AN APPROXIMATION OF PUERTO RICO'S HUMAN DEVELOPMENT INDEX

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ABSTRACT

This paper applies the latest methodology from the United Nations Development Programme to approximate Puerto Rico's Human Development Index (HDI) and Inequality-Adjusted Human Development Index (IHDI) for 2012. Results show that Puerto Rico's HDI places it in the category of very high human development, while the IHDI places it in the category of medium human development. Thus, there is a substantial gap between potential human development and actual human development due to prevailing levels of income inequality on the island.

Keywords: economics, wellbeing, human development, economic development, inequality, Puerto Rico

RESUMEN

En este artículo se aplica la metodología más reciente del Programa de las Naciones Unidas para el Desarrollo para aproximar el Índice de Desarrollo Humano (IDH) y el Índice de Desarrollo Humano Ajustado a Desigualdad (IDHD) de Puerto Rico para el 2012. Los resultados indican que el IDH coloca a Puerto Rico en la categoría de desarrollo humano muy alto, mientras que el IDHD lo coloca en la categoría de desarrollo humano mediano. Por tanto, hay una brecha sustancial entre el desarrollo humano potencial y el desarrollo humano actual debido a los actuales niveles de desigualdad en la Isla.

Palabras clave: economía, bienestar, desarrollo humano, desarrollo económico, desigualdad, Puerto Rico

RÉSUMÉ

Cet article applique la méthodologie la plus récente du programme des Nations Unis pour le Développement en s'alignant sur l'indice du développement humain et l'indice de développement humain ajusté aux inégalités de Porto Rico pour l'année 2012. Les résultats indiquent que le IDH que Porto Rico détient un niveau de développement humain très élevé. Alors que, IDHD le place dans la catégorie des pays à développement humain moyen. Cependant, il existe un décalage important entre le développement humain potentiel et le développement humain actuel de part les niveaux d'inégalité dans l'île.

Mots-clés : économie, bien-être, développement humain, développement économique, inégalité, Porto Rico

Introduction

Given the limitations of Gross Domestic Product (GDP) as a measure of wellbeing (cf. Stiglitz, Sen, & Fitoussi 2009), many researchers have made use of alternative indicators, such as the Human Development Index (HDI) introduced by the United Nations Development Programme (UNDP). Unfortunately, the UNDP does not calculate the HDI for Puerto Rico, and independent estimations have been scarce (Irizarry Mora 2001:297). This paper will estimate Puerto Rico's HDI, along with another recent indicator introduced by the UNDP, the Inequality-Adjusted Human Development Index (IHDI), for the year 2012. The estimation will be contrasted with previous estimates as well as for HDI values of other countries.

Method and Measurement

As discussed in the most recent Human Development Report (UNDP 2013), calculating the HDI consists of two main steps. The first step is calculating dimension indices for education, life expectancy, and Gross National Income (GNI) Per Capita. To ensure indices are between 0 and 1, maximum and minimum values are selected. Maximum values are the highest observed values for the UNDP's time series. Minimum values are set at 20 for life expectancy, 0 for education indicators, and $100 per capita for GNI. Finally, the dimension indices are computed in the following manner:

$$Dimension\ Index = \frac{actual\ value - minimum\ value}{maximum\ value - minimum\ value}$$

The education index is computed with two indicators, mean years of schooling and expected years of schooling. The previous equation is applied to each of them, and the geometric mean of the result is plugged into the equation again using 0 as the minimum, and the highest geometric mean of the resulting indices for the time period as the maximum. In terms of income, the natural logarithms of the actual, minimum, and maximum values are used.

The second step consists of aggregating these indices to produce the HDI. The most recent estimate of life expectancy in Puerto Rico is provided by the CIA World Fact Book (Central Intelligence Agency 2013), expected years of schooling (under the name "school life expectancy") is provided by the World Bank's EdStats database (World Bank 2013a),

and GNI Per Capita is provided by the Puerto Rico Planning Board in the Economic Report to the Governor (2012). Mean Years of Schooling was computed using the Microdata samples provided by the American Community Survey (U.S. Census Bureau 2012). Thus, the HDI may be computed in the following manner:

Indicator	Value
Life Expectancy	79.07
Mean Years of Schooling	11.76
Expected Years of Schooling	15.6
GNI per Capita	18,872

$$Life\ Expectancy\ Index = \frac{79.07 - 20}{83.6 - 20} = 0.9287$$

$$Mean\ Years\ of\ Schooling\ Index = \frac{11.76 - 0}{13.3 - 0} = 0.8842$$

$$Expected\ Years\ of\ Schooling\ Index = \frac{15.6 - 0}{18 - 0} = 0.8666$$

$$Education\ Index = \frac{\sqrt{0.8842 \times 0.8666} - 0}{0.971 - 0} = 0.9015$$

$$Income\ Index = \frac{\ln(18,872) - \ln(100)}{\ln(87,478) - \ln(100)} = 0.77358$$

$$HDI = \sqrt[3]{0.9287 \times 0.9015 \times 0.77358} = 0.8652$$

In terms of the IHDI, the process is composed of three steps. The first step consists of measuring inequality in each of the dimensions of the HDI. To do so, the UNDP computes an inequality measure $A = 1 - \frac{g}{\mu}$, where g is the geometric mean and μ is the arithmetic mean. This measure is computed for life expectancy, mean years of schooling, and disposable income. The geometric mean does not allow zero values, so for mean years of schooling one year is added to all observations. In order to deal with outliers in income, the top 0.5 percentile was truncated and negative and zero incomes were replaced with the minimum value of the bottom 0.5 percentile of the distribution of positive incomes.

The second step consists of adjusting the indices for inequality. For each index, I_x, the inequality adjusted index, I_x^*, is computed with its corresponding inequality measure, A_x, in the following manner:

$$I_x^* = (1 - A_x)I_x$$

Finally, the IHDI is calculated with the following formula:

$$IHDI = \sqrt[3]{(1 - A_{Life})(1 - A_{Education})(1 - A_{Income})} \times HDI$$

Geometric and arithmetic means for mean years of schooling and for income are calculated with the Microdata samples provided by the American Community Survey (U.S. Census Bureau 2012). For life expectancy, means are calculated using the variable "age of death" in the Basic Mortality dataset provided by the Puerto Rico Institute of Statistics. The calculation yields the following:

$$IHDI = \sqrt[3]{(1 - 0.0852)(1 - 0.08787)(1 - 0.404)} \times 0.8652 = 0.685$$

Analysis

In terms of trends in Puerto Rico's HDI, year to year comparisons are misleading as the UNDP constantly changes its methodology. Instead, comparisons of rankings are more appropriate. According to Irizarry Mora (2001:297), HDI estimates placed Puerto Rico at the 26th position in 1998, while the current estimate would place it in the 29th position in 2012. Puerto Rico may have slightly lagged behind or the drop could have been a result of the changes in methodology as well. Prior to 2010, the UNDP used GDP per capita instead of GNP per capita. Given Puerto Rico's significant gap between these two figures, this change could also explain the drop in ranking.

However, what is most interesting from the exercise is the substantial gap between HDI and IHDI. According to the UNDP (2010:87), "the HDI can be viewed as an index of "potential" human development" while "the IHDI is the actual level of human development." In other words, the "IHDI measures the "loss" in potential human development due to inequality." According to the American Community Survey data, in 2010 Puerto Rico had a significantly high GINI Index of 0.537 (U.S Census Bureau 2011). In other words, this would place Puerto Rico among the most unequal nations in the world, and as the seventh most unequal Latin American country (World Bank 2013b).

As stated above, HDI would rank Puerto Rico as the 29th country in terms of human development, not far behind countries such as the United Kingdom or Luxembourg (both tied at #26). Accordingly, Puerto Rico would be categorized as a "very high human development" country. However, in terms of the IHDI, Puerto Rico ranks as #39, with human development patterns closer to Romania (IHDI=0.687) and Croatia

(IHDI=0.683). In this case, Puerto Rico is not even in the "high human development" category. Instead, the island would be categorized as a "medium human development" country. In other words, in a context of significantly low income inequality, Puerto Rico could potentially achieve very high human development, close to the actual living standards of countries like Sweden (IHDI=0.859) and Netherlands (IHDI=0.857). However, given prevailing patterns of inequality, Puerto Rico will most likely remain in medium levels of human development.

Conclusion

The introduction of the IHDI, and the associated differentiation between actual and potential human development, leads to the conclusion that during the past decades human development in Puerto Rico was in a sense overestimated. In other words, by focusing on a measure of potential human development, it was concluded that Puerto Rico enjoyed very high levels of human development. However, by focusing on actual human development through the IHDI, this paper concludes human development is in fact much lower than what it was understood to be. The exercise supports the argument made by economists such as Dietz (1989:328), who argue that while Operation Bootstrap was successful in terms of growth, it was greatly unsuccessful in terms of development, in the broad concept of the term. Similarly, it supports the argument that what is most recommendable for Puerto Rico is a development strategy of "equality with growth," instead of the "grow first" strategies dominant on the island since the 1950s (cf. Dietz 1989:261-262). As previously discussed, Puerto Rico could potentially achieve levels of human development close to the actual levels currently found in countries like Sweden or Netherlands if it were to substantially reduce its levels of inequality.

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