Fiscal Forward Guidance

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Introduction

- Does *fiscal forward guidance* improve social welfare?
  - Should the government announce the future tax change in advance?
  - Should the government announce the future government expenditure in advance?
    government expenditure in advance?
- These are of particular relevance to the global economy as of now, where most of the developed countries are left with huge government debt.

Related Literature

- Angeletos and Pavan (2007): static, dispersed info.
  - "if business cycles are driven primarily by shocks in markups or other distortions that induce a countercyclical efficiency gap, it is possible that providing markets with information that helps predict these shocks may reduce welfare."
- Fujiwara and Waki (2016): dynamic, private news
  - "the central bank finds it optimal to commit to not revealing its superior information about news shocks at all, either directly through communication or indirectly through observable policy actions."
  - This *ignorance-is-bliss* result holds even with the news on the natural rate shocks and the Taylor rule, implying that future consumption tax announcement is welfare-detrimental.
- This paper examines whether this holds even without nominal rigidities.
  - A tax change, which is no doubt private information to the government, is a distortionary shock.

Main result

- Enabling the private sector to forecast future fiscal shocks more accurately can be detrimental to welfare.
- We prove this in some simple settings.
- We confirm this in more general settings through numerical exercises.

An illustrative example: Ramsey model with stochastic capital income tax

Ramsey model with stochastic capital income tax

- Rep. HH maximizes

$$u(c_0) + \mathbb{E}_0^P \sum_{t=1}^{\infty} \beta^t u(c_t)$$

subject to

$$c_t + k_{t+1} = (1 - \tau_t^K) r_t k_t + w_t + (1 - \delta) k_t + T_t.$$

- Inelastic labor supply
- Firm's optimality:

$$r_t = \alpha K_t^{\alpha - 1}, \quad w_t = (1 - \alpha) K_t^{\alpha}$$

- Government budget constraint:

$$\tau_t^K r_t K_t = T_t.$$

- In equilibrium, $k_t = K_t$.

Stochastic capital income tax

- Capital income tax starts high and is *reduced* at a random timing.
- τ_t^K follows a two-state Markov chain.
- Initial condition: $\tau_0^K = \tau_{high}^K$.
- Markov transition to $\tau_{low}^K < \tau_{high}^K$ with probability $1 - p$.
- τ_{low}^K is the absorbing state.

Question

- Q: Is it beneficial if the HH observes *n*-period ahead tax shock?
- Motivation: when the government privately knows its future action, credible communication can provide such information to the public.

Welfare criterion

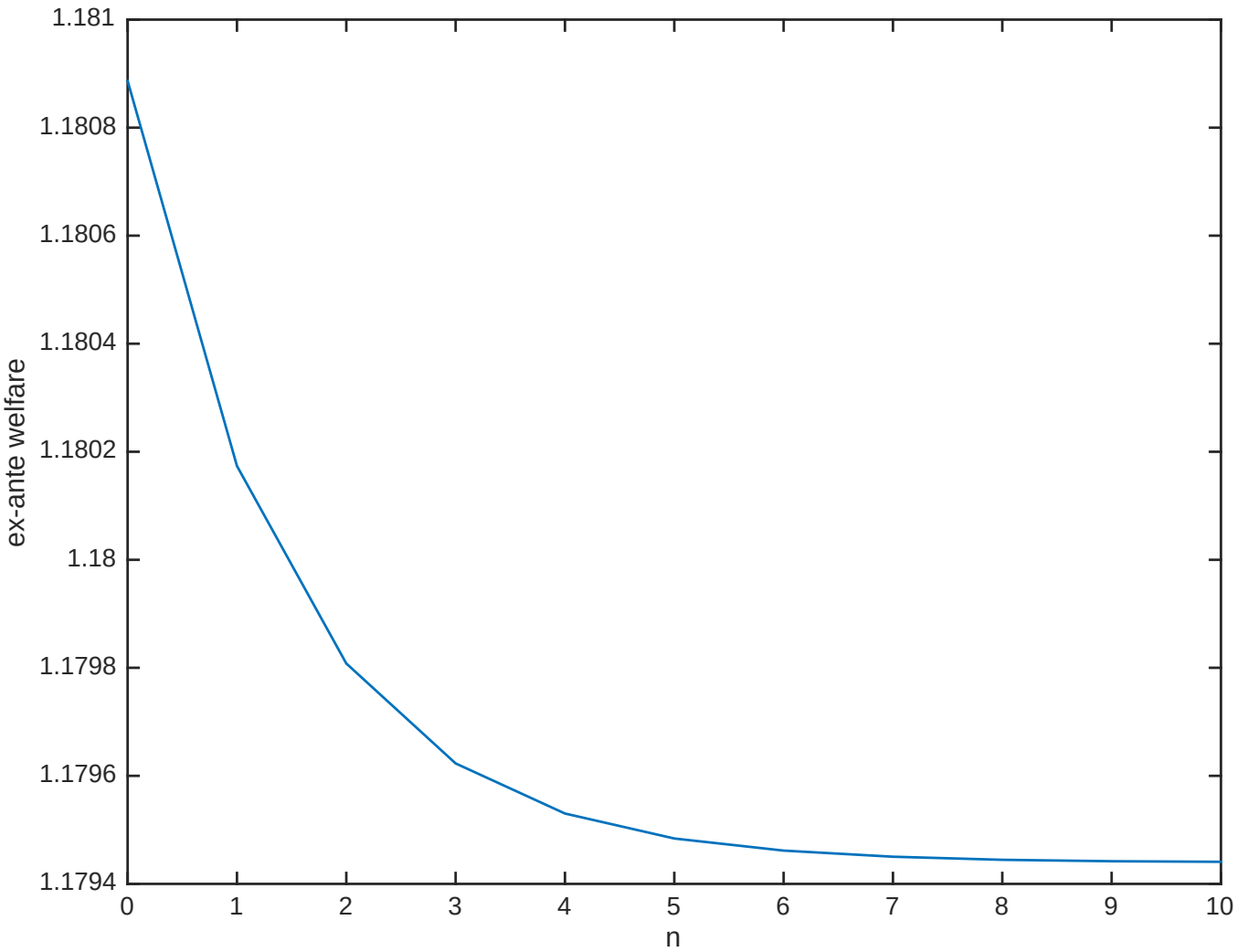
- Ex-ante welfare:

$$W_n := \sum_{i=1}^{n} Pr(\text{tax changes at } t = i) \times \text{corresponding HH's utility}$$
$$+ Pr(\text{tax doesn't changes by } t = n) \times \text{corresponding HH's utility}$$

- Welfare evaluated *before* the government receives *private news*.
- A: Ex-ante welfare decreases with n.
- Secrecy is ex-ante optimal.

Ex-ante welfare decreases with n

Log utility and $(\beta, \alpha, \delta, \tau^K_{high}, \tau^K_{low}, p) = (0.96, 0.3, 0.1, 0.2, 0.1, 0.8)$.



Intuition

- From the ex-ante viewpoint, policy can be
  - Good: distortionary tax is reduced quickly, or
  - Bad: distortionary tax stays high for many periods.
- HH's utility increases when learning that the policy is good increases but decreases when learning that the policy is bad.
- The latter effect dominates the former.
- Caveat: secrecy may not be optimal ex-post — time-inconsistency problem.

Theoretical results

A two-period consumption-savings model

- The representative HH solves:

$$\max_{C_1, C_2, S_1} \ln C_1 + \mathbb{E}^P[\ln C_2]$$

subject to

$$\begin{aligned} C_1 + S_1 &= Y_1 \\ C_2 &= (1 - \tau_2^K) S_1 + T_2 \end{aligned}$$

- Y_1 is exogenous income in period 1.
- GBC: the gov't rebates the tax revenue back to the HH:

$$T_2 = \tau_2^K S_1.$$

Equilibrium condition

$$\begin{aligned} \frac{1}{C_1} &= \mathbb{E}^P[\frac{1}{C_2}(1-\tau_2^K)] \\ C_2 &= S_1 \\ C_1 &= Y_1 - S_1 \end{aligned}$$

- Saving rate $s := S_1/Y$.
- Then

$$\frac{s}{1-s} = \mathbb{E}^P[1-\tau_2^K].$$

$$s = \frac{\mathbb{E}^P[1-\tau_2^K]}{1+\mathbb{E}^P[1-\tau_2^K]}, \quad 1-s = \frac{1}{1+\mathbb{E}^P[1-\tau_2^K]}.$$

Ex-ante welfare

- Let x denote $\mathbb{E}^P[1-\tau_2^K]$.
- Ex-ante utility of the HH is

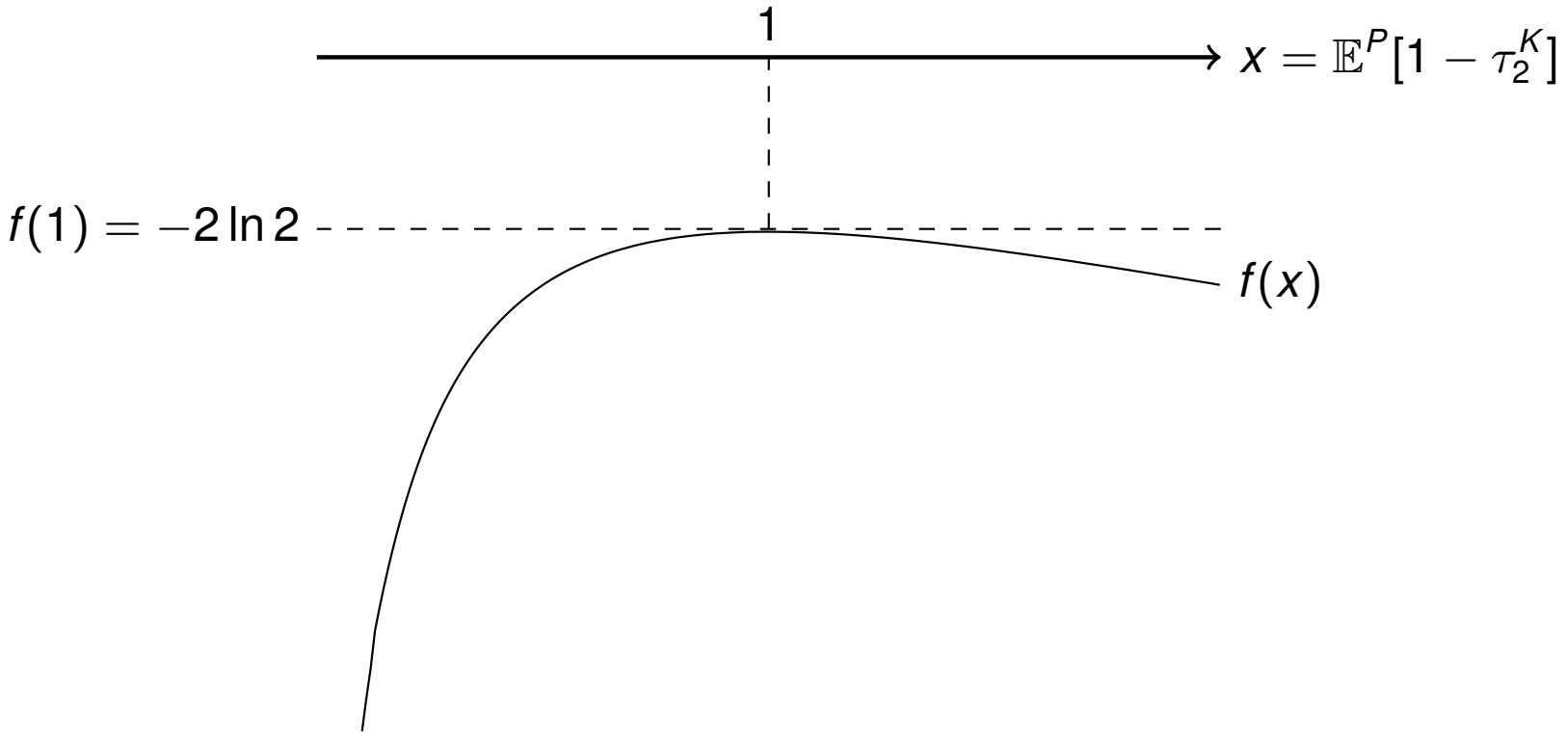
$$\begin{aligned}\mathbb{E}[\ln C_1 + \ln C_2] &= \mathbb{E}[\ln(1-s) + \ln s + 2\ln Y_1] \\ &= \mathbb{E}[\ln x - 2\ln(1+x)] + 2\ln Y_1.\end{aligned}$$

- Let $f(x) := \ln x - 2\ln(1+x)$. Then ex-ante welfare is

$$\mathbb{E}[\ln C_1 + \ln C_2] = \mathbb{E}[f(x)] + \text{constant}$$

- f is strictly concave on $[0, 1+\sqrt{2}]$.

Ex-post welfare is strictly concave in distortion



Concavity $\Rightarrow$ Variability of $\mathbb{E}^P[1 - \tau_2^K]$ is on average harmful.

Theorem

Suppose $0 < 1 - \tau_2^K < 1 + \sqrt{2}$ *almost everywhere. Then ex-ante welfare decreases when the HH obtains more information about* τ_2^K.

Robustness

Theoretical result extends to other settings

- Whenever $\mathbb{E}^P[1 - \tau_2^K]$ becomes more accurate, ex-ante welfare decreases. Noisy signals, etc.
- With log utility, no distortion when the tax revenue is used for gov't spending. (Still, giving more information is not welfare improving.)
- With a general CRRA utility function, savings still distorted by expectations.
- An infinite horizon Brock-Mirman model

Numerical exercises

- RBC model with news shocks for future taxes.
- Welfare loss from news is bigger for consumption and capital income taxes than for labor income tax.
- Welfare loss can be as large as 0.1% for consumption and capital income taxes. (STD of shocks = 5%; persistence $\approx$ 1.)
- Intertemporal distortion seems crucial.

Conclusion

Conclusion

- *Fiscal forward guidance* can be detrimental to ex-ante welfare.
- When possible, the benevolent government wants to commit to secrecy.
- Future extension includes
  - Quantitative analysis of fiscal uncertainty (fiscal consolidation)
  - Optimal fiscal policy using the LQ framework by Benigno and Woodford (2006) (complement to Fujiwara and Waki (2016) on monetary policy)
  - Time-consistent communication policy