Agricultural Statistics in Practice

Index Numbers & Forecasting

Index Numbers – An Introduction

Prof. J. Ramkumar

Dept. of ME & Design
Indian Institute of Technology Kanpur

Global Index Numbers

- *FAO Food Price Index:* measures monthly change in international prices of a basket of food commodities.

- *Global Agricultural Productivity Index:* measures agricultural productivity of 117 countries based on their ability to efficiently produce food.

- *Agri-Food Trade Index:* measures the competitiveness of countries' agri-food sectors based on various trade-related indicators.

FAO Food Commodity Price Indices

2014-2016=100

Vegetable oils

Cereals

Dairy

Meat

Sugar

M A M J J A S O N D J F M
2022   2023

Source: fao.org
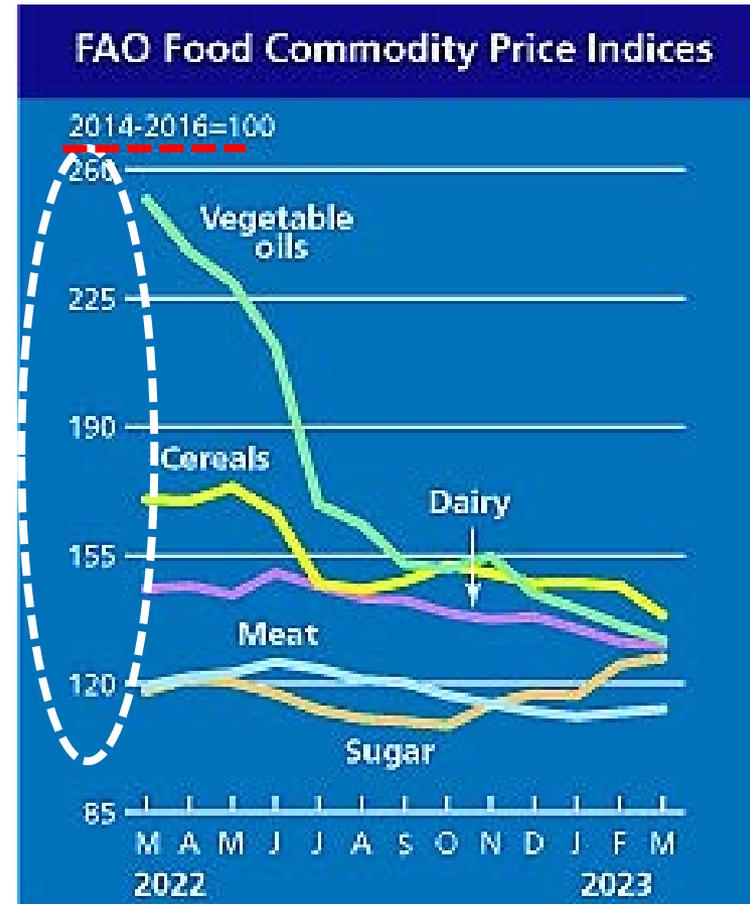
Index Numbers

- An economic data figure reflecting price or quantity compared with a standard or base value.

- Base usually = 100

- Index number usually = 100 × $ratio\ to\ the\ base\ value$

- Assume apples costs twice as much in 2023 as it did in 2000, its index number would be 200 relative to 2000.

- Allows economists to make comparisons of costs to reduce **_unwieldy business_** data into easily terms.

Components of Index Number

- Base period: This is the starting point or reference period against which we want to measure the changes

- Current period: This is period we want to compare to base period to see how things have changed.

- Weights: Values assigned to each *component* being measured to calculate overall index number.

Current Period

Reference Period 1983-1993
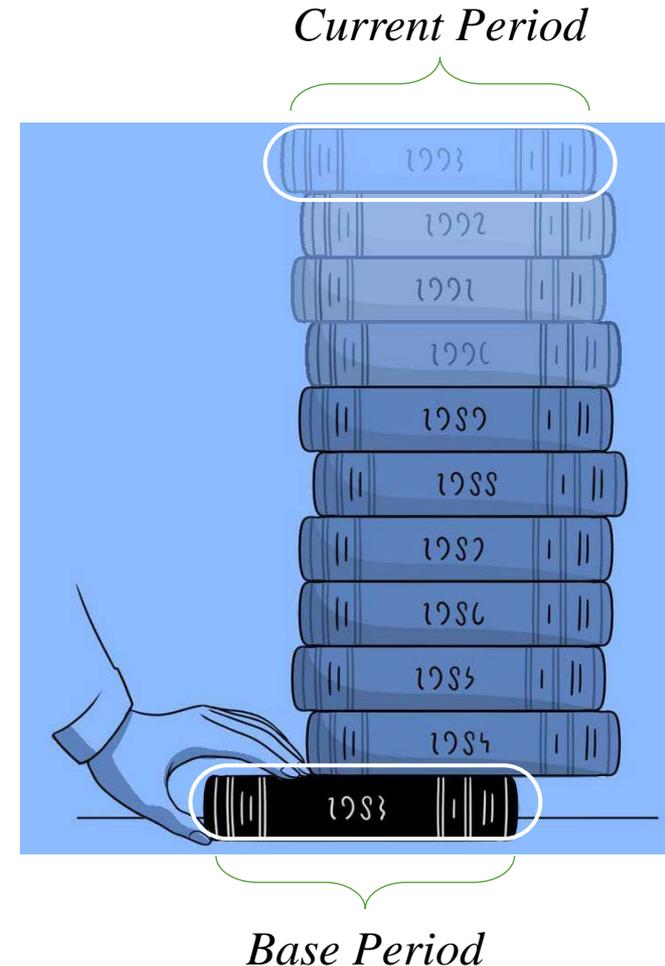
Base Period

Index Formulas

- Laspeyres Formula → $L = \frac{\sum p_c q_b}{\sum p_b q_b} \times 100$ *(uses quantities defined in base*

  period as weights)

- Paasche Formula → $P = \frac{\sum p_c q_c}{\sum p_b q_c} \times 100$ *(uses quantities in current period as weights)*

<u>*Key:*</u>

p_c = price in current period q_c = quantity in current period

p_b = price in base period q_b = quantity in base period

→The Laspeyres Formula can overestimate price changes due to not accounting for changes in consumer behavior, while Paasche Formula can underestimate price changes due non-accounting of introduction of new products.

→Additionally, both formulas can be difficult to calculate accurately as it requires detailed data collection, making them time-consuming & resource-intensive.

Solution

- Drobisch in 1871 gave $D = \frac{L+P}{2}$

- Fisher in 1920 gave F = $(L \times P)^{1/2}$

- But as firms are willing to incur expense these two indexes are never encountered.

- Both L & P indexes give near about same values

Thank You