Economics 102: Problem Set 1, Answers

Due date: September 11 (Tuesday), 2001.

For given $r$, the equilibrium wage $W^*$ is a solution to the following equation:

$$100 - W^* - 100r = 10 + W^* - 10c$$

which in turn implies

$$2W^* = 90 + 100r + 10c$$

or

$$W^* = 45 + 50r + 5c$$  \(\text{(1)}\)

The equilibrium number of employees employed is

$$Q^* = 10 + W^* - 10c = 10 + 45 + 50r + 5c - 10c = 55 + 50r - 5c$$  \(\text{(2)}\)

(1) Substitute $r = 0.05$ and $c = 1$ into equations (1), (2) we have

$$W^* = 47.5, \quad Q^* = 47.5$$

(2) Substitute $r = 0.10$ and $c = 1$ into equations (1), (2) we have

$$W^* = 45, \quad Q^* = 45$$

Thus wage and employment both decrease as interest rate increases.

Substitute $r = 0.04$ and $c = 1$ into equations (1), (2) we have

$$W^* = 48, \quad Q^* = 48$$

Thus wage and employment both increase as interest rate falls.

(3) From equation (1) it is clear that $W^*$ increases as $c$ increases. From equation (2) we know that $Q^*$ falls as $c$ increases.