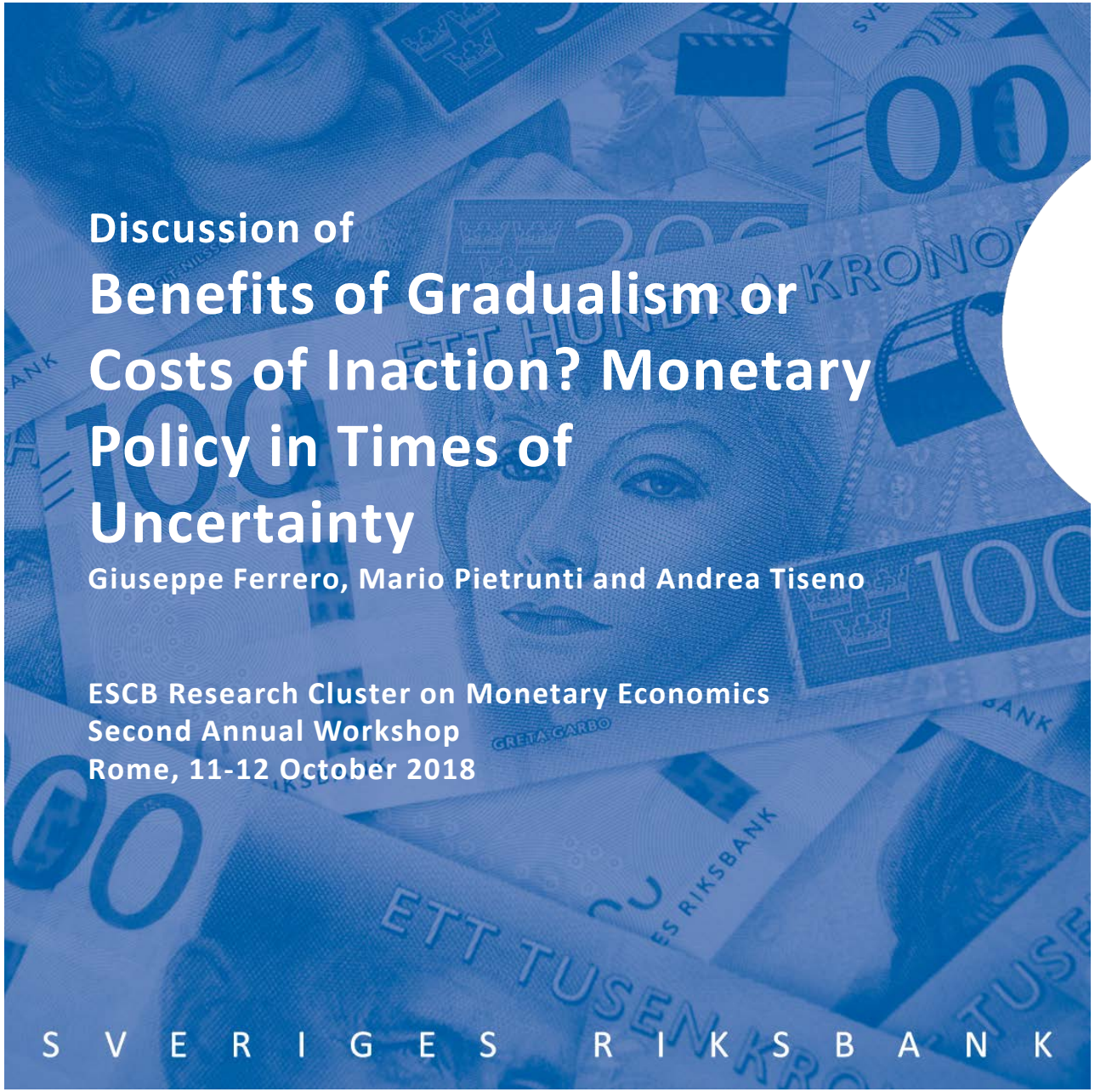


SVERIGES RIKSBANK

Stefan Laseen

1668 2018 350

Outline

- What is going on?
- Five comments:

1. The information structure.
2. Are all possible combinations of information and uncertainty really explored?
3. Where does $k_t = k + \tau_t$ show up in the non-linearised model? Welfare do not seem to be consistent with the structure of uncertainty in the model?
4. Strong case for a dual mandate / high weight on output gap?
5. Stability properties - ELB/ZLB and uncertainty - IRFs?

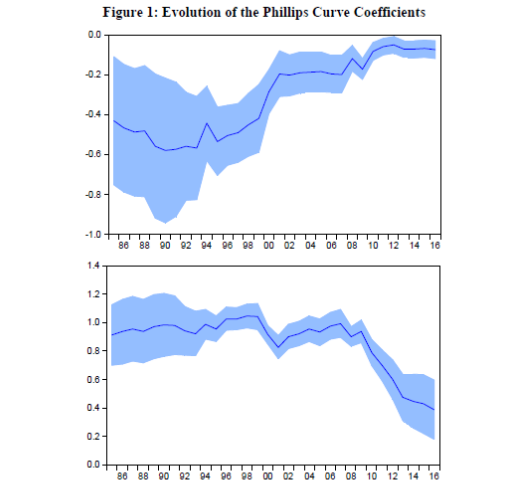
What is going on?

- Important question (good title)!
- Interesting paper!
- The paper studies optimal monetary policy under uncertainty in a basic forward looking New-Keynesian (NK) framework
  - Well known results here.. but…
- The paper also relaxes the assumption of full central bank information in this framework: introduces asymmetric information (Aoki 2003, Svensson and Woodford 2003).
- Contribution: (a) Closed form solutions

  (b) Show that there is an interaction between access to information and uncertainty. Agents realize that CB might make mistakes and adjust expectations accordingly.

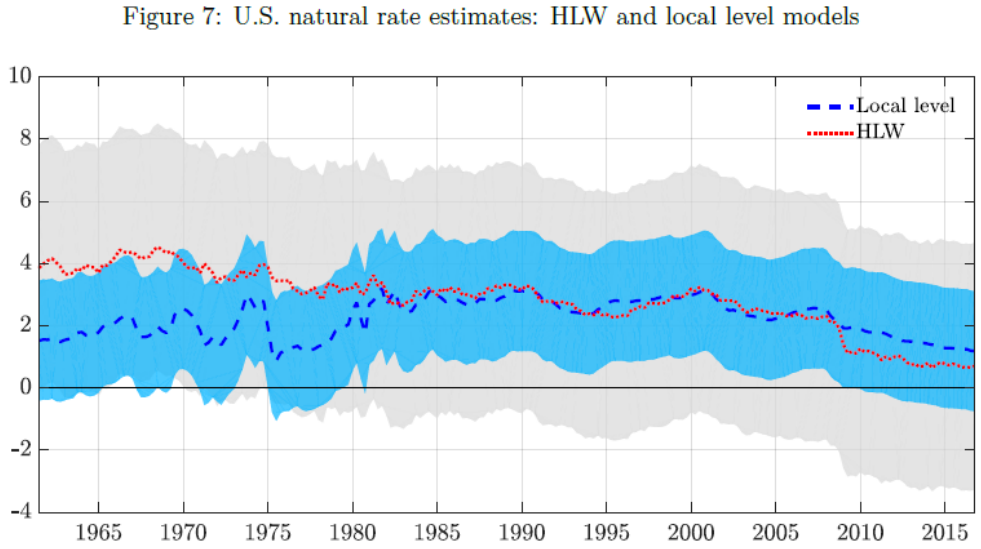
Comment 1: The information structure

- Good reason to be uncertain about slope of Phillips curve!
- Good reason to be uncertain about technology/natural rate of interest!
- Why?
    1. Empirically relevant



Note: Top panel and bottom panel show estimates of coefficients a and b, respectively, from $\Delta p^{core}(t) = a(U - U^*) + b\Delta p^{core}(t-1) + e(t)$ over 20-year rolling windows using annual data.

Erceg et al. (2018)



Fiorentini et al. (2018)

Comment 1: The information structure

- Good reason to be uncertain about slope of Phillips curve!
- Good reason to be uncertain about technology/natural rate of interest!
- Why?
    1. Empirically relevant
    2. Potentially important implications for monetary policy strategy.
        - Enormous literature
            - Knight (1921)
            - Brainard (1967)
            - Hansen and Sargent (2001)
            + many! applications

Comment 1: The information structure

- Good reason to introduce asymmetric information?
  - Yes… especially in general
    - Impact of heterogeneity and asymmetries in general are important to learn more about
    - CB makes only a few decisions each year.
    - Financial markets makes decisions continuously
    - Paper argues that agents have a better understanding of their own preferences and technology
  - Sort of no…
    - Forward guidance and CB transparency seems be of importance to financial markets.
    - Markets pay close attention to central banks' activities.. Why would they do that in this model? One reason: useful since the central bank gets it wrong all the time.. ?

Comment 1: The information structure

- Good reason to introduce asymmetric information?
  - Does a Central Bank have a private information (CBPI)?
    - Yes: Romer and Romer (2000), Barakchian-Crowe (2013), Campbell et. al (2016), Del Negro et.al (2015), Andrade-Ferroni (2016), Jarocinski and Karadi (2017), Nakamura and Steinsson (2018)
    - No: Faust, Swanson and Wright (2002)
    - Hence, private sector forecasters may according to these papers update their forecasts based on information they gleam from central bank announcements.
  - Four questions:

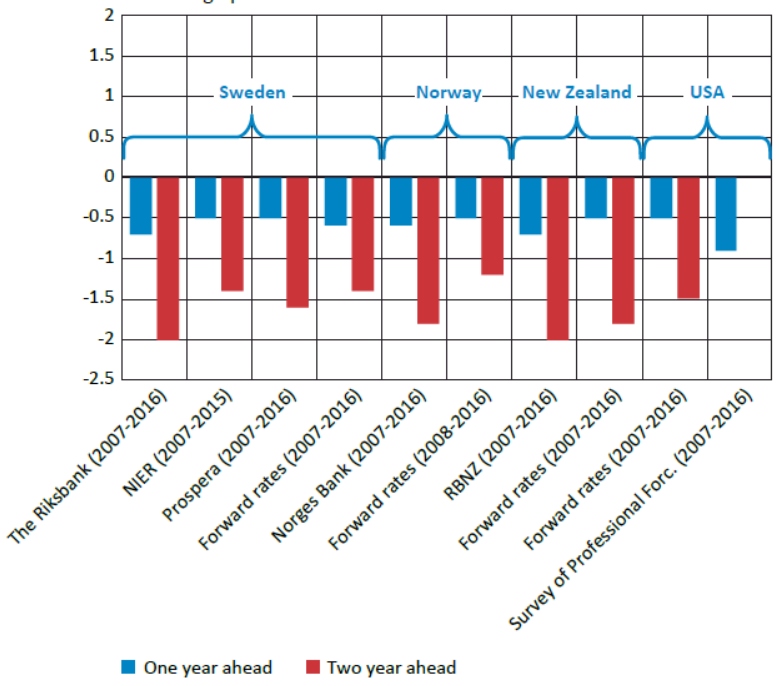
1. Can you strengthen the motivation? Do we observe this asymmetry? Is it plausible?
2. What are the implications of turning the information structure completely around?
3. Central bank never learns - good grief! /Martin Ellison 2005
4. Is the information assumption $\boldsymbol{i_t = \hat{i}_t}$ harmless?

Comment 1: The information structure $i_t = \hat{i}_t$?

Just an observation… Central bank and market expected policy rates are not always and everywhere equal…

Figure 2. Different analysts' policy rate forecasts: average deviation from outcome one and two years ahead

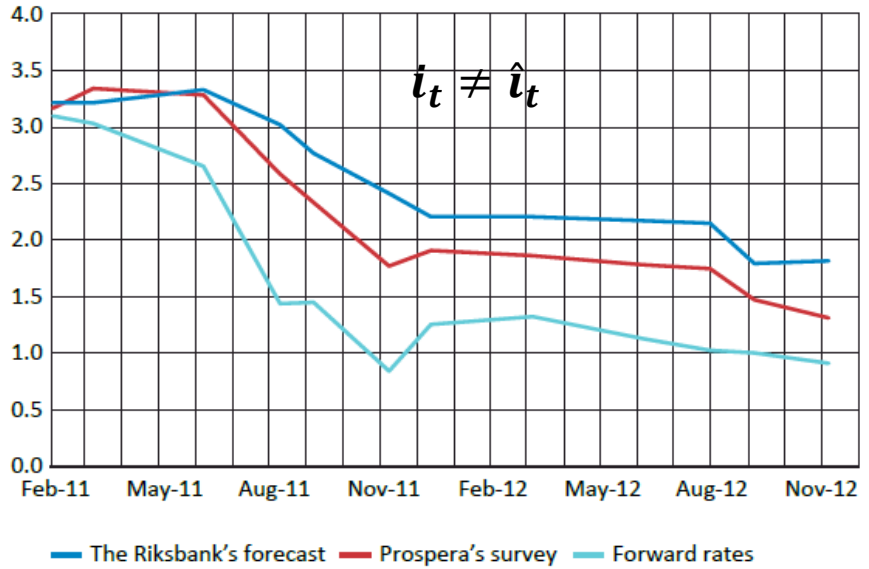
Percentage points



Note. A forecast deviation is defined as outcome minus the forecast, so a negative column entails an overestimation of the outcomes. For Survey of Professional Forecasters, only forecasts one year ahead are shown.
Source: Alsterlind (2017b)

Figure 4. Expected repo rate two years ahead during the period 2011-2012 according to the Riksbank's forecast, Prospera's survey and forward rates

Per cent



Note. Prospera's survey refers to money market participants.
Source: Alsterlind (2017a)

Comment 2: Combinations of asymmetric info and uncertainty

Are all possible combinations really explored in the paper?

ASYMMETRIC INFORMATION	UNCERTAINTY: Persistence of the technology shock = Yes	UNCERTAINTY: Persistence of the technology shock = No	UNCERTAINTY: Slope of the Phillips curve = Yes	UNCERTAINTY: Slope of the Phillips curve = No
Yes	Proposition 1 (CE)	√?	Proposition 2 & 3	√?
No	√?	Section 2.1	?	Section 2.1

√: Proposition 1
(By deduction from CE?)

Comment 2: Combinations of asymmetric info and uncertainty

Are all possible combinations really explored in the paper?

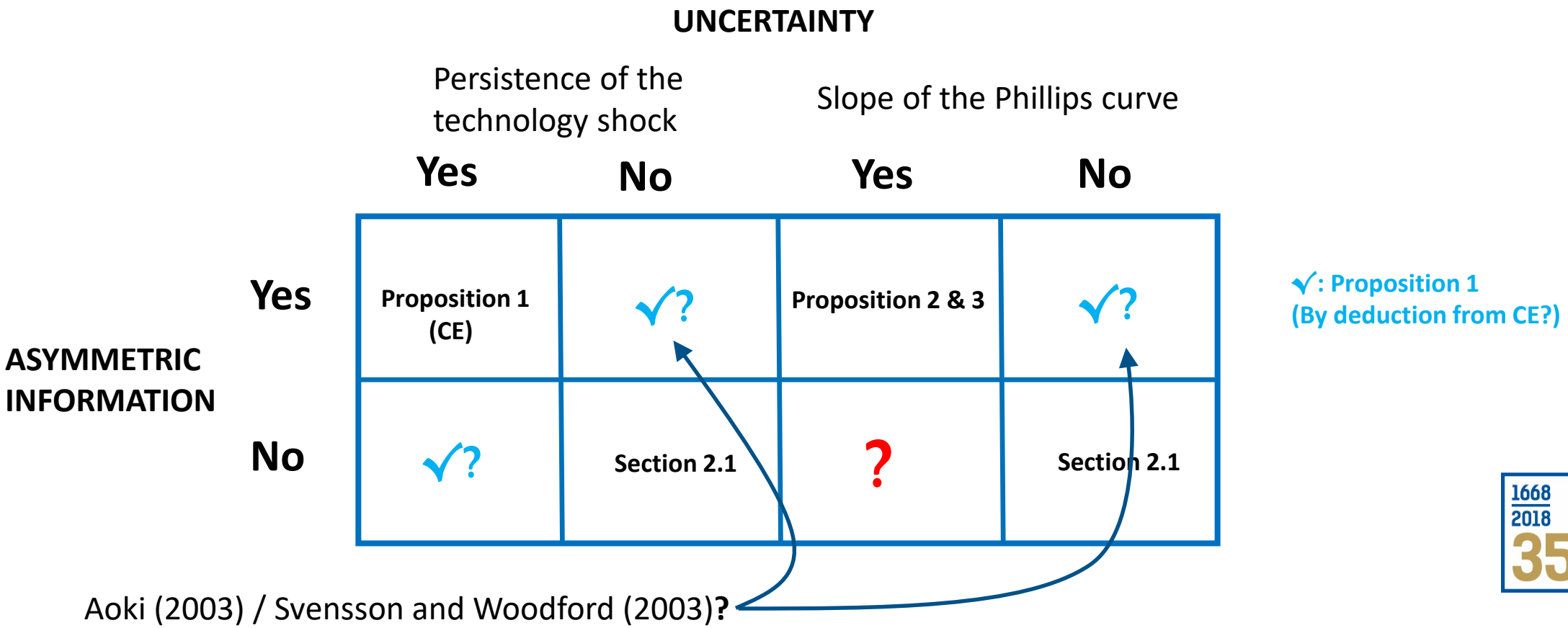
ASYMMETRIC INFORMATION	UNCERTAINTY: Persistence of the technology shock = Yes	UNCERTAINTY: Persistence of the technology shock = No	UNCERTAINTY: Slope of the Phillips curve = Yes	UNCERTAINTY: Slope of the Phillips curve = No
Yes	Proposition 1 (CE)	√?	Proposition 2 & 3	√?
No	√?	Section 2.1	?	Section 2.1

√: Proposition 1
(By deduction from CE?)

Söderström (2002) /Kimura and Kurozumi (2007) ?

Comment 2: Combinations of asymmetric info and uncertainty

Are all possible combinations really explored in the paper?



Comment 3: $k_t = k + \tau_t$?

- Where does $k_t = k + \tau_t$ show up in the non-linearised model?
  - The central bank's uncertainty about the fundamental parameters would generate uncertainty not only about the transmission of monetary policy but also about the transmission of shocks and about the welfare loss function.
  - Uncertainty about the Frequency of Price Adjustment?
  - Uncertainty about the Intertemporal Elasticity of Substitution?

- $x_t = E_t x_{t+1} - \frac{1}{\sigma}(i_t - E_t \pi_{t+1} - r_t^n)$
- $\pi_t = \beta E_t \pi_{t+1} + k_t x_t + u_t$
- $k_t = k + \tau_t$
- $k = \frac{(1-\theta)(1-\beta\theta)}{\theta} \frac{1-\alpha}{1-\alpha+\alpha\varepsilon}$
- $W = \frac{1}{2} E_0 \sum_{t=0}^{\infty} \beta^t [\pi_t^2 + \lambda \tilde{x}_t]$

θ: index of price stickiness
α : the measure of decreasing returns
ε : demand elasticity

Comment 3: $k_t = k + \tau_t$?

- Where does $k_t = k + \tau_t$ show up in the non-linearised model?
  - The central bank's uncertainty about the fundamental parameters would generate uncertainty not only about the transmission of monetary policy but also about the transmission of shocks and about the welfare loss function.
  - Uncertainty about the Frequency of Price Adjustment?
  - Uncertainty about the Intertemporal Elasticity of Substitution?

- $x_t = E_t x_{t+1} - \frac{1}{\sigma}(i_t - E_t \pi_{t+1} - r_t^n)$
- $\pi_t = \beta E_t \pi_{t+1} + k_t x_t + u_t$
- $k_t = k + \tau_t$
- $k = \frac{(1-\theta)(1-\beta\theta)}{\theta} \frac{1-\alpha}{1-\alpha+\alpha\varepsilon}$
- $W = \frac{1}{2} E_0 \sum_{t=0}^{\infty} \beta^t [\pi_t^2 + \lambda \tilde{x}_t]$ *vs* $W = \frac{1}{2} E_0 \sum_{t=0}^{\infty} \beta^t \left[\pi_t^2 + \left(\sigma + \frac{\varphi+\alpha}{1-\alpha}\right) \frac{k_t}{\varepsilon} \tilde{x}_t\right]$?

Welfare do not seem to be consistent with the structure of uncertainty in the model…

Comment 4: Easy solution - Dual mandate?

- In case λ is assigned to the central bank: Does the model imply a case for a dual mandate / high weight on x_t in the loss fcn?

  - $\hat{x}_t = x_t = -\frac{k}{\lambda+\sigma_k^2+k^2-\beta\lambda\varphi^u-\beta\varphi^u\sigma_k^2}u_t$ (according to Proposition 2)

  - Would not $\lambda \to \infty \Rightarrow \hat{\pi}_t = \pi_t$?

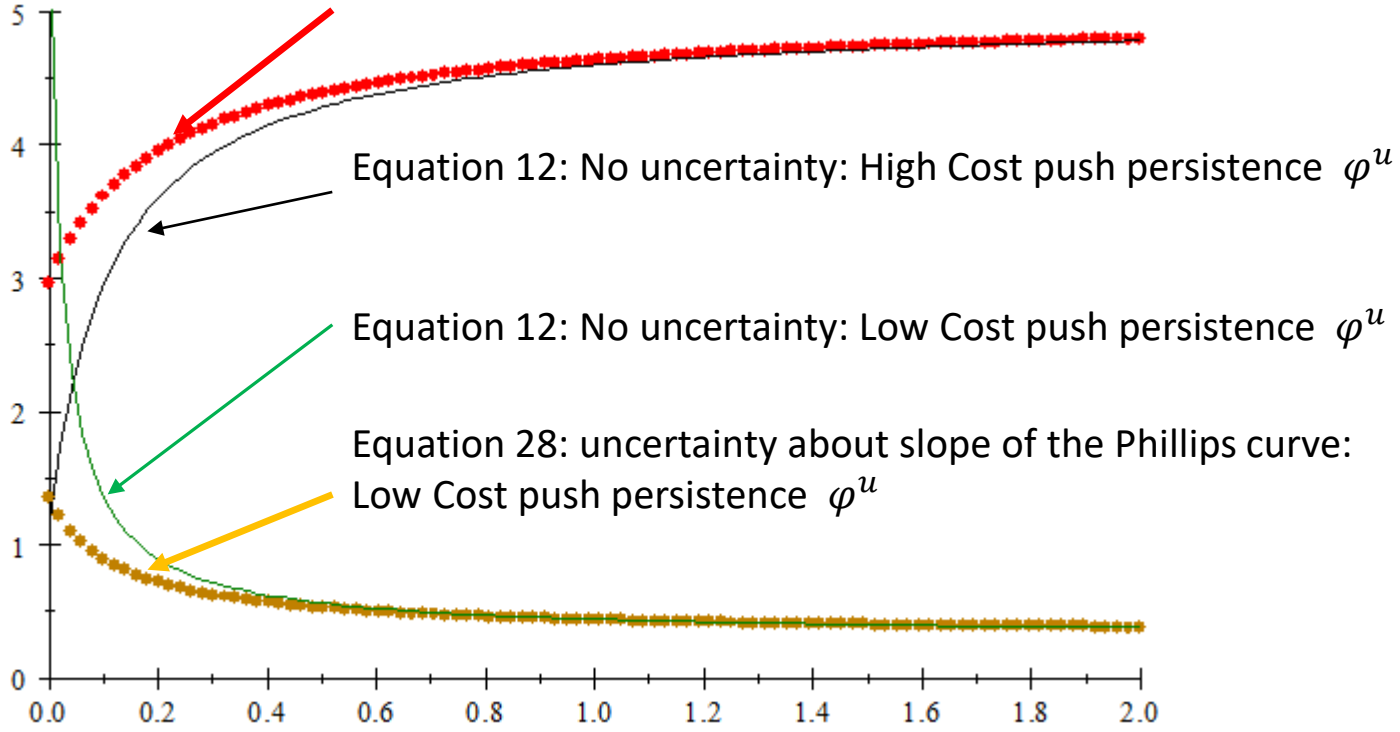
  - A high weight on output in the loss function gives a small difference between imperfect and perfect information

Comment 4: Easy solution - Dual mandate?

Interest rate reaction to supply shock

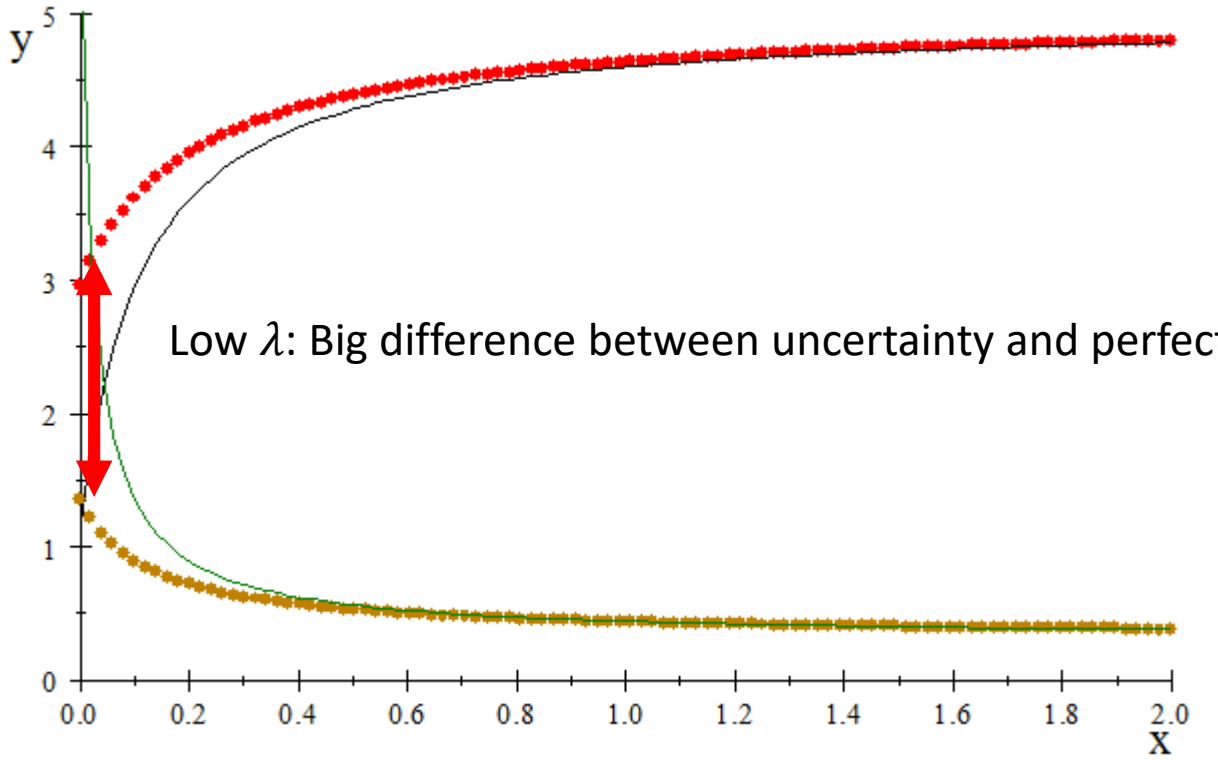
(12) $i_t = \rho - \sigma(1-\varphi_a)a_t + \frac{k\sigma(1-\varphi_u)+\lambda\varphi_u}{k^2+\lambda(1-\beta\varphi_u)}u_t$

(28) $i_t = \rho - \sigma(1-\varphi_a)a_t + \frac{k\sigma+\varphi_u\sigma_k^2+\lambda\varphi_u-k\sigma\varphi_u}{\lambda+\sigma_k^2+k^2-\beta\varphi_u(\lambda+\sigma_k^2)}u_t$



Comment 4: Easy solution - Dual mandate?

Interest rate reaction to supply shock

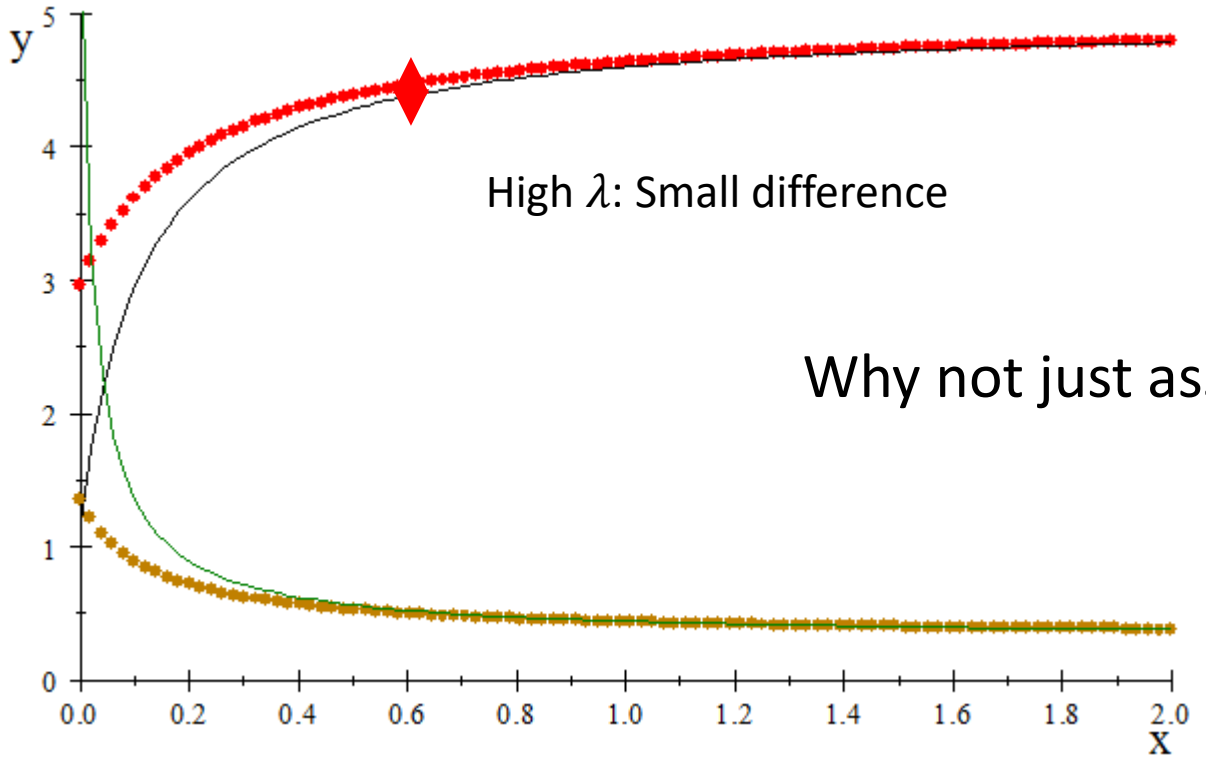


Low λ: Big difference between uncertainty and perfect information

Loss function weight λ

Comment 4: Easy solution - Dual mandate?

Interest rate reaction to supply shock



Loss function weight λ

High λ: Small difference

Why not just assign a high λ?!

Comment 5: Stability properties - ELB/ZLB and uncertainty - IRFs?

- Stability properties? Can (23) and (28) be viewed as desirable interest rate rules? I.e. do they guarantee a unique equilibrium? Is the Taylor principle modified?
- Unconventional monetary policy in the model?
  - ELB/ZLB and uncertainty of natural rate uncertainty – should interact but is missing in the paper..
  - Forward guidance? Would it ever be an option for a central bank with an outdated information set? Could it be explored?
    - Delphic forward guidance seems bound to fail: an expansionary forward guidance announcement reveals to the private sector proprietary central bank information that the economy is weaker than previously thought, which in turn implies that interest rates are likely to remain low for a longer time
- Some presentational suggestions:
  - Why not show IRFs accompanying Figure 1?
  - Taylor curves?

Summary

- Intersting paper!

1. Heterogeneity/asymmetric info is welcome but is the information structure plausible?
   - Can you strengthen the motivation? Do we observe this asymmetry? Is it plausible?
   - What are the implications of turning the information structure completely around?
   - Central bank never learns - good grief!
   - Is the information assumption $i_t = \hat{i}_t$ harmless?
2. Are all possible combinations of information and uncertainty really explored?
3. Where does $k_t = k + \tau_t$ show up in the non-linearised model? Welfare do not seem to be consistent with the structure of uncertainty in the model?
4. Strong case for a dual mandate?
5. Stability properties - ELB/ZLB and uncertainty - IRFs?