



Business Case, Economics & Finance

Computable General Equilibrium modelling for economic impact analysis

Evaluation scope of a business case

When assessing the viability of a business plan or new investment, it is important to consider new economic activity from a regional government or regional planner's point of view as well as the cost benefit analysis (CBA) to justify use of economically scarce resources in a proposed business case.

We adopt/ apply a combination of models and tools to achieve positive outcomes for your proposed investments.

Economic Impact Analysis (EIA) for a business case

The EIA attempts to capture all induced or flow-on impacts of a business case on a local or regional economy of which there are generally four:

- production induced impacts through input-output linkages of individual industries of an economy
- consumer induced impacts through household spending of their incomes on goods and services produced from a local or regional economy
- local price/ wage induced substitution impacts through their impacts on inter-regional trades and labour mobility across regions
- technology induced productivity spill-over impacts through business cost savings and regional competitiveness levels.

Input - output modelling

Traditionally these flow-on impacts are evaluated in terms of the so-called 'multipliers' impacts generated from a local or regional Input-Output (IO) table. The concept of 'multipliers' is based on the induced impacts mentioned above, assuming there are no price or wage implications generated from constraints in regional resources such as regional production capacity and regional skilled labor availability.

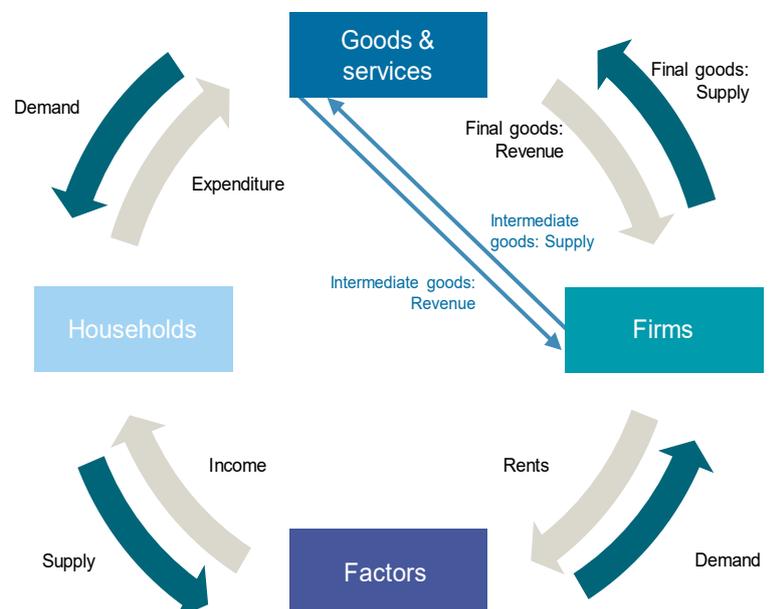
Despite these limitations, the IO approach is valid for small scale projects which will not disturb the market price signals and regional resource constraints.

Recent developments

Recent developments in highly elaborate multi-regional and multi-industry macroeconomic models address these implicit limitations of the IO approaches by capturing:

- local price/ wage induced substitution or technology induced spillover effects
- flexible treatments of local resource availability including capital stock, labour force and land as well as other natural resources.

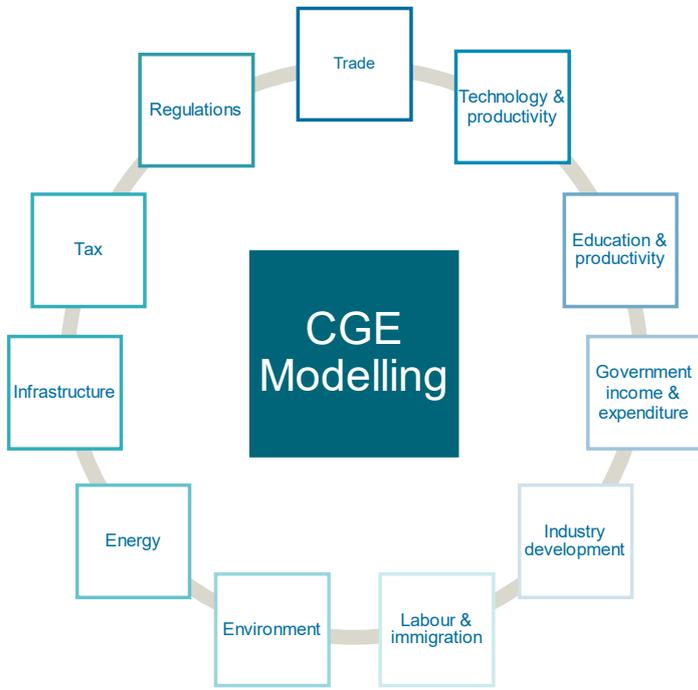
Figure 1. Inter-linkage system of a regional economy



Computable General Equilibrium (CGE) Modelling

A CGE model is a large scale system of equations used to capture detailed commodity and industry demand and supply transactions. In the model, domestic and import prices, wage and capital rental rates, as well as taxes and subsidies play key roles in determining optimal levels of transactions with economy-wide resource constraints.

Figure 2. Policy application areas of CGE modelling approach



Benefits of CGE modelling for the EIA

The CGE model is particularly well suited for EIA as it links specific markets into a single system and captures feedback and flow through effects induced by a regional business or a new business plan on regional investment, infrastructure and tourism related new spending, and regional sports and cultural events.

The CGE model has the capacity to represent price dependent market interactions as well as the origination and spending of income for various economic agents based on rigorous microeconomic theory. The CGE model also has a unique capacity to incorporate supply structure and demand patterns of detailed sector and sub-sector activities in the economy-wide context.

In particular, it will be able to account for potential substitution and price impacts generated from new technology embedded

CGE application areas for the regional economic impact analysis

Industry or business contributions	Tourism events
Tourism development project	Tourism related investment project
Energy and water supply project	Renewable energy project
Technology innovation oriented investment	Epidemic and natural disaster impacts
Sports and cultural events	Regulatory reform options
Environmental policy	

The outputs of CGE modelling analysis include

Value added, employment, turnover by industry
Household income and consumption by product
Wage and rental cost impacts and fuel and transport cost impacts by industry
Price, wage rate, the rate of return impacts by industry
Local, state and federal tax revenue impacts by type
Distributional impacts across households
Key macroeconomic impacts for a local and regional economy including gross regional products (GRP), gross outputs, regional employment, private consumption, investment, exports and imports

For more information about how GHD Advisory can help you with economic impact analysis and other economic modelling analysis, email us at advisory@ghd.com or contact:

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