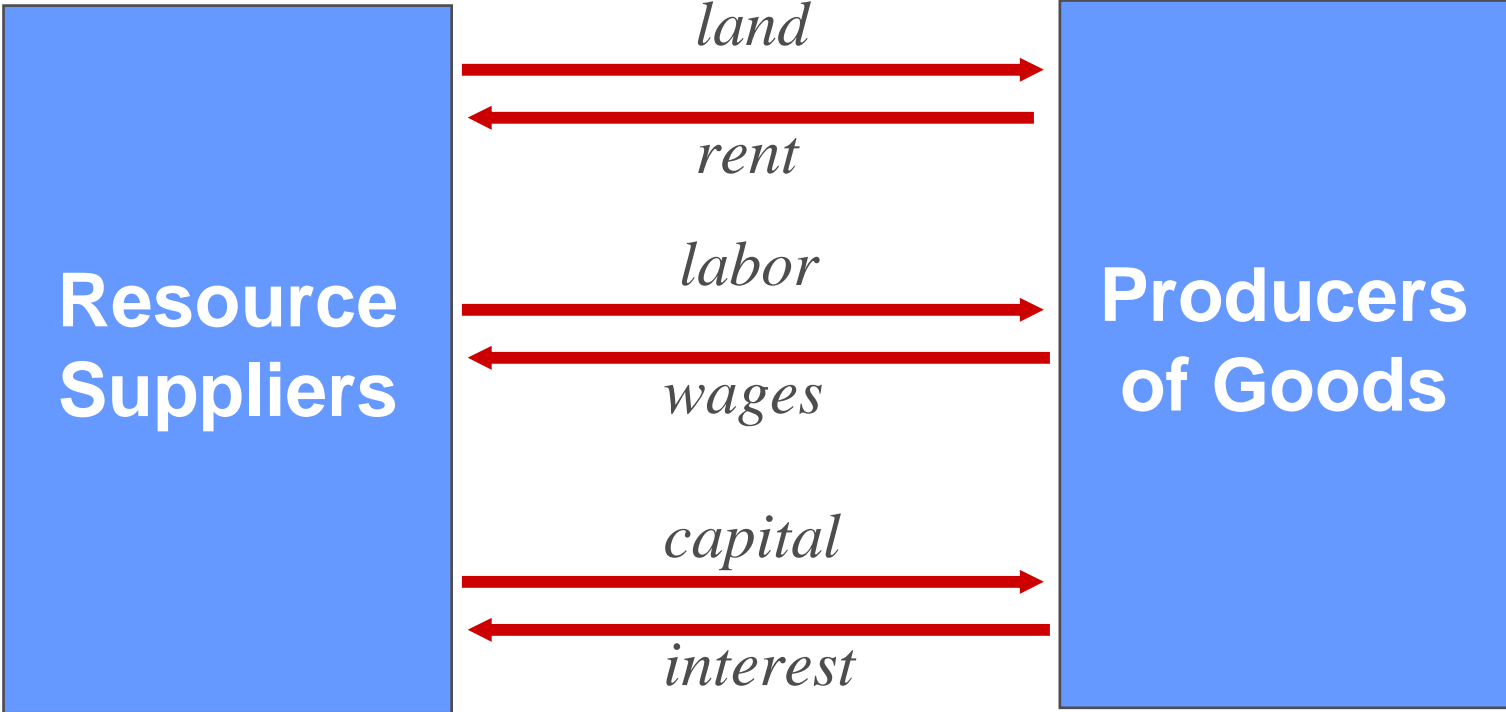


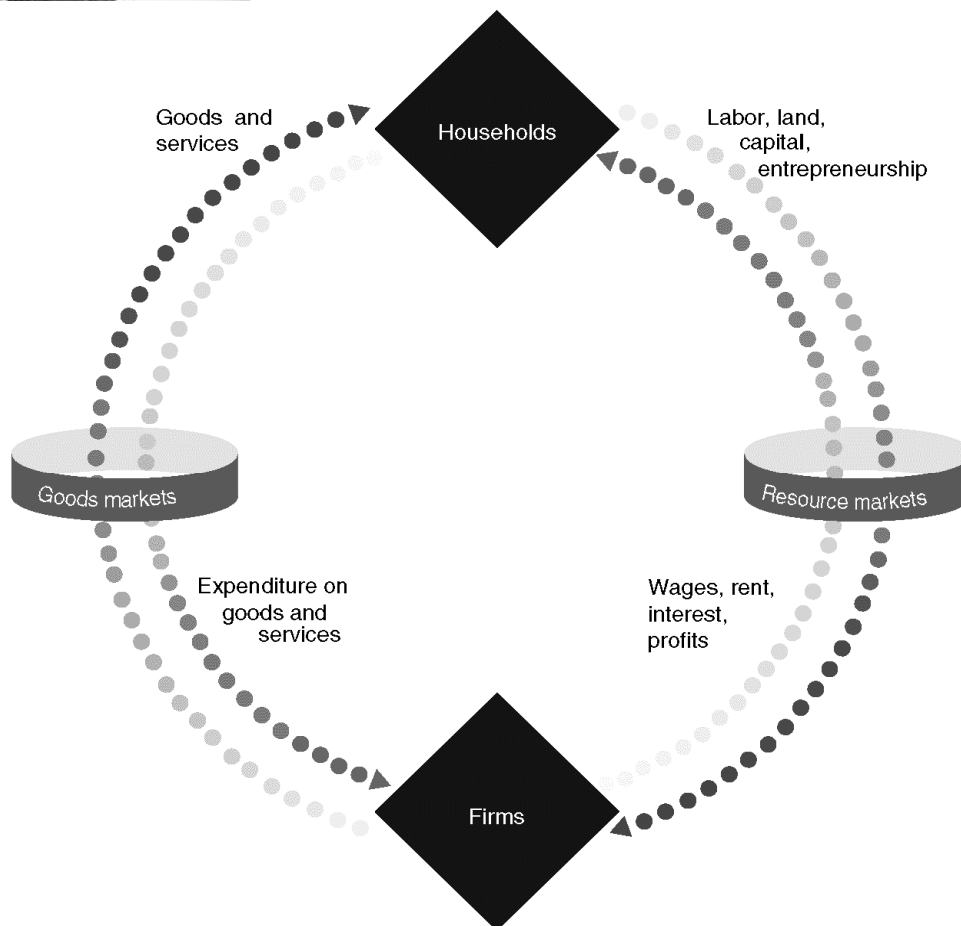
**Four Key Markets, the Circular Flow of Income and  
Aggregate Demand  
Ing. Mansoor Maitah Ph.D.**



# Circular Flow Diagram

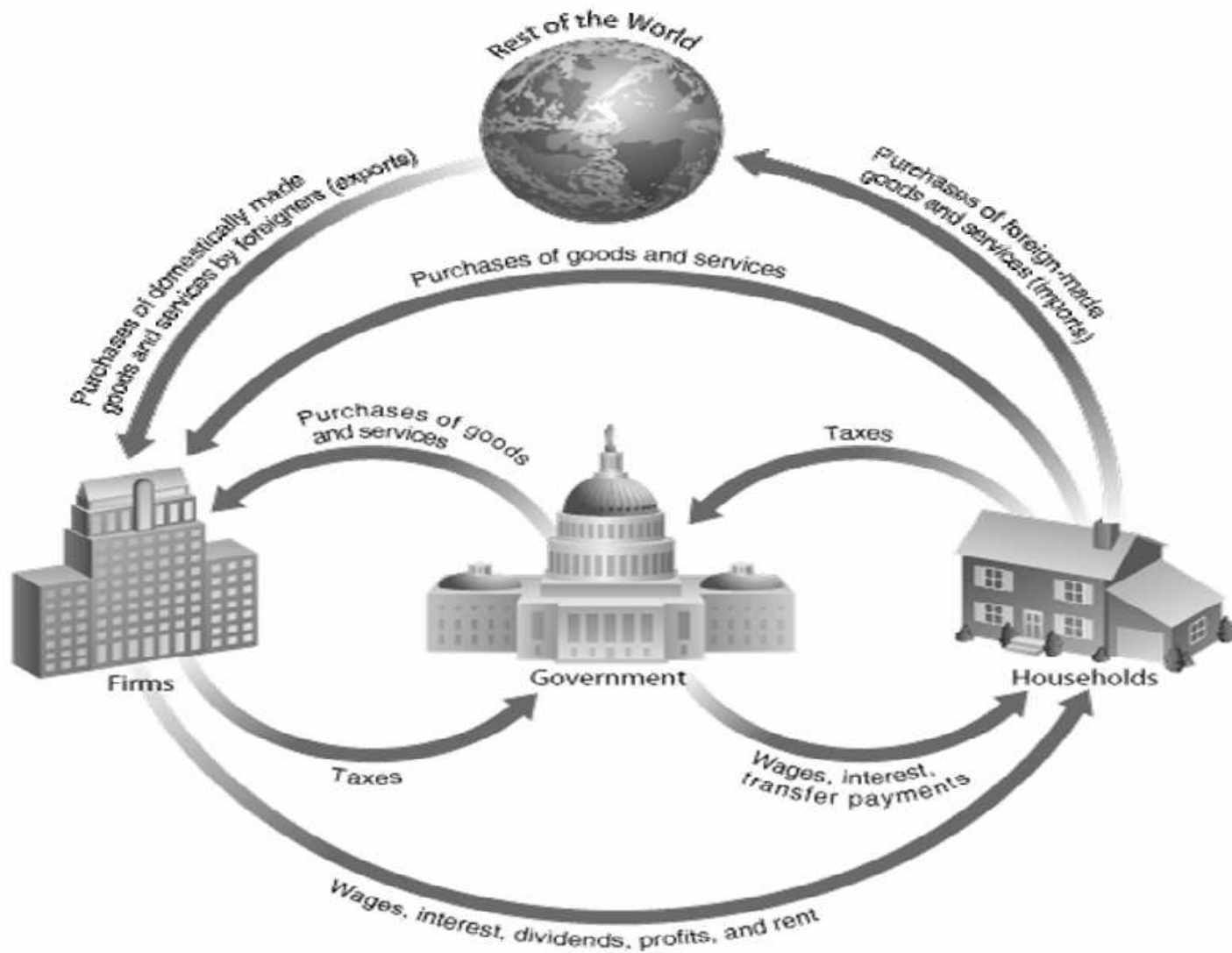


# Circular Flow Diagram



- Describes the flow of resources, products, income, and revenue among the *four* decision makers (Households, Firms, Output Market, Input Market.)

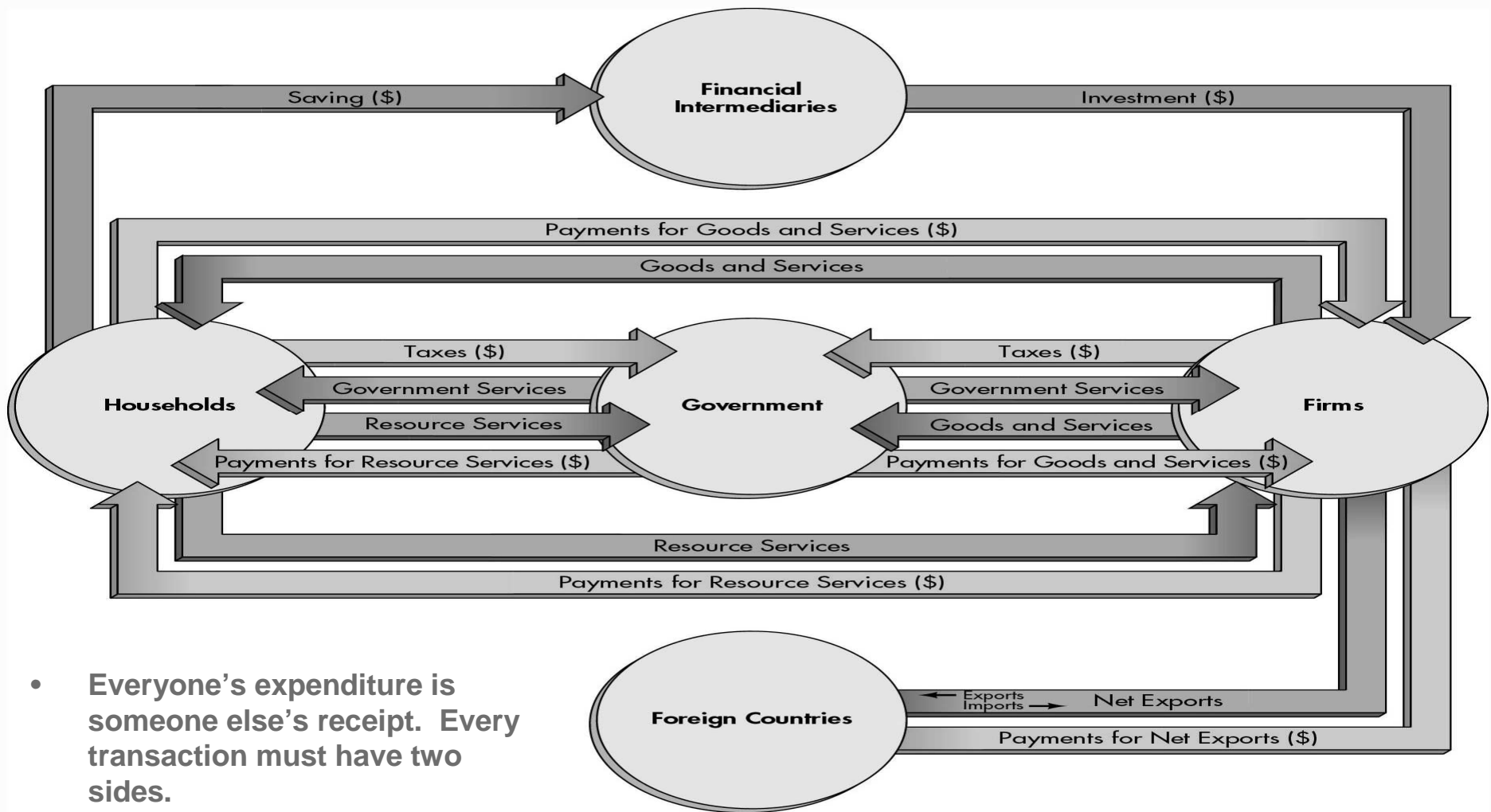
# Circular Flows in the Market Economy



$$\text{GDP} = \text{C} + \text{I} + \text{G} + \text{NX}$$



# Circular Flow Diagram



- Everyone's expenditure is someone else's receipt. Every transaction must have two sides.



# **Four Key Markets and the Circular Flow of Income**



## Four Key Markets Coordinate the Circular Flow of Income

- **Goods and Services market**
- **Resource market**
- **Loanable Funds market**
- **Foreign Exchange market**





# Four Key Markets

- ***Goods and Services Market:***  
Businesses *supply goods & services* in exchange for sales revenue. Households, investors, governments, and foreigners (*net exports*) *demand goods*.
- ***Resource Market:***  
Highly aggregated market where business firms *demand resources* and households *supply labor* and other resources in exchange for income.



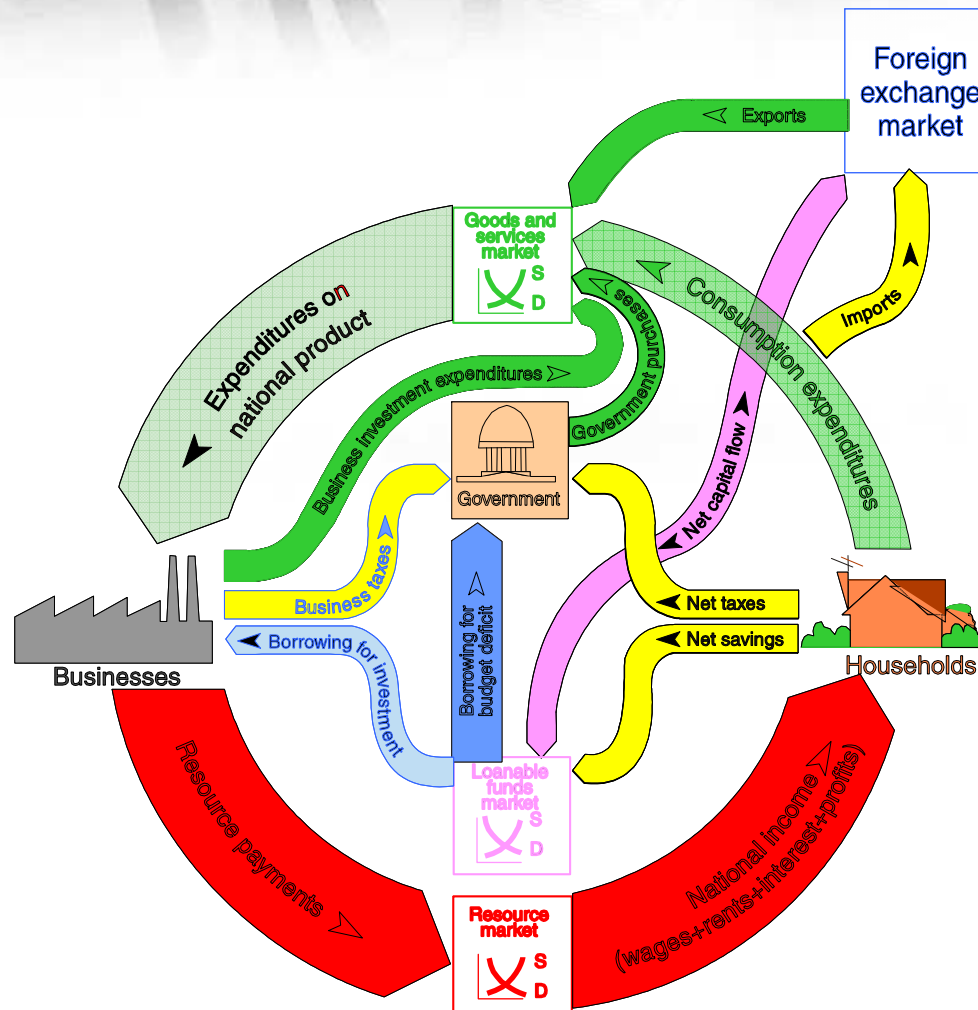


# Four Key Markets

- ***Loanable Funds Market:***  
Coordinates actions of borrowers and lenders.
- ***Foreign Exchange Market:***  
Coordinates the actions of citizens that ***demand foreign currency*** (in order to buy things abroad) and foreigners that ***supply foreign currencies*** in exchange for local currency (so they can buy things from local producers).

# The Circular Flow Diagram

- The *resource market* coordinates the actions of businesses demanding resources and households supplying them in exchange for income.
- The *goods & services market* coordinates the demand for and supply of domestic production (*GDP*).
- The *foreign exchange market* brings the purchases (*imports*) from foreigners into balance with the sales (*exports plus net inflow of capital*) to them.
- The *loanable funds market* brings net household saving and the net inflow of foreign capital into balance with the borrowing of businesses and governments.





# Aggregate Demand for Goods and Services

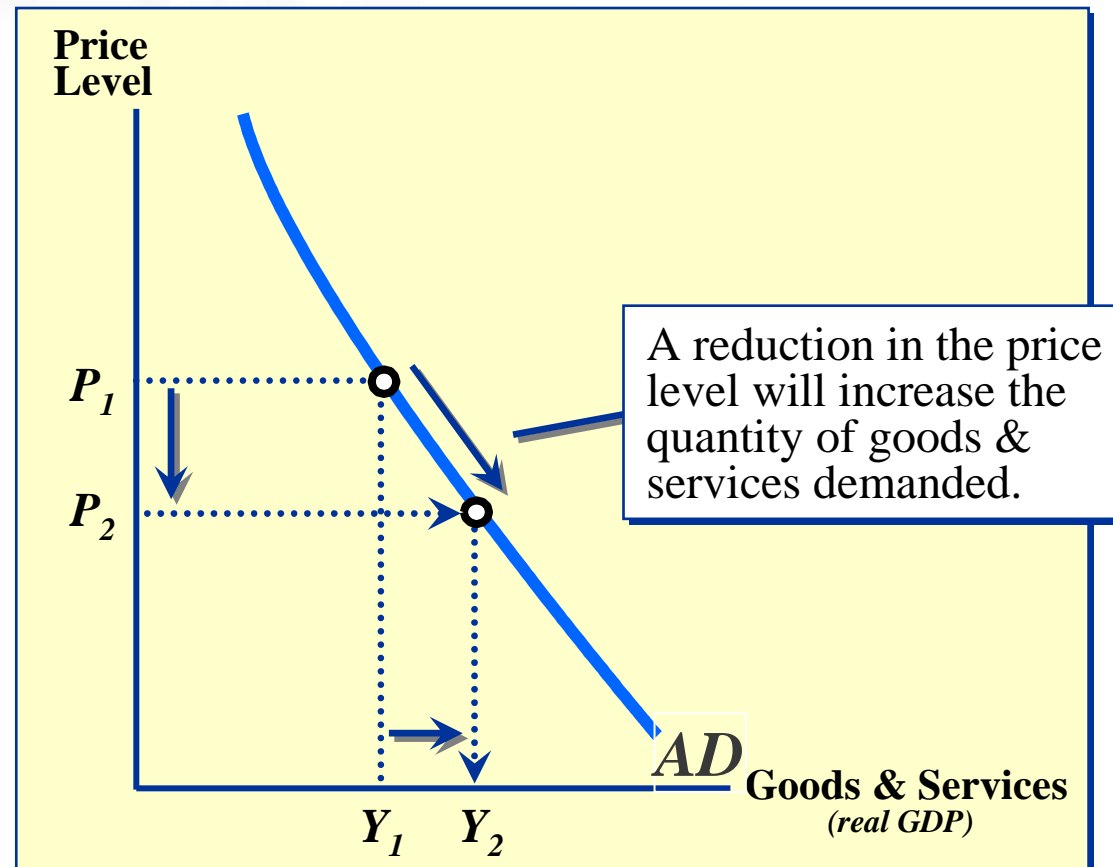


## Aggregate Demand for Goods & Services

- **Aggregate demand (AD) curve:** indicates the various quantities of domestically produced goods and services that purchasers are willing to buy at different price levels.
- **The AD curve slopes downward to the right,** indicating an inverse relationship between the amount of goods and services demanded and the price level.

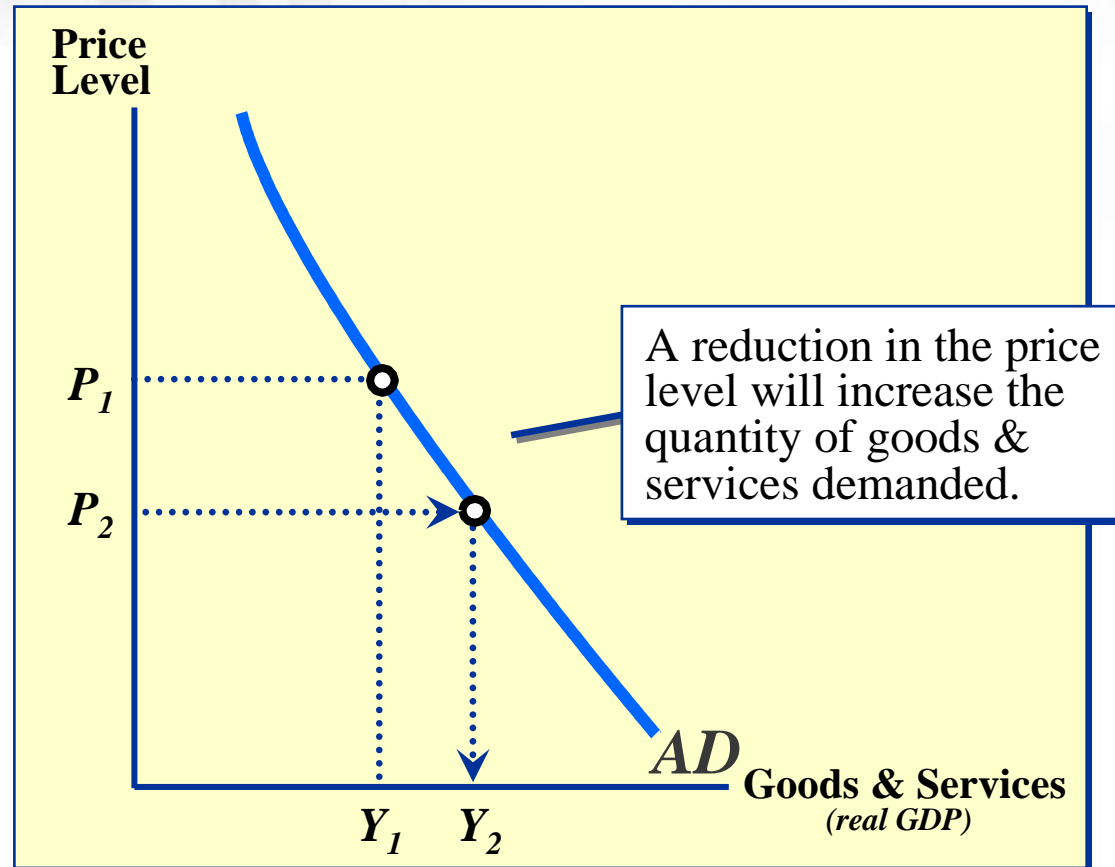
# Aggregate Demand Curve

- As illustrated here, when the general price level in the economy declines from  $P_1$  to  $P_2$ , the quantity of goods and services purchased will increase from  $Y_1$  to  $Y_2$ .



# Aggregate Demand Curve

- Other things constant, a lower price level will increase the wealth of people holding the fixed quantity of money, lead to lower interest rates, and make domestically produced goods cheaper relative to foreign goods.
- Each of these factors tends to increase the quantity of goods & services purchased at the lower price level.





## Why Does the Aggregate Demand Curve Slope Downward?

- A lower price level increases the purchasing power of the fixed quantity of money.
- The ***Interest Rate Effect***:  
a lower price level will reduce the demand for money and lower the real interest rate, which then stimulates additional purchases during the current period.
- Other things constant, a lower price level will make domestically produced goods less expensive relative to foreign goods.





# Aggregate Supply of Goods and Services



## *short-run vs long-run*

- When considering the **Aggregate Supply** curve, it is important to distinguish between the **short-run** and the **long-run**.
  - **Short-run:**  
A period of time during which some prices, particularly those in resource markets, are set by prior contracts and agreements. Therefore, in the short-run, households and businesses are unable to adjust these prices when unexpected changes occur, including unexpected changes in the price level.
  - **Long-run:**  
A period of time of sufficient duration that people have the opportunity to modify their behavior in response to price changes.

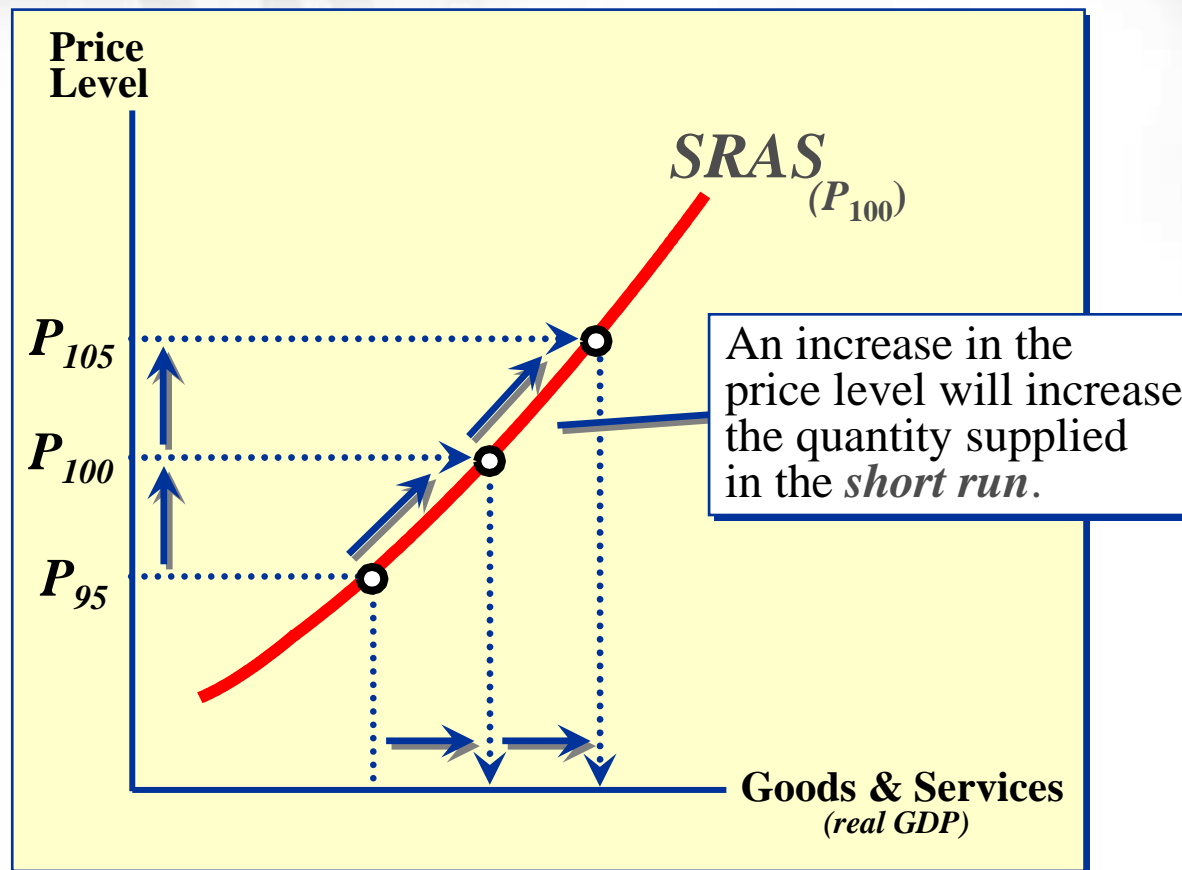


## Short-Run Aggregate Supply (SRAS)

- **SRAS** indicates the various quantities of goods and services that domestic firms will supply in response to changing demand conditions that alter the level of prices in the goods and services market.
- **The SRAS curve slopes upward to the right.**
  - **The upward slope reflects the fact that in the short run an unanticipated increase in the price level will improve the profitability of firms.**
    - Firms respond to this increase in the price level with an expansion in output.

## Short-Run Aggregate Supply Curve

- The **SRAS** shows the relationship between the price level and the quantity supplied of goods & services by producers.
- In the short-run, firms will expand output as the price level increases because higher prices improve profit margins since many components of costs will be temporarily fixed as the result of prior long-term commitments.



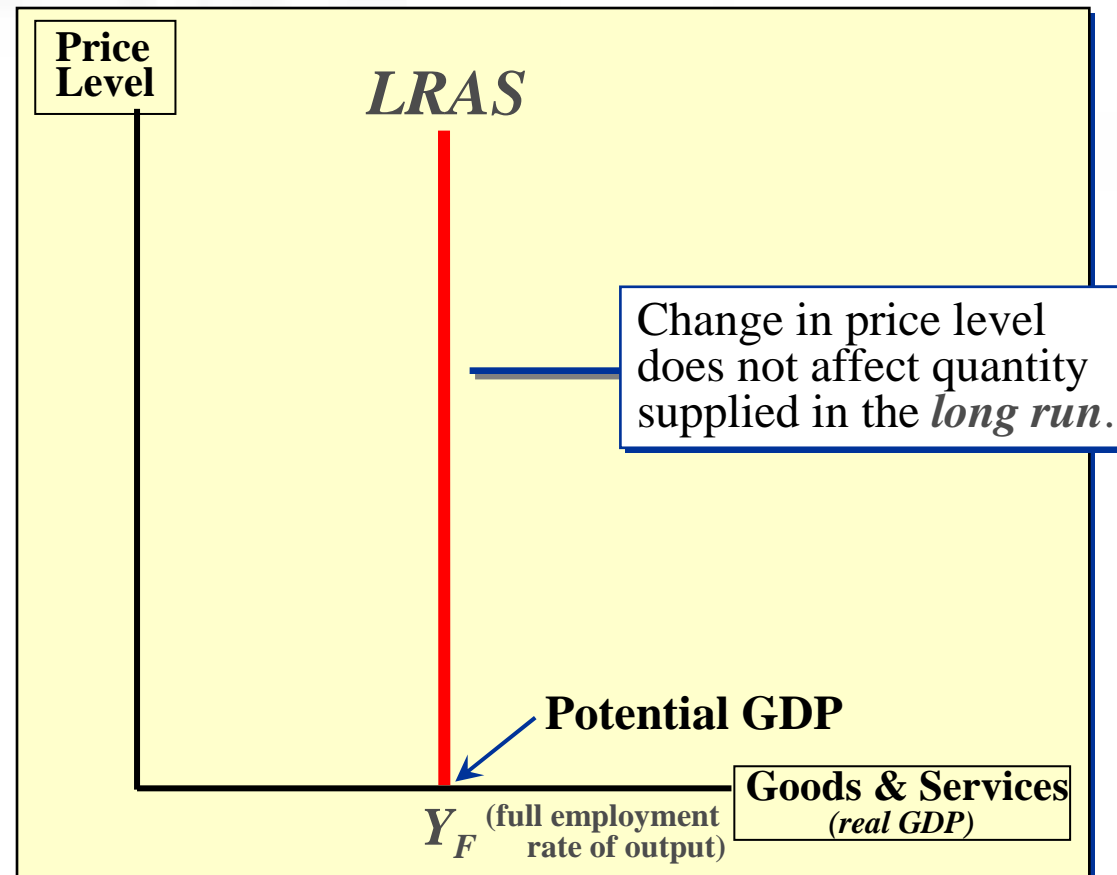


## Long-Run Aggregate Supply (*LRAS*)

- ***LRAS*** indicates the relationship between the price level & quantity of output after decision makers have had sufficient time to adjust their prior commitments where possible.
- ***LRAS*** is related to the economy's production possibilities constraint.
  - A higher price level does not loosen the constraints imposed by the economy's resource base, level of technology, and the efficiency of its institutional arrangements.
  - Therefore, an increase in the price level will not lead to a sustainable expansion in output.
- Thus, the ***LRAS*** curve is vertical.

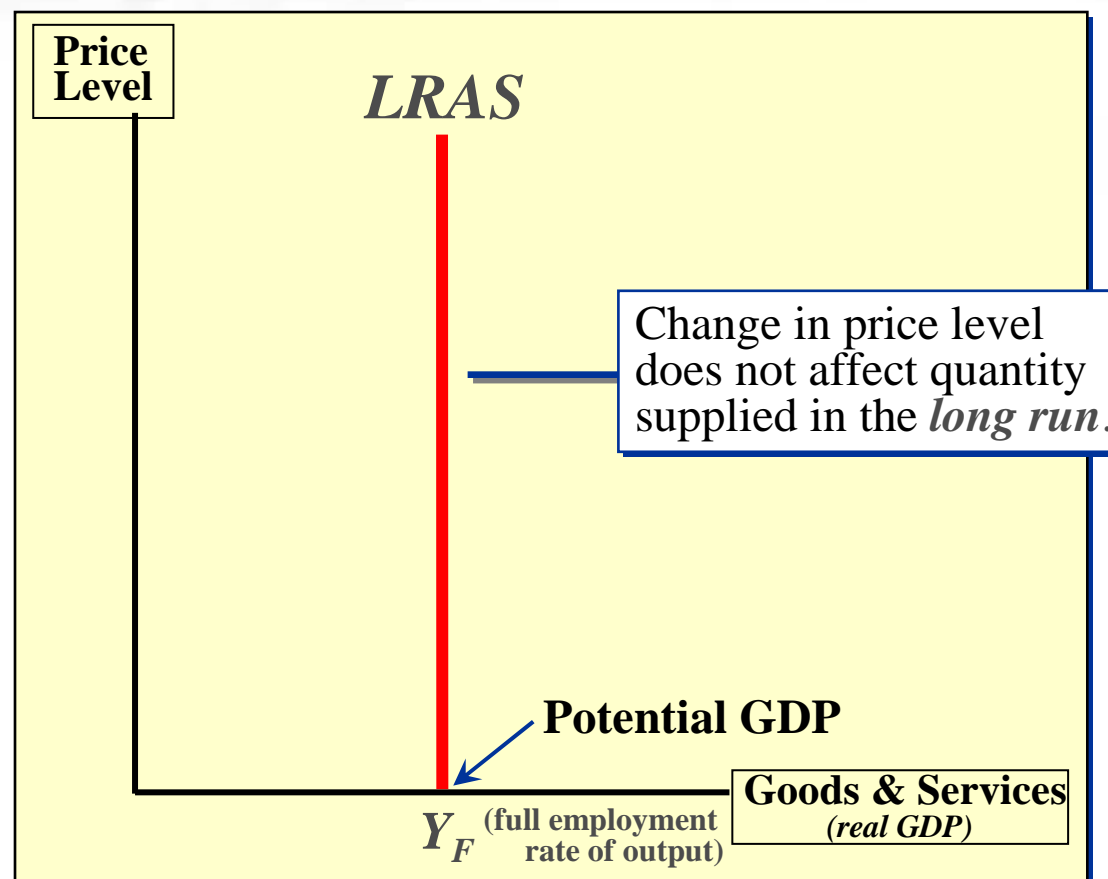
# Long-Run Aggregate Supply Curve

- In the *long-run*, a higher price level will not expand an economy's rate of output. Once people have time to adjust their long-term commitments, resource markets (and costs) will adjust to the higher levels of prices and thereby remove the incentive of firms to continue to supply a larger output.



## Long-Run Aggregate Supply Curve

- An economy's *full employment rate of output* ( $Y_F$ ), the maximum output rate that is sustainable, is determined by the supply of resources, level of technology, and the structure of the institutions, factors that are insensitive to changes in the price level. Hence the vertical *LRAS* curve.







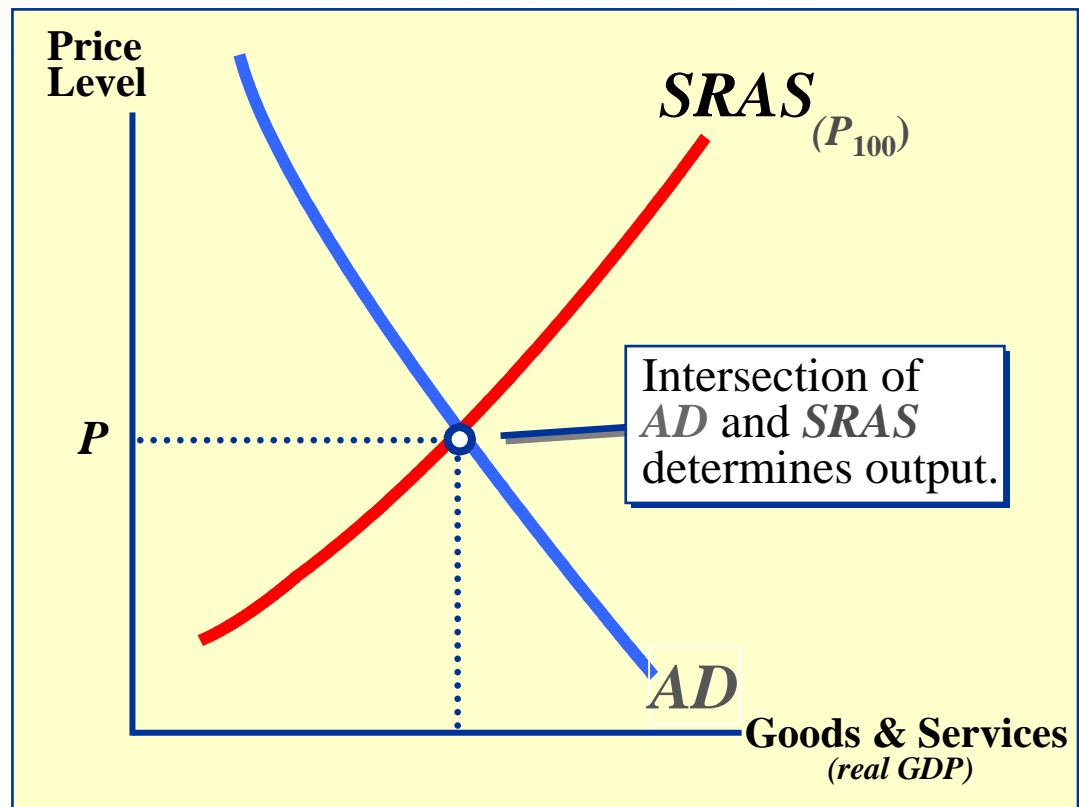
# Equilibrium in the Goods & Services Market



## Equilibrium in the Goods and Services Market

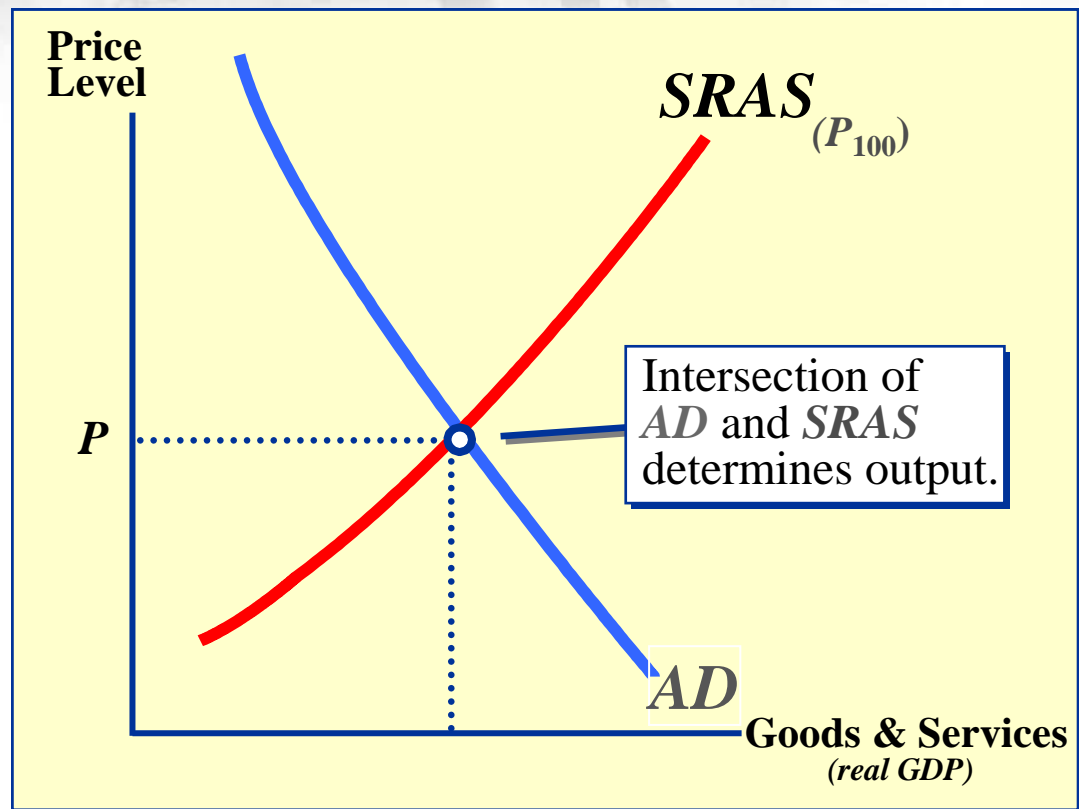
- ***Short-run Equilibrium:***
  - ***Short-run equilibrium*** is present in the goods & services market at the price level  $P$  where the aggregate quantity demanded is equal to the aggregate quantity supplied.
  - This occurs (*graphically*) at the output rate where the  $AD$  and  $SRAS$  curves intersect.
  - At this market clearing price  $P$ , the amount that buyers want to purchase is just equal to the quantity that sellers are willing to supply during the current period.

## Equilibrium in the Goods and Services Market



- Short-run equilibrium in the goods & services market occurs at the price level  $P$  where  $AD$  and  $SRAS$  intersect.

## Equilibrium in the Goods and Services Market



- If the *price were lower than  $P$* , general excess demand in the goods & services market would push prices upward.
- Conversely, if the *price level were higher than  $P$* , excess supply would result in falling prices.



## *Long-run* Equilibrium in the Goods and Services Market

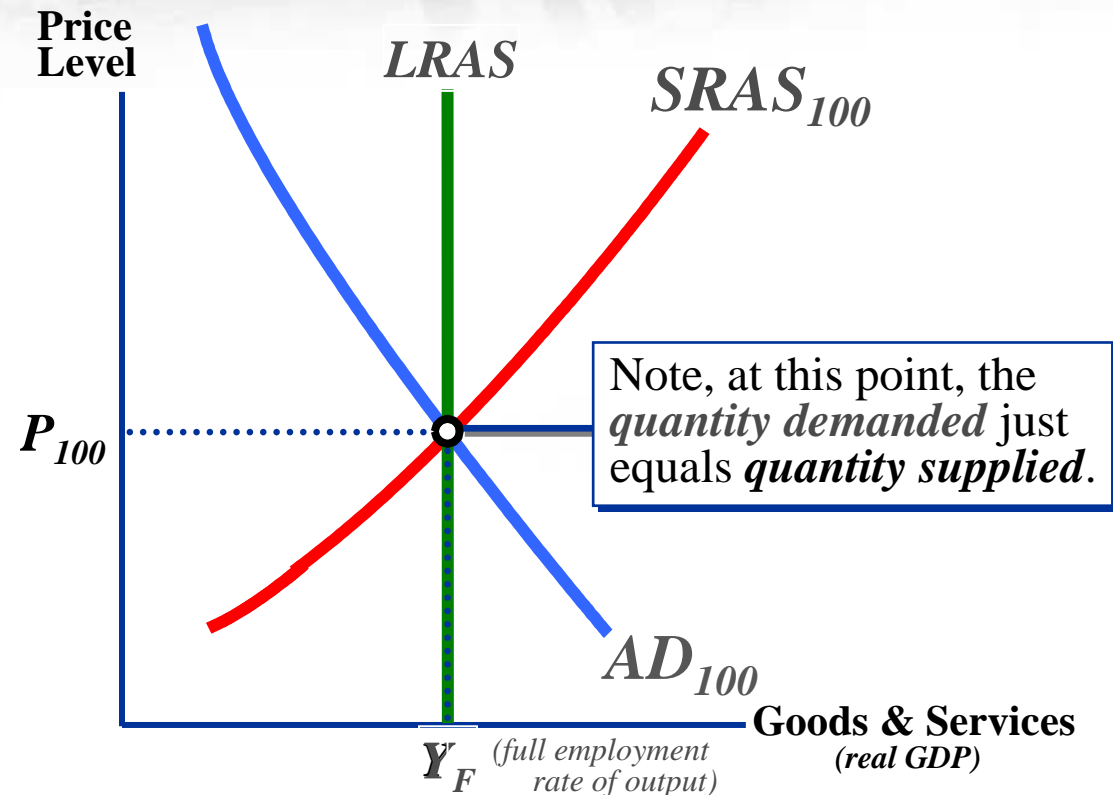
- ***Long-run Equilibrium:***
  - *Long-run equilibrium* requires that decision makers, who agreed to long-term contracts influencing current prices and costs, correctly anticipated the current price level at the time they arrived at the agreements.
    - If this is not the case, buyers and sellers will want to modify the agreements when the long-term contracts expire.



## Long-run Equilibrium in the Goods and Services Market

- When ***Long-run Equilibrium*** is Present:
  - Potential GDP is equal to the economy's ***maximum sustainable output*** consistent with its resource base, current technology, and institutional structure.
  - The Economy is operating at ***full employment***.
  - Actual rate of unemployment equals the ***Natural Rate of Unemployment***.
  - Occurs (***graphically***) at the output rate where the ***AD, SRAS, and LRAS*** curves intersect.

## Long-Run Equilibrium in the Goods and Services Market



- The subscripts on  $SRAS$  and  $AD$  indicate that buyers and sellers alike anticipated the price level  $P_{100}$  (where 100 represents an index of prices during an earlier base year).





## Disequilibrium in the Goods and Services Market

- ***Disequilibrium:*** Adjustments that occur when output differs from long-run potential.
  - An unexpected change in the price level (rate of inflation) will alter the rate of output in the short-run.
    - An ***unexpected increase*** in the price level will improve the profit margins of firms and thereby induce them to expand output and employment in the short-run.
    - An ***unexpected decline*** in the price level will reduce profitability, which will cause firms to cut back on output and employment.



# Resource Market

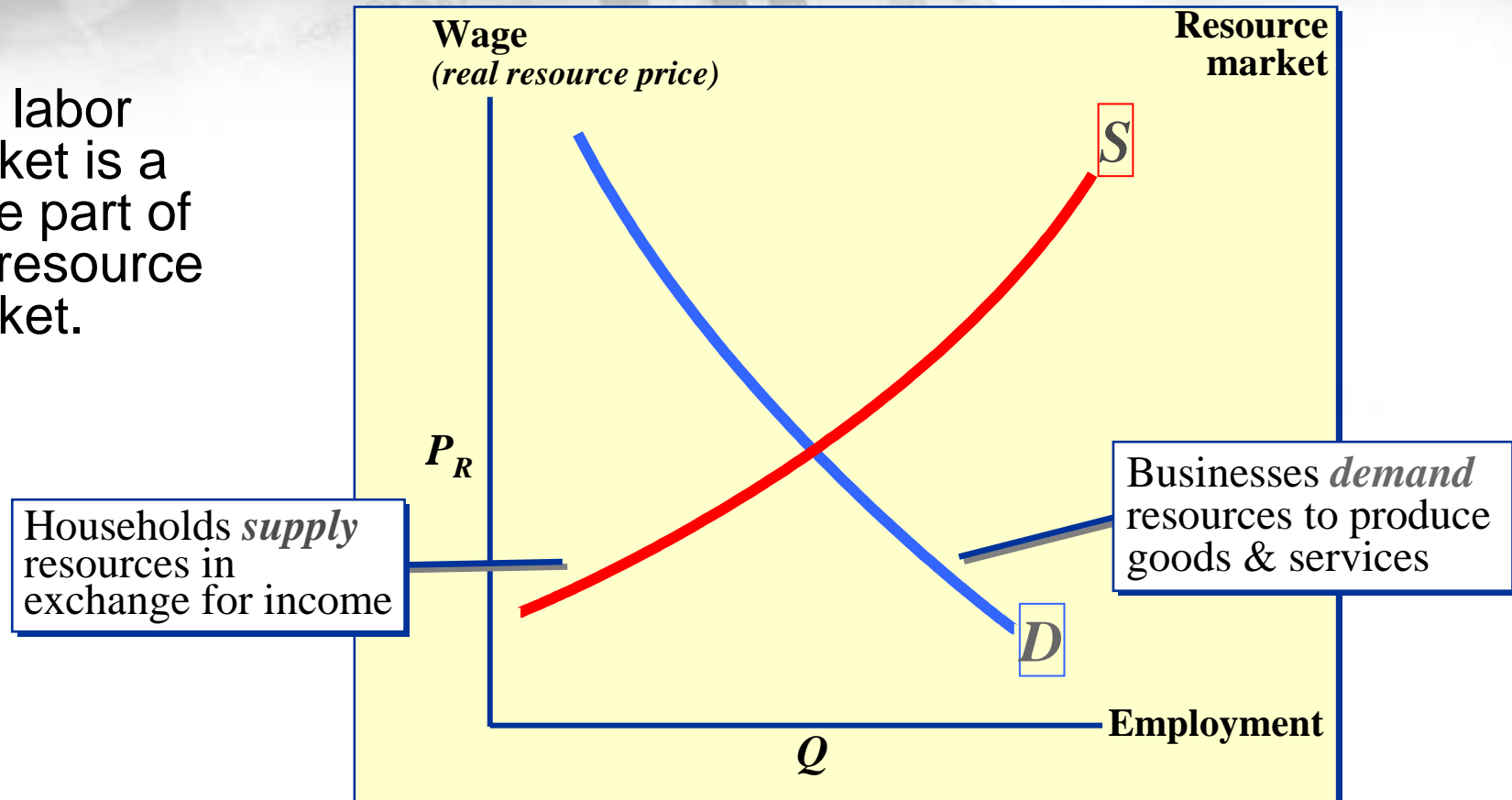


# Resource Market

- ***Demand for Resources:***  
Business firms demand resources because they contribute to the production of goods the firm expects to sell at a profit.
  - **The *demand* curve for resources slopes down and to the right.**
- ***Supply of Resources:***  
Households supply resources in exchange for income.
  - **Higher prices increase the incentive to supply resources; thus, the *supply* curve slopes up and to the right.**
- ***Equilibrium price:***  
Otherwise known as the market clearing price, equilibrium price brings the resources demanded by firms into balance with those supplied by the resource owners.

# Equilibrium in the Resource Market

- The labor market is a large part of the resource market.



- As resource prices increase, the amount *demand*ed by producers declines and the amount *supply*ed by resource owners expands.
- In *equilibrium*, the resource price brings the quantity demanded into equality with the quantity supplied.



# Loanable Funds Market



# Loanable Funds Market

- The ***interest rate*** coordinates the actions of borrowers and lenders.
  - From the ***borrower's*** viewpoint, interest is the cost paid for earlier availability.
  - From the ***lender's*** viewpoint, interest is a premium received for waiting, for delaying possible expenditures into the future.

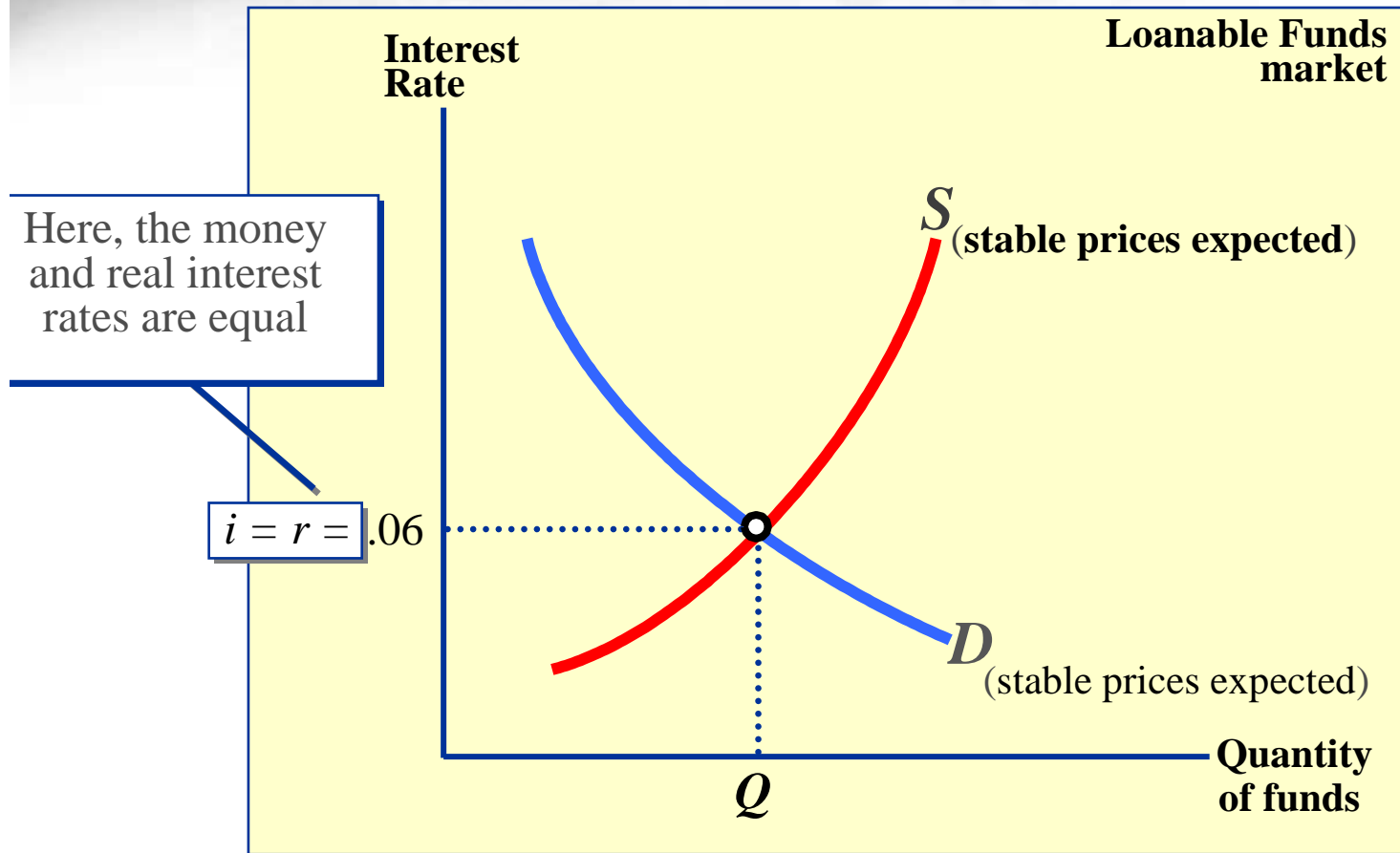


## The Money & the Real Interest Rates

- The *money interest rate* is the nominal price of loanable funds.
  - **When inflation is anticipated, lenders will demand (and borrowers pay) a higher *money interest rate* to compensate for the expected decline in the purchasing power of the currency.**
- The *real interest rate* is the real price of loanable funds.
- The difference between the money interest rate and real interest rate is the *inflationary premium*.
  - **This premium reflects the expected decline in the purchasing power of the currency during the period that the loan is outstanding.**

$$\textit{Real interest rate} = \textit{Money interest rate} - \textit{Inflationary premium}$$

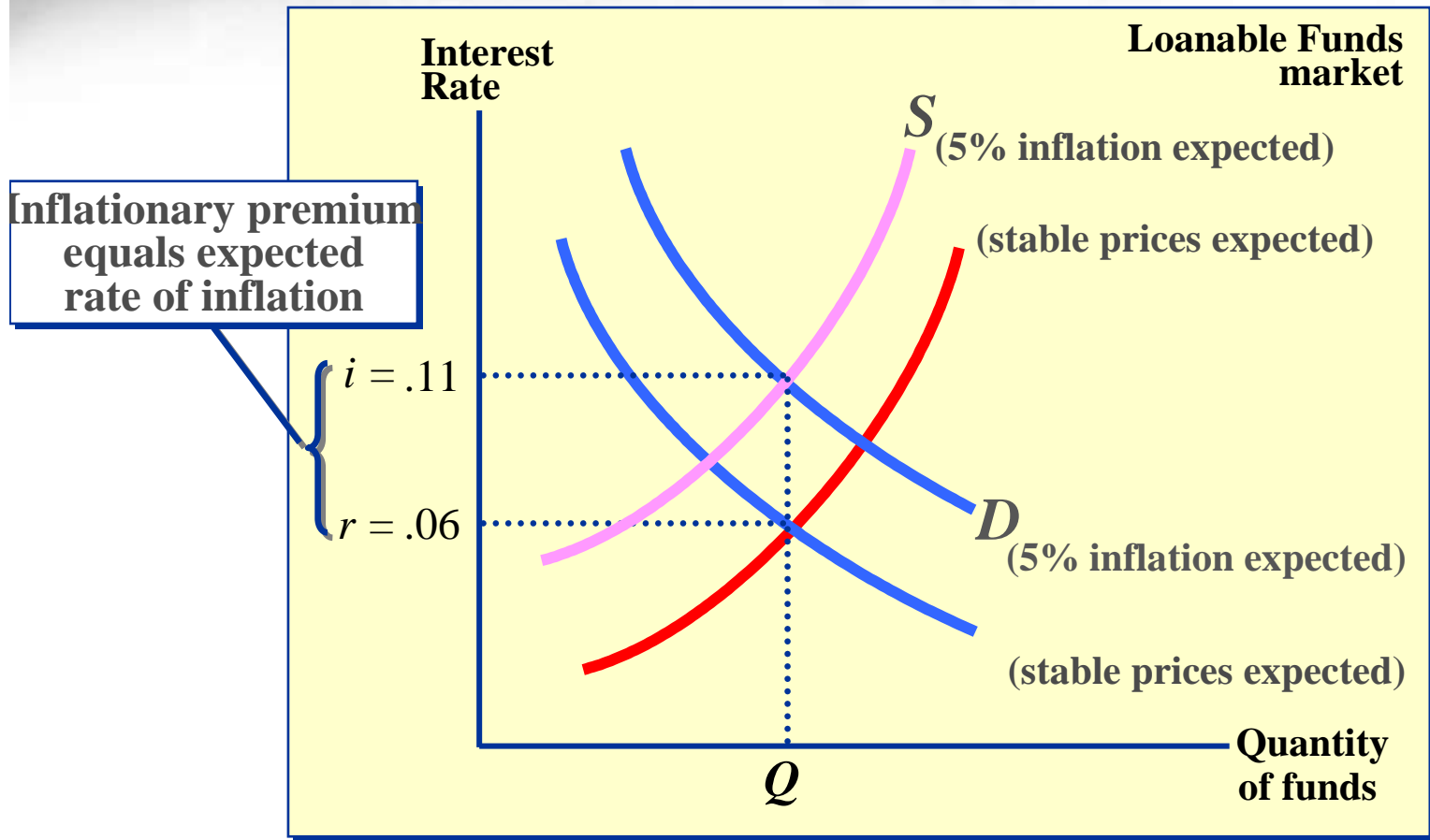
# Inflation and Interest Rates



- Suppose that when people expect the general level of prices to be remain stable (zero inflation), a 6% interest rate brings equilibrium in the loanable funds market.

- Under these conditions, the *money* and *real interest rates* will be equal (*here 6%*).

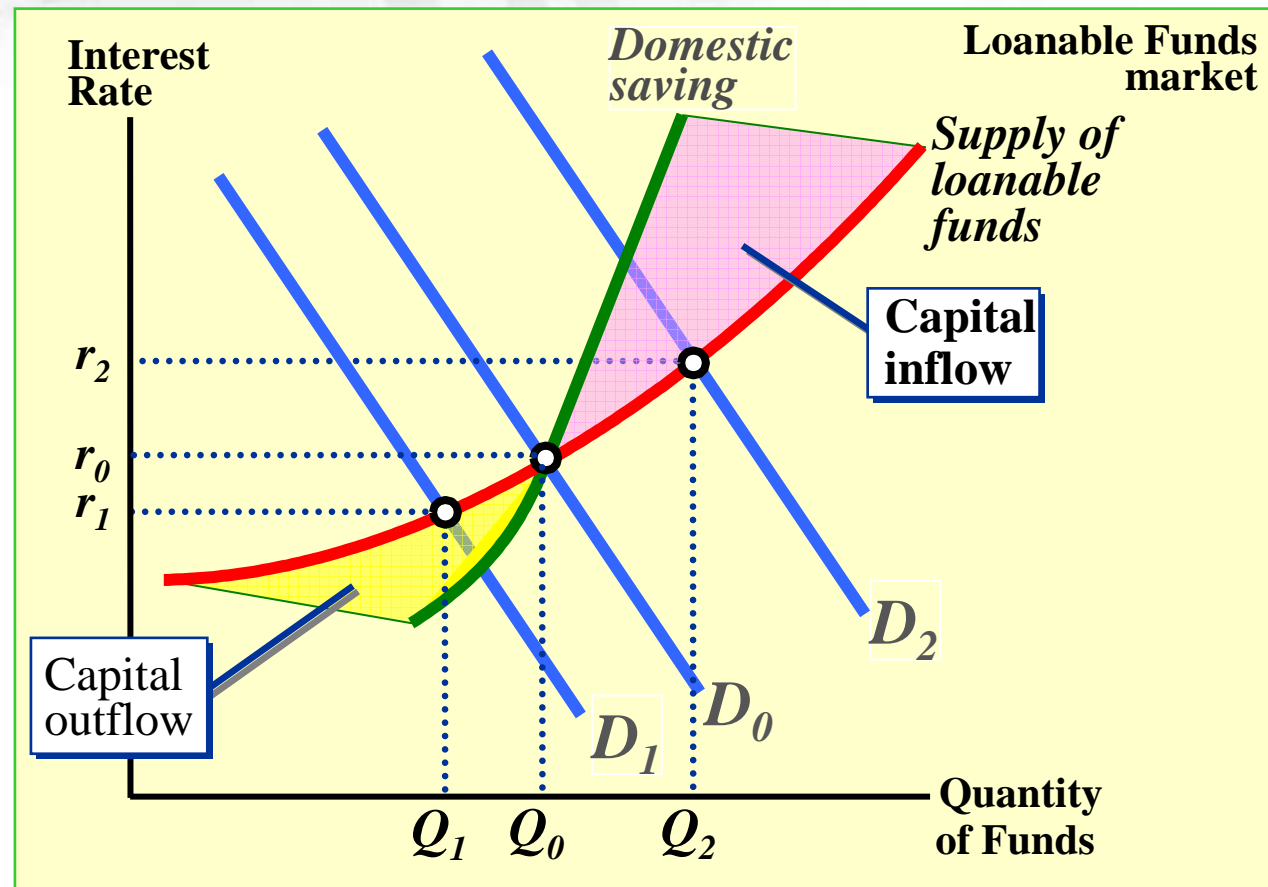




- When people expect prices to rise at a 5% rate, the **money interest rate** ( $i$ ) will rise to 11% even though the **real interest rate** ( $r$ ) remains constant at 6%.

# Interest Rates and Capital Flows

- **Demand** and **supply** in the loanable funds market will determine the interest rate.
- When **demand** for loanable funds is strong ( $D_2$ ), real interest rates will be high ( $r_2$ ) and there will be a inflow of capital.



- In contrast, weak demand ( $D_1$ ) and low interest rates ( $r_1$ ) will lead to capital outflow.



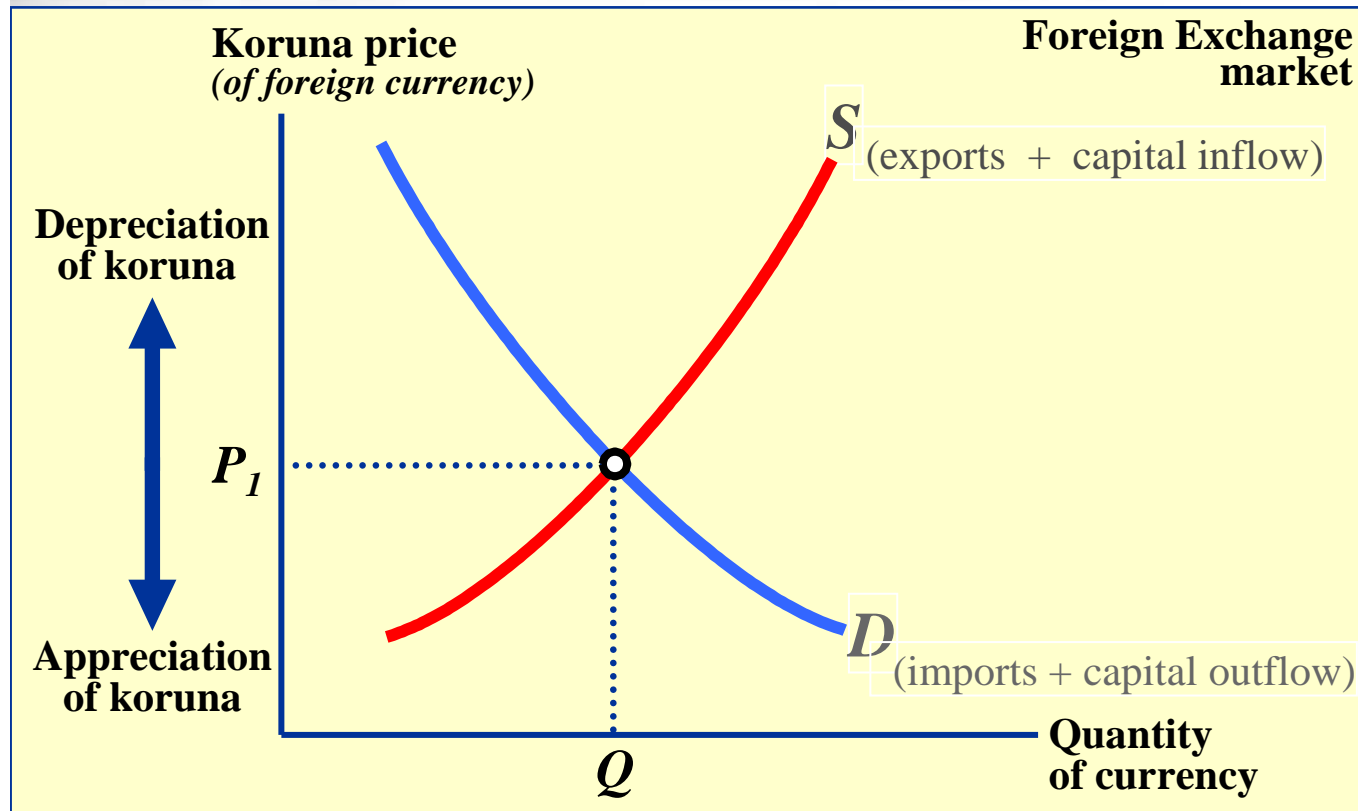
# Foreign Exchange Market



## Foreign Exchange Market

- When Czechs buy from foreigners and make investments abroad (*outflow of capital*), their actions generate a demand for foreign currency in the foreign exchange market.
- On the other hand, when Czechs sell products and assets (*including bonds*) to foreigners, their transactions will generate a supply of foreign currency (*in exchange for koruna*) in the foreign exchange market.
- The exchange rate will bring the quantity of foreign exchange demanded into equality with the quantity supplied.

# Foreign Exchange Market



- Czechs **demand** foreign currencies to import goods & services and make investments abroad.
- Foreigners **supply** their currency in exchange for koruna to purchase czech exports and undertake investments in the Czech Republic.

- The exchange rate brings quantity demanded into balance with the quantity supplied and will bring (**imports + capital outflow**) into equality with (**exports + capital inflow**).

## Capital Flows and Trade Flows

- When equilibrium is present in the foreign exchange market, the following relation exists:

$$\textit{Imports} + \textit{Capital Outflow} = \textit{Exports} + \textit{Capital Inflow}$$

- This relation can be re-written as:

$$\textit{Imports} - \textit{Exports} = \textit{Capital Inflow} - \textit{Capital Outflow}$$

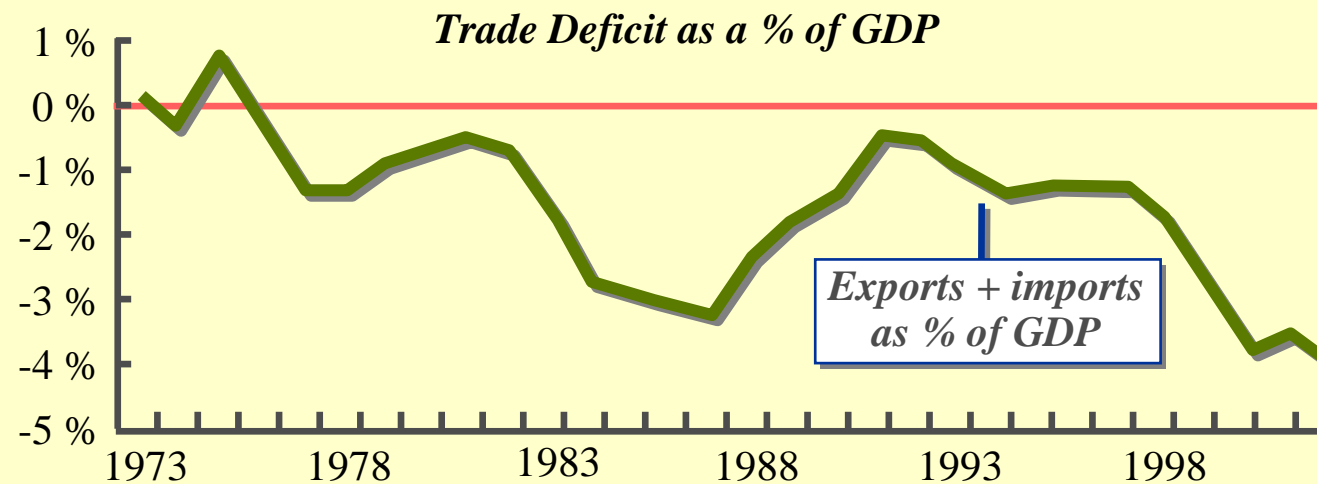
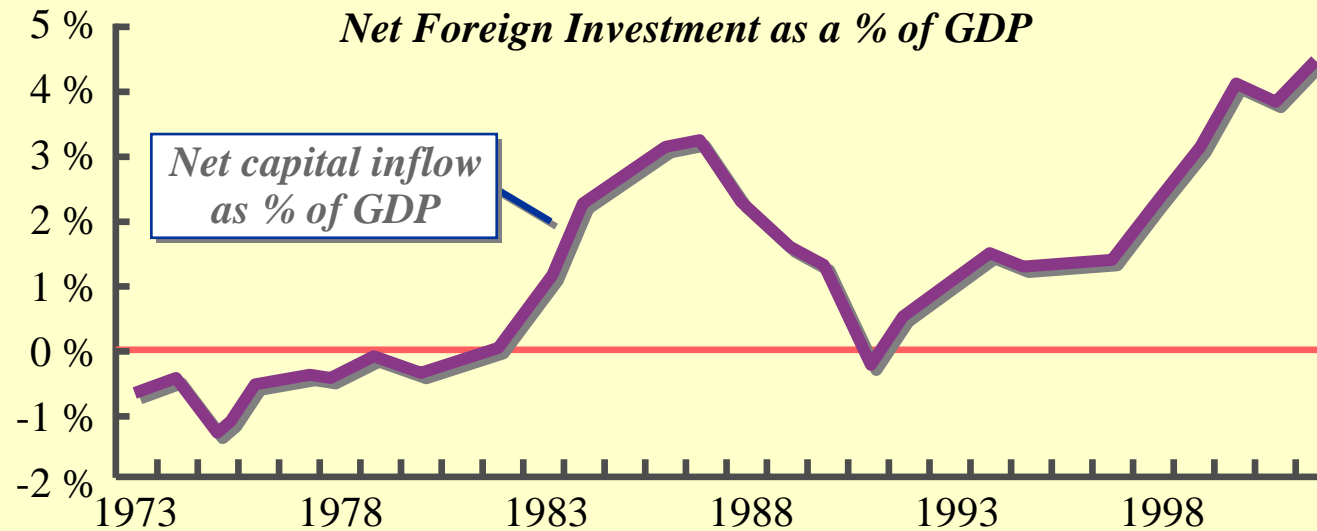
- The right side of this equation (capital inflow minus capital outflow) is called *net capital inflow*.
- *Net capital inflow* may be:
  - **positive**, reflecting a net inflow of capital, or,
  - **negative**, reflecting a net outflow of capital.

## Capital Flows and Trade Flows

$$\text{Imports} - \text{Exports} = \text{Capital Inflow} - \text{Capital Outflow}$$

- The left side of the equation above is called the *trade balance*.
  - **When imports exceed exports, this is referred to as a *trade deficit*.**
  - **On the other hand, if exports exceed imports, this is referred to as a *trade surplus*.**
- When the exchange rate is determined by market forces, trade deficits will be closely linked with a net inflow of capital. (See the following slide for evidence on this point.)
  - **Conversely, trade surpluses will be closely linked with a net outflow of capital.**

# U.S. Capital Flows and Trade Flows



- When the inflow of capital increases, the trade deficit widens.





## Are Trade Deficits Bad?

- The term deficit generally has negative connotations and there is a tendency to automatically believe that it implies that something is wrong.
- However, once you understand the link between capital inflows and trade deficits, it casts things in a different light.
- If investors, both domestic and foreign, weren't optimistic about an economy's future, there wouldn't be a net inflow of capital into that economy.
- Thus, trade deficits are often a reflection of something positive: a net inflow of capital that results because investors have substantial confidence in the future strength of the domestic economy.



# Leakages and Injections from the Circular Flow of Income

## Leakages and Injections from the Circular Flow of Income

- Equilibrium in the foreign exchange market implies:

(1)  $Imports + Capital\ Outflow = Exports + Capital\ Inflow$

- The equation may be re-written as:

(2)  $Imports - Exports = Capital\ Inflow - Capital\ Outflow$

- Or, more simply:  $Imports - Exports = Net\ Capital\ Inflow$

- Equilibrium in the *loanable funds market* implies:

(3)  $Net\ Saving + Net\ Capital\ Inflow = Investment + Budget\ Deficit$

- Substituting for *net capital inflow* from above:

(4)  $Net\ Saving + Imports - Exports = Investment + Budget\ Deficit$

## Leakages and Injections from the Circular Flow of Income

(4) 
$$\text{Net Saving} + \text{Imports} - \text{Exports} = \text{Investment} + \text{Budget Deficit}$$

- As *Budget deficit* = (government purchases - taxes):

(5) 
$$\text{Net Saving} + \text{Imports} - \text{Exports} = \text{Investment} + \text{Government Purchases} - \text{Taxes}$$

- Which may be re-written as:

(6) 
$$\text{Net Saving} + \text{Imports} + \text{Taxes} = \text{Investment} + \text{Government Purchases} + \text{Exports}$$

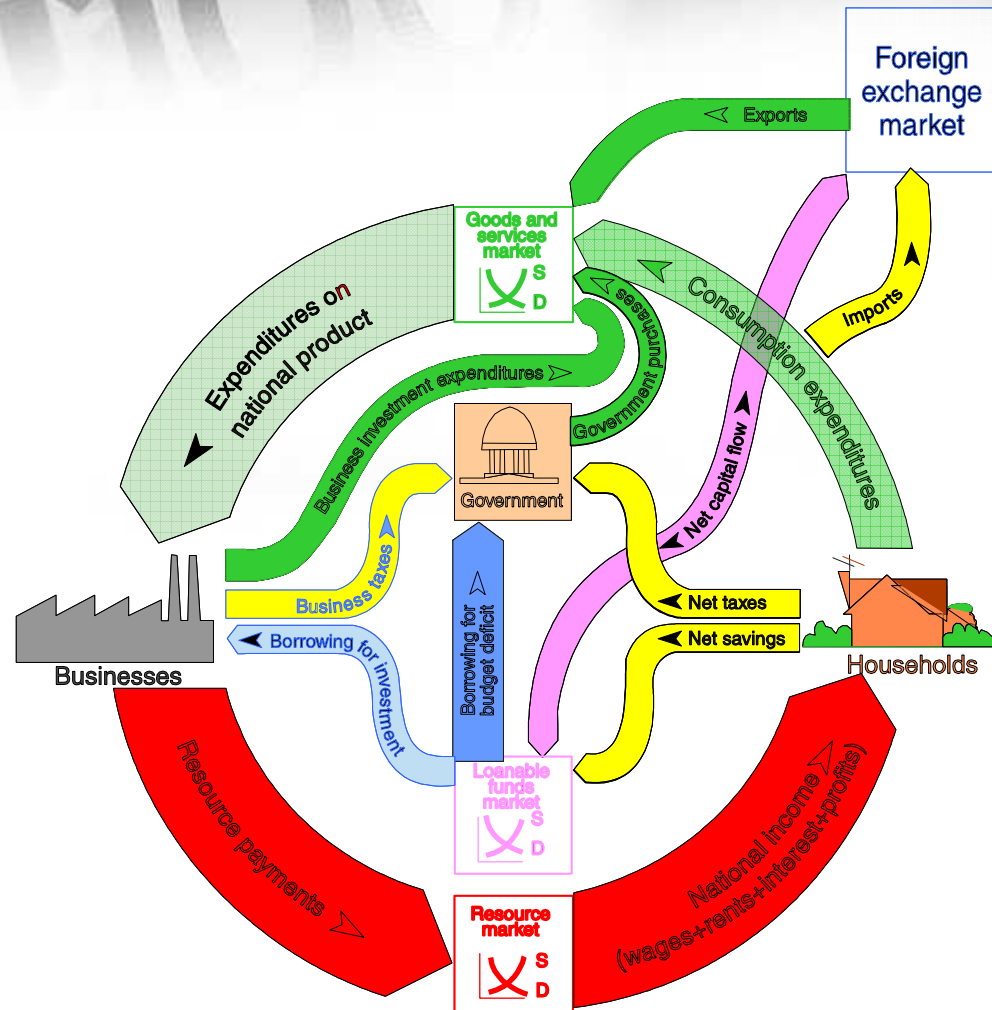
*Leakages*

*Injections*

- Therefore, when the loanable funds and foreign exchange markets are in equilibrium, **leakages** from the circular flow of income (savings + imports + taxes) are equal to **injections** into it (investment + government purchases + exports).

# The Circular Flow Diagram

- Macro equilibrium will be present when the flow of expenditures on goods & services (*top loop*) is equal the flow of income to resource owners (*bottom loop*).
- This condition will be present when the **injections** (*investment, government purchases, & exports*) into the circular flow ... equal the **leakages** (*saving, taxes, and imports*) from it.
- Hence, when equilibrium is present in the loanable funds and foreign exchange markets, injections equal leakages and Macro equilibrium will be present.





*Thank You for Attention*





# Literature

- 1 - John F Hall: Introduction to Macroeconomics, 2005
- 2 - Fernando Quijano and Yvonn Quijano: Introduction to Macroeconomics
- 3 - Karl Case, Ray Fair: Principles of Economics, 2002
- 4 - Boyes and Melvin: Economics, 2008
- 5 - James Gwartney, David Macpherson and Charles Skipton: Macroeconomics, 2006
- 6 - N. Gregory Mankiw: Macroeconomics, 2002
- 7- Yamin Ahmed: Principles of Macroeconomics, 2005
- 8 - Olivier Blanchard: Principles of Macroeconomics, 1996