PhD position

Economic analysis of the European regulatory procedure for pesticide market approval

The thesis aims to study the European regulatory procedure for the marketing authorisation of pesticide active substances, which leads to authorise or ban pesticides based on an a priori assessment of their health and environmental impacts. In recent years, this authorisation procedure has been strongly criticised by some scientists, environmental NGOs and elected representatives. The thesis will study this pesticide approval procedure, the determinants of approval or ban decisions and desirable regulatory changes. It is situated in the field of environmental economics, in strong interaction with toxicology. It responds to the twofold scientific challenge of developing economic approaches of chemical risks, hitherto little studied in environmental economics, and of strengthening interdisciplinary integrated EcoHealth approaches to address sustainability challenges.

The thesis will be integrated in the interdisciplinary scientific network Holimitox aimed at providing an evaluation of the toxicological and ecotoxicological impacts of mitotoxic pesticides (i.e. toxic to mitochondries) and of their regulation. This network associates sixteen French research teams from various disciplines of life and social sciences and is funded by Fondation pour la Recherche Médicale, ANR, Anses, and the French Office for Biodiversity via the Ecophyto plan. The thesis will take place in Toulouse, in TSE-R and Toxalim, with a visit at the University of Göteburg (Sweden) in the Centre for Future Chemical Risk Assessment and Management Strategies.

Following European legislation, the risk assessment of pesticides before their market release is based on dossiers provided by applicant agrochemical companies and involves multiple actors: representatives of firms; scientific experts and officials from national authorities; the European Food Safety Authority; the European Chemicals Agency; the European Commission; consultations of non-European agencies, such as the US Environmental Protection Agency. It also relies on international guidance documents that can be influenced by industry lobbying. Decisions result in practice from a process of interpretation of experimental data, whereby proof of the existence or absence of a risk is constructed, or even negotiated, by these actors. The thesis will analyse in detail decision-making in the carcinogenicity assessment for mitotoxic active substances, with an investment in understanding the toxicological mechanisms involved. It will develop a political economy analysis of the carcinogenicity classification process. It will discuss loopholes in the regulation and possible ways to improve them.

The thesis will also investigate how academic studies on pesticide toxicity influence their regulation: what evidence is provided by academic studies on the toxicity of pesticides, at what cost, after how long, with what level of information, how and when is this knowledge considered in the regulation. This analysis will use available stylized facts on banned pesticides and will discuss the implications for mitotoxic pesticides based on ongoing research in toxicology and ecotoxicology within the Holimitox network.

The thesis will also examine, in terms of industrial economics, the strategies of agrochemical firms in response to changes in regulatory requirements for pesticide approval. It will investigate the new families of fungicides proposed for approval over time by the agrochemical industry, and to what extent these products that are more likely to successfully pass through the approval procedures because their toxicity mechanisms are not targeted by regulatory procedures. It will discuss the evolution of the fungicide market in terms of the toxicity mechanisms of pesticides, versus other determinants of R&D: opportunities in the results of fundamental research, a search for broad markets in terms of protected crops and target pests and the development of resistance to certain pesticides.

The methodology will first rely on an in-depth descriptive and qualitative analysis, based on document analysis, interviews with scientists, non-governmental organisations and stakeholders of the regulatory process and appropriation of key concepts in toxicology. Research questions will be informed by a literature review on political economy analyses of government agency decision making in environmental policy and industrial economics of R&D strategies in relation with regulatory constraints. This qualitative approach will then feed into economic modelling aimed at clarifying key concepts and a quantitative approach based on an extended study of the mechanisms identified in the descriptive case studies.

Co-supervision: Marion Desquilbet (economist, TSE-R, Toulouse) and Laurence Huc (toxicologist, Toxalim, Toulouse)[1]

Beginning: September 1, 2021

Duration: three years

Place: Toulouse, France, TSE-R and Toxalim

Salary: 1874€/month

Funding: Fondation pour la Recherche Médicale; Occitanie region (selected for funding; validation on June 4)

Please send your application including your CV, cover letter, an example of academic production (thesis, class paper, article), recommendation letters and a copy of your degree, simultaneously to Marion Desquilbet (marion.desquilbet@inrae.fr) and Laurence Huc (laurence.huc@inrae.fr) before June 6, 2021.

[1] http://www.tse-fr.eu/people/marion-desquilbet

http://www6.toulouse.inrae.fr/toxalim/Equipes-Recherche-Publications/COMICS-Contaminants-Stress-Cellulaire/Equipe