



sustainable competitiveness  
vs.  
davos man competitiveness

## About this report

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## About SolAbility

SolAbility is a sustainability advisory consultancy based in Korea, providing sustainable management tools & services to corporate clients and advanced sustainable investment research covering Pan-Asian equities for institutional investors.

Three corporate clients who have implemented sustainability strategies and management systems developed and designed by SolAbility have been recognised as global sustainability leaders ("global super-sector leader") in their respective industry sector by the Dow Jones Sustainability Index (DJSI), an honour that is awarded to only 19 of the annually evaluated 2'500 companies world-wide.



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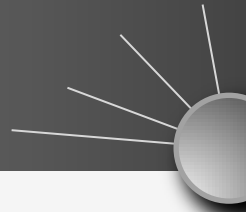
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### Competitiveness indexes: different competitiveness definitions = different results

Why a sustainable competitiveness Index? There are many different “indexes”, published by different organisations, ranking nations against each other in all possible (and, sometimes, impossible) different criteria. Amongst them are several indexes that in some way or another refer to “competitiveness” - in other words, indexes that rank countries according to their ability to create wealth, and the outlook for sustaining or increasing current wealth. However, the definition of competitiveness in a conventional approach tends to focus on economic and financial aspects of any given economy, and are based on momentary pictures in time. This approach has two main limitations:

- The focus on economic/financial performance aspects assumes that an economy works within an air-tight space independent of its physical environment (i.e. independent of the actual land it is built on)
- Does not take into account the ramifications of current economic activities on the future economic development and wealth creation capabilities

Through the inclusion of the so-called “non-financial” characteristics of national economies (the land that an economy is built upon, resource efficiency, and the way societies ensure equal opportunities, and distribute wealth and services amongst its citizens), the Sustainable Competitiveness Index aims at developing a broader picture of competitiveness that incorporates the normally omitted factors, which are essential pillars of an economy that is not built on borrowed time but is able to sustain growth and wealth into the future.

Different interpretations of different data sets or surveys analysed and put into indexes or rankings can open interesting new perspectives, regardless of the accuracy and real-life relevance of the index. However, real-life relevance and correlations to actual success factors depend on a) the source and reliability of the raw data, and b) - maybe more importantly - the definition of “competitiveness” that underlies a specific index. The definition or understanding of the term “competitiveness” guides the selection of competitiveness indicators and their analysis, i.e. the aspects of an economy that define the competitiveness of a nation according to the point of view of the publishing organisation or the individuals behind the index. It is therefore not really surprising that different “competitiveness” rankings come up with very different results.

Probably the most famous “competitiveness” index is the “**Global Competitiveness Report**”, annually published by and at the **World Economic Forum** (WEF). The WEF, and its annual forum held in Davos, enjoy a very good reputation amongst business executives and high-ranking politicians (the “Davos Man”) whose jets clog the runways of Zurich Airport each January.

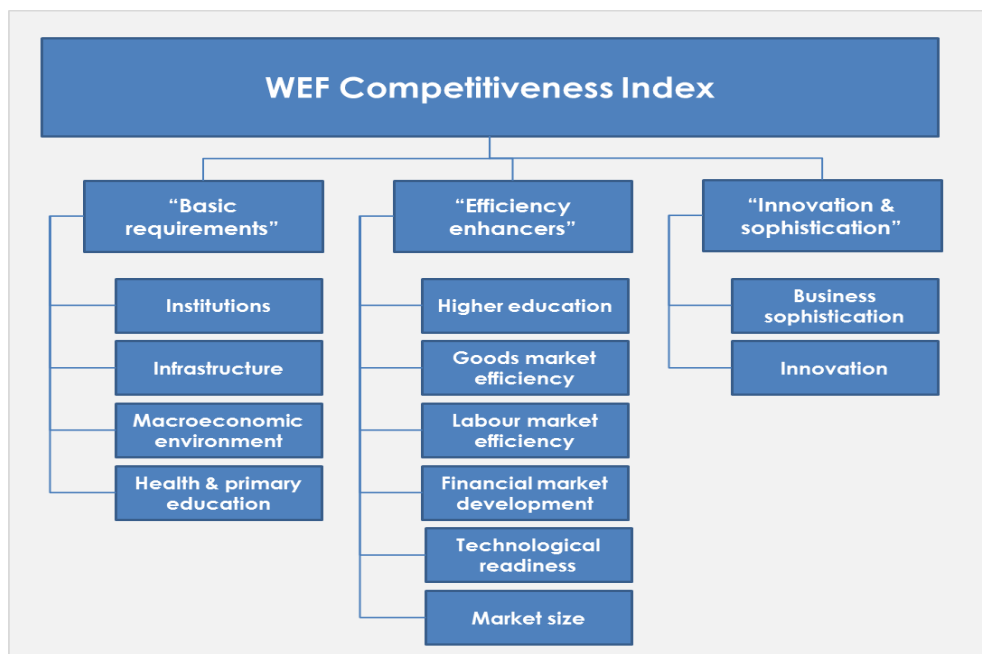
The WEF Report aims to “help understand of the key factors that determine economic growth, helps to explain why some countries are more successful than others in raising income levels, (...), and offers an important tool in the formulation of improved economic policies and institutional reforms”. These are very noble intentions, indeed. The interesting question is whether this holds true - in particular whether the competitiveness index correlates to actual wealth creation capabilities. The WEF's Global Competitiveness Report shall therefore be compared by methodology and results to the Sustainable Competitiveness Index on the following pages.

### The Davos Man Global Competitiveness Report: 3 main criteria, 12 pillars

The WEF (in the Global Competitiveness Report) defines competitiveness “as the set of institutions, policies, and factors that determine the level of productivity of a country”. It further argues that the level of productivity sets the level of prosperity that can be earned by an economy, as well as the rates of return obtained by investments in an economy. Productivity and returns of investments of an economy are considered “the fundamental drivers of its growth rates”, leading to “a more competitive economy which is likely to sustain growth.” Based on this definition, the WEF defined 3 main criteria, subdivided in 12 pillars of competitiveness, representing a total of 115 indicators. The three main criteria are “basic requirements” (institutions and infrastructure), “efficiency enhancers” (education levels, market mechanism and size, labor flexibility, financial market liberalization, technology adaption), and “innovation and sophistication (market maturity, R&D). The indicators are described in detail on the next page.

The index is computed based on indicator performance. The indicators within a category seem to be equally weighted, as are categories within a pillar. However, the weightings of the 3 main criteria differs depending on the level of development of a country (defined as GDP per capita). The weightings of the “basic requirements” indicators is higher for a poor countries (“factor-driven economies” according to the WEF terminology), and decreasing over 5 stages of development (GDP per capita) to mature “innovation-driven” economies. The weightings for the last criteria, “Innovation and sophistication”, is highest for the richest countries.

The Sustainable Competitiveness Index does not weight indicators or pillar according to the level of income of a country, but computes each indicator weighting according to its relevance in achieving and sustaining sustainable wealth e.



Composition of the WEF's Competitiveness Index

# Measuring Davos Men Competitiveness Indicators



Pillar	Category	Indicators		Data Source
Institutions	Public	Property rights	2	WEF executive opinion survey
		Ethics and corruption	3	WEF executive opinion survey
		Undue influence	2	WEF executive opinion survey
		Government efficiency	6	WEF executive opinion survey
		Security	4	WEF executive opinion survey
	Private	Corporate ethics	1	WEF executive opinion survey
		Accountability	4	WEF executive opinion survey
Infrastructure	Transport infrastructure	Roads, ports, railways, air	5	WEF executive opinion survey, International Air Transport Association
	Electricity and telephony infrastructure	Electricity supply, mobile/fixed line availability	3	WEF executive opinion survey, International Telecommunication Union
Macroeconomic environment		Budget balance, savings, inflation, debt, credit rating	5	IMF, Institutional Investor
Health and primary education	Health	Malaria, tuberculosis, HIV, life expectancy, child mortality rate	8	WEF executive opinion survey, World Bank
	Primary education	Quality and enrolment	2	WEF executive opinion survey, UNESCO
Higher education and training	Quantity of education	Secondary and tertiary enrolment	2	UNESCO
	Quality of education	Quality of schools and teaching, internet access in schools	4	WEF executive opinion survey
	On-the-job training	Training and availability of training	2	WEF executive opinion survey, UNESCO
Goods market efficiency	Competition	Domestic competition (competition, taxation, business barriers)	8	WEF executive opinion survey, World Bank
		Foreign competition (trade tariffs, custom proceedings, FDI, imports)	6	WEF executive opinion survey, International Trade Centre, WTO
	Quality of demand conditions	Customer orientation, buyer sophistication	2	WEF executive opinion survey
Labour market efficiency	Flexibility	Management-labour relations, hiring/firing freedom, redundancy cost, taxation	5	WEF executive opinion survey, World Bank
	Efficient use of talent	Pay & productivity, brain drain, female participation	4	WEF executive opinion survey, ILO
Financial market development	Efficiency	Availability and affordability of capital and venture capital	5	WEF executive opinion survey
	Trustworthiness and confidence	Soundness of banking systems, security market regulation	3	WEF executive opinion survey, World Bank
Technological readiness	Technological adoption	Technology availability, technology transfers	3	WEF executive opinion survey
	ICT use	Availability and speed of communication infrastructure	6	International Telecommunication Union
Market size	Domestic market size	Domestic market size index	1	WEF calculation
	Foreign market size	Foreign market size index	1	WEF calculation
Business sophistication	Supply, production, value chain utilisation, marketing	Supplier quantity and quality, production sophistication, value chain depth, marketing capabilities	10	WEF executive opinion survey
R&D Innovation	Research availability and spending	Researcher availability & quality, research institutions and capabilities, R&D expenditure, government procurement, patent applications	8	WEF executive opinion survey (7), OECD
<b>Total</b>			<b>115</b>	<b>WEF executive opinion survey: 79, others: 36</b>

The 115 WEF indicators determining competitiveness

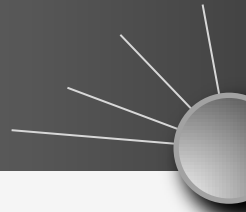
## The WEF's Sustainability-adjusted Competitiveness Index

One cannot say that the WEF is not reading the sign of times. The report is full of references to the potentially unsustainable side-effects of economic activity, and concludes that “competitiveness on its own may not lead to sustainable levels of prosperity”, and “competitiveness is a necessary but not sufficient condition for prosperity”. The WEF has therefore developed an additional index pillar on “sustainable competitiveness” since 2012. The sustainability pillar consists of 20 indicators divided in “social sustainability” and “environmental sustainability” (see table below).

However, it seems the WEF does not yet fully trust its own new insight – rather than fully integrating the sustainability pillars into the Global Competitiveness Index (GCI), the results are used to produce 3 sub-indexes – the Social sustainability-adjusted GCI, the Environment sustainability-adjusted GCI, and the Sustainability-adjusted GCI (combining the former two). It also does not cover the same number of countries/territories – while the GCI covers 144 nations, the Sustainability-adjusted GCI analysis has only be conducted for 126 countries. The Sustainability-adjusted GCI is calculated by applying a “sustainability coefficient” of between 80-120% to the original competitiveness score.

From a sustainable competitiveness view-point, this seems to be work in progress - but nevertheless marking a first step in the right direction. It is arguable whether the chosen indicators cover all relevant aspects of social and environmental sustainability, and some indicators seem to be chosen somewhat randomly, with 40% of the indicators relating to policies and perception rather than performance. In addition, it is questionable whether a survey conducted amongst “executives” and “leaders” (8 of the 20 indicators are based on the WEF's “executive opinion survey”) presents a reliable source to accurately and qualitatively assess the level of sustainability of an economy.

Pillar	Indicators		Source
Social sustainability pillar	Income Gini index	1	World Bank
	Youth unemployment	1	ILO
	Access to sanitation	1	WHO
	Access to improved drinking water	1	WHO
	Access to healthcare	1	WEF executive opinion survey
	Social safety net protection	1	WEF executive opinion survey
	Extent of informal economy	1	WEF executive opinion survey
	Social mobility	1	WEF executive opinion survey
	Vulnerable employment	1	World Bank
Environmental sustainability pillar	Stringency of environmental regulation	1	WEF executive opinion survey
	Enforcement of environmental regulation	1	WEF executive opinion survey
	Terrestrial biome protection	1	Environmental Performance Index (EPI) 2012
	No. of ratified international environmental treaties	1	IUCN
	Agricultural water intensity	1	FAO
	CO <sup>2</sup> intensity	1	World Bank
	Fish stocks overexploited	1	Environmental Performance Index (EPI) 2012
	Forest cover change	1	Environmental Performance Index (EPI) 2012
	Forest loss	1	Environmental Performance Index (EPI) 2012
	Particulate matter (2.5) concentration	1	Environmental Performance Index (EPI) 2012
	Quality of the natural environment	1	WEF executive opinion survey
Total		20	WEF executive opinion survey: 7, others: 13

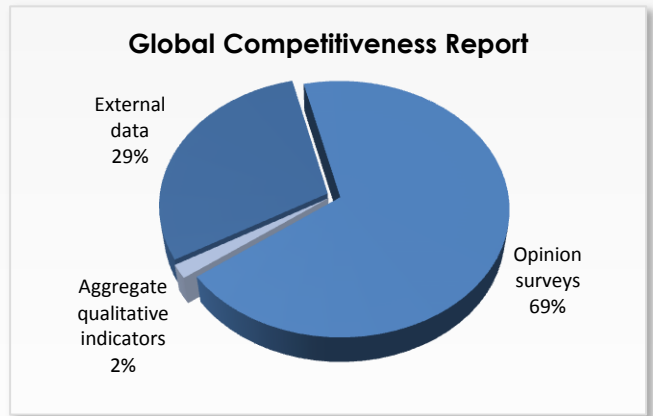


A very interesting – and probably not well know or overlooked factor – is that the Global Competitiveness Rankings are, to a major part, based on a survey conducted by the WEF, named "Executive Opinion Survey" – a stark contrast to the Sustainable Competitiveness Index, which is based on performance data. The executive opinion survey is conducted annually with the help of partner organisations across 150 countries. 14'059 respondents participated in 2012. The yearly responses are adjusted using a moving and discounted average of past surveys in order to reduce "sensitive to the specific point in time when the survey is administered". In addition, answers are adjusted for the economic structure of the country. Target respondents are business leaders from large and small companies in each country.

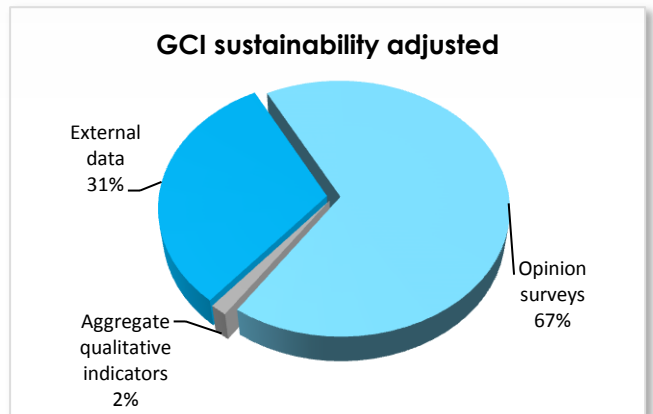
While the global coverage, computing and data weighting processes seem fairly sophisticated, there remain a some question marks:

- While "business executives" might have a clear understanding of the business environment and its regulation in their country, do "executives" have the same understanding of services that they perhaps never use, such as public services, public health services, social services, and environmental issues (all of which are part of the survey and basis for the Competitiveness Index)?
- Is a survey – regardless of whether conducted amongst "executives" or "non-executives" – that is based on individual perceptions rather than on facts - a reliable source to compose a ranking?

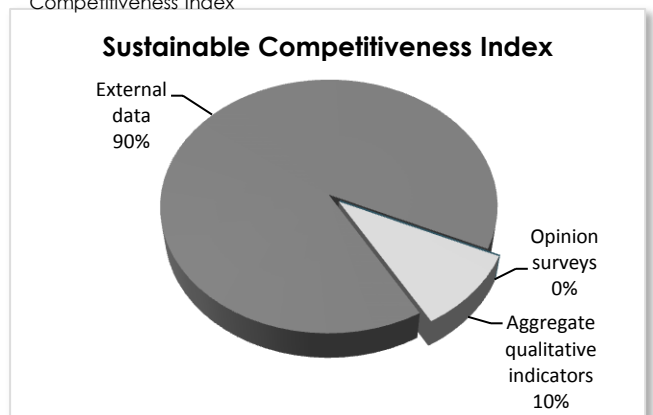
Considering that 70% of the WEF's GCI are based on perception and opinions of leaders, wouldn't it be more accurate to call the resulting ranking a "Competitiveness Perception Index" rather than "Competitiveness Index"?



The Global Competitiveness Index is to 69% based on perceptions of individuals, and only 30% on performance data



Data sources for the Sustainability-adjusted Global Competitiveness Index



The Sustainable Competitiveness Index is 90% based on performance data, and 10% on aggregated qualitative assessments in turn based on performance data

### Few environmental & social indicators

The table below shows the direct comparison of indicators used by the “Sustainable Competitiveness” and the “Global Competitiveness” indexes side-by side.

It is obvious that the Global Competitiveness Index hardly integrates and environmental or social factors, and focusses instead of economic environment and performance factors.

The new framework for a sustainability-adjusted GCI is a step in the right direction, but most indicators are addressing to policy and regulatory levels, which are considered to have limited meaningfulness for performance evaluation amongst sustainability experts.

Environmental & social indicators used for the two indexes. Numbers and indicators in brackets refer to indicators used in the Sustainability-adjusted WEF index, but not the main Competitiveness Index.

Pillar	Criteria	WEF Global Competitiveness Index		Sustainable Competitiveness Index	
		Number	Coverage	Number	Coverage
Natural capital	Water	0	-	4	Availability of freshwater resources, annual rain volumes & historical trends
	Biodiversity	(5)	(SA-GCI: Forest area, overfishing; policy indicators: environmental treaty signatures, protected areas, executive opinion on quality of environment)	4	Forest areas & changes, value of biodiversity, threatened species & historical trends
	Agriculture	0	-	5	Arable land per capita & land area, cereal yield per capita & area, potentially arable land
	Environmental degradation	0	-	4	Arable land under risk of desertification, arable land degradation rate, extreme weather events & historical trends
	Energy	0	-	4	Availability of energy resources (fossil & renewable) and level of depletion
	Minerals	0	-	2	Availability of mineral resources & level of depletion
Resource efficiency	Energy	0	-	5	Energy usage per capita & GDP, energy mix, CO <sub>2</sub> intensity of energy mix
	Climate change	(1)	(SA-GCI: CO <sub>2</sub> emissions per GDP)	4	CO <sub>2</sub> emissions per GDP and capita & their historical trends
	Water	(1)	(SA-GCI: agricultural water intensity)	4	Water productivity, freshwater withdrawal rate and their historical trends
	Waste	0	-	2	Volumes of ordinary and hazardous waste per capita and GDP & historical trends
	Pollution	(1)	(SA-GCI: particle mater pollution)	2	Particle mater pollution, SO <sub>2</sub> emissions & their historical trends
Social cohesion	Health	8 (3)	Prevalence and business cost of Malaria, Tuberculosis, and HIV, infant mortality, life expectancy (AS-GCI: access to health care, sanitation and water)	7	Child mortality, availability of nurses, doctors and hospital beds, affordability of medical services and drugs, overweight rates
	Social stability	(3)	(AS-GCI: social safety net, social mobility (as perceived by "executives"),GINI coefficient)	4	GINI coefficient, income quintile rate, life satisfaction perception index, gender equality index, and historical trends
	Public services	(1)	(AS-GCI: police services (as perceived by "executives"))	1	Stakeholder perception of quality of public services
	Crime	3	Cost of crime to businesses	4	Theft cases, homicide rates, prison population, safety perception index
	Freedom	0	-	2	Press freedom index, peace index (absence of violent conflicts and aggression)



# Economic & Innovation Criteria

## Competitiveness Indicators Side-by-side



### Focus on economic criteria

Innovation and economic indicators used for the two indexes. Numbers and indicators in brackets refer to indicators used in the Sustainability-adjusted WEF index, but not the main Competitiveness Index.

Pillar	Criteria	WEF Global Competitiveness Index		Sustainable Competitiveness Index	
		Number	Coverage	Number	Coverage
Sustainable innovation & economics	Education	10	Primary, secondary and tertiary enrolment, internet access in schools, quality of education systems and on-the-job education as perceived by "executives"	6	Primary, secondary and tertiary enrolment & completion rate and gender equality, historical trends
	Infrastructure	15	Air kilometers Internet, fixed line mobile communication usage Perception of quality of roads, ports, air transport infrastructure and electricity supply	5	Infrastructure investments Availability of roads and railways per area & population Internet & mobile communication availability
	Business environment	31	Government regulation, legal framework, government support, accountability, shareholder and investor protection, Market maturity and internal competitiveness, local supplier base, depth of internal value optimisation, export/import regulations and tariffs (all as perceived by "executives"), bribery payments	3	Ease of doing business index, bribery payments, Transparency International Corruption Index
	Innovation	10	Property rights & protection, quality and availability of research personal and institutes, spending on R&D (all as perceived by "executives"), patent applications per capita	7	R&D expenditure (per capita & GDP), R&D personnel, rate of engineering students, patent applications (per capita & GDP), value added through high-tech manufacturing
	Economic indicators	9	Tax rate, start-up requirements, FDI, GNI, Inflation, credit rating, domestic and foreigner market size	7	GNI growth rates, new business registrations, new trademark applications (per capita & GDP), obesity rates, health of balance between different sectors (agriculture, manufacturing, services), financial austerity crises management
	Governments	9	Public trust in politicians, diversion of funds, judicial independence, government misspending, transparency all as perceived by "executives") budget balance, debt	0	- Due to the lack of indicators that could measure quality of governments without ideological prejudices, this criteria has been omitted from the SCI
	Labour market	9 (2)	Labour flexibility, hiring/firing cost, taxation, wage flexibility, pay & compensation (all as perceived by "executives"), female labour participation rate (AS-GCI: youth unemployment & vulnerable employment)	3	Unemployment, vulnerable employment, female labour participation rate
	Banking system	6	Soundness of banks, access to, and affordability of, financing and venture capital	0	- A working banking systems providing financing for infrastructure and business investment as well as to guarantee financial transactions is essential to the functioning and development of a national economy. However, due to the lack of indicators that could adequately measure the quality and stability of a banking system, this criteria has been omitted from the SCI
	Financial markets	2	Regulation of securities exchanges, legal rights index	0	- Stock exchanges and trading of derivative products do not create sustainable value or wealth and are therefore not necessary foundations for national prosperity. Due to lack of accurate indicators that quantify the quality of regulation minimising the danger posed by financial markets to national economies, this criteria has not been included in the SCI.

# Davos Men vs. Sustainable Competitiveness Rankings (1-88)

## Competitiveness rankings: Sustainable Competitiveness Index (SCI) vs. WEF Competitiveness Index (GCI) vs. adjusted WEF Index (GCI adjusted)

Country	SCI	GCI	+/-	GCI adjusted	
Denmark	1	12	-11	10	-9
Sweden	2	4	-2	4	-2
Finland	3	3	-	2	+1
Norway	4	15	-11	5	-1
Switzerland	5	1	+4	1	+4
Germany	6	6	-	6	-
Canada	7	14	-7	13	-6
Ireland	8	27	-19	18	-10
Austria	9	16	-7	7	+2
Luxembourg	10	22	-12	-	n/a
Netherlands	11	5	+6	3	+7
Japan	12	10	+2	9	+2
Iceland	13	30	-17	16	-4
New Zealand	14	23	-9	11	+2
France	15	21	-6	14	-
Slovenia	16	56	-40	24	-9
Czech Republic	17	39	-22	23	-7
Estonia	18	34	-16	22	-5
Spain	19	36	-17	27	-9
Portugal	20	49	-29	35	-16
Belarus	21	-	n/a	-	n/a
Italy	22	42	-21	33	-13
Lithuania	23	45	-23	26	-5
Australia	24	20	+3	15	+7
United Kingdom	25	8	+16	8	+15
Belgium	26	17	+8	11	+13
USA	27	7	+19	17	+8
Brazil	28	48	-21	30	-4
Hungary	29	60	-32	37	-10
South Korea	30	19	+10	21	+7
Poland	31	41	-11	34	-5
Singapore	32	2	+29	-	n/a
Bhutan	33	-	n/a	-	n/a
Romania	34	78	-46	61	-31
Slovakia	35	71	-38	39	-8
Latvia	36	55	-21	25	+7
Croatia	37	81	-46	45	-12
China	38	29	+7	31	+3
Uzbekistan	39	-	n/a	-	n/a
Argentina	40	94	-57	71	-36
Costa Rica	41	57	-19	28	+8
Montenegro	42	72	-33	-	n/a
Indonesia	43	50	-10	43	-6
Uruguay	44	74	-33	40	-2

Country	SCI	GCI	+/-	GCI adjusted	
Malta	45	47	-5	-	n/a
Timor-Leste	46	136	-93	-	n/a
Israel	47	26	+18	20	+19
Russia	48	67	-22	49	-9
Peru	49	61	-15	53	-12
Serbia	50	95	-48	66	-24
Albania	51	89	-41	-	n/a
Bulgaria	52	62	-13	41	+2
Republic of Congo	53	-	n/a	-	n/a
Tajikistan	54	100	-50	-	n/a
Tanzania	55	120	-69	77	-33
Greece	56	96	-44	62	-17
Ghana	57	103	-50	-	n/a
Malaysia	58	25	+29	19	+27
Colombia	59	69	-14	59	-12
Zambia	60	102	-46	-	n/a
Cyprus	61	58	-1	36	+12
Sri Lanka	62	68	-10	50	-1
Cameroon	63	112	-53	-	n/a
Qatar	64	11	+49	-	n/a
Dominica	65	-	n/a	-	n/a
Liberia	66	111	-50	-	n/a
Moldova	67	87	-25	58	-8
Guyana	68	109	-46	-	n/a
Guinea-Bissau	69	-	n/a	-	n/a
Mozambique	70	138	-74	-	n/a
Laos	71	-	n/a	-	n/a
Armenia	72	82	-17	67	-16
Macao	73	-	n/a	-	n/a
Venezuela	74	126	-60	76	-24
Ethiopia	75	121	-54	-	n/a
Ecuador	76	86	-18	64	-11
Cote d'Ivoire	77	131	-62	-	n/a
Dominican Republic	78	105	-35	75	-21
Paraguay	79	116	-45	74	-19
Suriname	80	114	-42	-	n/a
Tunisia	81	-	n/a	-	n/a
Sudan	82	-	n/a	-	n/a
Kosovo	83	-	n/a	-	n/a
Democratic Republic of Congo	84	-	n/a	-	n/a
Kyrgistan	85	127	-54	-	n/a
Sierra Leone	86	143	-69	-	n/a
Gambia	87	-	n/a	-	n/a
Zimbabwe	88	132	-57	-	n/a

Ranking differences have been adjusted for the number of countries available in each index to allow for direct ranking comparisons

# Davos Men vs. Sustainable Competitiveness Rankings (89-176)



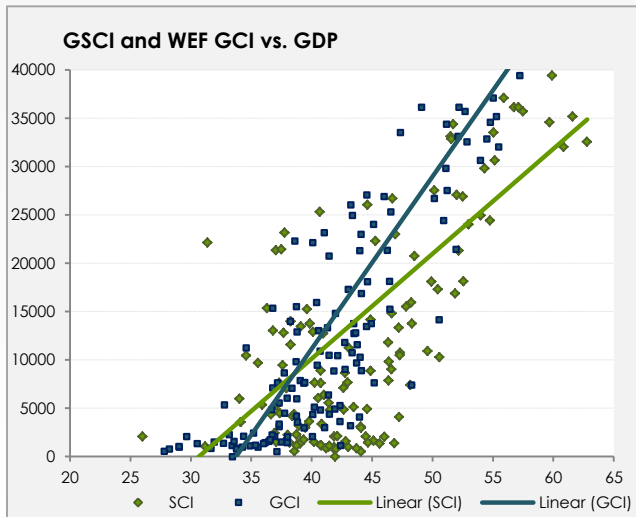
## Competitiveness rankings: Sustainable Competitiveness Index (SCI) vs. WEF Competitiveness Index (GCI) vs. adjusted WEF Index (GCI adjusted)

Country	SCI	GCI	+/-	GCI adjusted	
Mali	89	128	-52	-	n/a
Malawi	90	129	-52	-	n/a
Cambodia	91	85	-7	65	-9
Niger	92	-	n/a	-	n/a
Belize	93	-	n/a	-	n/a
Papua New Guinea	94	-	n/a	-	n/a
Georgia	95	77	+2	-	n/a
Nepal	96	125	-45	-	n/a
Egypt	97	107	-26	72	-15
Guinea	98	141	-59	-	n/a
Greenland	99	-	n/a	-	n/a
Madagascar	100	130	-47	-	n/a
Togo	101	-	n/a	-	n/a
Ukraine	102	73	+11	57	+1
Mauritius	103	54	+31	43	+16
Nicaragua	104	108	-22	-	n/a
Burkina Faso	105	133	-46	-	n/a
Bosnia and Herzegovina	106	88	-	-	n/a
Azerbaijan	107	46	+43	51	+9
Uganda	108	123	-33	-	n/a
Oman	109	32	+59	-	n/a
El Salvador	110	101	-9	-	n/a
Djibouti	111	-	n/a	-	n/a
Thailand	112	38	+55	38	+23
Lesotho	113	137	-43	-	n/a
Lebanon	114	91	+4	-	n/a
Angola	115	-	n/a	-	n/a
Burma	116	-	n/a	-	n/a
Panama	117	40	+56	32	+30
Philippines	118	65	+32	48	+15
Chile	119	33	+65	29	+35
Vietnam	120	75	+24	-	n/a
Cuba	121	-	n/a	-	n/a
Senegal	122	117	-17	-	n/a
Turkey	123	43	+58	42	+23
Bangladesh	124	118	-16	-	n/a
Chad	125	139	-36	-	n/a
India	126	59	+45	60	+6
Central African Republic	127	-	n/a	-	n/a
Rwanda	128	63	+42	-	n/a
Mauritania	129	134	-28	-	n/a
Kuwait	130	37	+70	-	n/a
Burundi	131	144	-36	-	n/a
Morocco	132	70	+39	68	-1

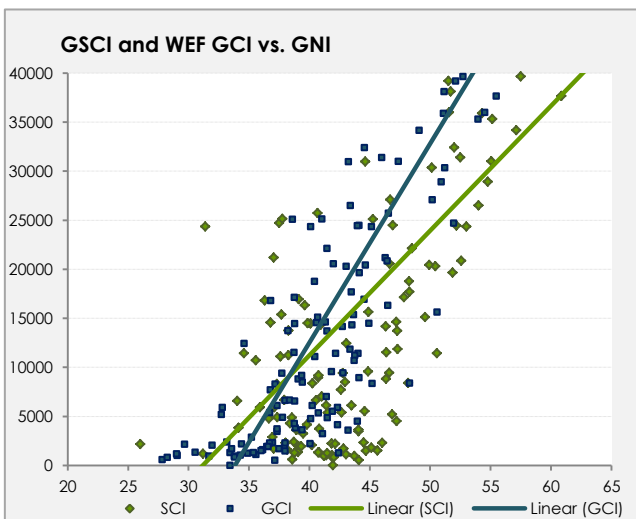
Country	SCI	GCI	+/-	GCI adjusted	
Mongolia	133	93	+17	-	n/a
Syria	134	-	n/a	-	n/a
Gabon	135	99	+12	-	n/a
Kazakhstan	136	51	+61	45	+23
Afghanistan	137	-	n/a	-	n/a
Benin	138	119	-6	-	n/a
Turkmenistan	139	-	n/a	-	n/a
Nigeria	140	115	-1	-	n/a
Jamaica	141	97	+18	70	-1
Seychelles	142	76	+40	-	n/a
Mexico	143	53	+64	47	+23
Macedonia	144	80	+38	63	+8
Saudi Arabia	145	18	+101	-	n/a
Bolivia	146	104	+16	-	n/a
Algeria	147	110	+11	78	-6
Eritrea	148	-	n/a	-	n/a
Jordan	149	64	+58	52	+21
Kenya	150	106	+17	72	+2
Bahrain	151	35	+89	-	n/a
Pakistan	152	124	+1	79	-4
Botswana	153	79	+47	-	n/a
Guatemala	154	83	+44	-	n/a
North Korea	155	-	n/a	-	n/a
Libya	156	113	+15	-	n/a
Comoros	157	-	n/a	-	n/a
Swaziland	158	135	-6	-	n/a
South Africa	159	52	+78	56	+20
United Arab Emirates	160	24	+107	-	n/a
Bahamas	161	-	n/a	-	n/a
Iraq	162	-	n/a	-	n/a
Iran	163	66	+66	54	+23
South Sudan	164	-	n/a	-	n/a
Hong Kong	165	9	+124	-	n/a
Honduras	166	90	+44	-	n/a
Namibia	167	92	+43	68	+10
Brunei	168	28	+108	-	n/a
Somalia	169	-	n/a	-	n/a
Maldives	170	-	n/a	-	n/a
Trinidad and Tobago	171	84	+53	55	+24
Haiti	172	142	-4	-	n/a
Fiji	173	-	n/a	-	n/a
West Bank and Gaza	174	-	n/a	-	n/a
Yemen	175	140	-1	-	n/a
Equatorial Guinea	176	-	n/a	-	n/a

Ranking differences have been adjusted for the number of countries available to allow for direct ranking comparisons

### High correlation to current GDP



Global Competitiveness and Sustainable Competitiveness Scores vs. GDP. Sources: WEF, World Bank, SolAbility



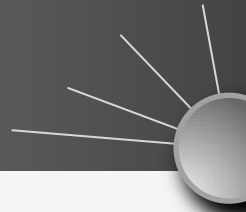
Global Competitiveness and Sustainable Competitiveness Scores vs. GNI. Sources: WEF, World Bank, SolAbility

A comparison of the rankings between the Competitiveness Index (GCI) and the Sustainable Competitiveness Index (GSCI) show similarities, but also certain dissimilarities. Scandinavian and other Northern European Countries e.g. are ranked high in both indexes, as is Japan. However, other large economies – in particular the US and the UK – are ranked distinctively higher in the GCI than in the GSCI as are new and emerging Asian economic powerhouses (China, South Korea). On the other hand, Eastern European nations are evaluated higher by the GSCI.

Given the set of indicators chosen to measure competitiveness, it is perhaps not really surprising that the Davos Man rankings show a very high correlation to current GDP levels of the respective country. The R square value (a statistical measurement quantifying the probability of two values matching a linear formula) for the WEF Index is a high 0.67, i.e. a 67% exact correlation between GDP and Competitiveness. Which raises the question – why not just use the GDP as a graduator of competitiveness...?

There seems to be a similar, albeit less positive correlation between GDP/GNI levels and the Sustainable Competitiveness Index. However, due to the integration of factors that currently might have limited direct financial impacts, (but influence long-term perspective, often referred to as “non-financial” aspects), the correlation is significantly less strong, with an R square value of 0.22 (i.e. 22% probability of an exact match).

The WEF Index might be a good measurement of current wealth. However, in light of the coming resource scarcity (i.e. when “non-financial” factors become financial factors), it is very probable that the GSCI is a more accurate forecast of future competitiveness and wealth creation and sustaining capabilities.



## So... how about growth rates?

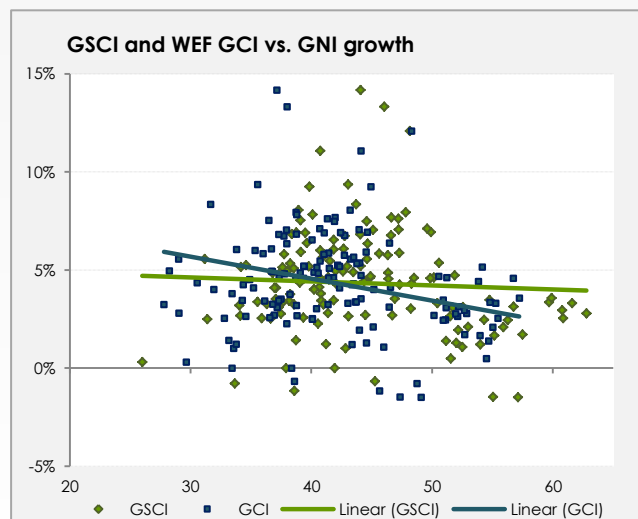
The previous page has shown the somehow expected correlations between current GDP levels and the WEF Competitiveness Index, and the also expected not-so strong correlation of the same value to the Sustainable Competitiveness Ranking.

However, a more interesting question relates to whether the Indexes have any correlation to growth rates, i.e. to the addition to, or sustaining, of, wealth by a given economy (or what is commonly perceived as wealth as measured by GDP or GNI). In other words – do the indexes have any value in predicting the capability of creating new wealth?

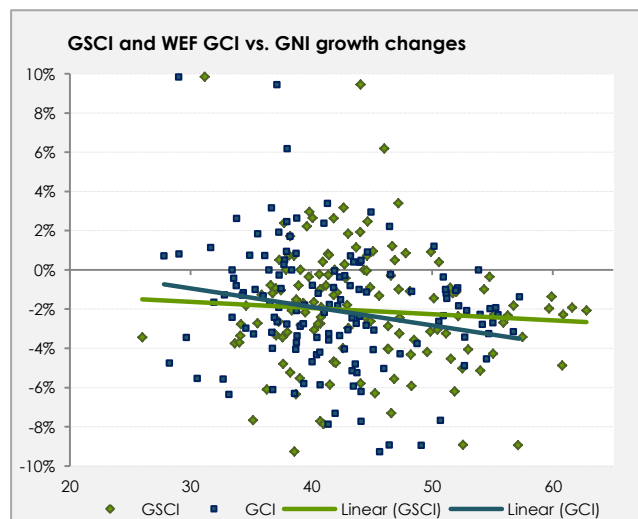
Given the spread of growth rates, it is not really surprising that comparing index scores and growth rates (without adjustments for development stage of an economy) is scattered rather than aligned, with no distinctive linear correlation visible. However, on average (looking at the average correlation), the association of competitiveness according to Davos Man and growth is negative (i.e. higher competitiveness averages lower growth rates and vice-versa). The average association of the sustainable competitiveness to growth is neutral, even before adjustment to development stages.

Analysis the changes to growth rates (also without adjustment to development stage of an economy) produces a very similar picture. However, the association of sustainable competitiveness and growth rate changes are also slightly negative, indicating that neither index is able to fully grasp the essence of growth and growth changes.

This analysis is by no means scientific, but rather intends to contribute to the discussion of what policies actually determine future wealth creation on the level of nations.

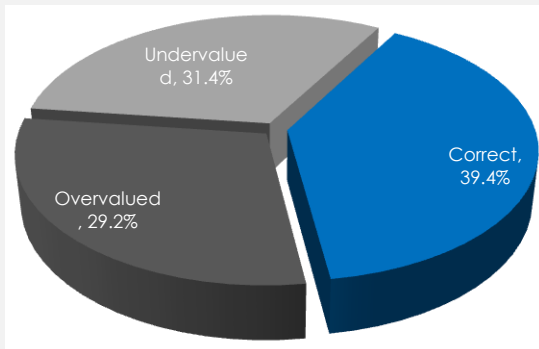


Global Competitiveness and Sustainable Competitiveness Scores vs. GNI growth rates. Sources: World Bank, WEF, SolAbility



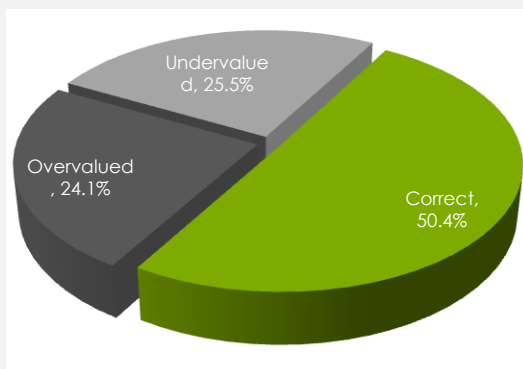
Global Competitiveness and Sustainable Competitiveness Scores vs. GNI growth rate changes 2006-2011. Sources: World Bank, WEF, SolAbility

### WEF GCI and GNI growth changes: correlations



WEF Global Competitiveness rankings and growth change rankings deviation: percentage of correct correlations (high rank, high growth rate changes) – the correlation holds true in 40% of cases.

### GSCI and GNI growth changes: correlations



Sustainable Competitiveness rankings and growth change rankings deviation: percentage of correct correlations (high rank, high growth rate changes) – the correlation holds true in 50% of cases.

Another statistical analysis consist of using of the average deviation of competitiveness and growth rates changes. This exercise has been conducted in order to analyse whether the competitiveness ranking of a country correlates to the ranking in terms of growth rates changes, or whether the country ranking would suggest a higher or lower growth rate than the actual, real growth rate.

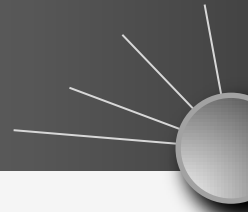
While this, again, does not intent and cannot represent a bullet-proof scientific analysis, it nevertheless gives interesting indications:

According to the WEF Index, only 40% of all cases show a positive correlation. In 30% of all cases a higher growth rate than anticipated by the WEF ranking is observed, while in another 30% the growth rate is lower than the WEF ranking would suggest. The hit rate of the Sustainable Competitiveness Index is 11% higher compared to the WEF index at marginally over 50%.

The reason why this important is the self-perception of the WEF and its competitiveness Index, that aims to “understand the key factors that determine economic growth, helps to explain why some countries are more successful than others in raising income levels, (...), and offers an important tool in the formulation of improved economic policies and institutional reforms”.

Comparing the WEF rankings and actual income level raising levels of the respective countries unfortunately does not support this notion.

Data analysis suggest that a country that would take the WEF's competitiveness blueprint as a development model has a statistical higher chance of such a strategy leading to undesired opposite results.



### High GDP level correlation , but low GDP growth correlation

The comparison of methodologies and empirical analysis of correlations with wealth levels and new wealth creation (growth and growth rate changes as measured in GDP or GNI per capital) leads to 4 major observations:

- **The data sources:** the WEF index is to 69% based on qualitative opinion surveys ("the executive survey"). While the high global number of respondents should lead to a representative picture, it is questionable whether opinion surveys based on a small bandwidth of the population ("the executives") are a true reflection of the respective quality and/or performance – in particular when it comes to non-business aspects such as quality of public services (health education, policing), or environmental matters. Reliance on data, on the other hand, would require exact and accurate data, which in turn requires the availability of data and application of streamlined data accounting across all countries – which, at this point in time, cannot be guaranteed for all relevant sustainable performance data.
- **The selection of indicators:** the WEF Competitiveness Index is based on the notion that "competitiveness" is based on economic performance and drivers that enhance economic performance (infrastructure, education, and regulations that affect businesses). In recognition that such economic activities might not be fully sustainable (i.e. not the sole ingredients of competitiveness in the longer term), The WEF has begun developing a "sustainable competitiveness" framework. However, this framework is limited in scope, selection of indicators, and not integrated in the main competitiveness Index at this point in time.
- **High correlation to current GDP:** The WEF Competitiveness shows a distinctive correlation to current GDP levels under exclusion of any environmental or equality indicators. The WEF ranking-GDP correlation also holds true in instances where current high GDP levels have been achieved mainly through the exploitation of natural resources (e.g. the fossil-rich states in the Middle East). In other words: the Competitiveness Report is a ranking of past achievements and current wealth of nations. This is not necessarily a sign of competitiveness, i.e. a country's capability to sustain and increase wealth in the future.
- **Low correlation to new wealth creation** (growth and changes of growth rates): empiric analysis of the WEF competitiveness scores and actual growth rates (measured in GDP or GNI) shows little correlation, and even less so to changes in growth rates. The Competitiveness Report aims to identify components of competitiveness and serve as tool for policy making to increase competitiveness, and due to the "brand-value" and international media presence is probably one of the most recognised indexes. However, there is no statistical (empiric) evidence that would support the notion that competitiveness - as defined through the selection of components by the WEF Index - actually lead to new or higher growth. Comparative analysis with the Sustainable Competitiveness Index suggests that full integration of sustainability factors yields a higher correlation to growth and growth changes, i.e. the capability to sustain or create new growth , the definition of future competitiveness.

The development of sustainability criteria by the WEF present a step in the right direction. However, the current version is work in progress. It is hoped that the WEF will continue to develop, and more importantly, fully integrate the sustainability factors in their Global Competitiveness Index.

# THE GLOBAL SUSTAINABLE COMPETITIVENESS INDEX 2013

