Materials 17 for Peter - Commitment vs. discretion

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1 A optimal commitment policy path for learning?

Take a very simple optimal policy problem

$$\mathcal{L} = \mathbb{E}_{t_0} \sum_{t=t_0}^{\infty} \beta^{t-t_0} \Big\{ \pi_t^2 + \varphi_t(\pi_t - \beta \pi_{t+1}) \Big\} \tag{1}$$

Under RE and commitment, the authority chooses a sequence $\{\pi_t\}_{t=0}^{\infty}$ to minimize the expected discounted loss function.

Under RE and discretion, the authority chooses π_t to minimize the expected discounted loss function. So I could write the expected inflation as a variable f_t that is exogenous to the authority:

$$\mathcal{L} = \mathbb{E}_{t_0} \sum_{t=t_0}^{\infty} \beta^{t-t_0} \Big\{ \pi_t^2 + \varphi_t(\pi_t - \beta f_t) \Big\} \tag{2}$$

The FOCs would differ, then, in that 1 would feature an additional φ_{t-1}, absent in the FOCs of 2.

The issue is, that with learning, f_t takes a particular form which is 1) internalized by the policy maker 2) but nonetheless backward-looking, not forward-looking. So that way of writing the problem would be:

$$\mathcal{L} = \mathbb{E}_{t_0} \sum_{t=t_0}^{\infty} \beta^{t-t_0} \Big\{ \pi_t^2 + \varphi_{1,t}(\pi_t - \beta f_t) + \varphi_{2,t}(f_t - f_{t-1} - t^{-1}(\pi_t - f_{t-1})) \Big\} \tag{3}$$

and FOCs associated with this problem would be those of the discretion problem 2 and the additional constraint from learning. But in none of those does a lagged Lagrange-multiplier show up. Does this mean that in a learning world, no commitment technology exists?