Approximating fixed-horizon forecasts using fixed-event forecasts

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Redundant disclaimer

The views in this presentation are solely those of the presenter's and so cannot be taken to represent those of the Bank of England or members of the Monetary Policy Committee or Financial Policy Committee or to express Bank of England policy. But then, who would ever think they were?

Macro forecasts for policymakers

- Forecasts typically have quarterly frequency but conditioned partly on higher (monthly or higher) frequency data
- Forecasts often updated when major pulse of quarterly data arrives but nevertheless policy decisions made at higher frequencies (often monthly)
- Commonly focus on h-step ahead forecasts, eg inflation in 12 month's time
- Equally, often focus on y-o-y proportional changes, particularly so for inflation
- These features imply forecast errors have a structure which is potentially informative
- Surveys of professional forecasters - and sometimes policy makers, eg UK HMT - may focus on fixed events (eg growth next year, inflation in Q4) so they need translation
- That also applies to evaluations of such forecast

Consensus forecasts

- Monthly survey of fixed-event annual $\dot{p}$ and $\dot{gdp}$ for current and next year
- Quarterly survey (March, June, Sept, December) of fixed-horizon forecasts of quarterly y-o-y $\dot{p}$ and $\dot{gdp}$

Patton and Timmermann

- P&T interested in unpicking professional forecasters forecasts
- An aggregation structure of overlapping forecasts based on low frequency data using higher frequency information - which is what we all do when we macro-forecast for a living
- Implies a helpful structure with restrictions that can allow inferences on real-time measurement error and underlying DGP, especially re persistence
- Given this interest, P&T develop GMM and ML methods to estimate parameters of interest

Knüppel and Vladu

- Malte and Andreea interested in optimally generating fixed-horizon forecasts from fixed events when fixed horizon forecasts unavailable
- Astonishing that never been done before!
- This paper will be widely cited
- Biggest achievement in this paper

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- Biggest achievement in this paper getting the notation straight

Ad-hoc approach

Dovern *et al*:

We approximate the fixed horizon forecast for the next twelve months as an average of the forecasts for the current and next calendar year weighted by their share in forecasting horizon

- Really *ad-hoc*!
- Ignores
  - known properties of the fixed-event forecasts (eg whether these refer to growth rates of annual averages or to growth rates of end-of-current-year on end-of-previous-year values)
  - Misleading as for many forecast objects, part of the early period contains known data (eg for next ten months, April 2016 HCPI inflation release informs y-o-y rate)
  - Ignores covariance structure of errors (from DGP)

An empirical matter?

- Maybe it's still OK?
- Maybe not: Hubert observed that for the SPF where fixed event and horizon forecasts both exist correlation of reported fixed-h forecast and *ad hoc* estimate only 0.5

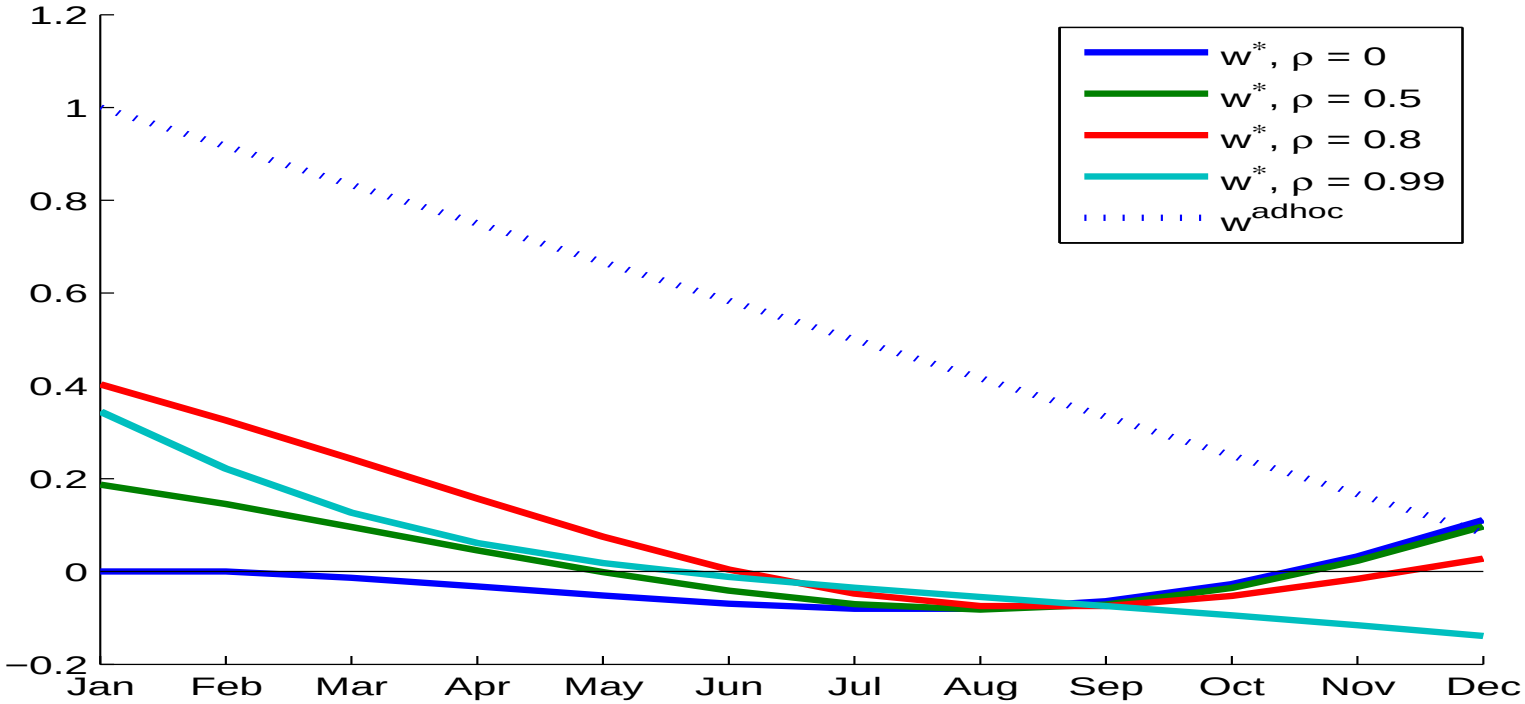
Optimal approach

- Like P&T, uses known properties of the fixed-event forecasts
- Like P&T, depends on a particular covariance matrix Ω of the (eg) monthly inflation rates, which is unfortunately unknown
- However, have some idea of what this looks like as often low order AR processes are good approximations
- And which very often have low persistence
- And for 12-month growth rates dominated by aggregation

Ad-hoc far from OK

- Nice extreme example where $g_{t+1,t}$ iid mean μ
- Two forecasts made at start of year - next and current year: have observed inflation at end of last year.
- That affects the first 11 months this year - but not the twelfth
- Forecasting December inflation this year
- Optimal weight 100% on next year's forecast, whereas *ad hoc* weight zero

Optimal *versus* ad hoc



- Remarkable *ex post* the *ad hoc* approach was ever used
- Negative weights - is that base effects from the y-o-y rates?

Persistence and ρ

- Inflation dominated by persistence from the y-o-y aspect (page 12 and appendix)
- And inflation ρ easy to estimate - at least we have data
- Not so clear about GDP
- Argued (monthly) ρ at zero seems sensible
- But in UK NIESR monthly GDP estimate has significant non-negligible 1st order autocorrelation, which is not implausible (special factors reverse over short periods)
- Examples with more complex AR processes?
- Approximation also depends on volatility of data - more examples?
- Monte Carlos?

Choice of ρ

- Can estimate processes for inflation - somewhat more difficult for GDP but can construct proxies
- Authors report doesn't matter - inflation ρ small (I found HICP ≈ 0.3)
- Cross-validation - optimising for ρ with a sub sample rather than picking a number
- Introduce estimation error of course - P&T find estimates of ρ for GDP growth very variable
- However, dynamics clearly dominated by the choice of y-o-y statistic

Seasonality?

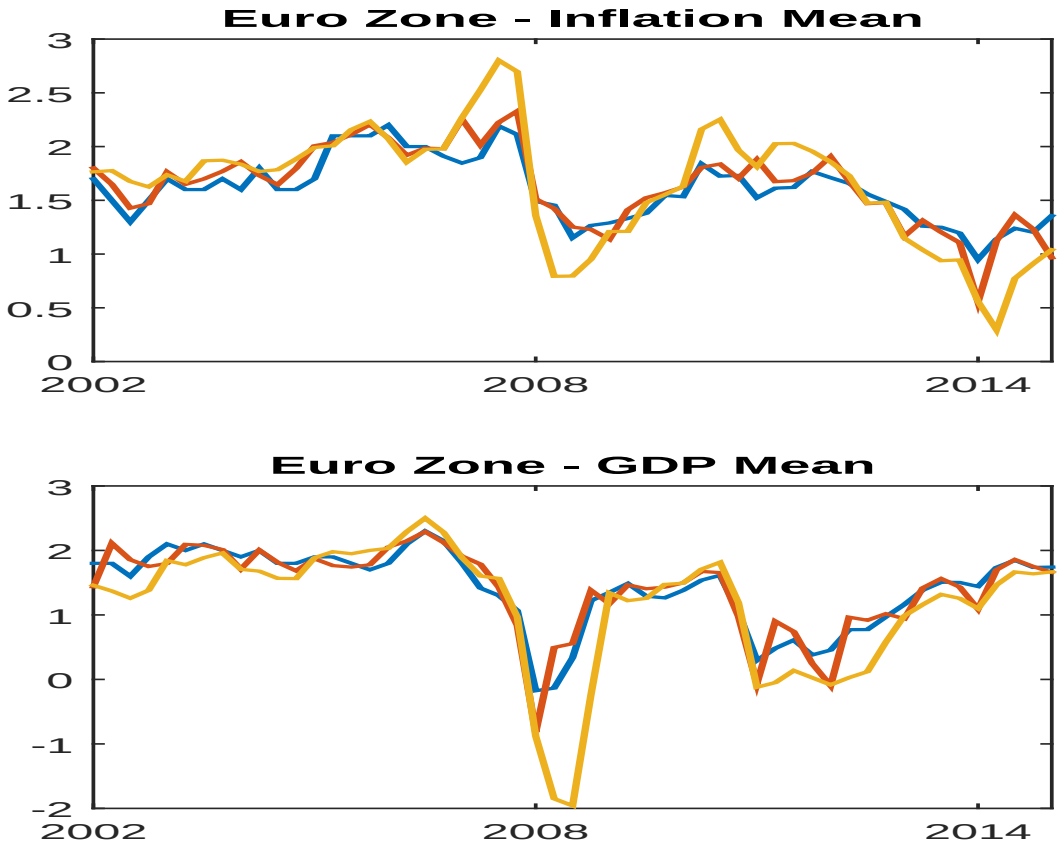
- Seasonality dominant but presumption is forecasters are using SA monthly data

Knüppel and Vladu - application

- Consensus allows us to evaluate the approach
- With fixed-event forecasts what would we expect the fixed-horizon forecasts to be (given they both have the same information set)?
- Then compare to actual fixed-horizon estimates
- Although not obvious that forecasters do not introduce error
- Might be interesting to evaluate forecast performance for the 'true' and optimal forecasts

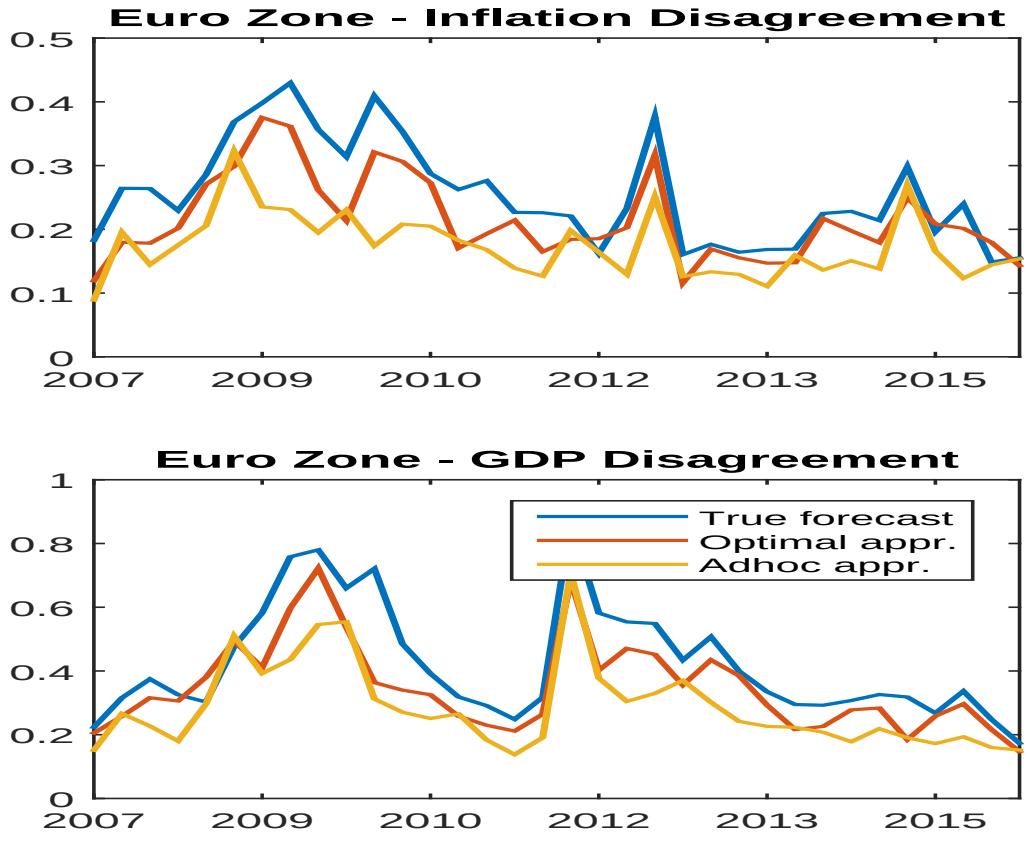
True, optimal and *ad hoc* for the Euro Zone

True, optimal and *ad hoc* for the Euro Zone



- Big improvement in some periods ie when forecasts change is big
- Optimal still approximation - but we don't know if forecasters construct consistent pairs of forecasts (another error source)

Disagreement



- Dispersion / disagreement uniformly lower in *optimal* case
- Approximation error not zero so would expect dispersion to increase?

Summary

- Well motivated, important
- Many authors will need to return to their papers
- Few substantive comments
- Minor reservations about choice of ρ
  - Would appreciate a few more experiments
  - Could explore with Monte Carlo experiments
  - Could use cross-validation to choose

Summary

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- Many authors will need to return to their papers
- Few substantive comments
- Minor reservations about choice of ρ
  - Would appreciate a few more experiments
  - Could explore with Monte Carlo experiments
  - Could use cross-validation to choose
- But in the end, good job

References

- Dovern, Fritsche and Slacalek RESTATS 2012 *Disagreement Among Forecasters in G7 Countries*
- Hubert 2014 JMCB *FOMC Forecasts as a Focal Point for Private Expectations*
- Patton and Timmermann JBES 2011 *Predictability of Output Growth and Inflation: A Multi-Horizon Survey Approach*