Discussion of 'The Ever-Changing Challenges to Price Stability' by Andrea De Polis, Leonardo Melosi, and Ivan Petrella

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Paper overview

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- Methodology: Score-driven nonlinear trend-cycle model for the location, scale and asymmetry parameters of the conditional distribution of inflation. Observed regressors incorporating are included to predict long-run and short-run dynamics of inflation moments.
- Findings: Large shifts in "balance of risks" over time, implying that no one-size-fits-all monetary policy rule exists for the observed sample. Fiscal policy plays an important role for long-run dynamics of inflation. Slope of the Phillips curve is time-varying and depends on inflation volatility.

Model

Observation equation:

$$\pi_t = \mu_t + \sigma_t \varepsilon_t, \qquad \varepsilon_t \sim \text{Skew-}t\,(0, 1, \varrho_t, \nu) \tag{1}$$

Define

$$\begin{pmatrix} \mu_t \\ \log(\sigma_t) \\ \operatorname{arctanh}(\varrho_t) \end{pmatrix} = \begin{pmatrix} \mu_t \\ \gamma_t \\ \delta_t \end{pmatrix} = \overline{f}_t + \widetilde{f}_t. \tag{2}$$

Stacked dynamics:

$$f_{t+1} = Af_t + BX_t + Cs_t, \tag{3}$$

with $f_t = (\overline{\mu}_t, \widetilde{\mu}_t, \overline{\gamma}_t, \widetilde{\gamma}_t, \overline{\delta}_t, \widetilde{\delta}_t)'$; X_t are observed long-run and short-run predictors, A, B, C are restricted coefficient matrices, and s_t is the scaled score of the predictive (skewed-t) log likelihood w.r.t. $(\mu_t, \sigma_t, \varrho_t)'$.

Model features

- Skew-t specification allows for expectations updates that are more general than for symmetric distributions:

$$\mathrm{E}_t[\pi_{t+1}] = \mu_{t+1} + g(\nu)\sigma_{t+1}\varrho_{t+1}$$

- Elasticities with respect to regressor X_t^k are time-varying:

$$\frac{\partial \mathrm{E}_t[\pi_{t+1}]}{\partial X_t^k} = \beta_{\mu,k} + g(\nu)\left[\varrho_{t+1}\frac{\partial \sigma_{t+1}}{\partial \gamma_{t+1}}\beta_{\gamma,k} + \sigma_{t+1}\frac{\partial \varrho_{t+1}}{\partial \delta_{t+1}}\beta_{\delta,k}\right]$$

Comments: Specification of the model

- Time-variation of η?
- Structural breaks? No time-variation of β, $\varkappa$, ...?
- Equation (7): $f_{t+1} = \overline{f}_{t+1} + \beta X_t$; what if there are missing variables in X_t?
- Diagnostics?
- Forecasting?

Other comments

- Terminology: inflation risk vs. inflation volatility/skewness vs. balance of risk...
- Notation, e.g. eq. (9): $\mathrm{E}[\pi_t|\Pi_{t-1}]$: Conditioning set Π_t only contains past inflation data, not regressors?
- Explicit expressions are given for conditional mean and variance but not skewness?
- Clarify relationship to the model for conditional distribution of GDP growth in Delle Monache, De Polis, Petrella (2021).

Conclusion

- Very interesting paper(s), combining reduced form time-varying parameters with structural features, such as long-run and short-run predictors.
- Model outcomes give rise to rich interpretations, e.g. on Phillips curve dynamics, shifts in optimal monetary policy, implications of fiscal expansions.
- Some robustness analysis and diagnostics would help to back up conclusions.

Thank you.