Minimizing post-shock forecasting error through aggregation of outside information

This paper considers a time series auto-regressive model where the dependent variable has recently experienced a shock. The purpose of the paper is to forecast the next time period observation by estimating the magnitude of the shock using donor pool (a pool of other time series that have experienced a shock). The proposed approach is to initially estimate the magnitude of the donor pool shocks. Then, using those estimates, three weighted average estimators for estimating magnitude of the shock of interest are considered: simple averaging, inverse-variance weighted averaging, and similarity weighting. Lastly, the forecast is the regular forecast (forecast by ignoring the shock) plus the estimated magnitude of the shock. The paper provides conditions under which the proposed forecast method performs better than the regular forecast, in terms of the mean squared errors. A Monte Carlo simulation study and an empirical example are provided.

Comments:

1. How could the method be applied to forecast two or more period after a shock?

2. Page 3, line 30: Blundell and Bond (1998) model is a fixed effect dynamic panel and estimate the parameters using the panel analysis. It would be nice if you clarify in what sense your work is similar to them.

3. Page 4, line 50: Your paper considers forecasting a time-series model. It is confusing for readers to read your sentence "In this article, we consider a dynamic panel data model...".

4. Figures on page 5: Figure labels, (a) and (b), are missing. What does the black line in the top graph represent? Is it the realized observations?

5. Page 7, line 52: Are these time series estimates or panel data estimates? If panel estimators are used, then OLS estimators in this model results in inconsistency of the estimators. In that case, how wouldn't this inconsistency affect the results in section 3 about the unbiasedness?

6. Page 8, line 46: It is not clear to me how you estimate α_i's by OLS. Could you give the expressions for $\widehat{\alpha}_i$? Also, how can you identify α_i from η_i? Isn't $\widehat{\alpha}_{adj}$ an estimator of $E(\alpha_1)$?

7. Page 9, line 10: It is not clear to me what U_i's are. An example could help understanding that better.

8. Page 9, line 15: Why the closed form expressions for $E(\widehat{\alpha}_{IVW})$ and $Var(\widehat{\alpha}_{IVW})$ are not provided?

9. Page 13, line 14: μ_α is unknown, and in practice we have to estimate it. Would the results hold if one replaces μ_α with its estimate?

10. Page 14, line 7: Shouldn't $E(\alpha_1)$ be μ_α? Previously μ_α was used.

11. Page 18, numerical example: The model setup does not contain the individual effects (intercepts) similar to the models in equations (1)-(2) on page 6. How would the result change if you include them with different variances?

12. Page 23, construction of donor pool: Your model assumes that the shocks have the same distribution. Given that these shocks are from different sources and happened because of various reasons, how could one justify them? Practically, there are many previous shocks. How can someone choose from them?

13. Figure 2 on Page 24: Are the black dots the real data? What does the line represent?