

### Inflation Calculator

*<http://spreadsheetml.com/finance/inflationcalculator.shtml>*

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## ConnectCode's Financial Modelling Templates

*Have you thought about how many times you use or reuse your financial models? Everyday, day after day, model after model and project after project. We definitely have. That is why we build all our financial templates to be reusable, customizable and easy to understand. We also test our templates with different scenarios vigorously, so that you know you can be assured of their accuracy and quality and that you can save significant amount of time by reusing them. We have also provided comprehensive documentation on the templates so that you do not need to guess or figure out how we implemented the models.*

*All our template models are only in black and white color. We believe this is how a professional financial template should look like and also that this is the easiest way for you to understand and use the templates. All the input fields are marked with the '\*' symbol for you to identify them easily.*

*Whether you are a financial analyst, investment banker or accounting personnel. Or whether you are a student aspiring to join the finance world or an entrepreneur needing to understand finance, we hope that you will find this package useful as we have spent our best effort and a lot of time in developing them.*

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# 1. Inflation and Consumer Price Index

## 1.1 Background

When people talk about the effects of their money getting smaller over time, they are talking about the effects of inflation. The question is of course, why our money gets smaller. Economists offer several schools of thoughts. For example, if a country prints more money to solve problems in a time of crisis, the supply of money will go up. This in turn will lead to the money becoming smaller. Another reason could be the production costs of goods and services have gone up, this will also lead to our money being smaller. We know that inflation causes our money to become smaller over time, which is one of the reasons that people put money in the bank to earn interests to counter the effects of inflation.

### 1.1.1 The impact of inflation on financial modelling.

In financial modelling, there are typically discussions on the nominal value versus the real value of something. The real value of something basically takes into account the effects of inflation. For example, if you have \$1000 today, what is the real value in 5 years time? The real value of the \$1000 in 5 years time is to take into account the effects of the yearly inflation. We can use the Time Value of Money concepts to discount the \$1000 using the inflation rate over a period of 5 years. This leads us to question what the inflation rate is and how do we calculate the inflation rate?

### 1.1.2 Consumer Price Index

Many countries periodically measure the average price of goods and services purchased by households. This data is in turn published on official government websites. This data allow us to calculate the rate of inflation.

### 1.1.3 Inflation

Inflation is defined as the rise in the general level of prices of goods and services purchased by households. Or in other words, it is a measure of the percent change in the consumer price index (CPI). For example, to measure the inflation in year 2008, we can use the following formula:

$$(\text{CPI at 2008} - \text{CPI at 2007}) / \text{CPI at 2007}$$

## 2. Inflation Calculator and Spreadsheet

The U.S. Department Of Labor (Bureau of Labor Statistics) published the Consumer Price Index (CPI) of United States periodically. This data can be used to calculate the inflation rate.

### 2.1 Calculating Monthly Inflation

The Inflation Calculator and Spreadsheet (InflationCalculator.xls) provided can be used to calculate the rate of inflation quickly and easily. By default the Inflation&CPI-Monthly worksheet already contains the monthly consumer price index from January 1913 to July 2009. The latest consumer price index can be keyed into the spreadsheet labelled "Consumer Price Index" to calculate the latest inflation.

#### 2.1.1 Consumer Price Index input

	A	B	C	D	E	F	G	H	I	J	K	L	M
103	Consumer Price Index*												
104													
105													
106	Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
107	1913	9.8	9.8	9.8	9.8	9.7	9.8	9.9	9.9	10	10	10.1	10
108	1914	10	9.9	9.9	9.8	9.9	9.9	10	10.2	10.2	10.1	10.2	10.1
109	1915	10.1	10	9.9	10	10.1	10.1	10.1	10.1	10.1	10.2	10.3	10.3
110	1916	10.4	10.4	10.5	10.6	10.7	10.8	10.8	10.9	11.1	11.3	11.5	11.6
111	1917	11.7	12	12	12.6	12.8	13	12.8	13	13.3	13.5	13.5	13.7
112	1918	14	14.1	14	14.2	14.5	14.7	15.1	15.4	15.7	16	16.3	16.5

The website to obtain updated data on consumer price index (CPI) is located at :

<http://www.bls.gov>

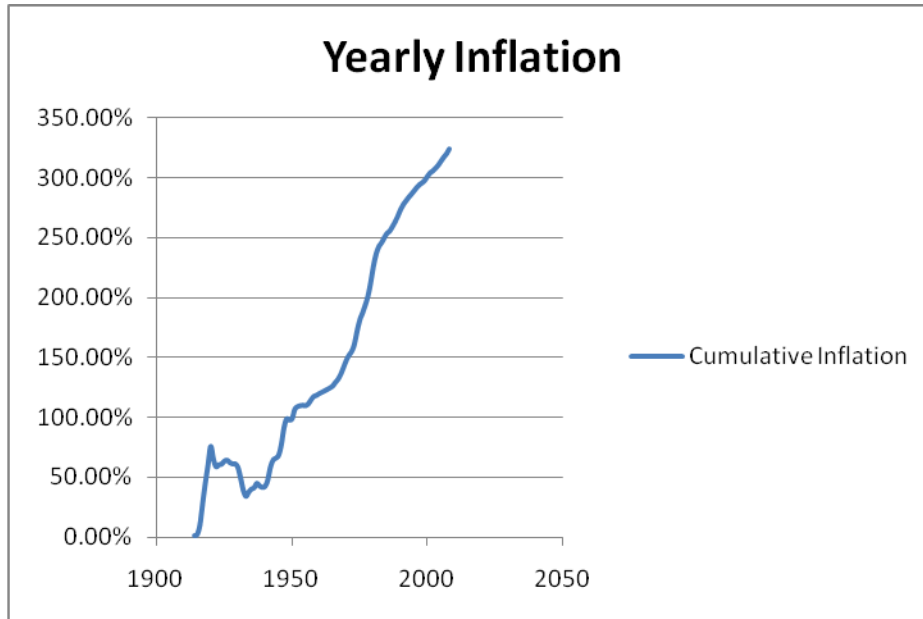
#### 2.1.2 Inflation calculation

The month-to-month inflation is calculated up to 3 decimal points and shown below.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Inflation												
2													
3													
4	Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	1913		0.000%	0.000%	0.000%	-1.020%	1.031%	1.020%	0.000%	1.010%	0.000%	1.000%	-0.990%
6	1914	0.000%	-1.000%	0.000%	-1.010%	1.020%	0.000%	1.010%	2.000%	0.000%	-0.980%	0.990%	-0.980%
7	1915	0.000%	-0.990%	-1.000%	1.010%	1.000%	0.000%	0.000%	0.000%	0.000%	0.990%	0.980%	0.000%
8	1916	0.971%	0.000%	0.962%	0.952%	0.943%	0.935%	0.000%	0.926%	1.835%	1.802%	1.770%	0.870%

### 2.2 Calculating Yearly Inflation

Upon keying in the CPI data in the previous worksheet, the yearly inflation rate will also be automatically calculated in the Inflation-Yearly worksheet. The Inflation-Yearly worksheet uses the average of all the monthly CPI to calculate the yearly inflation. The cumulative inflation is then plotted in a chart as shown on the screen below.



## 2.3 The Fisher Effect

Earlier we have discussed on the nominal value versus the real value of something. The real value of something basically takes into account the effects of inflation. This is useful in financial modelling when we need to calculate the real rate of returns based on the nominal rate of returns. The relationship between the real rate of returns, nominal rate of returns and inflation is commonly known as the Fisher Effect. The formula for the relationship is as shown below:

$$1 + \text{Nominal Rate of Returns} = (1 + \text{Real Rate of Returns}) * (1 + \text{Inflation Rate})$$

The FisherEffect worksheet allows us to calculate the Nominal Rate of Returns or Real Rate of Returns based on the formula above. It requires the Inflation Rate from one of the previous worksheet as an input.