

①

Here,

$$\text{Given, } P_t = W_t / B_t$$

$$\ln(A_t) = \beta_1 + \beta_2 \ln(W_t) + \beta_3 \ln(B_t) + e_t$$

Assume,

$\beta_2 = -\beta_3$, then replacing this assumption in above eqn,

$$\ln(A_t) = \beta_1 + \beta_2 \ln(W_t) - \beta_2 \ln(B_t) + e_t$$

$$= \beta_1 + \beta_2 (\ln(W_t) - \ln(B_t)) + e_t$$

$$= \beta_1 + \beta_2 \left(\ln \left(\frac{W_t}{B_t} \right) \right) + e_t \quad (\text{log properties})$$

$$= \beta_1 + \beta_2 \ln(P_t) + e_t \quad \because P_t = \frac{W_t}{B_t}$$

Proved