Macroeconomics A; EI056

Short problems

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1 Balance sheet of the Swiss National Bank

1.1 Current structure

Question: The SNB published its latest results on October 31:
https://www.snb.ch/en/publications/communication/press-releases/2023/pre_20231031_1
What are the main components of the balance sheet at end September 2023?
What is the main difference with the Fed?

1.2 Changes through time

Question: The SNB publishes its monthly balance sheet on its website:
https://data.snb.ch/en/topics/snb/cube/snbbipo
Since 2000, how has the size and composition of the balance sheet evolved (focus on the main components). Has the evolution been smooth?

2 Cagan model

2.1 Inflation under constant money supply

Question: The Cagan model is based on the money demand:

$$m_t - p_t = -\gamma \pi^e_{t+1} = -\gamma \left(p^e_{t+1} - p_t \right)$$

Iterating forward, this gives the price level:

$$p_t = \frac{1}{1+\gamma} \sum_{s=0}^{\infty} \left(\frac{\gamma}{1+\gamma} \right)^s m^e_{t+s}$$

Consider that the central bank keeps the money supply constant at $m_t = m^A$.
What is inflation?
What is the price level?

2.2 Change in level, rational expectations

Question: Consider that we are initially in a situation where money has been constant at m^A and is expected to remain so.

At period t we are told that starting at period $t+3$ money will be constant at $m^B = m^A + e$. What will inflation and the price level be at period $t+3$?

2.3 Adjustment dynamics

Question: Now consider the path of adjustment. Show that:

$$\begin{aligned}
\pi_t &= \left(\frac{\gamma}{1+\gamma}\right)^3 e \\
\pi_{t+1} &= \frac{1}{1+\gamma}\left(\frac{\gamma}{1+\gamma}\right)^2 e \\
\pi_{t+2} &= \frac{1}{1+\gamma}\frac{\gamma}{1+\gamma} e \\
\pi_{t+3} &= \frac{1}{1+\gamma} e
\end{aligned}$$

How does inflation behave along the adjustment path?