Model- Setup

- Time is discrete ($t \geq 0$)

- Continuum of heterogeneous firms i operated by price takers entrepreneurs

- Heterogeneity in entrepreneurs' net worth a_t and productivity z_t.

- z_t is persistent random with conditional probability distribution $H(z_{t+1}|z_t)$.

- A each t, the state of the economy is the joint distribution : $\Gamma(z_t, a_t)$

- Firms produce homogeneous good using capital k_t and labor ℓ_t.
  - Pollution is emitted during production process at t:

$$y_{it} = z_{it}(1 - \Gamma(M_t)) \left(k_{it}^{\alpha} \ell_{it}^{1-\alpha} \right)^{\theta} , \qquad \alpha, \theta \in (0,1) \tag{1}$$

  where M_t is an emission stock and $\Gamma(M_t)$ a damage function attached to pollution.

- Denote E_{it} Pollutant emitted by firm i at time t:

$$E_{it} = \frac{1}{\varphi_{it}} y_{it} \tag{2}$$