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Tourism Policy Modelling

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Modelling the Tourism Sector

- A range of different modelling options exist for the tourism sector and are entirely dependent on what you want to model.
- The focus of this presentation is on Economic Modelling. Examples of economic modelling issues include:
    - Demand Forecasting
    - Calculation of Elasticities
    - De-trending of data
    - Policy Impact Models
- Various Economic Models contribute to DCMS's understanding of the tourism sector. Having robust economic models is crucial for making our case about a range of issues across government and to the industry its-self.

Policy Impact Models: Computable General Equilibrium

- For the purposes of this discussion we refer to the class of models known formally in the literature as **Computable General Equilibrium** (CGE) Models.

Computable: this is a type of numerical simulation model

  - changes (e.g. to tourism demand) are introduced, and the resulting changes in GDP, welfare, output, employment… are calculated

General Equilibrium: supply equals demand in all markets simultaneously

  - all intermediate demands are taken into account, and the effects that they have on other sectors are included

- CGE models are of interest primarily because of the opportunities they offer in evaluating the impact of policy changes.

Where Does CGE Come From?

- General Equilibrium Theory
- Leontief's input-output models
- Early CGE models in early 1970s
  - Dale Jorgenson, John Whalley, ...
- 1970s/80s: trade modelling (WTO, regional trade agreements, developing countries – World Bank)
- Recently (starting with Adams and Parmenter 1995)
  - tourism

Computable General Equilibrium Models and TSAs

- CGE models are formal economic models that can extend TSA's.
    - **Remember that the term Tourism Satellite Account implies that the TSA is an annexe or rather an extension of the national economic accounts.**
- The CGE model uses both the TSA and the national economic accounts to create an economy wide economic model.
- Models of this nature allow the full potential of the detailed data contained in TSAs to be realised and facilitate:
    - The assessment of tourism's overall economic impact.
    - The analysis of tourism policy.
    - Tourism forecasting, predicting long-term trends in tourist numbers and expenditures.

CGE Models: Principles and Processes

- The principles underlying a CGE Model are relatively simple:

  1. Build and analytically consistent mathematical model of the economy. The underlying mathematics are rooted in economic theory.
  2. Collect data on the variables in the mathematical model
  3. Use the data collected and the derived mathematical interrelationships to solve the model.

- The resulting output gives a snapshot of the economy. This means that various scenarios can be defined and before and after effects compared.

CGE Models and Tourism Expenditure

- CGE models are ideally suited to capturing the wider effects of tourism expenditure.
- Tourism expenditure effects will have impacts on different sectors.
- Tourism expenditure effects combine so that the ultimate increase of income within the recipient destination exceeds the initial increase.

This occurs via:

- Direct Effects: Increased sales revenues are associated with tourism expenditure.
- Indirect Effects: Tourism related firms will purchase goods and services from other firms.
- Induced Effects: The recipients of tourism earnings will in-turn spend their increased earnings.

Tourism and CGE Models

What can CGE Models tell us about tourism?

- Tourism's impact across the whole economy
- The effects of exogenous demand shocks
  - The Foot and Mouth crisis, September 11th,...
- The effects of tourism taxation
- The use of taxation and other instruments to *respond* to exogenous demand shocks

Strengths of the CGE Approach

- Benefits of having solid microfoundations
  - Lays bare the substructure of the economy, the behavior of consumers, producers and the government is then explicitly modeled.
- Ability to Include Specific Welfare Effects.
- Distributional Aspects
  - ‘everything depends on everything else’
- Facility to evaluating second best situations.
- Ability to disaggregate sectors of interest.

Weaknesses of the CGE Approach

- Simplicity of functional forms
- Parameterisation and calibration
- Equilibrium is a strong assumption
- Possibility of multiple equilibria
- Confidence intervals cannot easily be derived
- Results can often be a black box to non-specialists.