Spreadsheets Used in the Construction of CBO's Fan of Uncertainty

Spreadsheet 1: Projections and Adjustments

Rows 3 through 10 provide historical data (by fiscal year) on the actual values of nominal gross domestic product, total budget revenues, total budget outlays, discretionary spending, net interest, all other outlays, the total budget surplus (or deficit), and the primary nondiscretionary budget surplus (or deficit), which excludes both net interest and discretionary spending. The data are in billions of dollars.

Rows 13 through 39 are the calculations of the forecast deviations (the difference between budget projections and actual outcomes) for the first baseline included in the fan chart, the one published in July 1981. Rows 13 through 19 provide the baseline projections of the variables whose actual values are reported in rows 4 through 10. The differences between those projections and the actual values are the measures of deviation before the effects of subsequent tax and spending legislation are taken into account.

Rows 21 through 23 provide the estimated effects of legislation enacted after those baseline projections were made. Those estimates are discussed and presented with detail in spreadsheets 2 and 3, below. The estimated effects of subsequent tax legislation (row 21) are added to the baseline revenue projections (row 13) to obtain baseline revenue projections adjusted for the effects of subsequent tax legislation (row 25). Similarly, the estimated effects of subsequent legislation affecting mandatory spending (row 22) are added to the baseline projections of nondiscretionary, noninterest outlays (row 17) to obtain the baseline projections of those outlays adjusted for the effects of subsequent legislation (row 26). Row 27 is line 25 minus line 26, which equals the difference between projected revenues and projected primary nondiscretionary outlays, both adjusted for the effects of legislation.

Rows 29 through 35 repeat some of the data on actual values of revenues and outlays discussed above.

Rows 37 through 39 present the measures of deviations, based on the preceding data and calculations. Row 37 is the deviation from projected revenues after taking into account subsequent legislation. Row 38 is the deviation from projected primary, nondiscretionary outlays, after taking into account subsequent legislation. The difference between those two lines (row 39) is the deviation from the projected primary nondisretionary surplus (or deficit), after taking into account the effect of subsequent legislation. That is the basic measure used to construct the probabilities underlying the fan chart; together with estimates of associated interest payments on those surpluses (or deficits), that measure produces the data reported in the tab labeled Fan Chart Data.

The remaining rows in this first spreadsheet repeat the operations of rows 13 through 39 for each of the winter baselines beginning with January 1983 and ending with the baseline produced in the most recently completed fiscal year.

Spreadsheet 2: Revenue Legislation

Rows 5 through 28 report the estimated budgetary effects of tax legislation enacted during the time between the baselines represented by adjacent rows. In the case of row 5, the numbers are the estimated effects of two major measures combined: the Economic Recovery Tax Act of 1981, which was enacted in August 1981, and the Tax Equity and Fiscal Responsibility Act of 1982, which was enacted in September 1982. Both measures were thus enacted after the July 1981 baseline, which is the first baseline in this analysis, and before the next baseline--February 1983. Row 6 shows the estimated budgetary effect of tax legislation enacted after the February 1983 baseline but before the February 1984 baseline. Subsequent rows show the tax legislation enacted in the intervals between subsequent baselines. For example, row 28 shows the effect of legislation enacted between CBO's January 2005 and January 2006 baselines. Since the most recently completed fiscal year is 2005, that is the only information used to adjust the six projections of the 2005 primary nondiscretionary budget surplus made in January 2000, 2001, 2002, 2003, 2004, and 2005.

Rows 38 through 61 make use of the data in rows 5 through 28. In particular, row 38 shows the adjustments that were made to the baseline revenue projections published in July 1981. Those adjustments include the effects of all legislation enacted after July 1981 that had an impact in one or more of the fiscal years from 1981 through 1986. By definition, that potentially includes all legislation enacted after July 1981 and before October 1986. No legislation enacted after September 1986 could affect revenues before fiscal year 1987.

Spreadsheet 3: Mandatory Outlay Legislation

Rows 5 through 28 report the estimated budgetary effects of legislation affecting mandatory spending (other than debt service) enacted in the time periods between the baselines represented by adjacent rows. In the case of row 5, the numbers are the estimated effect of outlay legislation enacted between July 1981 and February 1983. The budgetary effects of that legislation were estimated through fiscal year 1986. Similarly, row 28 shows the estimated effects of outlay legislation enacted between January 2005 and January 2006.

Rows 36 through 59 make use of the data in rows 5 through 28 in the same way as that for rows 38 through 61 in spreadsheet 2. In particular, row 36 shows the adjustments that were made to the baseline outlay projections (excluding net interest and discretionary spending) published in July 1981. Those adjustments include the effects of all legislation enacted after July 1981 that had an impact in one or more of the fiscal years from 1981 through 1986. By definition, that potentially includes all legislation enacted after July 1981 and before October 1986. No legislation enacted after September 1986 could affect outlays before fiscal year 1987.

Spreadsheet 4: Primary Surplus Deviations

This spreadsheet draws upon the data in the previous three spreadsheets to produce the basic data inputs for the construction of the probability distribution of the fan chart--the deviations from CBO's projections of the primary budget surplus, adjusted for the effects of subsequent legislation. It differs from the data in the first spreadsheet in that the deviations are presented here in terms of baseline horizons rather than for specific years. In other words, the data are assembled into six columns, each corresponding to a different year in the forecast horizon. The first column is the current fiscal year--the year in which the baseline forecast is reported. The second column is the budget year--the upcoming fiscal year. The remaining four columns are the next four years in the baseline forecast.

The box bounded by rows 7 through 35 reports those deviations as a percentage of actual budget revenues, which is the way they were used in calculating the probability distribution for the fan chart. The box bounded by rows 38 through 66 shows the deviations from the primary surplus projections in billions of dollars. The next two boxes, respectively, show the revenue and outlay components of those primary surplus deviations in billions of dollars.

Spreadsheet 5: Fan Chart Data

The last spreadsheet presents the data actually used to construct the fan chart. The column headed Baseline Surplus Forecast contains actual values of the total budget surplus or deficit (including net interest) for the period from 1989 through 2005 (the most recently completed fiscal year). Those values form the "handle" of the fan. After 2005, the numbers in that column constitute the middle of the fan.

The rest of the numbers in the rows for 2006 through 2011 correspond to various percentiles of the normal distribution. For example, the percentile with the greatest probability--the 50th percentile--is CBO's baseline forecast. In each year, as one moves to the left or to the right of that number, the probability of realizing some smaller or larger budget surplus or deficit declines. The area bounded by the 5th and 95th percentiles has a 90 percent probability of capturing the true budget surplus or deficit.