



EUROPEAN CENTRAL BANK

EUROSYSTEM

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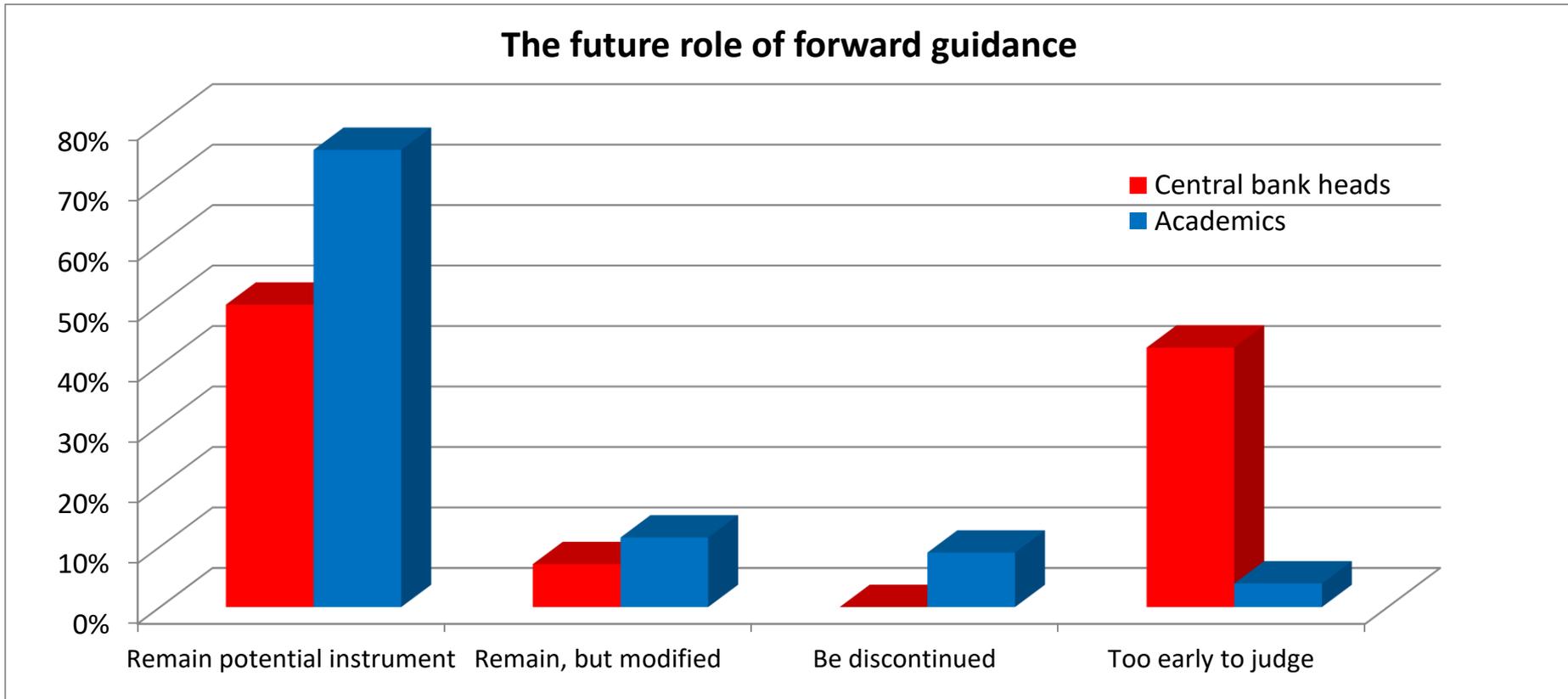
Can more public information raise uncertainty? The international evidence on forward guidance

May 2019

The views expressed here are our own and do not necessarily reflect those of the ECB, the Banque de France or the Eurosystem.

- Forward guidance (FG) as policy tool to
 - Provide additional accommodation (at the lower bound)
 - Anchor expectations, e.g. about policy rates
 - Reduce uncertainty, e.g. about policy rates
- But multifaceted ongoing discussions
 - FG puzzle (Del Negro et al. 2015)
 - Critical views by some central bankers (Poloz 2014)
 - Does the form of FG matter?

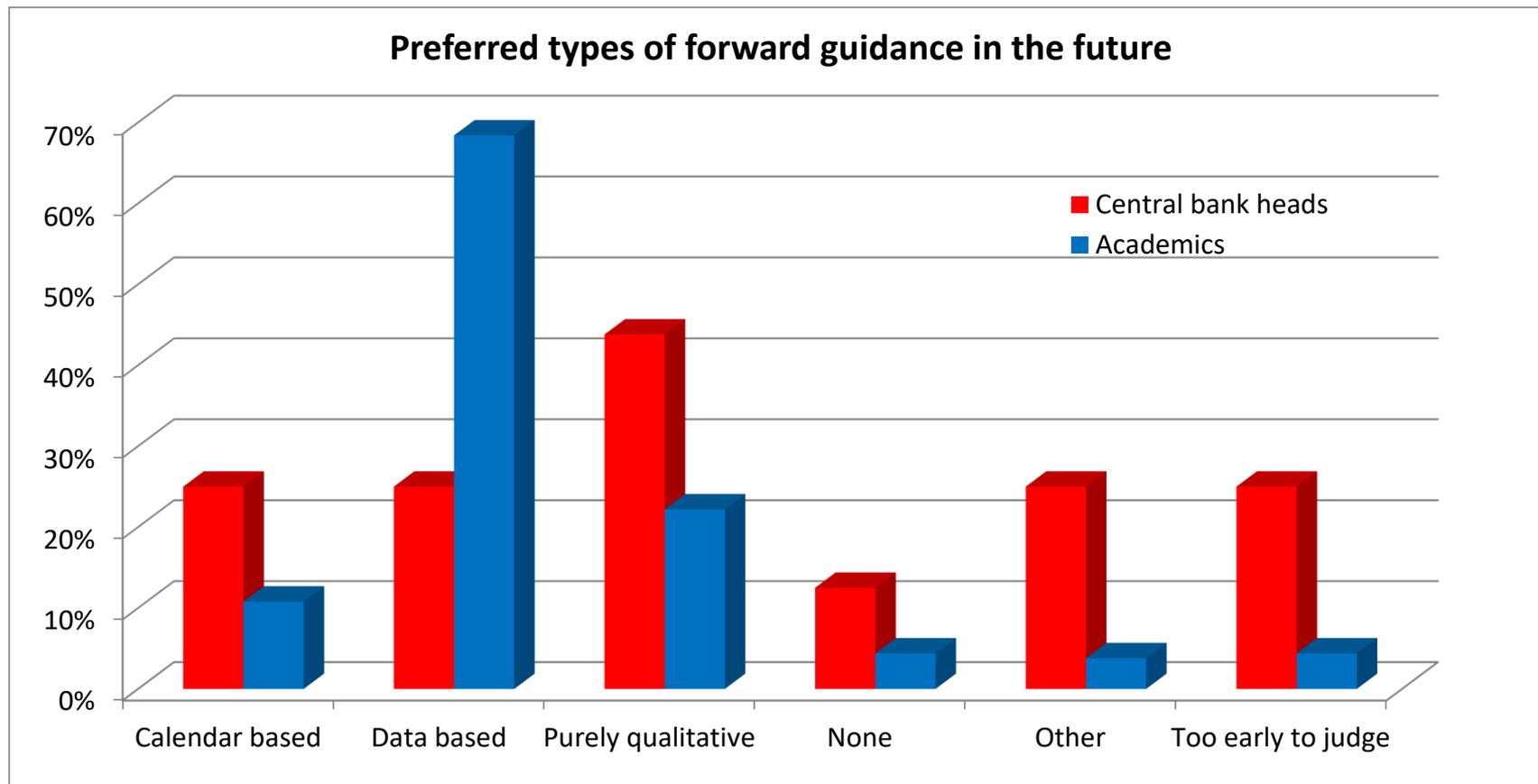
- Broad agreement that FG is to stay in the toolkit



Source: Blinder et al. (2017) survey among central bank governors (55 responses) and academic economists (159 responses).

“Once conditions return to normal, do you think each of the following should remain a potential instrument of monetary policy, remain an instrument but in modified form, be discontinued, or that it is too early to judge?”

- Different views on the preferred type of FG



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“In the future, which type(s) of forward guidance do you believe would be most effective for your central bank?”

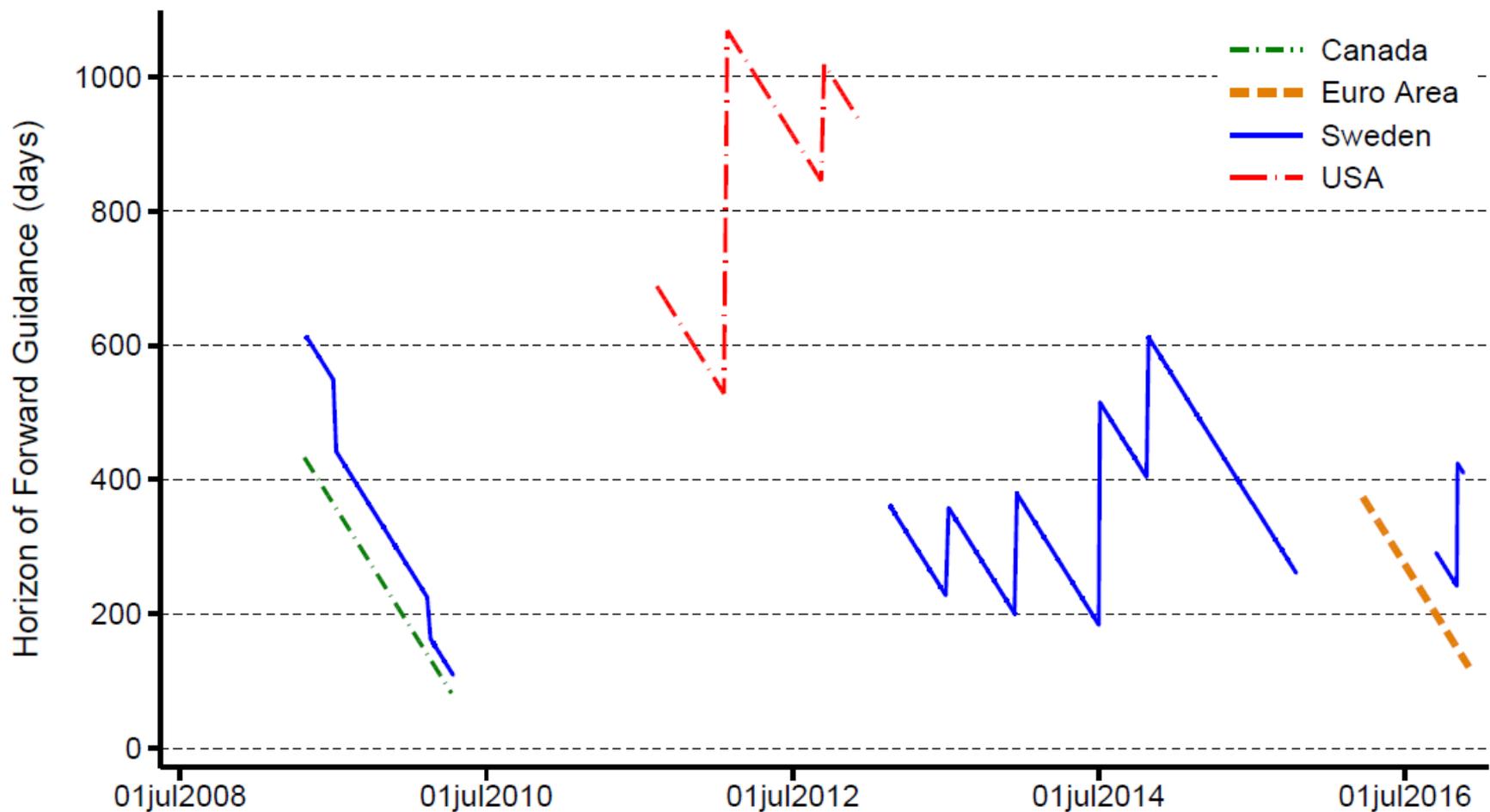
- Does the form of forward guidance (FG) matter?
 - Responsiveness of bond yields to macro news
 - Exploit cross-country dimension
- Can more public information be detrimental?
 - E.g., Amador and Weill, JPE (2010)

- Effect of FG on responsiveness to news depends on its horizon
 - Short-horizon time-contingent FG elevates uncertainty (relative to no FG)
 - Long-horizon time-contingent FG “cements” expectations
- This can be explained in a rational expectations model with noisy market information
 - With FG, price signal becomes less informative, as more precise public information crowds out aggregation of private information

- 1** Effect of forward guidance on responsiveness of bond yields
- 2** Rational expectations model with noisy market information
- 3** Summary

- Responsiveness of bond yields to macro news
 - Muted responsiveness under FG
 - Swanson & Williams (2014a,b); Feroli et al. (2016)
 - 7 advanced economies until November 2016
 - Periods with policy rates at or below 1%
 - Classify by FG regime
 - Open-ended FG: Euro Area, Sweden, Japan, UK, USA
 - State-contingent FG: Japan, UK, USA
 - Time-contingent FG: Canada, Euro area, Sweden, US;
Split into short and long horizon (1.5 years)

Horizon of time-contingent FG was often revised



- Responsiveness of bond yields to macro news
 - Daily returns of 2-year government bonds
 - Macroeconomic surprises
 - Defined via Bloomberg surveys
 - Business confidence, consumer confidence, CPI, GD, industrial production, non-farm payroll employment, purchasing manager indices, retail sales, unemployment
 - Positive surprises imply a tightening of monetary policy (if anything)

$$\Delta R_t^{c,i} = \alpha^{c,i} + \alpha_{FG} FG_t^c + \beta S_t^{c,i} + \beta_{FG} FG_t^c S_t^{c,i} + \varepsilon_t^{c,i}$$

$$\Delta R_t^{c,i} = \alpha^{c,i} + \alpha_{SG} SG_t^c + \alpha_{OG} OG_t^c + \alpha_{LTG} STG_t^c + \alpha_{STG} LTG_t^c + \beta S_t^{c,i} + \beta_{SG} SG_t^c S_t^{c,i} + \beta_{OG} OG_t^c S_t^{c,i} + \beta_{LTG} STG_t^c S_t^{c,i} + \beta_{STG} LTG_t^c S_t^{c,i} + \varepsilon_t^{c,i}$$

Differential effect of FG types on responsiveness of bond yields

	(1)	(2)	(3)	(4)
No FG (β)	0.465*** (0.168)	0.464*** (0.168)	0.465*** (0.168)	0.465*** (0.168)
FG ($\beta + \beta_{FG}$)	0.518*** (0.159)			
SG ($\beta + \beta_{SG}$)		0.226* (0.122)	0.223* (0.123)	0.223* (0.123)
OG ($\beta + \beta_{OG}$)		0.424* (0.231)	0.423* (0.231)	0.422* (0.231)
TG ($\beta + \beta_{TG}$)		0.920*** (0.212)	1.949*** (0.497)	
g (γ_g)			-1.815*** (0.583)	
STG ($\beta + \beta_{STG}$)				1.252*** (0.256)
LTG ($\beta + \beta_{LTG}$)				0.084 (0.089)

- Responsiveness of bond yields to macroeconomic surprises
 - Lower under state-dependent FG and long-horizon FG
 - No change under open-ended FG
 - *Increased* responsiveness under short-horizon FG
- Additional results in the paper
 - The role of QE
 - Increased responsiveness arises in absence of QE
 - Disagreement across 1-year ahead forecasts of 3-month rates
 - Consistent results
 - Robustness
 - Intraday data, 1-year bonds, off-ELB observations

- 1 Effect of forward guidance on responsiveness of bond yields
- 2 **Rational expectations model with noisy market information**
- 3 Summary

More precise public information can be detrimental:

1. Externalities in pay-offs

Agents are less uncertain about fundamentals, but using the better information is socially inefficient. (e.g. coordination motive as in Morris and Shin 2002, Angeletos and Pavan 2007)

2. Externalities in information structure

Price signal becomes less informative, as more precise public information crowds out aggregation of private information (Morris and Shin 2005, Amador and Weill 2010)

Financial markets

- Agents invest in bonds with payoff $\tilde{\theta} \sim N(\bar{\theta}, \tau_{\theta}^{-1})$

- Agents' optimisation problem

$$\max_{Q_i} \left[(E[\tilde{\theta}|\Omega_i] - P) Q_i - \frac{1}{2} Q_i^2 \right]$$

- Net supply of bonds $\tilde{\kappa} \sim N(\bar{\kappa}, \tau_{\kappa}^{-1})$

- Market clearing

$$p = \int E[\theta|\Omega_i] di + \kappa$$

$$(\text{where } p = P - \bar{\theta} + \bar{\kappa}, \theta = \tilde{\theta} - \bar{\theta}, \kappa = \bar{\kappa} - \tilde{\kappa})$$

Central bank

- CB mandate related to fundamental $\tilde{\pi} \sim N(\bar{\pi}, \tau_{\pi}^{-1})$
- CB observes $\pi = \tilde{\pi} - \bar{\pi}$ without noise
- CB is credible and time-consistent

Central bank without FG

- No-FG Taylor rule: $\theta = \alpha^{TR} \pi$,
with $\alpha^{TR} > 0$ common knowledge

Central bank providing FG

- CB announces α with $0 \leq \alpha < \alpha^{TR}$
- Lowering α implies “stronger” FG

Agents' information

- 1) Noisy public signal

$$y = \pi + \varepsilon$$

$$\varepsilon \sim N(0, \tau_\varepsilon^{-1})$$

- 2) Noisy private signal

$$s_i = \pi + \eta_i$$

$$\eta_i \sim N(0, \tau_\eta^{-1})$$

- 3) Heterogeneous interpretation of market prices
(Vives and Yang 2017)

$$x_i = p + \xi_i = \int E[\theta | \Omega_i] di + \kappa + \xi_i$$

$$\xi_i \sim N(0, \tau_\xi^{-1})$$

Equilibrium

Agents form expectations according to

$$E[\theta|\Omega_i] = a\alpha s_i + b\alpha y + cx_i$$

Aggregating and substituting the signals yields...

$$\int E[\theta|\Omega_i] di = \frac{a}{1-c}\alpha\pi + \frac{b}{1-c}\alpha(\pi + \varepsilon) + \frac{c}{1-c}\kappa$$

... and market price

$$p = \frac{a\alpha}{1-c}\pi + \underbrace{\frac{b\alpha}{1-c}y}_{\phi} + \frac{1}{1-c}\kappa$$

news sensitivity

Agents' expectations

$$E[\theta|\Omega_i] = a\alpha s_i + b\alpha y + cx_i$$

Structural disagreement $\Delta_s = a^2\alpha^2\tau_\eta^{-1}$

Behavioral disagreement $\Delta_b = c^2\tau_\xi^{-1}$

Total disagreement $\Delta = \Delta_b + \Delta_s$

News sensitivity

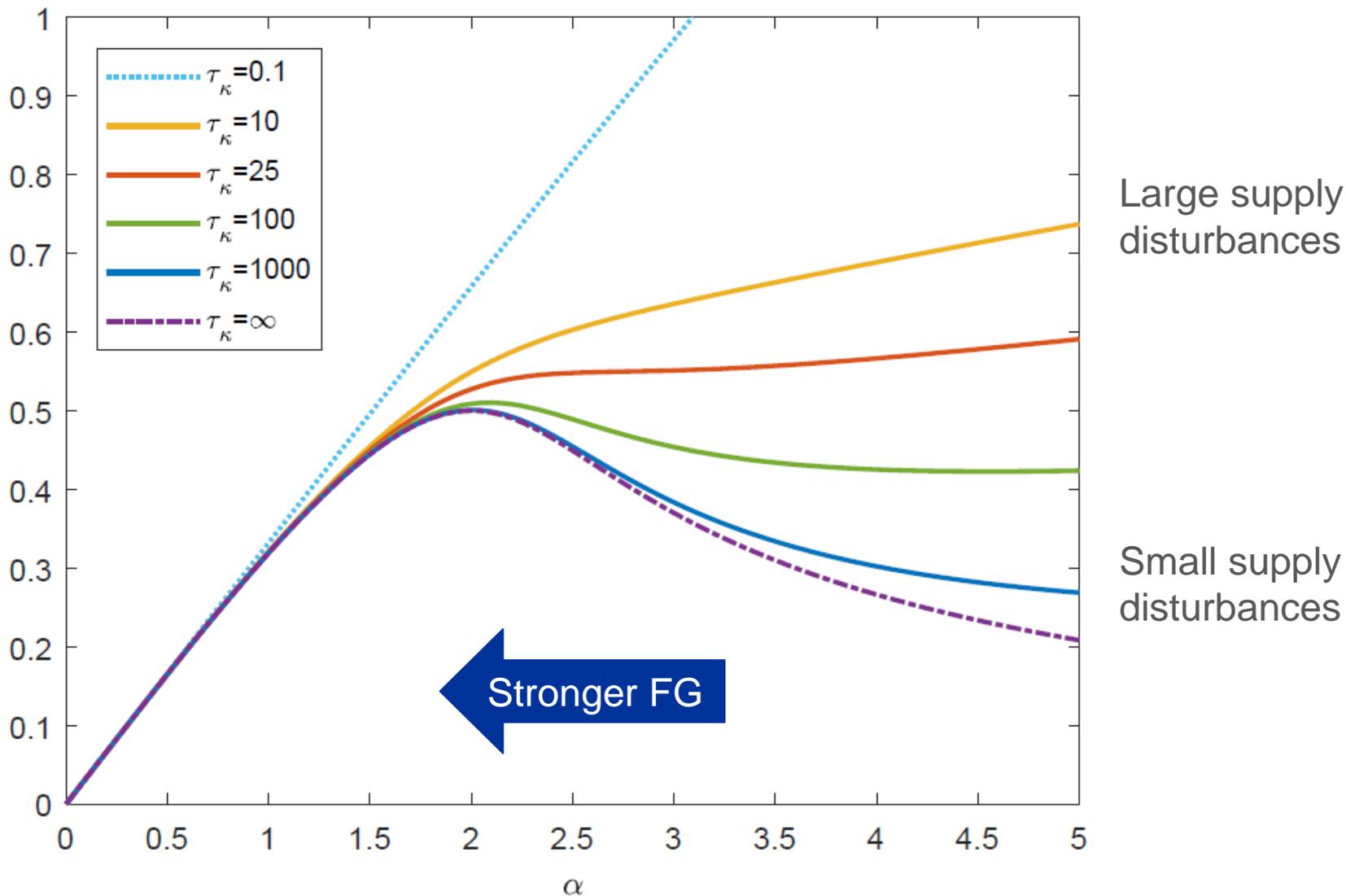
$$\phi = \frac{\alpha \tau_{\varepsilon}}{\frac{1}{1-c} \tau_{\eta} + \tau_{\varepsilon} + \tau_{\pi}}$$

- c is a real root of fixed-point equation

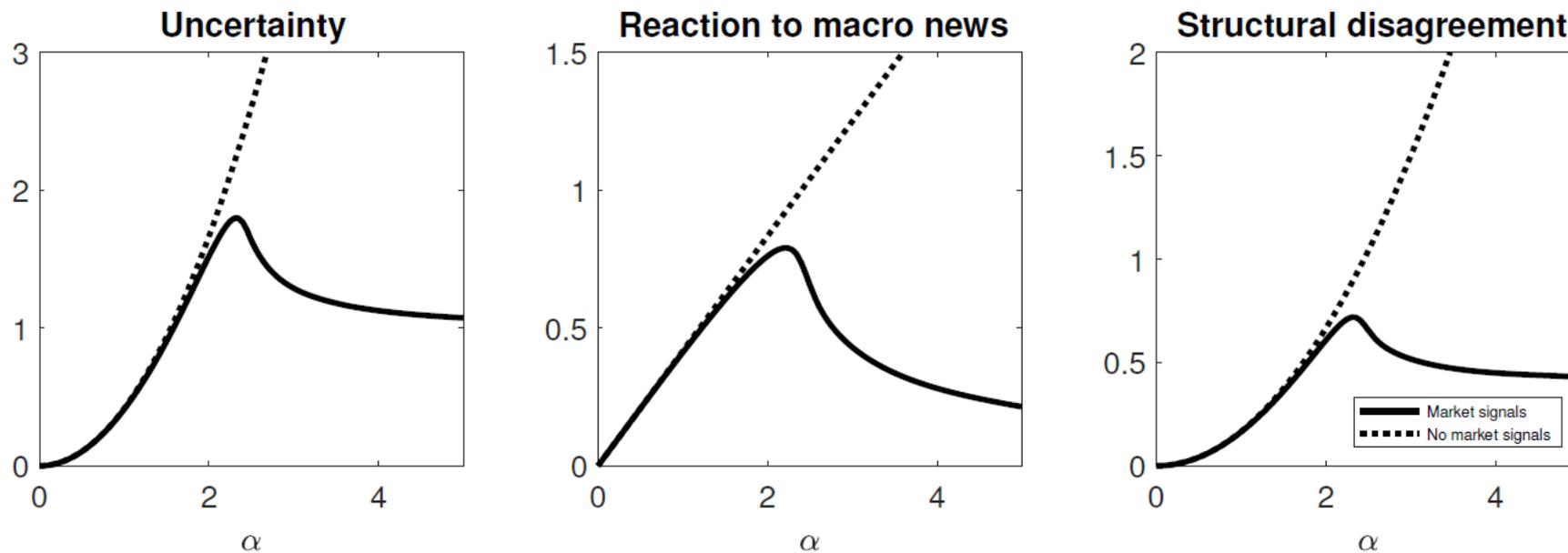
$$\frac{\frac{1}{1-c} \tau_{\eta}}{\left(\frac{1}{1-c} \tau_{\eta} + \tau_{\varepsilon} + \tau_{\pi}\right)^2} \alpha^2 - c \left[\frac{1}{(1-c)^2} \frac{1}{\tau_{\kappa}} + \frac{1}{\tau_{\xi}} \right] = 0$$

- $c \in (0,1)$ and $c \rightarrow 0^+$ as $\alpha \rightarrow 0^+$ or $\tau_{\eta} \rightarrow 0^+$
- If no endogenous price signal (i.e. $c = 0$):
 ϕ strictly increases in α , (same for disagreement)
- For $\tau_{\xi} \rightarrow \infty$, ϕ is a monotonic function of α
- For $\tau_{\kappa} \rightarrow \infty$, ϕ is a non-monotonic function of α

News sensitivity $\phi(\alpha)$

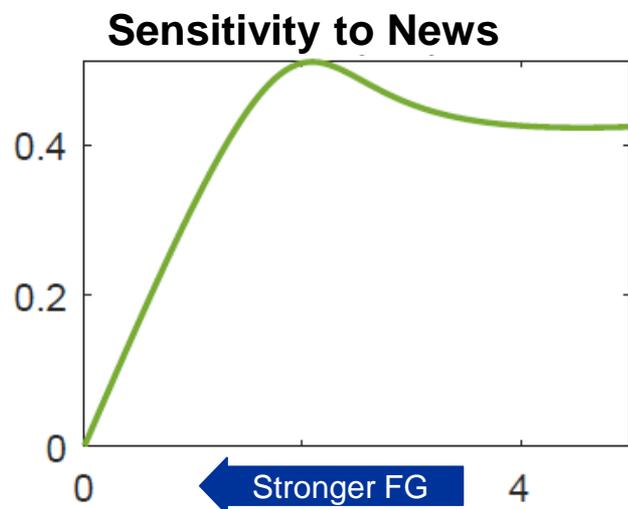


The role of the endogenous price signal



Notes: This figure shows how the presence of market prices affects the key quantities of the model. The figure is obtained with $\tau_\eta = 0.4$, $\tau_\varepsilon = \tau_\pi = \tau_\xi = 1$, which yields $\alpha^* = 2.21$.

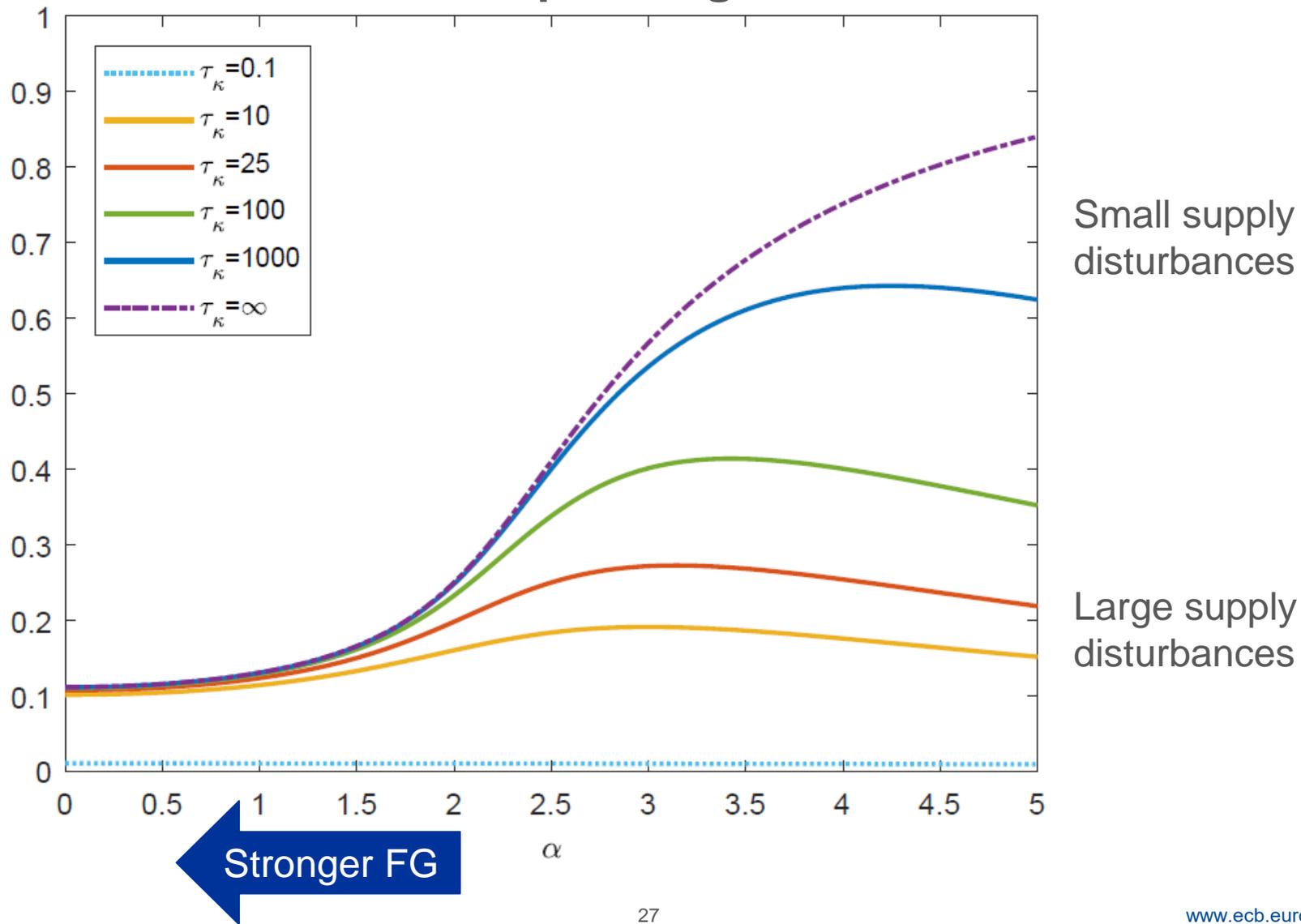
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- Effect of forward guidance depends on its strength
 - Sensitivity of bond yields to news *increased* under short-horizon FG
 - Effect differs by FG-type (e.g. no effect of open-ended FG on news responsiveness)
- In line with agents endogenously adjusting their reliance on private, public, and price signals
 - Effect of change in FG depends on strength of guidance already in place
 - Marginally increasing weak guidance may fail to reduce uncertainty

Thank you!

Precision of market price signal about θ



Weak forward guidance lowers overall disagreement, but can increase uncertainty

Case

$$\tau_K \rightarrow \infty$$

