Checking CPQ&R Assumptions and Cost Projections for Reasonableness

The built-in flexibility of the CPQ&R also obligates the user to check the model input (and output) frequently for reasonableness. Checking for reasonableness can take a variety of forms:

- Reviewing the green/red stoplight indicators on the HOME Page (also provided in the Index in Worksheet A) for signs of **incomplete or illogical assumptions**,
- Checking for **inconsistent assumptions** between tables of Worksheet B,
- Examining input assumptions and costs for **Year 0 relative to Years 1+**,
- **Using high/low values** to mitigate uncertainty and increase understanding regarding specific input assumptions.

Incomplete and Illogical Assumptions. On the HOME Page, and in Worksheet A (in the "Assumptions Complete?" column), indicators change in color from green to red based on logic built into the CPQ&R testing whether the table assumptions are complete and logical. A negative value entered by the user, as a rule, will trigger an alert. The following is a list of other user input errors or omissions within the different tables of the Implementation Plan will that trigger the stoplight indicators:

Worksheet B Table	Common Errors
B.2.a.1. Annual Preschool Slot Plan	- Zero total slots entered - ELL, Special Needs, and Rural percentages greater than 100% - Dosage exceeding 52 weeks in a year
B.2.a.2. Available Funding Streams	- FPL Thresholds not entered in ascending order % of Slots by Delivery Model exceeding 100% % Pass-Through exceeding 100% % of Eligible Funding Units that are Funded exceeding 100% - Ending Year occurring before Beginning Year

Worksheet B Table	Common Errors
B.2.b.1. Maximum Class Size	• Class size equal to zero • Enrollment efficiency greater than 100% • If entered by implementation year, then expressed in fewer years than the number of years in the slot plan
B.2.b.2. Staff-Child Ratio	• Zero values (with the exception that zero values are permitted for the maximum number of lead teachers per class) • If entered by implementation year, then expressed in fewer years than the number of years in the slot plan • Teaching capacities of zero • Average number of preschool classrooms per facility of zero
B.2.b.3. Teacher Degree **B.2.b.4. Assistant Teacher Degree B.2.b.5. Teacher Specialized Training**	• Percentages greater than 100% • Percentage assumptions that result in the number of participating teachers exceeding the total number of teachers (by degree level) • Years required to earn a degree equal to zero
B.2.b.6. Professional Learning and Support **B.2.b.7. Early Learning and Development Standards** **B.2.b.8. Continuous Quality Improvement System** **B.2.b.9. Curriculum**	• Percentages greater than 100% • Percentage participation rates expressed in fewer years than the number of years in the slot plan
B.2.b.10. Screening/Referral and Support Services	• Participation rates greater than 100%
B.2.c.2. Baseline Administrative Cost	• If entered by implementation year, then expressed in fewer years than the number of years in the slot plan
B.2.c.7. Capacity Building	• Annual participation rates expressed in fewer years than the number of years in the slot plan
B.2.d.1. Personnel Costs	• Number of total classrooms per facility equal to zero • Number of total classrooms per facility less than the number of early learning classrooms per facility • Paid Leave in excess of 365 days
B.2.d.2. Non-Personnel Costs	• Child Meals participation rates exceeding 100%

Worksheet B Table	Common Errors
B.2.d.3. Other Direct Costs	• Useful life (in years) equal to zero

Inconsistent Assumptions. Cases may arise where the input assumptions entered in one table are inconsistent with the assumptions in another table. This is a distinct issue from the list of potentially incomplete or illogical assumptions described above. An example of inconsistent assumptions is addressed at the end of this section, under "Checking for Inconsistency Between the Input Assumptions for State Average Teaching Salaries and Teacher Splits by Degree Level." Users should conduct a separate review of their input assumptions for inconsistencies after entering their data and checking that their assumptions are complete and logical.

Year 0 Relative to Years 1+. Rather than explicitly identifying implementation years as 2017, 2018, etc., the CPQ&R employs a naming convention with Year 0 for the current or most recent year and Years 1-10 for future years. Year 0 serves two purposes: first, it allows users to model current costs within the CPQ&R, for their existing early learning programs, before adding quality benchmarks. Second, it builds user confidence in the calculator by providing users with the opportunity to model current costs within the same modeling framework employed for forecasting future costs. If you do not want to model your existing early learning program, then Year 1 can serve as the first year for entering future preschool slot volumes and Year 0 would remain blank. If you do model Year 0 costs, then the Year 0 output should be reviewed against the output for Years 1+ to ensure that the input assumptions are not creating inconsistencies stemming from in an unintended and unrealistic increase or decrease in costs, frequently manifesting as a step-change in costs from Year 0 to Year 1.

There are cases where the user may choose to assign the current year (or most recent year) to Implementation Year 1 or later, rather than to Year 0. Years 1+ rely on the change in volumes from the prior year(s) to build certain costs. For example, capacity building costs in Table B.2.c.3 rely on the annual change in the number of facilities required to service the preschool slot plan. Year 0 has no prior year data from which to model such changes, but if the user assigns Implementation Year 1 to the current or most recent year and Year 0 to the year before that, and models two years of historical costs and volumes, then the change in volumes occurring in the most recent year (Year 1) would be accurately reflected. Another example can be shown in lead teacher degree costs in Table B.2.b.3: under a pre-existing tuition support program, with tuition support lasting up to five years per participating teacher, the past five years could be modeled as Implementation Years 0-4 and the next five years in a future preschool slot plan as Years 5-9. This approach would ensure that the most recent year of historical volumes driving tuition support—in this case Year 4—is accurate. These two examples illustrate how implementation years can be "repurposed" within the CPQ&R to better meet the needs of the user.

Using High/Low Values. You may encounter situations wherein there is a range of possible input assumptions you might use, but you lack the data to understand which is the correct value. Rather than feel thwarted by a lack of confidence in your data, you can set upper and lower bounds for these assumptions and then observe the impact on total cost and cost(s) per slot when they are changed. If the change in costs is fairly small, then this can give you greater confidence in using a median value for the input assumption and placing a lower priority on the need for further investigation. If the change is relatively large, then you can feel justified in investing additional time for research. The assumptions within the CPQ&R vary in the extent to which they contribute to total costs (per slot). The use of high/low values can help you determine when your assumptions are reasonable and how to prioritize additional research requirements (i.e., in what order to address them).

Checking for Inconsistency Between the Input Assumptions for State Average Teaching Salaries and Teacher Splits by Degree Level.

A special case of inconsistency can arise between the assumptions for the split of pre-existing teachers by degree level, the salary factors applied to teachers by degree level, and the current average state salary (to which the salary factors apply). This case is illustrated in the following examples:

> *Example: A user wants to set a salary factor for Assistant Teachers with a CDA as 1.10 and 110% of the salaries of Assistant Teachers without a CDA. Assistant Teachers without a CDA would then have a factor of 1.0. If the average state salary is equal to the weighted average salary of these two groups, then it can be shown below that the salary factors of 1.10 and 1.00 should not be used. To get to the correct factors, the following two formulas should be solved for "a" and "b":*

> $b/a = 1.10$ *(1)*
> $(a * c) + (b * d) = 1.00$ *(2)*

> *Where,*

> > *"a" = the salary index for Assistant Teachers with a CDA*
> > *"b" = the salary index for Assistant Teachers without a CDA*
> > *"c" = the percentage of Assistant Teachers (at Year 0) with a CDA*
> > *"d" = the percentage of Assistant Teachers (at Year 0) without a CDA*

> While the user should expect the average state salary to change in future Implementation years, the user should take steps to ensure that initial assumptions are consistent with state statistics, i.e., the assumed state average Assistant Teacher salary is equivalent to the weighted average salary based on the proportion of Assistant Teachers by degree level.

Note: the example above is also applicable for Teacher Specialized Training (an ECE Credential). For Lead Teacher Degree, the number of variables increases because there are now three possible degree levels: a BA degree, an AA degree, or neither. As a result, there will be three equations to solve for three variables.

Example: A user wants to model Lead Teachers with a BA as making 132% of the salary for Teachers with no degree, and Lead Teachers with an AA as making 116% of the salary for Teachers with no degree. The three equations are as follows:

$$a/e = 1.32 \qquad (3)$$
$$b/e = 1.16 \qquad (4)$$
$$(a * c) + (b * d) + (e * f) = 1.00 \qquad (5)$$

Where,

"a" = the index for Teachers with a BA
"b" = the index for Teachers without a BA but with an AA
"c" = the percentage of Teachers (at Year 0) with a BA
"d" = the percentage of Teachers (at Year 0) without a BA but with AA
"e" = the index for Teachers without an AA or BA
"f" = the percentage of Teachers (at Year 0) without an AA or BA