MIDAS includes the descriptions of models in use by the Commission in support to the policy cycle. MIDAS is developed and managed by the **Competence Centre on Modelling** of the European Commission.

Find out more at https://ec.europa.eu/knowledge4policy/modelling_en
Contact: EU-MIDAS@ec.europa.eu

Factsheet

SWD/2017/0293 final

Impact assessment accompanying the document Recommendation for a Council Decision: authorising the opening of negotiations for a Free Trade Agreement with Australia

Supporting model(s)

RunDynam

Impact assessment
SWD/2017/0293 final

Fact sheet on model contributions

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

Date of Report Generation: 06/10/2020

Copyright: © European Union, 2020

The Commission's reuse policy is implemented by the Commission Decision of 12 December 2011 on the reuse of Commission documents.

Unless otherwise indicated (e.g. in individual copyright notices), content owned by the EU on this website is licensed under the Creative Commons Attribution 4.0 International (CC BY 4.0) licence. This means that reuse is allowed, provided appropriate credit is given and changes are indicated.

You may be required to clear additional rights if a specific content depicts identifiable private individuals or includes third-party works. To use or reproduce content that is not owned by the EU, you may need to seek permission directly from the rightholders. Software or documents covered by industrial property rights, such as patents, trade marks, registered designs, logos and names, are excluded from the Commission's reuse policy and are not licensed to you.

Overview

Title

Impact assessment accompanying the document Recommendation for a Council Decision: authorising the opening of negotiations for a Free Trade Agreement with Australia

Document ID

SWD/2017/0293 final

Year of publication

2017

Led by

 TRADE

Model(s) used

RunDynam

RunDynam

Full title

RunDynam - Recursive Dynamic Model

Run for this impact assessment by

European Commission

Contributed to

Baseline and assessment of policy options

Helped to assess the following impacts

Impact area	Impact category	Impact subcategory
Economic impacts	Operating costs and conduct of business	Adjustment, compliance or transaction costs
Economic impacts	Trade and investment flows	EU Exports & imports
Economic impacts	Trade and investment flows	Investment flows & trade in services
Economic impacts	Trade and investment flows	Non-trade barriers
Economic impacts	Third countries and international relations	Impacts on developing countries
Economic impacts	Third countries and international relations	Goods traded with developing countries
Economic impacts	Macroeconomic environment	Economic growth and employment

RunDynam - Recursive Dynamic Model

Fact sheet

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

Date of Report Generation: 06/10/2020

Copyright: European Union, 2020

Overview

Acronym RunDynam

Full title RunDynam - Recursive Dynamic Model

Main purpose

A general equilibrium model used to analyse international trade policies scenarios.

Summary

Together with the GTAP database, Rundynam can be used to simulate different trade policy scenarios for more than 140 countries/regions and for around 65 sectors (agriculture, food, manufacturing and services).These tools allow to evaluate the impact in terms of export, import, GDP and sectoral output.

Rundynam is a model developed in the Center for Global Trade Analysis, at the Purdue University. It is a global network of researchers and policymakers conducting quantitative analysis of international policy issues. It also develops collaboration among academia, public sector and private sectors worldwide.

The use of economic models, like RunDynam, helps policy making with an economic theoretically consistent framework for analyzing trade policy questions. These types of models help to answer 'what if…' questions by simulating the price, income and substitution effects of different policy changes and comparing them to a so-called baseline (i.e., what would happen without a policy change). The baseline is key as it is the counterfactual against which the economic outcome of the initiative is assessed. Hence, CGE models allow economists to simulate, at the same time, how all sectors and actors adjust to the changes to costs, prices and/or incentives that a trade policy change would cause. This allows for an ex-ante assessment of all the direct and indirect effects of changes to trade policy. Usually, model results regard change in GDP, import and export flows, sectoral output, resources reallocation and price effect.

RunDynam, and similar models, are widely applied for providing the economic impact assessment of a trade policy agreement. The main advantage of CGE models is that they analyse the effects of trade policy taking into account the main links between the domestic and international production of goods and services.

Keywords

CGE

Model category (thematic)

Economy

Model home page

No information provided

Ownership & license

Ownership

Multiple copyright [Original code owned by 3rd party]

Ownership details

Based on GTAP Data Base (Purdue University, USA) and GEMPACKcode (Centre of Policy Studies, Victoria University, Australia).

Licence type

Non-Free Software licence. The license has one or more of the following restrictions: it prohibits creation of derivative works; it prohibits commercial use; it obliges to share the licensed or derivative works on the same conditions.

Details

RunDynam structure and approach

RunDynam is a recursively dynamic applied general equilibrium model of the world economy and is built upon the Social Accounting Matrices (SAMs) of individual countries and regions. This model extends the comparative static framework of the standard GTAP model developed by Hertel (1997) to a dynamic framework by incorporating international capital mobility and capital accumulation, while preserving all the features of the standard GTAP, such as constant returns to production technology, perfectly competitive markets and product differentiation by countries of origin – the so-called Armington assumption. RunDynam allows constructing a baseline (which may be a forecast) and policy deviations from the baseline. Users can view the results of the base case or policy deviation on the screen or export them to other programs. The model allows to simulate trade measure change, like tariffs cuts, in order to analyze the possible trade creation and trade deviation.

RunDynam relies on the Global Trade Analysis Project (GTAP). GTAP is a global network of researchers and policy makers conducting quantitative analysis of international policy issues. GTAP's goal is to improve the quality of quantitative analysis of global economic issues within an economy-wide framework. The GTAP network provides a global data base describing bilateral trade patterns, production, consumption and intermediate use of commodities and services. The latest version of the database, V10, refers to 2014 as reference year and covers 141 regions and 65 sectors (https://www.jgea.org/resources/jgea/ojs/index.php/jgea/article/view/77).

Input and parametrization

The impact of a trade policy shock cannot be evaluated without a baseline i.e. the counterfactual situation in which the economy would have been should there have been no trade policy change. Creating a realistic baseline is as difficult as it is important. The Commission usually relies upon predictions about the future by others, such as short term projections on GDP growth from the IMF and longer term projections on e.g. population from the UN, but also on energy consumption, labour participation rates, etc.

Main output

Output comes in the form of results on a wide range of indicators such as: (i) GDP or welfare (equivalent variation); (ii) Impact by sector in terms of exports, imports, production and value added reflecting inter -sectoral input -output links including sourcing of inputs (goods and services) from abroad; (iii) Impact on factors of production (land, capital and labour of various skill categories) in terms of e.g. wages and (iv) CO_2 emissions, land use, etc.

Spatial - temporal extent

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

Parameter	Description
Spatial Extent / Country Coverage	141 regions
(Spatial) resolution	Country
Temporal extent	Baseline 2014
Temporal resolution	Year

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?	not_applicable	Not applicable for a CGE model.
Sensitivity analysis helps identifying the uncertain inputs mostly responsible for the uncertainty in the model responses. Has the model undergone sensitivity analysis?	yes	Both RunGTAP and RunDynam, the static and the dynamic version of the GTAP model, include a in-build tool to perform sensitivity analysis with respect to parameters.
Has the model undergone external peer review by a panel of experts, or have results been published in peer-reviewed journals?	no	GTAP model has been widely used in many publications. There is also a specific journal focused on GTAP modelling, https://jgea.org/resources/jgea/ojs/index.php/jgea
Has model validation been done? Have model predictions been confronted with observed data (ex-post)?	yes	The network of GTAP users represents an excellent resource for extension of the data base. Another benefit from broad participation is the extensive scrutiny to which the data base is subjected. Those who identify areas for improvement or extension of the data base are free to make this available to GTAP staff in order to have it considered for incorporation into the next release of the data base. The operational concept is "if you don't like it, help fix it!

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

- No references provided in MIDAS

Transparency

Question	Answer	Details
Is the model underlying database (i.e. the database the model runs are based on) publicly available?	no	Public Availability. The data base is made available to anyone requesting it, at a modest fee. This prevents needless duplication of effort in creating this public good. By charging for the data base we are also able to cover a portion of the costs incurred in constructing it. However, those who contribute in a significant way to the construction of this data base receive it for free, and are given access to pre-releases as well, alongside the GTAP Consortium members who provide the bulk of the financial support through their annual contributions to the Project.
Can model outputs be made publicly available?	yes	Outputs are made publicly available.
Is the model transparently documented (including underlying data, assumptions and equations, architecture, results) and	yes	One requirement for new contributions to the GTAP Data Base is that the sources and procedures used to create them be provided along with the data. This publication

are these documents available to the general public?		represents a summary of the documentation for the GTAP Data Base. Additional detail may be found on the GTAP website, or in the documentation of previous versions of GTAP. However, in spite of this extensive documentation, other questions about data sources and methods may arise. Therefore, we refer interested users to the chapter authors themselves in those cases where this document is insufficiently detailed. Often it is only through bilateral correspondence of this sort that data base limitations can be properly identified and remedied This takes us to the final ingredient of the GTAP Data Base, namely quality control. All documentation is available on: https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=3169
Is the model source code publicly accessible or open for inspection?	yes	Code can be checked on request

References related to documentation:

- No references provided in MIDAS

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

The model is designed to contribute to the following policy areas
- Trade

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

The model's potential
CGE models, like RunDynam, are computer-based simulations which calculate the future state of the global economy (including any country or region specifically analysed) as a consequence of a specified set of (trade) policy changes.

RunDynam is used, among other models and other approaches, for the economic analysis (Impact Assessment) within the different steps of any EU trade policy initiative. A Commission Impact assessment (IA) is needed before major trade negotiations can begin and for all other significant trade policy proposal, a trade sustainability impact assessment (SIA) is carried out during negotiations process and finally the economic assessment of the negotiated outcome (EANO) focuses on the economic value of trade barrier reductions following the final, precise outcome of the negotiations. In all these steps, RunDynam could be used for the economic assessment.

Reference for EC Impact assessment can be found here: https://ec.europa.eu/trade/policy/countries-and-regions/negotiations-and-agreements/.

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

Use of the model in ex-ante impact assessments <u>since July 2017</u>.

In the Year	RunDynam contributed to the Impact assessment called	Led by	By providing input to the	The model was run by	Details of the contribution
2017	Impact assessment accompanying the document Recommendation for a Council Decision: authorising the opening of negotiations for a Free Trade Agreement with New Zealand

SWD/2017/0289 final | TRADE | Baseline and assessment of policy options | *European Commission* | The model helped to assess the following impacts:
- Adjustment, compliance or transaction costs
- EU Exports & imports
- Investment flows & trade in services
- Non-trade barriers
- Impacts on developing countries
- Goods traded with developing countries
- Economic growth and employment |
| 2017 | Impact assessment accompanying the document Recommendation for a Council Decision: authorising the opening of negotiations for a Free Trade Agreement with Australia

SWD/2017/0293 final | TRADE | Baseline and assessment of policy options | *European Commission* | The model helped to assess the following impacts:
- Adjustment, compliance or transaction costs
- EU Exports & imports
- Investment flows & trade in services
- Non-trade barriers
- Impacts on developing countries
- Goods traded with developing countries
- Economic growth and employment |

Bibliographic references

- *Ianchovichina, E., & Walmsley, T. (Eds.). (2009). Dynamic Modeling and Applications for Global Economic Analysis. doi:10.1017/cbo9781139059923*