

## From Module 4

### Real vs Nominal GDP

- Why the distinction- real gdp is adjusted for inflation
- The chain method for calculating real GDP growth rates- 2013-2012/2012
- Calculating the GDP deflator= nominal gdp/ real gdp (provides a measure of average price in an economy)
- Calculating the rate of inflation using the GDP deflator- we want to know how much higher the prices are in one period than the preceding period. **The percentage change in gdp deflator between 2 adjacent periods of time.** =  $\frac{\text{GDP deflator 2013} - \text{GDP deflator 2012}}{\text{GDP deflator 2012}} \times 100$

**Why GDP is not perfect-** it is not the only measure of well being, a higher level of output doesn't automatically mean a higher level of well being.

## From Module 5

### Labor Force Measures

- Labor force participation rate= civilian labor force/ working age population
- Employment to population ratio= employed/ working age population
- Unemployment rate=  $\frac{[(\text{labor force} - \text{employed labor force})]}{\text{Labor force}} \times 100$   
= Unemployed labor force/ Labor force x 100
  - Duration of unemployment and the business cycle
  - Average duration of unemployment
  - Long-term unemployment: proportion unemployed for more than 27 weeks.

### **Why the unemployment rate is not zero**

- Job rationing explanations- real wage is higher than market equilibrium, hence unemployment. It is to explain why wages don't adjust to bring about equilibrium in labor market. Due to minimum wage, insider/outsider theories, efficiency wage theories (a wage higher than that which would equate quantity supplied and quantity demanded set by employers in order to increase worker efficiency). The purpose of this is to explain why wages don't adjust in order to eradicate excess supply in the labor market as one there are barriers to how low wages can possibly go, there will always be unemployment.
- Job search/matching explanation- the labor market is in a constant state of flux. Some jobs are being destroyed while others are being formed, people are leaving one job and finding another, people are retiring/ entering because of this the labor market can never be in equilibrium and there will always be people searching for work.
- Involuntary unemployment.

**Natural rate of unemployment-** the rate of unemployment that occurs when the economy is neither in a recession nor in a boom. It's the unemployment rate that exists when real and potential gdp are equal.

Factors that determine the natural rate- 1. Frictional unemployment (look for work because they have entered or re-entered the labor force or they left a job in order to find a better job.

2. Structural unemployment (people who are unable to find a job because they don't have the correct skills or there are people located in areas where there is an insufficient demand for labor. Such individuals are usually unemployed for a long period of time)

Cyclical Unemployment- fraction of those that lost their jobs increases when economy contracts and is less when the economy expands. The fraction of those unemployed because of they quit or entered or reentered the labor force increases as economy expands and decreases when economy contracts.

### From Module 6

**National Saving(S)**= GDP(Y)- Consumption(C)- Government purchases (G) [ $S_p + S_g$ ]

Saving = investment plus net exports

Government( $S_g$ )= T- G

Private saving( $S_p$ )= Y- net taxes (T)- C

Increase in consumption and government purchases results in a decline in total savings. A change in taxes will not cause total saving to change.

### **The relationship between net exports, the trade deficit, and net foreign saving and the Source of funds**

Relationship between saving, investment and net exports-  $Y = C + I + G + X$  (net exports)

$Y - C - G = I + X$  which is  $= S$  therefore,  $S = I + X$ ,  $S - X = I$  where  $-X =$  trade deficit hence, **Saving + trade deficit (TD) = Investment ( $S + NFS = I$ )**

**Trade deficit**= net foreign saving- when a country runs a trade deficit, the foreign currency received from exports revenues is less than the amount of foreign currencies needed to pay for imports. To make up difference the country must borrow from the rest of the world. This borrowing takes the form of obtaining stocks, bonds and titles to land ownership in the country that his running a trade deficit.

**Net Foreign Saving (NFS)**- the amount of foreign currency that is borrowed

Investment- as the use of funds (demand curve)

Saving and net foreign saving- as the source of funds (supply curve)

Funds needed to finance investment activity in U.S. can come from National saving and NFS

Interest rates and consumption- Saving( $Y - C - G$ ) is inversely related to consumption. Consumption is inversely related to the real rate of interest. An increase in the  $rr$  causes current consumption to decline and saving to increase as 1. an increase in  $rr$  provides an incentive for people to save more for the future because a higher interest rate means more future funds and therefore more consumption in the future. 2. It becomes more expensive to finance consumption goods like cars, consumption falls and saving increases. *When the  $rr$  rises, total saving also rises.*

The Loanable Funds Model of Interest Rate Determination- equilibrium real rate of interest is where the supply of loanable funds ( $S + NFS$ ) line intersects the demand for loanable funds (I) line. This is where the amount of investment equals domestic plus NFS.

Nominal Interest rate(i)- reported interest rate not adjusted for inflation. (no. of dollars that a borrower pays and a lender receives in interest in a year expressed as a percentage of dollars borrowed or lent).

The real interest rate (rr)- interest rate adjusted for the effects of inflation.

$\Pi^e$ - the expected rate of inflation

The real interest rate= nominal interest rate - expected rate of inflation

$$rr = i - \Pi^e$$

The effect interest rates have on net foreign saving and net exports assuming no change in GDP- NFS is positively related to rr. If Canadian interest rate increases, assuming foreign interest rates remain constant, foreign investors would prefer Canadian assets to that of the other countries. Canadian dollar exchange rate appreciates as a result.

The relationship between the real interest rate, the exchange rate, exports & imports (net exports), the trade deficit and net foreign saving- An increase in rr causes the demand for dollars to increase. The increase in the demand for dollars causes the foreign currency price of dollars to increase. The appreciation of the dollar exchange rate causes the price of Canadian goods and services sold abroad to increase. This is because a unit of foreign currency buys less dollars as the foreign currency is now worth less. This strengthening causes the demand for Canadian produced goods and services to decrease. The appreciation of the Canadian dollar exchange rate causes the price of foreign produced goods and services to fall in Canada. Cause stronger Canadian dollar means that a dollar now buys more units of foreign currency. So demand for imported goods increases. **So the decrease in exports and the increase in imports means net exports decreases.**

There is a positive relationship between the rr and the source of funds (NFS+S)

Factors that cause the source of funds line to shift-

1. **Change in consumer optimism (sentiment):** An improvement in consumer optimism causes consumption to increase, which causes **saving to fall** and therefore the source of funds (S+NFS) line to shift to the left.
2. **Changes in government purchases of goods and services:** An increase in government purchases, causes govt. saving to decrease and therefore **total saving to fall**. The source of funds (S+NSF) line shifts left.
3. **Changes in demand for Canadian exports:** An increase in Canadian exports causes net exports to increase and therefore **net foreign saving to fall**, the source of funds (S+NFS) line shifts left.
4. **Changes in the Canadian demand for imported goods:** An increase in demand for foreign produced goods causes the net export to decrease and therefore **NFS to increase**, the source of funds (S+NFS) shifts to right.

### **Use of funds**

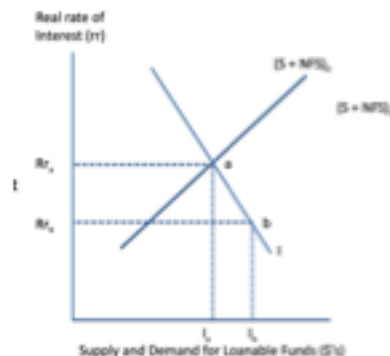
How the real rate of interest affects investment- when real rate of interest increases, the cost of financing the purchase of plant and equipment rises. The rise in financing cost causes investment spending to fall. This is why the demand for loanable funds is downward sloping.

Factors that cause the **use of funds** line to shift-

1. **Investment Tax Credit:** An investment tax credit means that a firm's taxes are reduced when the firm purchases new equipments. An investment tax credit causes the amount of investment occurring at a given rate of interest to increase. SO demand for loanable funds shifts to the right.
2. **Taxes on Revenue Earned from capital:** If taxes on revenue earned from capital are raised then the after tax return on capital falls, the fall in the after-tax return on capital causes investment to fall. The demand for loanable funds shifts to the left.
3. **Business Confidence:** If firms become more confident/optimistic about the future, then they will increase their purchases of plant and equipment. Investment spending increases and demand for loanable funds shifts to the right.

**Using the loanable funds model to determine the real rate of interest and the amount of investment.**

How a change in Government purchases affects the real interest rate and investment- initially the economy is at an equilibrium, a decline in govt. purchases( $G$ ) causes government saving( $S_g$ ), therefore causes total saving to increase, so the supply of loanable funds increases and shifts to the right. This shift down to the right. Compared to the initial equilibrium, the new equilibrium exhibits a lower rate of interest and a higher level of investment spending.



How a change in consumption (because of a change in consumer confidence) purchases affects the real interest rate and investment- initially at equilibrium an improvement in consumer confidence, increases consumption and decreases private saving, which decreases total saving and in turn causes the supply of loanable funds to shift to the left and in turn causes the real interest rate to be higher and investment spending to decrease.

How a change in Investment (because of changes in the investment tax credit, taxes on business capital, or business confidence) affects the real interest rate and investment- initially economy is at equilibrium, an increase in business confidence, causes more purchases of plant and equipments, causes investment spending to increase which causes demand for loanable funds to increase and therefore shift to the right. Compared to initial equilibrium the new equilibrium has a higher real rate of interest and a higher level of investment spending. Increase in investment tax credit causes investment spending to increase and therefore demand for loanable funds to increase and shifting it to the right, this causes the real rate of interest to be higher and investment spending to be higher. Tax

on business capital causes the investment spending to fall and therefore demand for loanable funds to decrease and shifts to left and therefore causes real rate of interest to be lower and investment spending to fall.

How a change in exports affects the real interest rate and investment- increase in exports causes net foreign saving to decrease and causes the supply for loanable funds to decrease and shift to the left, this causes the real rate of interest to increase and investment to decrease.

How a change in imports affects the real interest rate and investment- increase in demand for imports causes the NFS to increase and supply of loanable funds to increase, this then causes real rate of interest to decrease and investment to increase.

## From Module 7

**Economic fluctuations-** departure of real gdp from potential is due to changes in aggregate demand. The firm changes production by the same amount as the shift in demand: the firm's price is sticky it doesn't change. The firm changes production by less than the shift in demand: the firm's price must change.

- prices are sticky in the short run (prices don't change as soon as spending changes) because of limited information and implicit contracts. Rarely are there large declines in labor, capital or technology at the same time of recession.

Recessions- A decline in real GDP that lasts for at least 6 months.

Recoveries- The early part of economic expansion, immediately after the trough of the recession.

Expansions- the period between the trough of a recession and the next peak, consisting of a general rise in output and employment.

Peaks- the highest point in real GDP before a recession

Troughs- the lowest point in the real GDP at the end of recession.

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## The Income/Expenditure (Z-line/45°-line) model:

I will not be covering aggregate demand and supply the way it is covered in chapter 11 of the text.

The concept of the spending multiplier is briefly discussed on pages 341 through 345 of the text. However, the text discusses the multiplier within the context of fiscal policy. Fiscal policy is a topic that will be covered after this exam.

Also, the terms **total** and **aggregate** are synonyms. The terms *spending*, *expenditure*, and *demand* are also synonyms. This means the terms aggregate expenditure, aggregate spending, aggregate demand, total spending, total expenditure, and total demand all mean the same thing.

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## The Income/Expenditure Model

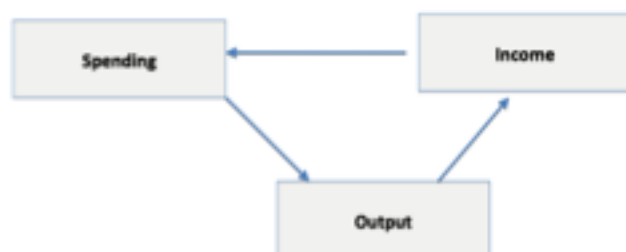
3 key points about economic fluctuations

**Forecasting real GDP-** expenditure approach is good when making short run (a time horizon of 1 to 3 years) forecast.

Short-run forecasts- expenditure approach  $Y=C+G+I+X$  if  $G$  increases  $Y$  increases. Why?

Because there is a simultaneous relationship between spending and income, a change in spending leads to an increase in output and the change in output leads to a change in income. Change in income leads to more spending.

**Multiplier Effect-** The initial increase in spending (eg increase in govt. spending) it causes both the output and income to increase, which in turn causes consumption spending to increase. The increase in consumption spending results in even more output and income which results in even more consumption spending. **More consumption leads to even more output etc.**



### **How spending affects production and income**

The income-spending identity (45-degree line)- The line shows the effect a change in spending has on income. Drawing it as a 45 degree line embodies the assumption that a change in spending causes income and output to change by the same amount.

The assumption about prices- prices are fixed in the short run: means that demand creates its own supply. A change in spending leads to a change in output by the same amount.

**How spending responds to changes in income-**  $C, I, G$  and  $X$  are 4 spending components of GDP. Their sum  $C+I+G+X$  is **aggregate expenditure(Z)/total spending.  $Z=C+I+G+X$**   
Of the 4 spending components making up aggregate expenditure, only consumption ( $C$ ) depends on income.

Disposable income ( $Y_d$ ), income or GDP ( $Y$ ), Net taxes- difference between taxes paid and transfer payments. ( $T$ ).

$$Y_d = Y - T$$

**The consumption function- depicting/representing the relationship between consumption and income:** 2 different set of factors influencing consumption spending.

1. Income
2. Non- income factors (consumer confident, interest rates and net worth(wealth))

Consumption(C)= autonomous consumption(C0)+ marginal propensity  
consume(C1)Yd

$$C = C_0 + C_1 Y_d$$

The marginal propensity to consume(C1)- represent how sensitive  
consumption is to changes in income(means either Y and Yd)

$$C = C_0 + C_1 Y_d$$

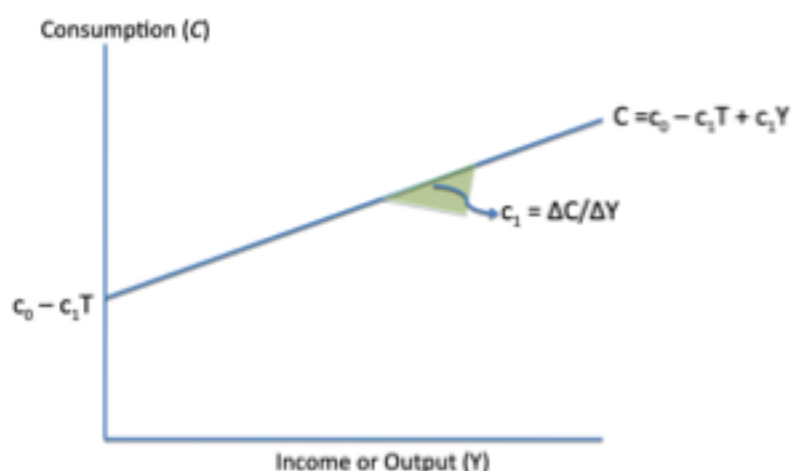
$$Y_d = Y - T$$

$$C = C_0 + C_1 (Y - T)$$

$$C = C_0 + (C_1 Y - C_1 T)$$

$$C = (C_0 - C_1 T) + C_1 Y$$

$$y = (c) + mx$$



Autonomous consumption(C0)- captures effect of non income factors. It changes when  
either interest rates, consumer confidence or net worth(wealth) changes.

Whenever u see a line ask:

- what causes the line to shift?
- What does the slope of the line represent?

Factor	Effect on autonomous consumption (C <sub>0</sub> )	Effect on Consumption
Net Worth (Wealth) ↑	↑	↑
Consumer Sentiment (Confidence) ↑	↑	↑
Interest rate ↑	↑	↑
Taxes (T) ↑	No Effect	↓

-taxes do not effect autonomous consumption

The reason an increase in taxes causes the consumption function to shift down is that an  
increase in taxes reduces disposable income which in turn leads to reduce in  
consumption.

- whenever autonomous consumption( $C_0$ ) increases, the consumption function shifts up due to an increase in either net worth (wealth) or consumer confidence or because of a decrease in interest rate.
- Whenever  $C_0$  decreases, the consumption function shifts down due to decrease in consumer confidence and net worth or increase in interest rates.

Disposable income

How wealth (net worth) affect consumption- increase wealth, shifts consumption function up

How the real interest rate affects consumption-

How consumer confidence affects consumption

How taxes affect consumption- if taxes decreases, the consumption function shifts up as there is more disposable income. More disposable income leads to more consumption.

- slope of the consumption function= marginal propensity to consume ( $C_1$ )

$$- C_1 = \Delta C / \Delta Y$$

$$- \Delta C = C_1 \Delta Y$$

- a larger marginal propensity to consume makes the consumption function steeper.

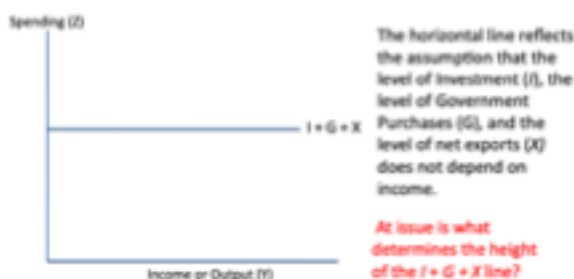
- A smaller  $C_1$  makes the consumption function flatter

**The aggregate expenditure (Z) line- relationship between total spending (Z) and income (Y)**

$$Z = C + I + G + X$$

**C:** depends on income

**I,G,X:** do not depend on income



G depends on political factors as its up to govt. to determine the level of spending

I depends on business confidence, interest rates (credit availability), taxes and tax incentives.

X depends on: change rate and interest rates

Anything that causes IGX to increase causes line to shift up and rise

The slope of the Z-line- total spending

Factors that cause the Z-line to shift

**The point of spending balance**

The spending multiplier

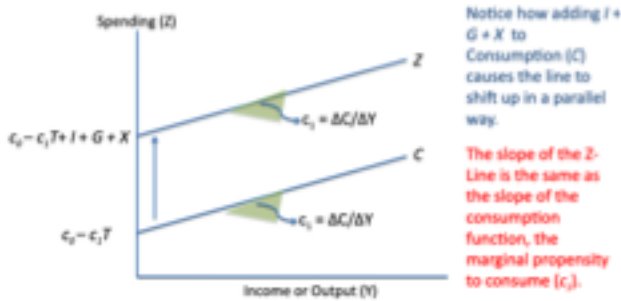
Finding income at the point of spending balance

Finding Consumption at the point of spending balance

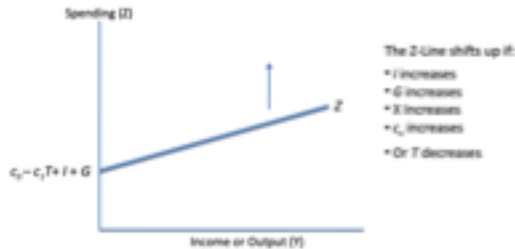
Finding private saving, government saving, and total domestic saving at the point of spending balance

## To Get the Z-Line

To get the Z-line, add  $I + G + X$  to Consumption (C)



## Shifting the Z-Line Up



## Finding the Point of Spending Balance: Adding the 45-Degree Line to Find the Equilibrium Point

