

## Balancing Matrices with Uncertain Totals

With the special use of proportional scaling RAS outlined below, it is possible to balance a matrix for which one or more row and/or column total is not known with any degree of certainty. The method, which allows these uncertain totals to change during the balancing process, opens up a row and/or column and moves the uncertain totals inside the matrix, so that these totals are treated as part of the matrix to be balanced. This depends critically on the ability of proportional scaling to scale rows and/or columns that sum to zero. (For an explanation of proportional scaling, see the G7 help file.) Finally, It is possible to use the precondition option in the psras command to control the change in any of the uncertain totals.

The example which follows uses detailed value added from a three-sector input-output table and subsequently published national accounts data for total value added. To see how it works, run the script SpecialPSRAS.add

**Step 1:** Read in and show the 5x4 matrix of detailed value added from the input-output table; then read in and show the vector of aggregate value added control totals.

**Step 2:** Expand the matrix to five columns, insert a column of zeros as column four, and add the insert the vector of value added control total as row five.

**Step 3:** Move the total factor payments (column five) to column four and change their sign. Show the matrix.

**Step 4:** The matrix is now ready to balance. The command for psras is:

```
<psras> <matrix>[(r rgroup)][(c cgroup)]<rowctrl><colctrl>[yr][r|c][-maxiter][-precon]
```

or in this example:

```
psras expB (r 1-4)(c 1-4) expB 5 expB 5 1997 r
```

Balance the matrix and show the result.

**Step 5:** Colapse the matrix to four columns, change the sign of the estimated factor payments, and show the result.