The limits of forward guidance

J.R.Campbell, F.Ferroni, J.D.M.Fisher & L.Melosi

Discussion by M.Bielecki, M.Brzoza-Brzezina, M.Kolasa

Narodowy Bank Polski

NBU & NBP Conference

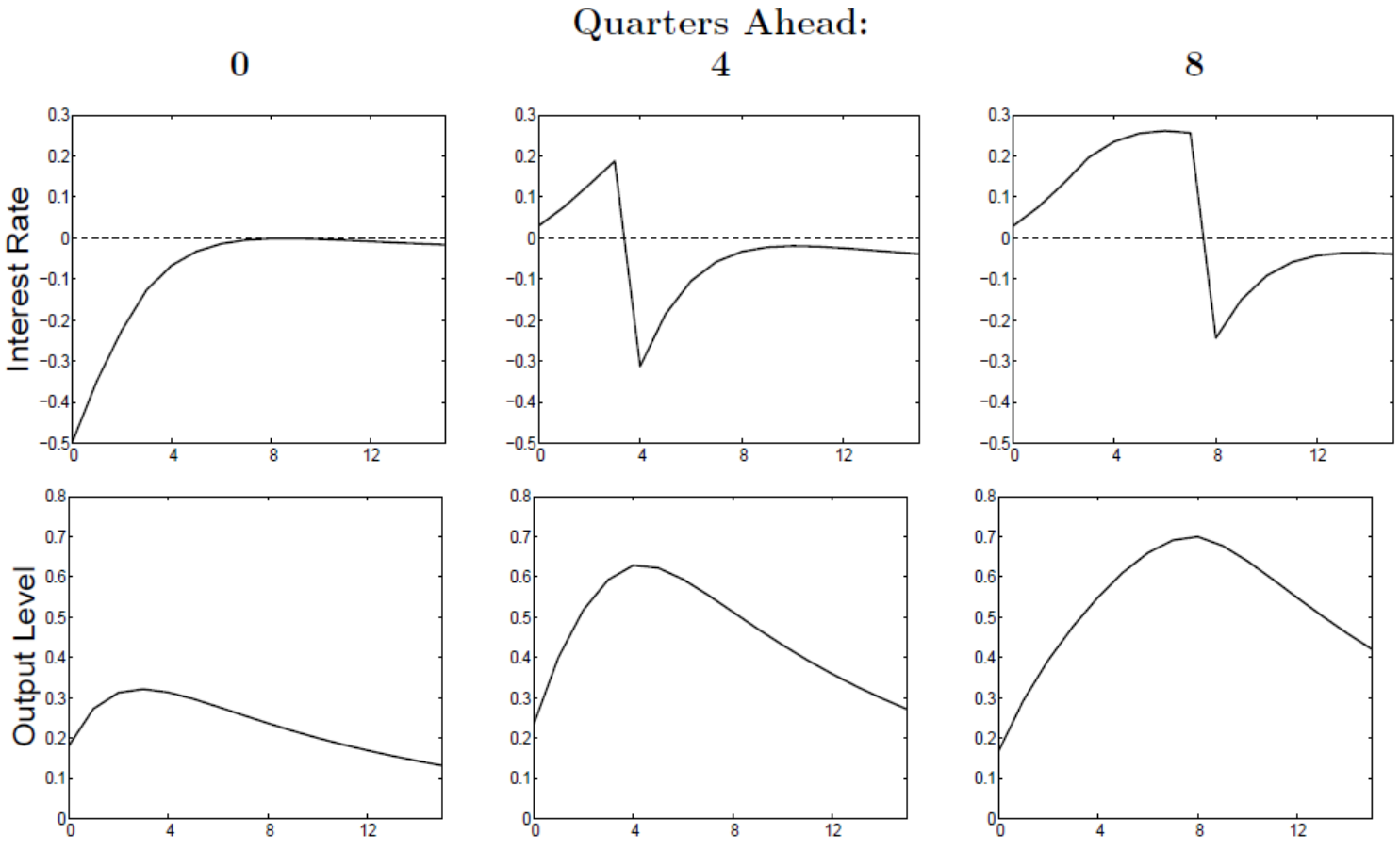
Kyiv, 23-24.05.2019

Outline

Motivation

- Forward guidance has been used by central banks at the ZLB
- Seems to work...
- ... but no miracles.
- While in the workhorse NK framework...
- ... it's a kind of magic (Del Negro, Giannoni & Patterson 2015)

Forward guidance puzzle (Del Negro et al. 2015)



The disease and the cure(s)

- The source of trouble: Euler equation
  $\hat{y}_t = -E_t \sum_{i=0}^{\infty} \hat{r}_{t+i}$
- Possible solutions:
  - agents die (hence discount the future) (Del Negro et al. 2015)
  - agents face idiosyncratic risk and borrowing constraints (McKay et al. 2016)
  - central bank promises are not fully credible (this paper)

Communication technology

- The bank communicates current and future policy deviations $\boldsymbol{\Theta}_t$ from policy rule
- Communication happens via noisy signal $\boldsymbol{s}_t = \boldsymbol{\Theta}_t + \boldsymbol{v}_t$
- So that expected policy deviation is $E_t\boldsymbol{\Theta}_t = E_{t-1}\boldsymbol{\Theta}_t + \boldsymbol{\kappa}(\boldsymbol{s}_t - E_{t-1}\boldsymbol{\Theta}_t)$, where $\boldsymbol{\kappa}$ is the Kalman gain

News vs. noise representation

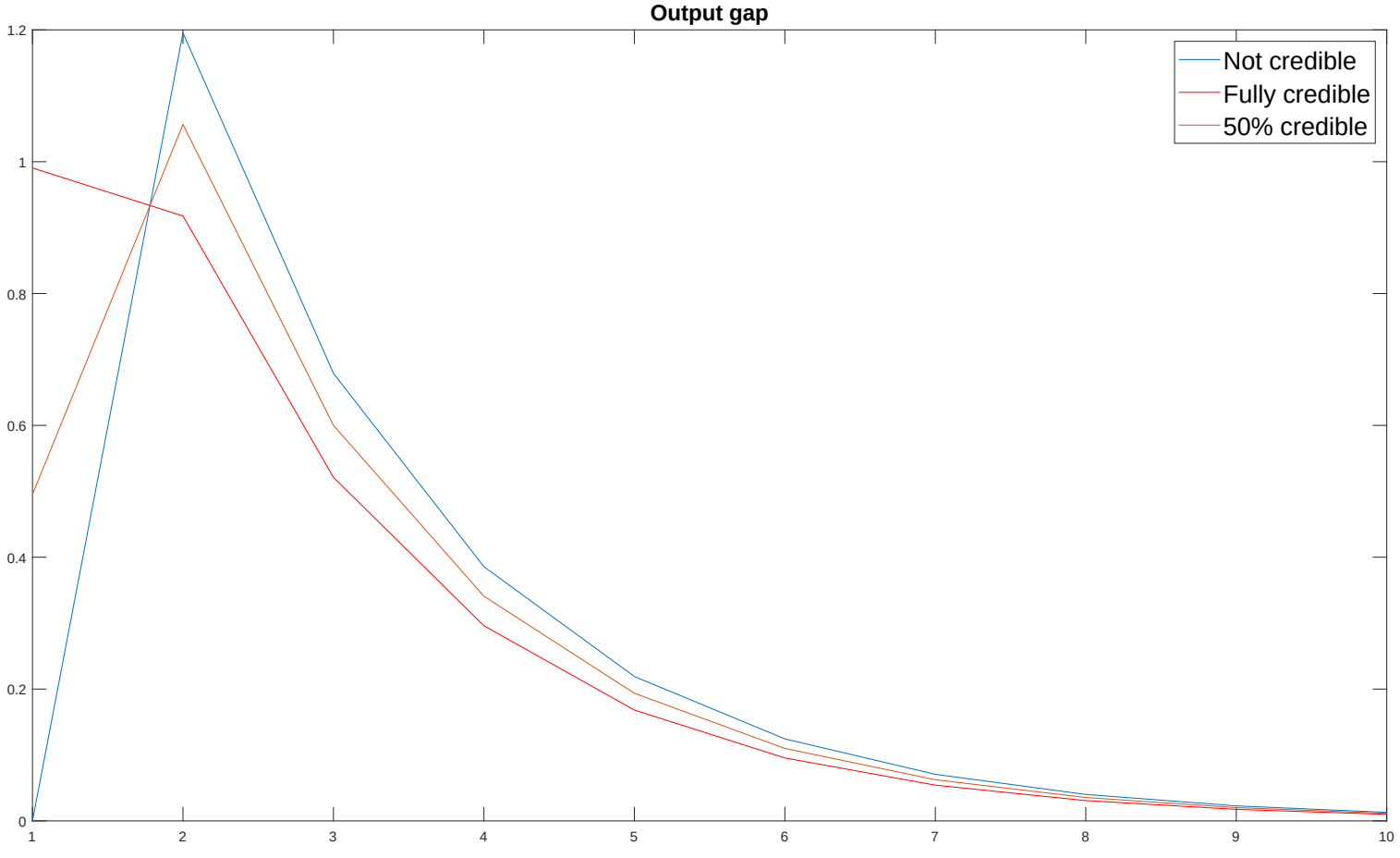
- How can we find the Kalman gain?
- The model with noisy signals is observationally equivalent to model with news shocks
- This can be estimated
- Kalman gain is $\boldsymbol{\kappa} = f(\Sigma_\varepsilon)$, where $\Sigma_\varepsilon = E(\boldsymbol{\varepsilon}_{R,t}\boldsymbol{\varepsilon}'_{R,t})$
- In particular:
  - if promissed deviations from the rule always materialize as announced $\boldsymbol{\kappa} = \boldsymbol{I}$ - full credibility ($E_t\boldsymbol{\Theta}_t = \boldsymbol{s}_t$)
  - if CB does not keep promisses $\boldsymbol{\kappa} \neq \boldsymbol{I}$ - partial (or no) credibility

Simple example

- Assume $H = 1$
- Illustrative cases:
  1. Full commitment to past communication: $\theta_t = \varepsilon^1_{R,t-1}$, $\Sigma_\varepsilon = \begin{bmatrix} 0 & 0 \\ 0 & \sigma^2 \end{bmatrix}$, which implies $\boldsymbol{\kappa} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, $E_t \begin{bmatrix} \theta_t \\ \theta_{t+1} \end{bmatrix} = \begin{bmatrix} s^0_t \\ s^1_t \end{bmatrix}$
  2. Past communication can be revised: $\Sigma_\varepsilon = \begin{bmatrix} \sigma^2 & 0 \\ 0 & \sigma^2 \end{bmatrix}$, which implies $\boldsymbol{\kappa} = \begin{bmatrix} 1 & 0 \\ 0 & 0.5 \end{bmatrix}$, $E_t \begin{bmatrix} \theta_t \\ \theta_{t+1} \end{bmatrix} = \begin{bmatrix} s^0_t \\ 0.5 s^1_t \end{bmatrix}$
- Imperfect credibility results from the central bank reneging on what it promised in the past

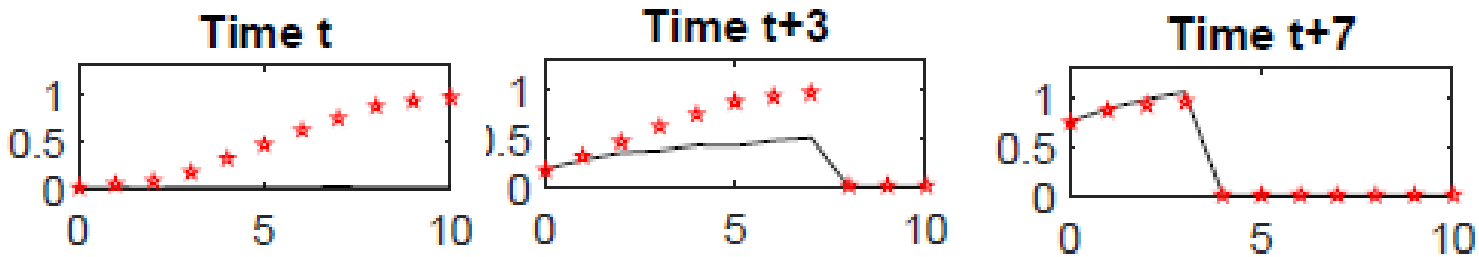
Simple example

- 3-equation NK model (CGG 1999)
- Forward-guidance shock: $s_1^1 = s_2^0 = 0.01$



What does the paper show?

- Fully-fledged medium-sized NK model estimated with Bayesian methods
- Estimated Kalman gain is sharply decreasing with horizon
- Outcome: FG at long horizons has very low power



Why do we like it?

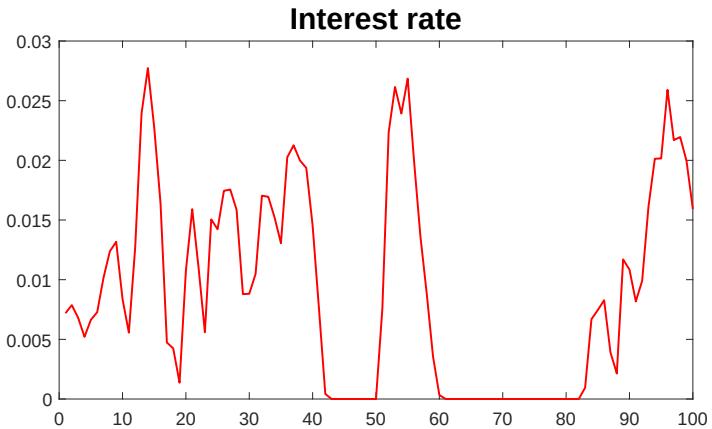
- Novel and smart approach to handling the FG puzzle
- The estimation is well disciplined (news shocks identified from future rates)
- But some concerns remain

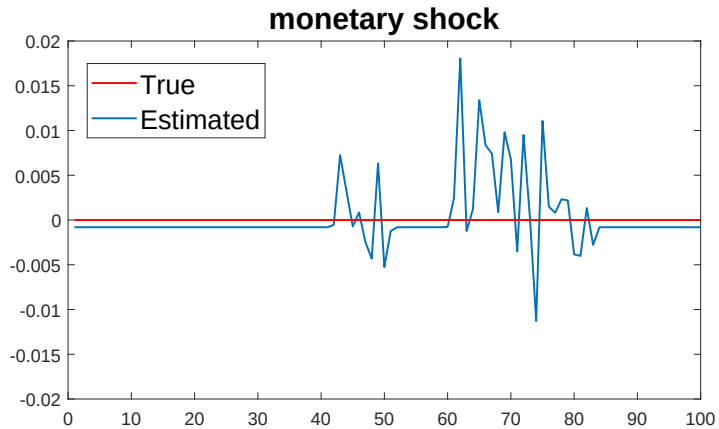
Outline

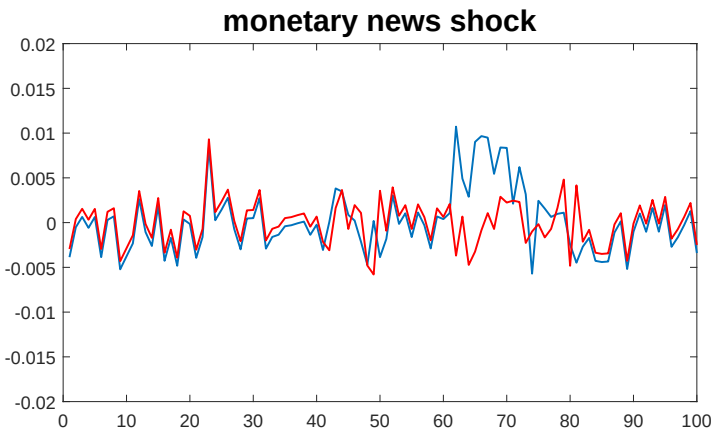
Concern #1: the role of ZLB

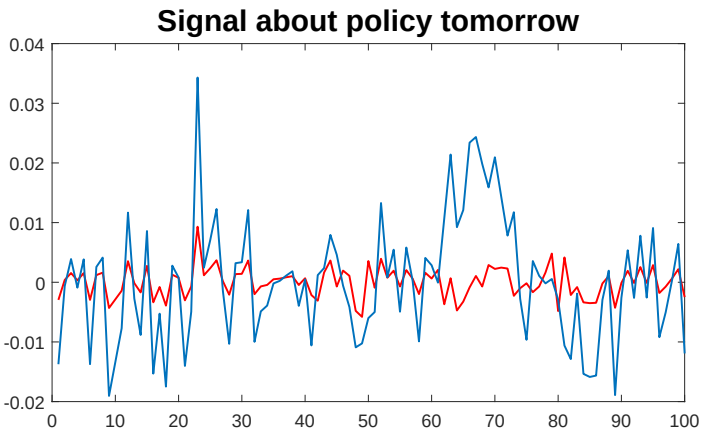
- Estimation ignores the ZLB.
- How innocent is this assumption?
- Let's check. Back to our 3-eq NK model:
  - Assume economy subject to the ZLB, driven by demand shocks and FG shocks only
  - Simulate data (we use OccBin)
  - Take model with the same structural parameters, but ignoring the ZLB
  - Estimate variance of demand, monetary policy and FG shock, filter shock series
  - Calculate the Kalman gain, recover signals

Simulation results



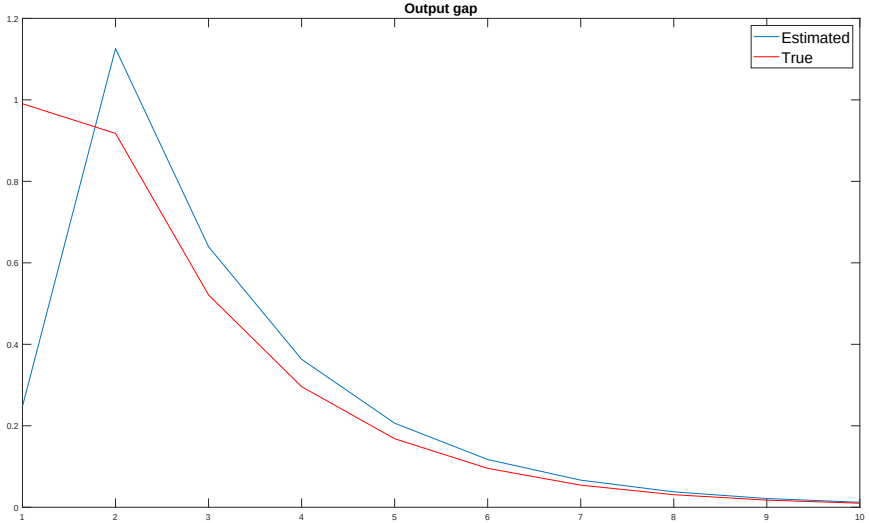




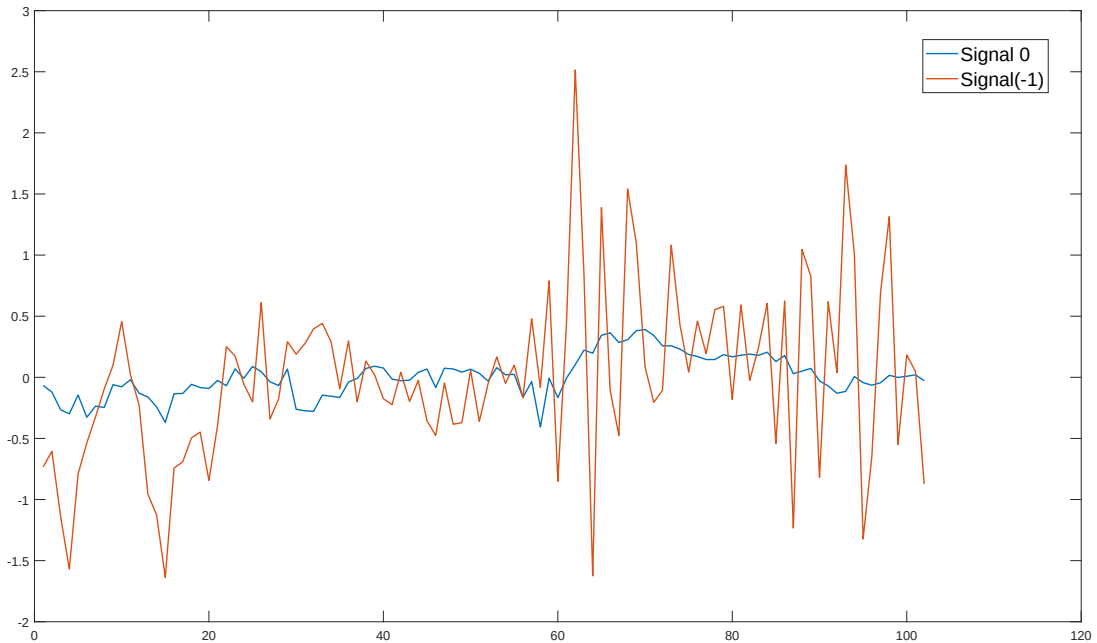


Kalman gain

- True Kalman gain matrix was $\boldsymbol{\kappa} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$
- But we estimate $\boldsymbol{\kappa} = \begin{bmatrix} 0.24 & 0.44 \\ 0 & 1 \end{bmatrix}$
- Does it matter? FG shock:



Concern #2: Signal revisions



- Correlation of policy today with previous signals about this policy:

s^1_{t-1}	s^2_{t-2}	s^3_{t-3}	s^4_{t-4}
0.39	0.07	-0.03	0.06

- Was the Fed communication really so noisy/ inconsistent?

Outline

Conclusions

- Very interesting and novel approach
- Major doubt is how well the estimation procedure really identifies Fed communication
- The findings may be too pesimistic for the Fed

Outline

General remarks

- This is a really novel and interesting paper
- And it has nice and intuitive results
- But their presentation is below their potential
- More could be shown, to:
  - convince that things have been done properly
  - show the intuition
  - satisfy estimation geeks

Add some external validation

- The model (in particular estimation of the monetary policy part) is a big black box for the reader
- Try to convince her/him that your estimation makes sense
- E.g. compare smoothed (unobservable) variables to data (e.g. news, signal, noise)
- Convince people that you really identify FG signals

Exploit the Kalman gain matrix

- A lot of the results boil down to the KG matrix
- This is 5x5 or 11x11 and thus hard to interpret
- But there must be a way to synthetise it
- Can it be related to some external measures of investors' attention?

Minor points

- Why is the FG shock for $t + 8$ missing?
- Show estimation results (priors + posteriors)
- Show and interpret selected FEVD and historical decompositions (to document the role of FG shocks in particular)
- Figures 1 and 2 show similar things, maybe one measure could be dropped?
- H=4 imposed in first sample, H=10 in the second. Why not let the data speak? If FG horizon was indeed short then this will be reflected in the VCV matrix of shocks.
- The paper assumes a slope shift in 2008. If we look at US GDP, it seems that there was a level shift of at least equal importance. Shouldn't this be taken into account?