Quiz on Unemployment Fluctuations

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Question 1

In the United States, which correlation do we observe over the business cycle?

A. Unemployment level and labor market tightness are positively correlated.

B. Employment level and labor market tightness are positively correlated.

C. Unemployment level and vacancies are positively correlated.

D. Unemployment level and employment level are positively correlated.

E. Unemployment level and labor force participation are positively correlated.

F. None of the above.

Question 2

In the matching model with fixed wage, which type of shocks can generate the correlation described in the previous question?

A. Shocks to labor productivity.

B. Shocks to the size of the labor force.

C. Shocks to the disutility from unemployment.

D. Shocks to monetary policy.

E. No shocks can generate such correlation.

Question 3

Consider a matching model with surplus sharing and a linear production function. Assume that the value of unemployment is $z > 0$ and that the bargaining power of firms is 1. Then an increase in labor productivity a leads to:

A. Higher tightness and lower unemployment

B. Lower tightness and higher unemployment

C. Higher tightness and higher unemployment

D. Lower tightness and lower unemployment

E. No effect on tightness and unemployment

Question 4

Let $c(x) = a(x) \times b(x)/d(x)$.Let ϵ_x^a, ϵ_x^b, ϵ_x^c, and ϵ_x^d be the elasticities of the functions a, b, c, and d with respect to x. Then:

A. $\epsilon_x^c = \epsilon_x^a \times \frac{\epsilon_x^b}{\epsilon_x^d}$

B. $\epsilon_x^c = \frac{a(x)}{d(x)}\epsilon_x^a + \frac{b(x)}{d(x)}\epsilon_x^b$

C. $\epsilon_x^c = \ln(a(x)) + \ln(b(x)) - \ln(d(x))$

D. $\epsilon_x^c = \epsilon_x^a + \epsilon_x^b - \epsilon_x^d$

E. None of the above

Question 5

Let $f(x, y)$ be a function of x and y. Let $\partial f/\partial x$ and $\partial f/\partial y$ be the partial derivatives of the function f with respect to x and y. Let $\epsilon_x^f = \partial \ln(f)/\partial \ln(x)$ and $\epsilon_y^f = \partial \ln(f)/\partial \ln(y)$ be the partial elasticities of the function f with respect to x and y. Then the infinitesimal change in f generated by infinitesimal changes in x and y satisfies:

A. $df = \epsilon_x^f \cdot dx + \epsilon_y^f \cdot dy$

B. $d\ln f = \epsilon_x^f \cdot dx + \epsilon_y^f \cdot dy$

C. $d\ln f = [\partial f/\partial x]dx + [\partial f/\partial y]dy$

D. $df = \epsilon_x^f \cdot d\ln x + \epsilon_y^f \cdot d\ln y$

E. $d\ln f = \epsilon_x^f \cdot d\ln x + \epsilon_y^f \cdot d\ln y$

F. None of the above

Question 6

Let $c(x) = [b \cdot a(x)]^d$, where $a(x) > 0$ and $b > 0$ and $d < 0$. Let ϵ_x^c and ϵ_x^a be the elasticities of the functions c and a with respect to x. Then:

A. $\epsilon_x^c = [b \cdot \epsilon_x^a]^d$

B. $\epsilon_x^c = d \cdot [\epsilon_x^a + b]$

C. $\epsilon_x^c = [b + d] \cdot \epsilon_x^a$

D. $\epsilon_x^c = d \cdot \epsilon_x^a$

E. $\epsilon_x^c = b \cdot \epsilon_x^a$

F. $\epsilon_x^c = d \cdot [b \cdot a(x)]^{d-1}$

G. None of the above

Question 7

Let $c(x) = a(x) + b$, where $a(x) > 0$ and $b > 0$. Let ϵ_x^c and ϵ_x^a be the elasticities of the functions c and a with respect to x. Then

A. $\epsilon_x^c = \epsilon_x^a$

B. $\epsilon_x^c = \epsilon_x^a + b$

C. $\epsilon_x^c = \frac{a(x)}{c(x)} \epsilon_x^a$

D. $\epsilon_x^c = \frac{b}{c(x)} \epsilon_x^a$

E. $\epsilon_x^c = \frac{a(x)}{b} \epsilon_x^a$

F. $\epsilon_x^c = \frac{a(x)}{c(x)} \epsilon_x^a + \frac{b}{c(x)}$

G. None of the above

Question 8

Consider a one-period matching model with a labor force of size 1. All workers are initially unemployed; firms post vacancies and match with workers; then production occurs. The matching function is $m = \sqrt{V}$. Firms incur a recruiting cost of $r > 0$ recruiters per vacancy. Firms have a production function $y = 2 \times a \times \sqrt{N}$, where a governs labor productivity and N denotes the number of producers in the firm. Firms pay a rigid wage: $w = a^{\gamma}$ with $\gamma < 1$. What is the elasticity of vacancies V with respect to productivity a in the model?

A. $\epsilon_a^V = (1 - \gamma) \cdot (1 + \tau)$

B. $\epsilon_a^V = 4 \cdot \frac{1-\gamma}{1+\tau}$

C. $\epsilon_a^V = 2 \cdot \frac{1+\tau}{1-\gamma}$

D. $\epsilon_a^V = 4 \cdot (1-\gamma) - \tau$

E. $\epsilon_a^V = 2 \cdot \gamma - r$

F. $\epsilon_a^V = 0$

G. None of the above

Question 9

Under a standard US calibration, what is the value of the elasticity computed in the previous question?

A. $\epsilon_a^V < 0$

B. $\epsilon_a^V \in [0, 1]$

C. $\epsilon_a^V \in (1, 2]$

D. $\epsilon_a^V \in (2, 3]$

E. $\epsilon_a^V \in (3, 4]$

F. $\epsilon_a^V \in (4, 5]$

G. $\epsilon_a^V > 5$