

Index Number

Unit 4

1. What do you mean by index numbers?

Index numbers are statistical measures that express changes in a variable or a group of related variables over time. They are commonly used to analyze economic and business trends. An index number typically represents a percentage comparison with a base year, allowing for an understanding of fluctuations in prices, production, or other economic indicators. The Consumer Price Index (CPI) and Wholesale Price Index (WPI) are common examples.

2. What are the uses of index numbers?

Index numbers serve various purposes in economics, business, and social studies. Their key uses include:

- Measuring inflation through price indices like CPI and WPI.
- Analyzing industrial growth trends.
- Comparing cost-of-living changes across time and regions.
- Assessing economic performance through indices such as GDP deflators.
- Facilitating business decision-making by tracking market trends.

3. What are the problems in constructing index numbers?

Constructing index numbers involves several challenges:

- **Choice of base year:** Selecting an appropriate base year is crucial to ensure accurate comparisons.
- **Selection of items:** The inclusion or exclusion of specific items can affect results.

- **Weightage assignment:** Different goods and services have varying importance, requiring appropriate weight distribution.
- **Data availability:** Reliable and comprehensive data is necessary for accuracy.
- **Formula selection:** Various index number formulas exist, and choosing the right one impacts results.

4. Write down the steps for the construction of index numbers.

The steps involved are:

- Define the objective and scope.
- Select the base year.
- Choose the items to be included.
- Collect relevant data.
- Assign appropriate weights.
- Choose a suitable formula.
- Compute and interpret the index.

5. What do you mean by the cost of living index?

The cost of living index measures changes in the average cost required to maintain a standard of living. It is primarily used to track inflation and adjust wages or pensions accordingly. The CPI is a commonly used cost of living index, reflecting price changes in consumer goods and services over time.

6. Index numbers are called economic barometers— Comment.

Index numbers serve as economic barometers because they indicate economic trends and stability. Just as a barometer predicts weather changes, index numbers help policymakers, businesses, and economists analyze price fluctuations,

economic growth, and inflation. They provide valuable insights into market conditions and guide economic policies.

7. Write a note on Time Reversal Test and Factor Reversal Test.

- **Time Reversal Test:** This test ensures that an index number formula remains consistent when the base year and current year are interchanged. If an index formula satisfies this test, the product of the forward and reverse indices should equal 1.
- **Factor Reversal Test:** This test ensures that when prices and quantities are interchanged in an index formula, their product should give the value index. This test is used to check the reliability of index numbers in economic analysis.

8. Why is Fisher's Index Number called an Ideal Index?

Fisher's Index Number is known as an **ideal index** because it overcomes the limitations of both **Laspeyres'** and **Paasche's** index numbers.

Reasons for being an Ideal Index:

- **Time Reversal Test** – Fisher's Index satisfies this test, meaning if we reverse the time period and recalculate, the result remains consistent.
- **Factor Reversal Test** – The product of price and quantity indices should equal the value ratio. Fisher's Index meets this requirement.
- **Eliminates Bias** – Unlike **Laspeyres** (which overstates) and **Paasche** (which understates) price changes,

Fisher's Index is more balanced.

- **Geometric Mean Property** – By taking the square root of both indices, Fisher's formula reduces distortions and provides a more **accurate measure of price changes**.

Thus, due to its mathematical **soundness and accuracy**, Fisher's Index is called an **Ideal Index Number**.

9. What are the different methods of calculating Index Numbers?

Index numbers are statistical tools used to measure relative changes in economic variables over time. The methods of calculating index numbers are:

- **Simple Aggregative Method**
- **Simple Average of Price Relatives Method**
- **Weighted Aggregative Method** (Laspeyres, Paasche, and Fisher's Index)
- **Weighted Average of Price Relatives Method**

Each method has its own advantages, and the choice of method depends on the purpose of measurement.

10. What are the Advantages of the Cost of Living Index?

The **Cost of Living Index (COLI)** measures changes in the price level of goods and services that households consume. It helps assess the impact of **inflation** on consumers.

Advantages:

- **Wage Adjustments** – Governments and businesses use it to adjust **salaries and pensions** to keep up with inflation.
- **Economic Planning** – Helps policymakers determine

monetary and fiscal policies for economic stability.

- **Business Pricing Decisions** – Companies adjust **product prices and wage structures** based on the cost of living index.
- **Comparison of Living Standards** – Helps compare **purchasing power** across different regions or time periods.
- **Measuring Inflation Effects** – It is used to analyze the real impact of **inflation** on consumers.
- **Social Welfare Programs** – Governments use COLI to **design welfare schemes** such as subsidies, food security programs, and housing allowances.

Overall, the **Cost of Living Index** is essential for economic stability and financial planning.

11. Name the Two Ideal Index Numbers.

The two **Ideal Index Numbers** are:

- **Fisher's Ideal Index** – It satisfies both the **Time Reversal Test** and **Factor Reversal Test**, making it an **accurate and unbiased** index number.
- **Törnqvist Index** – It is a **logarithmic index** that takes an **average of price and quantity weights** for two time periods, ensuring accuracy in measuring changes in the economy.

These two index numbers are considered **ideal** because they **minimize biases** and provide a more accurate representation of **price changes over time**.

