ISIM-MAMS: The Pre-Programmed Reference Scenario; Uganda0910v2

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Creating a New ISIM-MAMS Application Excel File

- To create a new ISIM-MAMS application Excel file,
  - open Excel
  - click on the ISIM-MAMS tab
  - click on **New | In New Workbook** in the **Application** ribbon group; then,
    - **Name** = Test
    - **Dataset** = Uganda0910v2
    - **Version** = MDG

MAMS / ISIM-MAMS Sets

- The following sets are used in MAMS / ISIM-MAMS to define simulations
  - sim = simulations
  - a = activities
  - c = commodities
  - f = factors
  - ins = institutions
  - insd = institutions, domestic
  - h = institutions, households
  - ac = global set

MAMS / ISIM-MAMS Elements

- The following elements are also used in ISIM-MAMS to define simulations
  - trgovrow = transfers from row to gov
  - trgovngov = transfers from non-gov to gov
  - gborz = gov domestic borrowing; interest
  - gbormsz = gov domestic borrowing; no interest
  - fborgov = foreign borrowing gov
  - trngovrow = transfers from row to non-gov
  - trfacrow = transfers from row to factors
  - fborngov = foreign borrowing non-gov
  - fdiz = foreign direct investment

The Pre-Programmed Reference Scenario

- As explained, the pre-programmed reference scenario reflects a business-as-usual situation from 2009/10 to 2015/16.
  - thus, other (non-base) simulation results are interpreted relative to the pre-programmed reference scenario

Key Default Assumptions in Uganda 2009/10 Reference Scenario

- The Uganda0910v2 pre-programmed reference scenario makes the following assumptions – can be changed using corresponding buttons in ISIM-MAMS **Setup** ribbon group.
- GDP growth rate during 2010/11 – 2015/16 is

2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
0.0579	0.0595	0.0625	0.0700	0.0700	0.0700

Source: World Economic Outlook International Monetary Fund

Model Closure and Rules

- Model Closure
  - clearing mechanisms that ensure equality between receipts and outlays for
    - balance of payments' current account
    - savings-investment
    - government budget
- Rules
  - specify payments (government and non-government; except those who clear macro balances) – taxes, transfers, borrowing, FDI, …
    - exogenous rates or growth
    - exogenous GDP shares
    - exogenous absorption shares

Balance of Payments (rowclos0)

- Non-trade-related payments (transfers, foreign investment) are non-clearing, determined by their own rules
  - exogenous growth rates in foreign currency
  - exogenous shares of GDP
  - exogenous shares of absorption
- The real exchange rate equilibrates inflows and outflows of FCU, by influencing export and import quantities.

Balance of Payments – cont.

- A BoP deficit (e.g., due to a decline in foreign aid) generates a depreciation of the real exchange rate
  - for producers: increased price for exports relative to price of domestic sales, increase in QE/QD
  - for consumers: increased price for imports relative to price of domestic purchases, decrease in QM/QD
- The exchange rate will change as much as needed to bring about the changes in export and imports needed to eliminate the imbalance.

Savings-Investment (siclos0)

- Government investment
  - typically, determined by needs for capital stocks in government service production – follows current consumption
  - government closure rule (discussed below) assures that it is financed
- Foreign Direct Investment changes according to a “rule” (see below).
- The relationship between private savings and investment depends on siclos0.

Savings-Investment – cont.

Table 8. Rules for clearing saving-investment balance

Rule No.	household investment	household saving
1	clearing variable (endogenous real growth, GDP and absorption shares)	rule-determined savings rate for households
2	exogenous absorption share	clearing variable: uniform savings rate point change for selected households
3	exogenous absorption share	clearing variable: uniform savings rate scaling for selected households
4	exogenous GDP share	clearing variable: uniform savings rate point change for selected households
5	exogenous GDP share	clearing variable: uniform savings rate scaling for selected households

Government Budget (govclos0)

- Select the variable that clears the government budget
  - essential for designing counterfactual scenarios
- The other components of the government budget follow some rule
  - for example, keep constant the ratio between government consumption and GDP

Government Budget – cont.

Table 4. Rules for clearing the government budget

Rule No.	Variable clearing the budget
1	all domestic tax rates (direct and indirect): uniform scaling
2	direct tax rates: uniform point change for selected households
3	direct tax rates: uniform scaling for selected households
4	transfers to government from the rest of the world (grant aid)
5	foreign borrowing;
6	domestic government borrowing (interest paid on debt)
7	government borrowing via monetary sector
8	separate treatment of current and capital budgets:* a. current budget: direct tax rates: uniform scaling for selected households (same as 3) b. capital budget: domestic government borrowing (same as 6) exogenous government savings*
9	government spending on one or more commodities (specified by government spending rule)

*To separate the two, government saving (current receipts - current spending) is exogenous; for all other rules, it is endogenous.

Rules for Government: Expenditures and Incomes – not selected in govclos0

- Should be specified for government expenditures and incomes that are not used to balance the government budget
  - expenditures in govspndrule0
  - incomes in govrecrule0
  - NOTE: in the “MDG scenarios” government consumption is endogenous

Rules for Government Spending (govspndrule0)

Table 5. Rules for government spending

Rule No.	Rule (disaggregated by spending item)	Controlling parameter*	Default (if controlling parameter is empty)
1	Fixed growth rate**	govspndgrw0	gdpgrw0
2	Fixed GDP share	govspndgdp0	base-year share
3	Fixed absorption share	govspndabs0	base-year share
4	Fixed educational quality for cycle of commodity***	eduqualgrw	NA****
5	Items under 1-4 are all flexible*****	NA	NA

***The controlling parameter defines the evolution over time for the item in question.

**For consumption and capital stocks, growth rates are real; for other items, they are nominal in LCU (implicitly indexed to the numeraire) or FCU. For interest payments, 1 signifies a exogenous rates, controlled by *gintrat0* and *fintrat0* and defaulting to the base-year rate (derived from debt stocks and interest payments in the SAM).

***Only for education services in the MDG version; quality = [service level]/[enrollment]; parameter is found in app-mdg-data.xls

****Data for the controlling parameter (*eduqualgrw*) is required.

*****If other rule controls spending. Required for at least one commodity or capital stock if the government closure is 9.

Rules for Government Spending – cont.

- The identified government spending items are
  - **c** = commodities = current consumption
  - **'trngovgov'** = transfers from gov to non-gov institutions
  - **'trrowgov'** = transfers from gov to row
  - **'intdomrow'** = domestic and foreign interest payments
- To impose growth rates, use govspndgrw0
- To impose GDP share, use govspndgdp0
- To impose absorption share, use govspndabs0

Rules for Government Receipts (govrecrule0)

Table 6. Rules for government receipts

Rule No.	Rule (disaggregated by spending item)	Controlling parameter*	Default (if controlling parameter is empty)
1	Fixed rate (for taxes) / growth rate (other items)	taxrate0 / govrecgrw0	base-year rate / gdpgrw0***
2	Fixed GDP share	govrecgdp0	base-year share
3	Fixed absorption share	govrecabs0	base-year share

***The controlling parameter defines the evolution over time for the item in question.

**Growth rates are nominal, in LCU (implicitly indexed to the numeraire) or FCU.

***For government domestic and foreign borrowing, the default for (1) is that borrowing is set so that the debt stocks grow at the same rate as gdpgrw0 (i.e., not that the flows of borrowing grow at the same rate as GDP). For foreign borrowing, this calculation assumes that there are no changes in the exchange rate.

Rules for Government Receipts – cont.

- The identified government receipts are
  - **tax** = tax accounts in SAM
  - **'trgovrow'** = transfers from row to gov
  - **'trgovngov'** = transfers from domestic non-gov institutions to gov
  - **'gborz'** = '**gbormsz** '= domestic gov borrowing
  - **'fborgov'** = foreign government borrowing
- To impose growth rates, use govrecgrw0
  - debtgrw if govrecrule0=1 and govrecgrw=blank
- To impose GDP share, use govrecgdp0
- To impose absorption share, use govrecabs0

Rules for Non-Government Payments – (ngovpayrule0)

Table 7. Rules for non-government payments

Rule No.	Rule (disaggregated by spending item)	Controlling parameter*	Default (if controlling parameter is empty)
1	Fixed growth rate	ngovpaygrw0	gdpgrw0***
2	Fixed GDP share	ngovpaygdp0	base-year share
3	Fixed absorption share	ngovpayabs0	base-year share

***The controlling parameter defines the evolution over time for the item in question.
**Growth rates are nominal, in LCU (implicitly indexed to the numeraire) or in FCU.
***For foreign borrowing, the default for (1) is that borrowing is set so that the debt debt stock(s) grow at the same rate as gdpgrw0 (i.e., not that the borrowing flow grows at the same rate as GDP); this calculation is based on the assumption that there are no changes in the exchange rate.

Rules for Non-Government Payments – cont.

- The identified non-government payments are
  - **'trngovrow'** = transfers from row to non-gov institutions
  - **'trfacrow'** = transfers from row to factors
  - **'fborngov'** = non-gov institutions foreign borrowing
  - **'fdiz'** = foreign direct investment
  - **'dkngov'** = non-government fixed investment
- To impose growth rates, use ngovpaygrw0
  - debtgrw if govrecrule0=1 and govrecgrw=blank
- To impose GDP share, use ngovpaygdp0
- To impose absorption share, use ngovpayabs0

Key Default Assumption in Uganda 2009/10 Reference Scenario – cont.

- Government Spending
  - primary education = exogenous GDP share
  - secondary education = exogenous GDP share
  - tertiary education = exogenous GDP share
  - health = exogenous GDP share
  - water and sanitation = exogenous GDP share
  - other infrastructure = exogenous GDP share
  - public administration = exogenous GDP share

Key Default Assumptions in Uganda 2009/10 Reference Scenario – cont.

- Government Receipts – Rules + Closure
  - tax-dir = exogenous tax rate (baseyr)
  - tax-com = exogenous tax rate (baseyr)
  - tax-imp = exogenous tax rate (baseyr)
  - trgovrow = exogenous GDP share (baseyr)
  - trgovngov = exogenous GDP share (baseyr)
  - gborz = exogenous GDP share (baseyr)
  - gbormsz = exogenous GDP share (baseyr)
  - **fborgov = endogenous – see govclos0 (!)**

Key Default Assumption in Uganda 2009/10 Reference Scenario – cont.

- Non-Government Payments -- Rules
  - trngovrow = exogenous growth rate
  - trfacrow = exogenous growth rate
  - fborngov = exogenous GDP share (baseyr)
  - fdiz = exogenous GDP share (baseyr)
- Saving-Investment Closure
  - exogenous GDP share (baseyr) with households savings rate as the clearing variable

Key Default Assumption in Uganda 2009/10 Reference Scenario – cont.

- Factor Market Closure
  - f-labn = unemployment with wage curve
  - f-labs = unemployment with wage curve
  - f-labt = unemployment with wage curve
  - f-capprv = full employment
  - f-land = full employment

Running the Pre-Programmed Reference Scenario

- In order to run the pre-programmed reference scenario without changes, click on **Run Setup** in the **Setup** ribbon group.
- Once finished, click on **Run** in the **Simulations** ribbon group; this action will generate reports for the base scenario, which at this point is identical to the pre-programmed reference scenario.

Results from the Pre-Programmed Reference Scenario

- To navigate across an ISIM-MAMS application Excel file, use the **Navigation Tree** – to make it visible, click on the corresponding button in the **View** ribbon group.
- To see the reports, go to repmacro-contents, repmeso-contents, and dashboard.

Pre-Programmed Reference Scenario Results

Changing Assumption for the Pre-Programmed Reference Scenario

- Now, we will introduce changes in
  - government closure
  - rules for government spending
  - GDP growth rate
  - expenditure (income) elasticities

Changing Assumption for the Pre-Programmed Reference Scenario – cont.

- To change the government closure rule,
  - click on **Closure and Rules | Closure | Government** in the **Setup** ribbon group; it will add the **closure0-and-rules0** sheet to the current ISIM-MAMS application Excel file
  - in column 2009 of **govclos0**, select 2 instead of 5 (what is the meaning of option 2?)
  - now, run the model setup and base scenario; then, compare the results to the previous base scenario in terms of government receipts and spending – hint: see **govgdp** report parameter

Changing Assumption for the Pre-Programmed Reference Scenario – cont.

- To change the rules for government spending items,
  - click on **Closure and Rules | Rules | Government Spending | Government Spending;** it will add **govspndrule0** to the **closure0-and-rules0** sheet
  - what is the meaning of option 2?
  - then, replace the default selection for c-edutgov (i.e., Tertiary education, government) by 2

Changing Assumption for the Pre-Programmed Reference Scenario – cont.

- To change the government spending GDP share for different items,
  - click on **Closure and Rules | Rules | Government Spending | GDP Share for Government Spending** in the **Setup** ribbon group; it will add **govspndgdp0** to the **closure0-and-rules0** sheet
  - then, introduce a 15% yearly increase for c-edupgov, c-edusgov, c-edutgov and c-healthgov relative to the base year values – see next slide

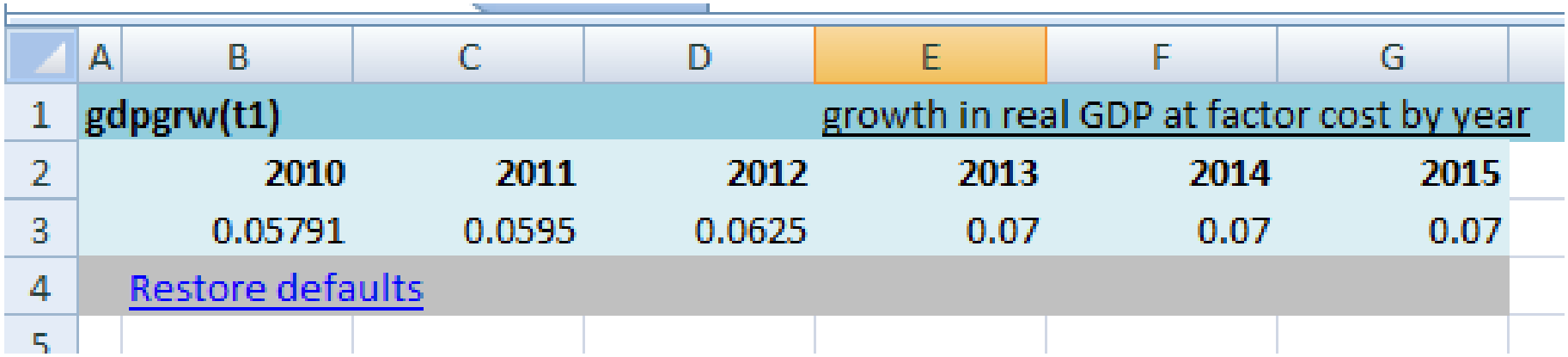
Changing Assumption for the Pre-Programmed Reference Scenario – cont.

19	govspndgdp0(ac,t1)			government spending on ac (GDP share) for model setup				
20		ac	2009	2010	2011	2012	2013	2014	2015
21	X	c-edupgov	0.0167	0.0192	0.0221	0.0254	0.0292	0.0336	0.0387
22	X	c-edusgov	0.0034	0.0039	0.0045	0.0051	0.0059	0.0068	0.0078
23	X	c-edutgov	0.0047	0.0055	0.0063	0.0072	0.0083	0.0095	0.0110
24	X	c-healthgov	0.0094	0.0108	0.0125	0.0143	0.0165	0.0190	0.0218
25		Add row							
26		Restore defaults							

Question: how to compute base year values?

Changing Assumption for the Pre-Programmed Reference Scenario – cont.

- To change the GDP growth rate,
  - click on **GDP Growth** in the **Setup** ribbon group; it will add the sheet **gdpgrw** to the current ISIM-MAMS application Excel file
  - in columns 2010-2015 introduce alternative GDP growth rates



	A	B	C	D	E	F	G
1	gdpgrw(t1)				growth in real GDP at factor cost by year		
2		2010	2011	2012	2013	2014	2015
3		0.05791	0.0595	0.0625	0.07	0.07	0.07
4		Restore defaults					
5							

Changing Assumption for the Pre-Programmed Reference Scenario – cont.

- To change the expenditure elasticities,
  - click on **Elasticities** in the Setup ribbon group; it will add the sheet **elasticities** to the current ISIM-MAMS application Excel file
  - in columns hhd of **leselas1** introduce alternative expenditure elasticities – note that the **dictionary** sheet provides a description of each commodity name abreviation

Important!

- The Closure and Rules selected in the Pre-programmed Reference Scenario provide the defaults for subsequent simulations, but the defaults may be overwritten for all or some of the simulations where these are defined.