Denise Osborn

University of Manchester

<u>Discussion of</u>:

1. **Pesavento & Rossi**

   Small sample confidence intervals for multivariate impulse response functions at long horizons

2. **Harding**

   Using turning point information to study economic dynamics

3. **den Reijer & Vlaar**

   Forecasting inflation: An art as well as a science!

- Three very different papers
- Little in common, beyond dynamic modelling
- Two essentially methodological;
  One empirical

Therefore, they will be discussed separately.

1. Pesavento & Rossi

Issue: Construction of confidence intervals for impulse response functions (IRF) when there is uncertainty about a unit root

Solution: Use "local to unit root" asymptotics

- A clever & insightful idea

- Method applies for "long" horizons where IRF depends (only) on largest root

- Much preferable to usual approach

  Either: believe the results of prior unit root tests & always difference when $I(1)$ indicated

  Or: use levels & ignore estimation biases

- Results are robust to lag selection criteria:

  Reassuring!

Some qualifications

- Method not satisfactory when distant from unit root
- $I(2)$ or "almost" $I(2)$ ruled out

  → Still need some pre-testing

- Cointegrating vectors assumed known

  → Principal use of method probably in univariate contexts

  - **Extension to allow uncertainty about cointegration would be of great value**

- Can be substantial differences in confidence intervals depending on unit root test approach used

  → More guidance on when to apply specific methods would help

But: A really good paper!

2. Harding

Issue: Analysis of turning point properties of series for testing dynamic models

- Turning point information used in business cycle regime analysis:

  Is it useful more generally in model specification?

- Analysis here depends on number of turning points in $\Delta^r y_t$ (r can negative):

  Suggestion this can be used for determining order of integration of y_t

  Example of use in checking model adequacy for US GDP

Some comments

- $\Delta^r y_t$ is readily interpretable for r = -1, 0, 1, 2:

  $r = -1: \Delta^{-1} y_t = y_0 + y_1 + \ldots + y_t$

  $r = 0 : y_t$

  $r = 1 : \Delta y_t = y_t - y_{t-1}$

  $r = 2 : \Delta^2 y_t = y_t - 2y_{t-1} + y_{t-2}$

  Perhaps applications might concentrate on these?

- Turning points are defined mathematically: Local maxima or minima

  They will be affected by outliers

- When applied in model checking, approach does not indicate possible source of misspecification. Obvious possibilities:

  Misspecified AR order
  Nonlinearity
  Other structural change, etc.

  In US example, 1980s volatility break remarked, but not accounted for by method

  No other diagnostic tests provided for estimated model – does turning point information add to these?

- Alternative idea:
  Examine turning point information for residuals

  Related to nonparametric runs test for randomness ("crossing point information")

Not clear yet what we gain from turning point approach compared to available methods

Worth pursuing!

3. den Reijer & Vlaar

Issue: Forecasting inflation for the Netherlands & the Euro Area

Including:

- Forecasting aggregates versus components
- Usefulness of exogenous information
- Model selection
- Evaluation of forecasts
- Seasonality & level of differencing

Note:

- Real world inflation forecasting involves all these & more!
- It is always easier to criticise an empirical paper than one developing methodology!

Some comments

<u>Treatment of seasonality is unconvincing</u>

- Selection between Δ_1 & $\Delta_1\Delta_{12}$

  Why consider $\Delta_1\Delta_{12}$?

  $\Delta_{12} = \Delta_1 (1 + L + \ldots + L^{11})$
  $\Delta_1\Delta_{12} = \Delta_1^2 (1 + L + \ldots + L^{11})$

  $\rightarrow$ using $\Delta_1\Delta_{12}y_t$ amounts to assumption $y_t \sim I(2)$ & nonstationary seasonality.

  $\Delta_{12}y_t \rightarrow y_t \sim I(1)$ & nonstationary seasonality.

- Visual inspection sometimes suggests break in seasonal pattern, rather than continual change implied by Δ_{12}

- Models may be "overdifferenced" & serial correlation checks are required

  Maximum lag order of 12 may be insufficient

  Criteria (AIC, etc) that select **all** lags to p may not be appropriate in seasonal case;

  For example: if lags are 1, 12, 13
  Criteria tend to select too low order (eg, 1)

<u>Model comparisons not based on common information set</u>

- Single equation information criteria are employed

  Models using exogenous variables have additional information compared with VAR-based ones

- Out-of-sample RMSFE given weight in model selection to counter this

  But RMSFE is computed using actual values of exogenous variables!

  RMSFE comparison should use **forecasts** of exogenous variables

- RMSFE used in model selection appears to be a single dynamic forecast (horizons 1, 2, …, 20), not accuracy at the most relevant horizon (eg, 12)

Some findings are surprising

- Interest rates do not enter any forecasting model;

  perhaps more surprising that industrial production (or output gap) does not.

- Euro Area model (either based on total or aggregated components) little better than "no change" 12 or more months ahead:

  Euro Area RMSFE 1998-2002

h	No change	Total	Aggregated
12	0.65	0.59	0.63
15	0.72	0.75	0.69
18	0.78	0.96	0.72

Questions:

Is this poor record due to the unanticipated inflation surge of early 2002?

Can monetary policy be based on such forecasts?