



Designing & Analysing Policy Experiments and Simulations

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Outline

- Simulations and Experiments
 - 'Backstory' and policy scenarios
- Shocks
 - 'The' policy and options
 - Ranges of shocks
- Market Clearing and Closures
 - Reality vv Relevance
- Comparative Statics & Designing Experiments
 - Changing the future
- Analysing the Results
 - Theory vv data
 - Stages of analyses

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What is the job of an analyst?

- Advice or Legitimisation?
- Advice
 - Analyse options
 - Identify implications
 - Provide information
- Legitimisation
 - 'post hoc urgo propter hoc' (after this, therefore because of this)
 - Argument by analogy (It worked in ****)
 - Appeal to authority (The **** says this is best)

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Backstory

- What is the policy issue being examined?
 - Is CGE the right method?
 - What is the time horizon?
- What is the 'economic' environment?
 - Socio-politico-economic issues
- How do the economies operate?
 - Exchange rate regimes
 - Tax system options
 - etc.

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Simulations and Experiments

- Simulate or experiment?
 - Simulate evaluate a specific option
 - Experiment analyse a range of options
- Time horizon
 - 'Short-run vv long-run'
- Responsiveness
 - Simulate specific elasticities
 - Experiment a range of elasticities

Aim: Understand how a system may operate and respond to policy changes

Objective: Provide information useful to policy makers

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The Model

Do model and/or data need changing?

Behavioural issues: change the model

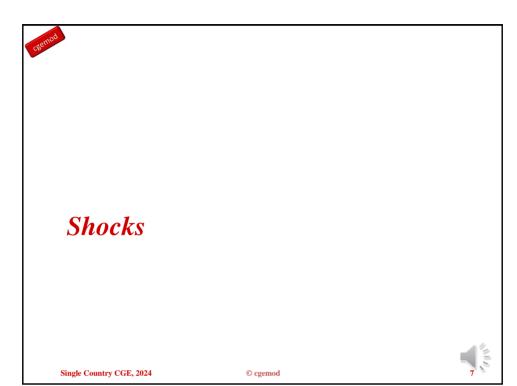
Data issues: change the database

It is (arguably) bad practice to change the data to fit the model

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Policy

- Policy Objectives
 - Reduce the government's budget deficit
 - Improve the efficiency of the tax system
- Policy proposal
 - the government plans to replace indirect commodity taxes with a single rate VAT system

Tinbergen 'principle'!!

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Shocks: Simulation

- Shocks
 - Set all indirect commodity tax rates to ZERO
 - Identify the VAT rate that the government should impose
- Report
 - Identify the aggregate welfare gains associated with a 'more efficient' tax instrument

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Shocks: Experiment

- Shocks
 - Remove each indirect commodity tax in turn
 - Assists with identifying less efficient tax instruments
 - Analyse the implications of differential VAT rates
 - Recognises differential patterns of expenditure by RHGs
 - Analyse a range of alternative fiscal policy options, e.g., direct taxes, reductions in government expenditure, etc.,
 - Checks the relative efficiency of VAT and other taxes
- Report
 - Identify the household welfare effects associated with different combinations of tax instruments
 - Identify implications for other dimensions of the economy, e.g., competitiveness of activities

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Market Clearing and Macroeconomic Closure

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Principles

- Different applications and uses/users require different closure settings
 - Reflect reality, e.g.,
 - Exchange rate regime
 - Unemployment/surplus labour
 - Analyse causal forces
 - Efficiency of different tax instruments
 - Identification of endowment effects
- Avoid distorting the results
 - Consistency with the research method

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Tax Replacement Instruments

- Tax replacement
 - Replacement of tax revenue lost by reducing the rates of one tax instrument by increasing the rates of one or more alternative tax instruments
 - Fix government's internal balance
- Tax efficiency
 - Different instruments have differential impacts upon 'efficiency'
 - Some taxes enter FOCs (explicit and implicit) and therefore directly influence prices
 - GST all activities and institutions
 - VAT only RHG
 - Some taxes are more like 'lumpsum' taxes income taxes, VAT

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Comparative Statics

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Comparative Static Models

- Comparative statics and 'manna from heaven'
 - Avoid
 - Free goods from the future unrequited debts
 - · Changing the future
- Comparative Statics and Deficits
 - Reduce tax rates with flexible internal balance
 - Welfare enhancing because government deficit does not enter the welfare/absorption metrics
 - debt passed to future generations
- Comparative Statics and the Future
 - Reduce savings rates
 - Welfare enhancing because households can consume more NOW at the expense of reductions in consumption later
 - capital stock in the future declines

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'Standard' Settings: Comparative Static

- Real Internal balance fixed
- Real External balance fixed
- Investment volumes fixed
- Tax rates fixed or flexible
- Factor supplies—fixed or flexible
- 1. All adjustments realised in household consumption expenditures/welfare
- 2. Alternative all adjustments realised in domestic absorption

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Changes to the Future

- Changes in internal and/or external balances
 - change debts owed to the future or RoW
- **BUT** future and RoW are **exogenous**
- Need to distinguish between impact of other shocks and changes to the future
 - closure swaps other shocks with/without changes to the future

Increases in the deficits on internal and/or external balances will by definition increase current welfare

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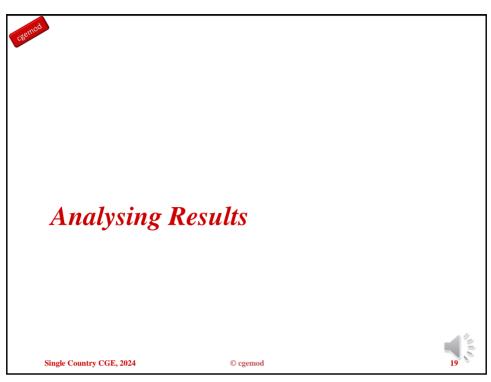
Changes in Technology

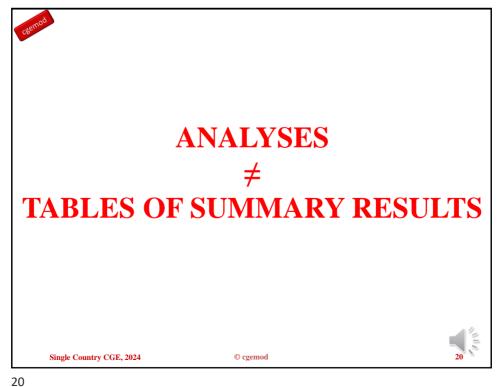
- Improving technology means ceteris paribus that welfare will increase – 'manna form heaven'
 - No behavioural relationship to explain changes in technology
- Improvements in technology are costly, e.g., R&D, education, training, capital investment, etc.
 - Proxy: Add behavioural relationships that link technology parameters to current expenditures, e.g., on R&D

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Analyses

- Results derive from
 - Model behaviours
 - Data shares, elasticities, etc.
 - Shocks
- Know your
 - Model
 - Data
 - Shocks

Follow the behaviours and prices in the model

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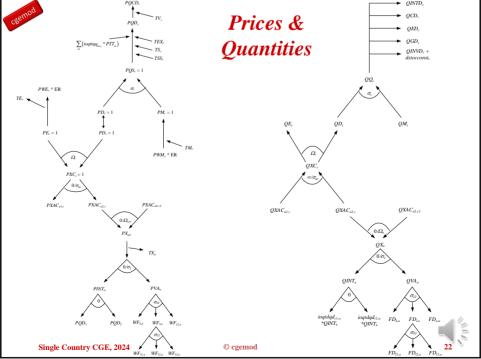


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Stages

- 1. Check the shock
- 2. Check the macroeconomic closure conditions
- 3. Check the market clearing conditions
- 4. Check first round changes match expectations
 - 1. Are prices change as expected?
 - 2. Do quantity changes 'match' price changes?
- 5. Review summary statistics
- 6. Explore the impacts expected to follow from the policy changes

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The End



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