THE HUMAN DEVELOPMENT INDEX AND SMALL STATES
WITH A FOCUS ON MAURITIUS

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1. Introduction

Why the HDI was created

The HDI was created so as to introduce the human factor when measuring economic development and not just the income generated, as is the case with GDP per capita.

For this reason, the HDI has three key dimensions of human development, namely:
(1) **Health:** measured by life expectancy at birth
(2) **Education:** measured by expected years of schooling for young children and mean years of schooling adults aged 25 years and more ;
(3) **Income per capita:** measure by GNI in $ Purchasing Power Parity.

Use of the FDI in various studies

The HDI can be used to compare the performance across countries in terms of the components of the index (i.e. health, education and income per capita) and also to assess how two countries with the same level per capita income can register different HDI scores.

The components of the index can also be used separately. For example, the present author has used the non-income components of the HDI to measure social development to construct a resilience index.

The Recent edition of the HDI

The 2016 HDI* with most data pertaining to 2015, covers 188 countries, making it a very useful tool for comparing countries of different level of development and of different sizes. Mariutius ranked 64 on this index.
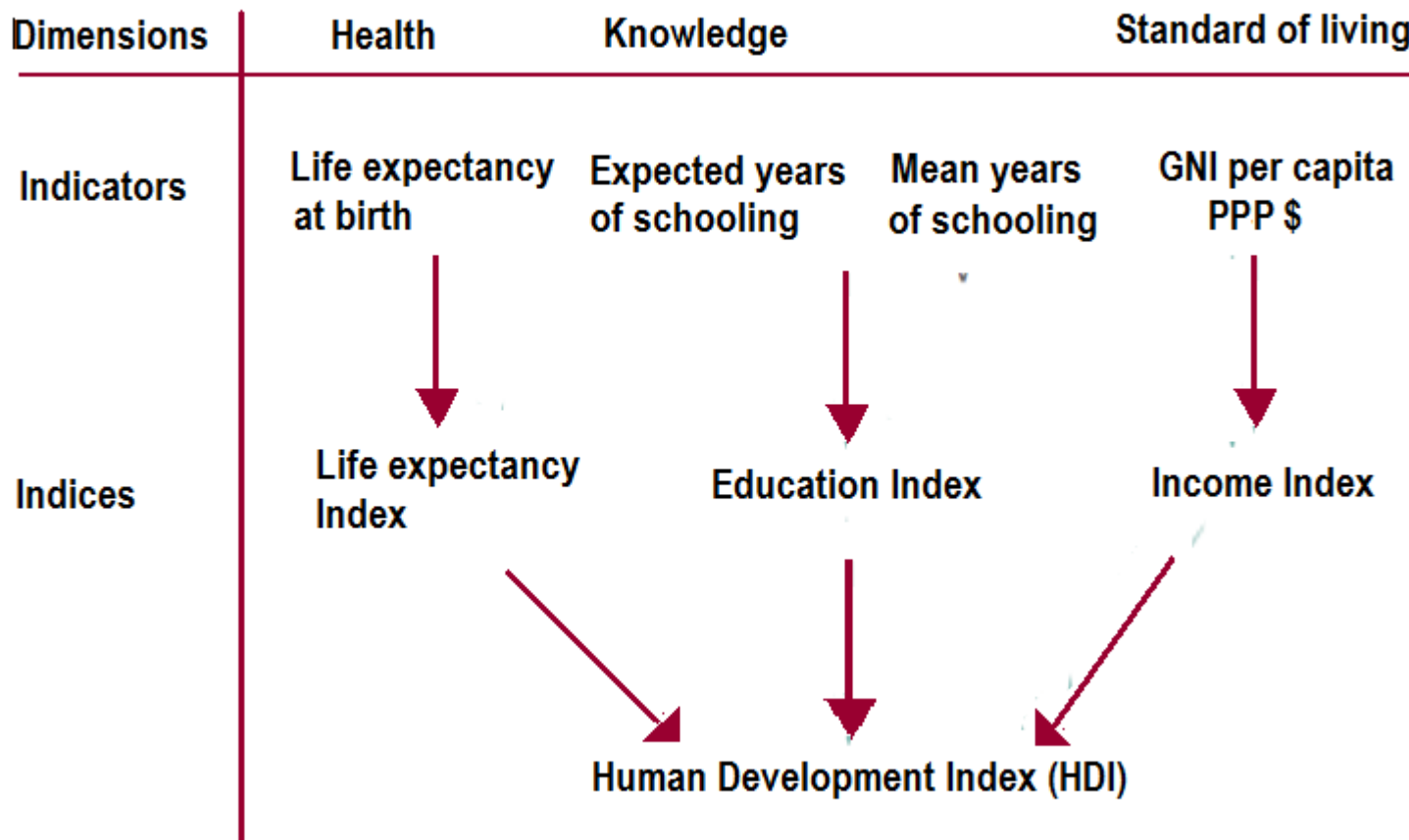
There is missing data for a few countries, namely Korea (DPR), Marshall Islands, Monaco, Nauru, San Marino, Somalia, and Tuvalu. Taiwan is probably left out for political reasons.

* available at:
http://hdr.undp.org/sites/default/files/2016_human_development_report.pdf

2. Components of the HDI

The Components of the HDI

Dimensions	Health	Knowledge		Standard of living
Indicators	Life expectancy at birth	Expected years of schooling	Mean years of schooling	GNI per capita PPP $
Indices	Life expectancy Index	Education Index		Income Index

Human Development Index (HDI)

The Components of the HDI

Although the components of the index are highly correlated, yet at the individual country level, considering the three dimensions makes a difference.

For example some countries generate a relatively high GNI per capita as a result of the natural resources endowments, but remain backword in terms of education and health, such as equatorial Guinea. Another example relates to Malaysia which has GNI per capita higher than Chile, but in Malaysia, life expectancy at birth and expected years of schooling are much shorter than in Chile, resulting in Chile having a much higher HDI value than Malaysia.

Changes over time

A look at the HDI over time shows that the rankings do not change much between one year and another in the education and health indices, with the component that changes most being GNI per capita.

The UNDP publishes a set of consistent data over time with data revisions, and according to this data it appears that Mauritius is one of the countries that improved its HDI fastest since 2010.

Small states with the highest increases in HDI scores since 2010

Almost all small states registered increases in the HDI scores since 2010. The fastest increases are those shown in the diagram, with Mauritius being one of them, even though it started from a relatively high score in 2010.
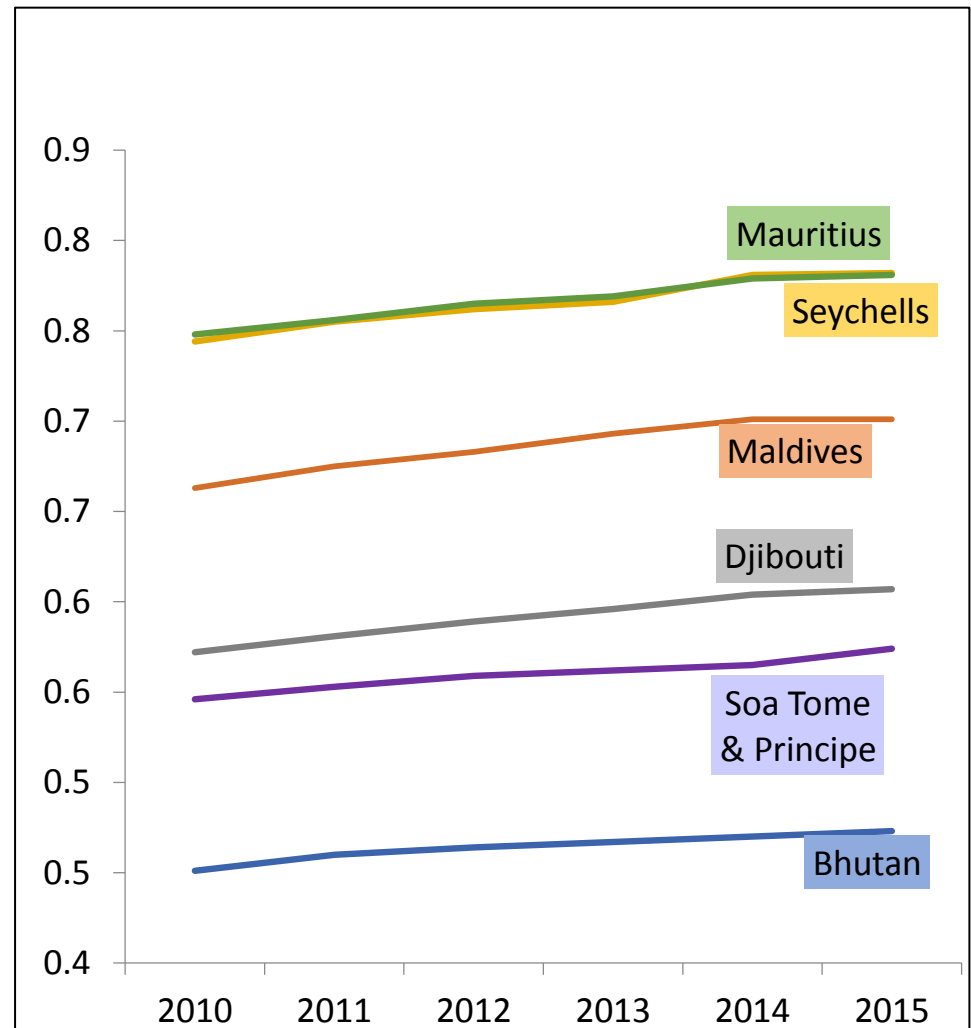
3. Measurement of the components

Rescaling the variables

The raw data of the index is rescaled to permit the averaging procedure. The simplest rescaling formula is the following:

$$XN_{ij} = (X_{ij} - X_{minj}) / (X_{maxj} - X_{minj})$$

where:
XN_{ij} is the normalized observation i of component j
X_{ij} is observation i of component j
X_{minj} is the minimum value in an array of observations of component j
X_{maxj} is the maximum value in an array of observations of component j.

If the index has three components, j would take a value of 1,2 and 3 and if each component has 200 observations, i would take a value of 1,2, 3, ..,200.

This equation rescales the array of observations of a given variable in a range of 0 to 1

The Formulae of the Components of the HDI

However the HDI uses slightly modified versions of this formula. The manner in which the indiced are calculted is available at:
http://hdr.undp.org/sites/default/files/2016_hdr_calculating_indices_final.xls

Life expectancy: **(LEi-20)/(85-20)**
where LEi is Life Expectancy for country i, with the minimum set 20 and the maximum set at 85.

Education: **{[(MYi - 0)/(15-0)] + [(EYi - 0)/(18-0)]} / 2**
where MYi is years of schooling for country i, with the minimum set 0 and the maximum set at 15. Eyi is expected years of schooling for country i, with the minimum set 0 and the maximum set at 18. The answer is divided by 2.

GNI per capita: **[LN(GNi)-LN(100)] / [LN(75000)-LN(100)]**
where GNi is the GNI per capita for country i, with the the minimum set 100 and the maximum set at 75,000. The values are transformed into natural logarithms.

Averaging the components of the HDI

The rescaled values of the three components of the HDI are averaged using the geometric mean, that is by finding the cubic root of their multiplied product.

The compilers of the HDI argue that this was done because poor performance in any dimension is directly reflected in the geometric mean. In this was a low achievement in one dimension is not linearly compensated for by high achievement in another dimension.

The HDI assigns equal weight to all three sub-indices. On the assumption that all three are equally important for human development.

Questions about the income indicator

A question frequently asked about the HDI relates to the income per capita component. As stated, GNI is measured in $PPP in order to converted into a common currency as well as the amount of goods and services that can be purchased by a given unit of money.

This PPP $ transformation is intended to capture the living standards of people living in different countries.

The Income Component of the HDI

Why is the income variable measured in logarithms? When an array of numbers are measured logarithmically, the increases between one number and the next one will diminish as the base number increases, i.e. increases at a diminishing rate, as in the following example:

Actual number						
Base	10	20	30	40	50	60
Changes		**10**	10	10	10	10
Logarithmic measurement						
Base	1.00	1.30	1.48	1.60	1.70	1.78
Changes		0.30	0.18	0.12	0.10	0.08

For example an increase of $10 over an income of $100 will have a much greater impact than the same increase (i.e. of $10) over an income of $500.

Minimum values of the Components

According to the compilers of the HDI, the minimum values are set to the values that a society needs to survive over time. For life expectancy – 20 years is based on historical evidence, which indicates 20 years as the minimum. If a society or a subgroup of society has a life expectancy below the typical age of reproduction, that society would die out.

For both education indicators, the minimum is set to 0 since societies can subsist without formal education. For income, it is set at $100 per capita GNI, which is lower than the lowest value attained by any country in recent history.

Maximum values of the Components

In the case of life expectancy the maximum is set at 85 which is currently just 1 year below the highest life expectancy (Hong Kong).

In the case of Education, the maximum years of schooling is set at 15 years and the maximum for expected years of schooling is set at 18 years -- both plausible maxima.

Fir income that the maximum is set at $75,000. Fixing the maximum at $75,000 means that for countries with GNI per capita greater than $75,000, only the first $75,000 contributes to human development. In this way the higher income is prevented from dominating the HDI value.

3. The HDI and the stages of development

The HDI and GDP Per capita (US$)

The HDI (data pertaining to 2105) is highly correlated with GDP per capita, considering all sovereign states, indicating that the stage of development matters.

$R^2 = 0.8665$

HDI score (y-axis)

Log of GDP per capita: Source: IMF World Economic Outlook)
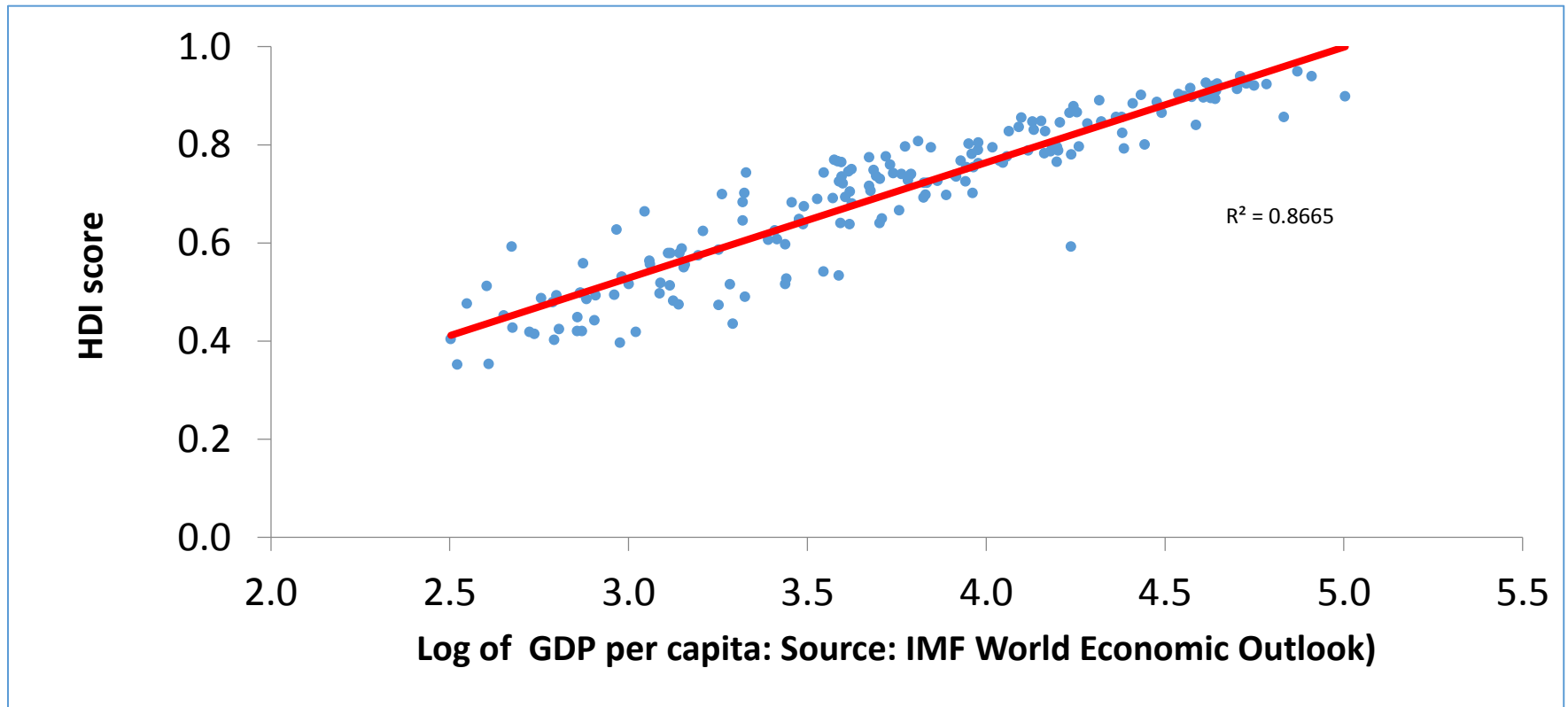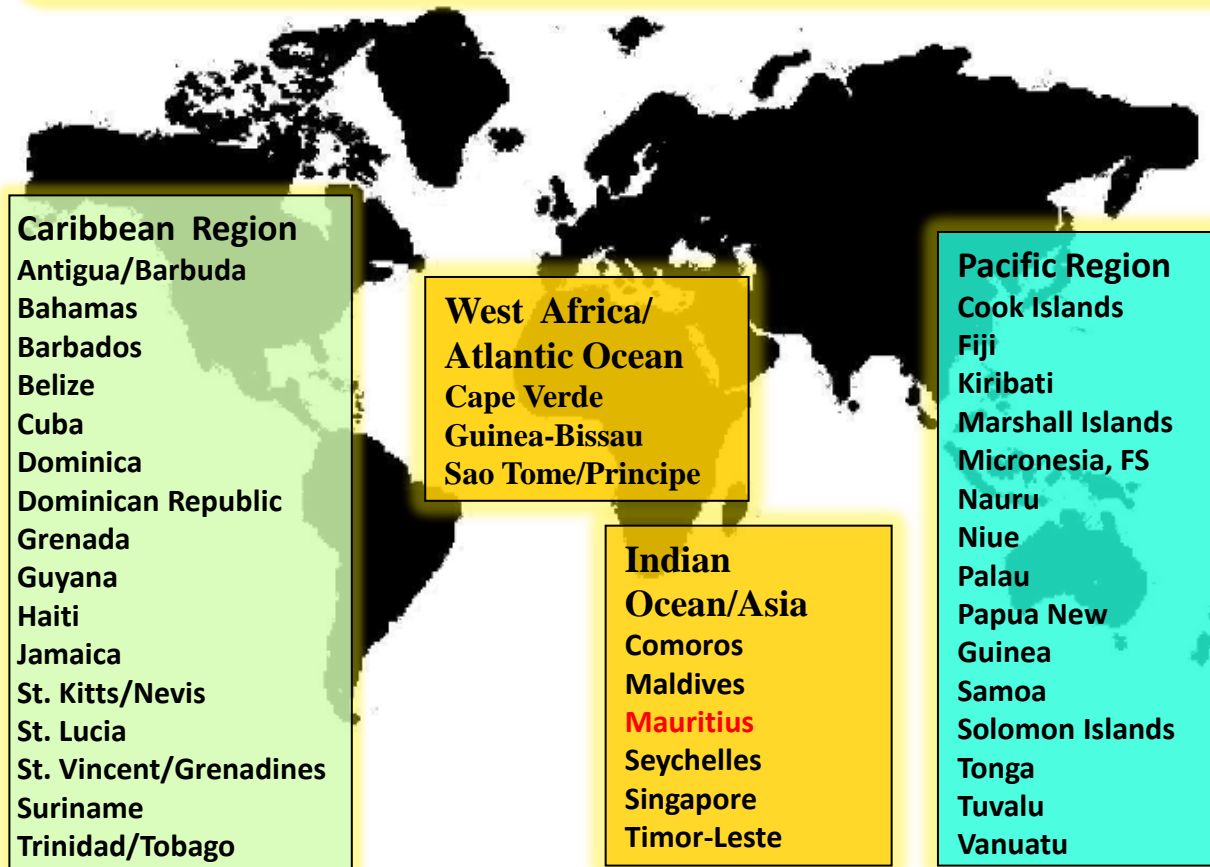
The HDI and GDP Per capita small states only

The HDI (data pertaining to 2105) is highly correlated with GDP per capita also for small states \9populsyion up to 1.5 million)
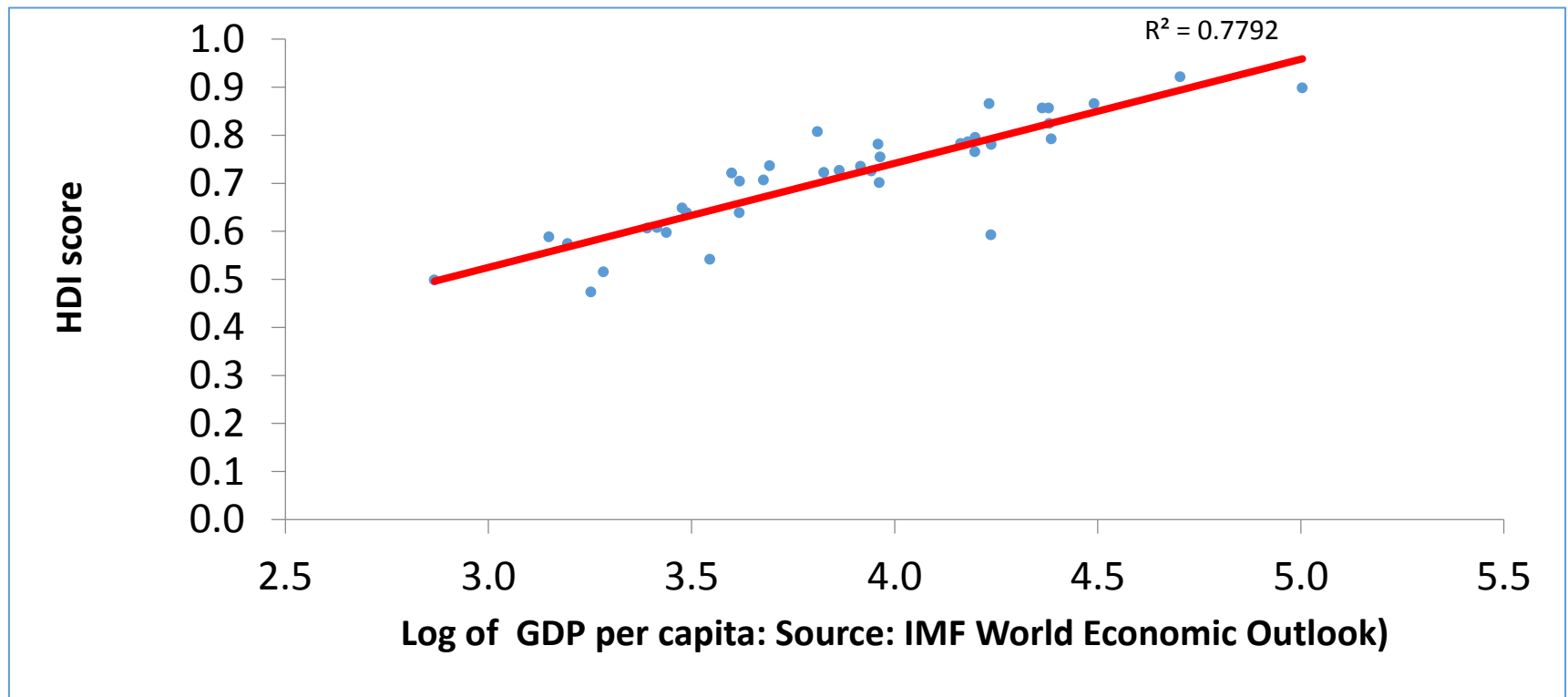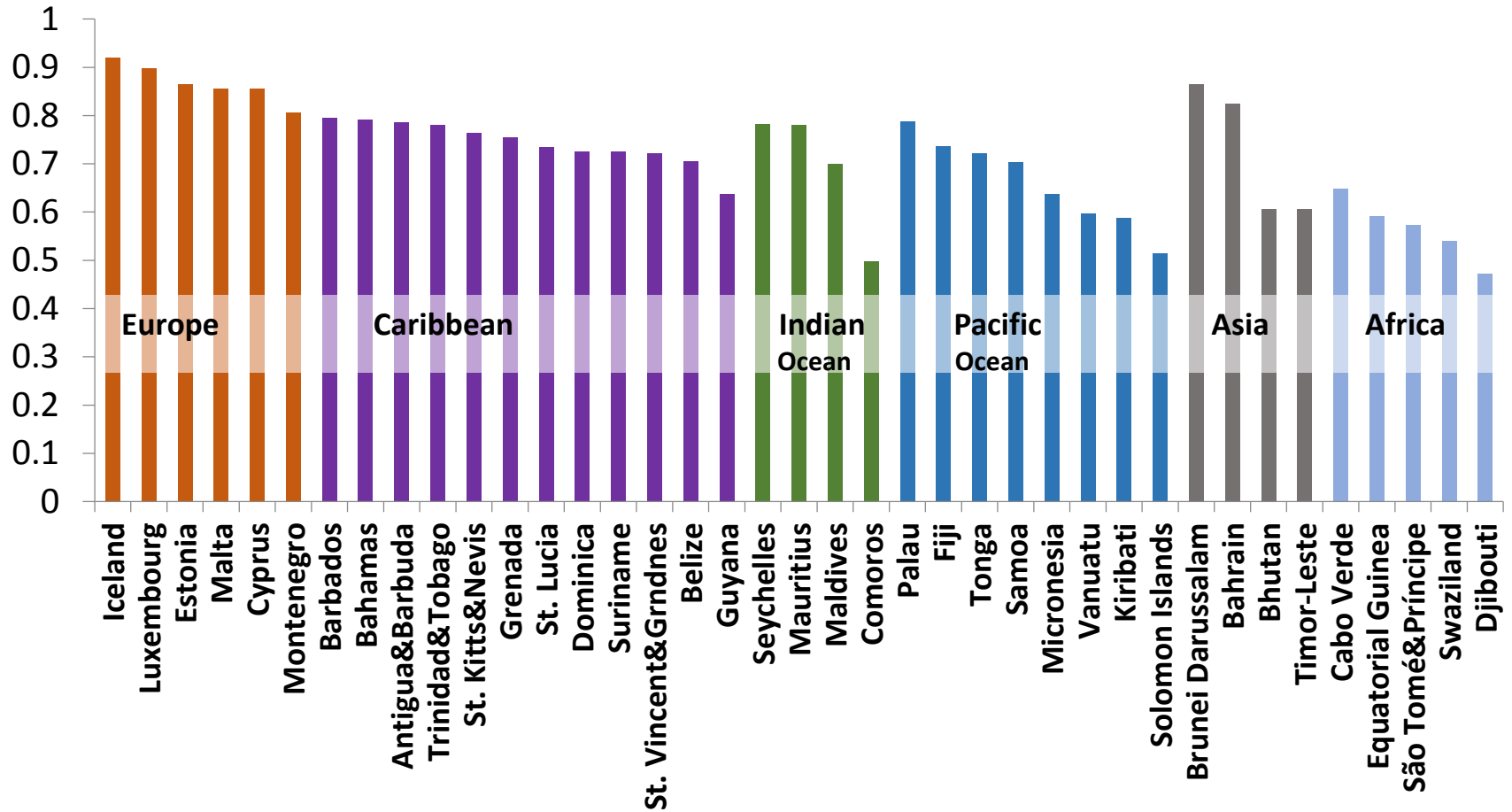
4. The HDI and small states

Location of SIDS

Most small island **developing** states are located in (a) the Caribbean Sea, (b) the South Pacific Ocean and (c) the Indian Ocean/East Atlantic Ocean

Caribbean Region
Antigua/Barbuda
Bahamas
Barbados
Belize
Cuba
Dominica
Dominican Republic
Grenada
Guyana
Haiti
Jamaica
St. Kitts/Nevis
St. Lucia
St. Vincent/Grenadines
Suriname
Trinidad/Tobago

West Africa/ Atlantic Ocean
Cape Verde
Guinea-Bissau
Sao Tome/Principe

Indian Ocean/Asia
Comoros
Maldives
Mauritius
Seychelles
Singapore
Timor-Leste

Pacific Region
Cook Islands
Fiji
Kiribati
Marshall Islands
Micronesia, FS
Nauru
Niue
Palau
Papua New Guinea
Samoa
Solomon Islands
Tonga
Tuvalu
Vanuatu

Most SIDS are located in the Pacific Ocean, Indian Ocean and the Caribbean Sea. They have an important voice in the international arena through the Alliance of Small Island States (AOSIS). AOSIS had a leading role in three major international conferences on the sustainable development of SIDS, under the auspices of the United Nations, namely those held in Barbados (114), Mauritius (2005) and Samoa (2014). The Alliance is also very visible in climate change negotiations, including the Conference of the Parties where signatories of the United Nations Framework Convention on Climate Change (UNFCCC) assess progress in dealing with climate change in order to establish obligations for countries to reduce their greenhouse gas emissions.
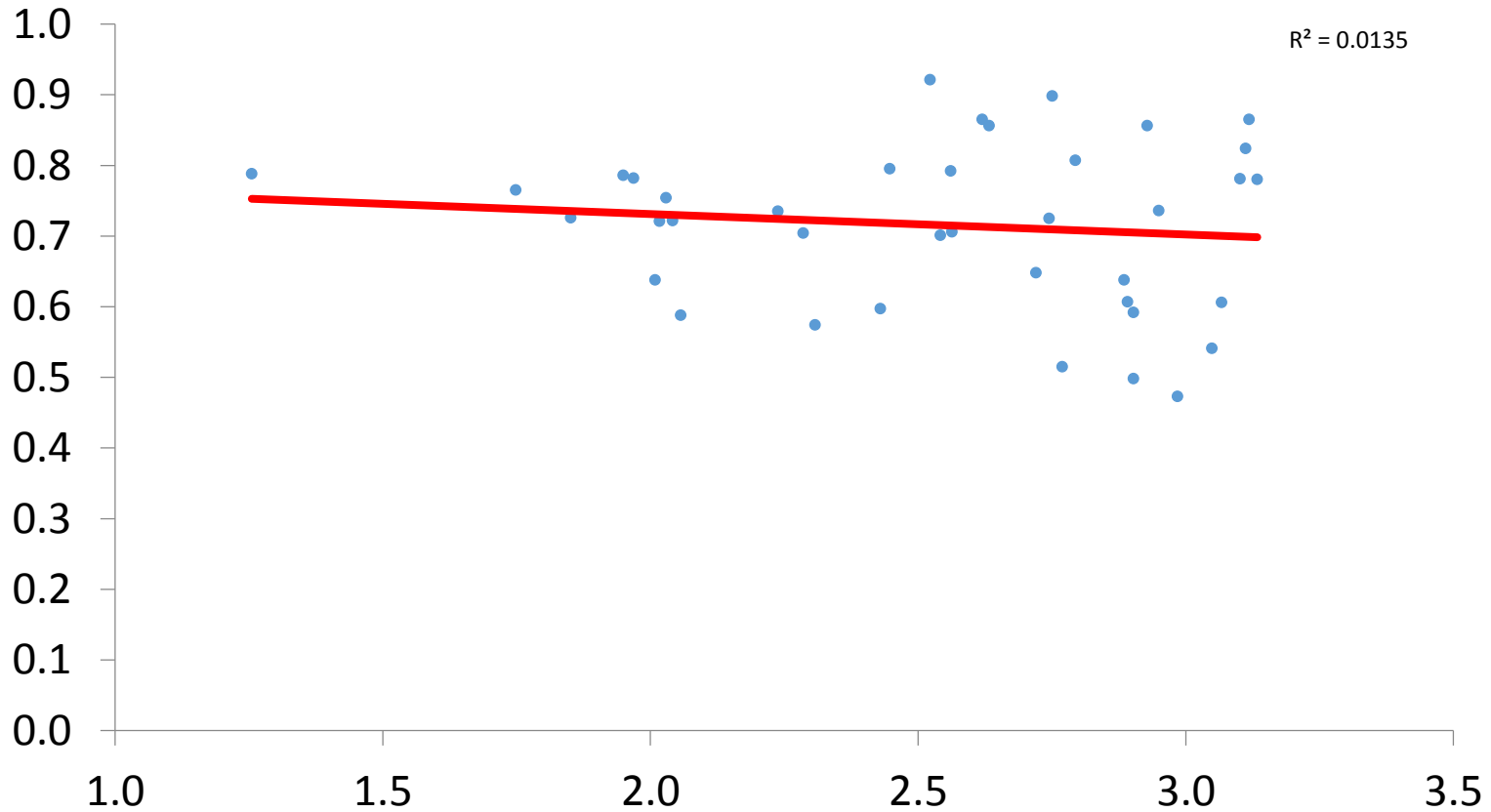
The 2015 HDI scores for small states

The HDI and country size
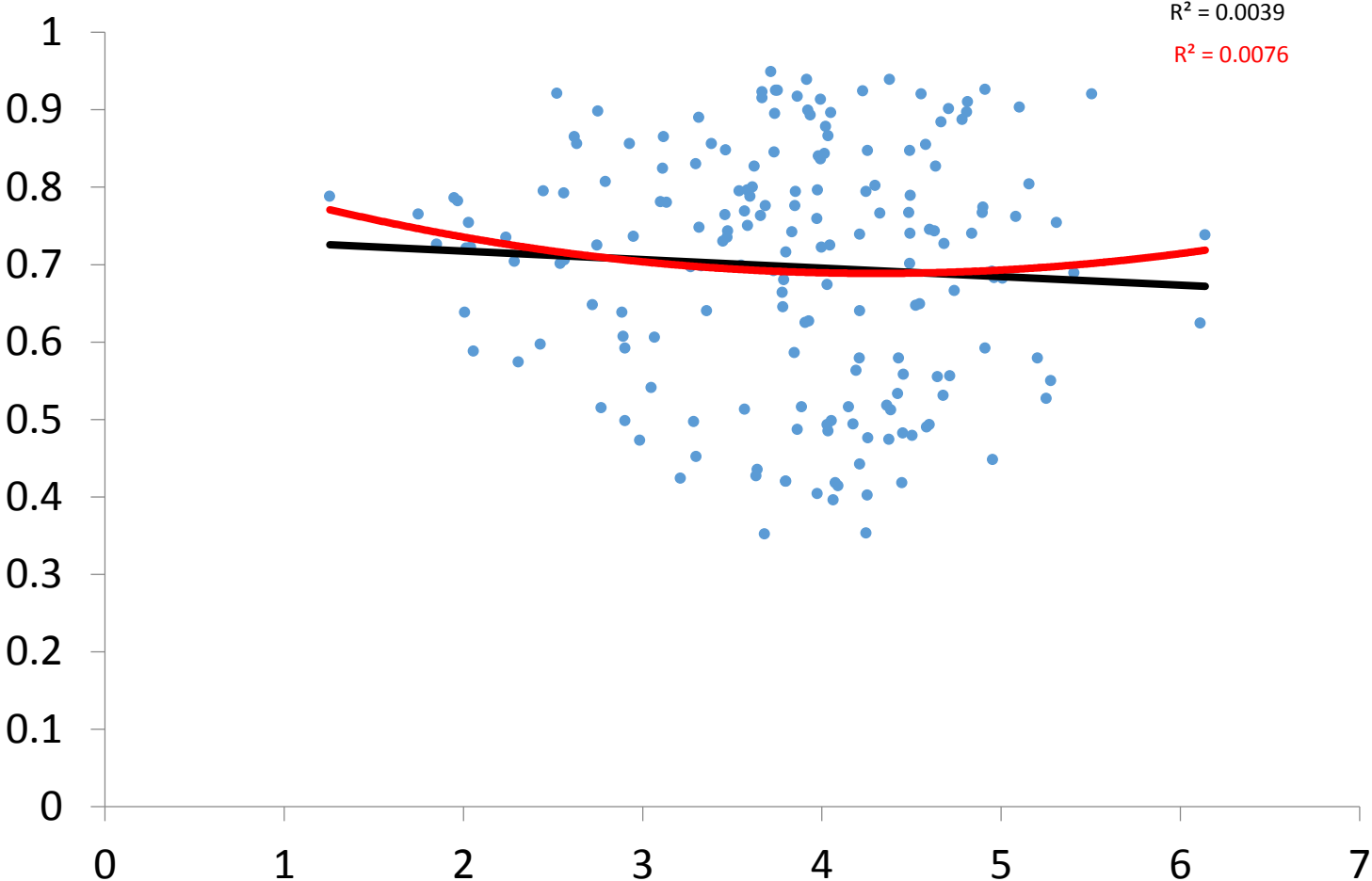
The HDI and country size – Small states only

5. Concluding remarks

Weakness of the HDI

The HDI has been criticised on several grounds, including that it does not really measure human development, which include quality of life factors, empowerment, especially of women and racial inequality, employment and related factors.

The Human Development Index has also because it lacks consideration of technological development

The compiler of the index admit that the HDI has a limited scope and cannot provide a complete picture of human development in any situation. In the Human Developemtn Report, the HDI is supplemented with other useful indicators in order to get a comprehensive view of human development.

An index very widely widely by scholars

However the HDI is probably one of the indices mostly used by scholars, partciualry in cross section studies of countries.

On 12 September 2017 I searched for "Human Development Index" in Google Scholar with the words in inverted commas, with the any time option, and about 75 thousand hits were returned. For this year alone, i.e. since January 2017, over 5.5 thousand hits were returned.

It is indeed an index that many scholars consult, particularly when the object of the exercise is to consider not only what is received in the form of income, but also how this income is translated in social development, through advances in education and health.

The End
Thank you for your attention