Concerns about the “robustness” of the standard formulation of robust control have been floating around for some time. As pointed out in Sims (2001, p. 52), “once one understands the appropriate role for this tool (i.e. robust control or maxmin expected utility), it should be apparent that, whenever possible, its results should be compared to more direct approaches to assessing prior beliefs.” Then he continues, “the results may imply prior beliefs that obviously make no sense … (or) they may … focus the minimaxing on a narrow, convenient, uncontroversial range of deviations from a central model.” In the latter case “the danger is that one will be misled by the rhetoric of robustness to devoting less attention than one should to technically inconvenient, controversial deviations from the central model.”

Tucci (2006, p. 538) argues that “the true model in Hansen and Sargent (2008) … is observationally equivalent to a model with a time-varying intercept.” Then he goes on showing that, when the same “malevolent” shock is used in both procedures, the robust control for a linear system with an objective function having desired paths for the states and controls set to zero applied by a “probabilistically sophisticated” decision maker is identical to the optimal control for a linear system with an intercept following a “Return to Normality” model and the same objective function only when the transition matrix in the law of motion of the parameters is zero. He concludes that the decision maker applying robust control implicitly assumes “that today’s malevolent shock is linearly uncorrelated with tomorrow’s malevolent” shock” (p. 553).

Are these conclusions correct? It may be argued that “the fact that the transition matrix does not appear in the relevant expression does not mean that the decision maker does not contemplate very persistent model misspecification shocks. For instance, the robust control in the worst case may not depend upon on transition matrix simply because the persistence of the misspecification shock does not affect the worst case! Again the robust decision maker accounts for the possible
persistence of the misspecification shocks, and that persistence may affect the evolution of the
control variables in other equilibria, but it happens that transition matrix does not play a role in the
worst case equilibrium.” Moreover, as commonly understood, “the robust control choice accounts
for all possible kinds of persistence of malevolent shocks, which again may take a much more
general form than the VAR(1) assumed in Tucci (2006). It just happens that in the worst-case
misspecification shocks are not persistent. While for many possible “models”, these
misspecification shocks may be very persistent, such models happen to result in lower welfare
losses than the worst-case model.” The goal of this paper is to further investigate the robustness of
robust control along these lines.

REFERENCES

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