

Assignment 6

$$3.1 \quad (1-f)W_0 + fW_0(1+\alpha) = W_0 + \alpha fW_0 = W_0(1+\alpha f)$$

$$(1-f)W_0 + fW_0(1-\beta) = W_0 - \beta fW_0 = W_0(1-\beta f)$$

$$3.2 \quad \log(W_0 + \alpha fW_0) = \log W_0 + \log(1+\alpha f)$$

$$\log(W_0 - \beta fW_0) = \log W_0 + \log(1-\beta f)$$

$$3.3 \quad E = p \log(W_0 + \alpha fW_0) + (1-p) \log(W_0 - \beta fW_0)$$

$$= \log W_0 + p \log(1+\alpha f) + (1-p) \log(1-\beta f)$$

$$3.4 \quad \frac{\partial E}{\partial f} = \frac{p}{1+\alpha f} \cdot \alpha + \frac{1-p}{1-\beta f} (-\beta)$$

$$3.5 \quad \frac{\partial E}{\partial f} = 0 \quad \frac{\alpha p}{1+\alpha f} = \frac{\beta(1-p)}{1-\beta f}$$

$$\alpha p(1-\beta f) = \beta(1-p)(1+\alpha f)$$

$$\alpha p - \alpha \beta p f = \beta(1-p) + \beta(1-p)\alpha f$$

$$\alpha p - \beta(1-p) = \alpha \beta p f + \beta(1-p)\alpha f$$