Yet, two more revisions to the Human Development Index

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Abstract

The Inequality-adjusted Human Development Index (IHDI) was presented in the 20th anniversary edition of the *Human Development Reports*, in 2010. In using a penalty setup for the calculations of the IHDI, however, the results overestimate the adjustments on the HDI. This paper suggests a revision to the current procedure in order to make the calculations of the IHDI consistent with the attainment setup of the HDI. In turn, the paper also suggests another inequality adjustment that is based on the self-reported evaluations of domains.

Keywords: Human Development Index; objective inequality; subjective inequality

JEL Codes: I31; D63; O15

INTRODUCTION

There is no opposition to the assessment that an index of human well-being would be a misleading indicator if it disregards inequality when, indeed, inequality is a problem. This issue haunted the Human Development Index (HDI) from the very beginning (c.f., Chowdhury 1991; Chatterjee 2005; Hicks 1997; Sagar and Najam 1998; Anand and Sen 2000; Stanton 2007; Seth 2009). There was no comprehensive attempt in the history of the *Human Development Reports* to calculate an

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Inequality-adjusted HDI (IHDI) prior to the *Human Development Report 2010*.[1] Thus, launching the IHDI in 2010 was a major milestone in the history of the HDI. The Technical Note of the *Reports* discusses the calculations in detail, and so there is no need to rehearse them here.

At this stage, though, what needs to be pointed out is that the HDI in its present form reflects an attainment but not a shortfall setup. Anand and Sen (2003: 119) are quite clear in stating that such a "formulation certainly seems more natural if one wishes to assess changes in the HDI over time. The attainment perspective is more relevant in assessing how *well* a country is doing, whereas the shortfall perspective is more relevant in looking at the *difficulty* of the task still remaining" (italics in original). This information is a crucial element that ought to guide any attempt at modifying or extending the HDI. For that reason, the introduction of an inequality adjustment to the HDI needs to be consistent with the attainment perspective.

Part 2 focuses on "objective inequality" to demonstrate where a revision to the IHDI is needed, and Part 3 makes a suggestion, namely the introduction of "subjective inequality" to the IHDI. The last part concludes the paper.

OBJECTIVE INEQUALITY

Recall that the calculation of a domain index in the HDI is $\frac{X_i - X_{\min}}{X_{\max} - X_{\min}}$, where X_i is a measure of a dimension pertaining to income, health, and education. By construction, the assessment of X_i is

[1] A possible exception to this assertion is the *Human Development Report 1993*, which presented an IHDI for selected countries, and the *Human Development Report 1995*, which introduced the gender-related development index (GDI). There are other proposals to include in the HDI like political freedom (Desai 1994) and sustainability (Sagar and Najam 1998). Historical discussions on the HDI are available in ul Haq (1995), Fukuda-Parr and Kumar (2003), and Alkire (2010).

dependent on its goalposts, which are set at X_{max} and X_{min}. This setup is the so-called "attainment perspective." From the *Human Development Report 2010*, it is known that an Atkinson (1970) metric for "objective inequality," A_i, is used to calculate the IHDI, $\left[\prod_i^n (1-A_i)\frac{X_i - X_{\min}}{X_{\max} - X_{\min}}\right]^{\frac{1}{n}}$, and A_i is obtained for each of the relevant domains in the HDI.

There is no quarrel with the Atkinson metric. But the issue here is that $(1 - A_i)$, as it is introduced in the calculation, assumes a penalty setup or the so-called "shortfall perspective." In doing so, there is inconsistency with the attainment setup that has characterized the HDI since 1994. The issue with it is simple, say: 'Why is a penalty imposed on a country if it has the least inequality in terms of, say, income, health, or education among the countries covered by the HDI?' Therefore, in using the above formulation, it is not a surprise that there are non-trivial reductions in the domain indexes and, consequently, in the IHDI relative to the HDI.

Rather than $(1-A_i)$, the suggestion in this paper is to stick to the customary attainment setup of the HDI; that is, $\left[\prod_i^n \left(\frac{(1-A_i)}{(1-A)_{\max}}\right)\left(\frac{X_i - X_{\min}}{X_{\max} - X_{\min}}\right)\right]^{\frac{1}{n}}$ given that $(1 - A)_{min} = 0$. Notice that $(1 - A_i) = (1 - A)_{max}$ when country-i reports the least objective inequality in a domain. The results using the revised calculations for the IHDI are shown in Table 1.

SUBJECTIVE INEQUALITY

More work still needs to be done before subjective reports (e.g., satisfaction over one's income, health, and education) are finally integrated in the HDI. That human development (i.e., objective well-being) and subjective well-being complement each other is not new nor an issue of debate. In fact, attempts have been made at finding common grounds between the two areas (Alkire 2005;

Comin 2005; Schokkaert 2007; Anand et al. 2009; Veenhoven 2010). Yet, the uneasiness with the subjective reports remains high (c.f., Sen 1987; Sen 2002).

One way to overcome the above problem is to find ways of aligning the key definitions in human development and subjective well-being. The first step in this direction is to accept that subjective reports actually represent the evaluations of one's own experienced functionings, which cover the same dimensions in the HDI.[2] For instance, people might have access to basic health services and facilities to match the conditions of human development but their experience with those health services and facilities are not satisfactory. The issue here is the following: 'Do people simply accept whatever is provided to them in terms of, say, health services and facilities?' 'Is it not that people are the end goal of human development and, therefore, how they feel about their situation provides an important input toward the realization of human development?' Thus, the challenge is to reach an acknowledgement that a so-called "life worth living" entails a self-evaluation on one's own achievements. If HDI measures the overall progress of a country toward a desired goal of human development, then self-reports on the quality of that progress is indispensable. The point here is that subjective well-being provides information about functioning and achievement that can enrich the HDI.[3]

For now, what this paper seeks to demonstrate is another extension to the extension of the IHDI

[2] "Subjective well-being" (SWB) is defined as how a person considers one's own state of being at a point in time. SWB is not what an external observer thinks about the state of being of another person; rather, it is personal knowledge or experience of one's state of being. Using the state of being of person-A as proxy for the state of being of person-B, or vice versa, is inconsistent with the premise of SWB.

[3] In fact, the relative stability of long-term measures of self-reports like "life satisfaction" (as opposed to short-term self-reports like "positive emotion") is well established in the literature. Diener (1984), Michalos (1985), Diener et al. (1999), and Kahneman et al. (1999) discuss the key concepts.

presented in Part 2, specifically a "subjective inequality" adjustment.[4] The procedure in essence is a replication of the calculation in Part 2; that is, $\left[\prod_{i}^{n}\left(\frac{(1-S_i)}{(1-S)_{\max}}\right)\left(\frac{(1-A_i)}{(1-A)_{\max}}\right)\left(\frac{X_i - X_{\min}}{X_{\max} - X_{\min}}\right)\right]^{\frac{1}{n}}$, where S is, again, the Atkinson metric of inequality but, in this case, it is derived using subjective reports on the domains of income, health, and education.[5] The setup and its respective components are straightforward to follow so a discussion is dispensed with at this point. The results of the calculations are also shown in Table 1.

CONCLUSION

The calculation of the HDI assumes an attainment setup. Accordingly, modifications or extensions to the HDI need to follow the same basic framework. In contrast, the IHDI, which was introduced in the *Human Development Report 2010*, assumes a penalty or shortfall setup in the calculations and, thus, explains the non-trivial reductions in the HDI. The reported IHDI and the revised IHDI shown in Table 1 validate this observation. The point here is that it is important to be consistent with the basic framework of the calculation. In addition, the paper showed another modification to the IHDI in the form of subjective inequality. The results on the subjective inequality adjusted IHDI shows that subjective assessments contribute valuable information, albeit still missing in the *Human Development Reports*, for a holistic appreciation of human development.

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[4] Subjective inequality is an emerging topic in SWB research. See Ferrer-i-Carbonell and van Praag (2003), Kalmijn and Veenhoven (2005), Kalmijn and Arends (2010), Dutta and Foster (2011), van Praag (2011), and Gandelman and Prozecanski (2012) for recent findings.

[5] The *Human Development Report 2010* and the subsequent issue(s) contain subjective report data from the *Gallup World Polls*. The raw data of the *Gallup World Polls* is not available without payment. The purpose of this paper, the *World Values Surveys* (available free) is used as data source. One can quarrel about the indicators in either the *Gallup World Polls* or the *World Values Surveys*. The appropriate indicators would elicit direct evaluations of one's own experienced achievements in terms of income, health, and education.

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Table: *Reported HDI and IHDI with the revised IHDI and subjective inequality adjusted IHDI*

	Data Reported in *HDR 2011*				Attainment setup		Attainment setup	
Name of Country	HDI	Rank	IHDI-1	Rank	IHDI-2	Rank	IHDI-3	Rank
Albania	0.739	43	0.637	44	0.664	44	0.643	44
Argentina	0.797	33	0.641	43	0.669	43	0.650	43
Australia	0.929	2	0.856	2	0.892	2	0.876	2
Austria	0.885	15	0.820	14	0.854	14	0.835	15
Bangladesh	0.500	66	0.363	65	0.379	65	0.363	65
Belarus	0.756	41	0.693	33	0.723	33	0.701	32
Belgium	0.886	14	0.819	15	0.853	15	0.839	14
Bosnia and Herzegovina	0.733	46	0.649	41	0.676	41	0.659	40
Brazil	0.718	49	0.519	55	0.541	55	0.521	55
Bulgaria	0.771	37	0.683	35	0.712	35	0.688	34
Burkina Faso	0.331	74	0.215	74	0.224	74	0.216	74
Canada	0.908	6	0.829	12	0.865	12	0.848	10
Chile	0.805	32	0.652	40	0.680	40	0.650	43
China	0.687	53	0.534	53	0.556	53	0.532	54
Colombia	0.710	50	0.479	60	0.499	60	0.479	60
Croatia	0.796	34	0.675	36	0.704	36	0.686	35
Cyprus	0.840	25	0.755	27	0.787	27	0.768	27
Czech Republic	0.865	22	0.821	13	0.856	13	0.847	11
Denmark	0.895	12	0.842	8	0.877	8	0.868	5
Egypt	0.644	57	0.489	59	0.509	59	0.491	59
Estonia	0.835	26	0.769	24	0.801	24	0.774	25
Ethiopia	0.363	73	0.247	73	0.258	73	0.248	73
Finland	0.882	18	0.833	11	0.868	11	0.842	13
France	0.884	17	0.804	16	0.838	16	0.804	20
Georgia	0.733	46	0.630	45	0.657	45	0.640	45
Germany	0.905	7	0.842	8	0.878	7	0.849	9
Ghana	0.541	64	0.367	64	0.383	64	0.371	64
Greece	0.861	24	0.756	26	0.788	26	0.782	24
Guatemala	0.574	62	0.393	62	0.409	62	0.397	62
Hungary	0.816	28	0.759	25	0.791	25	0.767	28
Iceland	0.898	10	0.845	5	0.881	5	0.872	3
India	0.547	63	0.392	63	0.409	63	0.393	63
Indonesia	0.617	58	0.504	58	0.526	58	0.514	58
Ireland	0.908	6	0.843	6	0.878	7	0.854	7
Israel	0.888	13	0.779	22	0.813	21	0.792	22
Italy	0.874	20	0.779	22	0.812	22	0.792	22
Jordan	0.698	52	0.565	48	0.589	48	0.574	47
Korea	0.897	11	0.749	28	0.781	28	0.769	26
Kyrgyzstan	0.615	59	0.526	54	0.549	54	0.536	53
Latvia	0.805	32	0.717	31	0.748	31	0.725	31
Lithuania	0.810	30	0.730	30	0.761	30	0.736	30
Luxembourg	0.867	21	0.799	18	0.833	18	0.815	16
Mexico	0.770	38	0.589	46	0.614	46	0.592	46
Moldova	0.649	55	0.569	47	0.594	47	0.549	49
Morocco	0.582	61	0.409	61	0.426	61	0.413	61
Netherlands	0.910	4	0.846	4	0.882	4	0.858	6
Nigeria	0.459	68	0.278	70	0.290	70	0.283	70
Norway	0.943	1	0.890	1	0.928	1	0.892	1
Pakistan	0.504	65	0.346	66	0.361	66	0.348	66
Peru	0.725	48	0.557	49	0.580	49	0.562	48
Philippines	0.644	57	0.516	56	0.538	56	0.516	56
Poland	0.813	29	0.734	29	0.766	29	0.743	29

Table *continued…*

Name of Country	Data reported in *HDR 2011* HDI	Rank	IHDI-1	Rank	Attainment setup IHDI-2	Rank	Attainment setup IHDI-3	Rank
Romania	0.781	36	0.683	35	0.712	35	0.681	37
Russian Federation	0.755	42	0.670	37	0.699	37	0.681	37
Rwanda	0.429	71	0.276	71	0.288	71	0.279	71
Serbia	0.766	39	0.694	32	0.723	32	0.699	33
Slovakia	0.834	27	0.787	20	0.820	20	0.804	20
Slovenia	0.884	17	0.837	10	0.873	10	0.846	12
Spain	0.878	19	0.799	18	0.833	18	0.810	18
Sweden	0.904	8	0.851	3	0.887	3	0.869	4
Switzerland	0.903	9	0.840	9	0.875	9	0.852	8
Tanzania	0.466	67	0.332	67	0.346	67	0.334	67
Thailand	0.682	54	0.537	52	0.559	52	0.542	52
Trinidad and Tobago	0.760	40	0.644	42	0.672	42	0.655	41
Turkey	0.699	51	0.542	50	0.565	50	0.547	50
Uganda	0.446	69	0.296	69	0.309	69	0.294	69
Ukraine	0.729	47	0.662	38	0.690	38	0.675	38
United Kingdom	0.863	23	0.791	19	0.825	19	0.813	17
United States	0.910	4	0.771	23	0.804	23	0.787	23
Uruguay	0.783	35	0.654	39	0.682	39	0.662	39
Venezuela	0.735	44	0.540	51	0.563	51	0.542	52
Viet Nam	0.593	60	0.510	57	0.532	57	0.515	57
Zambia	0.430	70	0.303	68	0.316	68	0.306	68
Zimbabwe	0.376	72	0.268	72	0.280	72	0.260	72

Notes:

1. Data are from the *Human Development Report 2011* and *World Values Surveys*. IHDI-1 is the reported inequality adjusted HDI.
2. IHDI-2 is revised IHDI using attainment setup $\left[\prod_i^3 \left(\frac{(1-A_i)}{(1-A)_{\max}}\right)\left(\frac{X_i - X_{\min}}{X_{\max} - X_{\min}}\right)\right]^{\frac{1}{3}}$ with the same three domains as HDI.
3. IHDI-2 is the subjective inequality adjusted IHDI-2, or $\left[\prod_i^3 \left(\frac{(1-S_i)}{(1-S)_{\max}}\right)\left(\frac{(1-A_i)}{(1-A)_{\max}}\right)\left(\frac{X_i - X_{\min}}{X_{\max} - X_{\min}}\right)\right]^{\frac{1}{3}}$, and with the same three domains as HDI.
4. The questions in the *World Values Surveys* that pertain to income, health, and education are, respectively:

   [On] a scale of incomes on which 1 indicates the 'lowest income decile' and 10 the 'highest income decile' in your country, [we] would like to know in what group your household is. Please, specify the appropriate number, counting all wages, salaries, pensions and other incomes that come in.

   Lowest decile *Highest decile*
   1 2 3 4 5 6 7 8 9 10

   All in all, how would you describe your state of health these days? Would you say it is:

   1 Very good; 2 Good; 3 Fair; 4 Poor

   What is the highest educational level that you have attained?

   1 No formal education; 2 Incomplete primary school; 3 Complete primary school; 4 Incomplete secondary school: technical/vocational type; 5 Complete secondary school: technical/vocational type; 6 Incomplete secondary: university-preparatory type; 7 Complete secondary: university-preparatory type; 8 Some university-level education, without degree; 9 University-level education, with degree
5. For the calculation of IHDI-3, the self-reports on income are compressed to form quintiles. Those on education are compressed into four categories: no and incomplete educate, complete primary education, complete secondary education, and complete tertiary education. An "incomplete" category is compressed to the lower attainment.