

Using the Model-Simulation and Results Excel Sheets

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1 Using the MS Excel Model Simulation and Calibration Interface

Regardless of the number of sectors and number of regions, each Excel file contains the following sheets that are explained in the following sections.

- Content: describes the various sheets and their specific usage.
- Start: defines the economic structure at the beginning of the simulation.
- Terminal: defines the economic structure at the end of the simulation.
- Baseline: scenario without climate change
- Temperature: scenario where only the increase in temperature is considered
- Sea Level: scenario where the increase in temperature and sea level is considered
- Adaptation: scenario where the increase in temperature and sea level is considered, but also counteracting adaptation measures.
- Extremes: in addition to Adaptation also the occurrence of weather extremes is considered.
- Dynamics: definition of initial sectoral growth rates and other parameters defining the dynamic behaviour of the model.
- Structural Parameters: defines values of structural parameters mainly elasticities.
- Damage Functions TFP: define coefficients regarding damages to total factor productivity for different sectors and regions.
- Damage Functions Labour: define coefficients regarding damages to labour productivity for different sectors and regions.
- Damage Functions Capital: define coefficients regarding damages to total capital stock for different sectors and regions.
- Data: sheet containing optional data to use for calibration.

1.1 Content

The classification of economic sectors (sector A–T) and the aggregation of individual sectors to the preferred number of sectors in the model are provided. For instance, in case of broad classification of 3 sectors (agriculture, industry and services), the classification is

- sector 1: A
- sector 2: B-F
- sector 3: G-T

In the case of 9 sectors, besides agriculture manufacturing, construction, transportation and storage, accommodation and food service activities are analyzed separately. All remaining sectors are aggregated to further production activities, services, state-related sectors and other service activities.

Furthermore, the number of regions is specified. In the case of 3 regions, we consider the two delta regions and the remaining ones as an aggregate separately. Otherwise, we consider the 6 regions Mekong River Delta, Red River Delta, North Central and Central Coast, Southeast, Central Highlands, and Northern Midlands and Mountains.

1.2 Data

Within this sheet we merge and link all data sources used for calibration. Data for different years is used. For instance, Supply-Use-Tables (SUT) refer to the year 2016 while the Statistical Year Book 2018 refers to data end of 2017. That covers among other things

- Sectoral Gross Value Added Shares
- Sectoral Employment Shares
- Sectoral Labor Cost Shares

1.3 Start

At the beginning we need to define initial values for economic variables, this includes, e.g. initial gross value added, initial price level, initial population, and initial employment level at the national level. Furthermore, at the sectoral and regional level gross value added shares, sectoral employment shares and labour cost shares.

1.4 Terminal

Within this sheet we define the terminal values for the baseline scenario. Just adjust the red numbers to specify the target values.

1.5 Baseline

In the standard version of the model we need to define how exogenous variables evolve over time. In the baseline, only population η_t^{Pop} until 2100 starting from 2016 (84 periods) changes.

The evolution of the population is given by the projection of the GSO. The GSO published four different projections with different fertility rates of the Vietnamese population. We use the medium variant population projection. The population is expected to grow from roughly 95 million people in 2016 to 108 million people by 2050. After 2050 the population stays constant.

1.6 Temperature

In this sheet the evolution for climate variables for the temperature scenario are defined. Hence, besides population also temperature in the regions change.

1.7 Sea Level

In this sheet the evolution of climate variables for the sea level scenario are defined. Hence, besides population and regional temperature, also the sea level changes.

1.8 Adaptation

In this sheet the evolution of adaptation measures are defined. Hence, besides population, regional temperature and the sea level, also government expenditure for regional and sectoral adaptation measures change.

1.9 Extremes

In this sheet cyclones and droughts are additionally specified by a variable, i.e. 1 in case of CYC or DRO or 0, respectively.

1.10 Dynamics

Values for structural parameters which influence the dynamics of the model are defined in the sheet Dynamics.

1.11 Structural Parameters

For each sector-region combination we define values for structural parameters mainly elasticities for labour and capital, adaptation cost effectiveness and taxes on capital and labor.

1.12 Damage Functions for TFP, Labour and Capital

Furthermore, we define the coefficients for the sectoral and regional damage functions to total factor productivity, labour productivity and capital stock for all sector-region combinations.

2 Interpreting the MS Excel Results and Scenario Interface

Regardless of the number of sectors and number of regions, each Excel file contains the following sheets that will be explained in the following sections.

- Plot: shows the simulation path for an optional variable
- Comparison: GDP levels for various scenarios are shown over time

For the remaining sheets the evolution of the exogenous variables are provided until the year 2100:

- Baseline
- Temperature
- Sea Level
- Adaptation
- Extremes