

## Introduction

The European Community Regulation on Chemicals (REACH) is supposed to be a modern and intelligent regulation. It entered into effect on June 1, 2007 and remains in its implementation phase. The modern and intelligent aspects primarily lie in the way in which self-responsible action on the part of the norm addressees should be linked with sovereign elements of the European Commission and the member states of the European Union. Especially given that many experiences have been collected since the beginning of the REACH implementation in 2007, it is worth focusing on some aspects in further detail now, especially with respect to the ambitious aims and expectations associated with this regulation.

“The purpose of this Regulation is to ensure a high level of protection of human health and the environment, including the promotion of alternative methods for assessment of hazards of substances, as well as the free circulation of substances on the international market while enhancing competitiveness and innovation. [...] This Regulation is based on the principle that it is for manufacturers, importers and downstream users to ensure that they manufacture, place on the market or use such substances that do not adversely affect human health or the environment. [...]” (Article 1 REACH-Regulation). In order to contribute to better regulation – particularly within the European legislation – many means and procedures have been invented and established. The umbrella term under which all of these efforts can be merged is named Regulatory Impact Assessment (RIA). The work in hand applies some means of the RIA toolbox to study aspects of the REACH-Regulation in depth. Collectively, three papers focus on prerequisites for the regulation of risk communication in supply chains with respect to the REACH-Regulation. The considerations and results presented in this work have been acquired under the Responsive Regulation of Innovation Behavior for Sustainability research project, funded by the German Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung (BMBF)). According to the three papers, the structure of the work in hand has three parts, A, B and C.

“The European Community Regulation on Chemicals REACH (EC) No 1907/2006: Considerations on the relation between positions and downstream risk communication within supply chains from the perspective of game theory” is the title of the first paper which constitute part A. As the title already suggests, in this paper game theory is used as an RIA tool to study the way in which positions in a supply chain influence the shape of downstream risk communication. Under the research hypothesis “The respective position within a supply chain influences the form of downstream risk communication”, it is shown that stable downstream risk communication in the form of equilibria emerges and that the quality of the

emerging downstream risk communication is sensitive to the different positions in the supply chain that are analyzed here.

In order to change the viewing direction from downstream to upstream risk communication, part B contains a paper entitled “The European Community Regulation on Chemicals REACH (EC) No 1907/2006: Incentives for upstream risk communication within supply chains – considerations from the perspective of game theory”. Again, game theory is used as an RIA tool to explore the hypothesis “There exists no incentive for upstream risk communication in compliance with REACH within the supply chain”. The results from the equilibrium analysis demonstrate that the normative requirements set forth by REACH in this context could be met under certain conditions. Especially this paper derives its importance through the fact that elaborations on the functioning of upstream risk communication are difficult to find, in comparison to reflections on downstream risk communication. However, one key element of REACH is the implementation of risk communication that works in both directions, upstream and downstream.

Alongside game theory, the means of experimental economics are also appropriate in the context of RIA. Besides risk communication up and down the supply chain, self-responsible action on the part of norm addressees is another key element of REACH. Accordingly, part C of the work in hand addresses issues of self-responsible behavior on part of the norm addressees. Under the title “Smart regulation of downstream communication in a supply chain – experimental evidence”, prerequisites and factors are studied that self-responsible behavior – in compliance with the normative requirements set forth by REACH – may help to happen. This is achieved by exploring the two hypotheses “If they are not sanctioned for non-compliant behavior, the actors will choose the form of downstream communication that brings them the highest cooperation gain possible, even if this form is not conformable to law” and “If non-compliant behavior is not sanctioned, the way of dividing the cooperation gain made through a form of downstream communication between two norm addressees is independent of whether this form is conformable to law”. The results show that self-responsible norm-compliant behavior does not emerge automatically and reveal factors that seem to be crucial in this context. This third paper is jointly work together with Kilian Bizer, who contributed to this paper by interpreting the results through offering an explanation titled ‘compensation for possible cognitive dissonances’.

All three papers presented in the parts A to C constitute the cumulative dissertation of Stephan Hensel, who is grateful to all persons who contributed to prepare this work in hand.