# Price Indeces and Inflation

**Inflation-** an increase in the overall level of prices.

**Hyperinflation-** very severe, very rapid inflation.

## How to build and use a price index

A **price index** is used to measure changes (or differences) in the cost of living. These can be used to measure changes in the cost of living from one year to the next or differences in the price level from one area to another. A price index measures the cost of purchasing a constant "market basket" of goods and services that would be consumed by the "typical" consumer. They do not measure the prices of every good, nor are they intended to. They are used to measure the approximate cost of living.

### How do you build a price index?

Assume the following table is a representative market basket of goods and services that a typical consumer would purchase during a given year.

| Product | Quantity | Price 1997 | Price 1998 | Price 1999 |
|---|---|---|---|---|
| Bread | 18 | $1.00 | $0.75 | $0.80 |
| Milk | 12 | $2.25 | $2.75 | $2.80 |
| Fruit | 15 | $1.00 | $0.90 | $1.20 |
| Twinkies | 6 | $3.00 | $4.00 | $3.50 |

You take this information to calculate the cost of purchasing the above quantities of those products during each of the years. To do this you multiply the quantity of the product consumed by the price of the product (for each year) then add up the total expenditures on those goods and services for each year.

So, to calculate the expenditure on the items in 1997 you would take the quantity of bread (18) and multiply it by the price of bread in 1997 ($1.00). This will come to $18. Then you multiply the quantity of milk (12) by the price of milk in 1997 ($2.25). This comes to $27. Multiply the quantity of fruit (15) by the price of fruit in 1997 ($1.00). This comes to $15. Do the same and multiply the quantity of Twinkies (6) by the price of Twinkies ($3.00). This comes to $18. Then figure the cost of purchasing all of these products in 1997, so you add $18 + $27 + $15 + $18 for a total expenditure of $78 on all of those products in 1997.

Use the same process for each individual year. With the above numbers, you would end up with the following expenditures for each of the named years:

| | |
|---|---|
| Expenditure 1997 | $78.00 |
| Expenditure 1998 | $84.00 |
| Expenditure 1999 | $87.00 |

Once you have calculated the total expenditures for each year, you can calculate the price index for each year.

A price index figure is used to compare prices from different years. It expresses the cost of living as a ratio of the cost of purchasing the goods in different years to the cost of purchasing the goods in a "base year" (reference year).

To calculate a price index you would divide the expenditure in each year by the expenditure in the base year and multiply it by 100.

In other words (using 1997 as the base year for all of the calculations):

PI 1997 = (expenditure in 1997/expenditure base year) * 100
PI 1998 = (expenditure in 1998/expenditure base year) * 100
PI 1999 = (expenditure in 1999/expenditure base year) * 100

Using the above table we would have:

PI 1997 = (78/78)*100=100.00
PI 1998 = (84/78)*100=107.69
PI 1999 = (87/78)*100=111.54

How do we interpret the results?

One way of looking at it is that in 1998 it took $107.69 to buy the same products that $100.00 bought in 1997, and in 1999 it took $111.54 to buy what $100.00 bought in 1997.

How do we calculate the inflation rate from price index numbers?

The inflation rate is simply the percentage change in the price level.

Here is the calculation: (PI most recent year-PI least recent year)/PI least recent year.

It would look like this:

Inflation from 1997 to 1999: (PI 1999 – PI 1997)/ PI 1997; OR (111.54-100.00)/100.00 = 11.54/100 = 11.54%
Inflation from 1997 to 1998 (PI 1998– PI 1997)/ PI 1997; OR (107.69-100.00)/100.00 = 7.69/100 = 7.69%
Inflation from 1998 to 1999: (PI 1999 – PI 1998)/ PI 1998; OR (111.54-107.69)/107.69 = 3.85/107.69 = 3.58%

## How do we get "real" or "nominal" numbers using a Price Index?

Real numbers are numbers that are adjusted for inflation (or differences in the cost of living).

Nominal numbers are not adjusted for inflation (or differences in the cost of living).

When you hear the expression ".. in terms of 1994 dollars" a "real" number has been presented. It allows for the comparison of the true purchasing power of money.

(Another way of looking at is a true comparison, for example ($5.00 in 1958 could buy more than $5.00 in 1998) so it expresses the amount in terms of the buying power from only one period so they can be easily compared.)

How do I do this calculation?

Real = (nominal/deflator).

What is a deflator? A deflator is a price index divided by 100.

May I see some examples?

1998 Nominal income = $37,000. What was real income?

Real = ($37,000 / 1.0769) ; Real = $34,357.88.
This means that $37,000 in 1998 had the same purchasing power as $34,357.88 did in the base year.
OR

1999 Real income = $35,000. What is nominal income?

Since Real = (nominal/deflator); Nominal = Real * deflator.

so

Nominal = $35,000 * 1.1154 ; Nominal=$39,039.00

So $39,039.00 in 1999 had the same buying power as $35,000 did in the base year.