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An Introduction to Basic Macroeconomic Markets

Full Length Text — Part: 3 Chapter: 9
Macro Only Text — Part: 3 Chapter: 9

To Accompany "Economics: Private and Public Choice 12th ed."
James Gwartney, Richard Stroup, Russell Sobel, & David Macpherson
Slides authored and animated by:
James Gwartney, David Macpherson, & Charles Skipton


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Understanding Macroeconomics: *Our Game Plan*

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Understanding Macroeconomics -- *Our Game Plan*

- A model is like a road map. It illustrates inter-relationships.
- We will use the circular flow of output and income between the business and household sectors to illustrate macro-economic inter-relationships.
- As our macroeconomic model is developed, initially, we will assume that monetary policy (*the money supply*) and fiscal policy (*taxes and government expenditures*) are constant.

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Four Key Markets and the Circular Flow of Income

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Four Key Markets Coordinate the Circular Flow of Income

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

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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.

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Four Key Markets

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

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The Circular Flow Diagram

- Four key markets coordinate the circular flow of income.
- 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.

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Aggregate Demand for Goods and Services

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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.

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Aggregate Demand Curve

The graph shows a downward-sloping curve labeled 'AD Goods & Services (real GDP)'. The vertical axis is labeled 'Price Level' and has two points, P_1 and P_2 , where $P_1 > P_2$. The horizontal axis is labeled 'Goods & Services (real GDP)' and has two points, Y_1 and Y_2 , where $Y_2 > Y_1$. Dotted lines connect P_1 to Y_1 and P_2 to Y_2 on the curve. A text box with an arrow pointing to the curve says: 'A reduction in the price level will increase the quantity of goods & services demanded.'

- 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 .

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Aggregate Demand Curve

The graph shows a downward-sloping curve labeled 'AD Goods & Services (real GDP)'. The vertical axis is labeled 'Price Level' and has two points, P_1 and P_2 , where $P_1 > P_2$. The horizontal axis is labeled 'Goods & Services (real GDP)' and has two points, Y_1 and Y_2 , where $Y_2 > Y_1$. Dotted lines connect P_1 to Y_1 and P_2 to Y_2 on the curve. A text box with an arrow pointing to the curve says: 'A reduction in the price level will increase the quantity of goods & services demanded.'

- 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.

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Why Does the Aggregate Demand Curve Slope Downward?

- A lower price level increases the purchasing power of the fixed quantity of money.
- 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.

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Aggregate Supply of Goods and Services

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Aggregate Supply of Goods and Services

- 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.

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Aggregate Supply in the Short Run

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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.

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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.

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Aggregate Supply In the Long Run

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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.

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Long-Run Aggregate Supply Curve

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- 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.

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Long-Run Aggregate Supply Curve

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

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Questions for Thought:

1. What is the circular flow of income? What are the 4 key markets of the circular flow model?
2. Why is the aggregate demand curve for goods & services inversely related to the price level? What does this inverse relationship indicate?
3. What are the major factors that influence the quantity of goods & services a group of people can produce in the long run? Why is the long run aggregate supply curve (**LRAS**) vertical? What does the vertical nature of the curve indicate?

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Questions for Thought:

4. Why does the short run aggregate supply (**SRAS**) curve slope upward to the right? What does the upward slope indicate?
5. If the prices of both (a) resources and (b) goods and services increase proportionally will business firms have a greater incentive to expand output? Why or why not?

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Equilibrium in the Goods & Services Market

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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.

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Short-Run Equilibrium in the Goods and Services Market

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

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Short-Run 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.

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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.

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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.

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Long-Run Equilibrium in the Goods and Services Market

Note, at this point, the quantity demanded just equals quantity supplied.

- 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).
- When the anticipated price level is attained, output Y_F will equal potential GDP and full employment will be present.

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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.

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Questions for Thought:

- If the price level in the current period is higher than what buyers and sellers anticipated, what will tend to happen to real wages and the level of employment? How will the profit margins of business firms be affected? How will the actual rate of unemployment compare with the natural rate of unemployment? Will the current rate of output be sustainable in the future?
- Why is an unanticipated increase in the price level likely to expand output in the short run, but not in the long run?

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Resource Market

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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:**
Known as the *market clearing price*, equilibrium price brings the resources demanded by firms into balance with those supplied by resource owners.

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Equilibrium in the Resource Market

Households **supply** resources in exchange for income

Businesses **demand** resources to produce goods & services

- As resource prices increase, the amount **demand**ed by producers declines and the amount **supplied** by resource owners expands.
- In **equilibrium**, the resource price brings the quantity demanded into equality with the quantity supplied.
- The labor market is a large part of the resource market.

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Loanable Funds Market

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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.

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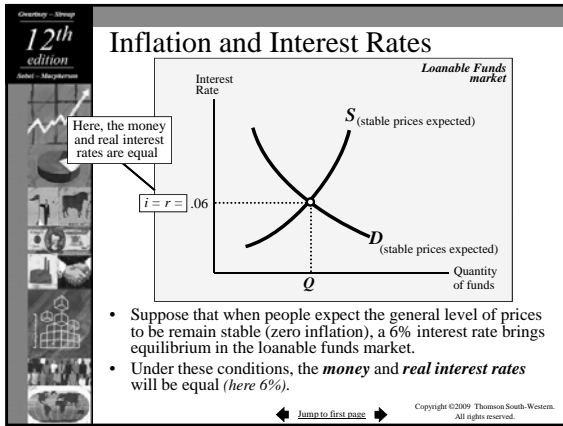
The Money & the Real Interest Rates

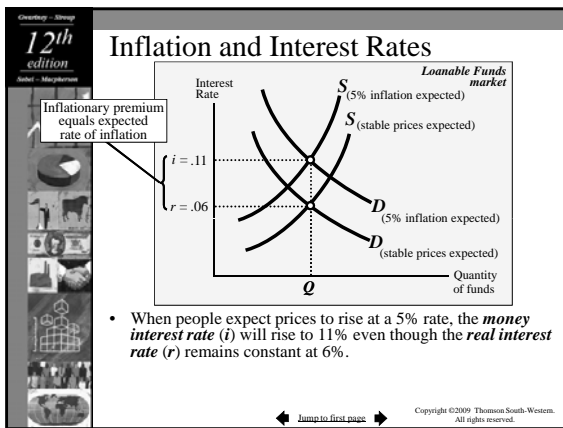
- The **money interest rate** is the nominal price of loanable funds.
 - When inflation is anticipated, lenders will demand (and borrowers pay) a higher **money interest rate** to compensate for the expected decline in the purchasing power of the dollar.
- The **real interest rate** is the real price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

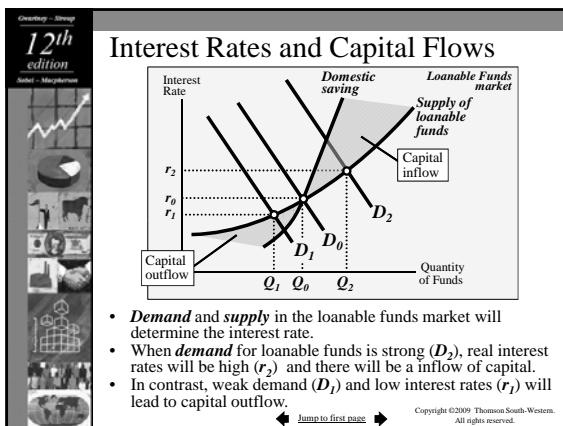
$$\text{Real interest rate} = \text{Money interest rate} - \text{Inflationary premium}$$

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Foreign Exchange Market

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Foreign Exchange Market

- When Americans 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 Americans sell products and assets (*including bonds*) to foreigners, their transactions will generate a supply of foreign currency (*in exchange for dollars*) in the foreign exchange market.
- The exchange rate will bring the quantity of foreign exchange demanded into equality with the quantity supplied.

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Foreign Exchange Market

Dollar price (of foreign currency)

Foreign Exchange market

Depreciation of dollar

Appreciation of dollar

P_1

Q

Quantity of currency

S (exports + capital inflow)

D (imports + capital outflow)

- Americans **demand** foreign currencies to import goods & services and make investments abroad. Foreigners **supply** their currency in exchange for dollars to purchase American exports and undertake investments in the United States.
- The exchange rate brings quantity demanded into balance with the quantity supplied and will bring (*imports + capital outflow*) into equality with (*exports + capital inflow*).

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Capital Flows and Trade Flows

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

$$\text{Imports} + \text{Capital Outflow} = \text{Exports} + \text{Capital Inflow}$$
- This relation can be re-written as:

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

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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 exhibit for evidence on this point.)
 - Conversely, trade surpluses will be closely linked with a net outflow of capital.

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U.S. Capital Flows and Trade Flows

Net Foreign Investment as a % of GDP

Net capital inflow as % of GDP

Trade Deficit as a % of GDP

Exports + imports as % of GDP

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

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Are Trade Deficits Bad?

- Trade deficits are usually presented in a negative light.
- However, once you understand the link between capital inflows and trade deficits, there is clearly another dimension to this issue.
- Remember, trade deficits are closely linked with a net inflow of capital. If investors, both domestic and foreign, weren't optimistic about an economy's future, there wouldn't be a net inflow of capital. Thus, trade deficits are generally indicative of something positive: a net inflow of capital because investors are confident about the future strength of the economy.

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Questions for Thought:

1. If the inflation rate increases and the higher rate is sustained over an extended period of time, what will happen to the nominal interest rate? What will happen to the real interest rate?
2. "When the U.S. dollar appreciates against the Euro, fewer dollars will be required to purchase a Euro." Is this true? If the dollar appreciates, how will this affect net exports?
3. Can output rates beyond the economy's long run potential be achieved? Can they be sustained? Why or why not?

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Questions for Thought:

4. When the economy is in long-run equilibrium, which of the following will be true?
 - a. The actual price level will be equal to the price level anticipated by decision makers.
 - b. The actual unemployment rate will be equal to the natural rate of unemployment.
5. (a) What is the difference between the real interest rate and the money interest rate?
(b) Suppose that you purchased a \$5,000 bond that pays 7% interest annually and matures in five years. If the inflation rate in recent years has been steady at 3% annually, what is the estimated real rate of interest? If the inflation rate during the next five years rises to 8%, what real rate of return will you earn?

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Questions for Thought:

6. How is a nation's trade balance related to its net inflow of foreign capital? If an economy provides more attractive investment opportunities than are available in other countries, how will this tend to influence its trade balance?

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**Addendum
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**Leakages and Injections from
the Circular Flow of Income**

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Leakages and Injections from the Circular Flow of Income

- Equilibrium in the foreign exchange market implies:
Equation (9-1) $Imports + Capital Outflow = Exports + Capital Inflow$
- The equation may be re-written as:
Equation (9-2) $Imports - Exports = Capital Inflow - Capital Outflow$
- Or, more simply: $Imports - Exports = Net Capital Inflow$
- Equilibrium in the *loanable funds market* implies:
Equation (9-A1) $Net Saving + Net Capital Inflow = Investment + Budget Deficit$
- Substituting for *net capital inflow* from above:
Equation (9-A2) $Net Saving + Imports - Exports = Investment + Budget Deficit$

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Leakages and Injections from the Circular Flow of Income

- Equation (9-A2) $Net Saving + Imports - Exports = Investment + Budget Deficit$
- As *Budget deficit* = (government purchases - taxes):
Equation (9-A3) $Net Saving + Imports - Exports = Investment + Government Purchases - Taxes$
- Which may be re-written as:
Equation (9-A4) $Net Saving + Imports + Taxes = Investment + Government Purchases + Exports$

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).

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The Circular Flow Diagram: Revisited

- Macro equilibrium will be present when the flow of expenditures on goods & services (**top loop**) is equal to 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.

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