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ANARRES

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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Shocks

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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
  - 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, NB: opportunity costs
- 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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Analysing Results

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ANALYSES

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TABLES OF SUMMARY RESULTS

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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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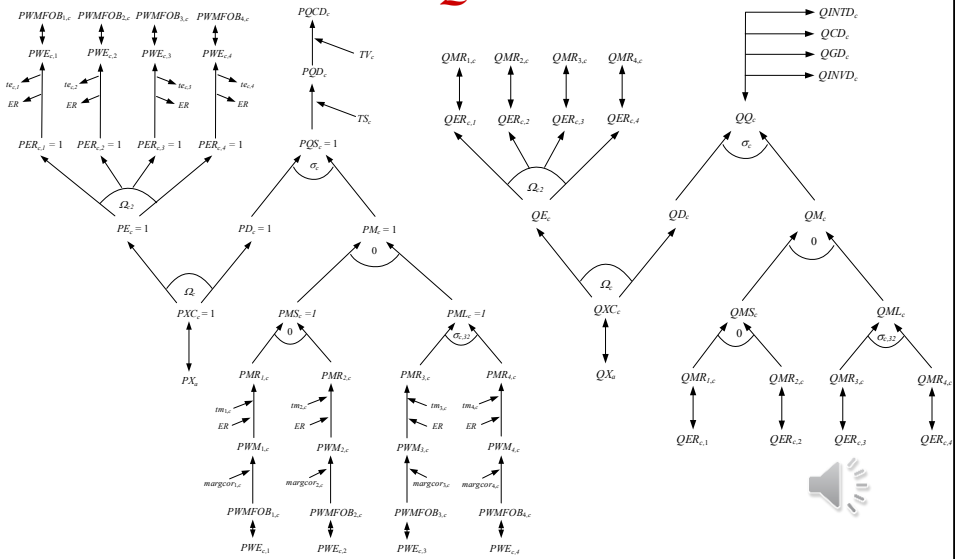
Prices & Quantities



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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 changing 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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