Referee Report on "News versus Sunspot Shocks in a New Keynesian Model"
MS# 432

1   Summary of the Paper

This paper compares news shocks and sunspot shocks, both of which are relevant to changes in expectations. In the prototypical New Keynesian model, it has been well known that, when a central bank is not aggressive enough against inflation, the equilibrium can be indeterminate, and that sunspot shocks, which induce non-fundamental revision in expectations, affect the equilibrium dynamics. News shocks also affect expectations since they are anticipated shocks for future fundamentals.

To compare news and sunspot shocks, the author introduces news shocks about future monetary policy into the simplest New Keynesian monetary DSGE model, and derives a full set of rational expectations solutions both under determinacy and indeterminacy following a method in Lubik and Schorfheide (2003). Based on the analytical solutions and their impulse responses, the author discusses the similarities and distinctions between news and sunspots, and shows that both shocks can induce almost the same equilibrium dynamics, depending on the choice of a specific solution.

2   Comments

A primary contribution of this paper is that the author compares the news and sunspot shocks both analytically and numerically in a quite explicit manner.

While both news shocks and sunspot shocks are related to changes in expectations, there is a distinction between the two. Sunspot shocks, by definition, cause non-fundamental revision in expectation, and hence they can be interpreted as

exogenous changes in expectation. On the other hand, news shocks cause agents' optimal responses to anticipated changes in fundamentals. In this sense, news shocks induce *endogenous* changes in expectations.

Although such a conceptual distinction between news and sunspots is easy, it is difficult to infer how these shocks are distinguished in rational expectations solutions. In this respect, the author carefully investigates rational expectations solutions in which both news and sunspots affect the equilibrium dynamics, and clarifies the differences between the two shocks.

Another contribution of this paper is that the author characterizes the properties of the news shocks analytically. While most of the existing literature on news shocks investigates their roles only by numerical exercises. The analytical characterization in this paper is helpful in understanding which parameters are crucial in the propagation of the news shocks.

The most interesting to me is that the news and sunspot shocks can be observationally equivalent, depending on the choice of a specific solution. This finding raises an important issue in identifying news and sunspots empirically.

However, we should note that the observational equivalence that the author has found does not mean the similarity between news and sunspots. The equivalence is a consequence of the multiplicity of the rational expectations solution under indeterminacy; that is, it is due to the existence of arbitrary matrix M in the solution. Depending on another choice of M, the sunspot shocks can be observationally equivalent not only to the unexpected policy shock, but also to the other fundamental shocks such as preference shocks and cost shocks if they are introduced to the model.

Reference

Lubik, T. A., and F. Schorfheide (2003): "Computing Sunspot Equilibria in Linear Rational Expectations Models." *Journal of Economic Dynamics and Control*, 28(2), 273-285.