

## 5.1 Basic Set-up

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

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

$$T = pS$$

$$S^* = S$$

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

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

$$Y \equiv wL + T + r\bar{K}$$

$$Y = wL + pS + r\bar{K}$$

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

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

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

$$\max_S U(f(L, S, K) + r(\bar{K} - K), S)$$

$$\frac{\partial U}{\partial S} = U_Y \left( f_S + f_K \frac{\partial K}{\partial S} - r \frac{\partial K}{\partial S} \right) + U_{S^*} \stackrel{!}{=} 0$$

$$U_Y \cdot f_S = -U_{S^*}$$

$$f_S = -\frac{U_{S^*}}{U_Y}$$