A number of concerns arising from a closer look at the estimation of the Consumer Price Index

Carlos Guerrero de Lizardi
cguerrero@economia.unam.mx

- Background.
- The basic problem of index numbers.
- The economic approach.
  - CPI biases.
  - Alternatives in the aggregate method.
  - Measurement of poverty in Mexico.
  - Economic growth.

William Fleetwood ([1707, 1745], 1969, p. 49) compared the value of money for an Oxford student from 1460 to 1707 using a basket with the following content, "5 quarters of wheat, 4 hogsheads of beer, and 6 yards of cloth".

"… how exactly should the microeconomic information involving possibly millions of prices and quantities be aggregated into a smaller number of price and quantity variables? **This is the basic problem of index numbers**."

To address the "**index number problem**" various "**calibrating instruments**" (Afrait, 2005) have been proposed, namely, the **fixed basket** approach, the **statistical** approach, the **test** approach (also known as axiomatic or instrumental), the **Divisia** approach, the **economic approach** (or **constant utility**), and the **factorial approach** (Diewert, 1988, p. 3, and Balk, 2008, p. xi).

A conditional cost of living index (COLI)… *measures the change in expenditures a household would have to make in order to maintain a given standard of living*.

COGI. The second one is based on a naive view of the CPI as a fixed basket of products priced in successive periods, that is, **a cost of goods index**.

The heart of the matter... To some extent, in an attempt to avoid criticism regarding potential errors and biases, statistical authorities around the world embrace a COGI approach.
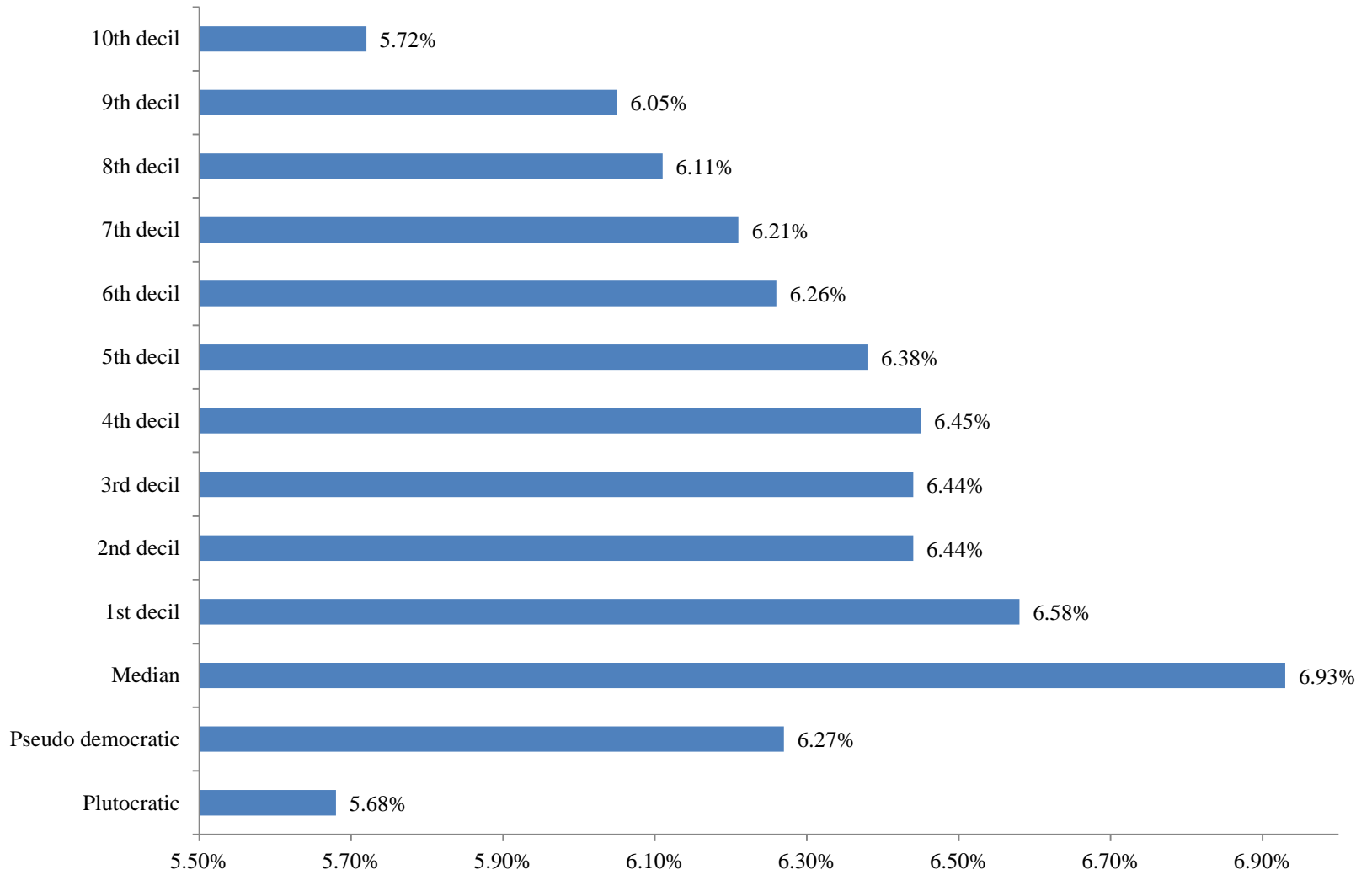
Table 1. Estimates of biases in the CPI-based measure of the cost of living (percentage points per annum)

Sources of bias	USA	Canada	Mexico
Commodity substitution	0.35	0.15	0.198
New products + Quality change	0.37	0.35	0.215
New outlets	0.05	0.08	0.100
Total	0.77	0.58	0.513

Source: Lebow and Rudd (2003), Rossiter (2005), and Guerrero (2008b).

$$P_L^t = \frac{\sum_{n=1}^{N} q_n^0 p_n^0 r_n^t}{\sum_{n=1}^{N} q_n^0 p_n^0} = \sum_{n=1}^{N} \frac{q_n^0 p_n^0}{x^0} r_n^t = \sum_{n=1}^{N} s_n^0 r_n^t$$

According to Deaton (1998, p. 43), the household for which the **American CPI** weights are correct lies at the **75th percentile** of the expenditure distribution. In the case of **Spain** the applicable percentile is the **61st** (Izquierdo, Ley and Ruiz-Castillo, 2003, p. 149), and for the **Mexican CPI** the percentile in question is the **86th** (Guerrero, 2010, p. 2).

Category	Value
10th decil	5.72%
9th decil	6.05%
8th decil	6.11%
7th decil	6.21%
6th decil	6.26%
5th decil	6.38%
4th decil	6.45%
3rd decil	6.44%
2nd decil	6.44%
1st decil	6.58%
Median	6.93%
Pseudo democratic	6.27%
Plutocratic	5.68%

Measurement of poverty in Mexico. As expected, the value of the **food and non-food baskets** and **household income** changed for every one of the 32 Federal States... In **four** States, the difference in the "**extreme multidimensional poverty**" was statistically significant; in **three** Federal States the difference in the "**multidimensional poor**" was statistically significant, and in **one** State the difference in the "**vulnerable due to income**" was statistically significant.

Economic growth. One of the most harmful consequences of the **upward bias in the CPI** is the **underestimation of the economic growth**. In the case of my country between 2000 and 2004, the economic average growth was 2.17%, and not 1.60% as was registered by the INEGI.

"Por el momento no se cuenta con un periodo bien establecido para actualizar de manera regular las ponderaciones del INPC, ya que hasta la fecha sólo se cuenta con un levantamiento bianual de la ENIGH y por estar esta encuesta referenciada a un trimestre tipo, algunos cambios de corto y mediano plazo podrían estar relacionados más con efectos estacionales que a cambios en los patrones de consumo de los hogares… Ante esta situación, el INEGI ha implementado la aplicación de una nueva encuesta continua: la Encuesta Nacional de Gasto de los Hogares (ENGASTO), la cual tiene como objetivo principal recabar información sobre los gastos en bienes y servicios de consumo de los hogares, las principales características demográficas y sociales, así como las características de sus viviendas."

Muchas Gracias...