

Subgame Perfect Implementation Under Value Perturbations and the Hold-Up Problem

Philippe Aghion, Drew Fudenberg, Richard Holden,
Takashi Kunimoto and Olivier Tercieux*

November 2, 2009

Abstract

We consider the robustness of extensive form mechanisms to common p -belief value perturbations from common knowledge, which are situations where each player believes with probability p slightly less than 1 that other players believe with probability slightly less than one... and so, that the state of nature is equal to a particular θ . We show that with even an arbitrarily small amount of such uncertainty, the Moore-Repullo mechanism does not yield (even approximately) truthful revelation and in addition there are sequential equilibria with undesirable outcomes. More generally, we show that any extensive form mechanism is fragile in the sense that if a non-monotonic social objective can be implemented with this mechanism, then there always exist arbitrarily small common p -belief value perturbations from common knowledge under which an undesirable sequential equilibrium exists. Finally, we analyze the implications of these non-robustness results for the hold-up problem and argue that our results restore Grossman and Hart's basic insights on the hold-up problem.

*Aghion: Harvard University, Department of Economics; email: paghion@fas.harvard.edu. Fudenberg: Harvard University, Department of Economics; email: dfudenberg@harvard.edu. Holden: University of Chicago, Booth School of Business; email: richard.holden@chicagobooth.edu. Kunimoto: Department of Economics, McGill University and CIREQ, Montreal, Quebec, Canada; email takashi.kunimoto@mcgill.ca. Tercieux: Paris School of Economics, Paris, France; email: tercieux@pse.ens.fr. We owe special thanks to Oliver Hart for numerous discussions, and to Johannes Horner, John Moore and Andy Skrzypacz for detailed comments on earlier drafts. We are also grateful to Mathias Dewatripont, Bob Gibbons, Ed Green, Matt Jackson, Philippe Jehiel, Hitoshi Matsushima, Eiichi Miyagawa, Roger Myerson, Andrew Postlewaite, Jean Tirole, Ivan Werning and Muhamet Yildiz for helpful discussions and comments. Michael Powell provided excellent research assistance.