

Chapter 20

FITTING

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20.1 Updating the regional data bases

This section discusses procedures for updating the Input-Output (I-O) information to 1995, based on the trade data in chapters 11A and 12, the protection data in chapter 13, and the macroeconomic data in chapter 17. The vehicle for accomplishing this update is the FIT software developed at the Australian Industry Commission (James and McDougall 1993). FIT is an economic model of a regional economy that allows targeting of economic magnitudes to match conditions in a particular year. These target variables are shocked, and changes in all other variables of the model are computed in response to these shocks. FIT maintains market clearing and zero profit conditions, while fixing primary factor prices and permitting value-added, as well as the intensity of input usage to adjust, subject to a pre-specified penalty function. Eight exogenous variables were targeted for the update in each region: (1) exports by commodity, (2) imports by commodity, (3) aggregate household consumption expenditures, (4) aggregate government spending, (5) aggregate expenditures for gross capital formation, (6) import tariffs, (7) export subsidies, and (8) production subsidies/taxes. The updated data represent an internally consistent I/O table that can be incorporated into the GTAP data base.

20.2 *Energy targets in FIT*

It was observed that data relating to certain of the energy commodities in version 3 of the data base were of questionable reliability. In particular the data base seemed to be at variance with the energy statistics of the International Energy Agency (Babiker and Rutherford, 1997).

An interim solution to this problem is implemented in the version 4. Data are obtained on the value of domestic output of each of the five energy commodities (coal, oil, gas, petroleum products, and electricity), and these data are used as targets in the FIT program. The sources of the data are discussed in chapter 17.

FIT is modified to include the additional set of targets. A new constraint (and associated changes to the first order conditions) is added to the program. Imposing a constraint on domestic output is analogous to imposing a constraint on imports in its effects on the FIT program.

While implementing the modified FIT program, it became apparent that a potential contradiction between the two sets of targets exists. The energy module targets domestic output values for the five energy commodities, while the trade module targets export values. The model which is used in the FIT process makes the assumption that no re-exporting occurs. This means that all exports must be sourced from domestic output. Therefore, in a situation where the export target is larger than the domestic output target, there is no feasible solution.

There are potentially a number of causes of discrepancies between the two sets of data:

- Tax and margin wedges which are not included in the data base,
- Differing domestic and export commodity compositions, and
- Mis-reporting of production and exports.

There are a number of cases where this contradiction occurs. Most cases are insignificant, but a few are not. In order to obtain a feasible solution, it is necessary to discard one of the two targets. We choose to preserve the export targets, when they come into conflict with the production targets, because otherwise it would be necessary to re-balance the entire trade matrix.

The revised target for the value of output is the maximum of three values: (A) the initial target; (B) the export target plus one tenth of the original value of domestic sales; and (C) one one-hundredth of the original value of output. Alternative (B) ensures that the revised output target is consistent with the export target. Alternative (C) catches problems that arise in a few cases where both the output target is much lower than the original output level, and the export target is much lower than the original export level.

References

- Babiker, M. and T.F. Rutherford (1997), 'Input-output and general equilibrium estimates of embodied carbon: A data set and static framework for assessment', Working paper 97-2, University of Colorado, Boulder.
- James, M. and R.A. McDougall (1993), 'FIT: An input-output data update facility for SALTER', SALTER working paper 17, Australian Industry Commission, Canberra.