

# Evaluating the Economic Impacts of Policies to Mitigate the Effects of Climate Change in Developing Countries

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# *Outline*

- Introduction
- Economic Models
- Forecasting vv What-If Analyses
- Data and Agents
- Endogenous vv Exogenous ‘Variables’
- Counterfactuals
- Policy Shocks
- Interpretation
- Costs
- Concluding Comments

# *Introduction*

- Role and scope of economic models
- Types of economic models
- Data
  - SNA
- Impacts
  - Climate change
  - Domestic policy responses
  - Mitigation strategies
- Role of ‘experts’
- Role of ‘clients’
- Interpretation

# *Economic Models*

- Econometric
  - Macroeconometric
  - Microeconometric
- Simulation
  - Macroeconomic
  - Microeconomic
    - Microsimulation
    - Partial Equilibrium
    - General Equilibrium
      - Global
      - Single-country
- Comparative Static
- Dynamic
  - Recursive
  - Forward-looking

# *Forecasting vv What-If Analyses*

## Forecasting/Prediction

- Econometric
  - Assumption of ‘regularity’
    - Statistical inference
- Structural breaks
  - Climate change
  - Policy responses
- Econometric Policy Analysis
  - Inductive
    - Lucas critique

**Simple answers**

## What-If Analyses

- Theoretical
  - Assumption that the theory is ‘correct’
- Controlled experiments
  - **If** these changes occur, and other things do not change, **what** will be the implications
- ‘Behavioural’ Policy Analysis
  - Deductive

**Conditional answers**

# *Data and Agents*

## **Single-Country**

- *Standard* **S**ystem of **N**ational **A**ccounts Data
  - Supply and Use tables
- Household and Labour force surveys
- Satellite Accounts
  - Population
  - Emissions, etc

**Country specific set of agents**  
**Multiple households**

## **Global**

- Transactions Data
  - Global Trade Analyses Project (GTAP)
  - World Input-output database (WIOD)
- Satellite Accounts
  - Population
  - Emissions, etc

**Common set of agents**  
**One household**

**Data are expensive BUT critical**

**Domestic Control of National Accounts is IMPORTANT**

# *Endogenous vs Exogenous 'Variables'*

## **NOT exhaustive**

### **Global Models**

- **Endogenous**
  - World prices (G&S)
  - Factor prices
  - Internal & external balances (?)
  - Global emissions etc.,
- **Exogenous**
  - Income distribution

### **Single-Country Models**

- **Endogenous**
  - Factor prices
  - Income distribution
- **Exogenous**
  - World prices (G&S)
  - Internal & external balances (?)
  - Global emissions etc.,

**ONE model may not be enough**

# *Counterfactuals*

Which variables are **endogenous** & which are **exogenous**?

- What is the global environment?
  - **International** responses to climate change
    - Technical and Economic
  - CHG levels/densities
  - International transfers
- What is the domestic environment?
  - **Domestic** responses to climate change
    - Technical and Economic
  - Domestic and International Constraints



# *Policy Shocks and Advice*

- The Modeller from Hell!!!
  - Highly sophisticated model
  - (highly) non-linear equations
  - Results ‘broadly’ consistent with theory, **but** ..
  - Results **cannot** be simply explained
  - The model was programmed correctly (by me)
  - The data have some issues (done by the RA)

## **KISS principle**

**Beware of those who tell you how much more sophisticated their model is compared to the competition**

# *Policy Shocks and Advice*

- Focus on ‘Evidence Based Policy Analyses’
  - What are the policy proposals?
  - What are the policy objectives?
  - What are the data?
- Sensitivity Analyses
  - Shocks
  - Assumptions
  - Parameters

**Evaluate options rather than quantify the impacts of ONE shock**

# *Interpretation*

**This is what it is all about.**

The objective of modelling is to provide insights that otherwise would not exist.

Model authors may be less interested in interpretation; that is why a team is often the best option.

Why different policy options have different implications are the insights you are paying for.

*Interpretation*  
**ANALYSES**  
**≠**  
**TABLES OF**  
**SUMMARY RESULTS**

**Simulation models are intended to explain why the results emerge**

**If the ‘experts’ cannot explain to YOU why their models produce the results: DO NOT pay them**

# *Interpretation*

- Unexpected Results
  - Results that are inconsistent with your and your ‘bosses’ priors can be difficult
    - Are the assumptions right?
    - Are there errors in
      - Model
      - Data
      - Experiments?
    - Are your analyses right?

**In retrospect everything coming out of mathematical models of economic systems is obvious. But getting to the insight that the results are obvious can be challenging.**

# *Costs*

- Data
  - Single country models
    - SAM – expensive but critical
    - National accounts – domestic control is important
  - Global models
    - GTAP or WIOD – cheap **BUT ....**
- Models
  - Fixed cost – relatively cheap
  - Customisable – not expensive, does the **client** know enough
- Support
  - **Critical**
  - Variable cost

**Policy errors are expensive and, typically,  
impact most on the poor**

# *Concluding Comments*

- Models can be useful
- **BUT**
  - Counterfactuals are critical
  - Interpretation is essential
- **Domestic** control over national data is very important
- Models are a fixed cost – **collaborate**
- Support – **you will need it**

“Essentially, all models are wrong,  
but some are useful” (G Box)

**The End**