

# Foundations of Modern Macroeconomics

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## Problem set for Chapter 9

### Question 1

- (a) What do we mean by a Beveridge curve? What could make the Beveridge curve shift?
- (b) Explain how modern search theory uses the so-called “matching function.” How can we this function to compute the probability that a job seeker finds a job? And, vice versa, how can we find the probability that an employer with a vacancy finds a worker? Provide examples with the aid of a Cobb-Douglas matching function.

### Question 2

Consider the following search-theoretic model of the labour market.

$$F_K(K, 1) = r + \delta, \tag{1}$$

$$\frac{\gamma_0}{q(\theta)} = \frac{F_L [K(r + \delta), 1] - w}{r + s}, \tag{2}$$

$$w = (1 - \beta)z + \beta [F_L [K(r + \delta), 1] + \theta\gamma_0], \tag{3}$$

$$U = \frac{s}{s + \theta q(\theta)}, \tag{4}$$

where  $U$  is the unemployment rate,  $s$  is the (exogenous) job destruction rate,  $\theta \equiv V/U$  is the labour market pressure index,  $V$  is the vacancy rate,  $K$  is the capital stock,  $w$  is the real wage,  $z$  is the (exogenous) income of job seekers,  $r$  is the (exogenous) real interest rate,  $\gamma_0$  is the employer’s (flow) search cost, and  $\beta$  is the relative bargaining power of the worker.

- (a) Give a brief interpretation of these equations.
- (b) Show what happens to unemployment, vacancies, and the real wage rate if the interest rate rises. Illustrate with the aid of a diagram and explain the economic intuition.

- (c) Assume that the policy maker decides to provide a subsidy to the employers for the search costs they have to incur. As a result of this policy measure,  $\gamma_0$  is reduced. Show what happens to unemployment, vacancies, and the real wage rate as a result of this policy measure.