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Factsheet

SWD/2018/297 final

Impact assessment accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the establishment of a European Investment Stabilisation Function

Supporting model(s)

QUEST

Impact assessment SWD/2018/297 final

Fact sheet on model contributions

Source: Commission modelling inventory and knowledge management system (MIDAS)

Date of Report Generation: 05/10/2020

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Overview

Title

Impact assessment accompanying the document Proposal for a Regulation of the European Parliament and of the Council on: the establishment of a European Investment Stabilisation Function

Document ID

SWD/2018/297 final

Year of publication

2018

Led by

ECFIN

Model(s) used

QUEST

QUEST

Full title

Macroeconomic model QUEST

Run for this impact assessment by

European Commission

Contributed to

Baseline and assessment of policy options

Helped to assess the following impacts

<i>Impact area</i>	<i>Impact category</i>	<i>Impact subcategory</i>
Economic impacts	Public authorities	Budgetary consequences for public authorities
Economic impacts	Macroeconomic environment	Economic growth and employment
Economic impacts	Macroeconomic environment	Macro-economic stabilisation

Macroeconomic model QUEST

Fact sheet

Source: Commission modelling inventory and knowledge management system (MIDAS)

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Overview

Acronym QUEST

Full title Macroeconomic model QUEST

Main purpose:

A macro-economic model used to analyse and understand the state of the EU economy.

Summary

QUEST is a macro-economic model (Dynamic Stochastic General Equilibrium) used to analyse and understand the state of the EU economy. It is developed by DG ECFIN, and estimated model variants have been developed jointly with support from the JRC. The first version of QUEST was applied in 2007, and many extensions have been developed since.

QUEST belongs to the class of New-Keynesian Dynamic Stochastic General Equilibrium (DSGE) models that are now widely used by international institutions and central banks. These models have rigorous microeconomic foundations derived from utility and profit optimisation and include frictions in goods, labour and financial markets. With empirically plausible estimation and calibration they are able to fit the main features of the macroeconomic time series. The QUEST model has been estimated on euro area and US data using Bayesian estimation methods. Calibrated model versions are used in wider applications.

QUEST supports questions related to policy formulation, implementation and evaluation. Many of the main applications deal with fiscal and monetary policy interactions. In order to deal with the wide range of policy issues in DG ECFIN, different model versions of the QUEST model have been constructed, each with a specific focus and regional and sectoral disaggregation.

Keywords

macroeconomic model , DSGE model

Model category (thematic)

Economy

Model home page

https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/economic-research/macro-economic-models_en

Ownership & license

Ownership

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Ownership details

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Details

QUEST structure and approach

QUEST III belongs to the class of New-Keynesian Dynamic Stochastic General Equilibrium (DSGE) models that are now widely used by international institutions and central banks. These models have rigorous microeconomic foundations derived from utility and profit optimisation and include frictions in goods, labour and financial markets. With empirically plausible estimation and calibration they are able to fit the main features of the macroeconomic time series. Calibrated model versions are used for most policy applications, but the QUEST III model has also been estimated on Euro Area, US and specific Euro Area countries (ES, DE) data using Bayesian estimation methods.

In order to deal with the wide range of policy issues in DG ECFIN, different model versions of the QUEST III model have been constructed, each with a specific focus and regional and sectoral disaggregation. Many of the main applications deal with fiscal and monetary policy interactions and either use a one-sector model or models that explicitly distinguish tradable and nontradable sectors, and include trade in intermediates. Other model variants also include housing and collateral constraints.

QUEST III has also been used for the analysis of structural reforms and another version has been employed for the analysis of energy and climate change policies. All these models are employed using different country disaggregations, focusing on the euro area or EU as a whole, and other global regions, or on individual member states.

The models are developed by the modelling unit in DG ECFIN. The Joint Research Centre of the European Commission supports QUEST development providing econometric, computational and methodological expertise in estimation and calibration, maintaining dedicated IT resources.

An update of some new developments of the QUEST III models was described in ECFIN Research Letter Vol.3.Issue 1/2009 (pp 10-13). For further references on the QUEST model, see the model homepage.

Input and parametrization

Key inputs for the estimated model versions are coming from national accounts and other macroeconomic data source. The main ones are:

- National account data (GDP and its components, current and constant prices)
- Labour market data (wages, employment)
- Financial variables (interest rates)
- Trade data
- Monetary data (interest rates)

Main output

Key outputs produced by the model:

- Model parameter estimates to be used for simulation (time evolution of all macro-variables of interest in response to a shock in the economy or changes in policy) and model-based policy analysis;
- Among the macroeconomic variables of interest, the model allows to study dynamics and economic drivers of:
 - GDP and its components
 - Price deflators
 - Fiscal variables
 - Employment, wages
 - Interest rates
 - Trade

Spatial - temporal extent

The output has the following spatial-temporal resolution and extent:

Parameter	Description
Spatial Extent / Country Coverage	Global, incl. individual EU countries, various EU aggregates (EU, Euro area, OMS, NMS, etc).
(Spatial) resolution	Up to country aggregation
Temporal extent	Estimation data range: 1985-2013 for Euro area aggregate; 1995-2013 for individual countries. Simulation horizon: the model is simulated for several periods ahead to allow convergence.
Temporal resolution	Quarterly

Quality & transparency

Quality

Question	Answer	Details
Models are by definition affected by uncertainties (in input data, input parameters, scenario definitions, etc.). Have the model uncertainties been quantified? Are uncertainties accounted for in your simulations?	yes	Possible
Sensitivity analysis helps identifying the uncertain inputs mostly responsible for the uncertainty in the model responses. Has the model undergone sensitivity analysis?	yes	Very often model versions are subject to sensitivity analysis.
Has the model undergone external peer review by a panel of experts, or have results been published in peer-reviewed journals?	yes	The model has many publications in peer-reviewed journals.
Has model validation been done? Have model predictions been confronted with observed data (ex-post)?	yes	k-periods ahead behavior of the model variables is compared with historical observations.

References related to external peer-review and publication in scientific journals:

- Ratto M, Roeger W, Int Veld J. QUEST III: An Estimated Open-Economy DSGE Model of the Euro Area with Fiscal and Monetary Policy. ECONOMIC MODELLING 26; 2009. p. 222-233. JRC46465

Transparency

Question	Answer	Details
Is the model underlying database (i.e. the database the model runs are based on) publicly available?	yes	Taken from public sources.
Can model outputs be made publicly available?	yes	In publications.
Is the model transparently documented (including underlying data, assumptions and equations, architecture, results) and are these documents available to the general public?	yes	Model structure is typically documented in scientific publications (e.g. Ratto et.al 2009). Technical algorithms and codes are available upon request.
Is the model source code publicly accessible or open for inspection?	no	Technical algorithms and codes of estimated model versions published in academic journals are made available upon request.

References related to documentation:

- Fiscal stimulus and exit strategies in the EU : a model-based analysis. – DOI: 10.2765/44208

The model's policy relevance and intended role in the policy cycle

The model is designed to contribute to the following policy areas

- Economy, finance and the euro
- Taxation
- Employment and social affairs
- Trade

The model is designed to contribute to the following phases of the policy cycle

- Anticipation
- Formulation
- Implementation
- Evaluation

The model's potential

QUEST III is a tool suitable for policy preparation and implementation. It is designed to analyze economic issues like the occurrence boom-bust cycles, the study of structural reforms (Lisbon process), fiscal policy, country debt stabilization and sustainability. Main policy areas requiring QUEST based analysis concern MIP (Macroeconomic Imbalance Procedure) assessments, EDP (Excess Deficit) procedures and debt sustainability analysis.

DG ECFIN uses QUEST III for macroeconomic policy analysis and research. Results of the studies feed into ECFIN policy reports. JRC supports DG ECFIN for the development of QUEST III, focusing on the estimation. JRC provides estimated versions of QUEST models for individual member states, used to support policy studies for macro-economic surveillance by DG ECFIN

Previous use of the model in ex-ante impact assessments of the European Commission

Use of the model in ex-ante impact assessments since July 2017.

In the Year	QUEST contributed to the Impact assessment called	Led by	By providing input to the	The model was run by	Details of the contribution
2018	Impact assessment accompanying the document Proposals for a Regulation of the European Parliament and of the Council on: the European Regional Development Fund and on the Cohesion Fund and; Proposal for a Regulation of the European Parliament and the Council on: a mechanism to resolve legal and administrative obstacles in a cross-border context and; Proposal for a Regulation of the European Parliament and the Council on: specific provisions for the European territorial cooperation goal (Interreg) supported by the European Regional Development Fund and external financing instruments SWD/2018/282 final	REGIO	Baseline and assessment of policy options	European Commission	The model helped to assess the following impacts: - Economic growth and employment - Investment cycle - Affects on individual Member States - Stimulation of research and development - Innovation for productivity/resource efficiency
2018	Impact assessment accompanying the document Proposal for a Regulation of the European Parliament and of the Council on: the establishment of a European Investment Stabilisation Function SWD/2018/297 final	ECFIN	Baseline and assessment of policy options	European Commission	The model helped to assess the following impacts: - Budgetary consequences for public authorities - Economic growth and employment - Macro-economic stabilisation
2018	Impact assessment accompanying the document Proposal for a Regulation of the European Parliament and the Council on: establishing Horizon Europe - the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination and; Proposal for a Decision of the European Parliament and the Council on: establishing the specific programme implementing Horizon Europe - the Framework Programme for Research and Innovation and; Proposal for a Regulation of the European Parliament and the Council on:	RTD	Baseline and assessment of policy options	European Commission	The model helped to assess the following impacts: - Investment cycle - Affects on individual Member States - Stimulation of research and development - Innovation for productivity/resource efficiency - Economic growth and employment

establishing the Research and
Training Programme of the
European Atomic Energy
Community for the period 2021-
2025 complementing Horizon
Europe - the Framework
Programme for Research and
Innovation

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