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Organized Symposium: “Policy evaluation of CAP Greening: Methodological challenges and potential impacts”

Chairs

Pavel Ciaian (JRC-IPTS European Commission) – Pavel.Ciaian@ec.europa.eu

Kamel Louhichi (JRC-IPTS European Commission) – Kamel.Louhichi@ec.europa.eu

Alan Matthews (Trinity College Dublin) – Alan.Matthews@tcd.ie

Liesbeth Colen (JRC-IPTS European Commission) – Liesbeth.Colen@ec.europa.eu

Other presenters

Louis Mahy (Ghent University) - Louis.Mahy@hotmail.com

Adrian Leip (JRC-ISPRA European Commission) – Adrian.Leip@jrc.ec.europa.eu

Alexander Gocht (Thünen Institut, Germany) – A.Gocht@ti.bund.de

Rationale

The CAP post-2013 proposes the greening of European agricultural policy by introducing three environmental measures (crop diversification, permanent pasture, EFA) which are required for farmers to receive full direct payments. This poses new methodological challenges for policy simulation models since eligibility and uptake are farm specific and measurement of localized environmental and economic effects is not straightforward.

We aim to bring together a number of scientists that are currently developing new methodological approaches to assess the economic and environmental impact of greening measures, going from the macro to the micro-level. Each modelling approach has its advantages and scope but is also confronted with specific difficulties. In this session we aim to discuss these difficulties, its consequences for the estimation of economic and environmental impacts, the relative importance of eventual biases in estimation and potential solutions. Based on the results of each model, the overall policy implications will be discussed.

Plan of the symposium

The session will start with an introduction by Prof. Alan Matthews, who is known for his broad knowledge and critical analysis of past and current CAP reforms. He will identify the main questions that agricultural models should aim to answer with respect to the CAP greening and raise the issues that need to be confronted when modelling these new policy measures.

Next, four papers will be presented, analysing the effects of CAP greening going from the micro- to the macro-level. Below, the abstract for each paper can be found.

First, an EU-wide micro-level mathematical programming model imposes greening constraints at the individual farm level thereby avoiding aggregation bias. Second, the micro approach is extended by the innovative use of proximity rules for addressing self-selection in crop diversification decisions. Third, a farm-type simulation model analyses the macro-

level impacts. Finally, a Bayesian disaggregation procedure links agro-economic policy impacts to environmental outcomes at high spatial resolution levels.

Finally, the different methodological approaches will be critically compared. The strengths and limitations of each model, and potential synergies will be discussed. The consequences of model assumptions and limitations for the policy simulation results will be analysed and the estimation results will be interpreted. This discussion will be led by Prof. Alan Matthews.

Proposed papers:

The Impact of Crop Diversification Measure: EU-wide Evidence Based on IFM-CAP Model

Kamel Louhichi, Pavel Ciaian, Maria Espinosa, Angel Perni, Liesbeth Colen² and Sergio Gomez y Paloma

European Commission, Joint Research Centre (JRC)

This paper presents simulation results of crop diversification measure adopted as part of the CAP greening within the 2013 CAP reform. The simulations are performed using the EU-wide individual farm-based model for CAP analysis (IFM-CAP). The IFM-CAP model is a static positive mathematical programming model builds on the EU-FADN (Farm Accountancy Data Network) data. The model is calibrated to the FADN farm constant sample for 2007- 2009 representing around 60,500 individual farms. The advantage of this model relative to existing models is that it captures the full heterogeneity of the EU farm population and covering all Member States. Results show that most farms choose to increase their compliance with the diversification measure owing to the sizable subsidy reduction imposed in case of non-compliance. However, the overall impact on farm income is rather limited: farm income decreases by less than 1% at EU level, and only 5% of the farm population will be negatively affected. Nevertheless, for a small number of farms the income effect could be more substantial (more than -10%).

Validation of a non-parametric farm level crop choice simulation method

Louis Mahy¹, Bérénice E.T.I. Dupeux¹, and Jeroen Buysse¹

¹*Ghent University, Belgium*

Mahy et al. (2014) have developed a non-parametric methodology to predict land use choices of farmers in the context of the crop diversification measure. The methodology uses simulation at the micro level because crops cultivated by one farm cannot compensate for a lack of diversity of crops at another farm. A key difficulty of simulating at farm level is that the crop choice of an individual farmer is very difficult to predict because it depends on more factors than gross margins only, such as crop rotation, farmers experience, adaptability of machines and supply chain possibilities of the harvested products. The non-parametric methodology presented in this paper uses peer behaviour of farmers to identify choices of other farmers. This paper validates and compares the approach with improved versions on a

regional case study in Flanders to show the possibilities and limitations of the methodology.

The macro-level impact of CAP greening using the CAPRI farm type simulation model.

Alexander Gocht¹, Norbert Röder¹ and Pavel Ciaian²

¹Thünen Institut, Germany; European Commission; ²Joint Research Centre (JRC)

The article assesses the potential market impacts of CAP greening on EU agricultural supply and demand using the Common Agricultural Policy Impact Regionalized (CAPRI) farm type model, which represents the EU-27 by 2500 farm types. The impact of the diversification measure is modeled using the Shannon index derived from EU-FADN data while market interactions are modeled with the global spatial market model of CAPRI. The degree of compliance with the greening measures is derived endogenously and depends on each farm type's marginal compliance cost. The advantage of the CAPRI approach is that it interlinks the economic and environmental consequences of CAP greening for different farm types across EU while it also provides overall market impacts. The simulation results indicate that CAP greening causes a decline in area of the main crops, increases market prices and leads to a slightly intensified production on the remaining areas, particularly in specialized farming systems.

Spatially explicit evaluation of the agri-environmental impact of CAP

Adrian Leip¹, Maria Bielza¹, Claudia Bulgheroni¹, Pavel Ciaian², Matiyendou Lamboni¹, Renate Koeble¹, Maria-Luisa Paracchini¹, Jean-Michel Terres¹, Franz Weiss¹, Heinz-Peter Witzke³

¹European Commission, Joint Research Centre (JRC), Institute for Environment and Sustainability, Ispra (VA), Italy;

²European Commission, Joint Research Centre (JRC), Institute for Prospective Technological Studies, Seville, Spain

³EuroCARE, Bonn, Germany

A specific challenge when analyzing the effectiveness of the new CAP, is to identify the localized environmental impacts of policies, especially of the new 'greening' measures. Agri-environmental indicators (AEI) are routinely used to monitor changes in environmental quality in general and the environmental impacts of CAP greening in particular and allow identifying hot- and cold-spots of environmental pressures. This paper proposes a methodology for the spatially explicit evaluation of agri-environmental impacts of CAP, which allows integrating environmental impact analysis into agro-economic models, with an application to CAPRI. We have developed an approach to estimate the impacts of CAP policy at high spatial resolution level using Bayesian disaggregation procedures taking into consideration local environmental conditions. We cover modelling of the following environmental indicators: nitrogen balances and emissions (GHG and reactive nitrogen), soil

erosion, biodiversity friendly farming practices, farmland bird index, agricultural landscape structure, and an indicator related to environmental compensation zones. The paper shows the simulation results for a set of CAP greening scenarios to illustrate the capabilities of the developed methodology and potential environmental impacts of the greening measures.