Answer keys to Problem set 2

1. Search and Unemployment

A. Two-sided model (DMP model)

1) (5pts) Given a share of worker’s bargaining power \((a)\), a matched firm and a worker determine how to split the total revenue, which is \(z - b\). The worker’s portion of TS is set to be worker’s surplus: \(a(z - b) = w - b\), through which the wage \((w)\) is set to \(az + (1 - a)b\).

2) (10pts) This is the case of a decrease in \(k\) (cost of recruitment): \(j \uparrow, Q \uparrow, u \downarrow, v \uparrow, Y \uparrow, w\) no change, TS no change. See the figures below.

3) (10pts) Two cases are acceptable for answers: \(\text{1} \) a decrease in \(k\), \(\text{2} \) an increase in the firm’s profit (and/or total surplus). If you choose \(\text{1} \), the results are the same as in (2). If you choose \(\text{2} \), the results are as follows: \(j \uparrow, Q \uparrow, u \downarrow, v \uparrow, Y \uparrow, w \uparrow, TS \uparrow\).

4) (10pts) There are two possible equilibria in the Keynesian DMP model. Here, I use the case where \(w_1 > w^*\) such that \(w^*\) is the socially optimal wages and \(w_1\) is the equilibrium wage in the model. The underlying assumption of this case is that \(Q_1 < Q^*\). The model predicts that \(\text{1} j_1\) is lower than \(j^*\), \(\text{2} u_1\) is higher than \(u^*\), \(\text{3} v_1\) is lower than \(v^*\), \(\text{4} Y_1\) is lower than \(Y^*\). \(\text{2} \) and \(\text{3} \) together indicate the Beveridge curve relationship.

5) (5pts) For example, an increase in the labor market uncertainty, sectoral shocks to the economy (negative shocks to the manufacturing industries and positive shocks to the IT industries), labor market globalization, etc..

6) (10pts) Suppose that \(w\) is “too high” in eql’m, which implies that \(Q\) and \(j\) are too low relative to what is socially efficient. If the gov’t were to subsidize successful matches by
paying ‘$s’ to a firm when a match occurs, the firm’s cond’n becomes $em\left(\frac{1}{j}, 1\right) = \frac{k}{z-w+s}$, that is, the firm’s profit increases. If the gov’t pays subsidies that offset the difference between $w^H$ (eql’m wage in the Keynesian DMP) and $w^*$ (efficient wage), $j^H$ becomes closer to $j^*$. So does $Q^H$. Eventually, it corrects the problem. Note that you can think of subsidizing $s$ as a decrease in the cost of posting a vacancy. In that case, $em\left(\frac{1}{j}, 1\right) = \frac{k-s}{z-w}$. But the results should be the same as the previous case where subsidizing $s$ is considered as an increase in the firm’s profit.

II. Growth Model

1) (10pts) Initial eql’m=$A$, transitional change=$A_t$, new eql’m=$A_N$.

In transition, $c$ falls and $\frac{N'}{N}$ starts to fall. Due to a decrease in the pop’n, $c$ starts to increase up to the original eql’m $c$, and the pop’n grows up to 1. Thus, in eql’m, $c$ remains the same as before while $l$ increases. Note that the pop’n size increases while the growth rate of pop’n is 1 in eql’m. (refer to the figures below.)

2) (10pts) Initial eql’m=$A$, new eql’m=$A_N$.

A decrease in the death rate shifts up the function $g(c)$ which leads to an increase in the size of pop’n. Eventually, $c$ and $l$ both decrease.