Why are inflation forecasts sticky?

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Banque de France

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    - updating forecast is also costly, with cost ψ

Assumptions

- Assumption 1: Optimal forecast is a Brownian Motion

$$\lim_{dt\to 0}\left(E\left[\pi_{t_0+h}\middle|\mathcal{I}_{t+dt}\right]-E\left[\pi_{t_0+h}\middle|\mathcal{I}_{t}\right]\right)\equiv d\pi_f^*\left(t\right)=\sigma dB\left(t\right)$$

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  - inflation is nonstationary without short-run dynamics (Stock & Watson, 2007)

- Dynamics of the "forecasting gap" $\tilde{\pi}_f(t) = \pi_f(t) - \pi_f^*(t)$

$$\begin{aligned}
\tilde{\pi}_f(t) - \tilde{\pi}_f(t_0) &= \pi_f(t) - \pi_f(t_0) - \left(\pi_f^*(t) - \pi_f^*(t_0)\right) \\
&= \pi_f(t) - \pi_f^*(t) = E_{t-\delta}\pi_{t_0+h} - E_t\pi_{t_0+h} \\
&= -\sigma \int_{t-\delta}^{t} dB(s) = -\sigma\left[B(t) - B(t-\delta)\right]
\end{aligned}$$

hence conditionally on $\mathcal{I}_{t_0}$,

$$\tilde{\pi}_f(t) = \tilde{\pi}_f(t_0) - \sigma\left[B(t) - B(t-\delta)\right] \sim N\left(\tilde{\pi}_f(t_0), \sigma^2\delta\right)$$

careful with the persistence induced by $B(t)$.

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4. *Notation:* $\lambda_{i,t,h}$ is an indicator for updates whereas $\lambda(i,h)$ is unconditional *probability*.

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