
The Context of the Game: Extended Abstract*

Amanda Friedenberg

Department of Economics
W.P. Carey School of Business
Arizona State University
amanda.friedenberg@asu.edu
<http://www.public.asu.edu/~afrieden/>

Martin Meier

Instituto de Análisis Económico – CSIC, Barcelona
and Institut für Höhere Studien, Wien
martin.meier@iae.csic.es

In games of incomplete information, the analyst must specify the players' choices, payoff functions, and hierarchies of beliefs (about the payoffs of the game). The importance of correctly specifying players' choices or actual payoff functions is well understood. (See, Kreps-Wilson [8, 1982] and Milgrom-Roberts [10, 1982], amongst many others.)

This project is concerned with the robustness to misspecifying players' hierarchies of beliefs. Here, the literature has focused on two questions:

(i) What if the analyst misspecifies players' actual higher-order beliefs?

(ii) What if the analyst misspecifies the players' parameter set?

Question (i) has a long history in game theory. This question goes back to Geanakoplos-Polemarchakis [6, 1982], followed by Monderer-Samet [11, 1989], Rubinstein [13, 1989], Carlsson-van Damme [3, 1993], Aumann-Brandenburger [1, 1995], Kajii-Morris [7, 1997], Oyama-Tercieux [12, 2005], and Weinstein-Yildiz [14, 2007], amongst many others. Question (ii) is more recent. It focuses on the case where the analyst correctly specifies players' hierarchies of beliefs about a parameter space Θ , but the players' are in fact uncertain about both Θ and some Σ . For instance, Θ may be payoff relevant moves by Nature and Σ may be external signals that the players' observe. This case is discussed in Battigalli-Siniscalchi [2, 2003], Ely-Peski [5, 2006], Dekel-Fudenberg-Morris [4, 2007], and Liu [9, 2009].

We are concerned with a new robustness question:

(iii) What if the analyst misspecifies the context within which the hierarchies lie?

Here, the analyst correct specifies the underlying parameter set. Moreover, the analyst correctly specifies players' hierarchies of beliefs, in the sense that each hierarchy in the players' structure is also a hierarchy in the analyst's structure. But, the analyst misspecifies the context within which the hierarchies lie.

We show that, in this case, there may be Bayesian equilibrium predictions associated with the players' structure, which are not Bayesian equilibrium associated with the analyst's structure. Thus, in general, the analysis is not robust to misspecifying the context of the game. We go on to provide conditions under which robustness does obtain.

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