Explanation note on 2010 HDR composite indices

Turkey

Explaining HDI value and rank changes in *Human Development Report 2010*

Introduction

The 2010 Human Development Report introduces several minor but still significant adjustments in the indicators and methodology used to calculate the Human Development Index. These changes incorporate newly available data sets and further strengthen the HDI's statistical integrity. This note explains those technical adjustments and the reasoning behind them, as well as the impact of these changes on this year's HDI values and ranks.

Readers are advised to assess progress in the HDI value by referring to Table 2 'Human Development Index Trends' in the Statistical Annex of the report. Table 2 is based on consistent indicators, methodology and time series data and thus shows real changes in values and ranks over time reflecting the actual progress countries have made. It is misleading and inappropriate to compare values and rankings across published reports, because the underlying data and methods have changed.

This year's Report introduces three new composite indices on an experimental basis – Inequality-adjusted HDI, the Gender Inequality Index, and the Multidimensional Poverty Index. This note illustrates and explains Turkey's achievements with respect to each of these indices. For details on how each index is calculated please refer to Technical Notes 1-4 in the 2010 report, and the associated report background papers.

Changes to the HDI

Indicators

The HDI is a summary measure for assessing long-term progress in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. In previous reports these basic dimensions were measured by life expectancy at birth; adult literacy rate and combined gross enrolment in education; and GDP per capita in purchasing power parity US dollars (PPP US$) respectively. The indicators measuring access to knowledge and a decent standard of living have changed in the tables in this report.

Access to knowledge is measured by: i) mean years of adult education, which is the average number of years of education received in a life-time by people aged 25 years and older; and ii) expected years of schooling for children of school-entrance age, which is the total number of years of schooling a child of school-entrance age can expect to receive if prevailing patterns of age-specific enrolment rates stay the same throughout the child's life. These new measures are used because a number of countries, especially those at the top of the HDI ladder, have achieved high levels of combined gross enrolment ratios and adult literacy rates. As such, the discriminatory power of these indicators has weakened. Mean years of adult education and expected years of schooling for children capture the concept of education better than the previous indicators and have stronger discriminating power across countries. These indicators are also better at capturing recent changes in education and school enrolment. However, as with the previous indicators, they do not assess quality of education.

Standard of living is now measured by Gross National Income (GNI) per capita in PPP US$, instead of Gross Domestic Product (GDP) per capita in PPP US$. While GDP is a measure of economic output, it does not reflect a country's disposable income—some profits may be repatriated abroad, some residents receive remittances from abroad, and in some cases inbound aid flows may be sizeable. GNI adjusts the GDP for these factors and is therefore a better measure of a country's level of income.

Transformation of dimension indicators

Calculating the HDI requires that the dimension indicators, which are measured in different units, are transformed to a unit-less scale ranging from zero to one. In order to make this transformation, minimum and maximum values are set for each indicator.

In this report, dimension indicators are transformed using observed maximum levels for all sub-components over the period for which HDI trends are presented (from 1980 to 2010). The minima are set as follows: for life expectancy - 20 years; for education - 0 years; and for GNI per capita - 163 (PPP US$), which is an observed minimum. The choice of minimum values is motivated by the principle of a subsistence level or 'natural zero', below which there is no possibility for human development. Transformed using these maxima and minima, the HDI provides a summary measure of a country's human development achievement relative to what is feasible at the time.

Method of aggregation

In past reports, the HDI was calculated as the arithmetic mean of the dimension indices. This method of aggregation allowed for perfect substitution between dimensions—in other words a low achievement in one dimension could be compensated for in the HDI calculation by high achievement in another dimension. This year, a multiplicative method of aggregation is used, i.e., aggregations are made using the geometric mean of the dimension indices. This approach reduces the level of substitutability between dimensions and ensures that a one per cent decline in, for example, life expectancy at birth, has the same impact on the HDI as a one per cent decline in education or income. Table A summarizes the changes made to the HDI in this year's report.

Table A: Summary of HDI reforms

Dimensions	Previous			2010		
	Indicators	Transformation		Indicators	Transformation	
		Minimum	Maximum value		Minimum	Maximum (observed values)
Health	Life expectancy at birth (years)	25	85	Life expectancy at birth (years)	20	83.2
Knowledge	Adult literacy rate (%)	0	100	Expected years of schooling	0	20.6
	Combined gross enrolment ratio (%)	0	100	Mean years of schooling	0	13.2
Standard of living	GDP per capita (PPP US$)	100	40,000 (capped)	GNI per capita (PPP US$)	163	108,211
Aggregation	Arithmetic mean			Geometric mean		

Data

Unlike past reports which presented the HDI on a two year time lag, this year's report presents HDI values and ranks for the current year 2010. Data for 2010 were available for life expectancy at birth and mean years of schooling, and data for the most recent year available were used for expected years of

schooling. For GNI per capita (PPP US$) 2010 estimates were made by applying GDP growth estimates from the IMF to the World Bank's most recent GNI per capita (PPP US$) data.

To ensure as much cross-country comparability as possible, the HDI is based primarily on international data from the UN Population Division, the UNESCO Institute for Statistics (UIS) and the World Bank.

However, because the UIS does not compile statistics on mean years of schooling, reliable estimates by renowned scholars (Barro and Lee)[1] have been used. The Barro and Lee estimates are based on school attainment data from censuses and school enrolment data compiled by UN agencies including the UIS and the UN Statistics Division.

This year, a number of countries are missing data for one or more of the four HDI components. Hence, the HDI was calculated for only 169 countries (168 UN member countries plus the Hong Kong Special Administrative Region of China). Micronesia entered the HDI table for the first time this year while Zimbabwe re-entered. Antigua and Barbuda, Bhutan, Cuba, Dominica, Eritrea, Grenada, Lebanon, Oman, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Seychelles, and Vanuatu dropped from the table because data were missing.

HDI values and ranks

Changes in the HDI values and ranks shown in the 2009 and 2010 reports result from the methodological changes described above in calculating the HDI, as well as from real underlying changes in status.

As stated earlier, the HDI values and ranks in this year's report are not comparable to those in past reports. To allow for assessments of progress in HDIs, the 2010 report includes recalculated HDIs from 1980 to 2010 for as many countries as data allow using the new methodology (see Table 2 in the Report). Unless otherwise noted, the data used in this document (taken from the Statistical Annex of the report) to assess HDI progress and ranks are based on the new HDI methodology. However, the progress and ranks presented in the chapters of the 2010 report use the 'original' HDI, also referred to as the Hybrid HDI. The Hybrid HDI uses the same method of normalization and aggregation as the new HDI.

Results

Turkey's HDI value for 2010 is 0.679—in the high human development category—positioning the country at 83 out of 169 countries and areas.

The HDI is not designed to assess progress in human development over a short time period because some of its component indicators do not change rapidly in response to policy changes. This is particularly so for mean years of schooling and life expectancy at birth. It is, however, useful to review HDI progress over the medium to long term. Between 1980 and 2010, Turkey's HDI value increased from 0.467 to 0.679, an increase of 45 per cent or average annual increase of about 1.3 per cent. With such an increase Turkey is ranked 14 in terms of HDI improvement based on deviation from fit, which measures progress in comparison to the average progress of countries with a similar initial HDI level (see Technical note 1 and Table 2 in Statistics Annex).

Table B reviews Turkey's progress in each of the HDI indicators. Between 1980 and 2010, Turkey's life expectancy at birth increased by almost 12 years, mean years of schooling increased by close to 4 years

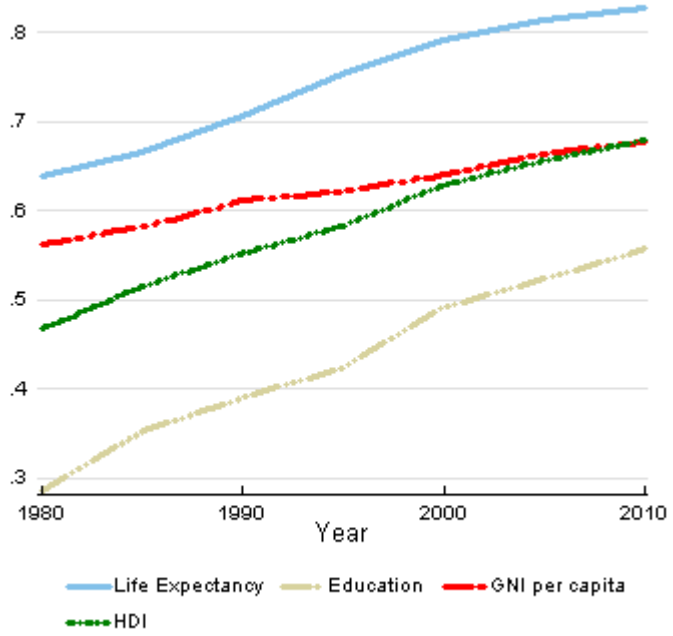
[1] **Barro, R. J. and Lee, J.W. (2010)**, "A New Data Set of Educational Attainment in the World, 1950-2010." *NBER Working Paper No. 15902*. Cambridge: National Bureau of Economic Research.

and expected years of schooling increased by almost 5 years. Turkey's GNI per capita increased by 112 per cent during the same period.

Table B: Turkey's HDI trends based on consistent time series data, new component indicators and new methodology					
	Life expectancy at birth	**Expected years of schooling**	**Means years of schooling**	**GNI per capita (PPP US$)**	**HDI value**
1980	60.3	7.0	2.9	6,291	0.467
1985	62.0	7.8	3.9	7,139	0.515
1990	64.6	8.4	4.5	8,632	0.552
1995	67.6	9.2	4.8	9,243	0.583
2000	70.0	10.8	5.5	10,422	0.629
2005	71.4	11.2	6.0	12,206	0.656
2010	72.2	11.8	6.5	13,359	0.679

Figure 1 below shows the contribution of each component index to Turkey's HDI since 1980.

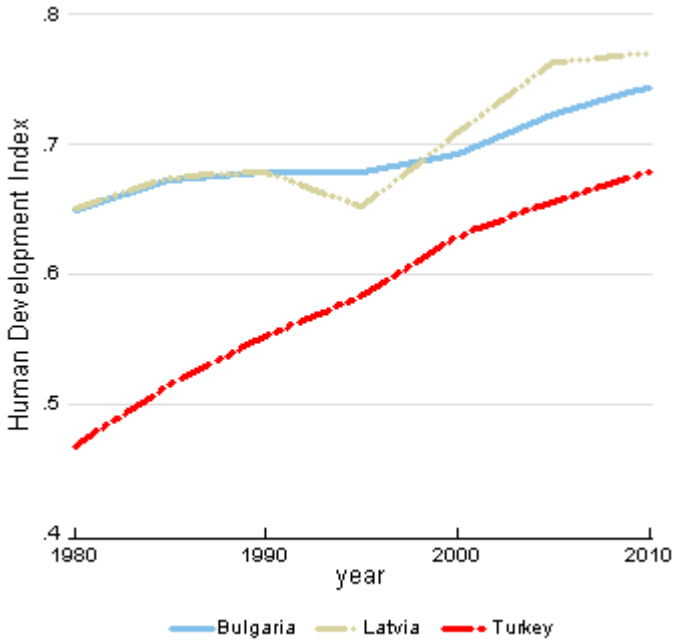
Figure 1: Trends in Turkey's HDI component indices 1980-2010



Assessing progress relative to other countries

Long-term progress can be usefully assessed relative to a country's neighbours -- both in terms of geographical location and HDI value. For instance, in 1980, Turkey, Bulgaria and Latvia had close HDI values for countries in Europe and Central Asia. However, during the period between 1980 and 2010 the three countries experienced different degrees of progress toward increasing their HDIs (See Figure 2).

Figure 2: Trends in Turkey's HDI 1980-2010



Turkey's 2010 HDI of 0.679 is below the average of 0.717 for countries in Europe and Central Asia. It is also below the average of 0.717 for high human development countries. From Europe and Central Asia, Turkey's 2010 "HDI neighbours", i.e. countries which are close in HDI rank and population size, are Serbia and Azerbaijan, which had HDIs ranked 60 and 67 respectively (see Table C). Turkey is also compared to Germany, a very high human development country.

	Table C: Turkey's HDI indicators for 2010 relative to selected countries and region					
	HDI value	**HDI rank**	**Life expectancy at birth**	**Expected years of schooling**	**Mean years of schooling**	**GNI per capita (PPP US$)**
Turkey	0.679	83	72.2	11.8	6.5	13,359
Serbia	0.735	60	74.4	13.5	9.5	10,449
Azerbaijan	0.713	67	70.8	13.0	10.2	8,747
Germany	0.885	10	80.2	15.6	12.2	35,308
Europe and Central Asia	0.717	—	70.4	13.9	9.4	12,555
High HDI	0.717	—	72.6	13.8	8.3	12,286

New Indices

Inequality-adjusted HDI

The HDI is an average measure of basic human development achievements in a country. Like all averages, the HDI masks inequality in the distribution of human development across the population at the country level. This year's report introduces the 'inequality adjusted HDI (IHDI)', a new measure for a large number of countries which takes into account inequality in all three dimensions of the HDI by 'discounting' each dimension's average value according to its level of inequality. The IHDI is thus a measure of the average level of human development that a country has achieved in the three HDI dimensions, given the existing inequality in distribution of achievements and the level of aversion to inequality which is set this year to a low level of 1. When there is no inequality in the HDI dimensions or

no aversion to inequality, the average level of human development is reflected in the HDI. In this sense, the HDI can be viewed as an index of 'potential' human development and IHDI as an index of actual human development. The 'loss' in potential human development due to inequality is given by the difference between the HDI and the IHDI, and can be expressed as a percentage. For more details see Technical note 2.

Turkey's HDI for 2010 is 0.679. However, when the value is discounted for inequality, the HDI falls to 0.518, a loss of 24 per cent due to inequality in the distribution of the dimension indices. Turkey's "HDI neighbours", Serbia and Azerbaijan, show losses due to inequality of 11 per cent and 14 per cent, respectively.

Gender Inequality Index

The new Gender Inequality Index (GII) reflects women's disadvantages in three dimensions – reproductive health, empowerment, and economic activity. Reproductive health is measured by maternal mortality and adolescent fertility rates; empowerment is measured by the share of parliamentary seats held by each gender and attainment at secondary and higher education by each gender; and economic activity is measured by the labour market participation rate for each gender. The GII replaces the previous Gender-related Development Index and Gender Empowerment Index. The GII shows the loss in human development due to inequality between female and male achievements in the three GII dimensions.

Aggregation of the GII dimensions is first done separately for each gender group using geometric means. The gender-specific means are then aggregated using harmonic means which capture the inequality between women and men and adjust for association between dimensions. Finally, the GII is expressed as the relative difference (loss) between the harmonic mean and the reference mean. The reference mean is obtained assuming equality of genders in all three GII dimensions. For more details on GII please see Technical note 3 in the Statistics Annex.

In Turkey, 9 per cent of parliamentary seats are held by women, and 27 per cent of adult women have a secondary or higher level of education compared to 47 per cent of their male counterparts. For every 100,000 live births, 44[2] women die from pregnancy related causes; and the adolescent fertility rate is 39 births per 1000 live births. Female participation in the labour market is 27 per cent compared to 75 per cent for men. The result is a GII value for Turkey of 0.621 ranking it 77 out of 138 countries based on 2008 data.

Turkey's "HDI neighbour", Azerbaijan, is ranked 62 ron this index.

Multidimensional poverty index

Since 1997, the Human Development Reports have presented the Human Poverty Index (HPI), which combines different aspects of non-monetary deprivations. The HPI has contributed to the way poverty is understood, but the measure does not capture overlapping deprivations suffered by individuals or households.

This year's report introduces the Multidimensional Poverty Index (MPI), which identifies multiple deprivations in the same households in education, health and standard of living. The education and health dimensions are based on two indicators each while the standard of living dimension is based on

[2] The maternal mortality estimates are those available at the time the report was being prepared. For updated estimates released in September 2010 refer to UNICEF (2010) "Trends in Maternal Mortality, 1990-2008". New York (also available at http://whqlibdoc.who.int/publications/2010/9789241500265_eng.pdf)

six indicators. All of the indicators needed to construct the MPI for a household are taken from the same household survey. The indicators are weighted, and the deprivation scores are computed for each household in the survey. Households with a score of 3, which is roughly equivalent to being deprived (or poor), in at least three out of ten indicators are considered multi-dimensionally poor. Households with a deprivation score between 2 and 3 are *vulnerable* to or at risk of becoming multi-dimensionally poor.

In Turkey 8 per cent of the population suffer multiple deprivations while an additional 19 per cent are vulnerable to multiple deprivations. The breadth of deprivation (intensity) in Turkey, which is the average percentage of deprivation experienced by people in multidimensional poverty, is 46 per cent. The MPI, which is the share of the population that is multi-dimensionally poor, adjusted by the intensity of the deprivations, is 0.039. Turkey's "HDI neighbours", Serbia and Azerbaijan, have MPIs of 0.003 and 0.021, respectively (see Table D).

Table D: Turkey's multiple deprivations relative to selected countries

	HDI value	MPI value	Multidimensional poverty headcount (%)	Intensity (%)	Population at risk (%)
Turkey	0.679	0.039	8.5	45.9	19.0
Serbia	0.735	0.003	0.8	40.0	3.6
Azerbaijan	0.713	0.021	5.4	38.6	12.4

Poverty has frequently been discussed in terms of income poverty. Figure 3 compares income poverty, measured by the percentage of the population living below PPP US$1.25 per day, and multidimensional deprivations in Turkey. It shows that income poverty only tells part of the story. The multidimensional poverty headcount is 6 percentage points higher than income poverty. This implies that individuals living above the income poverty line may still suffer deprivations in education, health and other living conditions. Figure 3 also shows the percentage of Turkey's population deprived in at least one indicator in each of the three dimensions: standard of living, education and health.

Figure 3: Turkey's Multidimensional deprivations compared to income poverty