

“Imagination is more important than knowledge!”-by Albert Einstein.

Problem #1: Aggregate Demand Saving the Jupiter

(Continued from last time) Careful as he is, Michael was kidnapped (We've said: Use your imagination!). There is a reason why Michael is kidnapped! The economy in Jupiter is experiencing a severe recession. Though technically advanced, they don't have any good economist. And there in this blue planet they found Michael and the 100 dollar bill in his pocket...

The economy in the Jupiter is described by (take the planet in its entirety as a closed economy):

$$Y = C + I + G, \quad C = 2,000 + 0.5(Y-T),$$

$$I = 10,000 - 40,000r, \quad G = 2,000, \quad T=0.2Y$$

And the supply and demand in the money market (sorry we don't know the name of their currency yet...)

$$M_s = 1,000$$

$$M_d = 5,000 - 20,000r$$

Where r is the interest rate written as a decimal (e.g., if the interest rate r equals 10% then it would appear in the equation as 0.1) and the required reserve ratio for demand deposit is 20%.

(a) Find the equilibrium interest rate

$$M_s = M_d \Rightarrow 1000 = 5,000 - 20,000r \Rightarrow r = 0.20$$

(b) Find the equilibrium investment level

$$I = 10,000 - 40,000 \cdot 0.20 = 2,000$$

(c) Find the equilibrium output level

$$Y = (2,000 + 0.5(Y - 0.2Y)) + 2000 + 2000 = 6,000 + 0.4Y$$

$$\Rightarrow 0.6Y = 6,000$$

$$\Rightarrow Y = 10,000$$

(d) Suppose that the potential GDP (or full employment GDP) is 20,000, if you were Michael (He will tell you how fun it is on Jupiter), what suggestion would you have for the central bank of Jupiter, assuming you want to reach full employment GDP? (You don't need to get the exact numbers.)

The central bank should increase the money supply, which will decrease the equilibrium interest rate, thus raising the equilibrium output level.

(e) Suppose that Michael suggests a targeted interest rate of 5% (if you want to know how does Michael get this number, ASK Michael.), what specific action should be taken by Jupiter's central bank in order to reach this interest rate?

Thought process for solving this problem: If $r = 5\%$ what is money demand in equilibrium? In equilibrium money supply has to be equal to money demand, so find the change in money supply. What monetary policy would induce such a change?

$$M_d = 5,000 - 20,000 \cdot 0.05 = 4,000 = M_s = 1,000 + \Delta M_s$$

$$\Delta M_s = 3,000$$

Using the required reserve ratio, we know the money multiplier is $5 = 1/0.20$

Thus, if the central bank purchases 600 worth of bonds, the money supply will increase by 3,000.

(f) Graph the money market and Keynesian cross diagram representing the above changes. Notice that the initial equilibrium output (real GDP) is lower than the long run macroeconomic equilibrium.

(g) Congratulations! You could have successfully solved the economic crisis in the Jupiter. But beware that since you are able to solve economic crisis, then.... Teach your friends around you some macroeconomics to lower the probability of you being kidnapped by aliens!

Problem #2: More AS-AD model

(a) Explain why the AS curve is upward sloping, and what could possibly shift the AS curve.

The inputs' prices are sticky in the short run, so when price increases, profit in the short run increases. P238

Changes in Commodity Prices (oil price); Nominal Wage; Productivity can shift the AS curve. P241

(b) Explain why the AD curve is downward sloping, and what could possibly shift the AD curve.

The wealth effect (if price decreases then purchasing power increases) and interest rate effect (if price goes up, then demand for money goes up, then interest rate goes up, then investment goes down)

Changes in Expectation (consumer confidence index); Change in Wealth (stock market boom); stock of physical capital; Fiscal policy and monetary Policy.

(c) Using AS-AD model, find at least another way to reach full employment equilibrium level in Jupiter. Show that not only Michael can save that planet.

Fiscal policy!

Problem #3: Quota Review Problem (written for Michael)

Michael returns from the Jupiter and got popular on both the planets and he brings the missing \$100 bill and gives it to his boss Malcolm. Malcolm hates Jupiter so he gives it to Jeff and Jeff in turn sells it to Chao at a price of \$150. And Chao suggests the King (who is a fan of astrology) of Tropicia set up a quota for importing tuna, and then Chao himself buys the license by paying the King that historical \$100 bill that has been to the Jupiter.

The MONTHLY demand and supply for tuna (in terms of lbs and \$) in Tropicia is:

Domestic Demand: $Q_d = 150 - P$ and

Domestic Supply : $Q_s = 2P$

Modern fishery techniques outside of Tropicia permit the market price of tuna in the world market to be \$30/pound. And the domestic price of Tuna is now \$40/pound.

Suppose Chao has imported as many units of tuna as the quota license allows, how much revenue does he earn by owning this license and how many units of tuna are imported? If producers and consumers from Tropicia could get damages from Chao due to the quota how much would Chao owe the people of Tropicia (what is foregone as a result of the quota versus free trade)?

**If price is \$40, then $Q_d = 150 - 40 = 110$; and $Q_s = 2 * 40 = 80$. So the quantity imported is $Q_d - Q_s = 30$
Chao's revenue is $30 * (40 - 30) = \$300$.**

Calculation the area (including Chao's revenue) lost to Pacifica as a result of the quota.

Method #1: By Parts

Quota revenue is \$300,

Deadweight loss on demand side $\Delta Q_d = 110 - 120 = 10 \Rightarrow DWL = 10 * 10 * 0.5 = 50$

Deadweight loss on supply side $\Delta Q_s = 80 - 60 = 20 \Rightarrow DWL = 20 * 10 * 0.5 = 100$

Total \$450

Method #2: One big trapezoid

the difference of Q_d and Q_s at 30 is $120 - 60 = 60$

the difference of Q_d and Q_s at 40 is $110 - 80 = 30$

the height is always the difference in price $40 - 30 = 10$

So the area is $0.5 * (30 + 60) * (10) = 450$