McQuilkin, Jamie (2018): Doing Justice to the Future: A global index of intergenerational solidarity derived from national statistics. In: Intergenerational Justice Review, 12 (1), 4-21.

Online Appendix

Appendix I – Descriptive Statistics

	Mean of top decile	Mean	Median	Mean of bottom decile	Range
Forest Degradation	81	72	76	41	100
Carbon Footprint	60	67	75	81	93
Low-Carbon Energy	43	28	25	19	100
Environmental Average	55	43	44	31	85
Wealth Inequality	52	47	49	54	64
Current Account	90	64	74	26	100
Adjusted Net Savings	69	42	34	14	100
Economic Average	67	42	45	18	79
Pupil-Teacher Ratio	81	62	74	25	100
Child Mortality	86	57	66	32	100
Fertility Rate	82	57	64	29	91
Social Average	83	52	57	15	94
Index	67	40	41	13	68

Descriptive statistics of indicators and index. Deciles are determined based on final index score, not indicator score

	Mean	Range
Countries with constitutional reference to future generations: Uganda; Burundi; Malawi; Jamaica; Qatar; Zambia; Ghana; South Africa; Portugal; Lesotho; Kenya; Albania; Armenia; Argentina; Bolivia; Poland; Morocco; Namibia; Brazil; Ecuador; Russian Federation; Czech Republic; Venezuela; Switzerland; France; Germany; Tajikistan; Sweden; Norway[1]	42	65
Communist/Post-Communist: Azerbaijan; Lithuania; Vietnam; Tajikistan; Latvia; China; Russian Federation; Estonia; Ukraine; Armenia; Kyrgyz Republic; Belarus; Kazakhstan; Mongolia; Poland; Slovakia; Romania; Bulgaria; Hungary; Czech Republic; Albania; Macedonia; Croatia; Slovenia, Lao, Cambodia	47	58
Nordic Countries: Sweden, Norway, Denmark, Finland, Iceland	61	28
Anglosphere: UK; USA; New Zealand, Australia, Canada, Ireland	53	24
Latin America: Costa Rica; Venezuela, RB; Peru; Ecuador; Brazil; Uruguay; Bolivia; Colombia; Argentina; Chile; Panamas; Paraguay; Nicaragua	47	46
Sub-Sahara: Mauritius; Kenya; Namibia; Senegal; Burkina Faso; Rwanda; Ethiopia; Congo, Dem. Rep.; Lesotho; Togo; Nigeria; Liberia;	21	24

Botswana; South Africa; Ghana; Sudan; Cameroon; Tanzania; Cote d'Ivoire; Malawi; Guinea; Zambia; Angola; Benin; Mali; Burundi; Niger; Uganda; Sierra Leone; Mozambique; Guinea-Bissau		
Oil-Producers[2]: Norway; Azerbaijan; Venezuela; Canada; Russian Federation; Denmark; Ecuador; Mexico; Australia; Algeria; Malaysia; Colombia; Nigeria; USA; Kazkhstan; Saudi Arabia; Angola; Kuwait	39	63
OECD: USA; Greece; Portugal; Chile; Israel; Poland; Turkey; Australia; Mexico; Slovakia; Estonia; Netherlands; Ireland; Spain; South Korea; Denmark; Italy; United Kingdom; Canada; Czech Republic; Japan; Switzerland; New Zealand; France; Austria; Finland; Germany; Belgium; Hungary; Slovenia; Norway; Iceland	54	46
Confucian: Vietnam; China; Japan; South Korea	63	11

Selected mean index scores and ranges of different groups of countries

	Forest Degradation	Carbon Footprint	Low-Carbon Energy	Environmental Average	Wealth Inequality	Current Account Balance	Adjusted Net Savings	Economic Average	Pupil-Teacher Ratio	Child Mortality	Fertility	Social Average	Index Average
Forest	1	-.229*	-0.069	.201*	0.003	0.016	0.068	0.111	.236*	0.075	.212*	.204*	.263**
Footprint	-.229*	1	0.02	.421**	0.173	-.434**	-.220*	-.375**	-.781**	-0.164	-.574**	-.516**	-.282**
Energy	-0.069	0.02	1	.747**	0.01	-0.037	-0.086	-0.054	0.075	.187*	0.152	.207*	.433**
Env. Average	.201*	.421**	.747**	1	0.06	-.201*	-0.144	-0.156	-.227*	0.032	-0.034	-0.029	.309**
Inequality	0.003	0.173	0.01	0.06	1	-.273**	-.228*	-0.158	-.196*	0.174	-.192*	-0.056	-0.141
BoP	0.016	-.434**	-0.037	-.201*	-.273**	1	.376**	.768**	.467**	-0.029	.374**	.270**	.472**
Savings	0.068	-.220*	-0.086	-0.144	-.228*	.376**	1	.779**	.267**	0.118	.305**	.262**	.490**
Econ. Average	0.111	-.375**	-0.054	-0.156	-0.158	.768**	.779**	1	.426**	0.098	.406**	.342**	.645**
Teachers	.236*	-.781**	0.075	-.227*	-.196*	.467**	.267**	.426**	1	.268**	.688**	.733**	.513**
Child Mortality	0.075	-0.164	.187*	0.032	0.174	-0.029	0.118	0.098	.268**	1	.275**	.711**	.466**
Fertility	.212*	-.574**	0.152	-0.034	-.192*	.374**	.305**	.406**	.688**	.275**	1	.725**	.588**
Social Average	.204*	-.516**	.207*	-0.029	-0.056	.270**	.262**	.342**	.733**	.711**	.725**	1	.724**
Index Average	.263**	-.282**	.433**	.309**	-0.141	.472**	.490**	.645**	.513**	.466**	.588**	.724**	1
Population	0.026	.185*	-0.023	0.102	-.190*	0.135	0.048	0.122	-.233*	-0.113	-0.119	-.191*	0.114
GDP/c (2013)	.234*	-.860**	0.119	-.236**	-.314**	.552**	.274**	.471**	.864**	0.115	.702**	.603**	.466**
Density (2013)	0.142	-0.152	-0.082	-0.032	0.05	0.062	.209*	.216*	0.045	.293**	0.108	0.153	0.149

**p<.05 (two-tailed); **p<.01.*

Bivariate correlations (Spearman's ρ) of indicators, averages and selected variables

Appendix II – Some indicators considered for inclusion

Indicator	Source	Reason for rejection
Maternity leave laws[3]	ILO	Despite being used elsewhere, there is little evidence linking this to the wellbeing of children, as opposed to parents.
Education spend (%GDP/c) per primary student	UNESCO	Not enough data points
School Attendance	UNESCO	Not enough differentiation in rich countries; statistics heavily skewed by repeat years, late entry etc.
Life Expectancy	World Bank	Not enough differentiation in rich countries; theoretically lacking as it describes current human capital rather than the next generation's.
Funding for health care as % of GDP/c	Various	Lack of centralised data on public/private spending splits; theoretically may relate exclusively to disproportionate investment in current generations e.g. healthcare for the elderly
State spending on the old vs. the young[4]	Various	Not enough data; may relate more to differences in pension funding mechanisms
Deforestation rate	FAO	Unreliable; superseded by satellite data
Consumption CO_2 per capita	Footprint of Nations	Not enough data points
Gross Capital formation	World Bank	Not as precise as Adjusted Net Savings
Gross Savings	World Bank	Not as precise as Adjusted Net Savings
Central Government Debt	World Bank	Not an indicator of short-termism (see Economics section) and non-comparable between federal and non-federal countries
Income Inequality (Gini)	World Bank	Wealth inequality more relevant
Research & Development Budget	World Bank	Non-comparable data due to differences in public/private investment
Advertising to Children	Various	Not enough data points
Social Discount Rate	Various	Not enough data points
Personal Discount Rate	Various	Currently too heterogeneous in measurement[5]
Household Debt	Various	Not enough data points

Pension spending/deficit by central government	Various	Non-comparable data due to differences in public/private investment; not enough data points
United Nations Voluntary Contributions (%GDP/c)	U.N.	Inadequate data; U.N. funding is generally progressive (even after corrections for GDP)
Child Wellbeing	UNICEF	Not enough data points
Status of tobacco	Various	Too much variation in policies
Soil erosion/land degradation	FAO	Not enough time-series data points (1991 only); doubts about accuracy; much reflects semi-natural change (e.g. desertification)

Appendix III – Full table of indicator and index scores

	Forest Degradation	Carbon Footprint	Low-Carbon Energy	Environmental Average	Inequality	Current Account Balance	Adjusted Net Savings	Economic Average	Pupil-Teacher Ratio	Child Mortality	Fertility	Social Average	Index Average	Rank
Norway	82	75	61	72	39	100	88	70	100	83	96	93	78	1
Costa Rica	68	86	59	70	41	58	75	56	76	91	91	86	70	2
Vietnam	64	100	21	51	57	100	76	76	73	82	86	80	68	3
Slovenia	90	23	51	47	71	100	54	73	85	100	82	89	67	4
Sweden	59	22	67	44	37	100	91	70	100	100	88	96	67	5
Nepal	96	100	16	54	53	100	100	81	38	88	82	65	66	6
Lithuania	73	46	43	52	55	100	36	58	91	90	89	90	65	7
France	86	30	68	56	51	85	46	59	79	92	81	84	65	8
Hungary	100	43	40	56	58	100	37	60	99	89	61	81	65	9
Sri Lanka	83	100	20	55	55	58	92	67	66	100	59	73	64	10
China	75	50	19	42	48	100	100	78	80	77	87	81	64	11
New Zealand	100	50	54	65	50	70	36	50	86	72	86	81	64	12
Switzerland	92	18	63	47	36	100	87	68	98	67	74	78	63	13
Belgium	73	21	46	41	60	93	50	66	97	83	98	92	63	14
Korea, Rep.	83	22	41	42	45	100	100	77	64	100	57	72	61	15
Bulgaria	99	40	48	58	56	82	37	55	83	62	76	73	61	16
Tajikistan		100	76	87	60	60	41	53	68	74	23	49	61	17
Germany	81	26	36	42	41	100	64	64	92	87	65	80	60	18
Peru	82	100	32	64	33	74	66	55	72	54	60	61	60	19
Philippines	81	100	49	74	30	100	100	67	40	50	40	43	60	20
Finland	54	17	45	34	49	100	52	63	88	100	96	95	59	21

Spain	90	32	40	49	55	74	34	52	92	91	57	78	58	22
Croatia	96	35	24	43	56	88	29	52	86	100	75	86	58	23
Austria	68	21	33	36	39	100	71	65	95	82	68	81	58	24
Netherlands	83	26	14	31	47	100	66	68	96	76	96	89	57	25
Latvia	33	55	25	35	54	100	56	67	95	72	68	78	57	26
Japan	94	25	38	45	60	100	21	50	79	100	69	82	57	27
Uruguay	100	86	38	69	40	66	18	36	81	60	81	73	57	28
Ireland	100	19	15	30	49	100	60	67	83	83	83	83	55	29
El Salvador	50	100	58	66	47	59	34	45	29	81	73	56	55	30
Czech Republic	90	23	41	44	40	77	28	45	81	100	72	83	55	31
United Kingdom	89	25	30	40	53	72	26	46	81	77	90	82	54	32
Romania	90	60	34	57	46	63	25	41	83	45	74	65	54	33
Italy	94	29	24	40	56	85	18	44	99	97	66	85	53	34
Ecuador	78	100	27	59	43	92	32	51	73	33	55	51	53	35
Brazil	52	100	39	59	32	76	23	38	70	46	92	67	53	36
Denmark	66	30	19	34	21	100	58	49	98	88	82	89	53	37
Thailand	75	75	8	35	32	100	70	61	83	64	64	70	53	38
Canada	63	18	47	38	47	68	41	51	85	66	76	75	52	39
Venezuela, RB	83	43	32	49	33	100	54	56	78	29	61	52	52	40
Macedonia, FYR	75	30	21	36	52	68	31	48	80	97	67	81	52	41
Estonia	48	35	6	22	53	100	66	71	96	100	70	88	51	42
Malaysia	28	55	9	24	35	100	85	67	87	77	90	84	51	43
Australia	100	25	12	31	59	60	36	51	86	79	88	84	51	44
Indonesia	45	100	28	51	29	94	100	65	79	12	65	40	51	45
Russian Federation	84	25	29	39	20	100	51	46	81	42	86	66	49	46
Iceland		75	91	82	53	82	0	16	100	100	72	90	49	47
Ukraine	82	50	43	56	16	45	22	25	83	100	69	83	49	48
Mexico	68	32	25	38	42	88	51	57	55	36	74	52	48	49
Bangladesh	72	100	5	32	54	100	100	81	14	70	80	42	48	50
Poland	95	32	6	26	44	62	45	50	99	98	64	85	48	51
Israel		26	21	24	40	100	70	65	92	98	36	69	47	52
Slovak Republic	70	33	50	49	80	90	4	30	84	68	66	72	47	53
Morocco	100	100	11	48	38	29	100	48	58	32	40	42	46	54
Colombia	76	100	35	65	41	72	5	25	55	52	67	57	45	55
Armenia	98	100	56	82	59	0	38	13	75	84	92	83	45	56
Argentina	10	86	25	27	35	100	30	47	84	44	72	64	44	57
Cyprus	84	26	16	33	35	35	17	28	86	100	69	84	42	58
Chile	100	100	25	63	38	91	0	15	62	80	97	78	42	59
Bolivia	54	100	18	46	44	100	20	45	65	18	36	35	41	60
Azerbaijan	96	86	14	48	58	100	57	69	94	0	95	21	41	61
United States	59	14	34	30	28	72	29	39	90	20	91	55	40	62
Tunisia	100	100	4	33	45	37	12	27	79	62	64	68	39	63
Egypt, Arab Rep.		100	13	37	35	78	18	37	62	30	46	44	39	64
Albania	64	100	45	66	55	0	26	11	75	72	92	79	39	65
Kyrgyz Republic	97	100	60	83	58	0	25	11	64	95	29	56	38	66
Paraguay	0	100	100	22	43	100	18	43	60	62	44	55	37	67
Haiti	73	100	7	38	41	61	68	55	10	39	35	24	37	68
Panama	59	60	32	48	39	5	100	27	65	14	58	37	36	69

Mauritius	100	43	29	50	45	3	31	15	71	44	61	57	35	70
Kenya	61	100	27	55	50	30	33	37	16	20	20	19	34	71
India	84	100	16	51	34	68	95	60	29	0	62	12	33	72
Portugal	45	32	27	34	50	42	0	13	97	100	64	85	33	73
Pakistan	89	100	20	56	61	86	48	63	27	0	41	10	33	74
Senegal		100	8	28	55	36	45	45	32	52	15	29	33	75
Jordan		75	13	31	56	4	54	24	75	40	34	47	33	76
Greece	72	27	17	32	54	34	0	12	97	96	70	87	32	77
Namibia		100	29	54	31	64	65	51	45	0	41	12	32	78
Turkey	93	55	24	49	29	36	40	35	75	0	84	18	32	79
Algeria	76	100	3	27	54	100	100	82	64	0	40	14	31	80
Belarus	97	35	1	16	58	1	96	18	86	100	93	93	29	81
Burkina Faso		100	21	46	55	67	34	50	4	28	13	11	29	82
Rwanda	90	100	27	62	48	19	30	30	0	88	19	12	28	83
Congo, Dem. Rep.	76	100	17	51	53	32	0	12	32	73	12	31	26	84
Ethiopia	84	100	11	45	61	56	11	34	0	86	20	12	26	85
Lao PDR	57	100	93	81	59	78	0	17	51	0	44	13	26	86
Togo	78	100	6	35	57	41	0	13	27	62	18	31	24	87
Lesotho		100	74	86	46	0	73	15	30	0	45	11	24	88
Bahrain		11	0	3	56	100	58	69	95	32	83	63	24	89
Nicaragua	0	100	32	15	49	0	66	15	44	86	58	60	24	90
Jamaica	66	75	7	33	41	0	28	6	60	70	69	66	23	91
Singapore		14	0	2	48	100	100	78	77	85	57	72	23	92
Nigeria	79	100	7	37	36	100	24	44	27	0	11	7	22	93
Liberia	69	100	0	19	57	0	31	12	58	100	17	46	22	94
Lebanon	98	38	11	34	26	0	0	3	89	76	69	77	20	95
Botswana		60	0	8	37	81	100	67	61	0	55	15	20	96
South Africa	100	38	16	39	33	61	1	14	47	0	63	14	20	97
Ghana	52	100	24	50	55	5	12	15	44	0	27	11	20	98
Sudan		100	14	37	59	39	4	20	42	0	21	10	19	99
Cameroon	89	100	23	59	54	63	4	24	6	0	18	5	19	100
Cote d'Ivoire	8	100	12	21	48	100	22	47	16	0	16	6	19	101
Malawi	21	100	71	53	55	0	21	11	0	99	13	11	18	102
Kazakhstan	98	22	10	28	24	100	0	13	83	0	50	16	18	103
Tanzania	60	100	11	40	58	0	67	16	0	60	13	9	18	104
Guinea	64	100	46	66	56	0	0	4	14	46	17	23	18	105
Saudi Arabia		25	0	5	40	100	66	64	97	0	53	17	18	106
Angola	76	100	15	49	43	100	0	16	17	0	14	6	17	107
Qatar		8	0	3	47	100	100	78	97	0	91	21	17	108
Benin		100	0	10	56	18	23	28	6	37	17	16	16	109
Mali		100	51	71	56	13	21	25	0	0	9	2	15	110
Cambodia	0	100	3	7	55	42	17	34	0	76	45	15	15	111
Kuwait		8	0	3	44	100	67	67	100	0	49	17	15	112
Trinidad & Tobago	65	9	0	8	49	100	0	17	82	0	95	20	14	113
Burundi	72	100	51	72	59	0	0	4	0	92	11	10	14	114
Niger		100	0	10	56	0	31	12	24	64	7	22	14	115
Uganda	36	100	51	57	53	2	0	4	1	63	11	9	13	116
Sierra Leone	66	100	29	58	56	0	0	4	45	0	22	10	13	117

Mozambique	35	100	38	51	51	0	0	4	0	73	15	10	12	118
Guinea-Bissau	58	100	0	18	59	40	0	13	0	11	18	6	11	119
Mongolia	0	50	0	4	59	0	8	8	47	18	54	36	10	120

References

Boyd, David R. (2011): The Environmental Rights Revolution: A Global Study of Constitutions, Human Rights, and the Environment. Vancouver: UBS Press.

CIA (2012): Country Comparison > Oil Production.

Havranek, Thomas et al. (2015): Cross-country heterogeneity in intertemporal substitution. In: Journal of International Economics, 96 (1), 100-118.

Kasser, Tim (2011): Cultural values and the well-being of future generations: A cross-national study. In: Journal of Cross-Cultural Psychology, 42 (2), 206-215.

Vanhuysse, Pieter (2013): Intergenerational Justice in Aging Societies: A Cross-national Comparison of 29 OECD Countries. Gütersloh: Bertelsmann Stiftung. https://www.bertelsmann-stiftung.de/en/publications/publication/did/intergenerational-justice-in-aging-societies/. Viewed on 16 September 2016.

Notes

[1] Boyd (2011): 311.
[2] >1000 litres per capita per year; CIA (2012).
[3] After Kasser (2011).
[4] After Vanhuysse (2013).
[5] Havranek et al. (2015).