

Tilburg University

Measuring well-being with social indicators, HDIs, PQLI, and BWI for 133 countries for 1975, 1980, 1985, 1988, and 1992

van der Lijn, N.J.

Publication date:
1995

[Link to publication in Tilburg University Research Portal](#)

Citation for published version (APA):

van der Lijn, N. J. (1995). *Measuring well-being with social indicators, HDIs, PQLI, and BWI for 133 countries for 1975, 1980, 1985, 1988, and 1992*. (Research memorandum / Tilburg University, Faculty of Economics and Business Administration; Vol. FEW 704). Unknown Publisher.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Nick van der Lijn, Faculty of Economics and Business Administration (room B420), Tilburg University, PO Box 90153, 5000 LE Tilburg, The Netherlands; tel. + 31 13 66 3146 / 2019 (secr.) / 3145 (fax)

Measuring well-being with social indicators, HDI^s, PQLI, and BWI for 133 countries for 1975, 1980, 1985, 1988, and 1992

I. Introduction

In the 1970s there was a growing discontent with the predominant use of GNP per capita data for measuring economic progress and human development. This discontent, which was felt well before the 1970s (considering, for example, the UN report on the international definition and measurement of the levels of living (United Nations 1954), and the social indicators movement of the 1960s), was responded to through the initiation of two separate developments. On the one hand, attempts were made to make income per capita data more useful for international comparisons by using purchasing power adjusted real GDP per capita figures. Substantial progress has been made in this respect. For a growing number of countries these real GDP per capita figures are estimated and the accuracy of these estimates is improving (see Summers and Heston 1984, 1988, 1991). On the other hand, the importance of establishing supplementary measures to GNP per capita as a unit for measuring development progress was recognized. In an effort to provide such an alternative measure, Morris developed for the Overseas Development Council the Physical Quality of Life Index (PQLI, Morris 1979). Other important exponents of work in this field are Drenowski's (1974) work on the measurement of levels of living and welfare, and the OECD research programme on the measurement of social well-being (OECD 1976, 1982, 1986). A very important recent, and continuing, contribution is the annual publication of the *Human Development Report* for the United Nations Development Programme. The first issue of the *Human Development Report* (HDR) in 1990 introduced the Human Development Index, which was continuously refined in later publications.

For some time, an underlying theoretical rationale for using the various sets of social indicators proposed for international and intercountry comparisons seemed to be lacking.

By some this was regarded as problematic (Baster 1985) and in general it might have been partly responsible for the underdevelopment of the data base. In a number of relatively recent works, however, the distinguished welfare theoretician Amartya Sen developed a firm theoretical basis for the use of certain social indicators for the measurement and assessment of well-being. In order to assess well-being, Sen (1982, 1985, 1987) has argued in favour of focusing on the capability to function, hence, on what a person can do or can be, and has argued against the more standard concentration on opulence or on utility. Insofar as opulence and utility have roles (and they certainly do) these can, according to Sen, be seen in terms of their indirect connections with well-being, in particular, the causal importance of opulence, and the evidential importance of utility (in its various forms, such as happiness, desire-fulfilment and choice).¹

In Sen's approach, a person's well-being is dependent upon his or her *functionings* and *capabilities*. Before we arrive at the functioning of a person, the vector of commodities possessed by that person is converted into a vector of characteristics of those commodities. The characteristics are the various desirable properties of the commodities in question and do not vary with the personal features of the individual possessing the goods. A personal 'utilization function' generates a functioning vector out of a characteristic vector of commodities possessed, reflecting one pattern of use of commodities that a person can actually make. This functioning vector, or for short functioning, can be thought of as the person's being (for example, whether well-nourished, well-clothed or taking part in the life of the community) and thus has a direct influence on well-being. In fact, well-being can be seen as the evaluation of this being.² The capabilities of a person reflect the various combinations of functionings ('beings') he or she can achieve, which depends on the freedom a person has in terms of the choice of functionings and his or her command over commodities.

The type of data one needs for the assessment of well-being within Sen's theoretical framework are mainly non-market observations of personal states.³ The concentration on functionings and capabilities represents the selection of a particular class of relevant

¹ For the detailed arguments why Sen rejects both the opulence and utility approaches to well-being see Sen (1982, 1985, 1987).

² Evaluating a life in this way, it should be noted, is substantially different from measuring the happiness generated in that life (see Sen 1985).

³ See chapter 6 of Sen (1985), for a discussion of the relation between the utility, opulence, and functionings approach to well-being and the type of data relevant for assessing well-being.

indicators, mainly objective social indicators measuring ends, not means.⁴ To give one example, the number of physicians per thousand inhabitants of a country does not say much about the access to medical care of the masses, and thus to capabilities and well-being, while life expectancy directly refers to one of the most important capabilities - that of long life - and, hence, has a direct relation to well-being. The indicators considered to be relevant refer to health (like morbidity or undernourishment), education, the ability to be housed and sheltered, employment, leisure, security, etc. Unfortunately, although the data base is expanding, internationally comparable data are not available for many of these indicators. This, however, "should not prevent us from making use of whatever data may be easily available already" (Sen 1985, p.73).

For comparisons between countries as well as for comparisons over time, it is often convenient to examine a composite index. For empirical research on, say, the relationship between well-being and economic development, one would also like to use such an index. In fact, PQLI has been commonly used as a measure of the fulfilment of basic needs, or, in more general terms, as a measure of social development.⁵ A disadvantage of a composite index is that the information on individual indicators gets lost and that the appropriate weighting scheme for the selected indicators is far from clear. Theoretically, weighting concerns the valuation of the functioning vector. Although to some extent the relative importance of the various functionings and capabilities might be examined, the scope of 'objective' weighting is limited. However, as long as the assumptions underlying different weighting procedures are made clear, the problems of weighting are not insurmountable (Baster 1985).

In this paper, bearing the theoretical contributions of Sen and the remark made above in mind, several well-being indices are constructed for a number of years for the vast majority

⁴ Sen (1985) outlined in appendix A how comparisons of the achievements of different countries in the field of extending capabilities and enhancing functionings should be made. In this appendix, intended primarily to illustrate the empirical relevance of his theoretical approach rather than to reach definite empirical conclusions, Sen compared for five countries a number of specific achievements (concerning life expectancy, infant mortality, child death rate, adult literacy rate and higher education) in relation to their GNP per capita. In Sen's theoretical framework these indices relate to capabilities to function and bear a direct relationship to well-being. The main economic conclusion which emerged from these comparisons was the relatively good performances of Sri Lanka and China.

⁵ For example, Newman and Thomson (1989) used PQLI in their analysis of the causal relation between economic growth and social development, while Stuart (1984) and Burkett (1985) examined the impact of the economic system on PQLI.

of countries with more than half a million inhabitants at the end of the 1980s. Due to data limitations, the indicators used to construct these indices only concern health and education. The constructed indices can be regarded to measure some kind of 'basic' well-being, as the underlying indicators most of all seek to measure the fulfilment of basic needs. As it is unclear what should be regarded as the 'best' index and how the respective indicators should be weighted, three basic well-being indices are constructed using partially distinct indicators and slightly different weighting schemes. Further, a brief comparison is made of the achievements of various groups of countries. Summary statistics are presented per continent, for developing and industrial economies, for (post)socialist and capitalist countries, and for five major oil-exporting countries, and the main trends are discussed. In this respect, this paper contributes to the literature as other studies aiming to assess the relative achievements of various groups of countries on basic well-being usually consider only one particular year (like Horvat 1974, Stuart 1984, Burkett 1985). Finally, some conclusions are given.

II. Well-being indices for 133 countries

The first of the well-being indices constructed in this section is based on the Human Development Index (HDI). At this time, the HDI is a weighted average of indices for life expectancy at birth, adult literacy, average years of schooling, and purchasing power adjusted real GDP per capita. This reflects the choice that "the measurement of human development should for the time being focus on the three essential elements of human life - longevity, knowledge and decent living standards" (HDR 1990, p.11-12). Within Sen's theoretical framework, the first three indices refer to 'capability welfare' and bear a direct relation to well-being, while the latter refers to 'commodity welfare', which can be regarded to be prior to capability welfare.⁶ Hence, real GDP per capita is regarded as one of the factors influencing well-being, but not as well-being itself. For this reason, HDI^s only comprises the social indicators component of HDI.

The second index constructed in this section is well-known. PQLI is a weighted average of indices of life expectancy at age 1, infant mortality, and adult literacy. The, so to speak,

⁶ A quote from Sen (1985, p.10-11) might clarify this issue more fully: "A functioning is thus different both from (1) having goods (and the corresponding characteristics), to which it is posterior, and (2) having utility (in the form of happiness resulting from that functioning), to which it is, in an important way, prior."

separation of life expectancy at birth (in HDI^S) into life expectancy at age 1 and infant mortality (in PQLI), means that more weight is attached to the mortality rate of infants under one year of age relative to the mortality rates of other age-groups. Even more so than HDI^S, PQLI measures the fulfilment of basic needs. Educational achievements are measured by adult literacy only. In order to capture a broader spectrum of education, gross secondary school enrolment is added to the indicators comprising PQLI to obtain another basic well-being index, BWI. For convenience, the social indicators used to construct HDI^S, PQLI, and BWI are represented in Table 1.

TABLE 1 Composition of several well-being indices

	HDI ^S	PQLI	BWI
1a. Life expectancy at birth	X		
1b. Life expectancy at age 1		X	X
2. Infant mortality		X	X
3. Adult literacy	X	X	X
4. Gross secondary school enrolment			X
5. Average years of schooling	X		

Note. The social indicators comprising HDI^S form, together with real GDP per capita, the Human Development Index. PQLI is the Physical Quality of Life Index, BWI is the Basic Well-being Index.

TABLE 2 Fixed minimum and maximum values for the social indicators used to construct HDI^S, PQLI, and BWI

	Minimum	Maximum
1a. Life expectancy at birth (years)	25	85
1b. Life expectancy at age 1 (years)	30	85
2. Infant mortality (per 1000 live births)	0	230
3. Adult literacy (%)	0	100
4. Gross secondary school enrolment (%)	0	100
5. Average years of schooling	0	15

Note. The minimum and maximum values for the social indicators 1a, 3, and 5 come from HDR 1994 (Table 5.1, p.92). The minimum and maximum values for indicator 2 are about equal to the ones used by Morris (1979; 7 and 229, respectively). The values for indicator 1b are chosen considering the values for indicators 1a and 2, while the minimum and maximum value for indicator 4 is an obvious choice.

The indices are constructed comparable to the manner in which HDI is constructed in HDR 1994. They can be regarded to reflect the distance travelled from a minimum to a maximum level, the minimum and maximum level being constant over time. This means that comparisons can not only be made between countries for a certain year, but also that meaningful comparisons can be made over time. First, indices are obtained for each social indicator by rescaling the data on a scale from zero to 100. The fixed minimum and maximum values used to rescale the respective social indicators are given in Table 2. On each index, except for the infant mortality index, zero represents the minimum value and 100 the maximum value. Hence, the maximum set for life expectancy at birth is rescaled to 100, while 7.5 average years of schooling equals 50. Infant mortality statistics are rescaled by setting the minimum equal to 100 and the maximum equal to zero. Subsequently, the rescaled social indicators are averaged to obtain the indices. HDI^S is constructed by giving life expectancy at birth, adult literacy, and average years of schooling the weights 1/2, 1/3, and 1/6. For PQLI and BWI the indicators have equal weights. Note that for HDI^S and BWI the health and education indicators have, in total, equal weights, while the health indicators make up two third of PQLI.⁷

HDI^S, PQLI, and BWI are both broad and limited measures. They are broad measures because they indirectly measure such things as maternal health, quality of prenatal care, access of women to health services, nutrition levels, adequacy of health care, deaths resulting from infectious and parasitic diseases, access to clean water, the quality and availability of education, and the degree of social mobility. They are limited measures because many other aspects related to well-being and human development are not incorporated in these indices, such as security, political freedom, human rights, employment, etc.⁸

Data were collected for countries with more than half a million inhabitants at the end of the 1980s. Much effort was made to obtain a data set of good quality. Information about the sources and methods of calculation can be found in the appendix. In Table 3,

⁷ Also note that the minimum and maximum values used to construct PQLI differ from the ones used by Morris, except for adult literacy which was rescaled in neither case. In Morris the minimum and maximum values were 7 and 229 for infant mortality, and 38 and 77 for life expectancy at birth.

⁸ Clavijo (1992) argued that an indicator regarding security should be one of the components of a well-being index. He observed that for Colombia both HDI and PQLI increased substantially from 1950-1987, while also the homicide rate increased during this period. He therefore proposed a 'Right to Safety Index', comprising this indicator as well as life expectancy and infant mortality.

TABLE 3 HDI^s, PQLI, and BWI for 133 countries for 1975, 1980, 1985, 1988, and 1992

	HDI ^s				PQLI					BWI				
	'80	'85	'88	'92	'75	'80	'85	'88	'92	'75	'80	'85	'88	'92
AFRICA														
1 Algeria	43	49	53	57	47	54	60	64	69	40	49	58	64	66
2 Angola	25	29	31	33	26	32	37	40	43	22	29	32	33	35
3 Benin	25	27	30	27	32	35	38	41	41	27	31	33	33	34
4 Botswana	48	54	55	57	53	60	66	68	70	44	50	57	59	66
5 Burkina Faso	20	23	24	26	26	29	32	34	38	20	22	25	27	30
6 Burundi	26	33	36	37	35	37	45	47	50	27	28	35	37	39
7 Cameroon	41	43	45	46	47	52	54	56	61	39	44	46	49	52
8 Centr. Afr.R.	30	32	34	33	32	39	40	46	45	26	32	34	37	37*
9 Chad	22	24	27	29	26	31	34	37	41	21	24	27	30	33
10 Congo	47	47	44	44	53	59	59	57	57	54	61	63	63	62**
11 Egypt	43	46	50	50	46	52	57	60	63	46	52	58	62	67
12 Ethiopia	28	35	39	36	31	35	42	48	46	25	29	34	40	37
13 Gabon	40	43	46	47	43	49	53	56	58	37	42	46	48	50**
14 Gambia	20	22	25	27	23	28	31	34	37	20	24	28	29	33
15 Ghana	42	45	47	50	47	51	55	57	61	45	48	51	53	55
16 Guinea	21	20	23	26	24	28	28	32	35	21	25	24	26	29
17 Guinea Bissau	17	22	24	28	21	25	31	33	38	17	20	26	27	30*
18 Ivory Coast	32	40	43	43	38	43	52	54	55	31	37	44	46	47
19 Kenya	44	51	53	54	50	56	63	66	67	41	46	53	55	57
20 Lesotho	49	52	55	59	54	57	61	64	69	43	47	51	54	58
21 Liberia	34	37	39	41	39	45	49	46	49	34	40	41	39	41**
22 Libya	46	51	54	57	49	55	61	64	68	51	58	67	71	73**
23 Madagascar	44	51	53	54	45	51	59	61	64	37	41	51	51	52
24 Malawi	30	33	35	33	31	35	39	42	41	24	27	30	32	32
25 Mali	21	26	28	29	22	26	32	34	37	18	22	25	27	29
26 Mauritania	23	26	28	31	28	33	37	39	42	22	27	31	34	35
27 Mauritius	64	66	68	68	74	78	80	82	82	65	70	73	74	75
28 Morocco	39	45	48	52	44	49	56	60	63	37	43	50	54	56
29 Mozambique	27	29	31	31	31	34	37	39	38	24	26	29	31	30
30 Niger	17	23	25	28	23	26	33	36	39	18	21	26	28	31
31 Nigeria	31	36	39	41	38	42	48	50	53	30	39	43	43	46
32 Rwanda	35	35	37	37	39	44	45	48	48	29	34	35	38	39
33 Senegal	25	30	32	34	30	33	39	46	49	25	28	33	39	41
34 Sierra Leone	20	18	21	23	21	26	26	29	32	19	23	24	26	28
35 Somalia	18	23	26	27	25	27	33	36	38	20	23	27	29	31**
36 South Africa	58	61	60	62	63	67	71	70	74	52	56	66	68	73

TABLE 3 HDI^s, PQLI, and BWI - *continued*

	HDI ^s				PQLI					BWI				
	'80	'85	'88	'92	'75	'80	'85	'88	'92	'75	'80	'85	'88	'92
37 Sudan	28	29	30	32	33	38	40	42	45	29	33	35	37	39
38 Swaziland	46	51	53	55	47	52	58	60	66	44	49	54	56	62
39 Tanzania	39	42	45	42	43	48	52	56	53	33	37	40	43	41
40 Togo	31	37	39	41	38	42	49	51	54	33	40	42	44	46
41 Tunisia	49	54	57	60	52	60	67	71	74	45	52	60	64	68
42 Uganda	32	34	36	33	44	43	46	48	46	34	34	38	40	38*
43 Zaire	40	46	47	49	46	51	57	59	61	39	44	49	50	52*
44 Zambia	47	48	50	45	54	58	60	62	58	44	48	49	52	48*
45 Zimbabwe	50	50	53	52	58	63	63	66	66	46	49	58	62	61
C. & N. AMERICA														
46 Canada	87	89	90	90	91	92	94	94	94	91	92	95	96	96
47 Costa Rica	76	77	79	80	83	87	88	90	91	73	77	77	77	80
48 Cuba	77	82	82	83	84	88	91	91	91	75	86	89	91	89
49 Dominican R.	61	65	66	68	67	70	74	76	78	59	63	68	76	77*
50 El Salvador	53	56	60	63	62	64	68	71	75	51	54	57	61	63
51 Guatemala	49	52	53	56	55	59	63	65	68	44	49	52	54	56
52 Haiti	34	42	44	46	38	42	51	53	58	30	35	43	45	49
53 Honduras	54	58	60	63	58	63	68	71	73	47	55	60	61	63
54 Jamaica	75	79	79	79	85	87	90	90	91	78	80	84	83	84
55 Mexico	65	69	70	72	73	76	80	81	83	63	69	74	75	77
56 Nicaragua	55	61	64	65	60	65	72	74	75	51	60	63	66	67
57 Panama	73	75	76	77	81	84	85	86	87	74	78	78	79	80
58 Trin. & Tob.	75	76	79	80	84	86	87	88	88	75	81	84	87	86
59 USA	87	88	89	89	91	92	93	93	93	91	91	94	93	93
SOUTH AMERICA														
60 Argentina	75	77	79	80	83	85	86	87	87	76	78	82	83	83
61 Bolivia	48	51	53	60	49	54	58	61	69	45	49	53	54	60
62 Brazil	60	63	64	66	68	70	73	75	77	58	61	64	66	67
63 Chile	75	77	78	79	79	85	87	88	88	72	77	82	85	84
64 Colombia	66	68	72	74	72	76	78	81	83	64	68	71	75	78
65 Ecuador	64	67	69	70	68	72	75	77	78	61	67	70	72	73*
66 Guyana	71	71	69	71	80	81	82	79	81	74	76	75	74	75*
67 Paraguay	68	69	70	71	77	79	81	81	81	63	67	68	68	69
68 Peru	61	63	66	68	63	67	69	72	74	59	65	68	70	73
69 Uruguay	76	78	79	81	84	86	87	88	89	78	79	83	86	88
70 Venezuela	69	72	73	74	77	79	82	83	84	64	65	68	71	71

TABLE 3 HDI^s, PQLI, and BWI - *continued*

	HDI ^s				PQLI					BWI				
	'80	'85	'88	'92	'75	'80	'85	'88	'92	'75	'80	'85	'88	'92
ASIA														
71 Afghanistan	16	21	24	26	16	19	26	30	33	14	17	22	24	27*
72 Bangladesh	31	34	35	37	36	39	43	44	47	34	34	36	38	40
73 Burma	53	57	58	57	56	62	66	68	68	48	52	55	57	57
74 Cambodia	21	29	33	36	15	25	36	41	45	13	24	35	39	42*
75 China	62	65	67	70	70	73	76	78	82	65	67	67	70	75
76 Cyprus	79	81	81	82	87	88	90	91	92	79	90	91	90	93
77 Hong Kong	76	79	81	82	84	87	90	91	91	75	82	85	87	87*
78 India	40	44	46	48	44	49	53	56	59	39	44	50	52	56
79 Indonesia	52	56	59	64	55	62	66	70	74	46	53	59	64	66
80 Iran	48	49	53	58	52	58	61	64	70	50	54	57	60	68
81 Iraq	52	54	57	60	57	62	64	66	70	52	60	61	61	63
82 Israel	81	84	85	86	87	89	91	92	92	81	85	87	90	91
83 Japan	87	88	89	90	92	94	94	95	95	92	93	95	95	96
84 Jordan	60	64	66	68	65	70	74	77	80	61	72	78	77	73
85 North Korea	70	72	75	76	78	81	84	86	87	72	77	79	81	82**
86 South Korea	73	77	79	80	80	83	86	87	88	74	81	88	87	88
87 Kuwait	64	68	70	72	74	77	81	82	84	72	77	81	83	76
88 Laos	32	36	41	43	33	38	42	50	53	27	34	37	44	45
89 Malaysia	63	66	69	71	72	76	79	81	83	64	69	72	75	77
90 Mongolia	69	69	69	71	74	78	79	77	79	76	81	82	80	78
91 Nepal	27	30	32	34	32	35	38	40	45	27	31	35	38	43
92 Oman	32	35	44	49	37	42	46	61	66	28	35	43	56	65
93 Pakistan	33	38	38	42	38	41	47	48	52	32	35	39	41	44
94 Philippines	65	69	70	72	72	74	77	79	80	68	71	74	77	79
95 Saudi Arabia	40	54	57	62	43	50	64	67	75	38	45	59	61	69
96 Singapore	69	71	74	76	81	84	86	88	90	73	77	82	83	85
97 Sri Lanka	71	73	75	76	76	81	83	84	86	69	73	78	81	83
98 Syria	52	56	59	61	58	64	68	71	73	54	60	66	67	67
99 Thailand	64	67	68	72	73	77	79	82	85	61	65	67	69	72
100 Turkey	56	61	63	66	58	64	70	72	77	51	57	63	66	71
101 Un. Ar. Em.	58	62	63	66	68	72	75	75	77	59	65	71	71	76
102 Vietnam	59	66	68	67	53	71	78	79	79	50	64	69	70	68
103 North Yemen ¹	24	32	31	37	28	33	43	41	49	22	26	36	37	44
104 South Yemen	28	29	35		33	37	38	45		30	32	33	39	
EUROPE														
105 Albania	68	72	74	75	75	78	82	84	85	68	75	79	82	83

TABLE 3 HDI^s, PQLI, and BWI - *continued*

	HDI ^s				PQLI					BWI				
	'80	'85	'88	'92	'75	'80	'85	'88	'92	'75	'80	'85	'88	'92
106 Austria	83	85	87	88	89	91	92	93	93	90	91	94	94	95
107 Belgium	82	84	86	88	90	91	92	93	93	89	91	93	95	95
108 Bulgaria	79	77	78	78	87	89	88	88	88	88	88	91	85	84
109 Czechoslovakia	80	80	81	82	89	89	89	90	91	84	89	88	88	88
110 Denmark	85	86	86	87	92	92	93	93	93	89	94	95	95	95
111 Finland	83	86	86	87	91	92	93	93	93	90	93	95	95	95
112 France	85	88	88	89	91	93	94	93	94	89	91	94	93	95
113 East Germany	80	82	82		91	91	91	92		89	88	88	88	
114 West Germany ²	83	85	86	88	90	91	92	93	93	89	92	94	95	95
115 Greece	78	81	82	83	86	88	91	92	92	84	86	91	93	94*
116 Hungary	79	81	81	81	87	88	88	89	89	81	83	84	85	87
117 Ireland	81	83	83	85	89	91	92	92	93	89	91	93	94	95
118 Italy	80	83	84	84	89	91	93	93	93	84	86	88	88	89
119 Netherlands	84	86	88	89	92	93	94	94	94	91	93	95	95	96
120 Norway	86	88	89	90	93	93	94	94	94	91	93	95	94	96
121 Poland	79	80	81	81	88	89	89	90	90	84	86	86	88	89
122 Portugal	70	74	75	77	78	83	86	87	88	72	73	78	80	86
123 Romania	77	79	77	78	85	87	88	87	87	80	83	87	90	86
124 Soviet Union ³	77	77	78	80	86	85	86	87	88	88	88	89	90	90
125 Spain	79	81	82	84	88	91	92	93	94	85	90	94	95	95
126 Sweden	86	87	88	90	93	93	94	94	95	89	92	92	93	95
127 Switzerland	85	87	88	90	92	93	94	94	95	86	90	93	93	94
128 Un. Kingdom	86	87	87	88	90	92	92	93	93	89	90	91	90	92
129 Yugoslavia	72	76	78		81	83	86	87		80	83	85	86	
OCEANIA														
130 Australia	85	87	88	89	91	92	93	93	94	86	87	90	90	91
131 Fiji	69	71	73	73	78	81	83	85	85	75	79	76	76	79
132 New Zealand	83	85	86	87	90	91	92	93	93	88	89	90	90	93
133 Papua NGuin.	36	40	42	48	46	51	56	58	65	38	41	45	47	52

Note. For a number of countries, the most recent figure for gross secondary school enrolment published in UNESCO, *Statistical Yearbook* 1994, refers to the end of the 1980s or to 1990 or 1991. An asterisk denotes that the figure for gross secondary school enrolment used to calculate BWI for 1992 refers to either 1988 or 1989. In some cases, the figure for 1988 is obtained by extrapolation (see the appendix). A double asterisk means that the extrapolated figure for 1988 is used to calculate BWI for 1992. 1. The figures for 1992 refer to Yemen. 2. The figures for 1992 refer to Germany. 3. The figures for 1992 refer to the Russian Federation.

HDI^s, PQLI, and BWI are given for 133 countries for 1980, 1985, 1988, and 1992, while PQLI and BWI are also given for 1975.

III. Some trends and comparisons for various groups of countries

Summary statistics for HDI^s, PQLI, and BWI, as well as averages of purchasing power adjusted real GDP per capita are given per continent in Table 4 and for various groups of countries in Table 6, while some comparisons of trends and achievements are presented in Tables 5 and 7. The achievements are given both as the increase of HDI^s, PQLI, and BWI in absolute numbers and as the reduction in shortfall. The reduction in shortfall from a desired value or target as a measure of achievement is proposed in HDR 1990. It is equal to the change of the value of the index over time as a percentage of the difference between the maximum value and the value of the index at the beginning of the period concerned. Thus, when PQLI increases from 50 to 60, the reduction in shortfall is 20%, and when BWI increases from 80 to 90, it equals 50% (the maximum value of HDI^s, PQLI, and BWI being 100). The reduction in shortfall is considered to be a good measure of achievement because it brings out more clearly than other measures the difficulty of the tasks accomplished, as it is acknowledged that an increase in the absolute number of, for instance, a well-being index is more difficult to achieve when the index is close to the maximum. Moreover, the shortfall measure of human progress emphasises the magnitude of the tasks that still lie ahead (HDR 1990, p.14).

From Table 5 it can be seen that although the increase in absolute figures for Africa was almost as much as it was for Asia, and higher than for all the other continents, the African countries experienced the smallest reduction in shortfall. While the countries of the other continents on average managed to reduce the gap to the maximum attainable level of PQLI and BWI from 1975-1992 with 30-35%, the average reduction in shortfall of the African countries was only about 20%. The relatively high increase in absolute figures of the Asian countries can be considered to be the kind of catch-up effect expected for countries with a relatively low level of basic well-being: the reduction in shortfall is about equal to the average reduction in shortfall for the other continents. The European countries show to have experienced a relatively favourable progress of secondary school enrolment. BWI increased relatively rapidly and is in 1992 almost equal to PQLI (see Table 4), reflecting the fact that secondary school attainment can by now be regarded as a basic need in Europe (for the other continents, BWI is still substantially lower than PQLI).

TABLE 4 Summary statistics for HDI^s, PQLI, and BWI per continent

	Africa (45)	North & Central America (14)	South America (11)	Asia (34) ¹	Europe (25) ²	Oceania (4)
HDI^s						
1980	34.5	65.7	66.7	53.2	80.3	68.1
1985	38.2	69.2	68.9	57.0	82.1	70.8
1988	40.4	70.7	70.3	59.2	83.0	72.1
1992	41.5	72.1	72.2	62.4	84.4	74.4
PQLI						
1975	39.4	72.2	72.9	58.1	88.0	76.2
1980	44.0	75.3	75.8	62.7	89.5	78.7
1985	48.3	78.8	78.1	66.8	90.5	81.1
1988	51.0	80.2	79.3	69.3	91.1	82.0
1992	52.9	81.9	81.2	72.9	91.8	84.1
BWI						
1975	33.2	64.5	64.7	52.9	85.5	71.7
1980	37.9	69.2	68.5	58.3	88.0	73.9
1985	42.2	72.7	71.3	62.8	90.0	75.4
1988	44.5	74.5	72.9	65.0	90.6	75.9
1992	46.3	75.7	74.7	68.1	91.7	78.6
RGDPcap	1401	4845	3116	4235	8853	7409

Note. Unweighted averages are presented. Number of countries concerned in parentheses. RGDPcap is purchasing power adjusted real GDP per capita in dollars for 1985. 1. The figures for 1992 refer to 33 countries, as the result of the unification of Yemen. 2. The figures for 1992 refer to 23 countries, as the result of the break up of Yugoslavia and the unification of Germany.

Source. Table 3. For the sources of the real GDP figures, see Van der Lijn (1995). The main original source is the PENN World Table (PWT), Mark 5.5 (for a description of PWT, Mark 5, see Summers and Heston 1991).

In Tables 6 and 7, the countries of Table 3 are divided into developing economies and industrial economies. A subdivision is made for major oil-exporting countries ('oil'), countries that were socialist for more than three decades ('soc1'), other (developing) countries that were considered to be socialist at the end of the 1980s ('soc2'), and other (capitalist) countries ('other'). Because most of the countries included in soc1 and soc2 abandoned the socialist system from 1989 onwards, in Table 7 the period 1975/80-1992

TABLE 5 Increase of HDI^S, PQLI, and BWI per continent in absolute numbers and measured as the reduction in shortfall

	Africa (45)	North & Central America (14)	South America (11)	Asia (33) ³	Europe (23) ³	Oceania (4)
ABSOLUTE NUMBERS ¹						
HDI ^S , 1980-92	7.0	6.4	5.5	8.5	3.7	6.3
PQLI, 1980-92	8.9	6.6	5.4	9.4	2.1	5.4
BWI, 1980-92	8.4	6.5	6.2	9.0	3.5	4.7
PQLI, 1975-92	13.5	9.7	8.3	14.0	3.6	7.9
BWI, 1975-92	13.1	11.2	10.0	14.5	6.1	6.9
RED. IN SHORTFALL ²						
HDI ^S , 1980-92	11	19	17	18	19	20
PQLI, 1980-92	16	27	22	26	20	25
BWI, 1980-92	14	21	20	22	30	18
PQLI, 1975-92	22	35	31	34	31	33
BWI, 1975-92	20	32	28	31	42	24

Note. Calculated from Table 4; see note at Table 4. 1. Increase in absolute numbers. 2. Reduction in shortfall in percentages. The reduction in shortfall (from the maximum value) is equal to the change of the value of the index over time as a percentage of the difference between the maximum value and the value of the index at the beginning of the period concerned. 3. For reasons of comparability, all figures for Asia are excluding South Yemen and for Europe excluding East Germany and Yugoslavia.

is subdivided into 1975/80-1988 and 1988-1992. Hence, inspection of the figures for 1988-1992 for soc1 and soc2 gives an impression of the achievements of the postsocialist countries after a few years of transition to a market economy.

A number of observations can be made. First, the achievements of the developing economies on PQLI are, when measured as the reduction in shortfall, comparable to the achievements of the industrial economies. On HDI^S and BWI, however, the achievements of the developing economies are relatively less favourable. Second, the average values of the respective basic well-being indices are quite high for the developing economies included in soc1. In fact, they are even higher than the average values for both North & Central America and South America. Moreover, the reduction in shortfall from 1975-1988 for these countries was 15% higher than for the developing economies included in 'other'

TABLE 6 Summary statistics for HDI^s, PQLI, and BWI for various groups of countries

	Developing economies					Industrial economies		
	Oil (5)	Soc1 (6)	Soc2 (12) ¹	Other (80)	Total (103) ¹	Soc1 (8) ²	Other (22)	Total (30) ²
HDI^s								
1980	48.0	67.5	31.1	47.8	47.1	78.1	83.0	81.7
1985	54.2	70.9	34.9	51.3	50.7	78.9	85.0	83.4
1988	57.5	72.4	37.5	53.2	52.7	79.5	86.0	84.3
1992	61.4	73.8	38.1	55.1	54.6	80.2	87.1	85.6
PQLI								
1975	54.2	72.3	34.4	53.6	52.4	86.7	89.8	88.9
1980	59.1	78.1	39.0	57.6	56.7	87.6	91.2	90.3
1985	65.4	81.4	43.5	61.5	60.7	88.2	92.4	91.3
1988	69.7	82.5	47.3	63.6	63.1	88.7	92.9	91.8
1992	73.9	83.7	48.7	66.0	65.5	89.0	93.4	92.4
BWI								
1975	49.6	67.5	29.4	46.6	46.0	84.2	87.5	86.6
1980	55.9	75.0	34.5	51.2	50.9	86.0	89.7	88.7
1985	64.2	77.5	38.9	55.2	55.0	87.3	92.0	90.7
1988	68.4	78.9	42.0	57.1	57.2	87.5	92.6	91.3
1992	72.0	79.2	42.9	59.3	59.3	87.2	93.7	92.3
RGDPcap	11931	1837	1041	2266	2567	5497	11441	9856

Note. The HDR classification is used to classify each country as either developing or industrial, except for Albania, which is in this table considered to be a developing country. Hence, industrial economies are Canada, USA, Israel, Japan, Australia, New Zealand, and all the countries of Europe, except for Albania. Under the heading 'oil', the following major oil-exporting countries are classified: Libya, Kuwait, Oman, Saudi Arabia, and the United Arab Emirates. The countries that were considered to be socialist at the end of the 1980s are headed under either 'soc1' or 'soc2'. The same classification is used as in Kornai (1992, p.6-7). Soc1 refers to those countries where the Communist party held power for at least three decades. These are the developing countries Cuba, China, North Korea, Mongolia, Vietnam, and Albania, and the industrial countries Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania, Soviet Union, and Yugoslavia. Soc2 includes the socialist developing countries Angola, Benin, Congo, Ethiopia, Mozambique, Somalia, Zimbabwe, Nicaragua, Afghanistan, Cambodia, Laos, and South Yemen. From 1989 onwards, the socialist system was abolished for most of the countries included in soc1 and soc2. RGDPcap is purchasing power adjusted real GDP per capita in dollars for 1985. 1. The figures for 1992 are excluding South Yemen. 2. East Germany and Yugoslavia are not included in the figures for 1992.

Source. Table 3; see also Table 4.

TABLE 7 Increase of HDI^S, PQLI, and BWI for various groups of countries in absolute figures and measured as a reduction in shortfall

	Developing economies					Industrial economies		
	Oil (5)	Soc1 (6)	Soc2 (12) ^{3,4}	Other (80)	Total (103) ⁴	Soc1 (8) ⁵	Other (22)	Total (30) ⁵
ABSOLUTE NUMBERS ¹								
PQLI, 1975-88	15.5	10.2	12.9	10.0	10.7	2.0	3.1	2.9
BWI, 1975-88	18.8	11.4	12.6	10.5	11.2	3.3	5.1	4.7
HDI ^S , 1980-88	9.5	4.9	6.4	5.5	5.6	1.4	3.0	2.6
PQLI, 1980-88	10.6	4.4	8.3	6.0	6.4	1.1	1.7	1.5
BWI, 1980-88	12.5	3.9	7.5	5.9	6.3	1.5	2.9	2.6
HDI ^S , 1988-92	3.9	1.4	0.3	1.9	1.7	0.9	1.1	1.0
PQLI, 1988-92	4.2	1.2	1.2	2.4	2.2	0.5	0.5	0.5
BWI, 1988-92	3.6	0.3	0.6	2.2	1.9	-0.5	1.1	0.7
RED. IN SHORTFALL ²								
PQLI, 1975-88	34	37	20	22	22	15	30	26
BWI, 1975-88	37	35	18	20	21	21	41	35
HDI ^S , 1980-88	18	15	9	10	11	6	18	14
PQLI, 1980-88	26	20	14	14	15	9	19	15
BWI, 1980-88	28	16	11	12	13	11	28	23
HDI ^S , 1988-92	9	5	0	4	4	4	8	6
PQLI, 1988-92	14	7	2	7	6	4	7	6
BWI, 1988-92	11	1	1	5	4	-4	15	8

Note. Calculated from Table 6; see note at Table 6. 1. Increase in absolute numbers. 2. Reduction in shortfall in percentages (see note at Table 5). 3. Part of the countries included in soc2 became socialist in 1975 or later (the latest was Zimbabwe in 1980). 4. Figures for 1988-1992 are excluding South Yemen. 5. Figures for 1988-92 are excluding East Germany and Yugoslavia.

and was also higher than the reduction in shortfall for the American continents. From 1988-1992 the achievements on HDI^S and PQLI were about the same, on BWI they were worse.

Third, the indices for the industrial socialist countries are somewhat lower than those for the capitalist industrial countries. However, considering the relatively low GDP per capita levels in the socialist countries, they can be regarded as rather high.⁹ The achievements since 1975, on the other hand, present a somewhat different picture. On each index, measured in either absolute terms or as the reduction in shortfall, the socialist industrial countries scored worse than the capitalist industrial countries. The achievements of the postsocialist countries from 1988-1992 seem to lag behind the other industrial countries in the same proportion as from 1975-1988, although on BWI the gap has grown relatively rapidly.¹⁰ Fourth, the developing economies included in soc2 have, on average, very low values for HDI^S, PQLI, and BWI. The relatively rapid increase in absolute figures can, just like for the Asian countries (see above), be considered as a catch-up effect. The reduction in shortfall is about the same as for the other developing economies. From 1988-1992, however, the countries included in soc2 scored relatively negatively. Finally, it can be seen that the five major oil-exporting countries included in 'oil', experienced a relatively rapid improvement on all three indices, both measured in terms of an increase in absolute numbers and as the reduction in shortfall. It seems that the relatively high per capita incomes of those countries have led, after some time, to a better provision of basic needs.

IV. Conclusion

In this paper, three well-being indices (HDI^S, PQLI, and BWI) are constructed for a number of years for 133 countries. It is argued that Sen's functioning's approach to well-being provides a firm theoretical basis for the use of the social indicators making up these indices for the measurement and assessment of (basic) well-being. The method used to construct HDI^S, PQLI, and BWI ensures that they are comparable not only between

⁹ A more formal analysis of the impact of the economic system on basic well-being is presented in Van der Lijn (1995). In that paper, regression estimates are given for several models containing HDI^S, PQLI, and BWI as dependent variables and the economic system, the level of political democracy, and the level of economic development as the principal explanatory variables. See Stuart (1984) and Burkett (1985) for earlier studies on the systemic impact on PQLI.

¹⁰ Ellman (1994) stressed that data on capabilities are a very useful source of information about welfare for the economies in transition. He analyzed developments in mortality and morbidity for Russia for 1988-1993 and concluded that the health situation had deteriorated significantly. The deterioration started under late perestroika and accelerated since the collapse of the Soviet Union late 1991.

countries for a certain year, but also over time. Apart from using these indices for comparisons of development progress for individual or various groups of countries, as is briefly done in section III, their availability might contribute to empirical analysis concerning the relationship between well-being and those factors, like economic development, that are considered to be related to or influencing well-being. In section III, the achievements of various groups of countries are compared in terms of the increase in absolute numbers of HDI^S, PQLI, and BWI, and in terms of the reduction in shortfall from the maximum level. Two of the observations made in this section are repeated here. First, the average reduction in shortfall of the African countries from 1975-1992 was about 20%, while the countries of the other continents on average experienced a reduction in shortfall of 30-35%. Second, the average values of the basic well-being indices for the socialist countries included in soc1 are relatively high. Moreover, from 1975-1988, the developing economies included in soc1 did relatively well. The achievements from 1975-1988 of the socialist industrial countries as compared to the capitalist industrial countries, however, are much less favourable. On each index, measured either in absolute terms or as the reduction in shortfall, the socialist industrial countries scored much worse. From 1988-1992, the developments of the (mainly) postsocialist countries relative to other developing or industrial countries are either comparable to, or show a worsening of, the relative achievements from 1975-1988.

Appendix

In collecting the data for each indicator it was tried, on the one hand, to make use of only one (main) source for a certain year or, even better, for several years. It may be expected that, in general, using one source for a particular indicator for a certain year improves the comparability of the data. On the other hand, it was aimed to obtain consistent time series. It turned out that these two goals were sometimes incompatible. Considering that different sources sometimes give different figures, and, hence, that it is unclear which figure most adequately reflects the existing situation, it was sought to balance the virtue of using one source against the virtue of consistent time series for every indicator. In one case it was not the apparent inconsistency of the data, but the differing methodology underlying the data that led to the use of another source. It is well-known that, until recently, official infant mortality figures for the former Soviet Union were not based on the WHO methodology. Estimates aiming to adjust for this difference in methodology are used. Moreover, both the life expectancy at birth and the adult literacy figures reported in the official Soviet statistical yearbooks are lower than those reported in World Bank and UNDP publications, respectively. In both cases, the official Soviet data are taken.¹¹

The data in the yearbooks and other publications used to construct the data set are usually derived from many sources and inevitably cover a wide range of data reliability. Mostly, the data are official government data received by the responsible United Nations system agencies or other international organizations. For cases in which there are no reliable official figures, estimates by either the responsible agency, UNDP, or the World

¹¹ Using World Bank figures for the Soviet Union for both life expectancy at birth and infant mortality, and United Nations figures for literacy, would lead to somewhat higher values for HDI^S, PQLI, and BWI, as can be seen in Table A1 below.

TABLE A1 Comparison of HDI^S, PQLI, and BWI for the Soviet Union reported in Table 3 with the values obtained by using World Bank and UN figures

	HDI ^S			PQLI				BWI			
	'80	'85	'88	'75	'80	'85	'88	'75	'80	'85	'88
Table 3	77	77	78	86	85	86	87	88	88	89	90
Based on World Bank/UN figures	80	79	79	87	88	88	88	89	90	91	91

Bank are published, often based on field information or comparable country data. Detailed information on the sources and methods of calculation is given below.

(1) Life expectancy at birth data for 1975, 1980, and 1985 are taken from Barro and Lee (1994), for 1988 from World Bank, *World Development Report* 1990 (WDR), and for 1992 from UNDP, *Human Development Report* 1994 (HDR), with the following exceptions.¹² Data for 1975, 1980, and 1985 for Angola, Libya, Cuba, Burma (Myanmar), Laos, Mongolia, North Korea, Vietnam, South Yemen, Albania, Bulgaria, Czechoslovakia, East Germany, and Romania come from WDR, various years. The figure for 1985 for Iran as well as the figures for 1975 and 1980 for Afghanistan are taken from WDR. For 1985 and 1988 the data for Afghanistan are calculated from United Nations, *Statistical Yearbook*, various years (UNSY), and from HDR, various years. Data for 1975, 1980, and 1985 for Guinea are calculated from UNSY, various years. The figure for 1985 for East Germany is taken from UNSY 1990/91. For the Soviet Union, the figure for 1975 comes from Naselenie 1988 (p.493), and the data for 1980, 1985, and 1988 come from Narkhoz 1990 (p.94). The figures for Cambodia are calculated from UNSY, various years, and HDR 1990. The figures for 1988 for Botswana, Liberia, Madagascar, and Zimbabwe from WDR 1990 strongly differ from their time trends; considering the time trends and using additional data from WDR, for 1987, and from HDR, for 1987 and 1990, the corrected figures used are 59, 54, 54, and 59, respectively.

Life expectancy at age 1 is constructed from the data for life expectancy at birth and infant mortality. The following formula was applied:

$$\begin{aligned} \text{LE}(0) &= \text{Infm} * \text{AVG} + (1-\text{Infm}) * \text{LE}(1), \text{ or} \\ \text{LE}(1) &= [\text{LE}(0) - (\text{Infm} * \text{AVG})] / (1-\text{Infm}), \end{aligned}$$

where LE(0) is life expectancy at birth, LE(1) is life expectancy at age 1, Infm is the number of deaths of infants under one year of age divided by the total number of live births, and AVG is the average time infants live who die in their first year of life. The 'rule of thumb' among demographers is that AVG is about a quarter of a year in countries with high infant mortality, and about half a year for countries with low infant mortality (personal communication). In the calculation, AVG was considered to be 0.25 for countries with an infant mortality rate of 100 per thousand live births or more, 0.5 for countries with

¹² The commonly used definition of life expectancy at birth is "the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life" (see, for example, WDR 1990, p.x, and HDR 1994, p.221).

an infant mortality rate of 10 per thousand live births or less, and in between 0.25 and 0.5 for countries with infant mortality rates in between 10 and 100 per thousand live births (for example, for $\text{Infm}=0.028$, $\text{AVG}=0.45$; for $\text{Infm}=0.046$, $\text{AVG}=0.40$; etc.).

(2) Infant mortality data (number of deaths of infants under one year of age per thousand live births) for 1970 are taken from World Bank, *World Bank Atlas 1985* (WBA), and for 1975, 1980, and 1985 come from Barro and Lee (1994), with the following exceptions. All data, except for 1970, for Angola, Guinea, Libya, Cuba, Laos, Mongolia, North Korea, Vietnam, South Yemen, Albania, Bulgaria, Czechoslovakia, East Germany, and Romania come from WDR, various years. The figure for 1975 is, for all of these countries except for Laos, Bulgaria, Czechoslovakia, and East Germany, obtained by averaging the figures reported for 1970 and 1980. For Bulgaria the figure for 1975 is a weighted average of the figures for 1970 and 1977; for Laos the figures for 1975 and 1980 are weighted averages of the figures for 1970 and 1982 (from WBA); for Guinea the figure for 1985 is a weighted average of the figures for 1980 and 1986. The data for the Soviet Union are taken from Ksenefontova (1994, Table 20.4).¹³ Data for Cambodia for 1985 and 1988 are calculated from UNSY. For 1975, the figure is considered to be equal to the maximum value (230 deaths per thousand live births); the figure for 1980 is the average of the figures for 1975 and 1985. For Afghanistan, the figure for 1975 is the average of the figures for 1970 and 1980 (from WDR), while the figures for 1985 and 1988 are the weighted averages of the figures for 1980 and 1991 (taken from HDR 1991). For Burma (Myanmar), the figure for 1980 comes from UNSY. Figures for 1985 and 1988 are weighted averages of this figure and the figure for 1990 (also from UNSY); the figure for 1975 is the average of the figures for 1970 and 1980.

For 1988, the data are taken from WDR 1990. However, for a number of countries, the figure for 1988 in WDR either strongly differs from its time trend, or is mentioned to be non-available. Inspecting additional information from WDR, for 1986, and from UNSY and HDR, for various years, led to the use of other sources for part of the countries concerned. Hence, data for 1988 for Botswana, Burundi, Congo, Gambia, Guinea Bissau, Senegal, Swaziland, Zimbabwe, Guyana, and Cyprus come from UNSY, while the figures for Cuba, Jamaica, Trinidad and Tobago, Sri Lanka, Albania, and Fiji are obtained by averaging the figures for 1985 and 1991 (as published in HDR 1991).

¹³ Official Soviet infant mortality data are not based on the WHO methodology. The estimates discussed in Ksenefontova (1994) are (upward) adjusted figures based on the WHO methodology. In particular, for 1975 the estimate proposed by Anderson and Silver is used, while for the other years the estimates by Ksenefontova are taken.

Infant mortality data for 1992 for developing countries come from HDR 1994 and for industrial countries from WDR 1994 (classification according to HDR). The figure for Czechoslovakia is the weighted average of the figures reported for the Czech and Slovak Republic.

(3) Adult literacy is the percentage of the population of 15 years of age or more who can, with understanding, both read and write a short simple statement on everyday life. Data for 1975, 1980, 1985, and 1990, their sources, and the method of calculation are given in Table A2. Data for 1988 are constructed by taking the weighted average of the data for 1985 and 1990.¹⁴ Data for 1992 are taken from HDR 1994. As in HDR, the maximum value for adult literacy is taken to be 99.0%. Data for 1990 in HDR, UNSY, and WDR are almost the same, except for the data for Eastern European countries in HDR and UNSY being somewhat lower than the figures reported in WDR (especially for Albania and Bulgaria). For the other years, different sources often report different figures. In constructing the literacy data set, the data published in HDR served as the starting point. The next step was to add data (mostly referring to other years) from other UN sources. Finally, some figures were taken from WDR and Kurian (1979).

(4) Gross enrolment in secondary education is the total number of people enrolled in secondary education as a percentage of the number of (secondary) school-age children. If reported figures exceed hundred percent, the figure is rounded off to 100. For 1975, 1980, and 1985 the data come from Barro and Lee (1994), while for 1988, 1992, and for other years the data come from UNESCO (mainly 1993 and 1994). Exceptions are described below. All data for Cuba, Laos, Mongolia, Vietnam, South Yemen, Albania, Bulgaria, Czechoslovakia, East Germany, Romania, and the Soviet Union come from UNESCO, various years. Also taken from UNESCO are figures for Angola (for 1980 and 1985), Guinea (1975 and 1980), Ivory Coast (1975 and 1980), Liberia (1985, this figure refers to 1984), Venezuela (1980 and 1985), Guyana (1985), Afghanistan (1980), Burma (Myanmar; 1985), Austria (1980 and 1985), West Germany (1975, 1980, and 1985)¹⁵,

¹⁴ Figure for 1988 = 0.4 * [figure for 1985] + 0.6 * [figure for 1990].

¹⁵ The figures reported for West Germany in Barro and Lee (1994), especially for 1975 and 1980, seem to be far too low.

TABLE A2 Literacy: percentage of adult population considered to be literate

	1975 (1)	1980 (2)	1985 (3)	1990 (4)	a-75 (5)	a-80 (6)
AFRICA						
1 Algeria	33.3 a	42.0	48.6	57.4	71,80	
2 Angola	19.8 a	27.5	35.7	41.7	70,80	
3 Benin	16.3 a	16.9 a	18.7	23.4	70,79	79,85
4 Botswana	49.9 a	61.0	70.0	73.6	71,80	
5 Burkina Faso	8.8	11.5	14.5	18.2		
6 Burundi	22.0 a	24.0	42.1	50.0	70,80	
7 Cameroon	39.8 a	49.0	48.0	54.1	70,76	
8 Central Afr.R.	18.2	33.5	31.5	37.7		
9 Chad	16.3 a	21.5	23.0	29.8	70,80	
10 Congo	46.0 a	57.0	51.7	56.6	70,80	
11 Egypt	37.7 a	42.0	44.6	48.4	70,76	
12 Ethiopia	19.5 a	34.7 a	50.0	66.0	70,85	70,85
13 Gabon	43.3 a	53.5	56.1	60.7	70,80	
14 Gambia	15.0 w	20.5	20.3	27.2		
15 Ghana	39.5 a	48.0	52.8	60.3	70,80	
16 Guinea	19.3 a	24.5	16.8	24.0	70,80	
17 Guinea Bissau	15.3 a	19.0	30.2	36.5	70,79	
18 Ivory Coast	23.5 a	29.0	48.7	53.8	70,80	
19 Kenya	40.8 a	49.5	65.0	69.0	70,80	
20 Lesotho	65.5 a	69.5	72.6	78.0	70,80	
21 Liberia	21.3 a	30.0	32.3	39.5	74,80	
22 Libya	42.4 a	51.0	56.5	63.8	73,80	
23 Madagascar	55.8 a	61.5	76.9	80.2	70,80	
24 Malawi	33.3 a	36.5	41.7	47.0	70,80	
25 Mali	9.2 a	13.5	22.7	32.0	70,76	
26 Mauritania	17.4 76	22.5 a	27.5	34.0		76,85
27 Mauritius	73.5 a	79.0	83.1	86.0	70,80	
28 Morocco	25.0 a	29.5	41.7	49.5	71,80	
29 Mozambique	24.5 a	27.0	27.6	32.9	70,80	
30 Niger	7.0 a	10.0	21.5	28.4	70,80	
31 Nigeria	29.5 a	34.0 d	42.7	50.7	70,80	
32 Rwanda	35.9 a	50.0	45.4	50.2	70,78	
33 Senegal	17.3 a	22.5	32.1	38.3	70,80	
34 Sierra Leone	18.5 a	24.0	13.3	20.7	70,80	
35 Somalia	4.6 a	6.1 d	16.9	24.1	70,80	
36 South Africa	75.8 a	81.0	85.0	70.0	70,80	
37 Sudan	21.5 a	26.0	24.4	27.1	70,80	

TABLE A2 Adult literacy - *continued*

	1975 (1)	1980 (2)	1985 (3)	1990 (4)	a-75 (5)	a-80 (6)
38 Swaziland	55.2 76	61.0	68.0	72.0		
39 Tanzania	41.3 a	47.9 a	52.0	65.0	70,78	78,85
40 Togo	21.8 a	26.5	37.9	43.3	70,80	
41 Tunisia	38.0	47.5	57.6	65.3		
42 Uganda	40.3 a	39.5	42.8	48.3	70,80	
43 Zaire	48.8 a	55.5	65.9	71.8	70,80	
44 Zambia	60.3 a	68.5	67.4	72.8	70,80	
45 Zimbabwe	62.0 a	69.0	62.3	66.9	70,80	
C. & N. AMERICA						
46 Canada	99.0 w	99.0 w	99.0	99.0		
47 Costa Rica	89.4 a	92.0	91.8	92.8	73,80	
48 Cuba	89.0 a	91.0	92.4	94.0	70,80	
49 Dominican R.	70.5 a	74.0	80.4	83.3	70,80	
50 El Salvador	62.0	66.5	68.8	73.0		
51 Guatemala	47.6 a	51.5	51.9	55.1	73,80	
52 Haiti	24.9 a	29.0	47.9	53.0	71,80	
53 Honduras	57.9 a	63.0	68.0	73.1	74,80	
54 Jamaica	94.3 a	91.5	98.0	98.4	70,80	
55 Mexico	76.1 a	78.0	84.7	87.3	70,80	
56 Nicaragua	63.4 a	70.7 a	78.0	81.0	71,85	71,85
57 Panama	83.8 a	86.5	86.4	88.1	70,80	
58 Trin. & Tob.	93.9 a	95.5	95.0	96.0	70,80	
59 USA	99.0 w	99.0	99.0	99.0		
SOUTH AMERICA						
60 Argentina	93.6 a	94.5	94.8	95.3	70,80	
61 Bolivia	62.2 a	68.5	72.5	77.5	70,76	
62 Brazil	74.1 a	74.5	78.5	81.1	70,76	
63 Chile	90.8 a	92.5	92.2	93.4	70,80	
64 Colombia	82.0 a	85.0	84.7	86.7	73,80	
65 Ecuador	75.0 a	79.0	83.0	85.8	74,80	
66 Guyana	93.1 a	94.5	95.4	96.4	70,80	
67 Paraguay	82.5 a	86.5	88.3	90.1	72,80	
68 Peru	76.3 a	82.5	82.0	85.1	72,80	
69 Uruguay	93.9	95.0	95.3	96.2		
70 Venezuela	78.5 a	81.0	85.7	88.1	71,80	
ASIA						
71 Afghanistan	12.2	16.0	24.1	29.4		
72 Bangladesh	26.3 a	28.7 a	32.2	35.3	74,81	74,81

TABLE A2 Adult literacy - *continued*

	1975 (1)	1980 (2)	1985 (3)	1990 (4)	a-75 (5)	a-80 (6)
73 Burma	73.0 a	78.0	78.0	80.6	73,80	
74 Cambodia	25.5 b	27.2 b	28.8	35.2		
75 China	62.3 a	65.0	68.2	73.3	60,80	
76 Cyprus	89.0 76	89.5	92.7 a	94.0		80,87
77 Hong Kong	80.9 a	85.5	88.0	90.0	71,80	
78 India	36.9 a	40.5	44.1	48.2	71,80	
79 Indonesia	63.4 a	72.0	71.8	77.0	71,80	
80 Iran	35.3 a	42.5	47.7	54.0	70,76	
81 Iraq	42.0 a	50.0	52.4	59.7	70,80	
82 Israel	90.0 a	93.5	95.0	95.8	72,80	
83 Japan	99.0 w	99.0	99.0	99.0		
84 Jordan	64.2 a	70.0	74.2	80.1	70,76	
85 North Korea	90.0 77	90.0 a	90.0	96.0		77,85
86 South Korea	89.8 a	92.0	94.7	96.3	70,80	
87 Kuwait	59.6	63.0	70.6	73.0		
88 Laos	38.0 a	43.5	50.0	54.0	70,80	
89 Malaysia	65.0 a	70.0	74.0	78.4	70,80	
90 Mongolia	85.0 a	89.5	91.0	93.0	70,80	
91 Nepal	19.2	20.4 a	22.4	25.6		75,81
92 Oman	26.6 b	28.3 b	30.0	35.0		
93 Pakistan	21.5 a	23.0	31.0	34.8	72,77	
94 Philippines	83.0 a	83.3 e	87.7	89.7	70,80	
95 Saudi Arabia	16.3 a	23.5	57.9	62.4	70,80	
96 Singapore	74.0 a	79.0	83.0	88.0	70,80	
97 Sri Lanka	81.5 a	86.5	86.7	88.4	71,80	
98 Syria	46.8 a	53.5	59.1	64.5	70,80	
99 Thailand	83.3 a	88.0	90.7	93.0	70,80	
100 Turkey	60.3 d	67.5	76.0	80.7		
101 Un. Arab Em.	53.5	56.8 a	60.0	55.0		75,85
102 Vietnam	65.0 77	72.3 a	84.4	87.6		77,85
103 North Yemen	10.5 a	13.0	32.4 c	38.5 c	70,80	
104 South Yemen	26.0 a	32.0	32.4 c	38.5 c	70,80	
EUROPE						
105 Albania	70.0 77	75.6 a	85.0	85.0		77,85
106 Austria	99.0 w	99.0 w	99.0	99.0		
107 Belgium	99.0 w	99.0	99.0	99.0		
108 Bulgaria	93.3 a	94.5	93.0	93.0	70,80	
109 Czechoslov.	99.0 77	99.0 a	99.0	99.0		77,85

TABLE A2 Adult literacy - *continued*

	1975	1980	1985	1990	a-75	a-80
	(1)	(2)	(3)	(4)	(5)	(6)
110 Denmark	99.0 w	99.0 w	99.0	99.0		
111 Finland	99.0 w	99.0 w	99.0	99.0		
112 France	99.0 w	99.0	99.0	99.0		
113 E. Germany	99.0 77	99.0 f	99.0 f	99.0 f		
114 W. Germany	99.0 w	99.0 w	99.0	99.0		
115 Greece	86.2 a	88.5	93.0	93.2	71,80	
116 Hungary	98.3 a	98.5	99.0	99.0	70,80	
117 Ireland	98.0 w	98.0 w	99.0	99.0		
118 Italy	94.6 a	95.5	97.0	97.1	71,80	
119 Netherlands	99.0 w	99.0 w	99.0	99.0		
120 Norway	99.0 w	99.0 w	99.0	99.0		
121 Poland	98.4 a	98.5	98.0	98.0	70,78	
122 Portugal	76.3 a	80.5	85.0	85.0	70,80	
123 Romania	94.8 a	95.5	96.0	96.0	70,80	
124 Soviet Union	98.0 a	98.0 g	98.0 g	98.0 89	70,89	
125 Spain	92.4	93.5	95.0	95.4		
126 Sweden	99.0 w	99.0 w	99.0	99.0		
127 Switzerland	99.0 w	99.0 w	99.0	99.0		
128 Un. Kingdom	99.0 w	99.0 w	99.0	99.0		
129 Yugoslavia	85.1 a	87.0	92.0	92.7	71,80	
OCEANIA						
130 Australia	99.0 w	99.0 w	99.0	99.0		
131 Fiji	79.0 76	82.5	85.5 e	87.0		
132 New Zealand	99.0 w	99.0 w	99.0	99.0		
133 Papua NGuin.	35.2 a	39.0	46.7	52.0	71,80	

Note. For some countries, the figure in column (1) does not refer to 1975. This is indicated by adding the year where the figure does refer to. a. This figure is a (weighted) average of the figures for the years given in column (5), for 1975, or column (6), for 1980. For example, the figure for 1975 for Algeria is equal to $5/9$ *[the figure for 1971] + $4/9$ *[the figure for 1980]. b. No reliable data are available for 1975 and 1980 for Oman and Cambodia. Estimates are obtained by assuming that the ratio of literacy in 1975 and 1980 in Oman and Cambodia, respectively, to the mean of literacy in all other countries in 1975 and 1980 was equal to the observed ratio in 1985. c. These figures refer to Yemen as a whole.

Sources. Figures for 1970, 1985, and 1990 come from UNDP, *Human Development Report*, various years; figures for 1980 are the unweighted averages of male and female literacy, as published in UNICEF, *The State of the World's Children* 1985; figures for other years are from United Nations, *Statistical Yearbook*, various years (UNSY; when the figures for a certain year were

not the same in various Statistical Yearbooks, the figure published in the most recent edition was selected). Exceptions (for 1970 only): the data for Guinea Bissau, Lesotho, Malawi, Mauritius, South Africa, Tanzania, USA, Laos, Mongolia, and South Yemen come from UNICEF, for Ethiopia, Trinidad and Tobago, Argentina, Guyana, South Korea, Philippines, Singapore, and Thailand the data come from UNSY, and data for Mexico, Brazil (also for 1976), Pakistan (for 1977), and Poland come from UNESCO, *Statistical Yearbook*, various years. Data in column (1) for North Korea, Vietnam, Albania, Czechoslovakia, and East Germany are taken from Kurian (1979). The figure for China for 1960 comes from WDR. d. Taken from UNESCO. e. Taken from UNSY. f. The figures for East Germany for 1980, 1985, and 1990 are based on the assumption that literacy in these years was at least at the level of the mid-1970s. g. The figure for 1989 for the Soviet Union is taken from Narkhoz 1990 and is equal to the figure for 1970 reported in HDR 1993. It is assumed that literacy was at a constant level in the period 1970-1989. UNICEF reports 98.5 for 1980, while HDR gives 99.0 for both 1985 and 1990. w. Taken from World Bank, *World Development Report*, various years.

Switzerland (1985), and Australia (1975, 1980, and 1985).¹⁶ The figures for Angola (for 1975), Congo (1980), Madagascar (1980), Libya (1980 and 1985), Cambodia (1975), and South Korea (1988) come from WDR. The figures for 1985 for Gabon and Cambodia, and for 1988 for Cambodia come from UNICEF (the figures are referring to 1983-86, for 1985, and 1986-89, for 1988). The figures for 1988 for Zaire, Ecuador and Hong Kong refer to 1987, for Dominican Republic this figure refers to 1986.

For a number of countries the figure for 1988 is calculated by taking the (weighted) average of figures for other years. This is the case for (relevant years in parentheses): Benin (85,89), Gambia (87,91), Mali (87,89), Mozambique (87,90), South Africa (86,89), Sudan (86,90), Guatemala (87,91), Honduras (86,91), Laos (87,89), Sri Lanka (87,89), and Portugal (87,89). For 1980 this is the case for Chad (76 [from UNICEF],85), Cambodia (75,85), and Switzerland (75,85), and for 1985 for Madagascar (84,87) and South Africa (80,86). For some countries it was not possible to use interpolation to estimate missing data. Estimates for 1988 for Congo, Gabon, Liberia, Libya, and Somalia are obtained by assuming that gross secondary school enrolment for each respective country increased by the same percentage as the average increase from 1985 to 1988 of all other countries (except for North Korea). The same assumption is made for 1985 for Congo (increase in

¹⁶ The Barro and Lee (1994) data on gross secondary school enrollment are mainly from UNESCO. For some countries, UNESCO 1993 reports substantially other figures than earlier yearbooks. For Venezuela, Austria and Australia the revised figures are taken. In earlier yearbooks, the figure for Austria for 1975 is equal to the figure for 1980. Hence, the (revised) figure for 1975 is assumed to be equal to the figure for 1980 in UNESCO 1993. For Venezuela, the figure for 1975 is, as in earlier yearbooks, taken to be equal to the figure for 1985 in UNESCO 1993.

percent from 1980 to 1985 is the same as the average increase in percent of 131 other countries), and for 1975 for Libya and North Korea (decrease in percent from 1980 to 1975 is the same as the average decrease in percent of 131 other countries). The figure for 1992 for Yemen is calculated as the weighted average of the figures reported for North Yemen (for 1990) and South Yemen (1989).

For North Korea no reliable data are available at all. The figures for average years of schooling (indicator 5) are used as a proxy for gross secondary school enrolment. The ratio of gross secondary school enrolment in North Korea to the mean value in all other countries was set equal to the ratio of average years of schooling in North Korea to the mean of average years of schooling in all other countries. The constructed figures for 1975, 1980, 1985 and 1988 are 56, 66, 66, and 66, respectively. Comparing these figures with data for other state socialist countries, it seems that they probably underestimate the true figures for North Korean gross secondary school enrolment.

(5) Average years of schooling refers to the average schooling years in the total population over age 25. Data for 1980 come from HDR 1991, for 1990 from HDR 1993, and for 1992 from HDR 1994. The figures for 1985 and 1988 are calculated as a weighted average of the figures reported for 1980 and 1990.¹⁷ In HDR 1993, no figure is published for 1990 for former Yugoslavia. The figure for 1985 is taken from Barro and Lee (1994). For 1988 it is assumed that the average years of schooling in Yugoslavia increased from 1985 to 1988 with the same percentage as the average increase in all other countries from 1985 to 1988. For East Germany, no figures are published in HDR. They are estimated to be equal to the simple average of the figures for the other European members of the CMEA (Bulgaria, Czechoslovakia, Hungary, Poland, Romania, and the Soviet Union).

References

- Barro, Robert, and Lee, Jong-Wha. Data set on floppies, Harvard University, 1994. For some information on the data set and how to obtain it, see R. Barro and X. Sala-i-Martin, *Economic Growth*, chapter 10, New York: McGraw-Hill, 1995.
- Baster, in J. Hilhorst and M. Klatter, eds., *Social Development in the Third World - Level of Living Indicators and Social Planning*, The Hague: Institute of Social Studies & London: Croom Helm, 1985.

¹⁷ Figure for 1985 = 0.5 * [figure for 1980] + 0.5 * [figure for 1990]; figure for 1988 = 0.2 * [figure for 1980] + 0.8 * [figure for 1990].

- Burkett, John. "Systemic Influences on the Physical Quality of Life: A Bayesian Analysis of Cross-Sectional Data." *Journal of Comparative Economics* 9, 2:145-163, 1985.
- Clavijo, Sergio. "Variations on the Basic Needs Yardstick: An Application to Colombia." *World Development* 20, 8:1219-1223, 1992.
- Drewnowski, Jan. *On Measuring and Planning the Quality of Live*, The Hague: Mouton, published for the Institute of Social Studies, 1974.
- Ellman, Michael. "The increase in death and disease under 'katastroika'." *Cambridge Journal of Economics* 18, 329-355, 1994.
- Horvat, Branko. "Welfare of the common man in various countries." *World Development* 2, 7:29-39, July 1974.
- Kornai, Janos. *The Socialist System - The Political Economy of Communism*, Oxford: Oxford University Press, 1992.
- Ksenefontova, Natalia. "Trends in Infant Mortality in the USSR," in W. Lutz, S. Scherbov, and A. Volkov, eds., *Demographic Trends and Patterns in the Soviet Union before 1991*, London and New York: Routledge, 1994.
- Kurian, G. *The book of World Rankings*, New York: Facts of File, 1979.
- Morris, Morris D. *Measuring the Condition of the World's Poor*, New York: Pergamon, published for the Overseas Development Council, 1979.
- Narkhoz. *Narodnoe Khozyaistvo SSSR*. Moscow: Goskomstat SSSR, various years.
- Naselenie. *Naselenie SSSR 1988*. Moscow: Goskomstat SSSR.
- Newman, Barbara, and Thomson, Randall. "Economic Growth and Social Development: A Longitudinal Analysis of Causal Priority." *World Development* 17, 4:461-471, 1989.
- Organization for Economic Co-operation and Development. *Measuring Social Well-Being: A Progress Report on the Development of Social Indicators*, Paris: OECD, 1976.
- Organization for Economic Co-operation and Development. *The OECD List of Social Indicators*, Paris: OECD, 1982.
- Organization for Economic Co-operation and Development. *Living Conditions in OECD Countries: A Compendium of Social Indicators*, Paris: OECD, 1986.
- Sen, Amartya. *Choice, Welfare and Measurement*, Oxford: Basil Blackwell, 1982.
- Sen, Amartya. *Commodities and Capabilities*, Hennisman Lectures in Economics, Vol. 7, Amsterdam: North-Holland, 1985.
- Sen, Amartya. *The Standard of Living*, The Tanner Lectures, Cambridge: Cambridge University Press, 1987.
- Stuart, Edward. "The PQLI as a Measure of Comparative Economic Performance." *ACES Bulletin* (now: *Comparative Economic Studies*), 43-53, Winter 1984.

Summers, Robert, and Heston, Alan. "Improved International Comparisons of Real Product and Its Composition, 1950-1980." *Review of Income and Wealth* 30, 2:207-262, June 1984.

Summers, Robert, and Heston, Alan. "A New Set of International Comparisons of Real Product and Price Levels Estimates for 130 Countries, 1950-1985." *Review of Income and Wealth* 34, 1:1-25, March 1988.

Summers, Robert, and Heston, Alan. "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950-1988." *Quarterly Journal of Economics*, 327-368, May 1991.

UNDP. *Human Development Report*, various years.

UNESCO. *Statistical Yearbook*, various years.

UNICEF. *The State of the World's Children*, various years.

United Nations. *Report on the International Definition and Measurement of Levels of Living*, New York: UN, 1954.

United Nations. *Statistical Yearbook*, various years.

Van der Lijn, Nick. "Well-being, democracy, and the economic system: an empirical analysis." Mimeo, *Tilburg University*, 1995.

World Bank. *World Bank Atlas*, various years.

World Bank. *World Development Report*, various years.