

Referee report on “Evaluating the New Keynesian Phillips Curve under VAR-based Learning” by Luca Fanelli.

Recent empirical evaluations of the New Keynesian Phillips Curve (NKPC), which put a high emphasis on the statistical modeling of the data generating process, tend to reject the NKPC as a good description of the observed inflation process. However, these results may in part be due to the stringent cross-equation restrictions that the rational expectations hypothesis (REH) place on the short-run dynamics of the inflation equation. In other words, the NKPC may provide a reasonable description of the inflation process when some deviations from the strict REH are allowed.

The main objective in Fanelli’s paper is to *test* the NKPC under one such deviation, namely the adaptive learning hypothesis (ALH). In Fanelli’s setup, agents update their beliefs about the short-run dynamics of the inflation process in accordance with the ALH, while taking the long-run steady state of the NKPC as given. This setup allows Fanelli to simultaneously model the non-stationary nature of the data in a satisfactory way and test the NKPC under the less demanding (with respect to the short-run dynamics) ALH. As such, Fanelli’s approach provides a clear contribution to the NKPC literature and is also of interest in other contexts as well. Moreover, Fanelli’s emphasis on *testing* rather than just *estimating* the NKPC is a step in the right direction.

Comments:

1. On p. 4, Fanelli makes the crucial assumption that the “agents’ learning rule involves only the parameters associated with the short run transient dynamics of the system, and not the cointegration parameters”. He interprets this assumption as consistent with the notion that the long-run parameters are not learnable during the transition process to equilibrium. However, this interpretation seems inconsistent with Fanelli’s econometric approach. In fact, the steady state equilibrium errors are in the Agent’s information set in Fanelli’s setup, and used in the forecasting. Thus, it seems that the correct interpretation of Fanelli’s assumption is that the agents *know* the long-run steady state (and hence do not update beliefs regarding it) but are uncertain about the short-run parameters. However, this is only reasonable if the cointegration parameter ϕ is structurally constant. By equations (9)-(11)

this seems to require that λ and the sum $\gamma_f + \gamma_b$ are constant (and thus only one of the γ :s can vary freely). However, having λ constant while the γ :s vary is strange since they are all functions of the same structural parameters in (2)-(4). This issue should be discussed in the paper since the assumption is critical to the analysis. In addition, since constancy of ϕ is a testable hypothesis, section 4 should also report the results from such testing (constancy should not be rejected in order for the setup to be persuasive).

2. In addition to inflation and marginal costs, Fanelli also includes the nominal interest rate in the empirical model. Why this particular choice? Why not include the output gap or some other variables? Or why not only use inflation and marginal costs? Fanelli claims that the interest rate may influence marginal costs and is therefore important but, by Fanelli's results in section 4, marginal costs and the interest rate are not even cointegrated. The choice of the vector a_t of "variables which are deemed to be relevant for the analysis" must be better motivated. It would also be prudent to check the sensitivity of the main results with respect to this choice. For instance, are the results on cointegration dependent on having the interest rate in the cointegration set or not?

Minor comments:

1. In the abstract and later in the paper Fanelli finds that "the model is supported by the data over relevant fractions of the chosen monitoring period, 1986-2006, under the adaptive learning hypothesis, although this evidence does not appear compelling". Why does it not appear compelling? My reading of Fanelli's results is that the evidence on the NKPC under the ALH is mixed and dependent on various choices, such as lag-length and critical values.
2. What is the message of Footnote 3 on page 2?
3. Footnote 4 and 5 on page 3 are poorly written.
4. To avoid confusion, the meaning of u_t should also be listed directly under equation (1).
5. ω should be $\bar{\omega}$ in equation (2).

6. Page 15, third paragraph: state which finding of O'Riley and Whelan (2005) is being referred to.
7. How should we interpret a result such as "it turns out that the NKPC is supported about 30% of times using $a = 0.75$, and about 70% of times using $a = 0.50$ " (page 16)? Did we reject the NKPC or not? A discussion of how to interpret a sequence of both rejections and non-rejections would be needed.
8. In figures 3 and 4, explain the key to the symbols (*e.g.* LR, cv_ir etc.) in the legend.
9. Are the estimates of the structural parameters reasonable? For instance, the estimate of the discount factor is very low.
10. Overall, the paper would benefit from a careful reading to eliminate strange sentences and spelling mistakes, such as "for *easy* of exposition" (page 9), "in order to *math* the formulation" (page 10), and "Figure 3, *uppuer* panel" (page 16), among others.