Guanghua School of Management Midterm Exam

Fall Semester, 2017-2018

Course: Macroeconomics
Instructor: Cheng Sun
Exam Date: November 9, 9am to 11am   Length: 2 hours

Student: **Class:**

Name: **Student ID:**

Format: Closed book. Please write all your answers on the exam paper.

INSTRUCTIONS

You have <u>2 hours</u> to complete this exam. This exam is strictly closed book and closed notes. You are NOT allowed to use any electronic devices such as cell phones, PDAs, laptops, MP3 players, iPods, iPads etc. during the exam. Calculators are allowed, but you must NOT use any calculator-related apps on your electronic devices.

There are **7 questions** for a total of **120 points.** Use your time wisely.
IMPORTANT: YOU NEED TO CLEARLY MARK THE CORRECT ANSWER AND SHOW YOUR WORK & CALCULATION TO GET FULL CREDIT!!!

To ensure fairness, you are requested to stop writing promptly at the end of the exam.

Please do not turn over this cover page, until requested.

1. Suppose that an economy's production function is Cobb-Douglas with parameter α=0.4.

   1) What fraction of income do capital and labor receive?

   2) Suppose that immigration increases the labor force by 15 percent. What happens to total output (in percent)? The rental price of capital? The real wage?

   3) Suppose that a gift of capital from abroad raises that capital stock by 15 percent. What happens to total output (in percent)? The rental price of capital? The real wage?

1、考虑一个拥有系数为 α=0.4 的 Cobb-Douglas 生产函数的经济体。

 1）资本和劳动力分别分享收入的多少（5分）

 2）如果移民导致劳动人口增加了百分之十五，那么这个经济体的总产出，资本回报和实际工资分别改变了百分之多少？（5分）

 3）如果这个经济体因为被其他经济体资助，所以资本增加了百分之十五。这个经济体的总产出，资本回报和实际工资分别改变了百分之多少？（5分）

2. Suppose consumption is a linear function of disposable income:

$$C(Y-T)=a+b(Y-T)$$

where a>0 and 0<b<1. The parameter b is the marginal propensity to consume, and the parameter a is a constant. Suppose also that investment is a linear function of the interest rate:

$$I(r)=c-dr$$

where c>0 and d>0. The parameter d measures the sensitivity of investment to the interest rate, and the parameter c is a constant.

1) Solve for IS model as a function of the exogenous variable G and T, and the model's parameters a,b,c, and d.

Now suppose demand for real money balances is a linear function of income and the interest rate:

$$L(r,Y)=eY-fr$$

where e>0 and f>0. The parameter e measures the sensitivity of money demand to income, while the parameter f measures the sensitivity of money demand to the interest rate.

2) Solve for LM as a function of M and P and the parameters e and f.

3) Solve for AD model as a function of exogenous policy variables M,G, and T; and of the model's parameters.

4) Assume the short run AS curve is $Y = \overline{Y} + \alpha(P - \overline{P})$. Solve the short run equilibrium.

2、假设消费是一个关于可支配收入的线性函数 C(Y-T)=a+b(Y-T) 期中 a>0, 0<b<1。a 和 b 都是常数，b 是边际消费倾向。同时假设投资也是一个关于利息的线性函数 I(r)=c-dr，其中 c>0 和 d>0。c 和 d 也都是常数，d 是边际投资倾向。

1) 求出 IS 模型，为政府开支 G，税收 T 和模型中系数 a，b，c，d 的函数。

现在假定货币需求函数是一个关于收入和利息的线性函数

L(r,Y)=eY-fr 其中 e>0 和 f>0。e 描述了货币需求对于收入的敏感性，f 描述了货币需求对利息的敏感性。

2) 求出 LM 模型，为 M, P, e, f 的函数。

3) 求出 AD 模型，为货币政策，财政政策以及其他相关系数的函数。

4) 假定短期 AS 函数是 $Y = \bar{Y} + \alpha(P - \bar{P})$。求出短期均衡。

3. An economy is described by the following equations

AD: Y=4000+2(M/P)

Short Run AS: $Y = \overline{Y} + 100(P - EP)$

Okun's Law: $\frac{Y - \overline{Y}}{\overline{Y}} = -2(u - u^n)$

This economy full employment output $\overline{Y}$ equals 6000 and the natural rate of unemployment rate u^n equals 0.05.

1) Suppose that the nominal money supply has long been constant at M=4000 and is expected by the public to remain constant forever. What are the equilibrium values of the price, P, the expected price level EP expected inflation Eπ, output Y and the unemployment rate u. (5pts).

2) A totally unexpected increase in the money supply occurs raising it from 4000 to 4488. What are the short-run equilibrium values of the price level, expected price level, output, and unemployment rate? (5pts)

3、一个经济体通过以下等式描述：

AD: Y=4000+2(M/P)

短期 AS：$Y = \overline{Y} + 100(P - EP)$

奥肯法则：$\frac{Y - \overline{Y}}{\overline{Y}} = -2(u - u^n)$

在完全就业的情况下，该经济体产出 $\overline{Y}$等于 6000，自然失业率u^n等于 0.05。

1）假设名义货币供应长期以来恒定在 M=4000，并且公众对其预期永远保持不变。请问均衡价格 P，预期价格水平 EP，预期通货膨胀Eπ，产出 Y 和失业率 u 分别为多少。（5分）。

2）完全在意料之外的货币供应量增加导致 M 从 4000 提高到 4488。请问此时短期均衡价格水平，预期价格水平，产出和失业率分别为多少？（5分）

4. Consider an economy described by the following equations:

Y=C+I+G+NX

Y=5000

G=1000

T=1000

C=250+0.75(Y-T)

I=1000-50r

NX=500-500ε

r=r*=5

1) In this economy, solve for national saving, investment, the trade balance, and the equilibrium exchange rate. (5pts)

2) Suppose now that G rises to 1250. Solve for national saving, investment, the trade balance and the equilibrium exchange rate. Explain what you find. (5pts)

3) Now suppose that the world interest rate rises from 5 to 10 percent. G is again 1000. Solve for the national saving, investment, the trade balance and the equilibrium exchange rate, Explain what you find. (5pts)

4、考虑由以下等式描述的经济

Y=C+I+G+NX

Y=5000

G=1000

T=1000

C=250+0.75(Y-T)

I=1000-50r

NX=500-500ε

r=r*=5

1）在这个经济体中，求出国家储蓄，投资，贸易平衡和均衡汇率。（5分）

2）假设现在 G 上升到 1250，求解此时的国家储蓄，投资，贸易平衡和均衡汇率。 请解释你的发现。 （5分）

3）现在假设世界利率从 5 上升到 10。G 仍旧为 1000。求解此时的国家储蓄，投资，贸易平衡和均衡汇率，请解释你的发现。（5分）

5. Consider the following small open economy:

Consumption: C=300+0.5Y-200r

Investment: I=200-300r

Government purchases: G=100

Net exports: NX=150-0.1Y-50e

The world interest rate is r=r*=0.1

1) Derive an expression for the IS* curve. (5pts)

2) The money demand function is L=0.5Y-200r. The money supply M=960 and the price level P=2. Derive the LM* curve. Find the equilibrium exchange rate e and the equilibrium level of income Y. (5pts)

3) Suppose that the government purchases are dropped from 100 to 50, and this economy has a floating exchange rate. How does the IS* curve shift? What are the new equilibrium exchange rate and the level of income? (5pts)

4) Suppose this economy has a fixed exchange rate. After the government purchases are dropped to 50 from 100, how do they adjust the monetary supply M? (5pts)

5) Again, assume this economy has a floating exchange rate. With the initial value for monetary and fiscal policy, suppose that the price level rises from 2 to 3. What are the new equilibrium exchange rate and the level of income? (5pts)

6) Derive an equation for the aggregate demand curve according to the initial value for monetary and fiscal policy under a floating exchange rate. What happens to this aggregate demand curve if the fiscal or monetary policy changes as in part 4) and 5)? (5pts)

5、考虑以下小型开放经济体

消费：C=300+0.5Y-200r

投资：I=200-300r

政府购买：G=100

净出口：NX=150-0.1Y-50e

世界利率水平：r=r*=0.1

1）推导出 IS*曲线的表达式（5分）

2）货币需求函数为 L=0.5Y-200r。货币供应 M=960，价格水平 P=2。据此请推导 LM*曲线。求出均衡状态下的汇率 e 和均衡状态下的收入 Y。（5分）

3）假设政府购买从 100 下降到 50，且该经济体的是浮动汇率制。请问 IS*曲线将怎样变化？新的均衡汇率和均衡收入是多少？（5分）

4）假设该经济体为固定汇率制。当政府购买从 100 下降到 50 后，经济体将如何调整货币供应 M？（5分）

5）再次假设这个经济体为浮动汇率制。在初始的货币政策和财政政策下，假设价格水平从 2 升高到 3，请问新的均衡汇率和均衡收入水平是什么？（5分）

6）根据浮动汇率下货币政策和财政政策的初始值，请推导总需求曲线的方程。如果财政政策或货币政策出现了诸如第 4）问和第 5）问所述的变化，总需求曲线会发生什么变化？（5分）

6. Consider an open economy that is described by the following equations

$$C = 140 + 0.8(Y - T) - 200r$$

$$T = 400 + 0.1Y$$

$$I = 1000 - 700r$$

$$NX = 50 - 0.07Y + 0.15Y_f - 100r + 400r_f$$

$$L = 0.5Y - 1000i$$

$\overline{Y} = 5000; G = 400; M = 489900; \pi = 0.17; P_{sr} = 213$. In the short run, the price level is fixed at P_{sr}. The foreign output is $Y_f = 4000$ and the foreign interest rate is $r_f = 0.2$. In this model, the home and foreign interest rate does not need to be the same, and the net export depends on foreign output and foreign interest rate.

1) Derive the IS curve. (5pts)

2) Derive the LM curve. (5pts)

3) Find the short run equilibrium interest rate and output. (5pts)

4) Find the equilibrium interest rate and the equilibrium price level in the long run. (5pts)

6、考虑一个开放经济如下

$$C = 140 + 0.8(Y - T) - 200r$$

$$T = 400 + 0.1Y$$

$$I = 1000 - 700r$$

$$NX = 50 - 0.07Y + 0.15Y_f - 100r + 400r_f$$

$$L = 0.5Y - 1000i$$

$\overline{Y} = 5000; G = 400; M = 489900; \pi = 0.17; P_{sr} = 213$. 短期价格水平为$P_{sr}$. 外国产出为 $Y_f = 4000$ ，外国利息为$r_f = 0.2$. 在这个

模型中，外国和本国的利息不需要一致。本国净出口取决于外国的产出和利息。

1) 求出 IS 曲线。

2) 求出 LM 曲线。

3) 求出短期均衡的利息和产出。

4) 求出长期均衡的利息和价格。

7. Consider a world with only two countries, which are designated the home country (H) and the foreign country (F). Output equals its full-employment level in each country. You are given the following information about each country:

Home Country

Consumption: $C_H = 100 + 0.5Y_H - 500r^H$

Investment: $I_H = 300 - 500r^H$

Government Purchases: $G_H = 155$

Full-employment Output: $\overline{Y}_H = 1000$

Foreign Country

Consumption: $C_F = 225 + 0.7Y_F - 600r^F$

Investment: $I_F = 250 - 200r^F$

Government Purchases: $G_F = 190$

Full-employment Output: $\overline{Y}_F = 1200$

1) Assume $r^H = r^F = r$. What is the equilibrium value of the world real interest rate r? What are the equilibrium values of consumption, national saving, investment, and the current account balance in each country? (5pts)

2) Assume home country is experiencing a political shock and has to pay risk premium of $\theta = 0.09$, and foreign country is still fine. What is the equilibrium value of the interest rate in each country? What are the equilibrium values of consumption, national saving, investment, and the current account balance in each country? (5pts)

7、假定时间上有两个国家：本国(H) 和外国 (F)。每个国家的产出都处于长期均衡水平。 关于两国经济的基本信息如下

本国

$C_H = 100 + 0.5Y_H - 500r^H$

$I_H = 300 - 500r^H$

$G_H = 155$

$\overline{Y}_H = 1000$

外国

$C_F = 225 + 0.7Y_F - 600r^F$

$I_F = 250 - 200r^F$

$G_F = 190$

$\overline{Y}_F = 1200$

1) 假定两国利息一致 $r^H = r^F = r$。求出均衡下的世界利息 r，以及各国的消费，储蓄，投资和经常项目余额。 (5pts)

2) 假定本国经历了政治风波，所以需要支付额外的风险溢价 $\theta = 0.09$，而外国是稳定的. 求出均衡下各国的利息，消费，储蓄，投资和经常项目余额。(5pts)