Xanadu by the Sea Property Owners Association

Calculating Inflation Factors for Cost Estimates

Treasurer Work Product

CALCULATING INFLATION FACTORS FOR COST ESTIMATES

Importance of using an inflation factor in your cost estimates

Even a modest rate of inflation can seriously erode purchasing power over time. Assume for example, that inflation is running at its historical average of 3%. At that rate, you, need $870,000 in five years to match the purchasing power of $750,000 today. At the end of 20 years, $1,357,500 is needed to construct that same $750,000 project. To avoid underestimating the needs of a critical project, make an inflation-adjusted estimate of your costs. In the following paragraphs you'll find a discussion on calculating inflation factors.

The Formula for Calculating Inflation Using Index Values

The formula for calculating the Inflation Rate is relatively simple. Every month various organizations survey prices and generate different indices that we base our estimates from. Usually, we average the various index values to find an average inflation percentage. Some of these indices are the Turner Building Index (TBI), Municipal Cost Index (MCI), and the Construction Cost Index (CCI). Assume for the sake of simplicity that the index consists of one item and that one item cost $1.00 in 1984. The BLS published the index in 1984 at 100. If today that same item costs $1.85 the index would stand at 185.0.

By looking at the above example, common sense would tell us that the index increased (it went from 100 to 185). The question is how much has it increased? To calculate the change, take the second number (185) and subtract the first number (100). The result would be 85. So it is known that since 1984 prices increased (Inflated) by 85 points. What good does knowing that it changed 85 do? Not much. A method of comparison is still needed, so we compare it to the price it started at (100). This is done by simply dividing the increase by the original price or 85/100. The result is (.85). This number is still not very useful so it is converted into a percent. To do that, multiply by 100 and add a % symbol. So the result is an 85% increase in prices since 1984.

Calculating a Specific Inflation Rate

Normally, you want to know how much prices have increased over the past couple of years. Fortunately, the method of calculating Inflation is the same, no matter what time period is desired. You just substitute a different value for the first one. So if you want to know how much prices have increased over the last 12 months (the commonly published inflation rate number) subtract last year's index from the current index and divide by last year's number, multiply the result by 100 and add a % sign.

The formula for calculating the Inflation Rate looks like this:

$$\frac{(B - A)}{A} * 100$$

So if exactly one year ago the Index Value was 178 and today the Index Value is 185, then the calculations would look like this:

$$\frac{(185-178)}{178} * 100$$

which is equivalent to

$$\frac{(7)}{(178)} * 100$$

which is equivalent to
0.0393*100

which equals 3.93% inflation over the sample year.

Calculating Total Cost & Inflation Factor for Estimates
Inflation is not always as simple as saying there's 3% inflation every year. To be correct, that inflation must be compounded in order to reflect new inflation prices from each previous value calculated instead of just using what 3% reflects for the base year you are calculating. This will be shown in detail below.

For example,
3% inflation rate factored into $100,000 gives you $103,000 (100,000 + (100,000 *0.03)) for the next year, which is accurate in both the simplified and compounding equations.
But, what if you use 3% inflation over the next 5 years?

- Using simple inflation techniques, the new value is (100,000 + (100,000 * 0.03 * 5 years)), which equals $115,000.

- But, when compounding the inflation factor you get a value of $115,927, which is a difference of $927 from using simple inflation rates. Why the difference? Well, instead of just adding $3,000 for every year of inflation, we take the previous value that was calculated ($103,000) and multiply by 3%. Then take that new value ($106,090) and multiply by 3% again. This is the longhand version and you continue this process up to however many years you are calculating, in our example, 5 times. The simple way to do this is shown in the equation below.

$Pn = P(1+i)^n$

Where:
Pn = Total Inflated Estimated Cost
P = *Base* estimated Cost
i = Inflation Rate
n = Difference between Base Year and Selected Year. Ex 2010 - 2005 = 5 years, therefore n = 5
(1+i)n = Inflation Factor

Example: The current (2005) estimated cost of a project is $100,000. Calculate the expected cost of the project in 2010. Assume a 3% inflation rate.
Base Year: 2005
Future Year: 2010
Initial Cost (P): $100,000
Inflation Rate (i): 3%

$Pn = \$100,000(1+0.03)^5 = \$115,927$