PRICE INDICES

MD. Shahabuddin Sarker

Deputy Director

National Accounting Wing

Bangladesh Bureau of Statistics

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Definitions

What is price?

➢ A price is the amount of money that buyer gives a seller in exchange for a good and service.

➢ The sum or amount of money or its equivalent for which anything is bought, sold, or offered for sale

What is market?

➢ Market is not only a place rather a mechanism where goods or services are sold by bidding among the buyers.

What is an index?

➢ A number indicating change in magnitude, as of price, wage, employment, or production shifts, relative to the magnitude at a specified point usually taken as 100.

What is Price index?

➢ A **price index** is a normalized average (typically a weighted average) of **price** relatives for a given class of goods or services in a given region, during a given interval of time.

Definitions

- What is Basic Price?
- The basic price is the amount receivable by the producer exclusive of taxes payable on products and inclusive of subsidies receivable on products. The equivalent for imported products is the c.i.f. (cost, insurance and freight) value, that is, the value at the border of the importing country.
- What is Producers Price?
- The producer price is the amount receivable by the producer inclusive of taxes on products except deductible value added tax and exclusive of subsidies on products. The equivalent for imported products is the c.i.f value plus any import duties or other taxes on imports (minus any subsidies on imports).
- Producer prices = Basic prices + taxes on products (excluding VAT) - subsidies on products
- What is Purchaser Price?
- The purchaser's price is the amount paid by the purchaser, excluding any deductible VAT or similar deductible tax, in order to take delivery of a unit of a good or service at the time and place required by the purchaser; the purchaser's price of a good includes any transport charges paid separately by the purchaser to take delivery at the required time and place.
- A purchaser's price for a product is the producer's price plus supplier's retail and wholesale margins, separately invoiced transport and insurance charges and nondeductible taxes on products payable by the purchaser.
- Purchasers' prices are the prices most relevant for decision-making by buyers.
- Purchaser prices = Producer prices + trade and transport margins + non-deductible VAT

Macroeconomic Stability

What is Macroeconomic Stability:

According to Stanley Fisher (1993)……,

- ❑ Inflation is low and predictable
- ❑ Real interest rates are appropriate
- ❑ Fiscal policy is stable and sustainable
- ❑ Real Exchange Rate is competitive and predictable
- ❑ BOP position is perceived (predictable) and viable(workable)

Laspeyres Price Index

a. Price* Quantity Version

$$LP_{0 \to t} = \frac{\sum p_{i,t} q_{i,0}}{\sum p_{i,0} q_{i,o}}$$

b. Weighted Price relative Version

$$LP_{0 \to t} = \sum_i \left(\frac{p_{i,t}}{p_{i,0}}\right) \frac{p_{i,0} q_{i,0}}{\sum p_{i,0} q_{i,0}} = \sum \left(\frac{p_{i,t}}{p_{i,0}}\right) w_{i,0}$$

Arithmetic average of price relatives with base period weights

Laspeyres Volume Index

a. Price* Quantity Version

$$LQ_{0 \to t} = \frac{\sum p_{i,0} q_{i,t}}{\sum p_{i,0} q_{i,o}}$$

b. Weighted Quantity Relative Version

$$LQ_{0 \to t} = \sum \left(\frac{q_{i,t}}{q_{i,0}} \right) \frac{p_{i,0} q_{i,0}}{\sum p_{i,0} q_{i,0}} = \sum \left(\frac{q_{i,t}}{q_{i,0}} \right) w_{i,0}$$

Arithmetic average of quantity relatives with base period weights

Paasche Price Index

a. Price* Quantity Version

$$PP_{0 \to t} = \frac{\sum_i p_{i,t} \, q_{i,t}}{\sum_i p_{i,0} q_{i,t}}$$

b. Weighted Price relative Version

$$PP_{0 \to t} = \left\{ \sum_i \left(\frac{p_{i,t}}{p_{i,0}} \right)^{-1} \frac{p_{i,t} q_{i,t}}{\sum_i p_{i,t} q_{i,t}} \right\}^{-1}$$

$$= \left\{ \sum_i \left(\frac{p_{i,t}}{p_{i,0}} \right)^{-1} w_{i,t} \right\}^{-1}$$

Harmonic average of Price relatives with current period weights

Paasche Volume Index

a. Price * Quantity Version

$$PQ_{0 \to t} = \frac{\sum_i p_{i,t}\, q_{i,t}}{\sum_i p_{i,t}\, q_{i,0}}$$

b. Weighted Quantity Relative Version

$$PQ_{0 \to t} = \left\{ \sum_i \left(\frac{q_{i,t}}{q_{i,0}}\right)^{-1} \frac{p_{i,t} q_{i,t}}{\sum_i p_{i,t} q_{i,t}} \right\}^{-1}$$

$$= \left\{ \sum_i \left(\frac{q_{i,t}}{q_{i,0}}\right)^{-1} w_{i,t} \right\}^{-1}$$

Harmonic average of quantity relatives with current period weights

Palgrave Price Index

a. weighted Price Relative Version

$$PalP_{0 \to t} \sum_i \left(\frac{p_{i,t}}{p_{i,0}} \right) \frac{p_{i,0} q_{i,0}}{\sum p_{i,0} q_{i,0}} = \sum \left(\frac{p_{i,t}}{p_{i,0}} \right) w_{i,t}$$

Arithmetic average of price relatives with current period weights

Fisher Index

Fisher Price Index

$$FP_{0 \to t} = \sqrt{LP_{0 \to t} * PP_{0 \to t}}$$

Fisher Volume Index

$$FP_{0 \to t} = \sqrt{LQ_{0 \to t} * PQ_{0 \to t}}$$

Geometric average of Laspeyres and Paasche indices

Lowe Price Index

$$LoP_{0 \to t} = \frac{\sum_i p_{i,t} q_{i,b}}{\sum_i p_{i,0} q_{i,b}} = \sum_i \left(\frac{p_{i,t}}{p_{i,0}}\right) \frac{p_{i,0} q_{i,b}}{\sum p_{i,0} q_{i,b}}$$

$$= \sum \left(\frac{p_{i,t}}{p_{i,0}}\right) s_{i,b}$$

In practice it is invariably the case that b ≤ 0 ≤ t

Where, b= weight reference period and 0= Price reference period

Advantages and disadvantages

Advantages of Fisher

❑ the index is call "Ideal" because it satisfies various tests such as *time reversal* (index for t based on 0 should be the reciprocal that for o based on t) and ***Factor reversal*** (the product of the price index and volume index should be equal to the proportionate) tests.

❑ It is extensively used in general economic statistics

Disadvantages of Fisher

❑ Fisher needs both Laspeyres and Paasche which leads costing and delay

❑ Laspeyre and Paasche is more simply understandable measuring change in the value of specified basket of goods and services.

❑ Fisher index is not additively consistent. It cannot be used to create an additive set of "constant price" data

❑ It is extensively used in general economic statistics

Advantages of Laspeyres

❑ Most commonly used index

Advantages and disadvantages

Two main requirements for volume and price measures in an accounting system

❑ Volume measures for multiplicity of goods and services within an accounting framework should for each period be additive

❑ The aggregate price measure times the aggregate volume measure should be equal to the current price

❑ The pair (Product) of Laspeyres volume and Paasche price indices, Vo-t= PPo-t*LQo-t. The Laspeyres Volume index consists of two **additive components**.

✓ $Lq = Q_{0-t}$=$\sum_i p_{i,o} q_{i,t}$=today at the base period's prices (const)

✓ $V_0 = \sum_i p_{i,o} q_{i,o}$= the base period at current prices

❑ The pair (Product) of Laspeyres Price and Paasche Volume indices, Vo-t= LPo-t*PQo-t. The Paasche Volume index consists of two **additive components**.

✓ $Pq = P_{0-t}$=$\sum_i p_{i,o} q_{i,0}$=the base period at today's prices

✓ $V_t = \sum_i p_{i,t} q_{i,t}$= today at current prices

✓ Satisfies the compilation requirments

Recommendations

SNA recommendations for Price and Volume measures:

❑ State of Art: Ideal method is Annually chained Fisher price and volume indices for GDP and its component

❑ Second best is Annually chained Laspeyres volume and Paasche price or Paasche volume and Laspeyres price