European Economic Modelling System (EU-EMS): new spatial CGE model for Europe with global dimension

European Economic Modelling System (EU-EMS) is a new global spatial CGE model developed by Department of Urbanisation, Traffic and Transport of PBL Netherlands Environmental Assessment Agency. The model includes the representation of 62 separate countries (all EU28 member states are presented as well) and one aggregated rest of the world region. EU28 countries are disaggregated into 267 NUTS2 regions of Europe in the model using the regional accounts and structural business statistics data from Eurostat. Country-level data on EU28 is based on Eurostat Supply and Use accounts. Data for non-EU countries is based on OECD Input-Output (IO) tables and the international trade data is consistent with reconciled UN COMTRADE database of BACI and UN trade in services database.

EU-EMS model uses the latest Eurostat sectoral classification for the representation of economic activities. This new classification has more focus on services and in particular on various transport and logistic sectors. The base year 2013 of the model is the latest year for which Eurostat supply and use tables are available for the majority of EU28 countries.

The data on interregional trade between NUTS2 regions and between NUTS2 regions and the rest of the world we use a newly developed estimation technique. We will determine these the trade between NUTS2 regions given data on freight transport and regionalized supply and use tables for the European NUTS2 regions. The methodology is based on linear and non-linear optimization techniques. The end result will generate regional trade matrices that are not only consistent with the regional supply and use tables, but also with the main European transport data and will take multimodal transport (5 modes) with endogenously determined transshipment locations into account.

EU-EMS is a dynamic spatial general equilibrium model. The model is used for policy impact assessment and provides sector-, region- and time-specific model-based support to Dutch and EU policy makers on structural reforms, growth, innovation, human capital and infrastructure policies. Goods and services are consumed by households, government and firms, and are produced in markets that can be perfectly or imperfectly competitive. Spatial interactions between regions are captured through trade of goods and services (which is subject to trade costs), factor mobility and knowledge spill-overs. This makes EU-EMS particularly well suited for analyzing policies related to human capital, transport infrastructure, R&I and innovation. The model includes New Economic Geography (NEG) features such as monopolistic competition, increasing returns to scale and migration.

EU-EMS includes the representation of both freight and passenger transport. Freight transport representation includes the generation of inter-regional trade flows and their distribution along the multimodal transport routes that are consistent with the latest transport statistics. Passenger trips include the commuting trips within the same region and business trips (linked to inter-regional trade between regions) . Commuting trips are associated with the amount of employed in the region.