



ADVANCED ANALYTICS
التحليلات المتقدمة



Advanced Analytics
Economic Consulting
Supporting Decision

Preparation
and writing of economic
reports and specialized research
to support decision-makers in
government entities, companies,
and institutions, by transforming
data and quantitative models
into practical outputs that can be
used in decision-making.

Making Through
Quantitative Analysis
of Economic and Social
Impact

ADVANCED ANALYTICS ECONOMIC CONSULTING COMPANY





EXECUTIVE OVERVIEW

Advanced Analytics is a consulting firm specialized in supporting strategic decision-making through advanced quantitative analysis of the economic and social impact of policies, programs, and initiatives.

We work with government entities, institutions, and companies to evaluate policies before their adoption, measure their impacts after implementation, and build future scenarios that support planning and decision-making on clear scientific foundations.

The company relies on advanced economic and econometric models that are developed and adapted to suit the local and regional context of each entity, with a focus on the applicability of results and their use within the client's institutional and regulatory environment.

We believe that quantitative analysis is not an end in itself, but a tool to support decision-making, reduce risks, and enhance the quality of strategic outputs.



OUR MISSION

Delivering advanced, scientific, and data-driven quantitative analyses that transform complex models and data into practical outputs supporting decision-makers across various sectors, and contributing to improving the quality of decisions and reducing risks at the national and regional levels.



OUR VISION

To be the leading reference in the application of advanced quantitative techniques to support strategic decision-making, and to empower leaders to make decisions based on rigorous scientific analysis and reliable data at the national and regional levels.





WHO WE ARE

Advanced Analytics is a wholly Saudi-owned consulting firm headquartered and registered in the Kingdom of Saudi Arabia (Commercial Registration No. 101052188).

The company also maintains a presence in the United Arab Emirates under Trade License No. 2017/10507. The company specializes in providing advanced economic and econometric analysis, in addition to preparing and writing specialized reports and research, and delivering behavioral advisory services, with a focus on applying quantitative methodologies to support decision-making for government entities, institutions, and companies at both the local and regional levels.

Our work relies on the application of advanced techniques in mathematics, statistics, econometrics, quantitative social sciences, and data science, with the aim of transforming complex data into precise analytical insights and actionable outputs.

The team brings together multidisciplinary quantitative expertise that combines advanced academic qualifications with practical experience across various sectors, supported by a proven professional track record in conducting strategic studies and analytical work.



ADVANCED ANALYTICS
التحليلات المتقدمة



A SAMPLE OF CURRENT AND FORMER CLIENTS





CHAIRMAN'S MESSAGE

Driven by our belief that sound economic decisions are grounded in rigorous scientific analysis, Advanced Analytics works to support decision-makers by delivering advanced economic and econometric analyses based on reliable data and quantitative models. We aim to enable government entities and institutions to understand the economic and social impact of policies and programs, and to evaluate different alternatives on clear scientific foundations.

Since the company's establishment, we have been committed to adopting internationally recognized analytical methodologies and developing economic models tailored to the specific characteristics of the national economy and the institutional context of each entity, ensuring the applicability of results and their transformation into practical outputs that support planning and decision-making.

We take pride in a team of distinguished experts and specialized consultants who operate within a clear governance and methodological framework that ensures the quality of analysis, the accuracy of outputs, and adherence to best professional practices. We are also committed to delivering analytical solutions that contribute to risk reduction, enhance policy efficiency, and support the achievement of strategic and developmental objectives in the short, medium, and long term.

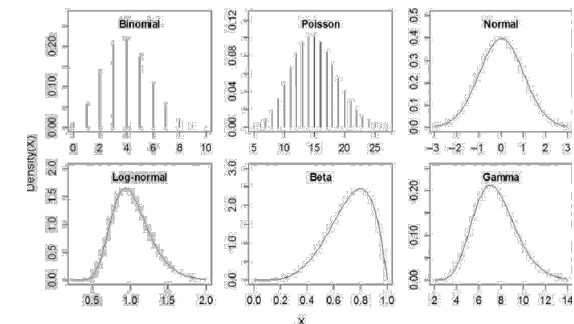
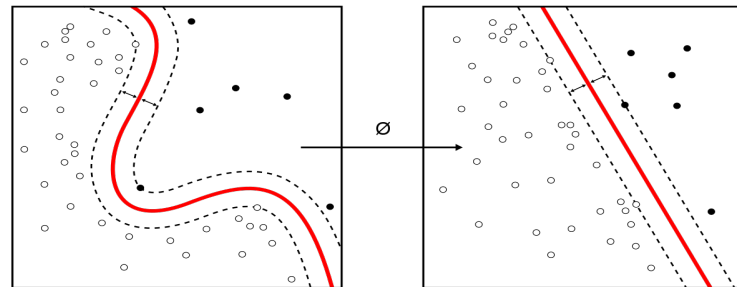
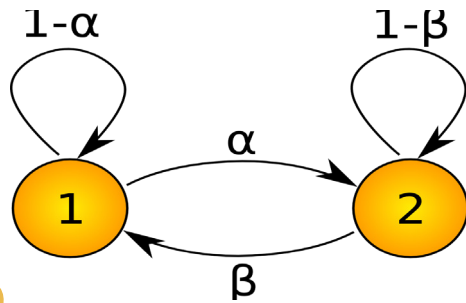
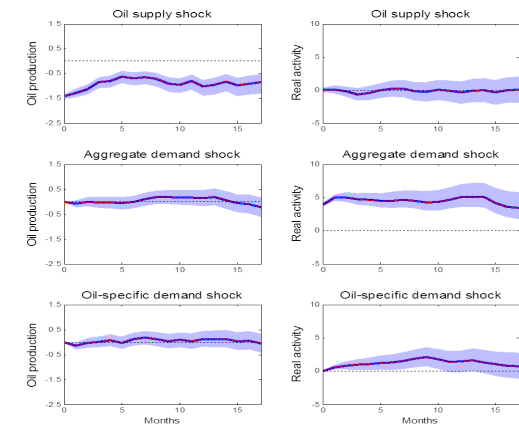
Dr. Ahmed Al-Zahrani

Economic Advisor, Founder and Chairman of the Board



ECONOMIC MODELING AND RESEARCH

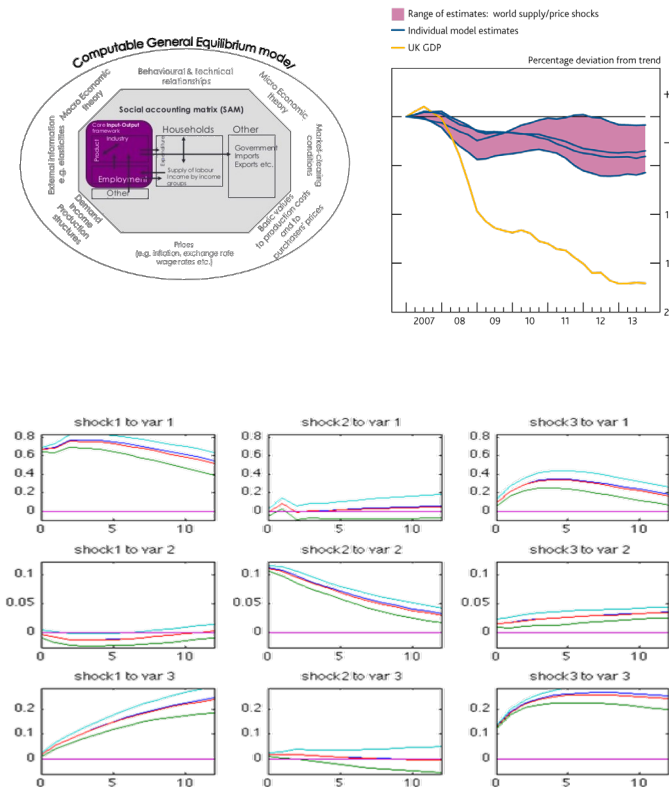
- Regional Economic Models
- Global Economic / Econometric Models
- Building Structural Vector Auto-Regression (SVAR) Models
- Building Vector Auto-Regression (VAR) Models
- Behavioural Economic Models
- Social and Economic Policy Impact Analysis and Simulations
- Computable General Equilibrium (CGE) Models
- Macro Econometric Models (MEM)
- Social Behaviour Prediction and Forecasting Models
- MIMIC Models (Prediction of Latent Uncaptured Variables)





DATA SCIENCE AND STATISTICAL AND MATHEMATICAL MODELING

- 01 Stochastic Processes / Markov Chain Models
- 02 Building Static & Dynamic Statistical Models
- 03 Advanced Regression Modelling
- 04 Probabilistic & Stochastic Models
- 05 Composite Indices & Indicators
- 06 Game Theory Modelling
- 07 Forecasting and Predictive Models



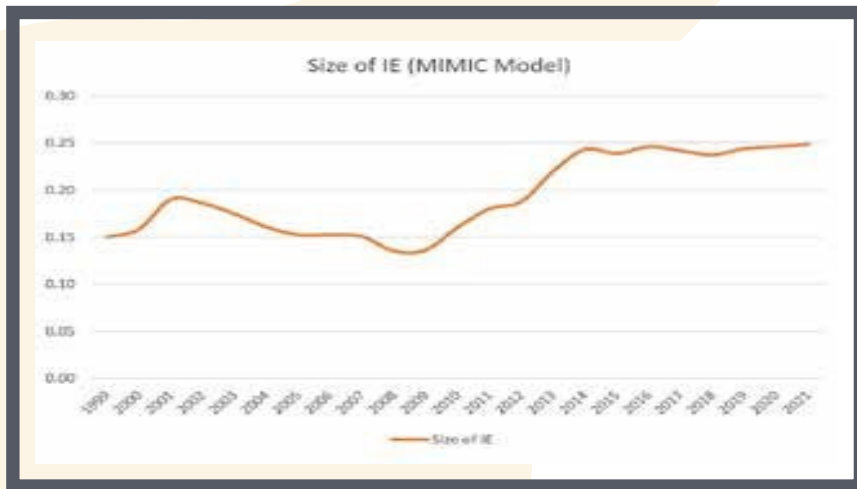
Saudi Multiple Indicators Multiple Causes (MIMIC) Model

The MIMIC model is used to support decision-makers in estimating and measuring the size of the shadow economy (informal economy), and in analyzing its determinants and impact on the macroeconomy.

The model enables:

- Estimating the size of the shadow economy as a percentage of GDP
- Analyzing the factors influencing the expansion or contraction of informal activities
- Providing medium- and long-term forecasts of shadow economy trends

This analysis helps relevant entities understand unobserved economic activities and supports the design of appropriate economic and regulatory policies.

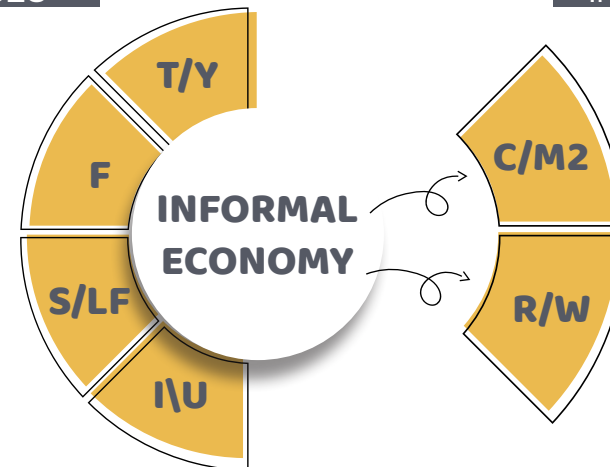


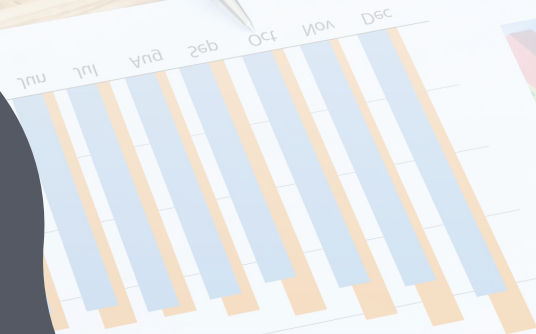
Primary Use

The model is a supporting tool for analyzing indirect economic phenomena that cannot be measured using traditional methods.

CAUSES

INDICATORS





ECONOMIC IMPACT ANALYSIS RECIPES USED

Stochastic Dynamic Sectorial Recursive Computable General Equilibrium Model (SDS-CGE)

The model was developed to support decision-makers in analyzing the economic impact of economic and social policies, measuring their effects on macroeconomic indicators, and supporting planning and the monitoring of development and reform programs.

The model is based on analyzing the interactions among different economic sectors within the Saudi economy, enabling the assessment of the overall and interrelated impact of policies rather than analyzing a single sector in isolation from others.

Main Uses:

- Analyzing the potential growth of the economy
- Measuring the impact of changes in economic policies (such as tax reforms, trade policies, investment programs, and changes in energy prices)
- Supporting trade-off analysis among alternatives and evaluating the costs of achieving economic objectives

Main Use



The model is used to support decision-making over the medium and long term, taking into account the sectoral interlinkages of the economy.

Saudi Structural Vector Auto-Regressive (SVAR) Model

Structural Vector Auto-Regression (SVAR) Model

The Structural Vector Auto-Regression model is used to support decision-makers in analyzing the short-term impact of economic policies and measuring the interactions among key macroeconomic indicators.

The model enables:

- Measuring the impact of economic policies on growth, inflation, and unemployment
- Analyzing the sensitivity of the domestic economy to changes in international indicators
- Producing short-term forecasts for key economic indicators

The model is suitable for supporting short-term decisions and monitoring economic developments in the near term.

Main Use



The model is suitable for supporting short-term decisions and monitoring economic developments in the near term.

Dynamic Stochastic Labour Transition Model – Stochastic Markov Chain Model

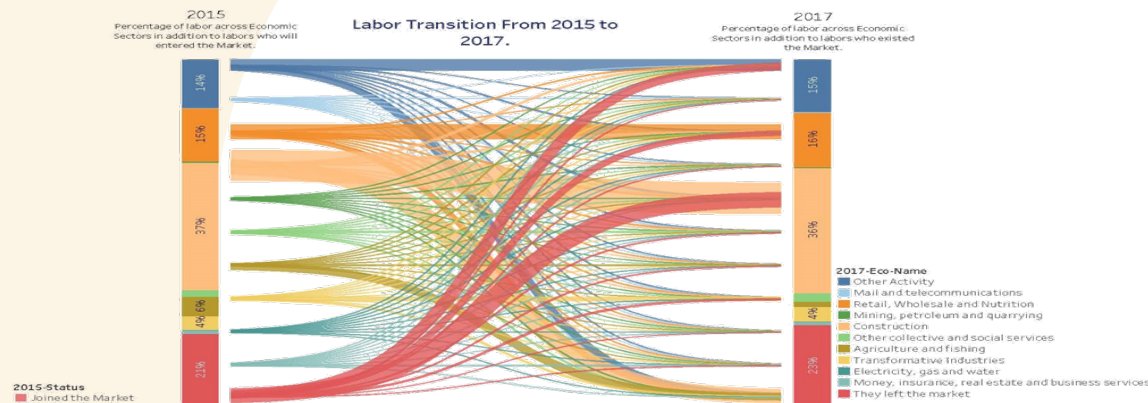
This model is used to analyze labor market dynamics by examining transitions of individuals between employment, unemployment, and inactivity, and measuring the impact of policies on these transitions over time.

The model enables:

- Analyzing labor market stability and mobility
- Evaluating the impact of policies on employment and unemployment rates
- Supporting forecasts of future labor market trends

Primary Use

The model is used to support the design and evaluation of labor market and human capital development policies.





SAMPLE OF MODELS INCLUDED IN THE ADVANCED ANALYTICS TOOLKIT FOR QUANTITATIVE MODELS (2/2)

Gini Coefficient and Human Development Index

This model is used to analyze the impact of economic and social policies on social equity and human development by measuring changes in income distribution and human development levels.

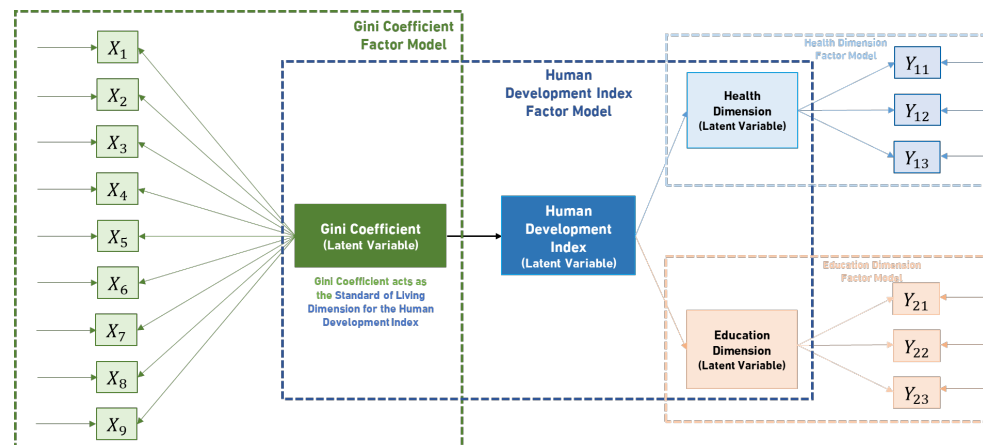
The model enables:

- Evaluating the impact of policies on inequality
- Linking economic performance to social and developmental outcomes
- Supporting the design of policies with sustainable social impact

Primary Use



The model is used to support decisions with social and developmental dimensions.



Saudi Nested Macro Econometric Model (SNMEM)

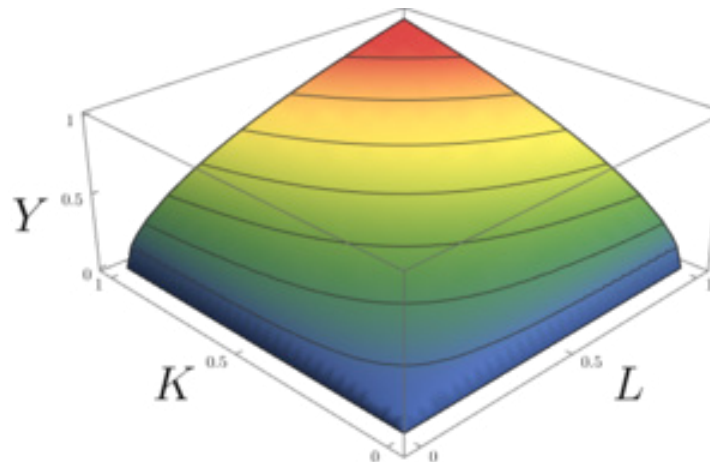
The Interlinked Macro Econometric Model is used to assess the historical impact of previously implemented policies, programs, and investment plans by measuring the gap between actual performance and the estimated trajectory in the absence of the policy.

The model enables:

- Measuring the actual impact of past policies
- Evaluating the efficiency of implemented programs and plans
- Supporting policy review and the extraction of lessons for the future

Primary Use

The model is used to support strategic evaluation and the formulation of more effective policies.



Advanced Analytics has implemented a number of consulting projects and economic and social studies supporting decision-making, in collaboration with government entities, national institutions, and consulting firms. Notable projects include:



OVERVIEW OF SELECTED RELEVANT PROJECTS OF ADVANCED ANALYTICS

-  Preparing and implementing economic and social impact studies of government policies and programs
-  Developing and operating economic and social research centers
-  Evaluating the economic impact of government support and public spending
-  Measuring the economic and social impact of strategic sectors
-  Analyzing and evaluating labor market and human capital development policies
-  Estimating the economic impact of investments and national initiatives
-  Conducting macroeconomic and sectoral studies at the national and regional levels
-  Measuring the economic and social impact of major seasons and events
-  Evaluating the historical impact of previous government policies and programs

These projects were carried out using advanced quantitative methodologies and in compliance with regulatory frameworks and the requirements of beneficiary entities.

Technical details of each project are provided in a separate technical appendix when required.



A SAMPLE OF PREVIOUS RESEARCH CONDUCTED FOR FORMER AND CURRENT CLIENTS

Selected Models of Completed Research and Studies

Advanced Analytics has conducted a wide range of economic and social studies and research supporting decision-making, including but not limited to the following:

Analysis of Economic and Development Policy Impact

(Government support, public spending, taxation, investments)

Shadow Economy and Unobserved Activities

(Estimating the size of the informal economy and unregistered activities)

Macroeconomic and Sectoral Analysis

(GDP, economic sectors, mining, housing, entertainment)

Social Analysis and Composite Indicators

(Social equity, satisfaction indicators, social contribution)

Labor Market and Human Development

(Wages, employment, unemployment, future workforce needs)

Regional Analysis and Economic Events

(Economic and social impact of regions and major events)

Technical details for each study are provided in a separate technical appendix when required.

The Computable General Equilibrium (CGE) model is an advanced quantitative tool used to analyze the economic impact of policies and programs by simulating interactions among different economic sectors within the overall economy.

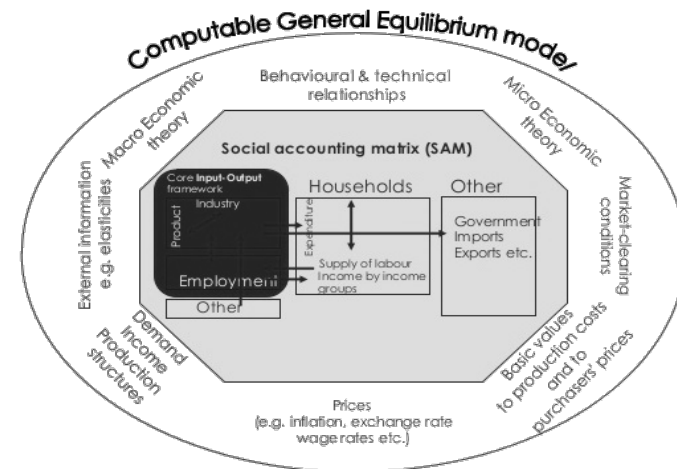
The model is based on representing the relationships among production, consumption, income, expenditure, and trade, enabling the assessment of the direct and indirect effects of economic policies over the medium and long term, while taking into account the sectoral interlinkages of the Saudi economy.

Economic Impact Analysis

The model enables the comparison of the baseline economic scenario with alternative scenarios resulting from the implementation of specific policies or economic interventions, thereby supporting:

- 🔗 Measuring the expected impact of policies before their implementation
- 🔗 Evaluating the outcomes of economic reforms and programs
- 🔗 Supporting trade-off analysis among alternatives and decision-making

The model is used as a decision-support tool rather than as a theoretical study.



**SAUDI DYNAMIC STOCHASTIC COMPUTABLE GENERAL
EQUILIBRIUM (CGE) MODEL**

Coverage of Economic Sectors in the Saudi CGE Model

The Computable General Equilibrium (Saudi CGE) model provides comprehensive coverage of the Saudi economy by representing key economic activities in accordance with official classifications, enabling the analysis of the overall and sectoral impact of economic policies.

The scope of coverage includes:

- Productive activities (agriculture, mining, industry, energy)
- Service activities (trade, transport, communications, education, health)
- Financial and real estate sectors
- Government activities and public services
- Social, cultural, and recreational activities

This comprehensive coverage enables the assessment of sectoral interlinkages and the measurement of direct and indirect policy impacts.

Economic activities and sectors are detailed according to the ISIC classification in the technical appendix upon request.

Sectors of the Saudi Computable General Equilibrium (CGE) Model (Among the models proposed for use in this project)

Scope of Coverage of the Saudi CGE Model

The Computable General Equilibrium (Saudi CGE) model provides comprehensive coverage of the Saudi economy by representing interactions among production sectors, consumption, trade, the labor market, prices, and the government sector.

The model includes:

- Key economic sectors (oil and non-oil)
- Components of consumption and investment
- External trade (exports and imports)
- Prices and inflation indicators
- The government sector, taxes, and fees
- The labor market and capital formation

This comprehensive scope enables the assessment of the overall and sectoral impact of economic policies and programs.

The technical details for each study are included in a separate technical appendix when needed.

Analytical Framework of the Saudi CGE Model

The Computable General Equilibrium (Saudi CGE) model is based on an integrated analytical framework that links production, the labor market, income, consumption, trade, and prices, enabling the analysis of the overall and sectoral economic impact of policies and programs. The framework is built upon:

- Representing the behavior of producers and consumers
- Analyzing the interaction between supply and demand
- Measuring value added and sectoral output
- Modeling external trade and prices
- Incorporating the role of government, taxation, and expenditure
- This framework enables the simulation of economic scenarios and the evaluation of policy impacts before and after implementation.

The model's equations and technical assumptions are documented in the technical appendix upon request.

Sector Representation Methodology in the Saudi CGE Model

The Computable General Equilibrium (Saudi CGE) model represents the main economic sectors in a manner that preserves the partial equilibrium of each sector within an integrated general equilibrium framework of the Saudi economy.

This approach enables:

- Analyzing the sectoral impact of economic policies
- Capturing structural differences among sectors
- Measuring the transmission of effects across sectors within the overall economy

This methodology contributes to achieving more accurate analytical results when evaluating economic policies and programs.

Input-Output Table within the Saudi CGE Model

The Computable General Equilibrium (Saudi CGE) model relies on the Input-Output table to represent interrelationships among economic sectors, enabling the analysis of sectoral linkages and the measurement of direct and indirect effects of economic policies.

This framework is used to analyze:

- The impact of policies on production and value added
- The transmission of effects across economic sectors
- The relationship between final demand, production, and income

The Input-Output table forms the quantitative foundation for measuring overall and sectoral impacts within the model. The figure illustrates the core relationships among economic sectors (the diagram shown in the previous slide will be included).

Output	Allocated to intermediate consumption	And to final demand category
X1	X11 X12 X1n 0	D11 D12 D1r
X2	X21 X22 X2n 0	D21 D22 D2r
...		
...		
...		
...		
Xn	Xn1 Xn2 Xnn 0	
M	M1 M2 MN 0	0 0 0
Y	Y1 Y2 Yn M	0 0 0
	X1 X2 Xn M	D1 D2 Dr

Purchases by Sales of	Industry 1	Industry 2	Industry n	Total sales
Industry 1	x_{11}	x_{12}	x_{1n}	$X_1 = \sum_j x_{1j}$
Industry 2	x_{21}	x_{22}	x_{2n}	$X_2 = \sum_j x_{2j}$
...	...	...	...	...
Industry n	x_{n1}	x_{n2}	x_{nn}	$X_n = \sum_j x_{nj}$
Total purchases	X_1	X_2	X_n	

The Input-Output table is detailed in the technical appendix upon request.

WHAT ARE ECONOMIC AND ECONOMETRIC MODELS? WHAT ARE THEIR ADVANTAGES AND DISADVANTAGES?

- Predicting the behavior of economic variables
- Evaluating the impact of economic policies before implementation
- Supporting planning and resource allocation
- Interpreting complex economic phenomena
- Assisting decision-makers in selecting the most appropriate alternatives

Advantages of Economic Models

Model Limitations

- Based on simplified assumptions of reality
- Sensitive to data quality and underlying assumptions
- Results vary depending on structure and methodology
- Not a substitute for professional judgment, but a supporting tool
- Theoretical models do not provide full justification

The economic model is explained within the technical concept upon request.

What are economic and econometric models?

Economic and econometric models are quantitative tools used to simplify economic reality and analyze relationships among economic variables in order to simulate policies, interpret phenomena, and forecast the future trajectories of the economy.

These models are built on economic and statistical assumptions that vary depending on their intended purpose, and they include macroeconomic, microeconomic, structural, and equilibrium models.

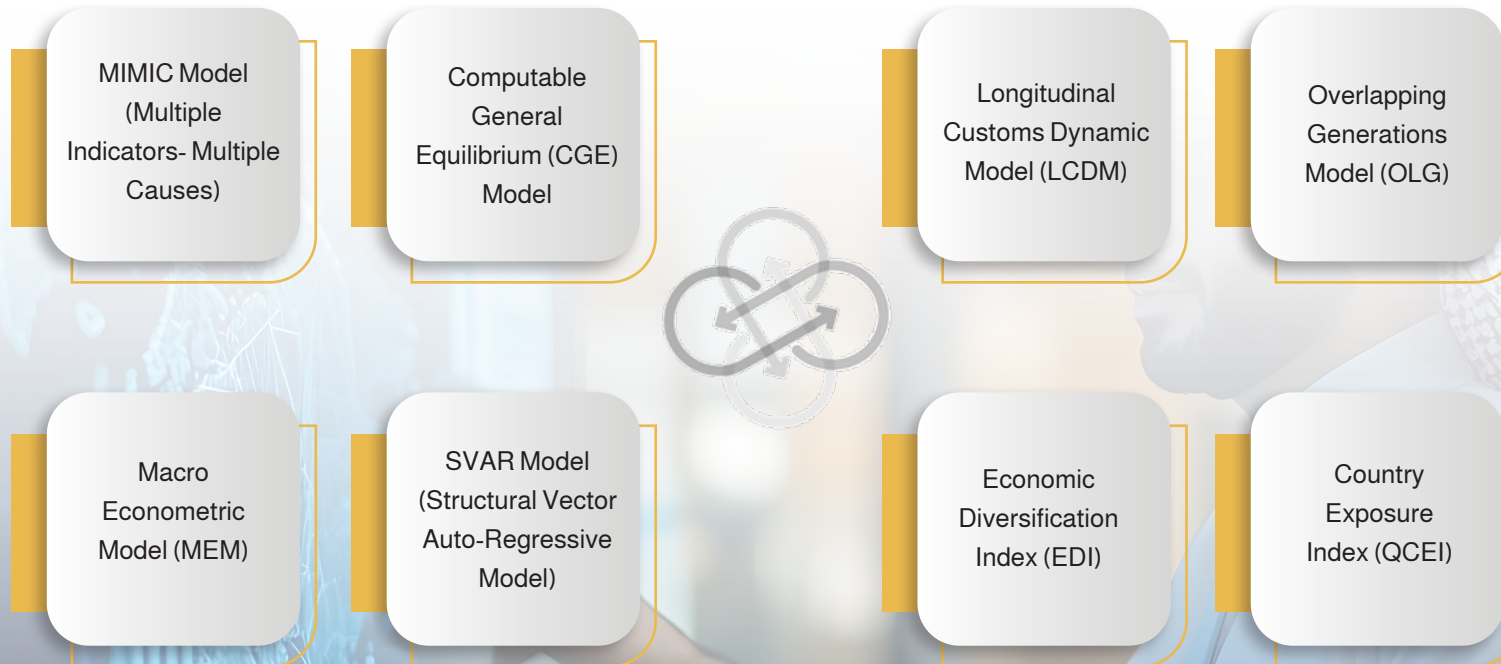


QUANTITATIVE MODELS TOOLBOX: MODEL LINKAGES

The company relies on an integrated suite of economic and statistical models that are systematically linked, whereby the outputs of each model are used as inputs for other models to achieve a more comprehensive and in-depth analysis.

The toolbox includes short-, medium-, and long-term models, enabling:

- Real-time analysis of economic impact
- Short- and medium-term forecasting
- Evaluation of long-term structural effects
- This integration allows for the provision of a consistent quantitative perspective that supports decision-making while taking into account the structural characteristics of the Saudi economy and multiple sources of uncertainty.



Each model is explained in terms of its technical comparison and mathematical details in a separate technical appendix, available upon request.



ECONOMIC POLICY IMPACT ANALYSIS

Tools Used

Advanced economic and econometric models are employed, most notably:

- Computable General Equilibrium (CGE) Model
- Structural Vector Auto-Regression (SVAR) Models
- Macroeconometric Models

Analysis Outputs

The outputs of economic impact analysis include:

- Baseline scenario (without the policy)
- Policy scenario (with the intervention)
- The gap between the two scenarios (policy impact)

Economic policy impact analysis is a quantitative tool used to assess the direct and indirect effects of economic policies on overall economic performance or on specific sectors, before or after implementation, in order to support evidence-based decision-making.

Scope of Policies Subject to Analysis

Economic, social, environmental, and sectoral policies can be evaluated, provided they are quantitatively measurable.

Key Indicators Analyzed

- Gross Domestic Product (total, oil, non-oil)
- Investment and consumption
- Employment and unemployment
- Inflation
- Sectoral performance

Indicators are selected according to the decision-maker's priorities and the nature of the policy under study.

The economic policy impact analysis is explained in the technical appendix upon request



WHAT ARE THE MOST COMMONLY USED ECONOMIC AND ECONOMETRIC MODELS?

The Most Commonly Used Econometric Models

Macroeconometric Models

It is used to analyze macroeconomic behavior and forecast key variables in the short term, such as output, inflation, and income, without going into deep sectoral detail.

Optimal Use:

- Short-term forecasting
- Analysis of rapid economic shocks

Structural Vector Autoregression Models (SVAR)

Structural econometric models are used to measure the causal impact of economic policies and analyze dynamic interactions among economic variables.

Optimal Use:

- Short-term forecasting
- Measuring responses to shocks
- Analyzing the impact of monetary and fiscal policies

Computable General Equilibrium (CGE) Model

A comprehensive structural model that simulates the economy across all its sectors, linking production, consumption, prices, and trade while maintaining general equilibrium.

Optimal Use:

- Evaluation of policies and structural reforms
- Analysis of intersectoral linkages
- Medium- and long-term economic impact analysis

The economic model is explained in the technical appendix upon request



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