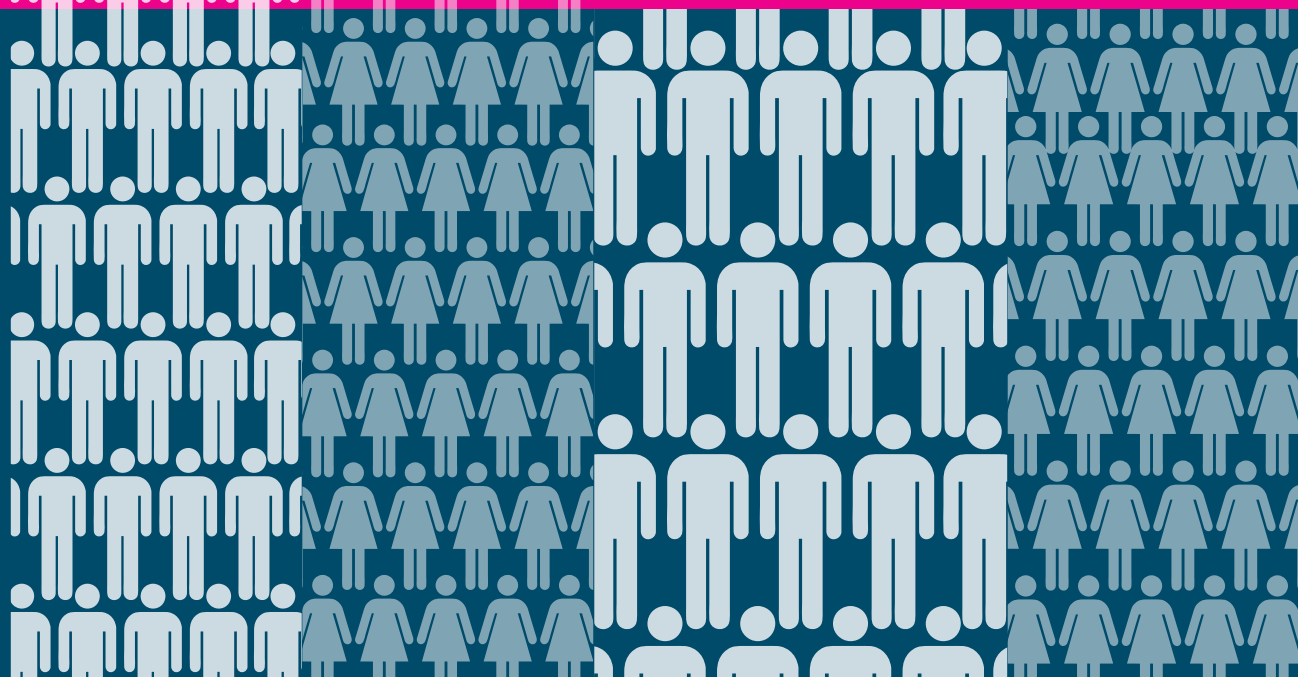
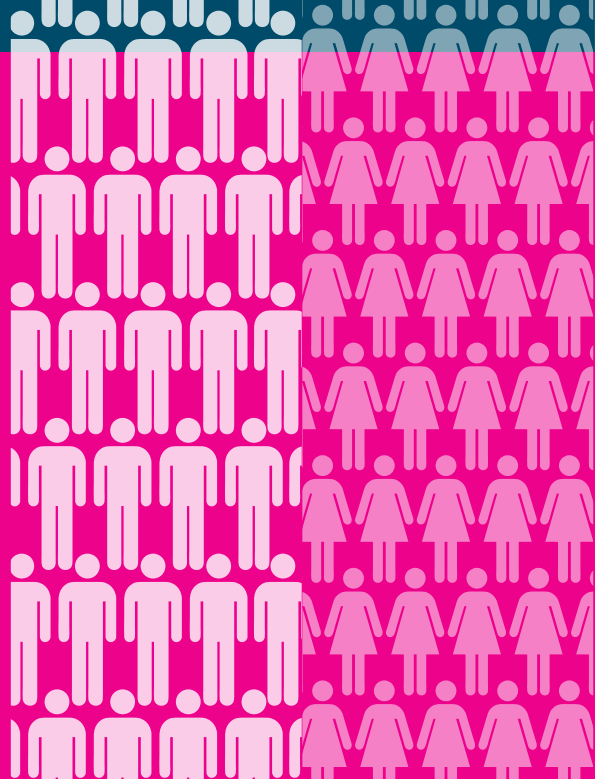




Kai L. Chan, PhD

GENDER PROGRESS INDEX

**"Society progresses when all its
members are able to achieve more."**



GENDER PROGRESS INDEX

Mao Zedong once remarked that “women hold up half the sky.” Yet in many countries today women are not fulfilling their potential due to cultural, legal and social impediments. But just as society loses when women fall short, so too when men are stifled. Although obstacles to men are less frequent (and perhaps even self-imposed), it is increasingly becoming more relevant (e.g. females outnumber males in tertiary education in many countries; men are much more likely to engage in dangerous activities; etc). Regardless, society progresses when all its members are able to achieve more.

Hitherto most measures of gender issues have acknowledged only female shortfalls. Furthermore, they have invariably taken one-dimensional views of gender differences by focusing on just the gap or just the level. Moreover, such measures seldom control for factors that can explain differences in outcomes.

To help societies to better reach the full potential of both sexes, and to facilitate international comparisons to reflect both levels and ratios, a measure is needed that captures gender issues on multiple dimensions and without prejudice on the gender of outcomes. This is not just an academic exercise, but rather it will enable policy makers to better understand the problems within society and where effort should be placed in ensuring that their nation’s full potential is realised.

The Gender Progress Index (GPI) takes a holistic view on gender issues. First, levels are important as a country where people are equally under-utilised is not ideal. Secondly, gaps within a country matter and equality (of opportunity) should be lauded and targeted. Finally, the index considers the relative performance of men versus women with no *a priori* distinction between the two; i.e. male under-performance of female outcomes is equal to the inverse.

Differences in outcome by gender are not always nefarious. Cultural, social and biological reasons may explain some of the discrepancies in outcomes. Also, men and women may simply choose different paths because of personal preferences. For this and other reasons the index tries to avoid normative positions on particular outcomes but is more focused on equality of opportunity. However, the index does highlight differences in outcomes, and through such a spotlight it is hoped will steer society in a direction towards equal gender rights and opportunities. Moreover, variables are calibrated against the population or its segments when relevant to account for the natural pipeline in certain outcomes. For example, the gender composition of corporate boards is calibrated against the gender composition of the labour force.

METHODOLOGY

The GPI consists of five dimensions: (1) education; (2) health; (3) labour; (4) politics and power (P&P); and (5) society. Within each of these dimensions are a set of indicators, ranging from a low of 3 to a high of 5. In total there are 20 indicators, each of which are tracked at the level of gender (female and male).

Table 1: Gender Progress Index methodology

#	EDUCATION (20%)	HEALTH (20%)	LABOUR (20%)	POLITICS & POWER (20%)	SOCIETY (20%)
1	Schooling years	Obesity rate	Labour participation	Parliament*	Suicide rate
2	Tertiary ER	Life expectancy	Unemployment rate	Cabinet*	Leisure time
3	Avg PISA score	Adult mortality rate	Senior jobs*	Board seats*	Parental leave
4	Science degrees	Tobacco use	Unpaid work hours		GNI per capita
5					Population*

* Indicators expressed as shares that sum up to 100%; their level scores are undefined but are taken as 1 for the pair calculation. Female outperformance indicators: tertiary ER, PISA, life expectancy, adult mortality rate, tobacco use, suicide rate, and leave.

Kai L. Chan, PhD

Distinguished Fellow, INSEAD

E: Kai.Chan@INSEAD.edu W: www.KaiLChan.ca

The index is constructed using both the levels of and the ratios of the female and male indicator values. For the levels, the indicator values are transformed into unit-free measures by subtracting the worst value and then dividing by the sample range. This is done at the female-male aggregated level. For the ratio, the female indicator value is divided by the male value unless the latter is larger. That is,

$$s_L = \frac{(x_f + x_m) - \min\{x_f + x_m\}}{\max\{x_f + x_m\} - \min\{x_f + x_m\}}; s_R = x_f/x_m \text{ if } x_f \leq x_m \text{ and } s_R = x_m/x_f \text{ if } x_f > x_m$$

where s_L is the level score¹ and s_R is the ratio. Both scores fall in the range [0, 1]. The level-ratio indicator pair is then assigned a value equal to the geometric average of the two scores:²

$$y = s_L^{1/2} s_R^{1/2} = \sqrt{s_L s_R}$$

The GPI score is a weighted sum of the 20 indicator level-ratio scores and so its value also lies in [0, 1].

The Index is robust in that there is a tradeoff between levels and ratios: A country cannot improve on the index by merely having one of the gender-level indicators regress. Likewise, it allows comparisons across countries on two dimensions: (1) How they are doing in absolute progress; and (2) How they are faring internally between the sexes.

Full details on the methodology (normalisation, missing values, weights, etc.) and indicators (definition, source, etc.) can be found [here](#).

RESULTS (TOP 10)

Which countries are best at reaching the full potential of their population? Table 2 below lists the top ten countries that achieve both high absolute (level) and relative (ratio) outcomes for the two sexes. Columns 4 and 5 (level and ratio) show country performance on the level of progress of men and women as a whole, and the relative performance between the two, respectively.

The top country is Norway. In fact, the top-performing countries are all from north Europe; Scandinavian nations dominate the list. The only non-European nations represented in the top 10 are New Zealand (6) and Canada (9). The top-performing non-Occidental country is Singapore (19). Costa Rica (29) is the top country in Latin America, while Tunisia (59) is the best amongst Arab nations, and Ghana (67) leads Sub-Saharan Africa. Full results (122 countries are assessed) [here](#).

Table 2: Gender Progress Index results (top-10 countries)

Top-10 GPI countries			Sub-index ranks		GPI dimension ranks				
RANK	COUNTRY	SCORE	LEVEL	RATIO	EDU	HEALTH	LABOUR	P&P	SOCIETY
1	Norway	0.698	1	2	22	2	12	1	1
2	Sweden	0.685	12	1	33	1	4	2	4
3	Netherlands	0.659	4	8	11	3	46	7	12
4	Denmark	0.649	3	10	8	4	36	21	8
5	Finland	0.648	14	6	8	18	33	3	19
6	New Zealand	0.646	6	12	7	8	16	25	20
7	Iceland	0.645	11	3	26	6	10	22	11
8	Germany	0.642	10	7	3	16	54	23	7
9	Canada	0.638	5	14	17	9	15	33	17
10	France	0.637	24	4	23	15	65	5	18

¹ If the variable is a “bad” then the **min** and the **max** operators are swapped.

² This is equivalent to a Cobb-Douglas utility function with constant returns to scale parameters and $\alpha = 1/2$.

GENDER PROGRESS INDEX (RESULTS, METHODOLOGY & INDICATORS)

RESULTS

Although women “hold up half the sky”¹ their full potential is often not realised because of cultural, legal and social impediments. But just as much as society loses when women are hindered from reaching their maximum, so too when men fall short. Although obstacles to men are less frequent (and perhaps even self-imposed), it is increasingly becoming more relevant (e.g. women outnumber men in tertiary education in many places). In short, society progresses when all its members are able to achieve more.

The Gender Progress Index (GPI) is a measure of the utilisation of a country’s human potential. When half the population – be it either females or males – are not achieving their capacity society loses. The GPI is a holistic measure on the ability of society to capture its fullest from both sexes. It does so by examining the gap between the two sexes, as well as the overall level of development. The gap shows the potential as (certain) outcomes should not be limited by sex. The level matters because a country where both genders are equally under-utilised is not ideal. The GPI furthermore takes an agnostic view of gender difference; i.e. male gaps relative to females is equally as bad as the inverse. The index is constructed to reflect trade-offs between level and ratio gaps. Moreover, it is robust to spurious index improvements generated by regressions in the underlying indicators, so the index can be used to generate meaningful policy recommendations, as well as being a tool for better benchmarking.

Table 1 below lists 122 countries on their ability to tap the potential of both sexes. Column 3 is the GPI score, which ranges from 0 (worst) to 1 (best). Columns 4 and 5 are the level and ratio sub-index ranks. They measure the overall and the inter-gender progresses, respectively. Columns 6 through 10 are the ranks associated with each of the five domains: (1) education; (2) health; (3) labour; (4) politics and power (P&P); and (5) society.

Table 1: Gender Progress Index (full results)

GPI ranking (122 countries)			GPI sub-index rank		GPI domain rank				
RANK	COUNTRY	SCORE	LEVEL	RATIO	EDU	HEALTH	LABOUR	P&P	SOCIETY
1	Norway	0.698	0.666	0.758	0.670	0.840	0.688	0.619	0.674
2	Sweden	0.685	0.629	0.769	0.636	0.845	0.709	0.609	0.625
3	Netherlands	0.659	0.646	0.694	0.696	0.839	0.638	0.529	0.591
4	Denmark	0.649	0.646	0.689	0.696	0.830	0.648	0.467	0.602
5	Finland	0.648	0.628	0.696	0.697	0.773	0.652	0.545	0.574
6	New Zealand	0.646	0.641	0.680	0.704	0.820	0.682	0.451	0.571
7	Iceland	0.645	0.630	0.722	0.650	0.821	0.693	0.464	0.595
8	Germany	0.642	0.632	0.695	0.729	0.783	0.630	0.464	0.606
9	Canada	0.638	0.643	0.671	0.681	0.820	0.683	0.422	0.582
10	France	0.637	0.599	0.718	0.665	0.785	0.617	0.540	0.580
11	Australia	0.631	0.641	0.665	0.706	0.802	0.663	0.399	0.585
12	Switzerland	0.625	0.619	0.675	0.683	0.814	0.634	0.443	0.554
13	Belgium	0.625	0.607	0.685	0.656	0.789	0.610	0.469	0.598
14	UK	0.624	0.629	0.663	0.696	0.821	0.652	0.387	0.564
15	Slovenia	0.620	0.619	0.663	0.695	0.770	0.640	0.453	0.543
16	Austria	0.619	0.627	0.649	0.676	0.761	0.650	0.421	0.584
17	USA	0.616	0.622	0.668	0.672	0.766	0.695	0.361	0.588
18	Ireland	0.616	0.623	0.652	0.729	0.824	0.578	0.382	0.567
19	Singapore	0.605	0.665	0.661	0.687	0.734	0.663	0.277	0.662
20	Italy	0.603	0.598	0.652	0.650	0.799	0.528	0.508	0.532

¹ This quote has been attributed to Mao Zedong, as well as an older-dating Chinese proverb.

Gender Progress Index (Dec 2016)

Kai L. Chan, PhD

GPI ranking (122 countries)			GPI sub-index rank		GPI domain rank				
RANK	COUNTRY	SCORE	LEVEL	RATIO	EDU	HEALTH	LABOUR	P&P	SOCIETY
21	Spain	0.598	0.591	0.662	0.687	0.778	0.532	0.436	0.558
22	Estonia	0.579	0.601	0.609	0.680	0.649	0.638	0.417	0.512
23	Luxembourg	0.578	0.574	0.653	0.564	0.800	0.535	0.402	0.589
24	Portugal	0.578	0.589	0.653	0.672	0.716	0.592	0.380	0.528
25	Poland	0.576	0.582	0.617	0.650	0.712	0.621	0.387	0.509
26	Israel	0.570	0.585	0.617	0.641	0.739	0.623	0.351	0.499
27	Japan	0.564	0.638	0.614	0.682	0.740	0.546	0.251	0.599
28	China	0.561	0.607	0.647	0.606	0.672	0.619	0.300	0.607
29	Costa Rica	0.560	0.568	0.597	0.514	0.711	0.552	0.508	0.517
30	Bulgaria	0.559	0.543	0.644	0.614	0.681	0.589	0.387	0.522
31	Czech Republic	0.550	0.578	0.587	0.661	0.731	0.561	0.304	0.491
32	Croatia	0.548	0.536	0.631	0.638	0.732	0.512	0.367	0.490
33	Latvia	0.547	0.572	0.579	0.627	0.618	0.678	0.330	0.483
34	Serbia	0.547	0.524	0.638	0.614	0.701	0.505	0.394	0.520
35	Lithuania	0.545	0.551	0.591	0.614	0.635	0.656	0.341	0.477
36	Greece	0.544	0.578	0.598	0.742	0.710	0.444	0.289	0.537
37	Brunei	0.542	0.627	0.587	0.540	0.741	0.655	0.154	0.619
38	Colombia	0.541	0.575	0.589	0.519	0.682	0.618	0.357	0.527
39	Romania	0.537	0.553	0.622	0.607	0.693	0.591	0.283	0.511
40	Korea	0.537	0.639	0.557	0.708	0.667	0.542	0.198	0.568
41	Cyprus	0.534	0.545	0.616	0.603	0.746	0.545	0.283	0.492
42	Albania	0.532	0.539	0.609	0.576	0.704	0.501	0.338	0.540
43	Argentina	0.530	0.524	0.611	0.611	0.743	0.502	0.437	0.354
44	Malta	0.527	0.553	0.582	0.600	0.759	0.545	0.286	0.444
45	Mexico	0.524	0.531	0.607	0.517	0.662	0.617	0.347	0.478
46	Belarus	0.522	0.553	0.562	0.643	0.574	0.602	0.330	0.460
47	Panama	0.521	0.558	0.608	0.405	0.671	0.639	0.413	0.479
48	Hungary	0.517	0.559	0.589	0.618	0.709	0.635	0.120	0.506
49	Philippines	0.513	0.537	0.602	0.446	0.614	0.692	0.339	0.475
50	Slovakia	0.511	0.599	0.568	0.615	0.672	0.569	0.217	0.481
51	Ecuador	0.510	0.547	0.586	0.365	0.630	0.580	0.468	0.509
52	Indonesia	0.507	0.541	0.576	0.504	0.598	0.586	0.296	0.549
53	Ukraine	0.504	0.535	0.569	0.644	0.567	0.605	0.266	0.439
54	Chile	0.502	0.511	0.589	0.604	0.721	0.496	0.324	0.367
55	Tunisia	0.499	0.511	0.569	0.540	0.671	0.406	0.365	0.511
56	Laos	0.498	0.506	0.648	0.395	0.667	0.624	0.289	0.515
57	Thailand	0.498	0.580	0.568	0.527	0.594	0.698	0.184	0.486
58	Vietnam	0.498	0.574	0.585	0.434	0.611	0.680	0.282	0.481
59	Russia	0.496	0.529	0.571	0.622	0.542	0.637	0.213	0.465
60	Malaysia	0.496	0.568	0.554	0.505	0.592	0.603	0.260	0.517
61	Peru	0.487	0.526	0.582	0.347	0.606	0.663	0.312	0.505
62	Turkey	0.486	0.539	0.534	0.615	0.627	0.445	0.224	0.519
63	Ghana	0.486	0.521	0.620	0.278	0.550	0.754	0.351	0.494
64	Moldova	0.485	0.504	0.573	0.544	0.526	0.549	0.361	0.447
65	Algeria	0.481	0.491	0.541	0.468	0.630	0.332	0.439	0.537
66	Georgia	0.481	0.535	0.536	0.590	0.574	0.572	0.225	0.443
67	Cuba	0.480	0.460	0.624	0.343	0.665	0.532	0.531	0.331
68	Macedonia	0.480	0.467	0.599	0.494	0.681	0.434	0.285	0.505
69	Nepal	0.480	0.511	0.623	0.310	0.725	0.596	0.303	0.465
70	Mongolia	0.475	0.523	0.569	0.406	0.563	0.695	0.246	0.466
71	Kazakhstan	0.474	0.507	0.570	0.428	0.553	0.661	0.271	0.456
72	Gambia	0.472	0.495	0.617	0.371	0.528	0.698	0.341	0.421
73	El Salvador	0.471	0.505	0.562	0.352	0.540	0.590	0.392	0.483

Kai L. Chan, PhD

Distinguished Fellow, INSEAD

E: Kai.Chan@INSEAD.edu W: www.KaiLChan.ca

Gender Progress Index (Dec 2016)
Kai L. Chan, PhD

GPI ranking (122 countries)			GPI sub-index rank		GPI domain rank				
RANK	COUNTRY	SCORE	LEVEL	RATIO	EDU	HEALTH	LABOUR	P&P	SOCIETY
74	Cambodia	0.470	0.563	0.543	0.379	0.585	0.636	0.252	0.500
75	Uruguay	0.466	0.492	0.581	0.391	0.744	0.533	0.308	0.357
76	Madagascar	0.466	0.506	0.600	0.276	0.598	0.686	0.329	0.442
77	Kyrgyzstan	0.466	0.522	0.558	0.383	0.541	0.618	0.294	0.491
78	Iran	0.465	0.530	0.519	0.569	0.572	0.371	0.292	0.522
79	Brazil	0.464	0.502	0.554	0.491	0.696	0.539	0.235	0.361
80	South Africa	0.464	0.445	0.616	0.363	0.447	0.508	0.510	0.495
81	Namibia	0.462	0.473	0.612	0.257	0.569	0.604	0.368	0.515
82	India	0.458	0.479	0.614	0.383	0.655	0.426	0.336	0.489
83	Benin	0.456	0.490	0.617	0.209	0.591	0.726	0.316	0.439
84	Kenya	0.456	0.444	0.632	0.270	0.531	0.644	0.421	0.415
85	UAE	0.452	0.520	0.523	0.314	0.671	0.429	0.342	0.503
86	Jordan	0.451	0.423	0.603	0.570	0.595	0.343	0.341	0.406
87	Dominican Republic	0.450	0.465	0.580	0.320	0.731	0.463	0.366	0.372
88	Mozambique	0.450	0.408	0.699	0.197	0.458	0.715	0.472	0.406
89	Uganda	0.449	0.459	0.610	0.205	0.491	0.666	0.469	0.415
90	Tanzania	0.449	0.476	0.594	0.177	0.522	0.641	0.477	0.426
91	Armenia	0.449	0.528	0.501	0.542	0.518	0.539	0.202	0.443
92	Zimbabwe	0.448	0.470	0.616	0.322	0.457	0.694	0.350	0.418
93	Burundi	0.447	0.426	0.651	0.215	0.547	0.639	0.432	0.401
94	Azerbaijan	0.445	0.524	0.554	0.378	0.483	0.645	0.208	0.508
95	Lebanon	0.444	0.476	0.563	0.507	0.743	0.360	0.227	0.382
96	Bangladesh	0.441	0.514	0.567	0.292	0.663	0.485	0.245	0.522
97	Iraq	0.440	0.414	0.564	0.332	0.576	0.341	0.412	0.539
98	Mauritius	0.440	0.543	0.485	0.410	0.559	0.482	0.240	0.507
99	Kuwait	0.439	0.520	0.539	0.330	0.591	0.505	0.130	0.639
100	Paraguay	0.435	0.460	0.574	0.309	0.642	0.551	0.316	0.357
101	Burkina Faso	0.433	0.457	0.598	0.177	0.559	0.671	0.329	0.429
102	Ethiopia	0.431	0.493	0.550	0.188	0.569	0.604	0.375	0.421
103	Bahrain	0.431	0.500	0.503	0.371	0.653	0.426	0.205	0.501
104	Morocco	0.430	0.476	0.542	0.483	0.631	0.438	0.308	0.291
105	Barbados	0.428	0.505	0.559	0.361	0.600	0.557	0.298	0.324
106	Mauritania	0.428	0.408	0.606	0.243	0.507	0.461	0.503	0.426
107	Guatemala	0.428	0.430	0.614	0.294	0.620	0.532	0.349	0.343
108	Liberia	0.426	0.489	0.546	0.231	0.565	0.621	0.292	0.420
109	Belize	0.424	0.443	0.564	0.375	0.601	0.509	0.326	0.307
110	Saudi Arabia	0.417	0.525	0.494	0.490	0.624	0.297	0.134	0.539
111	Jamaica	0.415	0.456	0.559	0.310	0.605	0.473	0.321	0.364
112	Honduras	0.414	0.451	0.550	0.277	0.534	0.519	0.398	0.342
113	Oman	0.412	0.485	0.511	0.372	0.598	0.365	0.203	0.523
114	Mali	0.398	0.448	0.550	0.141	0.522	0.533	0.347	0.449
115	Sri Lanka	0.396	0.512	0.465	0.370	0.544	0.448	0.187	0.432
116	Pakistan	0.390	0.462	0.525	0.247	0.650	0.331	0.197	0.525
117	Qatar	0.385	0.541	0.437	0.297	0.612	0.410	0.093	0.513
118	Swaziland	0.383	0.374	0.624	0.237	0.287	0.536	0.401	0.455
119	Niger	0.376	0.456	0.526	0.068	0.548	0.537	0.296	0.431
120	Sierra Leone	0.363	0.405	0.560	0.122	0.415	0.564	0.271	0.445
121	Lesotho	0.363	0.378	0.584	0.229	0.176	0.562	0.414	0.434
122	Egypt	0.355	0.422	0.471	0.432	0.500	0.292	0.180	0.372

* Only countries with 67% data coverage are included.

METHODOLOGY

GROUPING

The GPI is comprised of 20 indicators aggregated into 5 groups (“domains”).

Domain 1: Education

Education covers outcomes in school with respect to quantity of schooling, academic performance and the realm of learning.

Domain 2: Health

Covers life expectancy – a general proxy of health – and the prevalence of bad/unhealthy outcomes.

Domain 3: Labour

This domain considers participation and seniority in the job market. Additionally, it considers (unpaid) labour at home.

Domain 4: Politics & power

Measures which gender occupies more positions of authority in business and politics.

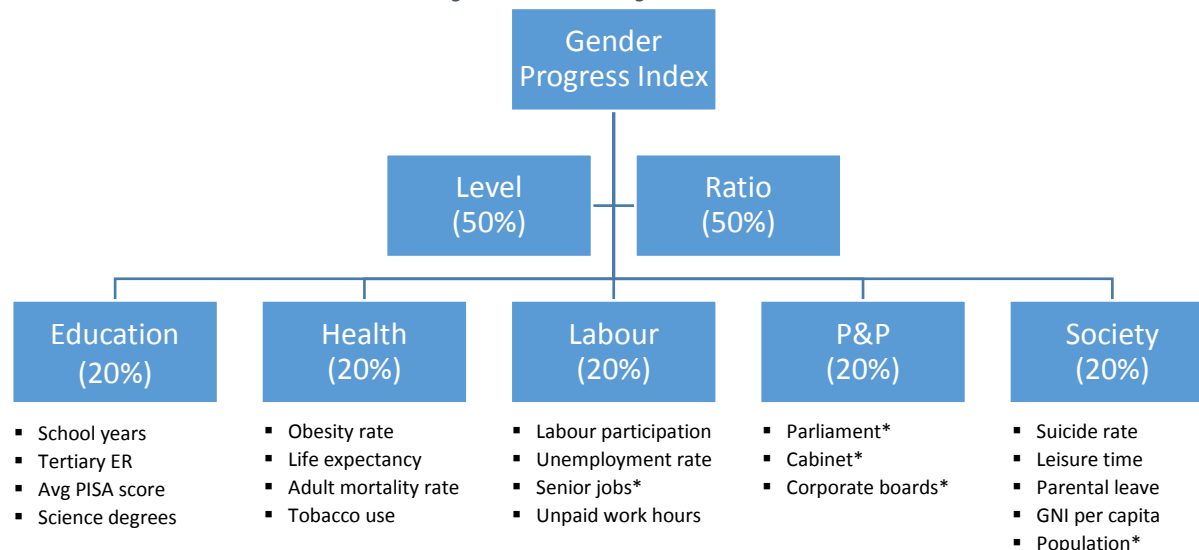
Domain 5: Society

An assessment of the relative values (expressed through revealed outcomes) society places on men and women.

WEIGHTS

The index is (linearly) additive in the pairwise (level-ratio) scores, where each pair gets mapped to a real number using a Cobb-Douglas function. Each of the five domains have equal weight (20%) in the final index score. Within each domain, the indicator weights are inversely proportional to the number of indicators in that group. The GPI has two sub-indices. The level sub-index is an average of all the level indicator scores. The ratio sub-index is an average of all the ratio indicator scores.

Figure 1: Gender Progress Index structure



NORMALISATION & RATIOS

The level score is calculated using a distance-to-frontier function on the aggregate of the female-male indicator values:

$$s_L = \frac{(x_f + x_m) - (\min\{x_f\} + \min\{x_m\})}{(\max\{x_f\} + \max\{x_m\}) - (\min\{x_f\} + \min\{x_m\})}$$

where x are the raw indicator values and the f and m subscripts denote female and male variables, respectively. Note that the max/min operators are applied at the individual gender level.

On the other hand, the ratio score is taken as the female indicator value over the male if the female value is less than male value, but is the opposite when the male value is less than the female value:

$$s_R = x_f/x_m \text{ if } x_f \leq x_m \text{ and } s_R = x_m/x_f \text{ if } x_f > x_m$$

LEVEL-RATIO FUNCTION

Each level-ratio indicator pair (s_L, s_R) is converted to a single real-value output using a Cobb-Douglas function with constant returns to scale with $\alpha = 0.5$:

$$y(s_L, s_R) = s_L^{1/2} s_R^{1-1/2} = \sqrt{s_L s_R}$$

This is equivalent to taking the geometric average of the two variables. However, the Cobb-Douglas utility interpretation is illuminating because it suggests a trade-off between progress in level versus progress in ratio. For example, a country in which men earn \$100,000 and women earn nothing would score highly in level but poorly in ratio. If we supposed that the level score in this theoretical situation attained the maximal score, then its level-ratio pair score would be

$$y(s_L, s_R) = \sqrt{1 \cdot 0} = \sqrt{0} = 0$$

Likewise, the situation where men and women both earn \$0 would score a perfect 1 on the ratio score but would have a level score close to 0.² That is,

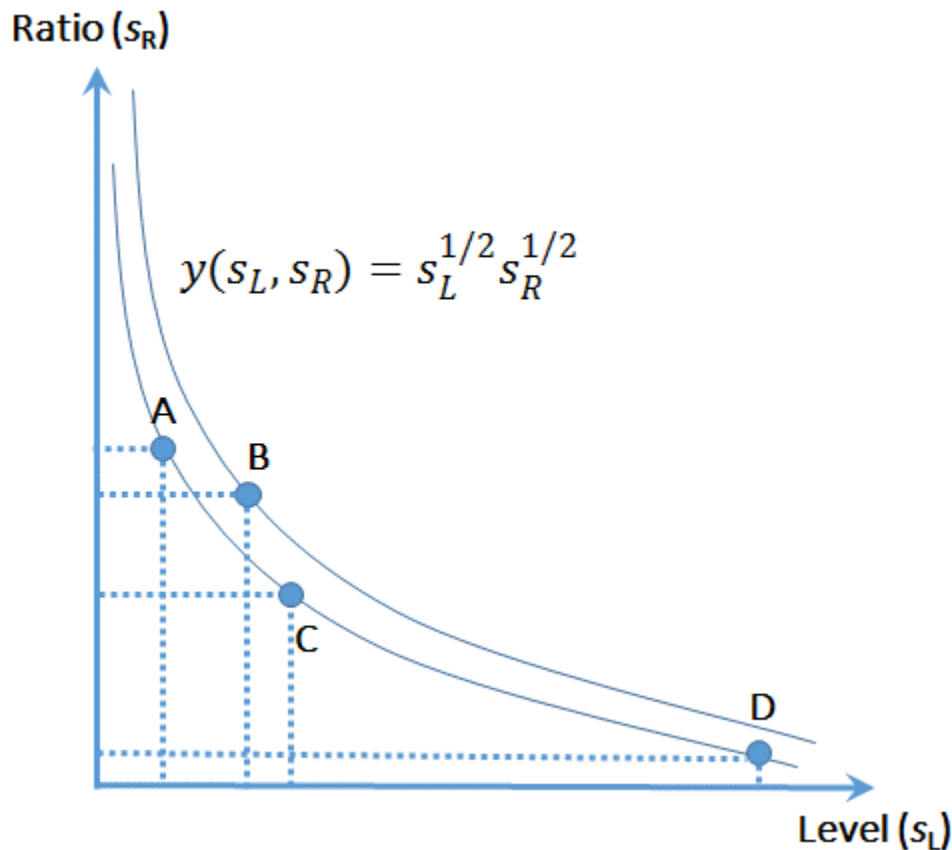
$$y(s_L, s_R) = \sqrt{0 \cdot 1} = \sqrt{0} = 0$$

The Cobb-Douglas utility function (with constant returns and $\alpha = 0.5$) is a smooth convex function, so is robust to such extremes and yields a higher output for more balanced inputs: when the level and ratio scores are both 0.5 the output is $\sqrt{0.5 \times 0.5} = 0.5$. That is, even as the sum of the pairwise elements are 1 in all cases, we have $(1, 0) = (0, 1) < (0.5, 0.5)$.

The diagram below illustrates this trade-off. Points A, C, and D all have the same output. Point A is associated with a low level and high ratio. Point D is associated with a high level and low ratio. Point C has a medium level and medium ratio. Point B is preferred to the three other (equivalent) points as it is associated with a higher output of the function.

² The ratio 0/0 is undefined but the limit of x/x as x approaches 0 is 1.

Figure 2: Cobb-Douglas utility function in level and ratio



MISSING VALUES

The index takes a multi-stage process in dealing with missing indicator values. Firstly, it should be noted that indicators always take on a value in an index – either explicitly or implicitly. For example, when an indicator is “not considered” most indices redistribute the weight of the missing indicator to the remaining indicators (usually within its most local grouping). But this is mathematically equivalent to the missing variable taking an “implicit” value equal to the inverse function of the (weighted) average of the scores of the remaining indicators in the grouping. Thus when an index takes this approach the missing value has, *a priori*, no impact on the index score, but *ex post* can have a big impact depending on how the implicit value of the indicator compares with the real value (if it were known).

In the GPI, when indicators are missing, the principle of conservatism (in two stages) is applied. First, for the purpose of dealing with missing values countries are grouped into like categories based on geography, culture and development. Then the minimum principle is applied in 2 stages: (1) Use the minimum value for that indicator within the group for the country with the missing value; (2) If no values exists for the entire group then take the global minimum value.

This technique avoids rewarding countries with missing values by simply “not considering” the indicator as when countries do not report data it is often a sign of low level of development. The majority of the indicator gaps are for PISA scores and other variables associated with the OECD countries (and some special cases). But as the OECD countries are essentially a “rich countries group” (high income

democracies), the countries with missing variables are likely to be at the lower spectrum of the development (and gender progress) distribution. Thus the principle of conservatism is likely to be a more accurate representation rather than “ignoring” the values in favour of their implicit values.

AGGREGATION

The index is a weighted average of the 20 indicators

$$I(x) = \sum_{i=1}^{20} \omega_i \cdot y(s_L, s_R)$$

where the $y(s_L, s_R)$ are as defined above and the weights ω_i sum to 1. The Index value is an ordinal measure.

COVERAGE & INCLUSION

197 economies are assessed by the Index; however, only 122 are reported in the final index. For inclusion a country must have at least 12 valid indicators out of a total of 20 used in the index.

The excluded entities are, for the most part, either small countries/economies/dependencies or least developed nations that typically have porous (and weak) development indicators. The average score of the excluded group is 0.423 (rank of 110) and none have a score higher than 0.537 (rank of 40).

INDICATORS

1. EDUCATION (20%)

1.1 Years of schooling – YS

Taken as the average of mean years of schooling (MYS) and expected years of schooling (EYS). The former is the average number of ISCED completed years of schooling of the 25+ age group in a country. The latter is the years of schooling people under age 25 could expect to receive by the time they are reach age 25, based on current patterns of enrolment and graduation.

Source: Unesco Institute for Statistics – UIS

1.2 Tertiary enrolment ratio (gross) – TER

The gross tertiary enrolment ratio is the value of the total number of students enrolled in full-time tertiary education (ISCED 6, 7, 8) regardless of age divided by the 5-year age group that follows after secondary education (typically the 18-22 age group). Note that this ratio excludes those registered in post-secondary non-tertiary education (ISCED 4).

Source: Unesco Institute for Statistics – UIS (2015)

1.3 Average PISA score

The average score on the math, reading and science assessments in the PISA (programme for international student assessment) test administered by the OECD.

Source: Organisation for Economic Cooperation and Development – OECD (2015)

1.4 Science degrees

The share of tertiary degrees in the natural and physical science (including mathematics and statistics), and also within the ICT field.

Source: Unesco Institute for Statistics – UIS (2015)

2. HEALTH (20%)

2.1 Obesity rate

The share of the adult (20+) population with a body mass index (BMI) over 30.

Source: Global Burden of Disease Study 2013 (GBD 2013) Obesity Prevalence 1990-2013. Seattle, United States: Institute for Health Metrics and Evaluation (IHME), 2014.

2.2 Life expectancy at birth

The average age a newborn child could expect to live based on prevailing age-specific mortality rates.

Source: World Health Organisation – WHO (2014)

2.3 Adult mortality rate

The probability that those who have reached age 15 will die before age 60 (per 1,000 persons).

Source: World Bank Development Indicators – WBDID (2014)

2.4 Tobacco use

Current smoking of any tobacco product for 15+ age group.

Source: World Health Organisation – WHO (2013)

3. LABOUR (20%)

3.1 Labour participation rate

The share of the population (15+) who are either employed or are actively looking for work.

Source: International Labour Organisation – ILO (2014)

3.2 Unemployment rate

The share of the labour force that are unemployed and actively looking for work.

Source: International Labour Organisation – ILO (2014)

3.3 Unpaid work hours

Expressed as the share of unpaid work hours to total work hours (paid and unpaid).

Source: UNPD (various)

4. POLITICS & POWER

4.1 Share of seats in Parliament*

Proportion of seats held by women in national parliaments. This indicator is calibrated against the gender composition of the population.

Source: Inter-Parliamentary Union – IPU (2015)

4.2 Share of members in Cabinet*

Proportion of ministerial posts held by women in national parliaments. This indicator is calibrated against the gender composition of the population.

Source: Inter-Parliamentary Union – IPU (2015)

4.3 Share of corporate board seats*

The share of corporate seats held by females of males. The indicator is calibrated against the gender composition of the labour force.

Source: MSCI; Catalyst

5. SOCIETY (20%)

5.1 Suicide rate

The number of deaths from suicide and intentional self-harm expressed per 100,000 people.

Source: World Health Organisation – WHO (2013)

5.2 Time spent on leisure activities

Time (minutes per day) spent on social life and leisure. (This includes: Time spent in socialising and community participation; attending cultural, entertainment and sports events; participating in hobbies, games and other pastime activities; participating in sports and outdoor activities and using mass media.)

Source: UNDP (various)

5.3 Parental leave

The amount of paid leave in full weeks of equivalent pay given to parents.

Source: Organisation for Economic Cooperation and Development – OECD (2105)

5.4 GNI per capita

Gross national income per capita.

Source: World Bank (2015)

5.5 Population

This is the only indicator which is not assigned a direction (i.e. either a positive or negative variable). So the level score is undefined and uniformly taken as 1 across all countries. Population may, *prima facie*, seem like an unusual indicator to include. But it is meaningful because gender imbalances in society are challenging to society. A shortage of men (or women) is invariably linked with social ills and it makes creating meaningful pair-bonding difficult.

Source: United Nations Population Division – UNPD (2016 mid-year estimates)

GENDER PROGRESS INDEX ANALYSIS

GENDER-BIAS OF VARIABLES

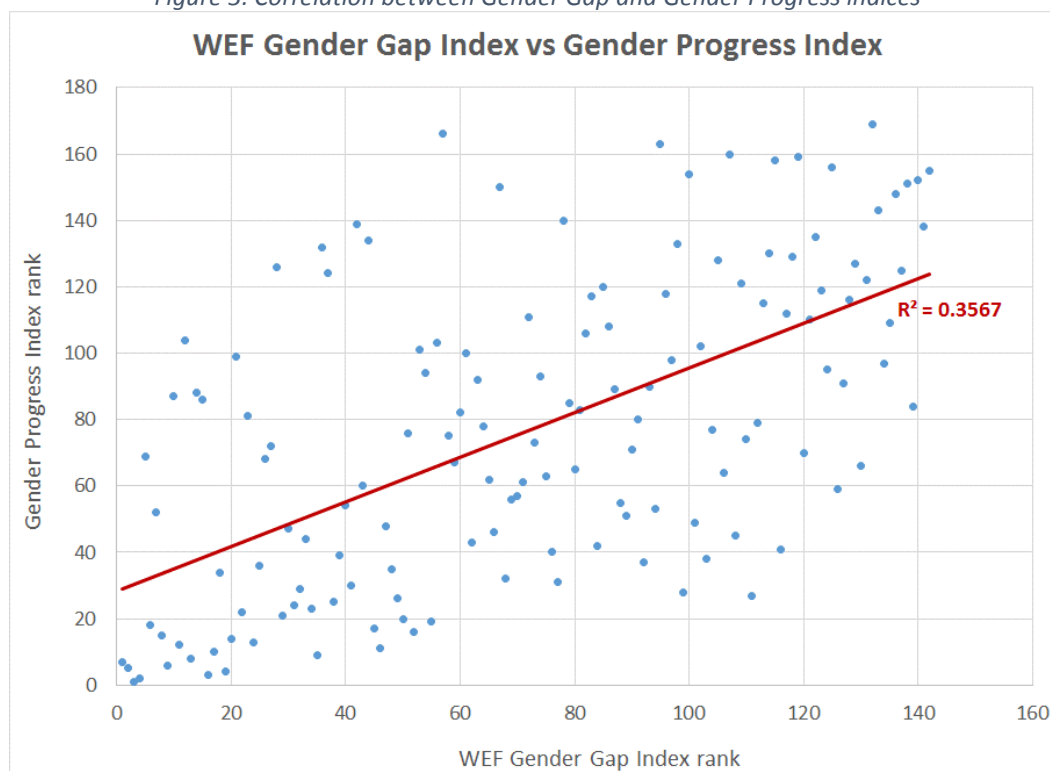
The gender-bias refers to which sex fares better on an indicator at a global level. Of the 20 indicators in the GPI women perform better on 8 (40%) variables, while men outperform on the remaining 12 (60%).

Table 2: Gender-bias of GPI variables

FEMALE INDICATORS	MALE INDICATORS
Tertiary enrolment ratio	School years
PISA	Science degrees
Life expectancy	Obesity rate
Adult mortality rate	Labour participation rate
Tobacco use	Unemployment rate
Suicide rate	Senior jobs
Parental leave	Unpaid hours
Population	Share of parliament
	Share of Cabinet
	Share of corporate boards
	Leisure time
	GNI per capita

COMPARISON WITH WEF GENDER GAP REPORT

Figure 3: Correlation between Gender Gap and Gender Progress indices



Source: Gender Progress Index; WEF Gender Gap Report

One of the flagship reports on gender is the WEF Gender Gap Report. It is focused on the gap between females and males. The GPI, on the other hand, takes a wholly different perspective on gender issues. The WEF Report is focused on the gap that women face relative to men, whereas the Gender Progress

Kai L. Chan, PhD

Distinguished Fellow, INSEAD

E: Kai.Chan@INSEAD.edu W: www.KaiLChan.ca

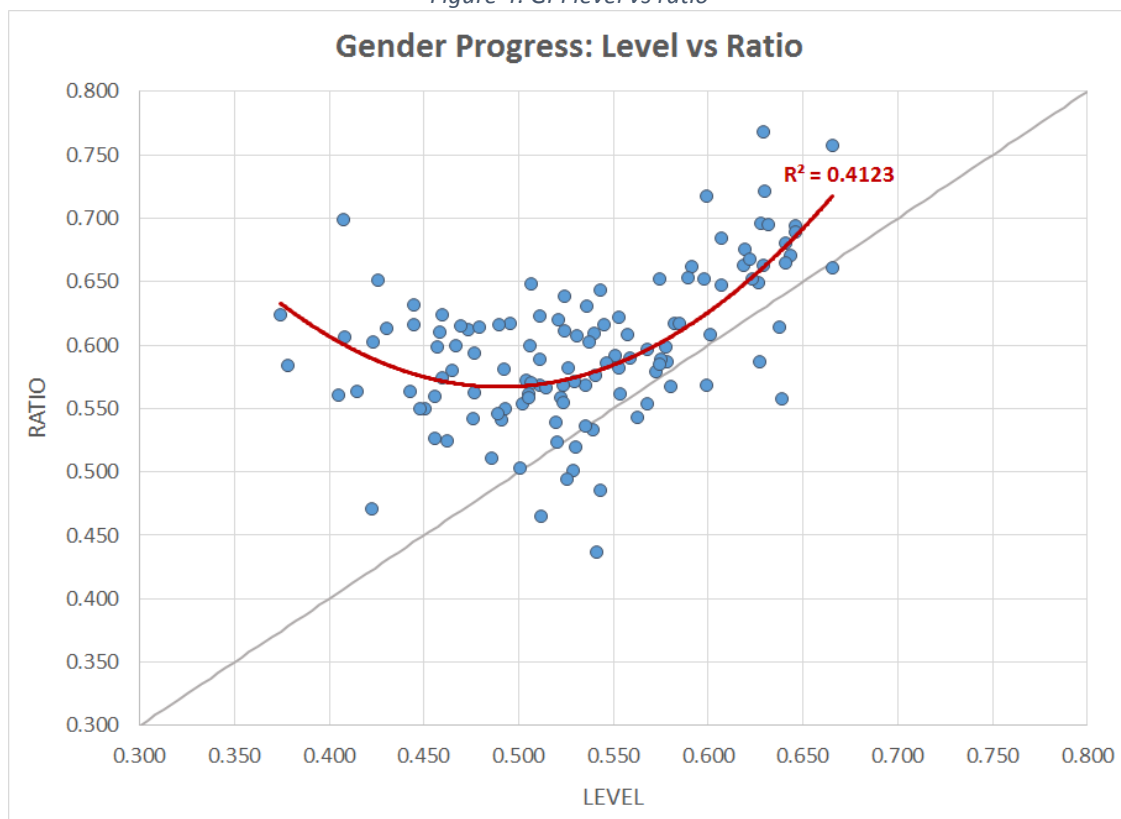
Index looks at the gap and the level (irrespective of gender), and is constructed to be robust to gap “improvements” derived from deterioration in male values. More-over, the GPI believes that male shortcomings are just as bad as female shortcoming as in either case society loses when half is population (for the most part) is not realising its potential. So it should come as no surprise that the two (and also for other gender indices, such as the Gender Inequality Index) yield highly different (albeit still related) results.

Figure 3 above shows the Gender Gap Index rank (x-axis) versus the Gender Progress Index (y-axis). Overall, there is a high degree of correlation ($r\text{-square} = 0.3567$) between the two but the relationship is not tight. This is because the GPI penalises countries with low levels of development – whereas in the WEF report Rwanda, Philippines and Nicaragua all figure in the top 10 for “gender gap”. On the other hand, Japan vault from 111 in the WEF report to 25 in the GPI. Indeed, Japan is one of the few countries with a level score higher than its ratio score (see Figure 4 below).

RELATIONSHIP BETWEEN LEVEL AND RATIO ACROSS COUNTRIES

Figure 4 below is a plot of the level-ratio pairs of the 122 countries covered in the GPI. A few notable points: (1) There is a U-shaped relationship between ratio and level; and (2) The level-ratio pairs are mostly above the 45-degree diagonal. The former suggests a Kuznet-style curve in development: As nations develop gender differences grow, but after reaching a certain level of development, societies value greater gender equity. Of course the chart below is a snap shot in time across countries, whereas the development story is within a country over time.

Figure 4: GPI level vs ratio



Source: Gender Progress Index

Kai L. Chan, PhD

Distinguished Fellow, INSEAD

E: Kai.Chan@INSEAD.edu W: www.KaiLChan.ca

COUNTRY PROFILE (TOP 10)

NORWAY

GPI rank: 1

GPI score: 0.698

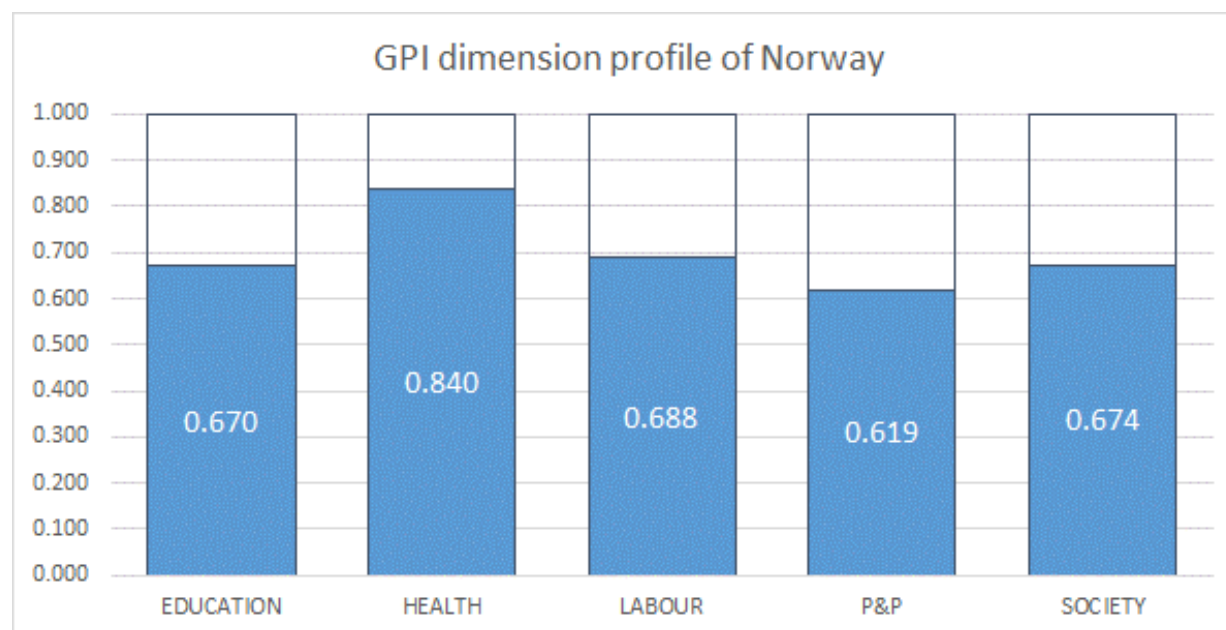
Level rank (score): 1 (0.666)

Ratio rank (score): 2 (0.758)

Geography: North Europe



IND #	INDICATOR	VALUE			IND #	INDICATOR	VALUE	
1	EDUCATION	F	M		4	POLITICS & POWER	F	M
1.1	Schooling years	15.4	14.7		4.1	Share of parliament*	39.6	60.4
1.2	Tertiary enrolment rate	91.5	62.8		4.2	Share of Cabinet posts*	47	53
1.3	Average PISA score	503	501		4.3	Share of corporate boards*	40.1	59.9
1.4	Science degrees	4.2	12.1					
					5	SOCIETY	F	M
2	HEALTH	F	M		5.1	Suicide rate	5.2	13
2.1	Obesity rate (> 30 BMI)	18.0	19.1		5.2	Leisure & socialising time	338	347
2.2	Life expectancy at birth	83.6	79.5		5.3	Parental leave (weeks equiv.)	45.5	9.9
2.3	Adult mortality rate	47	73		5.4	GNI per capita	57,140	72,825
2.4	Tobacco use	23.9	24.3		5.5	Population share*	49.6	50.4
3	LABOUR	F	M		DIM #	DIMENSION	RANK	
3.1	Labour participation rate	61.2	68.7		1	Education	21	
3.2	Unemployment rate	3.1	3.9		2	Health	2	
3.3	Senior jobs*	36	64		3	Labour	12	
3.4	Unpaid work hours (% total)	56	42		4	Politics & power	1	
					5	Society	1	



SWEDEN

GPI rank: 2

GPI score: 0.685

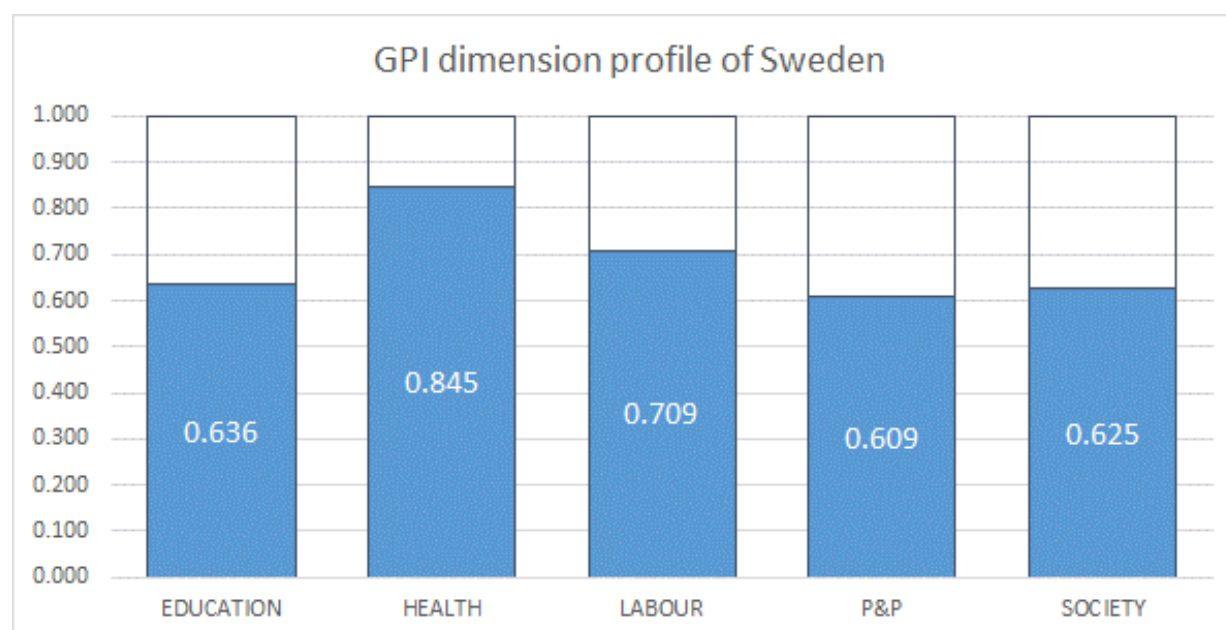
Level rank (score): 12 (0.629)

Ratio rank (score): 1 (0.769)

Geography: North Europe



IND #	INDICATOR	VALUE		IND #	INDICATOR	VALUE	
1	EDUCATION	F	M	4	POLITICS & POWER	F	M
1.1	Schooling years	14.4	13.5	4.1	Share of parliament*	43.6	56.4
1.2	Tertiary enrolment rate	76.0	49.4	4.2	Share of Cabinet posts*	52.0	48.0
1.3	Average PISA score	495	493	4.3	Share of corporate boards*	33.9	66.1
1.4	Science degrees	4.9	12.3				
2	HEALTH	F	M	5	SOCIETY	F	M
2.1	Obesity rate (> 30 BMI)	19.8	18.9	5.1	Suicide rate	6.1	16.2
2.2	Life expectancy at birth	83.9	80.4	5.2	Leisure & socialising time	285	305
2.3	Adult mortality rate	43	69	5.3	Parental leave (weeks equiv.)	38.1	7.6
2.4	Tobacco use	22.1	21.7	5.4	GNI per capita	40,222	51,084
				5.5	Population share*	50.0	50.0
3	LABOUR	F	M	DIM #	DIMENSION	RANK	
3.1	Labour participation rate	60.3	67.9	1	Education	32	
3.2	Unemployment rate	7.8	8.3	2	Health	1	
3.3	Senior jobs*	40	60	3	Labour	4	
3.4	Unpaid work hours (% total)	54	44	4	Politics & power	2	
				5	Society	4	



NETHERLANDS

GPI rank: 3

GPI score: 0.659

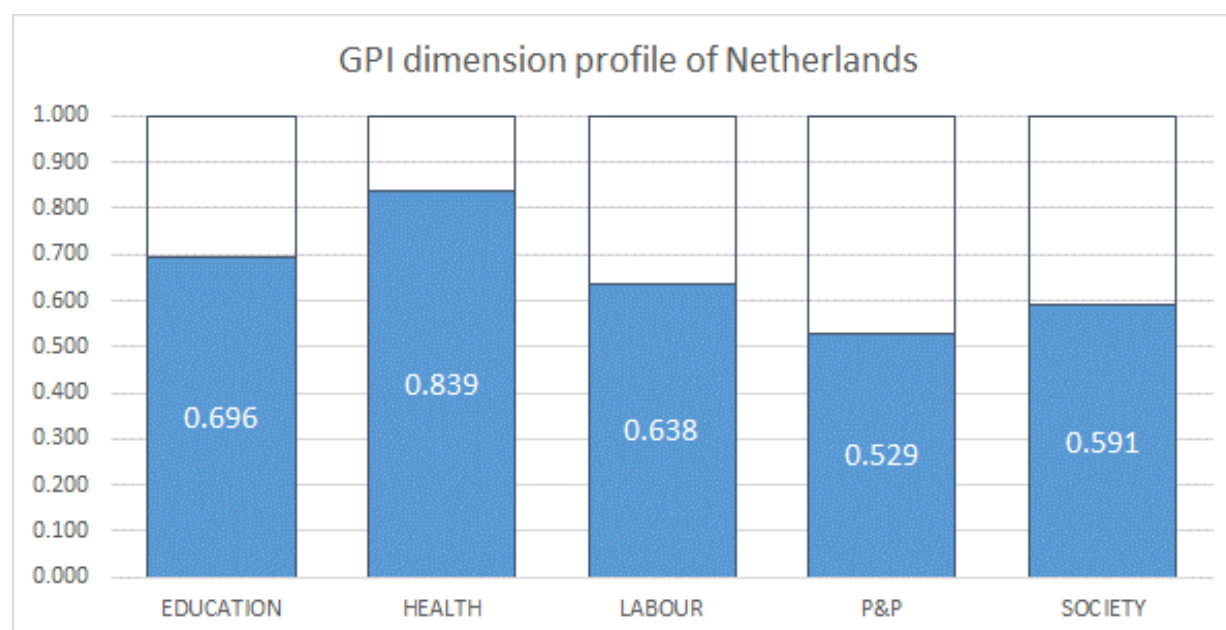
Level rank (score): 4 (0.646)

Ratio rank (score): 8 (0.694)

Geography: West Europe



IND #	INDICATOR	VALUE		IND #	INDICATOR	VALUE	
1	EDUCATION	F	M	4	POLITICS & POWER	F	M
1.1	Schooling years	14.8	15.0	4.1	Share of parliament*	36.9	63.1
1.2	Tertiary enrolment rate	82.5	74.7	4.2	Share of Cabinet posts*	47	53
1.3	Average PISA score	511	513	4.3	Share of corporate boards*	22	78
1.4	Science degrees	2.9	10.2				
2	HEALTH	F	M	5	SOCIETY	F	M
2.1	Obesity rate (> 30 BMI)	15.9	12.7	5.1	Suicide rate	4.8	11.7
2.2	Life expectancy at birth	83.3	79.7	5.2	Leisure & socialising time	297	308
2.3	Adult mortality rate	54	69	5.3	Parental leave (weeks equiv.)	16	0.4
2.4	Tobacco use	24.2	27.3	5.4	GNI per capita	29,500	61,641
				5.5	Population share*	50.3	49.7
3	LABOUR	F	M	DIM #	DIMENSION	RANK	
3.1	Labour participation rate	58.5	70.6	1	Education	10	
3.2	Unemployment rate	6.5	6.8	2	Health	3	
3.3	Senior jobs*	26	74	3	Labour	37	
3.4	Unpaid work hours (% total)	64	32	4	Politics & power	6	
				5	Society	12	



Gender Progress Index (Dec 2016)
Kai L. Chan, PhD

DENMARK

GPI rank: 4

GPI score: 0.649

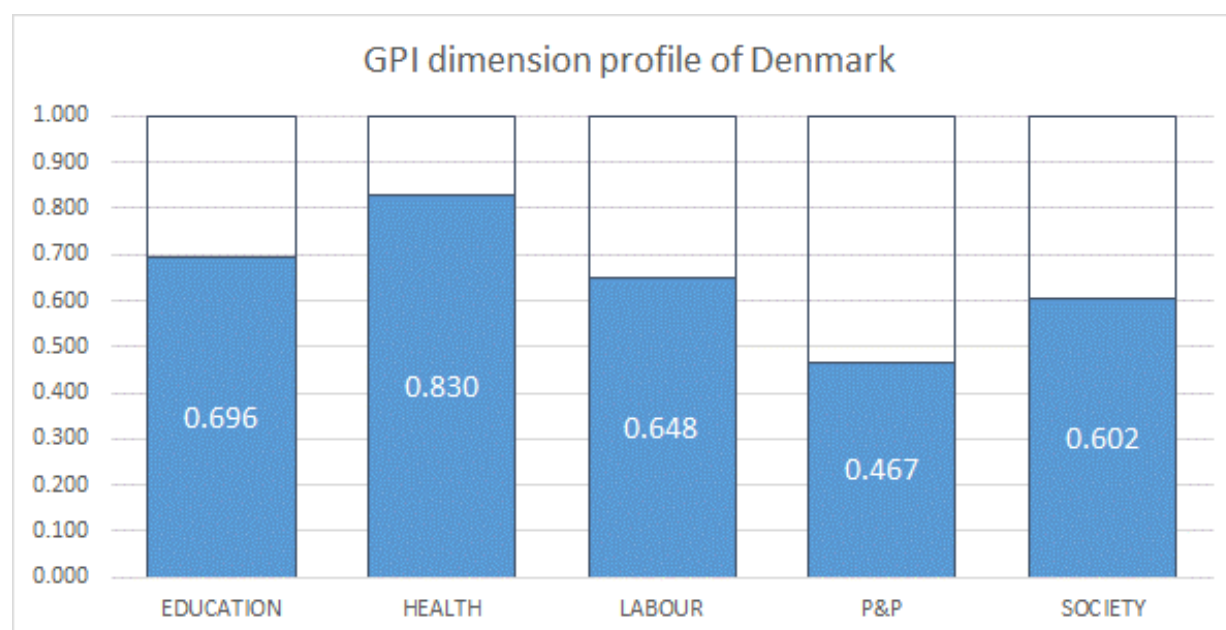
Level rank (score): 3 (0.646)

Ratio rank (score): 9 (0.689)

Geography: North Europe



IND #	INDICATOR	VALUE		IND #	INDICATOR	VALUE	
1	EDUCATION	F	M	4	POLITICS & POWER	F	M
1.1	Schooling years	16.1	15.4	4.1	Share of parliament*	38.0	62.0
1.2	Tertiary enrolment rate	95.4	68.2	4.2	Share of Cabinet posts*	26	74
1.3	Average PISA score	506	516	4.3	Share of corporate boards*	25.9	74.1
1.4	Science degrees	5.1	12.7				
2	HEALTH	F	M	5	SOCIETY	F	M
2.1	Obesity rate (> 30 BMI)	19.9	19.6	5.1	Suicide rate	4.1	13.6
2.2	Life expectancy at birth	82.2	78.3	5.2	Leisure & socialising time	325	346
2.3	Adult mortality rate	60	100	5.3	Parental leave (weeks equiv.)	27	1.1
2.4	Tobacco use	18	19.9	5.4	GNI per capita	36,439	51,727
				5.5	Population share*	50.4	49.6
3	LABOUR	F	M	DIM #	DIMENSION	RANK	
3.1	Labour participation rate	58.7	66.4	1	Education	8	
3.2	Unemployment rate	7.0	7.2	2	Health	4	
3.3	Senior jobs*	27	73	3	Labour	29	
3.4	Unpaid work hours (% total)	62	47	4	Politics & power	16	
				5	Society	8	



FINLAND

GPI rank: 5

GPI score: 0.648

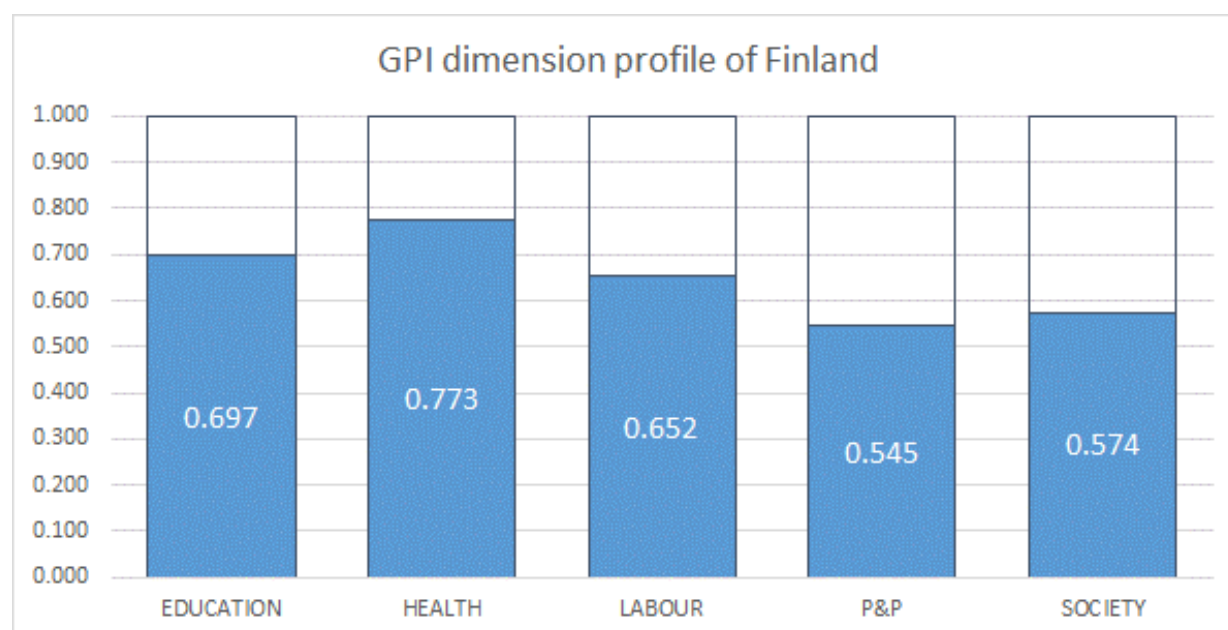
Level rank (score): 14 (0.628)

Ratio rank (score): 6 (0.696)

Geography: North Europe



IND #	INDICATOR	VALUE		IND #	INDICATOR	VALUE	
1	EDUCATION	F	M	4	POLITICS & POWER	F	M
1.1	Schooling years	13.9	13.3	4.1	Share of parliament*	42.5	57.5
1.2	Tertiary enrolment rate	95.6	79.3	4.2	Share of Cabinet posts*	63	38
1.3	Average PISA score	515	507	4.3	Share of corporate boards*	29.9	70.1
1.4	Science degrees	5.0	10.4				
2	HEALTH	F	M	5	SOCIETY	F	M
2.1	Obesity rate (> 30 BMI)	22.3	20.9	5.1	Suicide rate	7.5	22.2
2.2	Life expectancy at birth	83.6	78.0	5.2	Leisure & socialising time	301	362
2.3	Adult mortality rate	51	114	5.3	Parental leave (weeks equiv.)	16	0.4
2.4	Tobacco use	19.3	24.6	5.4	GNI per capita	31,644	45,994
				5.5	Population share*	50.7	49.3
3	LABOUR	F	M	DIM #	DIMENSION	RANK	
3.1	Labour participation rate	55.7	64.0	1	Education	7	
3.2	Unemployment rate	7.2	9.0	2	Health	18	
3.3	Senior jobs*	34	66	3	Labour	26	
3.4	Unpaid work hours (% total)	57	41	4	Politics & power	3	
				5	Society	19	



NEW ZEALAND

GPI rank: 6

GPI score: 0.646

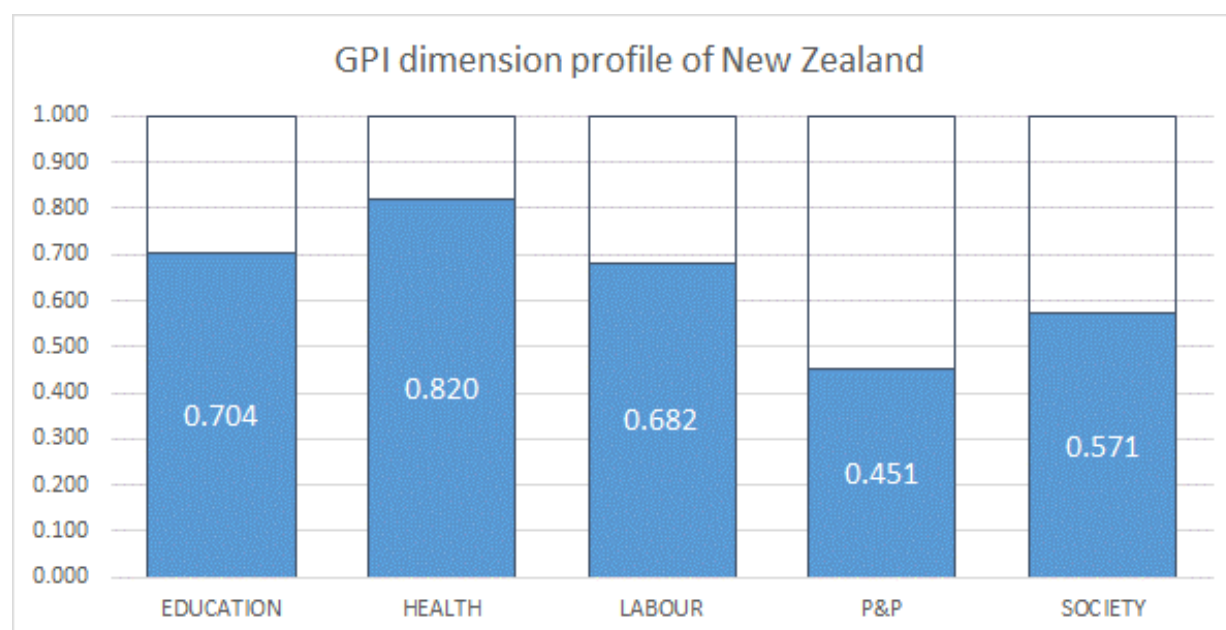
Level rank (score): 6 (0.641)

Ratio rank (score): 11 (0.680)

Geography: Anglo



IND #	INDICATOR	VALUE		IND #	INDICATOR	VALUE	
1	EDUCATION	F	M	4	POLITICS & POWER	F	M
1.1	Schooling years	16.2	15.4	4.1	Share of parliament*	31.4	68.6
1.2	Tertiary enrolment rate	94.0	68.2	4.2	Share of Cabinet posts*	33	67
1.3	Average PISA score	491	499	4.3	Share of corporate boards*	22.5	77.5
1.4	Science degrees	8.0	17.7				
2	HEALTH	F	M	5	SOCIETY	F	M
2.1	Obesity rate (> 30 BMI)	30	28.1	5.1	Suicide rate	5	14.4
2.2	Life expectancy at birth	83.6	80.0	5.2	Leisure & socialising time	311	311
2.3	Adult mortality rate	52	80	5.3	Parental leave (weeks equiv.)	7.7	0
2.4	Tobacco use	16.7	18.5	5.4	GNI per capita	24,309	41,372
				5.5	Population share*	51.1	48.9
3	LABOUR	F	M	DIM #	DIMENSION	RANK	
3.1	Labour participation rate	62.0	73.8	1	Education	6	
3.2	Unemployment rate	6.9	5.9	2	Health	8	
3.3	Senior jobs*	40	60	3	Labour	15	
3.4	Unpaid work hours (% total)	63	36	4	Politics & power	20	
				5	Society	20	



ICELAND

GPI rank: 7

GPI score: 0.645

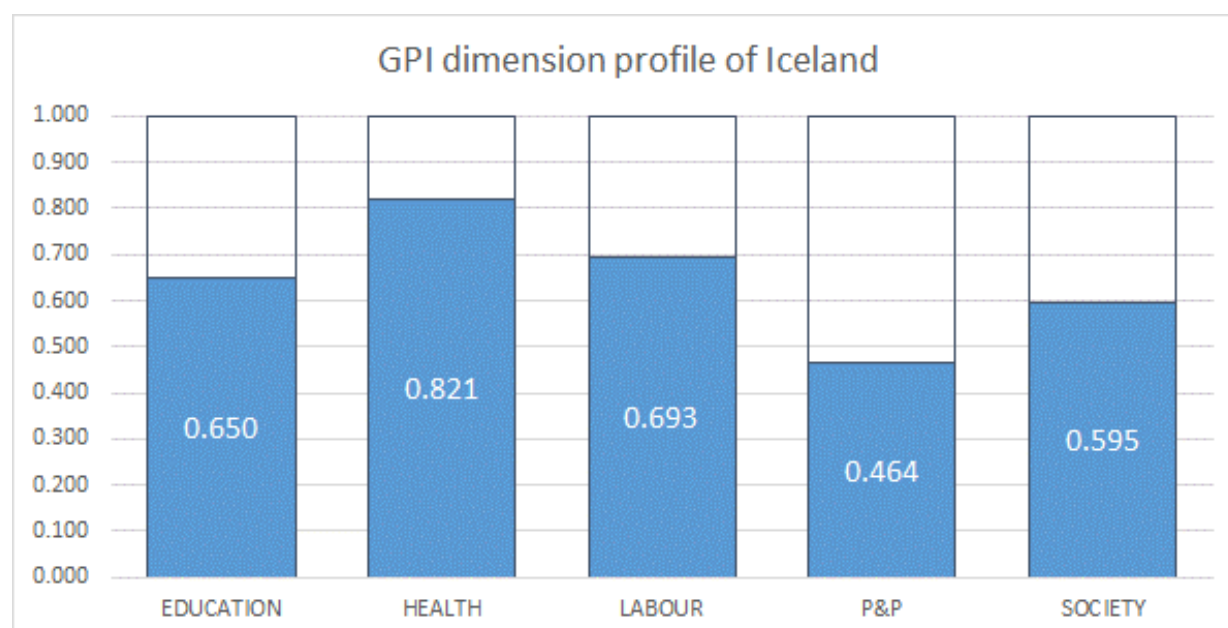
Level rank (score): 11 (0.630)

Ratio rank (score): 3 (0.722)

Geography: North Europe



IND #	INDICATOR	VALUE		IND #	INDICATOR	VALUE	
1	EDUCATION	F	M	4	POLITICS & POWER	F	M
1.1	Schooling years	15.4	14.1	4.1	Share of parliament*	41.3	58.7
1.2	Tertiary enrolment rate	103.1	60.2	4.2	Share of Cabinet posts*	44	56
1.3	Average PISA score	489	487	4.3	Share of corporate boards*	n/a	n/a
1.4	Science degrees	4.7	10.4				
2	HEALTH	F	M	5	SOCIETY	F	M
2.1	Obesity rate (> 30 BMI)	28.8	26.9	5.1	Suicide rate	6.7	21
2.2	Life expectancy at birth	84.0	81.0	5.2	Leisure & socialising time	n/a	n/a
2.3	Adult mortality rate	37	61	5.3	Parental leave (weeks equiv.)	16.6	8.3
2.4	Tobacco use	16.3	18.6	5.4	GNI per capita	28,792	41,486
				5.5	Population share*	49.9	50.1
3	LABOUR	F	M	DIM #	DIMENSION	RANK	
3.1	Labour participation rate	70.5	77.4	1	Education	25	
3.2	Unemployment rate	4.9	6.1	2	Health	6	
3.3	Senior jobs*	38	62	3	Labour	10	
3.4	Unpaid work hours (% total)	n/a	n/a	4	Politics & power	17	
				5	Society	11	



GERMANY

GPI rank: 8

GPI score: 0.642

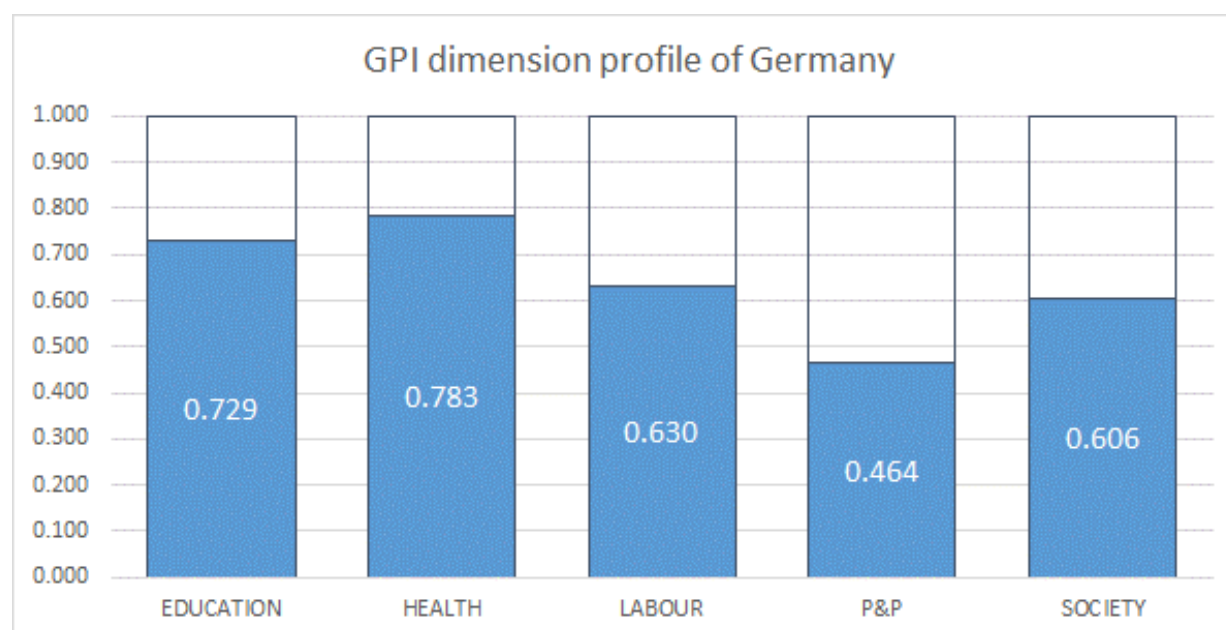
Level rank (score): 10 (0.632)

Ratio rank (score): 7 (0.695)

Geography: West Europe



IND #	INDICATOR	VALUE		IND #	INDICATOR	VALUE	
1	EDUCATION	F	M	4	POLITICS & POWER	F	M
1.1	Schooling years	14.6	15.2	4.1	Share of parliament*	36.9	63.1
1.2	Tertiary enrolment rate	66.8	69.7	4.2	Share of Cabinet posts*	33	67
1.3	Average PISA score	498	514	4.3	Share of corporate boards*	20.1	79.9
1.4	Science degrees	10.9	18.0				
2	HEALTH	F	M	5	SOCIETY	F	M
2.1	Obesity rate (> 30 BMI)	22.5	21.9	5.1	Suicide rate	4.1	14.5
2.2	Life expectancy at birth	83.3	78.5	5.2	Leisure & socialising time	330	355
2.3	Adult mortality rate	50	92	5.3	Parental leave (weeks equiv.)	42.6	5.7
2.4	Tobacco use	28.5	33.1	5.4	GNI per capita	34,886	53,290
				5.5	Population share*	50.8	49.2
3	LABOUR	F	M	DIM #	DIMENSION	RANK	
3.1	Labour participation rate	53.6	66.4	1	Education	3	
3.2	Unemployment rate	5.1	5.5	2	Health	16	
3.3	Senior jobs*	29	71	3	Labour	42	
3.4	Unpaid work hours (% total)	67	42	4	Politics & power	18	
				5	Society	7	



Gender Progress Index (Dec 2016)
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CANADA

GPI rank: 9

GPI score: 0.638

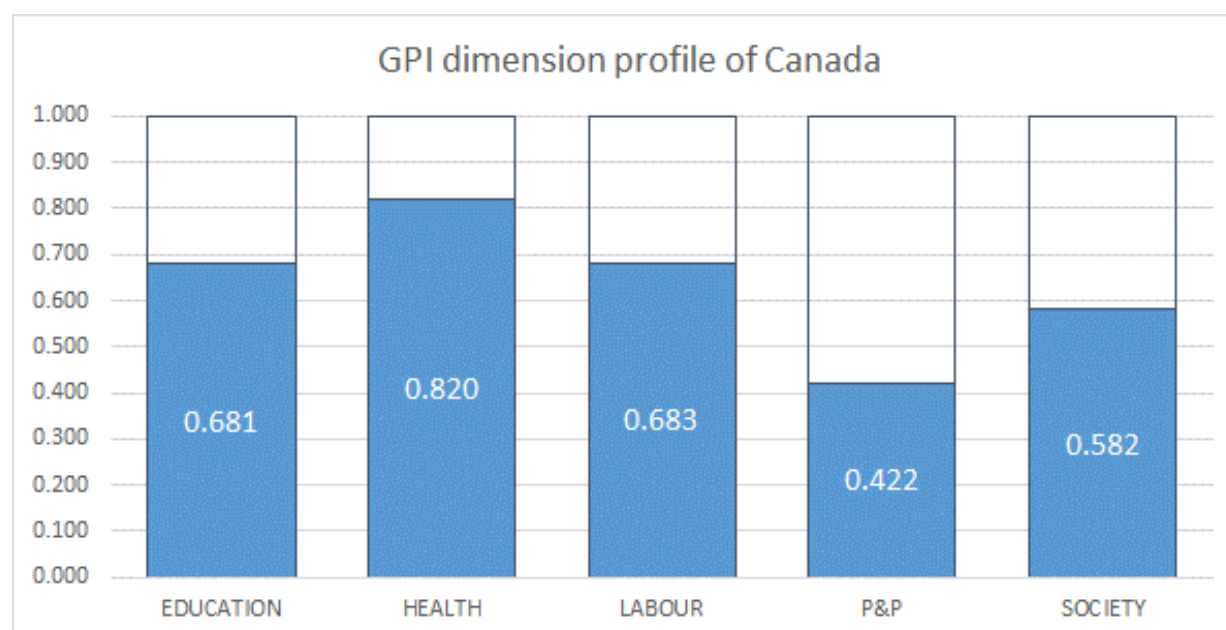
Level rank (score): 5 (0.643)

Ratio rank (score): 13 (0.671)

Geography: Anglo



IND #	INDICATOR	VALUE		IND #	INDICATOR	VALUE	
1	EDUCATION	F	M	4	POLITICS & POWER	F	M
1.1	Schooling years	14.7	14.2	4.1	Share of parliament*	28.2	71.8
1.2	Tertiary enrolment rate	67.7	50.5	4.2	Share of Cabinet posts*	31	69
1.3	Average PISA score	511	520	4.3	Share of corporate boards*	19.4	80.6
1.4	Science degrees	7.6	14.8				
2	HEALTH	F	M	5	SOCIETY	F	M
2.1	Obesity rate (> 30 BMI)	20.5	21.9	5.1	Suicide rate	4.8	14.9
2.2	Life expectancy at birth	84.0	80.0	5.2	Leisure & socialising time	309	346
2.3	Adult mortality rate	52	81	5.3	Parental leave (weeks equiv.)	27.3	0
2.4	Tobacco use	13.6	18.9	5.4	GNI per capita	33,587	50,853
				5.5	Population share*	50.4	49.6
3	LABOUR	F	M	DIM #	DIMENSION	RANK	
3.1	Labour participation rate	61.6	71.0	1	Education	16	
3.2	Unemployment rate	6.7	7.5	2	Health	9	
3.3	Senior jobs*	36	64	3	Labour	14	
3.4	Unpaid work hours (% total)	59	40	4	Politics & power	26	
				5	Society	17	



Gender Progress Index (Dec 2016)
Kai L. Chan, PhD

FRANCE

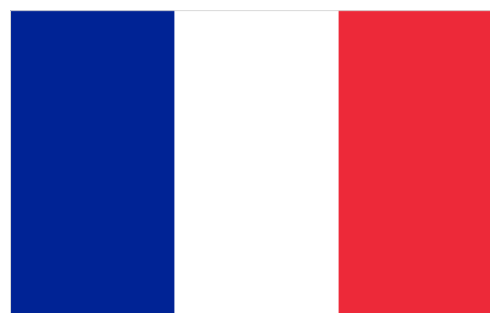
GPI rank: 10

GPI score: 0.637

Level rank (score): 24 (0.599)

Ratio rank (score): 4 (0.718)

Geography: West Europe



IND #	INDICATOR	VALUE		IND #	INDICATOR	VALUE	
1	EDUCATION	F	M	4	POLITICS & POWER	F	M
1.1	Schooling years	13.7	13.5	4.1	Share of parliament*	25.7	74.3
1.2	Tertiary enrolment rate	71.0	57.9	4.2	Share of Cabinet posts*	50	50
1.3	Average PISA score	490	496	4.3	Share of corporate boards*	33.5	66.5
1.4	Science degrees	6.0	12.3				
2	HEALTH	F	M	5	SOCIETY	F	M
2.1	Obesity rate (> 30 BMI)	19.7	19.3	5.1	Suicide rate	6	19.3
2.2	Life expectancy at birth	85.1	79.2	5.2	Leisure & socialising time	269	309
2.3	Adult mortality rate	52	109	5.3	Parental leave (weeks equiv.)	18.8	5.7
2.4	Tobacco use	25.8	30.6	5.4	GNI per capita	31,073	45,497
				5.5	Population share*	51.3	48.7
3	LABOUR	F	M	DIM #	DIMENSION	RANK	
3.1	Labour participation rate	50.7	61.6	1	Education	22	
3.2	Unemployment rate	10.8	10.3	2	Health	15	
3.3	Senior jobs*	32	68	3	Labour	50	
3.4	Unpaid work hours (% total)	65	43	4	Politics & power	4	
				5	Society	18	

