

# GTAP related activities of CPB Netherlands Bureau for Economic Policy

## Analysis 2005

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### *Introduction*

Below you find a summary of our GTAP-related activities last year and our projects for this year, see also our website: <http://www.cpb.nl/eng/research/sector6/>.

Last year we did not produce much output on GTAP and CGE -related activities for at least three reasons. The first is that we have shifted our priorities to European policy issues that require other methodologies than CGE modeling. Examples are projects on out-sourcing, and the internal market in services within the EU, productivity and subsidiarity within Europe, see our website for more information.

The second is that we have invested much time in writing a new publication on our CGE model WorldScan. We are finalizing our update of the publication from 1999. Moreover we have done some fair amount of modeling work.

- We have introduced R&D stocks in the sectoral production functions such that the R&D stock and R&D expenditures are based on profit-maximization behavior of firms. This is an extension of the model upon the R&D spillovers on TFP growth which we have modeled in the recent past.
- Furthermore, we have relaxed our assumption on perfect competition and constant returns to scale in the model. We introduce imperfect competition and economies of scale in WorldScan, in particular because we want to evaluate the welfare effects on the internal market in services within the EU.
- Later on this year we want to model (bilateral) FDI flows and stocks in WorldScan. As FDI is becoming more and more important in international trade relations, and also in the policy debate, we want to spend some resources on modeling FDI. At the moment it is not clear what our available resources are for this project and what our ambition level is.

The third is that we are facing problems in filling our vacancy on CGE modeling in our sector. This restricted our work on climate-change issues, in particular.

## *Publications*

**Non-CO2 Greenhouse gases: All gases count by** Willemien Kets and Gerard Verweij, CPB Discussion Paper 44, The Hague, <http://www.cpb.nl/eng/pub/discussie/44/>.

Under the Kyoto Protocol, a group of countries commit themselves to reduce the emissions of greenhouse gases to some 5% below the 1990 level. Countries can decide to spread their reduction commitment over several gases to lower compliance costs. Employing a multi-gas strategy can offer considerable efficiency gains because of the widely diverging marginal abatement cost for the different emission sources. In this Discussion Paper, the analysis of climate policy for the most important greenhouse gas, carbon dioxide, is extended with two other important greenhouse gases, methane and nitrous oxide. The multi-region and multi-sector Applied General Equilibrium model WorldScan has been used as an instrument for addressing this issue. The approach presented is consistent with the bottom-up information on reduction possibilities for those non-CO2 greenhouse gases while it allows for general equilibrium effects and intergas interactions. Including non-CO2 greenhouse gases into the analysis has important sectoral impacts while the regional effects are limited. A considerable part of the burden on gas, coal and oil products will be shifted to the agricultural sectors. Reductions of non-CO2 gases could be especially important for countries like China and India.

**How much does a 30% emission reduction cost? Macroeconomic effects of post-Kyoto climate policy in 2020** by Paul Veenendaal, Ton Manders and Johannes Bollen, CPB Document 64, The Hague, <http://www.cpb.nl/eng/pub/document/64/>.

This study analyses the macroeconomic impacts of a climate policy that aims to reduce emissions of greenhouse gases by industrialized nations to 30% below the 1990 level. Such an effort is consistent with the European Union's policy target to limit the increase of the average world temperature to 2°C above pre-industrial levels. The economic consequences of such a climate policy may vary widely. In 2020, the economic loss to the Netherlands of such a strategy is assessed as 0.8% of national income, provided that all countries implement the climate policy and that efficient international emissions markets are in place. However, if the developing countries do not join the abatement coalition, and only industrialized nations are engaged in climate policy, the costs to the Netherlands may rise to 4.8% of national income. The costs also depend on economic growth in the underlying scenario. In a scenario with a global abatement coalition and moderate economic growth, these costs will amount to 0.2% of the national income.

**Reducing the administrative burden in the European Union**, Paul Tang, and Gerard Verweij, CPB memorandum 94, <http://www.cpb.nl/eng/pub/memorandum/93/>

The Netherlands wants to reduce the administrative burden for businesses between 2003 and 2007 with a quarter. With the aid of the so called Standard Cost Model, the burden is estimated to amount to 16.4 billion euro in 2002. This is about 3.6 % of the Dutch gross domestic product (GDP). This memorandum considers the direct and indirect effects of reducing the administrative burden on firms. Reducing the burden is expected among other things to boost investment, adding to the increase in production and labour productivity. For an individual country a unilateral reduction probably has different effects than a reduction that is part of a co-ordinated, European effort to scale down the administrative burden of government regulations. Based on Dutch data, reducing the administrative burden with 25% leads to a 1.7% increase in real GDP for the European Union. The long-term effect is higher than the initial impact, since the reduction induces extra capital accumulation and brings spillovers from extra R&D. The production growth is not fully translated into welfare gains. The gap between the two follows from a loss in terms-of-trade, but is generally small. For individual EU-25 member states the effects are broadly similar.

The simulations show that the gains from a co-ordinated reduction are somewhat larger than from a unilateral reduction. The main reason is not terms-of-trade effects but rather spillovers from extra R&D investment.

**Highlights of Lisbon: a framework for analysis**, by George Gelauff and Arjan Lejour, will be published as Chapter in the yearly Competitiveness Report of DG Enterprise of the European Commission, October 2005.

This is a common project with WIFO (Wien, Austria) in which we simulate five highlights of Europe's Lisbon strategy. For that purpose we develop an analytical framework to assess the impact of Lisbon policies on employment and economic growth. The analytical framework links a large sectoral model for the world economy (WorldScan) to specific 'satellite' sub models, accounting schemes or empirical background research. The analytical framework has been applied to five highlights of the Lisbon strategy: employment, skills, R&D, the internal market for services and the administrative burden on firms.

Simulations quantify the consequences of Europe reaching the Lisbon targets in these fields for Europe as a whole, for individual countries and for sectors in Europe. The simulations answer the question: 'What if Europe reaches the Lisbon targets?' They do not take into account the costs of policy measures needed to get to the targets.

## *New Projects*

### **Welfare effects of the services directive, contact Arjan Lejour**

This project is a continuation of previous research into the operation of the internal market for services (CPB document 69). In that project we assessed the impacts of the EU services directive on bilateral trade and investment in services. The services directive is introduced by the European Commission in order to stimulate the internal market in services. According to our analysis, application of this directive would increase bilateral trade in services by 15% to 30% and bilateral direct investment by 20% to 35%. Taking these results as a point of departure, we want to investigate the effects on GDP, consumption, welfare and employment, using our general equilibrium model WorldScan.

### **Project Welfare impacts of tax harmonization (TAXBEN WP2), contact Albert van der Horst**

Using a dedicated applied general equilibrium model we will analyze the impacts on economic welfare of European policy coordination, focusing on reforms of company taxation in EU member states. This project is part of the EU-funded project TAXBEN, which is a joint undertaking of partners in the European research network ENEPRI and the German research institute ZEW. The aim of TAXBEN is to assess the welfare impacts of reforms of several schemes of taxes and benefits within the EU. .

### **Project Climate change policies and energy taxes (TAXBEN WP5), contact Paul Veenendaal**

Climate change policies may affect taxation schemes in different ways. Carbon taxes and the auctioning of emissions permits may raise revenues which in turn can be recycled to the economy, e.g. by adaptation of existing taxation schemes. In close collaboration with the Centre for European Economic Research (ZEW) we will analyze both the influence of the timing of emissions reductions on average global temperature and economic welfare and the economic impacts of a variety of post-Kyoto policy options. At the European as well as the national level the introduction of the EU Emissions Trading Scheme raises the question to what extent existing schemes of energy taxation should be adapted. CPB will use the climate change version of its WorldScan model to address this question. Because the possibility of diverging marginal and average costs is relevant to the project, we will introduce imperfect competition in this model. The analysis also involves the study of alternative ways of allocating emissions permits to firms because of their diverging impacts on economic welfare. This project is part of the EU-funded project

TAXBEN, which is a joint undertaking of partners in the European research network ENEPRI and ZEW.

**Project European emissions trading**, (contact: [Paul Veenendaal](#))

In 2005 an European scheme of emissions trading started for installations with large energy-use. How this scheme is to be extended at the start of the first budget-period of the Kyoto (2008) is an important policy question, that we will address in a study on European emissions trade. We hope to benefit from the results of an investigation that is soon to be completed into the costs and benefits of accession of Dutch horticulture under glass to the EU Emissions Trading Scheme.

*Data activities*

- Improvement for IO table for the Netherlands for GTAP version 6 in a fruitful collaboration with LEI taking account of re-exports.
- Improvement of bilateral services trade data within GTAP. For our project the EU internal market in services, we have improved the GTAP data in bilateral services trade. Based on the Eurostat/OECD data on “transactions in international services by partner country”, by have introduced for the OECD countries for the sectors transport services, other commercial services and government services, bilateral trade data in our data set which is aggregated form the GTAP 6 data base (see presentation of Nico van Leeuwen at the conference).