Model:

The individual state vector for the household is $\mathbf{s} = (a, K, A)$ where a is individual capital/asset level, K is the aggregate level if capital, and A is the exogenous TFP shock. The **household's recursive problem** is formulated as follows:

$$V(a, K, A) = \max_{c,n,a'} \left\{ \frac{c^{1-\sigma}}{1-\sigma} - \eta \frac{n^{1+1/\chi}}{1+1/\chi} + \beta \mathbb{E}_{A'} V(a', K', A') \right\} \tag{1}$$

$$\textbf{s.t.} \quad c + a' = (1 + r(K, A))a + w(K, A)n, \quad c \geq 0, \quad n \in [0, 1], \quad a' \geq 0$$

The **representative firm's problem** is as follows:

$$\max_{K,L} AK^{\alpha}L^{1-\alpha} - (\delta + r(K, A))K - w(K, A)L \tag{2}$$

The **Market clearing** conditions are:

$$a = K \tag{3}$$

$$n = L \tag{4}$$

and where the good's market clears by Walras' Law.

The **consistency condition** for a Recursive Competitive Equilibrium becomes:

$$a'(a, K, A) = K' \tag{5}$$

Finally, the **TFP** follows a stochastic log-AR1 process:

$$\log(A') = \mu + \rho \log(A) + \sigma_{\epsilon}\epsilon, \quad \epsilon \sim iid\, N(0, 1). \tag{6}$$