24

Measuring the Cost of Living

Measuring the Cost of Living

- *Inflation* refers to a situation in which the economy's overall price level is rising.
- The *inflation rate* is the percentage change in the price level from the previous period.

THE CONSUMER PRICE INDEX

- The *consumer price index (CPI)* is a measure of the overall cost of the goods and services bought by a typical consumer.
- The Bureau of Labor Statistics reports the CPI each month.
- It is used to monitor changes in the cost of living over time.

THE CONSUMER PRICE INDEX

When the CPI rises, the typical family has to spend more dollars to maintain the same standard of living.

How the Consumer Price Index Is Calculated

1. *Fix the basket.* Determine what prices are most important to the typical consumer.
   - The Bureau of Labor Statistics (BLS) identifies a market basket of goods and services the typical consumer buys.
   - The BLS conducts monthly consumer surveys to set the weights for the prices of those goods and services.

How the Consumer Price Index Is Calculated

2. *Find the prices.* Find the prices of each of the goods and services in the basket for each point in time.
3. *Compute the basket's cost.* Use the data on prices to calculate the cost of the basket of goods and services at different times.

How the Consumer Price Index Is Calculated

4. Choose a base year and compute the index.
   - Designate one year as the base year, making it the benchmark against which other years are compared.
   - Compute the index by dividing the price of the basket in one year by the price in the base year and multiplying by 100.

$$\text{Consumer price index} = \frac{\text{Price of basket of goods and services}}{\text{Price of basket in base year}} \times 100$$

How the Consumer Price Index Is Calculated

5. *Compute the inflation rate.* The *inflation rate* is the percentage change in the price index from the preceding period.

How the Consumer Price Index Is Calculated

- The inflation rate is calculated as follows:

$$\text{Inflation Rate in Year 2} = \frac{\text{CPI in Year 2} - \text{CPI in Year 1}}{\text{CPI in Year 1}} \times 100$$

Table 1 Calculating the Consumer Price Index and the Inflation Rate: An Example

Step 1: Survey Consumers to Determine a Fixed Basket of Goods

Basket = 4 hot dogs, 2 hamburgers

Step 2: Find the Price of Each Good in Each Year

Year	Price of Hot Dogs	Price of Hamburgers
2005	$1	$2
2006	2	3
2007	3	4

Table 1 Calculating the Consumer Price Index and the Inflation Rate: An Example

Step 3: Compute the Cost of the Basket of Goods in Each Year

2005	($1 per hot dog × 4 hot dogs) + ($2 per hamburger × 2 hamburgers) = $8 per basket
2006	($2 per hot dog × 4 hot dogs) + ($3 per hamburger × 2 hamburgers) = $14 per basket
2007	($3 per hot dog × 4 hot dogs) + ($4 per hamburger × 2 hamburgers) = $20 per basket

Step 4: Choose One Year as a Base Year (2005) and Compute the Consumer Price Index in Each Year

2005	($8/$8) × 100 = 100
2006	($14/$8) × 100 = 175
2007	($20/$8) × 100 = 250

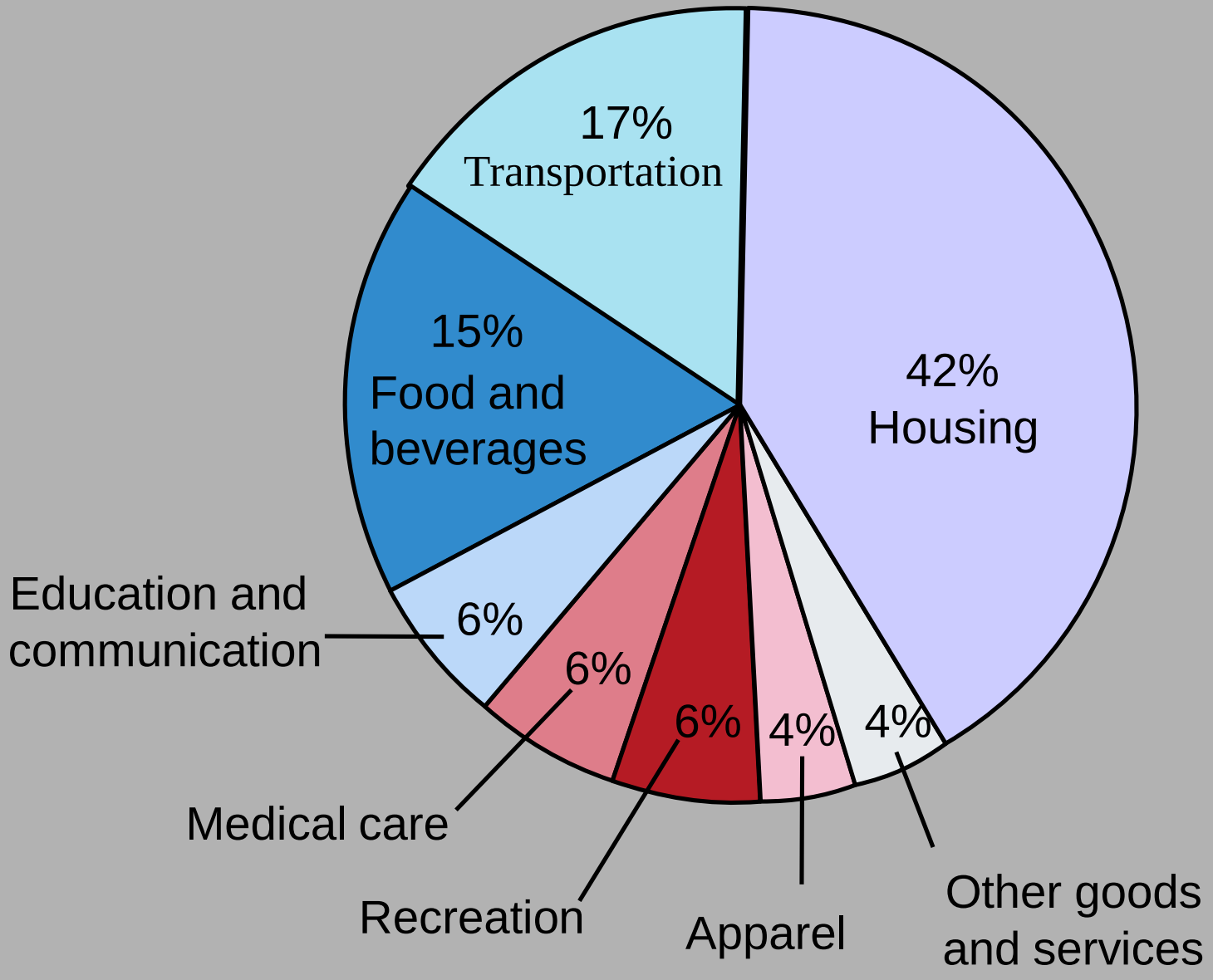
Step 5: Use the Consumer Price Index to Compute the Inflation Rate from Previous Year

2006	(175 − 100)/100 × 100 = 75%
2007	(250 − 175)/175 × 100 = 43%

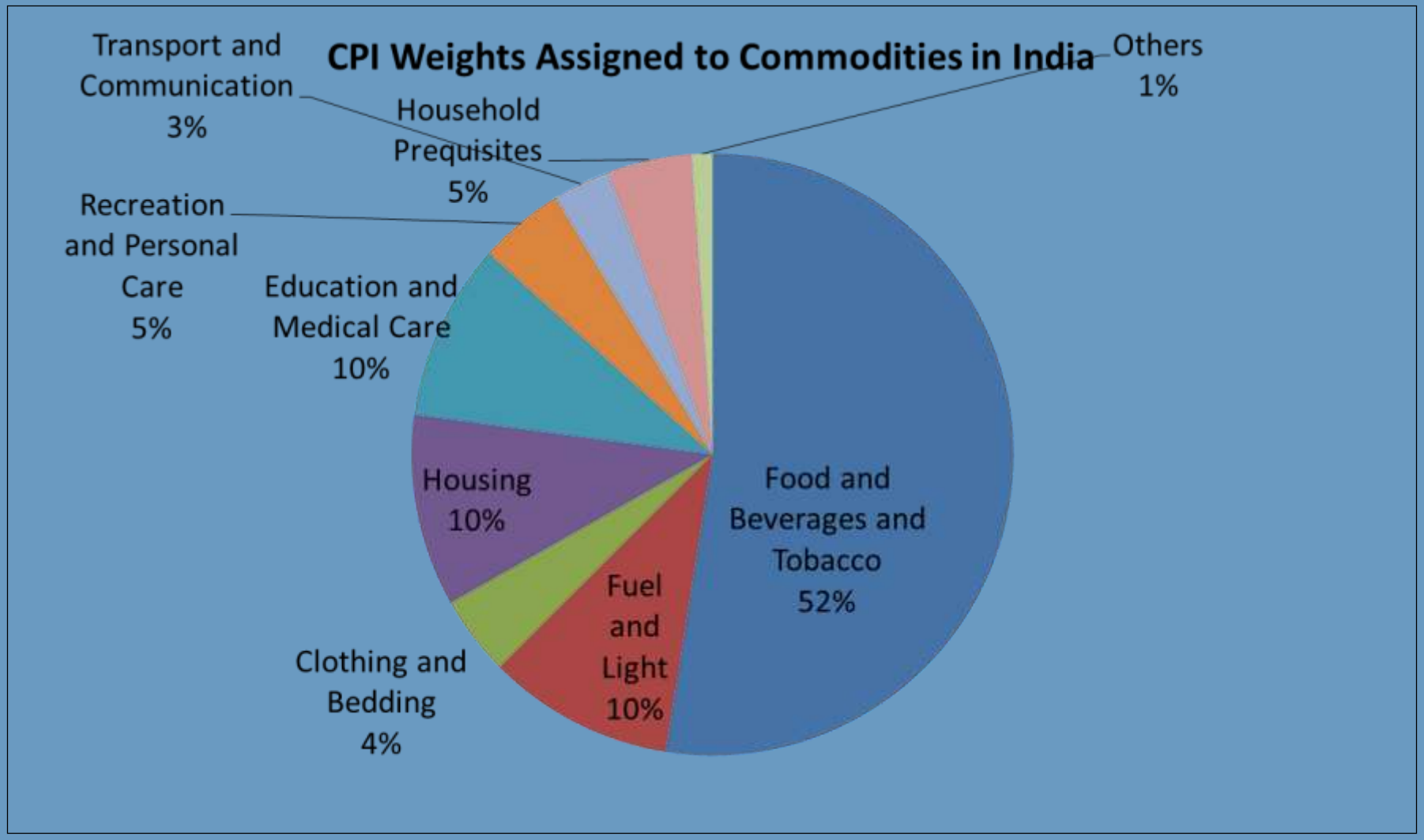
How the Consumer Price Index Is Calculated

- Calculating the Consumer Price Index and the Inflation Rate: Another Example
  - Base Year is 2002.
  - Basket of goods in 2002 costs $1,200.
  - The same basket in 2004 costs $1,236.
  - CPI = ($1,236/$1,200) × 100 = 103.
  - Prices increased 3 percent between 2002 and 2004.

FYI: What Is in the CPI's Basket?



Consumer Price Index- Weights in India



Source: CSO

Problems in Measuring the Cost of Living

- The CPI is an accurate measure of the selected goods that make up the typical bundle, but it is not a perfect measure of the cost of living.
- Substitution bias
- Introduction of new goods
- Unmeasured quality changes

Problems in Measuring the Cost of Living

- Substitution Bias
- The basket does not change to reflect consumer reaction to changes in relative prices.
  - Consumers substitute toward goods that have become relatively less expensive.
  - The index overstates the increase in cost of living by not considering consumer substitution.

Example:

Imagine that in the base yr, apples are cheaper than pears, and so consumers buy more apples than pears. When the BLS constructs the basket of goods, it will include more apples than pears.

Suppose the next yr pears are cheaper than apples. Consumers will naturally respond to the price changes by buying more pears and fewer apples.

Yet when computing the consumer price index, the BLS uses a fixed basket, which in essence assumes that consumers continue buying the now expensive apples in the same quantities as before.

For this reason, the index will measure a much larger increase in the cost of living than consumers actually experience.

Problems in Measuring the Cost of Living

- Introduction of New Goods
  - The basket does not reflect the change in purchasing power brought on by the introduction of new products.
  - New products result in greater variety, which in turn makes each rupees more valuable.
  - Consumers need fewer rupees to maintain any given standard of living.

Example:

Suppose you could choose b/n a 1000 RS gift coupon at a large store that offered a wide array of goods and a 1000 RS gift coupon at a small store with the same prices but a more limited choice. Which would you prefer?

First option. In essence, the increased set of possible choices make each dollar more valuable. The same is true with the evolution of economy over time:

New products result in greater variety, which in turn makes each rupees more valuable.

Yet because the consumer price index is based on a fixed basket of goods and services, it does not reflect the increase in the value of rupees that arises from the introduction of new goods.

Problems in Measuring the Cost of Living Unmeasured Quality Changes

- If the quality of a good rises from one year to the next, the value of a dollar rises, even if the price of the good stays the same.
- If the quality of a good falls from one year to the next, the value of a dollar falls, even if the price of the good stays the same.
- When the quality of a good in the basket changes – ex, when a car model has get better mileage from one year to the next-the Bureau adjusts the price of the good to account for the quality changes.
- The BLS tries to adjust the price for constant quality, but such differences are hard to measure.

Problems in Measuring the Cost of Living

- The substitution bias, introduction of new goods, and unmeasured quality changes cause the CPI to overstate the true cost of living.
- The issue is important because many government programs use the CPI to adjust for changes in the overall level of prices.
- The CPI overstates inflation by about 1 percentage point per year.

The GDP Deflator versus the Consumer Price Index

- Because nominal GDP is current output valued at current prices and real GDP is current output valued at base year prices
- The GDP deflator is calculated as follows

$$\text{GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

The GDP Deflator versus the Consumer Price Index

- The BLS calculates other prices indexes:
- The index for different regions within the country.
- The producer price index, which measures the cost of a basket of goods and services bought by firms rather than consumers.

The GDP Deflator versus the Consumer Price Index

- Economists and policymakers monitor both the GDP deflator and the consumer price index to gauge how quickly prices are rising.
- There are two important differences between the indexes that can cause them to diverge.

The GDP Deflator versus the Consumer Price Index

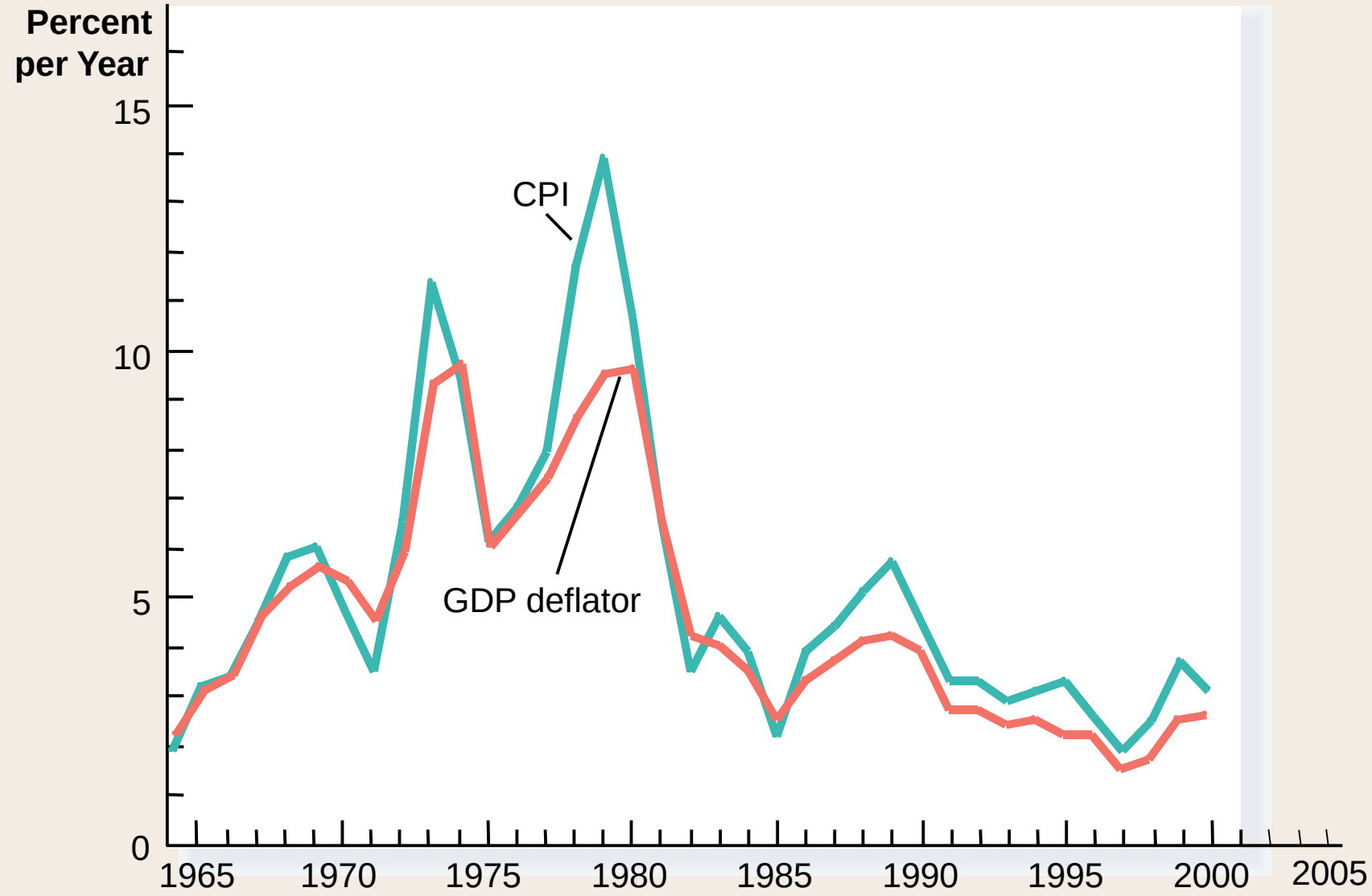
- The GDP deflator reflects the prices of all goods and services produced domestically, whereas...
- …the consumer price index reflects the prices of all goods and services bought by consumers.

The GDP Deflator versus the Consumer Price Index

- The consumer price index compares the price of a fixed basket of goods and services to the price of the basket in the base year (only occasionally does the BLS change the basket)...
- …whereas the GDP deflator compares the price of currently produced goods and services to the price of the same goods and services in the base year.

- GDP deflator is the ratio of nominal GDP to real GDP. Because nominal GDP is current output valued at current prices and real GDP is current output valued at base year prices, GDP deflator reflects the current level of prices relatives to the level of prices in the base year.

Figure 2 Two Measures of Inflation



When they do diverge and what may be the cause?

1979 and 1980 Oil prices more than doubled during these two years.

Oil price hike.

WPI and CPI- Comparison

W.P.I	C.P.I
Wholesale price index measures inflation at each stage of production	Consumer price index measures inflation only at final stage of production
Wholesale price index is the middle point of the sum of all the goods bought by the traders	Consumer price index is the middle point of the sum of all the goods bought by consumers
Wholesale Price Index (WPI), is based on the price prevailing in the wholesale markets or the price at which bulk transactions are made	The Consumer Price Index (CPI) is based on the final prices of goods at the retail level.
There are only few countries that uses WPI to calculate inflation rates	Many nations have already shifted to using CPI.
There are 679 elementary items included in WPI, some of which are insignificant & outdated goods that are considered in WPI	CPI, on the other hand, have well-selected variables.
Category Weights – Base Year is 2004-05 with Energy Products having 14.91% weights, food 14.34% while services are not included.	Category Weights – Base Year is 20105 with Energy Products having 9.49% weights, food 49.71% while services are included with 26.3% weightage.

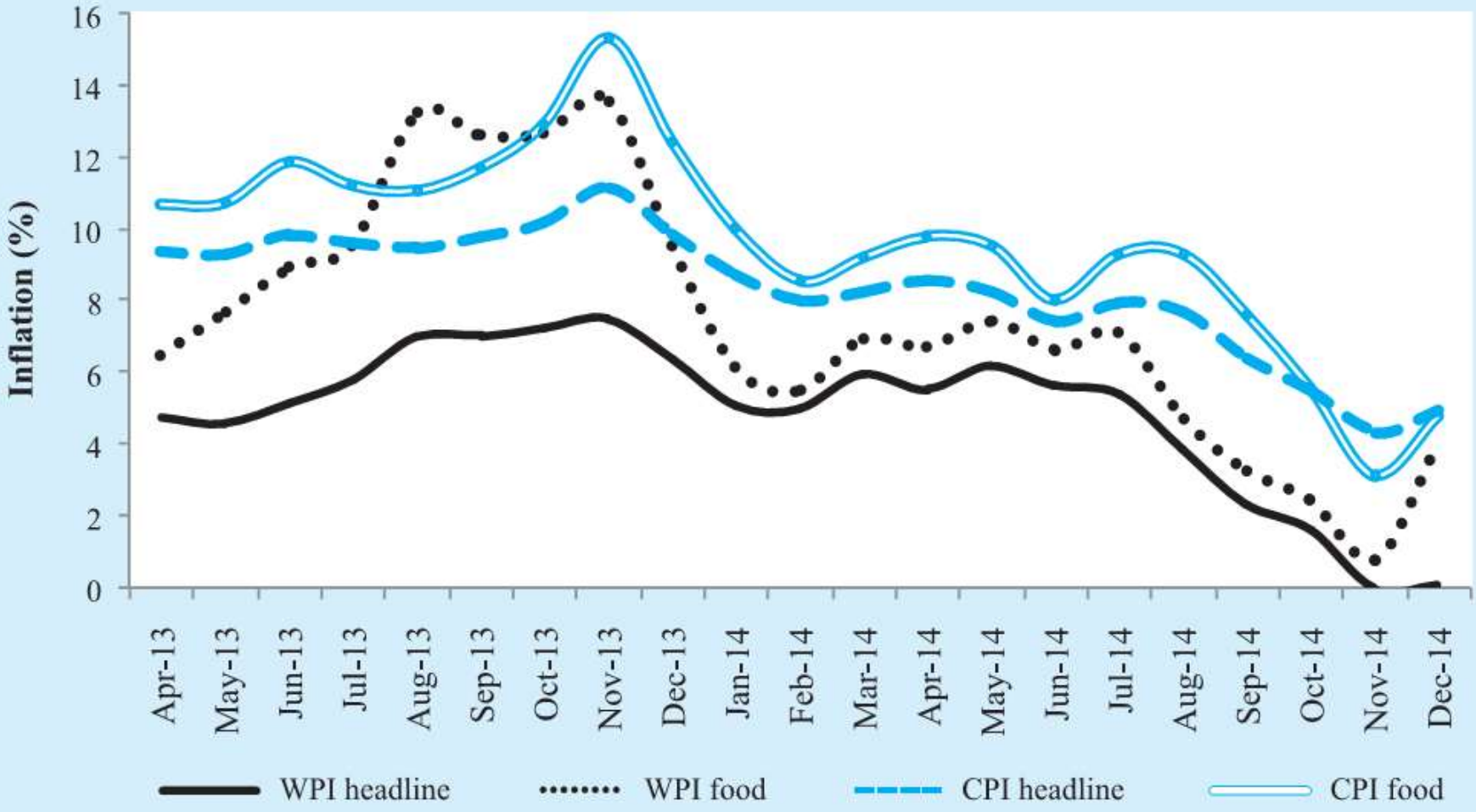
Source: CSO

Weights assigned to Product Groups in CPI

January 2014	Weights
General Index	**100.0**
Food, Beverages and Tobacco	**49.7**
Cereals and Products	14.6
Egg, Fish and Meat	3.9
Condiments and Spices	5.4
Vegetables	1.9
Fruits	1.9
Milk and Products	2.9
Prepared Meals etc.	2.8
Pan, Tobacco and Intoxicants	2.1
Fuel and Light	**9.5**
Housing	**9.8**
Clothing, Bedding and Footwear	**4.7**
Clothing and Bedding	4.1
Footwear	0.7
Miscellaneous	**26.3**

Source: MOSPI

Inflation in WPI and CPI in India (April 2013- December 2014)



Source: CSO

CORRECTING ECONOMIC VARIABLES FOR THE EFFECTS OF INFLATION

- Price indexes are used to correct for the effects of inflation when comparing dollar figures from different times.

Dollar Figures from Different Times

- Do the following to convert dollar values from year T into today's dollars:

$$\text{Amount in today's dollars} = \text{Amount in year T's dollars} \left(\frac{\text{Price level today}}{\text{Price level in year T}} \right)$$

Dollar Figures from Different Times

- Do the following to convert (inflate) Mohan's wages in 1931 to dollars in 2014:

$$\text{Salary}_{2014} = \text{Salary}_{1931} \frac{\text{Price level in 2014}}{\text{Price level in 1931}}$$

$$= \$80{,}000 \frac{195}{15.2}$$

$$= \$1{,}026{,}316$$

Real and Nominal Interest Rates

- Interest represents a payment in the future for a transfer of money in the past.

Real and Nominal Interest Rates

- The *nominal interest rate* is the interest rate usually reported and not corrected for inflation.
  - It is the interest rate that a bank pays.
- The *real interest rate* is the interest rate that is corrected for the effects of inflation.

Real and Nominal Interest Rates

- You borrowed $1,000 for one year.
- Nominal interest rate was 15%.
- During the year inflation was 10%.
- Real interest rate = Nominal interest rate – Inflation
- = 15% – 10% = 5%

Who is hurt by Inflation?

Unanticipated inflation hurts Fixed-Income Receivers, Savers and Creditors.

Savers:

Example: A HH may save $1,000 in a CD in a commercial bank or saving and loan association at 6% annual interest. But if inflation is 13%, the real value of purchasing power of that 1,000$ will be cut to about $938 by the end of the year.

Although the saver will receive $ 1,060 (equal to $1,000 plus $ 60 of interest), deflating that for $1,060 for 13 percent inflation means that its real value is only about $ 938 (= $ 1,060/1.13)

Causes and Theories of Inflation

A. Causes and Theories of Inflation

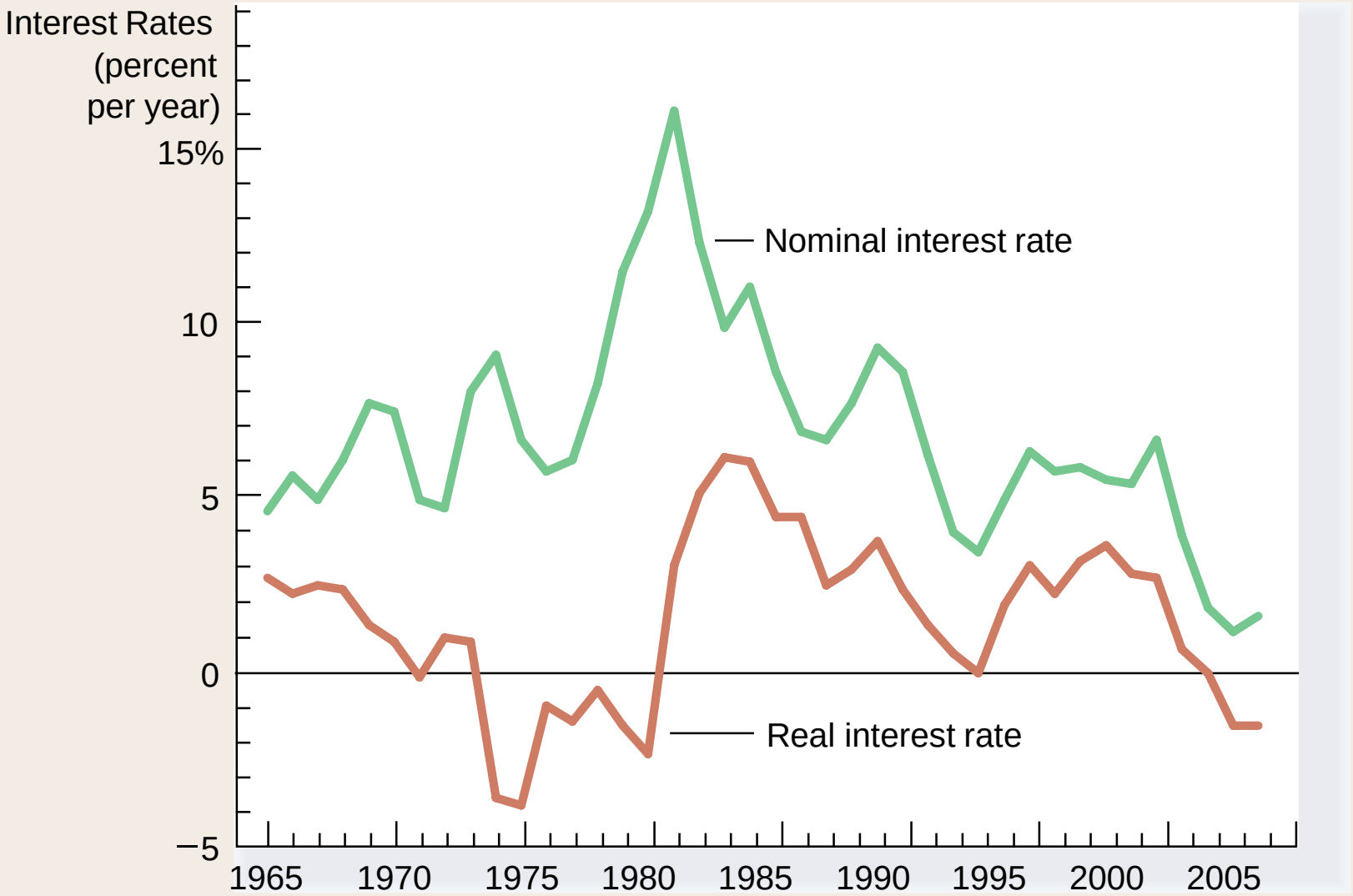
1. Demand-pull inflation: Spending increases faster than production. When resources are already fully employed, the business sector can not respond to excess demand by expanding output. So the excess demand bids up the prices of the limited output, producing demand –pull inflation. The essence of this inflation is that "too much spending chasing too few goods."
2. Cost-push or supply-side inflation: Prices rise because of rise in per-unit production costs (Unit cost = total input cost/units of output).The theory of cost push inflation explains rising prices in terms of factors that raise per-unit production cost at each level of spending.
    a. Output and employment *decline* while the price level is rising.
    b. The major source of cost-push inflation has been the so called supply shocks.. These typically occur with dramatic increases in the price of raw materials or energy. The rocketing prices of imported oil in 1973-74 and again in 1979-80 are food example of cost push inflation.
3. Complexities: It is difficult to distinguish between demand-pull and cost-push causes of inflation, although cost-push will die out in a recession if spending does not also rise.

B. Core Inflation

1. Food and energy prices are very volatile due to changes in supply and demand, which are usually temporary changes.
2. To prevent a misinterpretation of the changes in the CPI that might be due to temporary changes in supply and demand, economists use core inflation.
    a. Core inflation doesn't include food and energy goods.Core inflation is the underlying inflation rate after volatilie food and energy prices have been removed.
    b. If core inflation is low and stable, current policy may not need to be changed even if the CPI is rising.

- Economists will be greatly concerned if core inflation increases

Figure 3 Real and Nominal Interest Rates



Sources of Data on the Indian Economy

- GOI (Economic Surveys);
- RBI Bulletins,
- RBI reports on currency and finance
- CMIE
- EPW Research Foundation
- The directorate general of foreign trade
- The directorate general of Commercial Intelligence and statistics
- Tata services Limited (statistical Outline of India)

Summary

- The consumer price index shows the cost of a basket of goods and services relative to the cost of the same basket in the base year.
- The index is used to measure the overall level of prices in the economy.
- The percentage change in the CPI measures the inflation rate.

Summary

- The consumer price index is an imperfect measure of the cost of living for the following three reasons: substitution bias, the introduction of new goods, and unmeasured changes in quality.
- Because of measurement problems, the CPI overstates annual inflation by about 1 percentage point.

Summary

- The GDP deflator differs from the CPI because it includes goods and services produced rather than goods and services consumed.
- In addition, the CPI uses a fixed basket of goods, while the GDP deflator automatically changes the group of goods and services over time as the composition of GDP changes.

Summary

- Dollar figures from different points in time do not represent a valid comparison of purchasing power.
- Various laws and private contracts use price indexes to correct for the effects of inflation.
- The real interest rate equals the nominal interest rate minus the rate of inflation.