$$\pi_i(j) = \sum_n p_{ni}(j) \cdot c_{ni}(j)$$

$$- w_i l_i(j)$$

$$= \sum_n p_{ni}(j) \cdot \alpha X_n P_n^{\sigma-1} p_{ni}(j)^{-\sigma}$$

$$- w_i \underbrace{\left(F + \frac{1}{A_i} \sum_n d_{ni} \cdot c_{ni}(j) \right)}_{l_i(j)}.$$

$$= \sum_n p_{ni}(j)^{1-\sigma} \cdot \alpha X_n P_n^{\sigma-1}$$

$$- w_i F - \frac{w_i}{A_i} \sum_n d_{ni} \cdot \alpha X_n P_n^{\sigma-1} p_{ni}(j)^{-\sigma}$$

The first-order condition is:

$$\frac{\partial \pi_i(j)}{\partial p_{ni}(j)} = (1-\sigma) p_{ni}(j)^{-\sigma} \alpha X_n P_n^{\sigma-1}$$

$$- \frac{w_i}{A_i} d_{ni} \alpha X_n P_n^{\sigma-1} (-\sigma) p_{ni}(j)^{-\sigma-1}$$

$$= 0.$$

$$\frac{\partial \pi_i(j)}{\partial p_{ni}(j)} = (1-\sigma)\, p_{ni}(j)^{-\sigma} \cancel{\alpha X_n P_n^{\sigma-1}}$$

$$- \frac{w_i}{A_i} d_{ni} \cancel{\alpha X_n P_n^{\sigma-1}} (-\sigma)\, p_{ni}(j)^{-\sigma-1}$$

$$= 0.$$

$$\frac{w_i}{A_i} d_{ni} \cdot \sigma\, p_{ni}(j)^{-\sigma-1}$$

$$= (\sigma-1)\, p_{ni}(j)^{-\sigma}$$

$$p_{ni}(j) = \frac{\sigma}{\sigma-1} \cdot \frac{w_i d_{ni}}{A_i}.$$

//.