Construction of GDyn v.9 data base

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February 2016

The construction of the GDyn data base is described in detail in McDougall et al. (2012). This note describes changes in the data sources used and some other minor modifications implemented in the production of GDyn Data Base, reference year 2011, consistent with the GTAP Data Base version 9 (Narayanan et al. 2015).

1. *Foreign income receipts and payments*

Foreign income receipts and payments data (in 2011 million USD) come from IMF's Balance of Payments and International Investment Position Statistics. Some earlier versions of the GDyn data base, for example GDyn version 6.0 data base described in McDougall et al. (2012), employed foreign income receipts and payments from World Development Indicators (WDI) data base. The data from IMF is then further processed to fill in missing values and balance global receipts and payments (see McDougall et al. for details). This procedure determines coefficients YQHTRUST (foreign income receipts) and YQTFIRM (foreign income payments) in the GDyn data base.

Income payments from local firms to regional household are determined according to the formula:

YQHFIRM(r) = VOA(“capital”, r) – VDEP(r) – YQTFIRM(r),

where VOA(“capital”) – VDEP denotes net of depreciation capital earnings. If YQTFIRM recorded in IMF data is too large relative to net (of depreciation) capital earnings, then

YQHFIRM is negative. This is problematic because the coefficient must be positive in the GDyn model. For version 9, reference year 2011, this situation arises in 6 countries listed in Table 1.

Table 1 Original calculation of coefficient YQHFIRM

Country	VOA("capital") (GTAP)	VDEP (GTAP)	YQTFIRM (IMF)	Calculated YQHFIRM	YQTFIRM/ (VOA-VDEP)
Ireland	97,879	17,546	122,781	-42,447	1.53
Luxembourg	19,119	8,574	212,440	-201,895	20.15
Malta	2,760	1,105	2,746	-1,091	1.66
Netherlands	267,544	95,309	306,406	-134,171	1.78
Croatia	11,741	9,565	3,492	-1,315	1.60
Hong Kong	126,400	31,734	128,762	-34,096	1.36

Note, in countries listed in table 1 ratio YQTFIRM/(VOA("capital")-VDEP) exceeds 1. In all other countries in the data base, the ratio does not exceed 0.8. This observation is used to calculate new YQTFIRM for the 6 countries (table 2). YQHFIRM is then 20% of net capital earnings. If we adjust income payments abroad, we should also adjust income receipts. For this, ratio of new YQTFIRM to YQTFIRM from IMF is calculated and applied to YQHTRUST from IMF (Table 2). New values for coefficients YQTFIRM and YQHTRUST for the 6 countries replace values obtained from IMF.

Table 2 Corrected coefficients YQTFIRM and YQHTRUST

Country	New YQTFIRM	Ratio of new YQTFIRM to YQTFIRM from IMF	YQHTRUST from IMF	New YQHTRUST
Ireland	64,267	0.52	78,721	41,204
Luxembourg	8,436	0.04	209,307	8,312
Malta	1,324	0.48	2,267	1,093
Netherlands	137,788	0.45	331,701	149,163
Croatia	1,741	0.50	381	190
Hong Kong	75,733	0.59	135,752	79,844

2. Normal rate of growth coefficients

Computing the normal rate of growth in capital stock in each region, coefficient KHAT, requires construction of time series data on capital stock (details of the calculation are available in McDougall et al. 2012, pages 125-127). This, in turn, requires investment time series data. For this task, Gross Fixed Capital Formation data for 2000-2013 period are obtained from WDI.

In addition, calculation of the normal rate of growth in income, coefficient YHAT, requires time series data on national income (details are available in Golub and McDougall 2012, page 394). Time series data on Gross National Income for 2000-2013 period is obtained from WDI. Note that both coefficients, KHAT and YHAT, are updateable within simulations with the GDyn model.

References

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