



MODULE 4 VIDEO 6.2 TRANSCRIPT: ADJUSTMENTS AND SENSITIVITY ANALYSIS IN A COST ANALYSIS TEMPLATE: AMORTIZATION

In Section 2 of Module 4 Video 6, I'll be showing you how CAPCAT 1.2 amortizes certain ingredients for you. That means spreading out the costs of ingredients over their useful lifetime.

In the Key Parameters table in the Setup tab, we already indicated the number of years over which we want to amortize or spread the costs of various types of ingredients that last more than a year. So, for example, you can see that we want startup personnel costs like initial training spread over 7 years. You may recall that we used 7 years because that's the average tenure of a Reading Recovery teacher in this district.

The Reading Recovery Teacher Leader's initial training is a very costly full-year endeavor before she can deliver the program. However, using the amortization adjustment, we can include just a portion of these non-recurring training costs, about 1/7th, in each year that the program is implemented.

As we are making assumptions about what these useful lifetimes are, we could come back to this table after we finish our base case analysis and change one or more of the lifetimes in a sensitivity analysis to see how these changes affect our results. Changes made in this table will be applied automatically to all startup ingredients listed in the 4 ingredients tabs and all facilities construction costs.

In addition to specifying the lifetime of items that last more than a year, you also need an interest rate. In theory, this is the rate at which the dollar amounts that are spread over future years are invested and earn interest.

CAPCAT uses US Treasury bond rates from the year in which you want to present costs. You can see for example that, in 2017, the rate for 7 years was 2.16%, meaning that if you invested a dollar amount for 7 years, you'd earn just over 2% in interest each year. These rates appear automatically in the Interest Rates table

in the Setup tab as long as you choose a year for which rates are listed in the Rates tab.

If you choose a year that is not listed or want to use a different set of interest rates, you'll need to find and enter them here in the Rates tab.

In reality, we don't actually know what the relevant interest rates would be for this particular school district so this is another set of assumptions that you might want to come back and vary in a sensitivity analysis.

Now let's see how these numbers are used to make adjustments to the data we entered in the personnel tab.

You'll see that CAPCAT auto-populates the column "Period over which the cost is spread" differently for ingredients labeled "Start-up" like the Teacher Leader's time spent on training, and ingredients labeled "Ongoing" like the Teacher Leader's time on program delivery. For startup ingredients, CAPCAT pulls in the number of years that you entered in the Key Parameters table in the Setup tab. Remember we had 7 years for startup personnel costs.

For ongoing ingredients - which are items that need to be acquired each year - CAPCAT uses a default value of one year which means that no amortization occurs.

The interest rate column is auto-populated from the Interest Rates table in the Setup tab so here you can see the 2.16% rate has been pulled in.

For ongoing ingredients, we assume their costs are incurred at the beginning of the year so the interest rate is set at zero as there is no opportunity to earn interest.

I'll focus on the national costs but the same adjustment happens with the local costs.

CAPCAT amortizes the national costs of the ingredient in the National Cost column taking into account what percentage of the costs of the ingredient is attributable to the program.

Prior to amortization, CAPCAT has already adjusted the national price for inflation and added any fringe benefits that we indicated here.

So, the national cost column is actually doing several calculations at once as you can see from the very long formula up here.

To clarify, the National Cost is obtained by multiplying

- The quantity of the ingredient
- By the percentage of time spent on the program
- By the inflation-adjusted national salary and fringe benefits
- By the percentage of costs to include in this analysis
- By the amortization factor which Rob explained in an earlier video.

Here are the actual numbers.

- We have 1 Teacher Leader
- multiplied by 100% time spent on the program
- multiplied by an inflation-adjusted salary of \$71,273 + 54% in fringe benefits
- multiplied by 100% to be included in this analysis
- multiplied by the amortization factor which uses 2.16% as the interest rate and 7 years as the period over which to spread costs

This gives us the \$17,087 that's in the National Cost column right here.

If you want to spread costs of a single ingredient over a different number of years from the value you set in the Key Parameters table, or you want to use a different interest rate from the defaults I showed you in the Rates tab, you can overwrite the formulas in the relevant columns by entering the numbers you want to use.

For example, let's say you happen to know the Teacher Leader position in this district has very little turnover, you could enter 15 years instead of 7 for the "Period over which the cost is spread". This should give you a lower number in the national cost column because you're spreading the training costs over more time. However, you'll see that the Interest rate column changed to "N/A" because CAPCAT does not provide a default interest rate for 15 years.

So, I need to come up with one myself. If I go back to the Interest Rates table, I can calculate the midpoint between the 10-year and 20-year interest rates which is 2.49%, and I can enter that number directly in the Interest Rate column.

As expected, the national cost drops and is now \$8,871.

Now, what do you think would happen to the National Cost if I doubled that interest rate to 5%? The amounts spread over future years will earn more interest so I think the number will rise. Let's see.

Yes, the annualized amount has gone up about \$1,700 to \$10,589.

Now we can check amortization off our list of adjustments. Video 6, sections 3 and 4 cover discounting or compounding, and geographical adjustments.