



Release Notes for gtap.tab 6.2

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1 Introduction

`gtap.tab` 6.2 is a minor upgrade to the GTAP model source code, containing bug fixes (section 2) and minor enhancements (section 3). It benefits from suggestions, problem reports, and advice from Tom Hertel, Ken Pearson, and Terrie Walmsley, and from work by Huey-Lin Lee.

The changes in `gtap.tab` require matching changes in other files, including `decomp.tab` and the standard model closure. New versions of these accompany this note.

2 Bug Fixes

Two bugs are fixed:

- in the equations for `EV_ALT` and `CNTdpar`, and
- in the formula for `SX_IR`.

In the welfare decomposition, in releases 6.0 and 6.1, there was an error in the sign of the preference shift term. In simulations in which the preference shift variables (`dppriv`, `dpgov`, `dpsave`) were non-zero, this led to errors in the calculation of `EV_ALT` and `CNTdpar`; `CNTdpar` was -1 times its true value. In the examples we have seen, the errors are small but sometimes non-trivial; your mileage may vary.

The error in the code arose from an error in the underlying technical paper ([1], now fixed in a revision 1).

In the terms-of-trade decomposition, an error in the formula for `SX_IR` affected the world price and export price effect variables `c1_ir`, `c2_ir`, `c1_r`, and `c2_r`. The error was the omission of margin exports from a denominator representing total regional exports. With any realistic data base, for almost all countries, the errors would be small.

3 Enhancements

Enhancements include:

- more AnalyseGE-friendly formulae and equations:
 - `INCOME` formula,
 - tax revenue equations, and
 - trade quantity index equations,
- variable `CNTalleffir` extended in range from `TRAD_COMM` to `DEMD_COMM`,
- new and (as we hope) clearer longnames for `decomp` output.

AnalyseGE supports simulation analysis based on the formulae and equations of the model; how useful it is depends on how the formulae and equations are written. For example, with the 6.1 export price index equation,

$$VXWREGION(r) * pxwreg(r) = \text{sum}(i, \text{TRAD_COMM}, VXW(i,r) * pxw(i,r));$$

AnalyseGE can show the contributions to the change in the price index `pxwreg` of individual commodity prices `pxw`. On the other hand, with the quantity index equation,

$$qwxreg(r) = vxwreg(r) - pxwreg(r);$$

it merely reports the value and price indices `vxwreg` and `pxwreg`, which are available anyway from the solution file. A more useful form of equation would be

$$VXWREGION(r) * qwxreg(r) = \text{sum}(i, \text{TRAD_COMM}, VXW(i,r) * qwx(i,r));$$

then AnalyseGE would provide a decomposition of the quantity index just as for the price index.

In 6.2 we make such changes for all the trade quantity indices, and likewise for the GDP quantity index `qgdp`. We change the `INCOME` formula show that the right-hand side shows the private consumption, government consumption, and saving aggregates:

$$INCOME(r) = PRIVEXP(r) + GOVEXP(r) + SAVE(r);$$

We change the tax revenue equations so that the left-hand side and right-hand side totals represent (100 times) the absolute change in revenue collected, and so that a right-hand side analysis provides a commodity breakdown; for example, for taxes on private consumption,

$$\begin{aligned} 100.0 * INCOME(r) * del_taxrpc(r) + TPC(r) * y(r) \\ = \text{sum}(i, \text{TRAD_COMM}, \\ \quad VDPA(i,r) * tpd(i,r) + DPTAX(i,r) * [pm(i,r) + qpd(i,r)]) \\ + \text{sum}(i, \text{TRAD_COMM}, \\ \quad VIPA(i,r) * tpm(i,r) + IPTAX(i,r) * [pim(i,r) + qpm(i,r)]); \end{aligned}$$

The variable `CNTalleffir` provides a commodity-by-region breakdown of allocative efficiency effects. We extend the commodity range from `TRAD_COMM` to `DEMD_COMM`, so that it covers not only the tradeable but also the endowment commodities. Matching changes in `decomp.tab` mean that the array `A1` in the `decomp` output now provides a full breakdown of the allocative efficiency column of array `A`.

References

- [1] R.A. McDougall. *A New Regional Household Demand System for GTAP*. GTAP Technical Paper No. 20. Rev. 1. September 2003.