I extend a basic New Keynesian model resembling Galí 2015, Chap. 3 to have two production functions of a firm in a sector $l$: is given by $w(Y_{lk}) = A_l(N_{lk})^{\lambda_l}$ where $l \in \{ h, l \}$. Firm $i$ in a sector $l$ can reset its price at time $t$ to optimize

$$\max_{P^t} \sum_{l \in \{ h, l \}} \int_t^{t+h} \left[ \log C_t - P^t \left( \frac{\lambda_l}{\theta} \right)^{\beta} \left( \frac{N_{lk}}{W_{lk}} \right)^{\lambda_l} - \phi \theta \right] dt,$$

where $P^t$ denotes the reset price and $\phi$ is the probability of price stickiness. Note that firm $i$ is a price-taker for the relative wage $\frac{w(Y_{lk})}{P^t}$ in the labor market. I assume that consumers substitute their consumption within-sector. For example, those who purchase high-markup products consider only other high-markup products as substitutes.

Consider the periodic utility function of the representative household is given by

$$\nu = \frac{1}{\beta} \left[ \log C_t - \frac{\lambda_h}{\theta} \left( \frac{N_{hk}}{W_{hk}} \right)^{\lambda_h} - \phi \theta \right].$$

In this paper, I extend a basic New Keynesian model to have two production functions of a firm in a sector $l$: is given by $w(Y_{lk}) = A_l(N_{lk})^{\lambda_l}$ where $l \in \{ h, l \}$. Firm $i$ in a sector $l$ can reset its price at time $t$ to optimize

$$\max_{P^t} \sum_{l \in \{ h, l \}} \int_t^{t+h} \left[ \log C_t - P^t \left( \frac{\lambda_l}{\theta} \right)^{\beta} \left( \frac{N_{lk}}{W_{lk}} \right)^{\lambda_l} - \phi \theta \right] dt,$$

where $P^t$ denotes the reset price and $\phi$ is the probability of price stickiness. Note that firm $i$ is a price-taker for the relative wage $\frac{w(Y_{lk})}{P^t}$ in the labor market. I assume that consumers substitute their consumption within-sector. For example, those who purchase high-markup products consider only other high-markup products as substitutes.