Rational Expectations

With adaptive expectations, people can systematically make expectational errors - which they should try to avoid. We would prefer to model expectations so that systematic errors are avoided.

$$p_{t+j}^{e} = E\left(p_{t+j}|\Omega_t\right)$$

Subjective Expectation = Conditional Mathematical Expectation

Implications:

$$E\left(p_{t+1} - p_{t+1}^{e}\right) = 0$$
$$E\left[\left(p_{t+1} - p_{t+1}^{e}\right)x_t\right] = 0$$

The Cagan model revisited:

$$m_t - p_t = g + a\Delta p_{t+1}^{e} + u_t$$

where

$$E_t \Delta p_{t+1} = E\left(\Delta p_{t+1}|\Omega_t\right).$$

Substituting,

(8) $$m_t - p_t = g + a\left(E_t p_{t+1} - p_t\right) + u_t .$$

We must now add a specification for the process determining m_t:

$$m_t = m_0 + m_1 m_{t-1} + e_t .$$

To solve, follow these procedures:

1. Substitute the policy process for m_t into equation (8).
2. Conjecture a linear solution for p_t as a function of m_{t-1}, e_t, u_t.
3. Using your conjectured solution, write an expression for $E_t p_{t+1}$.
4. Substitute your conjectured solutions for p_t and $E_t p_{t+1}$ into the equation derived in step (1).
5. Subsitute the money supply process for m_t on the right-hand side of that equation.
6. Equate coefficients of corresponding terms on each side of the resulting equation.
7. Solve for the parameters of your solution.