mpitb: A toolbox for calculating multidimensional poverty indices in R

by Ignacio Girela

Abstract This article presents **mpitb**, an R package for calculating multidimensional poverty indices (MPIs) based on the popular Alkire-Foster measurement approach. **mpitb** package provides a tractable and extensive framework for researchers, analysts, and practitioners working on mutltidimensional poverty measurement projects in the same vein of the well-known global MPI workflow.

Introduction

Although poverty is widely understood as the inability to achieve basic standards of living, the measurement of poverty has traditionally been based on monetary deficits. However, over the past two decades, there has been a significant increase in the use of multidimensional approaches to measuring poverty in an attempt to capture different dimensions of this phenomenon. In this context, the dual-cut-off-counting measurement approach proposed by Alkire and Foster (2011) (AF, hereafter) has become particularly popular due to its flexibility and ability to inform policy. For example, the AF method is the basis of the global Multidimensional Poverty Index (MPI) which is yearly published by the United Nations Development Programme and the Oxford Poverty and Human Development Initiative (UNDP and OPHI 2022). In addition, many countries are developing their own official MPIs to track poverty reduction progress using the AF method.

This measurement approach stands out both for providing an extensive policy information platform and remaining relatively understandable by the general public. In other words, AF measures point estimates entail simple algebraic operations. Some R packages that computes AF measures include **MPI** (Kukiattikun and Chainarong 2022) and **mpindex** (Abdulsamad 2023). Notwithstanding, these packages do not account for the complex survey design of micro data and, as a result, assume the data was obtained through a simple random sampling which is barely the case of household surveys. Certainly, not considering the complex survey design affects further statistical inference exercises of interest. Namely, is multidimensional poverty in one subgroup of the population greater than another? Has poverty been reduced over time?

Therefore, calculating AF measures in practice is still a challenging task Motivated by this problem, OPHI launched a Stata package (Suppa 2023) with the aim of providing a framework that mirrors the production process of the well-known global MPI to researchers, analysts and practitioners. To do so, Suppa (2023) (continue...). This package adapts this framework for R users.

Measuring multidimensional poverty: the Alkire-Foster Method

Overview of mpitb

mpitb is a packages for ...

Applications

Suppa (2023) provide a set of examples .... With the view of consistency, we apply ... on the same data...

```
library(mpitb)

data <- swz_mics14
```

Table 1 prints at the first few rows of the `penguins` data:

Figure 1 shows an plot of the penguins data, made using the **ggplot2** package.

```
penguins %>%
  ggplot(aes(x = bill_depth_mm, y = bill_length_mm,
             color = species)) +
  geom_point()
```

Table 1: A basic table

species	island	bill_length_mm	bill_depth_mm	flipper_length_mm	body_mass_g	sex	year
Adelie	Torgersen	39.1	18.7	181	3750	male	2007
Adelie	Torgersen	39.5	17.4	186	3800	female	2007
Adelie	Torgersen	40.3	18.0	195	3250	female	2007
Adelie	Torgersen	NA	NA	NA	NA	NA	2007
Adelie	Torgersen	36.7	19.3	193	3450	female	2007
Adelie	Torgersen	39.3	20.6	190	3650	male	2007

Summary

In this paper, we introduced a package for calculating multidimensional poverty indices based on the Alkire-Foster method

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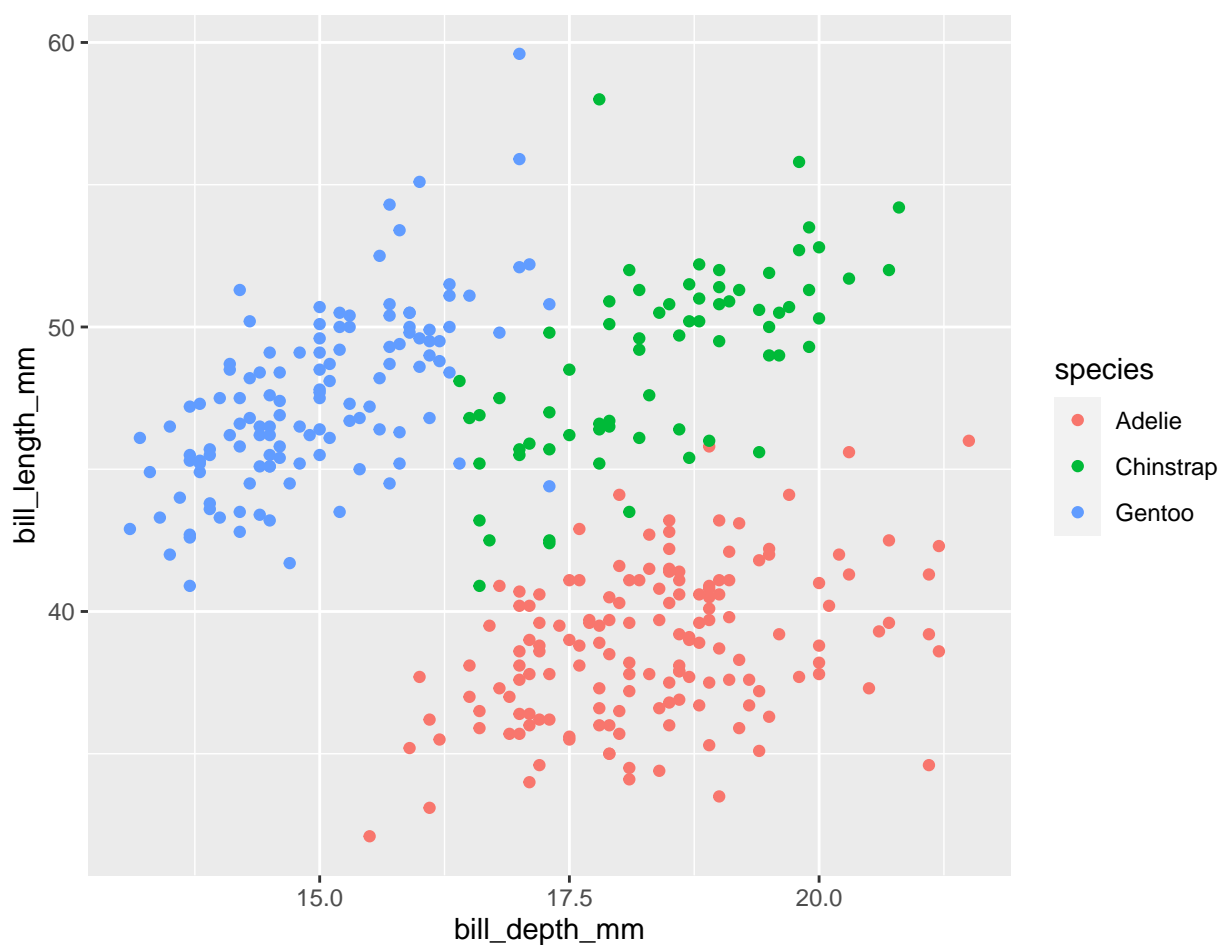
Figure 1: A basic non-interactive plot made with the ggplot2 package on palmer penguin data. Three species of penguins are plotted with bill depth on the x-axis and bill length on the y-axis. Visit the online article to access the interactive version made with the plotly package.