

5.3 Tradeable Permits

$$\max_{L, S, K} f(L, S, K) - wL - pS - rK$$

$$f_L = w \quad f_S = p \quad f_K = r$$

$$T = p(S - Q)$$

$$S^* = S$$

$$f(L, S, K) = f_L L + f_S S + f_K K$$

$$wL + pS = f(L, S, K) - f_K K$$

$$Y \equiv wL + (1 - \alpha)Qp + T + r\bar{K}$$

$$Y = wL + p(S - \alpha Q) + r\bar{K}$$

$$Y = f(L, S, K) - f_K K - p\alpha Q + r\bar{K}$$

$$Y = f(L, S, K) + r(\bar{K} - K) - f_S \alpha Q$$

$$\max_S U(Y, S^*)$$

$$\max_S U(f(L, S, K) + r(\bar{K} - K) - f_S \alpha Q, S^*)$$

$$\frac{\partial U}{\partial S} = U_Y \left(f_S - \frac{\partial f_S}{\partial S} \alpha Q \right) + U_S \stackrel{!}{=} 0$$

$$f_S = -\frac{U_S}{U_Y} + \frac{\partial f_S}{\partial S} \alpha Q$$