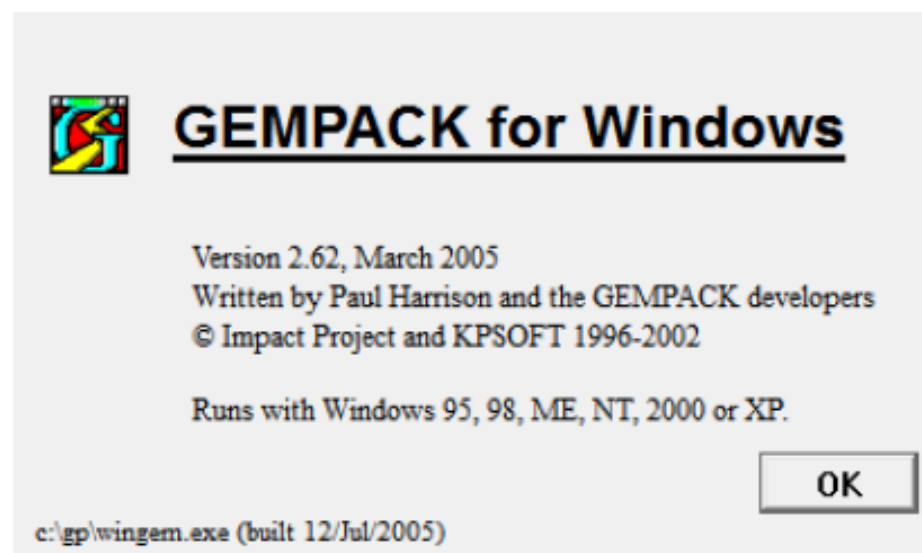


Getting to know the Gempack software and First Simulation (Hands-on with MINIMAL)

Day 1 Session 1

Outline

- Overview of Gempack
- The Gempack windows Programs
- Gempack's way of solving CGE models
- Exercise



- Gempack (General Equilibrium Modelling Package) A suite of general-purpose economic modelling software.
- Designed for general equilibrium models (unlike GAMS which is designed for any algebraic mathematical modeling)
- Developed by Centre for Policy Studies (CoPS) Monash University, Australia.

Overview (cont)

- GEMPACK software is being used in over 400 organizations around the world (universities, government departments and private sector firms), about two thirds of which are outside Australia. It is used to implement and solve a number of economic models.
- The software is user-friendly, and fully documented from a user's point of view.
- GEMPACK provides a number of features designed to make this sort of modelling easier.
- GEMPACK runs on a variety of different machines.

Source: <http://www.monash.edu.au/policy/gpinfo.htm>

The Gempack Programs

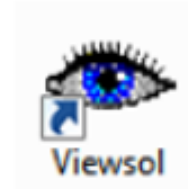
Gempack Provides:

- a simple language in which to describe and document the equations of your economic model;
- a program which converts the equations of your model to a form ready for running simulations;
- options for varying the choice of endogenous, exogenous and shocked variables;
- powerful tools to help you understand or analyze simulation results;
- utility programs to assist in managing model databases. The data can be inspected, modified, or converted to other formats, such as spreadsheets;
- programs to generate reports from simulation results or from initial data.

Gempak Windows program

- ① WinGEM \Rightarrow Windows interface to GEMPACK
 - ② TABmate \Rightarrow Windows text editor for developing TABLO Input files
 - ③ ViewHAR \Rightarrow Windows program for looking at data in a Header Array file
 - ④ ViewSOL \Rightarrow Windows program for looking at Solution files
 - ⑤ AnalyseGE \Rightarrow Windows program assisting modellers to analyse their results
 - ⑥ GemEdit \Rightarrow Windows text editor sometimes used with WinGEM
 - ⑦ RunGEM \Rightarrow Windows program for automating simulations with models
 - ⑧ RunDynam \Rightarrow Windows interface for recursive dynamic models
 - ⑨ Charter \Rightarrow Windows program for drawing graphs
 - ⑩ AggHAR \Rightarrow Windows program for aggregating data files
 - ⑪ ConvHAR \Rightarrow Windows program for converting Header Array files to different formats
- *We are going to use mostly 1-4! We will use 5 and 10 sometimes.*

Four most often used Gempack Windows program in this training

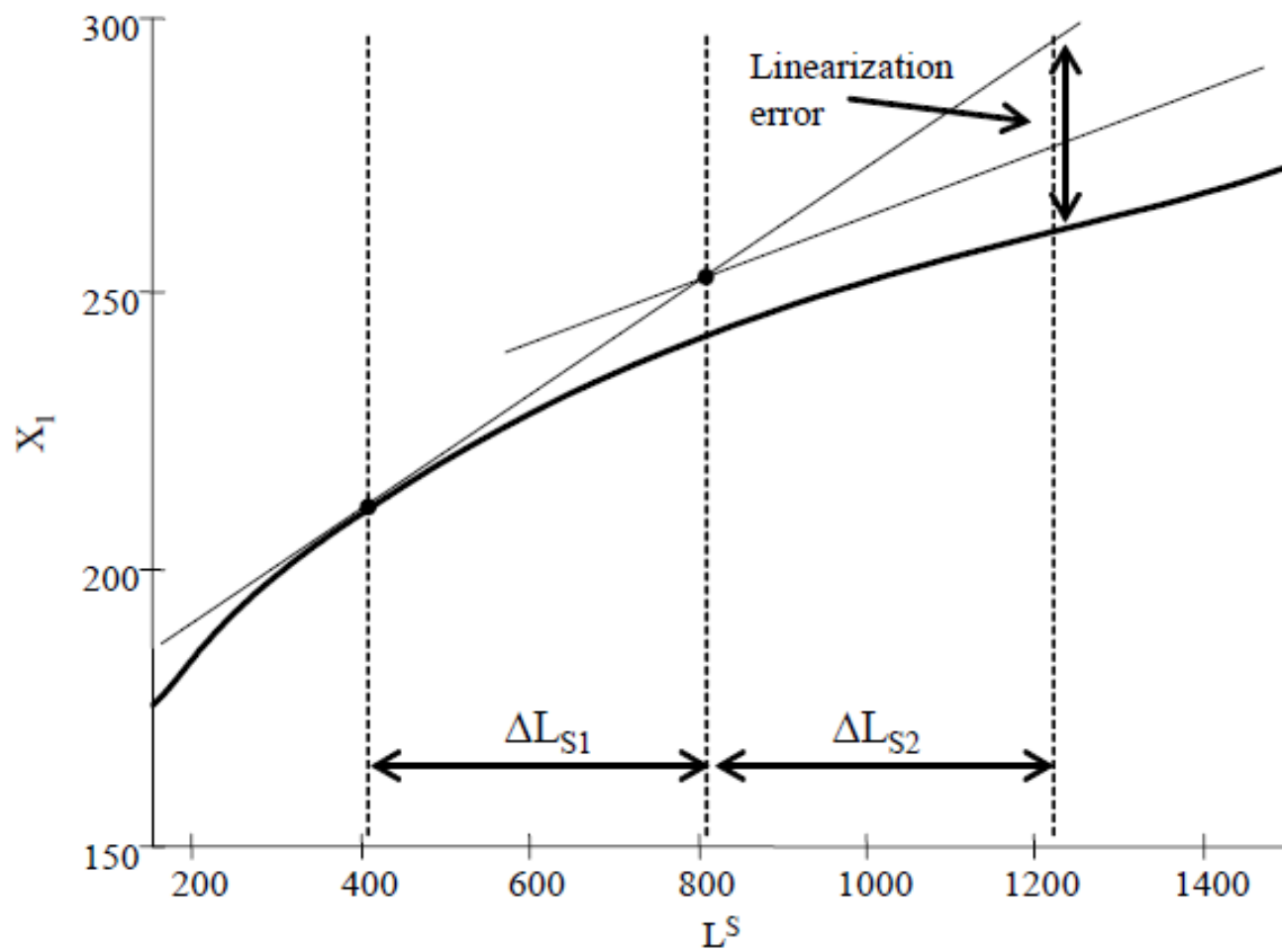


- 1 WinGEM \Rightarrow Windows interface to GEMPACK
- 2 TABmate \Rightarrow Windows text editor for developing TABLO Input files
- 3 ViewHAR \Rightarrow Windows program for looking at data in a Header Array file
- 4 ViewSQL \Rightarrow Windows program for looking at Solution files

Gempack's way of solving CGE models


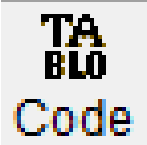
- CGE model is simply a system of non-linear equations of n variables and n equations. GEMPACK solves the system.
- How? Simply through Matrix Inversion.
- In GEMPACK we work with *linearized equations*, the CGE model become a system of linear equations.
- But, that's not the only thing GEMPACK do. Gempack correct the linearization error such that the solution is as if solved through non-linear computation.

GEMPACK Solution Method



Correcting Linearization Error

Exercise

- Open your tablo file
- Tablo Check (F4) The icon consists of the text 'TABLO' in a bold, black, monospace font, stacked above the word 'Check' in a smaller, blue, monospace font. A vertical orange bar is positioned to the right of the word 'Check'.
- Tablo code (F11) The icon consists of the text 'TABLO' in a bold, black, monospace font, stacked above the word 'Code' in a blue, monospace font.
- Go to Wingem
 - File => Change both default directories
 - Simulation => tablo implement ...
 - Viewsol

DIAGNOSTIC SIMULATION

Diagnostic simulation (1)

- NOMINAL HOMOGENEITY TEST

In a CGE model, you cannot have all prices endogenous ==> a CGE model cannot solve for absolute prices

==> You cannot determine that $P(\text{'rice'}) > P(\text{'clothes'})$

==> You can only say that $p_P(\text{'rice'}) > p_P(\text{'clothes'})$, where $p_$ is percentage change.

A CGE Model can only solve for relative price, all prices are stated relative to a numeraire

==> To check nominal homogeneity, shock the numeraire, let's say by 1.444% then all prices and nominal variable will rise by 1.444%, real/quantity won't change

- NOMINAL HOMOGENEITY TEST IS THE FIRST USEFUL CHECK THAT OUR MODEL IS CORRECTLY SPECIFIED!

Diagnostic simulation (2)

- REAL HOMOGENEITY TEST

A typical neoclasical CGE model exhibits Constant Returns to Scale ==> doubling input will doubling output

- THE TEST: shock all real exogenous variables (by 1.4444%)

- CHECK: all real/quantity variables will rise by 1.4444%
All prices won't change

- REAL HOMOGENEITY TEST IS THE SECOND USEFUL CHECK THAT OUR MODEL IS CORRECTLY SPECIFIED!

CONTOH SIMULASI

Melakukan shock dengan menaikkan variabel numeraire sebesar 10%
shock phi = 10;

TERIMA KASIH