

TIMES Time-Stepped Solve (TIMESTEP) Option in ANSWER-TIMES

Introduction

The purpose of this note is to briefly describe how to invoke the TIMES Time-Stepped Solve (TIMESTEP) option in ANSWER-TIMES.

For an explanation of the TIMES Time-Stepped Solve (TIMESTEP) option, see section 6.2 of TIMES Version 2.8 User Note “User Control Switches in TIMES” (author Antti Lehtila), which can be downloaded from the ETSAP website as *TIMES-Control-Switches.pdf*.

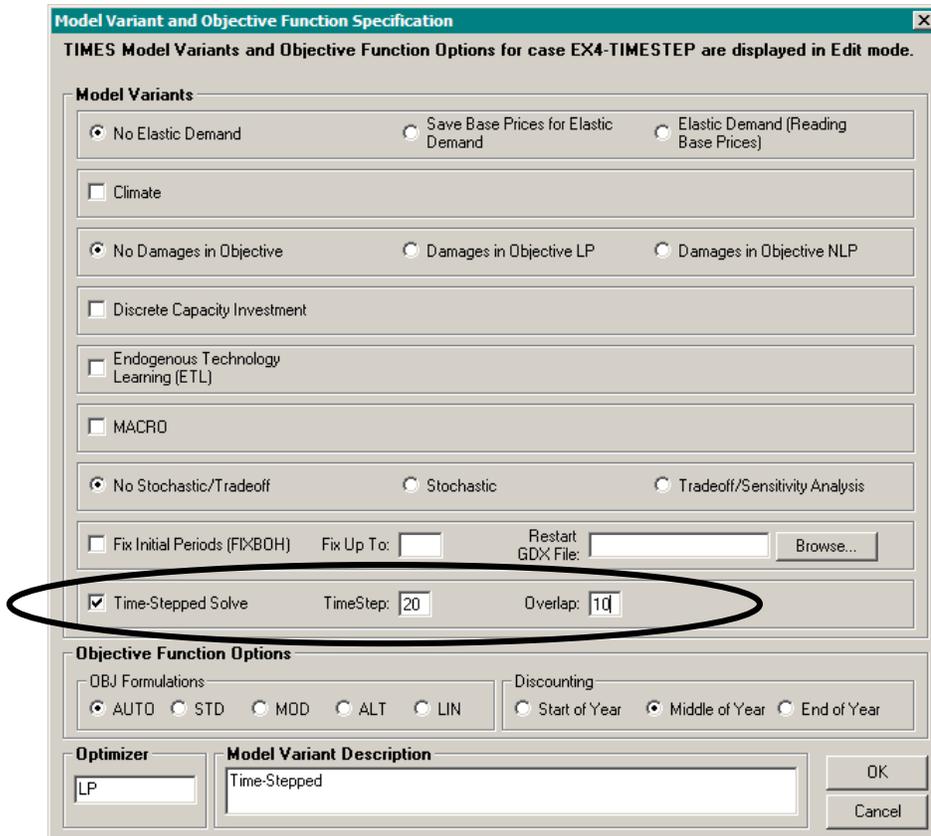
For a concrete example demonstrating Run Model using the TIMES Time-Stepped Solve option, see the online Run (case) called **EX4-TIMESTEP** in database Example4-v661.mdb.

Time-Stepped Solve in ANSWER-TIMES

The essence of what is required by the ETSAP TIMES GAMS code is to specify values for:

| | |
|-----------|---|
| TIMESTEP | the number of years that should be optimized in each solution step |
| G_OVERLAP | the number of overlapping years between successive optimization steps |

To specify in ANSWER-TIMES that a TIMES model run uses the Time-Stepped (TIMESTEP) option, and to specify the values for TIMESTEP and for G_OVERLAP, click on the **Specify Model Variant...** button on the Run Model form, and then check the Time-Stepped Solve checkbox, and specify values for TIMESTEP and for G_OVERLAP in the TimeStep and Overlap textboxes respectively:



ANSWER-TIMES then ensures that TIMESTEP is specified as a control variable in the GEN file that controls the TIMES GAMS model run, by inserting:

\$SET TIMESTEP 20

and also that G_OVERLAP is specified, as it happens also by inserting in the GEN file (lower down):

G_OVERLAP = 10;

In ANSWER-TIMES the value for the TIMES parameter G_OVERLAP must be specified via the Overlap textbox on the Model Variant Specification form. (Right now G_OVERLAP cannot be specified as a Data Parameter in ANSWER-TIMES.)

Time-Stepped Solve in conjunction with other TIMES Model Extensions

The TIMES Time-Stepped Solve Option is available in conjunction with most of the other TIMES Model Extensions, so for example a model run that combines Endogenous Technology Learning (ETL) with Time-Stepped Solve is allowable:

The screenshot shows the Model Variant Specification dialog box. The 'Endogenous Technology Learning (ETL)' checkbox is checked and circled. The 'Time-Stepped Solve' checkbox is also checked and circled, with 'TimeStep' set to 20 and 'Overlap' set to 10. The 'MACRO' checkbox is unchecked. The 'No Stochastic/Tradeoff' radio button is selected. The 'Fix Initial Periods (FIXBOH)' checkbox is unchecked. The 'Restart GDY File' field is empty. The 'Objective Function Options' section shows 'OBJ Formulations' with 'AUTO' selected and 'Discounting' with 'Middle of Year' selected. The 'Optimizer' is set to 'LP + MIP' and the 'Model Variant Description' is 'ETL + Time-Stepped'.

The Time-Stepped Solve Option is not available in conjunction with the Macro, Stochastic and Tradeoff/Sensitivity Analysis Extensions. So for example if the user invokes both Stochastic and Time-Stepped Solve, the Model Variant Description textbox on the Model Variant Specification form indicates "Combination of Model Variants not allowed".

No Stochastic/Tradeoff **Stochastic** Tradeoff/Sensitivity Analysis

Fix Initial Periods (FIXBOH) Fix Up To: Restart GDX File:

Time-Stepped Solve TimeStep: Overlap:

Objective Function Options

OBJ Formulations: AUTO STD MOD ALT LIN Discounting: Start of Year Middle of Year End of Year

Optimizer **Model Variant Description**