Chapter 8.E

Government Consumption

Angel H. Aguiar, Robert A. McDougall and Vitaly Kharitonov

Under standard national accounting conventions, government consumption includes the outputs of non-market processes of production and excludes their inputs, these being accounted as intermediate usage by various industries, mainly public administration and defense (SNA 2008). Most I-O tables contributed to GTAP follow this convention, but some do not. The non-compliant tables differ from the compliant in presenting much lower totals for government consumption expenditure, and, within those totals, much lower expenditure shares for public administration and defense (more precisely, for the GTAP commodity *osg* in which public administration and defense are included). This has been a major source of variation in I-O structure across regions in previous releases. This chapter explains the procedure used to improve government consumption representation in the non-compliant tables.

The objectives of this procedure are to identify the non-compliant tables, and to revise them so as to approximate a more compliant treatment. The procedure is applied after initial cleaning (chapter 7), but before any sectoral disaggregation (chapter 8.D). Therefore, the I-O tables are not yet uniform in sectoral classification: some use the GTAP sectoral classification, others various aggregations thereof.

To identify non-compliant tables, the ratio of government consumption to GDP is calculated for each table, and compared to external macroeconomic data. Since the contributed tables have various reference years, time series data are used for the comparison. A table is deemed non-compliant if its ratio of government consumption to GDP is less than half the corresponding ratio in the external data.

The time series data source used is the International Monetary Fund's *International Financial Statistics* (IMF, 2011). This distinguishes 177 countries corresponding to GTAP standard countries, plus a few other items such as "Euro Area". We extract estimates for GDP and government consumption in local currency units, and exchange rate estimates for 162 countries, for the years 1985 to 2007. For some countries, some observations are missing; we treat zero observations as miscoded missing values; a few wild-seeming observations, we consider likely miscodes and discard.

After discarding all observations for which we lack matching GDP, government consumption, and exchange rate data, our data set contains 162 countries. For these countries overall, about two thirds of the possible observations are present and one thirds are absent. We fill in the missing observations, using an entropy-based method. The method identifies and exploits both country-specific and year-specific characteristics of the data set. It has however this weakness, that it does not capture country-specific time trends; if observations are missing for a given country for the years 2000 to 2004, say, in filling in those data it gives as much weight to that country's observation for 1985 as for 1999. We find therefore that this method is not well suited to filling in long time series; finding a more suitable filling-in method remains a task for future versions.

That first step fills in the missing observations for those countries for which some IFS observations are available. The next step supplies estimates for the 82 standard GTAP countries for which no observations are available, again for the years 1985-2007. For this we use the GDP and government consumption estimates from the GTAP macroeconomic data set (chapter 6), together with year-specific factors extracted from the time-series data. This gives us our final multi-year macroeconomic data set.

We identify the reference year for each contributed I-O table. Some contributed tables are a hybrid of original I-O data for an earlier year and macroeconomic data for a later year; for such tables, we take the reference year for the macroeconomic data. For some tables, the reference year is not a calendar year but a financial year; for those, we use the simple average of the data for the calendar years that overlap the financial year.

We find that in almost all contributed tables, we have original macroeconomic data for the required reference year. For three countries, Laos, Taiwan, and Tanzania we have no original macroeconomic data, so there we rely on the second filling-in procedure.

We now compare the ratio of government consumption to GDP in each contributed table with the corresponding ratio for that table's reference year in the time-series macroeconomic data set. We reject the government consumption data for those tables in which the ratios differ by a factor of more than 2. We find five such tables; Table 8.E.1 shows them, and also the tables for which ratios compare relatively poorly, but for which we did not reject the government consumption data.

Table 8.E.1   Government Consumption Data, Selected Countries

Country	Government Consumption/ GDP Ratio		Accept/Reject	Government Services Share in Government Consumption
	I-O Data	Macro Data		
Estonia	0.12	0.20	accept	0.90
Bulgaria	0.21	0.18	accept	0.96
Georgia	0.09	0.10	accept	0.79
Norway	0.28	0.21	accept	0.92
Albania	0.10	0.09	accept	0.94
Belarus	0.55	0.21	reject	0.80
Malta	0.03	0.19	reject	0.96
Laos	0.04	0.21	reject	1.00
Ukraine	0.18	0.07	reject	0.83
Nigeria	0.16	0.08	reject	0.42
Egypt	0.04	0.13	reject	0.01

The tables for which we reject the I-O data are Belarus, Malta, Laos, Ukraine, Nigeria, and Egypt. We note that the I-O tables present not only sizable apparent underestimates of government consumption, but also some sizable apparent overestimates. We note that for five rejected tables, we have macroeconomic data for the I-O table reference year. Laos is not available in the time-series macroeconomic data set and we reject it based on the GTAP macroeconomic data set and the second filling-in procedure.

In the last column of table 8.E.1, we report the share from the contributed table. As noted above, one feature of tables using non-standard treatments of government consumption is a low share of government services (GTAP commodity *osg*) in government consumption expenditure. This is the case in for Nigeria and Egypt. For the other countries being rejected, the share of *osg* in government consumption expenditure appears reasonable, but the share of government consumption in GDP is either underestimated or overestimated.

For the six countries for which we reject the I-O table government consumption data, we proceed as follows. We aggregate the representative table (see chapter 8.F) to the same sectoral classification as the contributed table, and calculate the sectoral composition of government consumption at that aggregation. We then adjust the contributed table, so that the ratio of government consumption to GDP matches the macroeconomic time-series data set, and the sectoral composition of government consumption as in the representative table. In the adjusted tables therefore the *osg* share is the same as in the representative table, 95 per cent.

References

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