Discussion of "Monetary and Fiscal Interaction without Commitment and the Value of Monetary Conservatism," by Klaus Adam and Roberto Billi

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Very nice paper!

Part of a broader research agenda of integrating monetary and fiscal policy in DSGE models.

Makes an important contribution by analyzing monetary and fiscal policy interactions *without commitment* in a dynamic model.

Shows several interesting results.

Main contribution is the ambitious setup of the model, careful expositions, and several equilibrium definitions that can be useful to understand the value of commitment.

Outline of talk:

1. Summary of Adam and Billi's results in a simplified (less ambitious) model.

2. One extension (shocks) that changes the value of inflation conservatism (creates a deflation bias that can be disastrous).

Summary of (a few) results in Adam and Billi:

(i) In addition to inflation bias there is a government spending bias

(ii) this spending bias is higher the more conservative the CB

(iii) under some assumptions (about taxes) the inflation bias is increasing in the government spending bias

(iv) both biases can be eliminated by appointing an inflation conservative central banker if the central bank moves after the treasury.

Simplified (less ambitious) model: No tax distortions

For simplicity I linearize around the efficient equilibrium where the government subsidizes production so that the economy is fully efficient.

I also assume lump-sum taxes.

Proposition one can proof: If we choose subsidies to eliminate monopoly markups Ramsey and Markov agree: There is no inflation or government spending bias.

This Proposition tells us: The source of both biases is the same, i.e. monopoly power of firms, that both authorities try to correct by stimulating the economy.

Here: Summarize the result of the paper by a local expansion around this efficient equilibrium. Advantage: Gives closed form solutions that helps us understand the results.

A second order Taylor expansion of utility yields:

$$U_t = -\tfrac{1}{2} E_t \sum_{T=t}^{\infty} \beta^T L_T$$

where

$$L_t = \pi_t^2 + \lambda_y (\hat{Y}_t - \hat{Y}_t^n - x^*)^2 + \lambda_G (\hat{G}_t - \hat{G}_t^n)^2$$

here $x^* > 0$ measures the degree of monopoly power of firms that creates inefficiently low production.

If optimal subsidies $x^* = 0$.

Policy authorities will try to target output that is above the "natural rate" captured by $\hat{Y}_t^n$ to reduce the monopoly distortions.

Euler Equations of firms

$$\pi_t = \kappa(\hat{Y}_t - \hat{Y}_t^n) + \beta E_t \pi_{t+1}$$

Euler Equations of households

$$\hat{C}_t = E_t \hat{C}_{t+1} - \sigma(i_t - E_t \pi_{t+1})$$

Resource constraint

$$\hat{Y}_t = \hat{C}_t + \hat{G}_t$$

Natural Rates:

$$\hat{Y}_t^n = \frac{\sigma^{-1}}{\sigma^{-1}+\omega} \hat{G}_t$$

$$\hat{G}_t^n = 0$$

Markov Perfect Game:

The Central bank plays i_t taking expectations and fiscal policy as given.

–> This implies that the CB determines $\hat{C}_t$ by the household Euler Equation.

Fiscal policy plays $\hat{G}_t$ taking expectations and monetary policy as given.

Both authorities can predict each others equilibrium actions even if they do not act strategically.

Central Bank puts and extra weight α on inflation

Form Lagrangian

$$\begin{aligned} L_t &= (1+\alpha)\pi_t^2 + \lambda_y(Y_t - \frac{\sigma^{-1}}{\sigma^{-1}+\omega}\hat{G}_t - x^*)^2 + \lambda_G \hat{G}_t^2 \\ &+\phi_{1t}(\pi_t - \kappa Y_t + \kappa\frac{\sigma^{-1}}{\sigma^{-1}+\omega}\hat{G}_t - \beta E_t\pi_{t+1}) \\ &+\phi_{2t}(Y_t - \hat{C}_t - \hat{G}_t) \end{aligned}$$

For Treasury $\alpha = 0$ but it could be > 0 for a conservative CB.

We can solve first order conditions for fiscal policy by taking $\hat{C}_t$ and $E_t\pi_{t+1}$ as given.

We can then solve first order conditions for monetary policy by taking $\hat{G}_t$ and $E_t\pi_{t+1}$ as given

The Inflation Bias

Steady state equilibrium derived from the CB FOC

$$\pi = \frac{\kappa\lambda_y}{(1-\beta)\lambda_y + \kappa^2(1+\alpha)}x^*$$

$$Y = (1-\beta)\kappa^{-1}\bar{\pi} + \frac{\sigma^{-1}}{\sigma^{-1}+\omega}\bar{G}$$

Can determine the inflation bias independently of fiscal policy.

But equilibrium output depends on it.

This means that in equilibrium the central bank sets $\hat{C}_t$ (i.e. interest rate) so as to achieve a given inflation target no matter how aggressive fiscal policy is.

Output, however, is increasing in fiscal spending.

The inflation bias is decreasing in α as in Rogoff (1987).

The Spending Bias

Steady state equilibrium from the FOC of the Treasury imply

$$\begin{aligned} G &= -\frac{\omega}{\sigma^{-1}+\omega}\frac{(1-\beta)\lambda_y+\kappa^2}{\kappa\lambda_G}\bar{\pi}+\frac{\omega}{\sigma^{-1}+\omega}x^* \\ &> 0 \text{ if } \pi < \frac{\kappa\lambda_y}{(1-\beta)\lambda_y+\kappa^2}x^* \end{aligned}$$

There is spending bias at low inflation.

This is because if there is low inflation the Treasury wants to stimulate output closer to its efficient level by a fiscal expansion.

Higher level of inflation reduces the spending bias.

What is going on?

$$\hat{Y}_t = \hat{C}_t + \hat{G}_t$$

$$\begin{aligned} \pi_t &= \kappa \hat{Y}_t - \kappa \frac{\sigma^{-1}}{\sigma^{-1} + \omega} \hat{G}_t + \beta E_t \pi_{t+1} \\ &= \kappa \hat{C}_t + \kappa \frac{\omega}{\sigma^{-1} + \omega} \hat{G}_t + \beta E_t \pi_{t+1} \end{aligned}$$

Because the treasury takes $\hat{C}_t$ and $E_t \pi_{t+1}$ as given any additional spending $\hat{G}_t$ increases output 1-1 and inflation by a factor of $\frac{\omega}{\sigma^{-1}+\omega}$.

Increasing output serves its objectives but increasing inflation does not.

—> On the margin the treasury will increase $\hat{G}_t$ by less the higher the *equilibrium* inflation it predicts (taking the CB actions into account).

If Central Bank is not goal conservative and lump-sum taxes, derivation above shows that there is no spending bias local to the efficient steady state (authors find very small bias in an earlier version of the paper assuming lump-sum taxes).

–> But the authors consider an additional source of distortions, namely distortionary labor taxes.

This gives a government spending bias that is significant, even locally to the efficient equilibrium.

It also creates an interesting feedback between the spending bias and the inflation bias —> Higher taxes –> Higher distortions –> Higher inflation bias.

Authors show in numerical examples that labor taxes increases the distortions of discretionary monetary and fiscal policy significantly.

Assume that any changes in the budget (from the efficient steady state) need to be raised by a distortionary labor taxes. Then (assuming a balanced budget) the only changes from previous analysis is that

$$\pi_t = \kappa \hat{C}_t + \kappa \frac{\omega}{\sigma^{-1} + \omega} \hat{G}_t + \psi \kappa \hat{\tau}_t + \beta E_t \pi_{t+1}$$

Assuming a balance budget we can now derive optimal monetary and fiscal policy. From the monetary policy problem one obtains:

$$\pi = \frac{\kappa \lambda_y}{(1-\beta)\lambda_y + \kappa^2(1+\alpha)} x^* + \psi \frac{\kappa \lambda_y}{(1-\beta)\lambda_y + \kappa^2(1+\alpha)} G$$

so that the inflation bias depends on government spending.

A spending bias increases the inflation bias!

Distortionary taxes

-> Output farther away from efficient level

–> Increases the benefit of a monetary expansion.

Formula for fiscal spending bias takes a similar from as before.

Again it is decreasing in $\bar{\pi}$.

Need certain parameter restrictions to ensure a fiscal spending bias?

To summarize the paper so far:

There is a government spending bias that has the same source as the inflation bias

–> Inefficiently low output (through monopoly distortions) give the Treasury an incentive to boast output through spending.

With labor tax distortions a government spending bias *increases* the inflation bias because taxation moves output further away from its efficient level.

Open to question: Is this model of taxes the best? Here taxation increases marginal cost so that $\tau_t \uparrow$ then $\pi_t \uparrow$.

But many economist believe tax increase to be deflationary and tax cuts inflationary.

This could have to do with different form of taxation or finite lifetime of the consumers (so there is wealth effect).

Not clear if the results generalize to this environment.

Clever extension in the paper: Suppose the Treasury always moves first.

Alternative interpretation: Suppose that the monetary authority can react to fiscal policy.

In this case if we appoint a conservative central banker both biases vanish!

–> Strong case for a conservative central bank coupled with flexibility to react to fiscal authorities simultaneously.

If the Treasury understands that the CB will undo the expansionary effect of fiscal spending

—> The Treasury will not increase spending in the first place!

Bottom line of the paper: Lack of fiscal commitment strengthens the case for an inflation conservative CB.

Another extension (not in this paper!): The Case Against Inflation Conservatism

Based on:

Eggertsson (2005), "The Deflation Bias" JMCB

Eggertsson (2005), "Fiscal Policy multipliers and the Economic Consequences of FDR" WP

Extent the model:

Consider shocks

Introduce a non-trivial state variable: Nominal debt.

Assume the conservative loss function suggested by Adam and Billi

$$U_t = -\frac{1}{2}E_t \sum_{T=t}^{\infty} \beta^T \pi_t^2$$

Add shock to their model and hold fiscal policy constant. Then the linearized consumption Euler Equation is:

$$\hat{Y}_t = E_t\hat{Y}_{t+1} - \sigma(i_t - E_t\pi_{t+1} - \hat{r}_t^n)$$

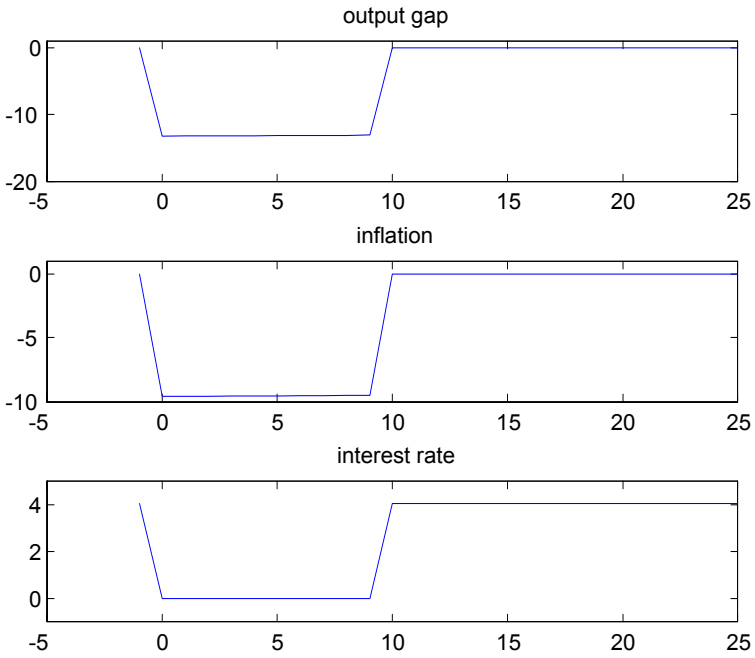
The nominal interest rate cannot be negative so that:

$$i_t \geq 0$$

Now consider a shock to the natural rate of interest so that it is negative in period 0 and return with probability α.

$$\begin{aligned} \hat{Y}_t &= \frac{1-\beta(1-\alpha)}{\alpha(1-\beta(1-\alpha)) - \sigma\kappa(1-\alpha)}\sigma\tilde{r}_L^n < 0 \\ \text{if } \tilde{r}_t^n &= \tilde{r}_L^n \text{ and } \hat{Y}_t = 0 \text{ otherwise} \end{aligned}$$

$$\begin{aligned} \pi_t &= \frac{1}{\alpha(1-\beta(1-\alpha)) - \sigma\kappa(1-\alpha)}\kappa\sigma\tilde{r}_L^n < 0 \\ \text{if } \tilde{r}_t^n &= \tilde{r}_L^n \text{ and } \pi_t = 0 \text{ otherwise} \end{aligned}$$



The Markov Equilibrium under a conservative Central Bank with negative natural rate of interest.

Deflation bias created by a commitment to conservative objective and discretionary policy.

The optimal thing to do would be to commit to future inflation

This is impossible if CB cannot commit to future policy.

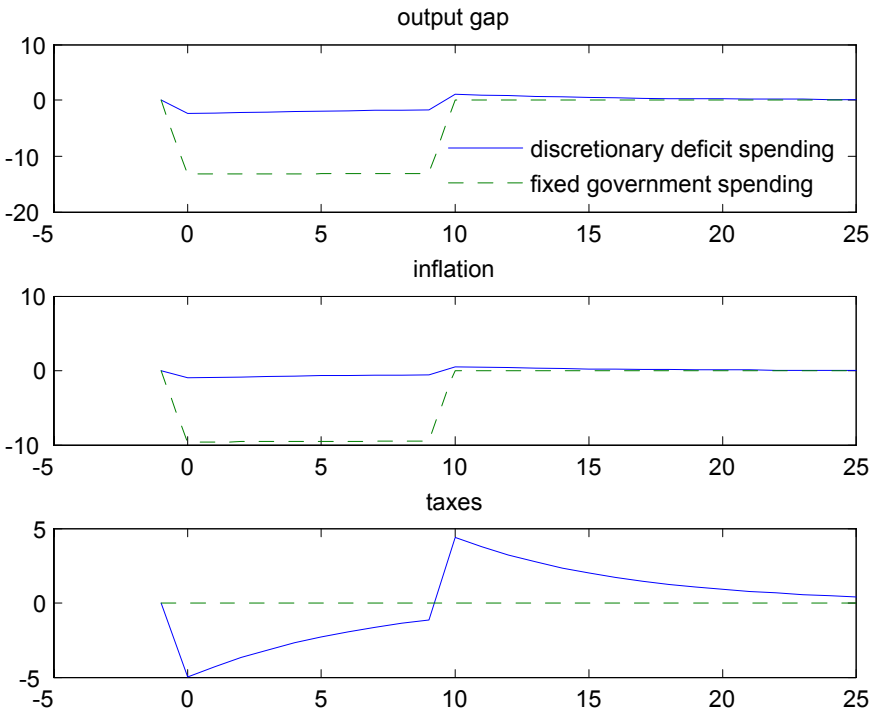
The welfare cost of conservative CB:

4.7 percent in consumption equivalence units in the figure.

One Possible Solution if the government cannot commit: Coordinate monetary and fiscal policy to maximize social welfare. In this case one can make reflation credible by deficit spending or printing money and buying real assets (such as the gold purchase program of FDR).

Eggertsson (2005) analyses a Markov Perfect Equilibrium in the *same model* and shows that coordination of monetary and fiscal policy is optimal when there are large deflationary shocks and inflation bias is modest.

Allows the government to change expectations from deflationary to inflationary ones.



The Markov Equilibrium under coordination vs. a conservative central bank when the natural rate of interest is negative.

Conclusion:

Conservatism on inflation can solve the inflation bias and even a government spending bias.

Conservatism on inflation, however, can lead to a deflationary bias when there are large shocks.

The Federal Reserve during the Great Depression and the Bank of Japan today are examples of that the cost of the deflationary bias can be very large.

Can easily dominate other considerations and make a case for at least temporary coordination of monetary and fiscal policy.