

Problem Session II

May 9th, 2014

Reference: Parkin, Introduction to economics, 2011.

Important Note: Please contact to your professor about which chapters are included in the midterm and final exams.

1. Colombia is the world's biggest producer of roses. The global demand for roses increases and at the same time, the central bank in Colombia increases the interest rate. In the foreign exchange market for Colombian pesos, what happens to
 - The demand for pesos?
 - The supply of pesos?
 - The quantity of pesos demanded?
 - The quantity of pesos supplied?
 - The exchange rate of peso against the US dollar?

Answer: *Foreign currency* is the money of other countries. The currency of one country is exchanged for the currency of another in the *foreign exchange market*.

An *exchange rate* is the price at which one currency exchanges for another currency in the foreign exchange market. It is a *price* -the price of one currency in terms of another. For example, recently, \$ 1 would buy 2,1 TL, approximately.

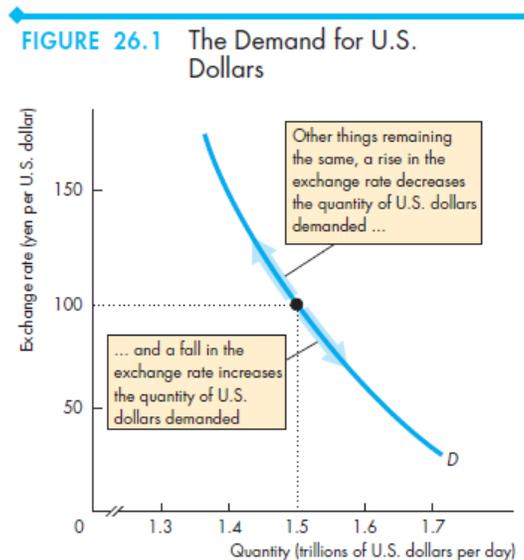
The quantity of foreign currency demanded in the foreign exchange market is the amount that traders plan to buy during a given time period at a given exchange rate. This quantity depends on many factors, but the main ones are:

- **Exchange Rate:** Other things remaining the same, the higher the exchange rate, the smaller is the quantity of foreign currency (e.g.,dollar) demanded in the foreign exchange market. The exchange rate influences the quantity of foreign currency demanded for two reasons:
 - *Imports Effect:* The larger the value of the country’s imports, the larger is the quantity of foreign currency demanded in the foreign exchange market.
The value of imports depends on the prices of foreign goods and services expressed in terms of domestic currency (in the case of Turkiye, it is TL). The lower the exchange rate, other things remaining the same, the lower are the prices of foreign goods and services in terms of domestic currency, hence, the greater is the volume of country’s imports. Therefore, if the exchange rate falls, the quantity of foreign currency demanded in the foreign exchange market increases.
 - *Expected Profit Effect:* The larger is the expected profit from holding foreign currency, the greater is the quantity of foreign currency demanded in the foreign exchange market.
The expected profit depends on the exchange rate. For a given expected future exchange rate, the lower is the exchange rate today, the larger is the expected profit from buying foreign currency today and holding them, so the greater is the quantity of foreign currency demanded in the foreign exchange market today.
- **Country’s Demand for Imports:** The larger is a country’s desire for foreign goods, the greater is the country’s demand for foreign currency.
- **Interest rates in the country and other countries:** The relative expected rate of return of the assets nominated in domestic and foreign currency is also effective on the foreign exchange market. For example, if the relative rate of return of the foreign assets increases (for example, this may happen if the foreign central bank increases the interest rates of the assets denominated in foreign currency, when the domestic interest rate is fixed), then the demand for assets denominated in foreign currency increases, therefore, the demand for foreign currency increases in the foreign

exchange market.

- **The Expected Future Exchange Rate:** Given the current exchange rate in the foreign exchange market, the higher is the expected future exchange rate, the higher is the expected rate of return from holding the foreign currency, therefore, the greater is the demand for foreign currency.

Then the figure 26.1 shows the demand curve for foreign currency in the foreign exchange market. A change in the exchange rate brings a movement along the demand curve. Other factors except the exchange rate shifts the demand curve.



The quantity of foreign currency supplied in the foreign exchange market is the amount that traders plan to sell during a given time period at a given exchange rate. This quantity depends on many factors, but the main ones are:

- **Exchange Rate:** Other things remaining the same, the higher the exchange rate, the greater is the quantity of foreign currency (e.g., dollar) supplied in the foreign exchange market. The exchange rate influences the quantity of foreign currency supplied for two reasons:

- *Exports Effect:* The larger the value of the country's exports, the larger is the quantity of foreign currency supplied in the foreign exchange market.

The value of exports depends on the prices of domestic goods and services expressed in terms of foreign currency. The higher the exchange rate, other things remaining the same, the lower are the prices of domestic goods and services in terms of foreign currency, hence, the greater is the volume of country's exports. Therefore, if the exchange rate increases, the quantity of foreign currency supplied in the foreign exchange market increases.

- *Expected Profit Effect:* The larger is the expected profit from holding foreign currency, the smaller is the quantity of foreign currency supplied in the foreign exchange market.

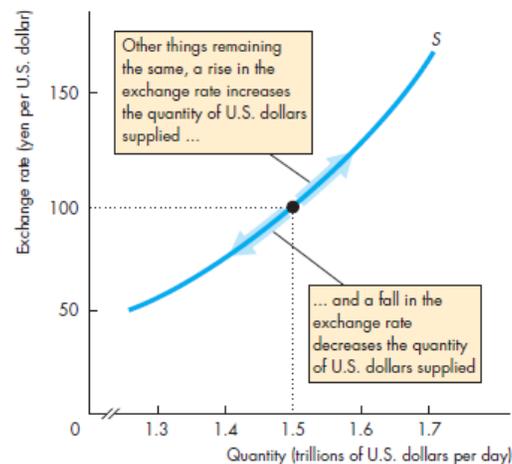
The expected profit depends on the exchange rate. For a given expected future exchange rate, the lower the exchange rate today, the larger is the expected profit from buying foreign currency today and holding them, so the smaller is the quantity of foreign currency supplied in the foreign exchange market today.

- **World Demand for Country's Exports:** The larger is the world's desire for country's goods and services, the greater is the supply of foreign currency in the foreign exchange market.
- **Interest rates in the country and other countries:** The relative expected rate of return of the assets denominated in domestic and foreign currency is also effective on the foreign exchange market. For example, if the relative rate of return of the foreign assets decreases (for example, this may happen if the foreign central bank decreases the interest rates of the assets denominated in foreign currency, when the domestic interest rate is fixed), then the demand for assets denominated in domestic currency increases, therefore, the supply of foreign currency increases in the foreign exchange market.
- **The Expected Future Exchange Rate:** Given the current exchange rate in the foreign exchange market, the higher is the expected future exchange rate, the higher is the expected rate of return from holding the foreign currency, therefore, the smaller is

the supply of foreign currency.

Then the figure 26.2 shows the supply curve for foreign currency in the foreign exchange market. A change in the exchange rate brings a movement along the demand curve. Other factors except the exchange rate shifts the demand curve.

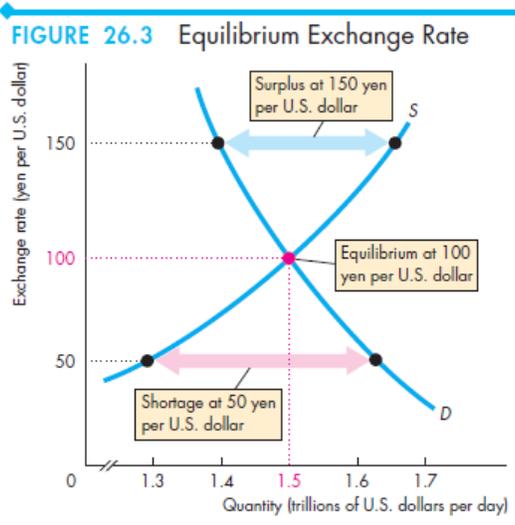
FIGURE 26.2 The Supply of U.S. Dollars



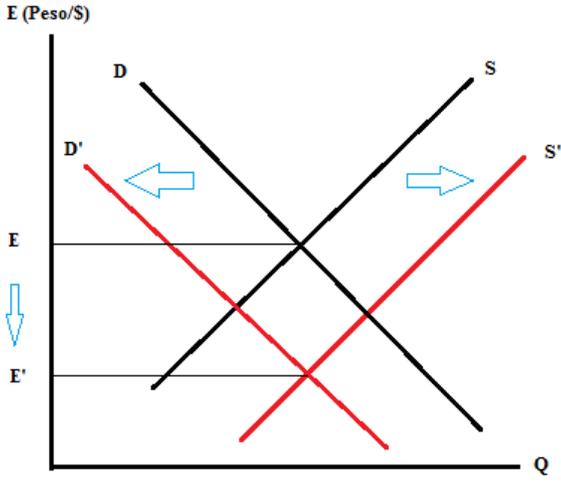
Equilibrium in the foreign exchange market occurs where the demand for foreign currency is equal to the supply of foreign currency. Figure 26.3 shows the foreign exchange market equilibrium.

According to the information given in the question, an increase in the world demand for roses increases the Colombian exports, resulting in an increase in the supply of foreign currency in the Colombian foreign exchange market, which means a rightward shift in the foreign currency supply curve.

On the other hand, if the Colombian central bank increases the interest rates at the same time, demand for assets denominated in Colombian peso increases, which means a greater demand for Colombian peso (and hence a smaller demand for US dollars) in the Colombian foreign exchange market.



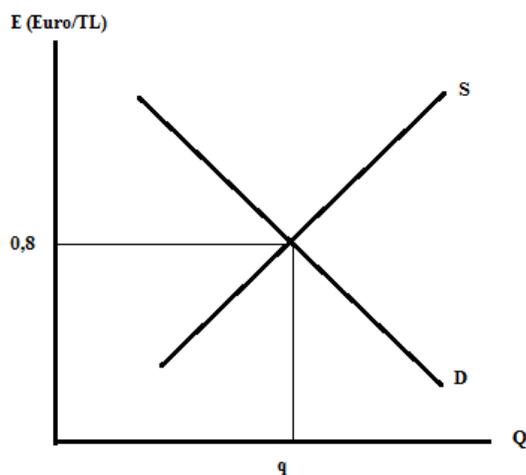
Then the figure below shows what happens in the Colombian foreign exchange market roughly.



- According to the figure;
- The demand for pesos increases,
 - The supply of pesos decreases,

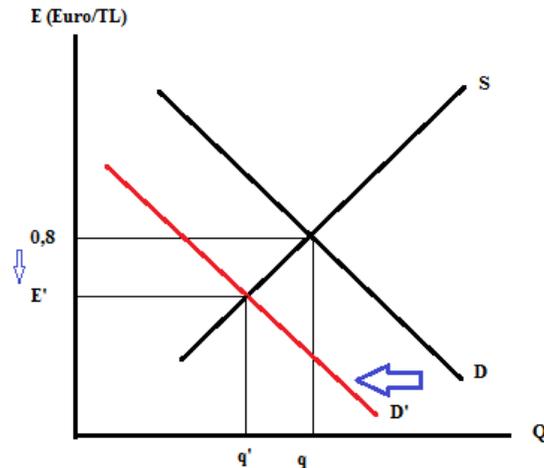
- The change in the quantity of pesos demanded and supplied in the equilibrium depends on the relative movements of the demand and supply curves.
 - And finally, the exchange rate decreases, which means an appreciation of the Colombian peso.
2. Assume that central bank announced a fixed exchange rate of 0.8 Euro/TL and the foreign exchange market is currently in equilibrium exactly at this exchange rate. Draw the graphs which depict the following cases and explain what should the central bank do in order to keep the exchange rate fixed if:
- People start to expect that TL will depreciate?
 - Government deficit increases at a very high rate?
 - Turkish goods become very popular in the world?
 - Oil prices in global markets increased immensely?

Answer: The equilibrium in the foreign exchange market can be depicted as in the following graph.



- If people start to expect that TL will depreciate, it means that the expected future level of exchange rate decreases. This will result

in a decrease in the demand curve for TL, hence, the TL demand curve shifts leftward.



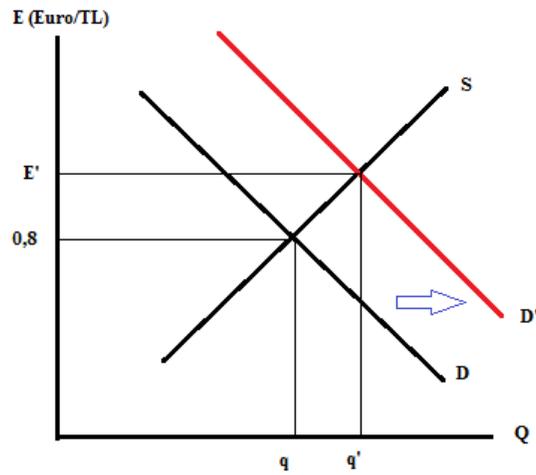
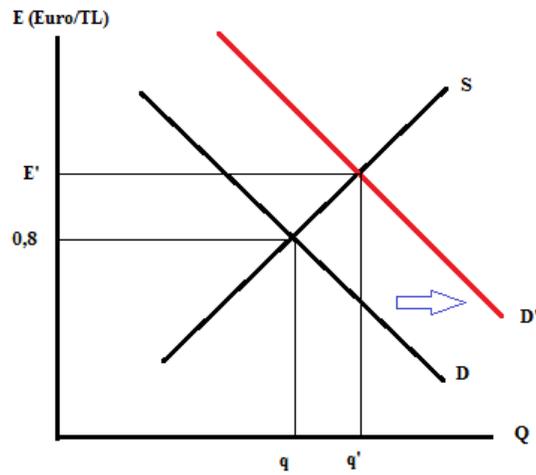
This brings a depreciation pressure on TL. In order for central bank to hold the exchange rate constant, central bank must intervene the market by buying TL (selling foreign currency) or increasing the domestic interest rate.

- If the government deficit increases, at a very high rate, this means the government will borrow more, which will result in an increase in the domestic interest rates. Since the relative expected return of the assets denominated in TL increases, demand curve for TL in the foreign exchange market shifts rightward.

This brings an appreciation pressure on TL. In order for central bank to hold the exchange rate constant, central bank must intervene the market by selling TL (buying foreign currency) or decreasing the domestic interest rate.

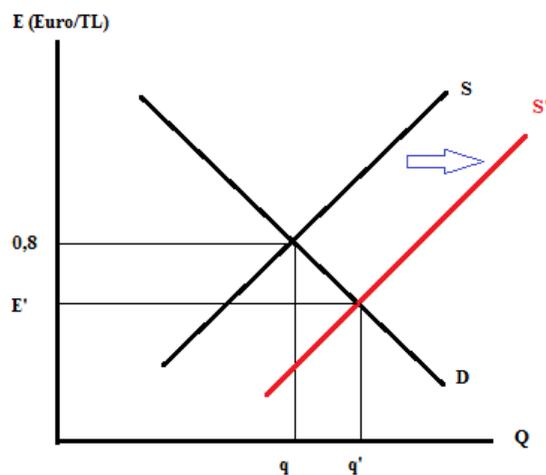
- If Turkish goods become very popular in the world, then Turkish exports increase and demand for TL rises. This results in a rightward shift in the TL demand curve.

This brings an appreciation pressure on TL. In order for central bank to hold the exchange rate constant, central bank must intervene the market by selling TL (buying foreign currency) or decreasing the domestic interest rate.



- Finally, if oil prices in global markets increase immensely, Turkiye's imports will increase and the demand for foreign currency (which is equal to the supply of TL) in the foreign exchange market increases. Therefore, the supply curve for TL shifts rightward in the foreign exchange market.

This brings a depreciation pressure on TL. In order for central bank to hold the exchange rate constant, it must intervene the



market by buying TL (selling foreign currency) or increasing the domestic interest rate.

3. The Brazilian real has appreciated 33 percent against the US dollar and has pushed up the price of a Big Mac in Sao Paulo to \$ 4.60, higher than the New York price of \$3.99. Despite Brazil's interest rate being at 8.75 percent a year compared to the US interest rate at near zero, foreign funds flowing into Brazil surged in October. (Source: Bloomberg News, October 27, 2009).

- Does purchasing power parity hold? If not, does PPP predict that the Brazilian real will appreciate or depreciate against the US dollar? Explain.
- Does interest rate parity hold? If not, why? Will the Brazilian real appreciate further or depreciate against the US dollar if the Fed raises the interest rate while the Brazilian interest rate remains at 8.75 percent a year?

Answer:

- The *purchasing power parity (PPP)* means *equal value of money*. If purchasing power parity does not prevail, powerful arbitrage

forces go to work.

Since the Big Mac in Sao Paolo and New York are different when expressed in the same currency, the PPP does not hold. In order for PPP to hold, exchange rate must adjust, which means Brazilian real must depreciate against dollar.

- On the other hand, *interest rate parity (IRP)* means *equal rates of return*. Adjusted for risk, interest rate parity always prevails. Funds move to get the highest expected return available. If for a few seconds, a higher return is available in New York than in Sao Paolo, the demand for US dollars increases and the exchange rate rises until the expected rates of return are equal. Therefore, we can say that interest rate parity always prevails.

If Fed increases the US interest rates, the relative expected rate of return of assets denominated in US dollars increases, and the relative expected rate of return of assets denominated in Brazilian real decreases. Therefore, demand for Brazilian real decreases, which results in a depreciation in Brazilian real.

4. The US price level is 106.3, the Japanese price level is 95.4 and the real exchange rate is 103.6. Japanese real GDP per unit of US real GDP. What is the nominal exchange rate?

Answer:

$$RER = \frac{E \cdot P^*}{P} \Rightarrow 103,6 = \frac{E \cdot 106,3}{95,4}$$
$$E = \frac{103,6 \cdot 95,4}{106,3} \Rightarrow E = 92,9768 \text{ Yen}/\$$$

5. Explain how fixed and crawling peg exchange rates can be used to manipulate trade balances in the short run, but not the long run.

Answer:

A fixed exchange rate is an exchange rate that is determined by a decision of the government or the central bank and is achieved by central bank intervention in the foreign exchange market to block the unregulated forces of demand and supply.

On the other hand, a crawling peg is an exchange rate that follows a path determined by a decision of the government or the central bank and is achieved in a similar way to a fixed exchange rate by central bank

intervention in the foreign exchange market. A crawling peg works like a fixed exchange rate except that the target value changes at fixed intervals, or at random intervals.

Developing countries might use a crawling peg as a method of trying to control inflation.

In the short run, by a fixed exchange rate, you can keep export prices low and make it easier to compete in the world markets. But in the long run, the exchange rate has no effect on competitiveness. The reason is that prices adjust to reflect the exchange rate and the real exchange rate is unaffected by the nominal exchange rate.

6. The following table gives some information about the US international transactions in 2008.

Item	Billions of U.S. dollars
Imports of goods and services	2,561
Foreign investment in the United States	955
Exports of goods and services	1,853
U.S. investment abroad	300
Net interest income	121
Net transfers	-123
Statistical discrepancy	66

Then;

- Calculate the current account balance.
- Calculate the capital and financial account balance.
- Did US official reserves increase or decrease?
- Was the US a net borrower or a net lender in 2008? Explain.

Answer:

$$\begin{aligned} \text{Cur.Acc.Balance} &= \text{Net Exports} + \text{Net Interest Income} + \text{Net Transfers} \\ &\Rightarrow (1853 - 2561) + 121 - 123 = -710 \text{ billions of dollars} \end{aligned}$$

Therefore, there is a current account deficit of \$710 billion.

$$\begin{aligned}\text{Cap.and Fin.Acc.Balance}&=\text{Foreign Inv.In US}+\text{US} \\ &\text{Inv.Abroad}+\text{Statistical Descripency} \\ \Rightarrow 955 - 300 + 66 &= 721 \text{ billions of dollars}\end{aligned}$$

There is a capital and financial account surplus of \$721 billion. This means, US is a net borrower in 2008.

$$\begin{aligned}\text{Official Set.Acc.}+\text{Cur.Acc.Balance}+\text{Cap.and Fin. Acc.Balance}&=0 \\ \Rightarrow x - 710 + 721 &= 0 \Rightarrow x = -11 \text{ billions of dollars}\end{aligned}$$

This means the official reserves of US increased by 11 billions of dollars. There is a minus sign, because holding foreign currency reserves are like investing abroad.

7. Why is the Aggregate demand curve negatively sloped? Explain.

Answer: There are two reasons for this:

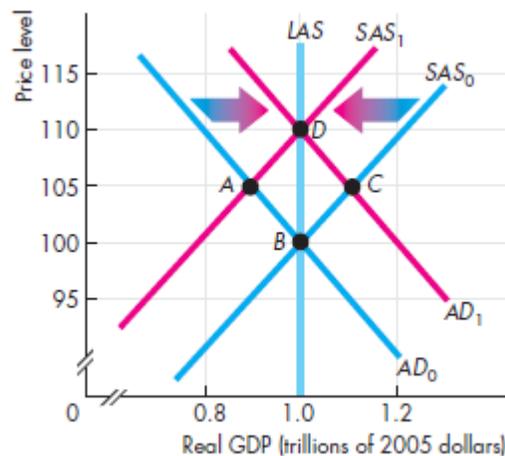
- *Wealth Effect:* When the price level rises but other things remain the same, real wealth of people decreases. People then try to restore their wealth. To do so, they must increase savings, and equivalently decrease current consumption. Such a decrease in consumption is a decrease in AD.
- *Substitution Effect:* When the price level rises, and other things remain the same, interest rates rise. Because, a rise in the price level decreases the real value of money in people's pockets and bank accounts. With a smaller amount of real money around, banks and other lenders can get a higher interest rate, people and businesses delay plans to buy new capital and consumer durable goods and cut back on spending.

This substitution effect involves change in the timing of purchase of capital and consumer durable goods and is called an intertemporal substitution effect -a substitution across time. Saving increases to increase future consumption.

8. Canada trades with the US. Explain the effect of each of the following events on Canada's aggregate demand.
- The government of Canada cuts income taxes.
 - The US experiences strong economic growth.
 - Canada sets new environmental standards that require power utilities to upgrade their production facilities.

Answer:

- If the government of Canada cuts income taxes, Canadian disposable income increases, therefore the consumption expenditure increases. And this results in a rise in the Aggregate demand.
 - If US experiences strong economic growth, the US real GDP increases. Since US trades with Canada, US demand for Canadian goods and services increases. This results in an increase in Canadian exports, and hence, Canadian aggregate demand increases.
 - If Canada sets new environmental standards that require power utilities to upgrade their production facilities, this results in an increase in the investments that these facilities planned. Since investment is one of the components of the aggregate demand, aggregate demand increases.
9. Initially, the short-run aggregate supply curve is SAS_0 and the aggregate demand curve is AD_0 .
- Some events change aggregate demand from AD_0 to AD_1 . Describe two events that could have created this change in aggregate demand. What is the equilibrium after aggregate demand changed? If potential GDP is \$ 1 trillion, the economy is at what type of macroeconomic equilibrium?
 - Some events change aggregate supply from SAS_0 to SAS_1 . Describe two events that could have created this change in aggregate supply. What is the equilibrium after aggregate supply changed? If potential GDP is \$ 1 trillion, does the economy have an inflationary gap, a recessionary gap, or no output gap?



- Some events change aggregate demand from AD_0 to AD_1 and aggregate supply from SAS_0 to SAS_1 . What is the new macroeconomic equilibrium?

Answer:

- Any kind of event that increases aggregate demand may have caused this rightward shift in AD curve. For example, an expansion in the world economy that increases the exports of the country, or a cut in income taxes by the government may be two of these reasons.

In the short run, firms increase their production and raise their prices. The economy comes to an equilibrium at the point C. Real GDP increases above its potential and price level increases to 105. There is an *inflationary gap*.

Since the price level increased and the nominal wage rate is unchanged, workers have experienced a fall in the purchasing power of their wages, and firms' profits are increased. Under these circumstances, workers demand higher wages and firms, anxious to maintain their employment and output levels, meet those demands. As the money wage rises, aggregate supply decreases, the short run aggregate supply curve SAS_0 begins to shift leftward, and

eventually AD_1 and SAS_1 curves intersect at the full-employment equilibrium (At the point D).

- Any kind of event that decreases aggregate supply may have caused this leftward shift in short run aggregate supply curve. For example, a temporary increase in the price of oil, or an increase in employment benefits that increase the costs of firms may be two of these reasons.

In the short run, firms cut their production and raise their prices, at the same time. The economy comes to an equilibrium at the point A. The real GDP decreases below its potential level and the price level rises to 105. There is a recessionary gap. Since there is recession and inflation at the economy at the same time, this situation is an example of stagflation.

When the price of oil returns to its original level, the economy returns to the full-employment level.

- Since the AD and SAS curves intersect on the long-run aggregate supply curve LAS , economy is at full-employment equilibrium. Only the price level has increased.

10. In Japan, potential GDP is 600 trillion yen and the table shows the aggregate demand and short-run aggregate supply schedules.

Price level	Real GDP demanded	Real GDP supplied in the short run
	(trillions of 2005 yen)	
75	600	400
85	550	450
95	500	500
105	450	550
115	400	600
125	350	650
135	300	700

- Draw a graph of the aggregate demand curve and the short-run aggregate supply curve. What is the short-run equilibrium real GDP and price level?

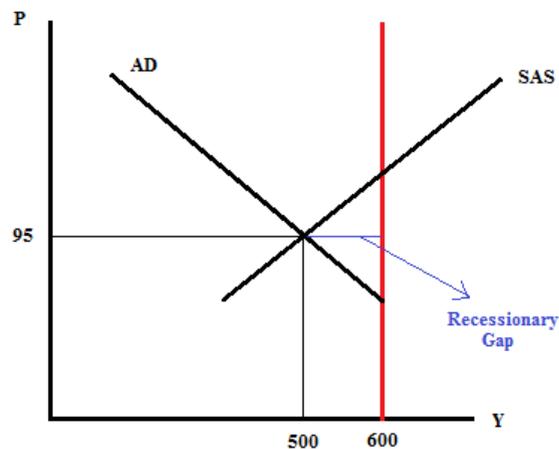
- Does Japan have an inflationary gap or a recessionary gap and what is its magnitude?

Answer: The short-run equilibrium occurs where the aggregate demand and short-run aggregate supply are equal to each other.

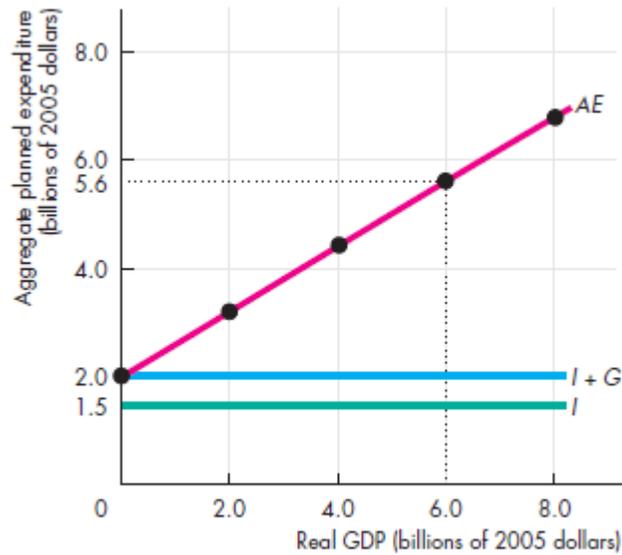
Price level	Real GDP demanded	Real GDP supplied in the short run
	(trillions of 2005 yen)	
75	600	400
85	550	450
95	500	500
105	450	550
115	400	600
125	350	650
135	300	700

According to the table, in the short-run, real GDP is equal to 500 and the price level is 95. Since real GDP is below its potential level, there is a recessionary gap in the economy, the magnitude of which is equal to 100 (=600-500).

We can depict the short-equilibrium as in the following graph.



11. The figure illustrates the components of aggregate planned expenditure on Turtle island. Turtle island has no imports or exports, no income taxes, and the price level is fixed.



- Calculate autonomous expenditure and the marginal propensity to consume.
- What is aggregate planned expenditure when real GDP is \$ 6 billion?
- If real GDP is \$ 4 billion, what is happening to inventories?
- If real GDP is \$ 6 billion, what is happening to inventories?

Answer:

- In the question we are given $X = 0, M = 0$
Autonomous expenditures are the expenditures which are independent of real GDP. Then;

$$\text{Autonomous Expenditure} = I + G + X$$

In the graph we are given $I + G = 2$ billion \$. Therefore,

Autonomous Expenditure=2 billions of dollars.

Marginal propensity to consume (mpc) is equal to the increase in consumption when real GDP is increased by one additional unit

$$mpc = \frac{\Delta C}{\Delta Y}$$

If we write the consumption function;

$$C = C_0 + mpc.Y_d$$

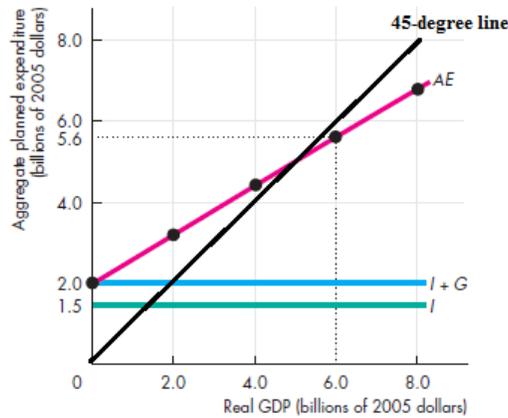
We can see from the graph that when real GDP is 0, $AE=I+G$, then we can conclude that there is no autonomous expenditure ($C_0 = 0$). Since there is no taxes in the economy, real GDP is equal to the disposable income. Then;

$$C = mpc.Y$$

Since there are no export or import in the economy, if we subtract investment (I) and government expenditure (G), only the consumption is left in the AE. And we know that both investment and government expenditures are autonomous. Therefore, the slope of the aggregate planned expenditure curve is equal to the slope of the consumption curve and it is equal to the marginal propensity to consume. From the graph;

$$mpc = \frac{5,6 - 2}{6} = 0.6$$

- From the graph, we can find that $AE = 5,6$ billions of dollars when real GDP is 6 billions of dollars.
- When we draw the 45-degree line, we see that when GDP is 4 billions of dollars, Aggregate planned expenditure (AE) is greater than real GDP. This means that goods sold are greater than goods produced, and some of the goods demanded by people are met from the inventories of the firms. Therefore, firms' inventories decrease.
- On the other hand, when real GDP is 6 billions of dollars, aggregate planned expenditure (AE) is less than real GDP. This means that goods sold are less than goods produced, and some of the



goods produced are accumulated in the inventories of the firms. Therefore, firms' inventories increase.

12. Suppose that the economy is at full employment, the price level is 100, and the multiplier is 2. Investment increases by \$ 100 billion.

- What is the change in equilibrium expenditure if the price level remains at 100?
- What is the immediate change in the quantity of real GDP demanded?
- In the short run, does real GDP increase by more than, less than, or the same amount as the immediate change in the quantity of real GDP demanded?
- In the short run, does the price level remain at 100? Explain why or why not.
- In the long run, does real GDP increase by more than, less than, or the same amount as the immediate increase in the quantity of real GDP demanded?
- Explain how the price level changed in the long run.
- Are the values of the multipliers in the short run and the long run larger or smaller than 2?

Answer: In the question we are given $P = 100$, $\Delta I = 100$, multiplier=2.

- $\Delta AE = multiplier \cdot \Delta I \Rightarrow \Delta AE = 2 \cdot 100 = 200$ billions of dollars.
- $\Delta Y = \Delta AE = 200$ billions of dollars.
- It increases less than the increase in the quantity of real GDP demanded. Because the prices rise and the increase in prices shifts the aggregate planned expenditure curve downwards.
- No, because in order to increase supply, firms produce over their capacity, which results in a rise in their costs. Therefore, they raise the prices of their products.
- In the long run, the real GDP is equal to the potential GDP, so it does not change.
- In the long run, shortages of labor increase the money wage rate. This increases firms' costs, which decreases short-run aggregate supply and shifts SAS curve leftwards until it intersects with the AD curve at the potential real GDP level.
- In the short-run it is less than 2 but still greater than 1. In the long run, multiplier is 1.

13. In the Canadian economy, autonomous consumption expenditure is \$ 50 billion, investment is \$ 200 billion, and government expenditure is \$ 250 billion. The marginal propensity to consume is 0.7 and net taxes are \$ 250 billion. Exports are \$ 500 billion and imports are \$ 450 billion. Assume that net taxes and imports are autonomous and the price level is fixed.

- What is the consumption function?
- What is the equation of the AE curve?
- Calculate equilibrium expenditure.
- Calculate the multiplier.
- If investment decreases to \$ 150 billion, what is the change in equilibrium expenditure?

Answer: In the question we are given;

$C_0 = 50, I = 200, G = 250, T = 250, X = 500, M = 450, mpc = 0.7$ and prices are fixed.

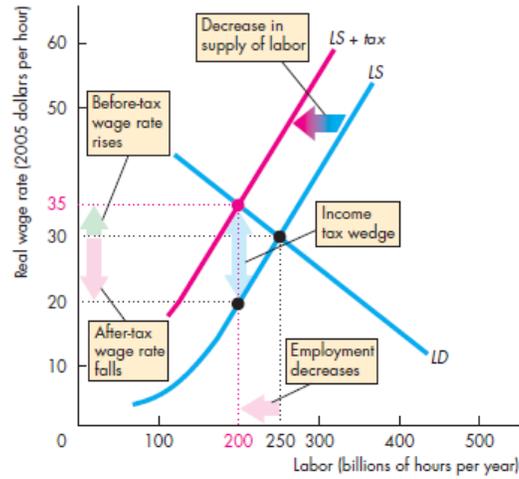
- $C = C_0 + mpc \cdot Y_D$
 $\Rightarrow C = C_0 + mpc \cdot (Y - T)$
 $\Rightarrow C = 50 + 0,7 \cdot (Y - 250)$
 $\Rightarrow C = 50 + 0,7Y - 175$
 $\Rightarrow C = -125 + 0,7Y$
- $AE = C + I + G + (X - M)$
 $\Rightarrow AE = (-125 + 0,7Y) + 200 + 250 + (500 - 450)$
 $\Rightarrow AE = -125 + 0,7Y + 500$
 $\Rightarrow AE = 375 + 0,7Y$
- $AE = Y$
 $\Rightarrow 375 + 0,7Y = Y$
 $\Rightarrow 375 = 0,3Y$
 $\Rightarrow Y = \frac{375}{0,3} = 1250$
- $multiplier = \frac{1}{1 - mpc} = \frac{1}{1 - 0,3} = \frac{1}{0,3} = \frac{10}{3}$
- $\Delta I = -50 \Rightarrow \Delta AE = multiplier \cdot \Delta I = \frac{-50 \cdot 10}{3} = -\frac{500}{3}$

14. The government is considering raising the tax rate on labor income and asks you to report on the supply-side effects of such an action. Answer the following questions using appropriate graphs. You are being asked about directions of change, not exact magnitudes. What will happen to:

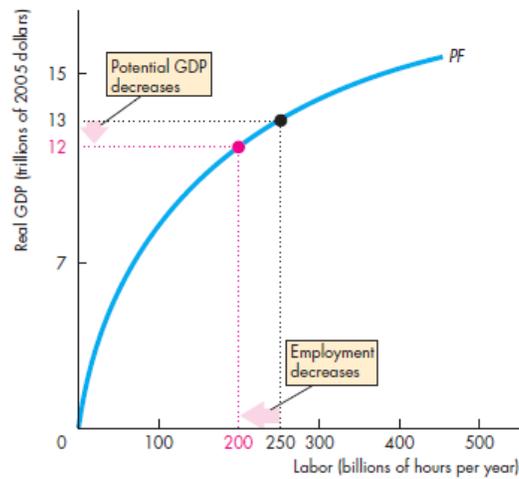
- The supply of labor and why?
- The demand for labor and why?
- The equilibrium level of employment and why?
- The equilibrium before-tax wage rate and why?
- The equilibrium after-tax wage rate and why?
- Potential GDP?

Answer: The tax on labor income influences potential GDP and aggregate supply by changing the full-employment quantity of labor. The income tax weakens the incentive to work and drives a wedge between the take-home wage of workers and the cost of labor to firms. the result

FIGURE 30.5 The Effects of the Income Tax on Aggregate Supply



(a) Income tax and the labor market



(b) Income tax and potential GDP

is a smaller quantity of labor and a lower potential GDP. Figure 30.5 shows this outcome.

- An income tax weakens the incentive to work and decreases the supply of labor. The reason is that for each dollar of before-tax

earnings, workers must pay the government an amount determined by the income tax code. So workers look at the after-tax wage rate when they decide how much labor to supply. An income tax shifts the supply curve leftward.

- The income tax has no effect on the demand for labor. The reason is that the quantity of labor that firms plan to hire depends on how productive labor is and what it costs -its real wage rate.
- The equilibrium level of employment decreases because labor supply has decreased.
- The vertical distance between the old and new labor supply curves is called the income tax wedge.

With a smaller supply of labor, the before-tax wage rate rises. If the labor demand curve were horizontal (infinitely elastic), before-tax wage wouldn't have changed, because firms would have demanded labor only from the current wage rate and would have demanded zero labor if the wage were different. Therefore, all the tax must have been paid by the laborers. But since the labor demand curve isn't infinitely elastic, some part of the tax must be paid by the firms.

- After-tax wage rate falls. If the labor demand curve were vertical (inelastic), after-tax wage wouldn't have changed, because firms would have demanded the same quantity of labor whatever the wage rate is. Therefore, all the tax must have been paid by the firms. But since the labor demand curve isn't inelastic, some part of the tax must be paid by the laborers.
- Because the full-employment quantity of labor decreases, so does potential GDP.

15. The economy is in a boom and the inflationary gap is large.

- Describe the discretionary and automatic fiscal policy actions that might occur.
- Describe a discretionary fiscal restraint package that could be used that would not produce serious supply-side effects. Explain the risks of discretionary fiscal policy in this situation.

Answer:

- A fiscal policy action that is triggered by the state of the economy with no action by government is called *automatic fiscal policy*.

One of these automatic fiscal policies is tax policy. When the economy is in a boom and the real GDP increases, wages and profits rise, so tax revenues from these incomes rise.

Another automatic fiscal policy may be *needs-tested spending*. The government creates programs that pay benefits to qualified people and businesses. The spending on these programs results in transfer payments that depend on the economic state of individual citizens and businesses. When economy is in a boom, unemployment falls, the number of people experiencing economic hardship decreases, so needs-tested spending decreases.

On the other hand, a fiscal policy initiated by an act of government is called *discretionary fiscal policy*. The government may change the aggregate demand by changes in government expenditure and changes in taxes.

When the economy is in a boom and there is an inflationary gap, the government may decrease the aggregate demand by decreasing its expenditures, or increasing the taxes in order to decrease the aggregate expenditure.

- A tax on labor income drives a wedge between the cost of labor and the take-home pay of workers and lowers employment and output.

A tax on capital income (on interest) drives a wedge between the cost of borrowing and the return to lending and lowers saving and investment. With less saving and investment, the real GDP growth rate slows.

These supply-side effects of a tax increase occur along with the demand-side effects and are probably much larger than the demand-side effects and make the overall tax multiplier much larger than the government expenditure multiplier.

On the other hand, a decrease in government expenditure, decreases borrowing and decreases the demand for loanable funds in the loanable funds market. This results in a decrease in real interest rate, which in turn increases investment. This increase in investment raises aggregate demand, therefore limits the effect of government expenditure on aggregate demand.

So, a fiscal restriction package that is heavy on tax increase and light on government spending works.