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1 Summary

This paper studies the stability of equilibria in linear rational expectations models. In particular, the authors study two classes of equilibria and analyze conditions under which the equilibria are informationally stable, which essentially means that perturbations of initial conditions have effects which vanish asymptotically. The first class of equilibria are the standard full information equilibria, which in this case expresses all variables in terms of the underlying structural shocks. They also study what they define as information equilibria, which are incomplete information equilibria for different information structures. The main results in the paper hinge on the issue of whether the exogenous stochastic process for the shocks, written as an $ARMA(1, \cdot)$, has an invertible moving-average component. If it does, then the full information equilibrium is an information equilibrium for any information structure and it is informationally stable. If the process is not invertible, then the full information equilibrium requires sufficient initial conditioning information to be an information equilibrium, and it is not informationally stable. The authors then construct an alternative information equilibrium with no exogenous information which is informationally stable. They then illustrate their results in two simple examples, showing that the stable information equilibria may have significantly different dynamics than the unstable full information equilibrium.

2 Comments

Overall, this is an interesting paper which is relatively easy to follow and raises some interesting issues. The notion of informational stability is rather novel, although it does seem to be related to expectational stability (E-stability). The authors acknowledge this, but the relationship needs to be further sorted out, as I discuss more below. In addition, more work needs to be done to interpret the results, which will help readers to assess the plausibility of the informational assumptions.

Ultimately, I interpret the paper as showing that different informational structures have different consequences for stability and hence for the dynamics of equilibrium outcomes. Stated at this general level, it is not surprising that equilibrium dynamics can be markedly different when agents are endowed with different information structures. A more interesting finding is that the authors are able to construct an incomplete information equilibrium which is informationally stable for any parameter values. Again in general terms, the results seem to be a special case of the

well-known distinction between solving expectational difference equations forward or backward depending on the stability of the roots.

While the authors gain much utility and tractability from the working with the lag polynomial algebra and the associated Wold representations, for me it served to obscure somewhat how agents in the model are actually performing inference and the implications of the information structure. In a revised version of the paper, I would strongly suggest that the authors make much more explicit what agents actually observe and how they are forming expectations, presumably via some type of filtering or inference problem. In the current paper there are several references to problems or instabilities which result from how agents are learning from endogenous variables. But this seems to be more asserted than shown. How can we see those effects? How are agents actually learning from the endogenous variables? One of my main desiderata for a revision is to unpack the results more and to explicitly show how agents are forming expectations and forecasting future variables.

A more explicit focus on agents' expectation formation will also make it easier to see how the informational fragility causes problems. The simple examples in sections 4 and 5 of the paper are useful in illustrating the stability and instability problems, but they are phrased in terms of the solved-out equilibrium dynamics. This obscures how the informational fragility causes problems for inference by agents. Being more explicit on the agents' expectation formation will also help make more clear the implications of the different informational assumptions underlying the informational equilibria.

Additionally, it is not entirely clear to me how to interpret the perturbation to the initial conditions that the authors consider in their discussion of informational stability and fragility. For example, equation (3.5) gives the required initial conditions for stability as a relationship between (a_0, y_0, u_0). In the usual interpretation, this is a way to solve for the initial value of y_0, the endogenous variable, given the specifications of the exogenous a_0 and u_0. The informational perturbation the authors consider is that u_0 is perturbed, which they interpret as a perturbation of the information structure. I suppose another way of saying that is that agents condition on a mistaken value of the initial shock u_0, which is still assumed to be observable. Perhaps this is just semantics, but I would think of a perturbation of the information structure as varying the amount of information that agents observe rather endowing them with incorrect (point) observations.

This last issue also brings up the relationship with E-stability. In discussing the perturbations of equation (3.5) they state that the perturbation could also be interpreted as a perturbation in the knowledge of the structure of the model, as in the literature on adaptive learning. They make this link more explicit later in section 5 where they show that the informationally fragile equilibrium is not E-stable while the informationally stable equilibrium is E-stable. They show this in the context of a simple $MA(1)$ process for the exogenous shock, but the relationship is worth pursuing in more detail. Does the relationship between informational stability and

E-stability extend beyond this simple case? The example certainly suggests it does, and thus leads me to question whether informational stability and E-stability are in fact equivalent concepts (at least for learning of particular structural parameters). If they are, then that would lessen interest in the results of the paper. On the other hand if there examples where E-stability and informational are different, that would be of interest to show.