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Macroeconomics

Long run closed economy study question 2

Here's a closed economy in the long run:

Full employment GDP 2000
C = 100 + .8(Y-T) – 5r
I = 300 – 5r
G = 500
T = .25Y

a) Calculate full employment values of C, private savings, public savings, national savings, investment, and the expected real interest rate.

b) Now suppose a new government increases G to 600. Calculate new full employment values for of C, private savings, public savings, national savings, investment, and the expected real interest rate.

a)
In equilibrium, output = aggregate expenditures:

$$Y = C + I + G$$

Substitute what we know about our economy into the equation:

$$2000 = [100 + .8(2000 - .25(2000)) – 5r] + [300 – 5r] + 500$$

Simplify the equation:

$$2000 = 100 + 1200 – 5r + 300 – 5r + 500$$

Simplify the equation some more:

$$2000 = 2100 – 10r$$

Subtract 2000 from both sides:

$$0 = 100 – 10r$$

Add 10r to both sides

$$10r = 100$$

Divide both sides by 10”

$$r = 10$$

To get C, use the consumption equation:

$$C = 100 + .8(Y-T) – 5r$$

$$C = 100 + .8(2000 - .25(2000)) – 5(10)$$

$$C = 1250$$

To get I, use the investment equation:

$$I = 300 – 5r$$

$$I = 300 – 5(10) = 250$$

Private savings = Y – T – C:

$$= 2000 – 500 – 1250 = 250$$

National savings = Y – C – G:

= 2000 – 1250 – 500 = 250

Public savings (aka the budget surplus) = T – G

= 500 – 500 = 0

b) In equilibrium, output = aggregate expenditures:

Y = C + I + G

Substitute what we know about our economy into the equation:

2000 = [100 + .8(2000 - .25(2000)) – 5r] + [300 – 5r] + **600**

Simplify the equation:

2000 = 100 + 1200 – 5r + 300 – 5r + 600

Simplify the equation some more:

2000 = 2200 – 10r

Subtract 2000 from both sides:

0 = 200 – 10r

Add 10r to both sides

10r = 200

Divide both sides by 10”

r = 20 (the interest rate has increased from 10 to 20)

To get C, use the consumption equation:

C = 100 + .8(Y-T) – 5r

C = 100 + .8(2000 - .25(2000)) – 5(20)

C = 1200 (consumption has fallen from 1250 to 1200)

To get I, use the investment equation:

I = 300 – 5r

I = 300 – 5(20) = 200 (investment has fallen from 250 to 200)

Private savings = Y – T – C:

= 2000 – 500 – 1200 = 300 (private savings has risen by 50)

National savings = Y – C – G:

= 2000 – 1200 – 600 = 200 (national savings has fallen by 50)

Public savings (aka the budget surplus) = T – G

= 500 – 600 = -100 (there's now a budget deficit of 100)