An economic perspective on regulating neurotechnologies

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Awareness towards the rise of neurotechnologies is globally increasing. In how they challenge concepts as freedom, identity, autonomy and responsibility, by themselves alone or combined with AI. As a consequence ethical discussions and proposals for regulations are advancing. This contribution offers an overview of current regulatory efforts concerning neurotechnologies and adds to the economical thinking in respect to this institutional change.

To begin with, the contribution briefly considers the current state of neurotechnology regulations.

Following, the paper offers an economic perspective regarding the legal and institutional change brought by neurotechnologies. It applies tools from game theory and the economics of law to better understand how market actors, especially firms developing neurotechnological devices, strategically behave in conditions of cognitive asymmetry. Using principal-agent models, it aims at illustrating how firms may exploit informational and cognitive vulnerabilities of users, who are often unable to fully assess the nature, risks, or implications of neural data collection and manipulation. It turns then to the contributions of Sacconi whose contractarian model of corporate governance and "reputation-based compliance" is particularly apt for analyzing firms operating in ethically sensitive sectors. Building on this,

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the contribution proposes economic and legal tools that can structure incentive-compatible environments where firms internalize ethical and cognitive risks rather than externalizing them onto users.

Finally, drawing on institutional economics theories, the contribution suggests that the mere presence of legal rules is insufficient unless institutions provide credible enforcement and normatively accepted procedures. It suggests thus that regulatory approaches to neurotechnology must therefore go beyond idealistic declarations and engage with real-world constraints such as limited state capacity, cross-border technology markets, and institutional inertia.

The paper's interdisciplinary approach rooted in law and economics aims to offer a sustainability oriented, democratic and robust contribution in respect to the debate on neurotechnologies. By offering a multidimensional analysis of emerging regulatory models, this paper adds to the ongoing debate on the legal governance of neurotechnologies and responds to the theme of the *21st SIDE* conference.