are less well known than most of the economic indicators, we provide a brief description of them.

1. *Sustainable Society Index (SSI) – Environmental component*: The SSI ranks 151 countries on the basis of 21 indicators grouped according to three broad “dimensions” of human, environmental and economic wellbeing. The environment indicators are: air quality, biodiversity, renewable water resources, consumption, renewable energy and greenhouse gases (GhG).
2. *Ecological Footprint*: “The Ecological Footprint tracks humanity’s demands on the biosphere by comparing humanity’s consumption against the Earth’s regenerative capacity, or biocapacity. It does

this by calculating the area required to produce the resources people consume, the area occupied by infrastructure, and the area of forest required for sequestering CO<sub>2</sub> not absorbed by the ocean” (Living Planet Report 2012:36).

3. *Gasoline Consumption per Capita*: Road sector gasoline fuel consumption expressed per capita (kg of oil equivalent).
4. *Carbon Footprint*: Refers to GhG emissions (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, and F-Gas) from a variety of sectors including energy, industrial processes, agriculture, waste, bunker fuels, land use change and forestry.
5. *Domestic Material Consumption Indicator (DMC)*: DMC refers to the total amount of materials directly used in the economy from domestic extraction and imports, minus materials that are exported. Very broadly, materials of domestic origin comprise the three main groups of minerals, biomass and fossil fuels, whereas imports are classified in terms of the materials that go into their production and packaging.
6. *Material Footprint (MF)*: Proponents of this measure argue that for both national accounting and national comparisons the MF provides a more accurate assessment of resource productivity than DMC because it includes upstream raw materials related to imports and exports originating from outside the domestic economy (e.g. Wiedmann *et al.* 2013).
7. *Genuine Saving or Adjusted Net Saving (ANS), pc*: Although ANS is often used as an economic indicator, this measure is included under environmental indicators because genuine or adjusted net saving is a sustainability indicator building on the concepts of green national accounts. ANS measures the true rate of savings in an economy after adding investments in human capital minus the depletion of natural resources and damage caused by pollution. Among several other benefits, this metric makes the growth – environment conflict explicit, since countries focused on short to medium term growth at the expense of their own future will be identifiable by their depressed rates of ANS. For Switzerland, Germany and New Zealand we had to use 2006, 2007 and 2006 data respectively.

### ***Social indicators***

Since the social indicators in Table 6 are also less well known than most of the economic indicators, we provide a brief description of them:

1. *Sustainable Society Index (SSI) – Social component*: The SSI ranks 151 countries on the basis of 21 indicators grouped according to human, environmental and economic wellbeing dimensions. The social indicators are: sufficient food, sufficient to drink, safe sanitation, healthy life, clean air, clean water, education, gender equality, income distribution, good governance.
2. *GINI Index, Distribution Family Income*: The GINI index measures the degree of inequality in the distribution of family income in a country and plots the cumulative family income ranging from the poorest to the richest. Perfect equality is rated at zero (zero difference between all) and perfect inequality would be 100.
3. *Obesity (Body Mass Index – BMI)*: Obesity is defined as an adult having a BMI equal to or greater than 30.0. For most people, BMI provides a convenient indicator of body fatness and identifies weight categories that may be prone to health problems.
4. *Life Expectancy at Birth*: The average number of years to be lived by defined groups of people born in the same year, if mortality at each age remains constant in the future. Life expectancy is an indicator of overall quality of life in a country and is used in various actuarial measures.
5. *Happiness Ranking (World Happiness Report)*: This ranking represents the composite total of seven sub-scales: a so-called base country ranking, GDP per capita, social support, healthy life expectancy, freedom to make life choices, generosity and perceptions of corruption.
6. *Maternal Mortality Rate (MMR)*: MMR is the number of female deaths per 100,000 live births per year from any cause related to or aggravated by pregnancy or its management, apart from accidental or incidental causes. According to the CIA’s World Factbook, it includes deaths during pregnancy, childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, for a specified year.
7. *People in Prison or Jail*: The International Centre for Prison Studies records the number of prisoners held in 222 independent countries and dependent territories. (Small countries have been deleted from the sample.)

## RANKINGS NOT USED

We excluded several rankings from our composite table because of one or more of the flaws identified above. Table 3 depicts which flaws a particular ranking was prone to. Space constraints prevent us from providing a detailed rationale for our findings here. Having said that many rankings are flawed, we found – not unsurprisingly – that the relative position of a country on our composite table moved less and less with each additional ranking. This suggests that there is fairly strong concordance between rankings that comply with our methodological framework. Inversely, a lack of concordance in extant research may be explained by biased or otherwise flawed research questions. For example, oekom (2003) drew attention to an anomaly in research investigating the link between a country’s sustainability performance and its credit rating and competitiveness. They found that “Scandinavian and Central European countries which top the sustainability rating generally had a credit rating of at least AA+, while the countries doing badly in the Country Rating, such as Mexico, Turkey and Russia, failed to score higher than a BBB. Only the USA, which in the sustainability rating of 31 countries was ranked in only 25th place, achieves a high credit rating of AAA that is unusual for a country in this position” (oekom 2003: p.6 of 8). Oekom, however, had no explanation for this anomaly. Bergsteiner and Avery (2012) also reported on this anomaly, proposing that the anomaly disappears when the US’s competitiveness ranking is adjusted nearer to where they argued it is more likely to be.

**Table 3: Extant rankings and methodological flaws**

INDICES	Flaws									
	1	2	3	4	5	6	7	8	9	10
<b>Economic indices</b>										
Global Innovation Index	X			X				X		
Net government debt		X	X							
Soundness of banks				X	X					
Net international investment position	X									
Investment gross fixed	X							X		
Industrial production growth rate								X		
Global Competitiveness Index	X			X	X			X		
Market capitalisation	X			X						
Global Index of Workplace Performance & Flexibility	X	X		X				X		
<b>Social indices</b>										
UNICEF Child Well-being Index	X	X								
Human Development Index				X				X		

Flaw 1: Relies on independent variables

Flaw 2: Small sample size

Flaw 3: Too many small countries in sample (can be dealt with by removing them, subject to Flaw 2)

Flaw 4: Ideological bias

Flaw 5: Too much reliance on naïve perceptions

Flaw 6: Too much weighting on economic factors

Flaw 7: Data not converted to per capita measure

Flaw 8: Data lacking in relevance or applicability

Flaw 9: Failure to invert scale

Flaw 10: Transcription error

Note, where a ranking was rejected because of an obvious defect such as reliance on independent variables or small sample size, we did not investigate this ranking any further. This explains why Flaws 6, 7, 9 and 10 on Table 3 are blank. We found no reasons to reject any of the environmental indices.

## ANALYSIS OF COMPOSITE RANKINGS

The next four tables depict 28 scorings grouped into economic, environmental and social themes. We first examine the three individual themes by looking at the first six and the last six countries only, and then the average scores across all 28 rankings.

### *Economic scores (Table 4)*

The leading six countries in our group of 20 (remembering that this is in the context of scoring 100+ countries) are Switzerland, Singapore, Sweden, Germany, The Netherlands and Australia, which score 9, 14, 15, 20, 21 and 24 points respectively. Switzerland is the standout country by far, scoring in first place on 5 of the 14 measures

and second place on another 2 indices. The two dominant Anglo countries – the US and the UK – are in the bottom six of the 20 named countries. Australia stands out by having the lowest score of all countries on Current Account Balance (CAB), scoring in 100<sup>th</sup> place on the 100-point scale; however, overall it still scores in the top 6 of the 20 countries named. The UK and the US are not far ahead on the CAB score respectively scoring 98 and 97 on this measure.

**Table 4: Economic scores - first six and last six**

Country	CH	SG	SE	DE	NL	AU	TH	UK	IT	US	BR	IN
Population in million	7.93	5.35	9.10	81.3	16.7	22.0	67.1	63.0	61.3	314	199	1205
GDP per capita	4	<b>1</b>	8	9	7	5	44	12	18	2	39	66
Gross National Income (US\$), pc	<b>2</b>	9	4	11	7	3	47	14	15	5	28	67
Gross Nat'l Savings (% GDP), pc	13	4	32	31	23	30	15	76	60	77	56	16
Inflation Rate	<b>2</b>	54	6	19	30	16	36	30	42	18	59	85
Direct+PCT patent applicat's/mio pop	<b>1</b>	14	4	5	7	18	45	15	19	10	100	48
Unemployment rate	8	3	51	28	24	22	<b>2</b>	52	59	53	26	53
Budget Surplus or Deficit, % of GDP	17	8	23	16	65	56	70	90	49	86	<b>7</b>	77
Current Account Balance	3	<b>2</b>	6	8	5	100	39	98	72	97	73	51
Public Debt as a % of GDP	67	93	41	85	80	30	56	89	97	79	74	64
Foreign Exch Reserve (billion US\$), pc	<b>1</b>	2	10	21	20	30	27	37	22	61	35	73
Stock of Broad Money (billion US\$), pc	<b>1</b>	3	9	7	4	2	32	5	17	13	27	63
Stock Direct Foreign Inv- Home, pc	4	2	6	20	8	12	58	16	35	30	53	94
Stock Direct Foreign Inv- Abroad, pc	<b>1</b>	5	7	17	6	18	49	14	24	20	47	72
Sovereign Credit Rating (S&P)	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	27	<b>1</b>	22	4	30	37
Average of economic indices	9	14	15	20	21	24	39	39	39	40	47	62

#### *Environmental scores (Table 5)*

India, Thailand, China, Brazil, Switzerland and Sweden lead the group of 20. This is not very surprising for the first four of them given their stage of development. However, this high scoring result is unlikely to continue as they grow in wealth. A study by Hertwich and Peters (2009: 6415) found that "...as nations become wealthier the CF [carbon footprint] increases by 57% for each doubling of consumption". Notably, five of the countries in the bottom six are Anglo countries, with the US scoring lowest with a score of 91 on the 100-point scale. The high scores for Switzerland and Sweden are a considerable achievement given their advanced state of economic development. The Global Competitiveness Report does not include any environmental indices.

**Table 5: Environmental scores - first six and last six**

Country	IN	TH	CN	BR	CH	SE	NZ	IE	NL	AU	CA	US
Population in million	1205	67.09	1343	199.3	7.926	9.104	4.327	4.722	16.73	22.02	34.30	313.8
Sust. Society Index (Envir. wellbeing)	46	38	55	<b>33</b>	36	52	54	94	84	97	93	85
Ecological footprint	<b>10</b>	54	52	64	88	92	79	94	95	96	95	98
Gasoline consumption per capita	<b>14</b>	49	33	55	93	90	96	88	82	97	99	100
Carbon footprint (greenhouse gases)	<b>16</b>	50	61	77	54	62	91	83	89	97	94	95
Domestic material consumption t/c/yr	<b>24</b>	56	57	77	75	90	99	97	86	100	96	95
Material footprint (tons/cap/year)	<b>32</b>	50	66	69	95	83	84	93	89	97	95	91
Genuine adj. net savings (Sust. Indicator)	5	17	<b>1</b>	61	8	11	53	51	83	25	50	74
Average of environmental indices	21	45	46	62	64	68	79	86	87	87	89	91

#### *Social scores (Table 6)*

Sweden, Japan, Switzerland, Finland, The Netherlands and France lead on social themes with scores of 13, 17, 17, 19, and 23 respectively. Standout scores are Sweden's two highest rankings on the Sustainable Society Index and the GINI Index. The US shares the lowest six scores with five developing countries and has the worst possible score of 100 on the number of people in prison or jail.



**Overall composite scores (Table 7)**

Looking across the three themes, a consistent pattern emerges. Four European countries, and Japan and Singapore dominate the first six places of the economic and social themes. The leading environmental country by far is India (attributable to its low stage of development), followed some distance behind by Thailand and China, and then some distance further along Brazil, Switzerland and Sweden. The results across the three themes for the last six countries are more mixed; however, the US is in the last six for each theme.

Country	SE	JP	CH	FI	NL	FR	IN	US	CN	TH	BR	RU
Population in million	9.104	127.4	7.926	5.263	16.73	65.63	1205	313.8	1343	67.09	199.3	142.5
Sust. Society Index (Human wellbeing)	<b>1</b>	4	5	2	5	8	91	20	64	46	50	38
GINI Index, Distrib'n Family Income	<b>1</b>	42	12	6	16	22	39	70	79	92	89	62
Obesity - Adult prevalence rate	53	24	49	69	55	52	<b>6</b>	99	27	38	54	83
Life expectancy	7	<b>1</b>	2	16	8	5	67	19	41	47	51	62
Happiness ranking	4	28	<b>2</b>	5	3	19	70	13	59	25	18	45
Maternal Mortality Rate	<b>3</b>	7	16	5	9	15	68	27	38	41	43	37
No. of people in prison or jail	23	13	34	18	34	40	<b>3</b>	100	53	94	87	98
Average of social indices	<b>13</b>	17	17	17	19	23	49	50	52	55	56	61

In rating the economic, environmental and social themes of equal value for the composite scale, we simply used the mean of the three averages. This changed the relative positions of the 20 countries, creating a somewhat unexpected pattern. The first six positions are occupied by four European and two Asian countries: Switzerland (score 30), Sweden (31), Germany (38), Japan (39), Singapore (42) and The Netherlands (43). None of the Anglo countries are in the first six or even the first ten countries. The best-scoring Anglo country is Australia with a score of 46, and the worst Anglo country is the US with a score of 61, which is the lowest score overall of the 20 countries investigated.

**Table 7: Composite ranking of 12 countries on 28 criteria (averages shown only)**

Country	CH	SE	DE	JP	SG	NL	CA	IE	UK	BR	RU	US
Population in million	7.926	9.104	81.31	127.4	5.353	16.73	34.30	4.722	63.01	199.3	142.5	313.8
Average of economic indices	<b>8</b>	13	18	28	17	23	30	35	39	49	32	41
Average of environmental indices	64	68	72	73	73	87	89	86	75	62	76	91
Average of social indices	17	<b>13</b>	23	17	37	19	27	26	37	56	61	50
<b>Average of averages</b>	<b>30</b>	<b>31</b>	<b>38</b>	<b>39</b>	<b>42</b>	<b>43</b>	<b>49</b>	<b>49</b>	<b>50</b>	<b>56</b>	<b>56</b>	<b>61</b>
GCR competitiveness ranking 2012	1	4	6	10	2	5	14	27	8	48	67	7

Note: Countries in italics not shown on table.

AU Australia BR Brazil CA Canada CH Switzerland CN China DE Germany J  
 FI Finland FR France IE Ireland IN India IT Italy P Japan  
 NL Netherlands NZ New Zeal. RU Russia SE Sweden SG Singapore TH Thailand  
 UK United Kingd. US United States

**CONCLUSIONS**

Bergsteiner and Avery (2012) boldly asserted that the US's high GCR ranking is substantially overstated. They proposed that the US's high ranking, on a more objective and methodologically correct examination, was likely to lie somewhere between 30<sup>th</sup> and 60<sup>th</sup> place out of the 139 economies ranked, the equivalent of between positions 20 and 40 on our 100-point scale. The present study indicates that this was a conservative estimate. Our analysis places the US at point 61 on a 100-point scale, with scores 41, 91 and 50 on the economic, environmental and social themes respectively. The major detractor from a higher scoring is clearly the US's extremely poor environmental record. Comparing this result with the GCR exposes a huge disparity, with the GCR's overall score for the US being 7 on the 100-point scale, a shift of 54 points. Similarly, the UK's and Canada's scores appear significantly inflated on the GCI.

## Ethical implications

The role of science is to discover the truth and to use these truths to improve the human condition. Unfortunately many so-called facts produced by scientists are ideologically contaminated and methodologically flawed. Perpetuating such contaminated facts, in the knowledge that they are flawed, is unethical because it reinforces behaviours and systems that may materially, socially, psychologically and environmentally impoverish individuals and societies. Unfortunately, as we have shown, many country rankings are based on data that our analysis shows to be irrelevant, biased and/or incorrect. This (mis)leads key decision-makers and the public at large to make and accept poor decisions. The results can be catastrophic as the 1997 East-Asia crisis and the 2007–2008 Global Financial Crisis showed.

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