

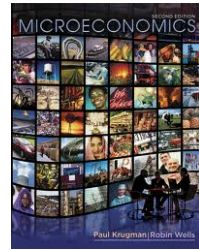


Economics 202 Principles Of Macroeconomics

Professor Yamin Ahmad

Lecture 10

- Investment, Savings and the Real Interest Rate
- The role of the Government
- Savings and Investment in the National Economy



Big Concepts

- The “Real Interest Rate”
- What factors determine Investment?
- What factors determine Savings?
- Understanding the Consumption Savings Decision faced by Households...

Note: These lecture notes are incomplete without having attended lectures



Investment and Capital

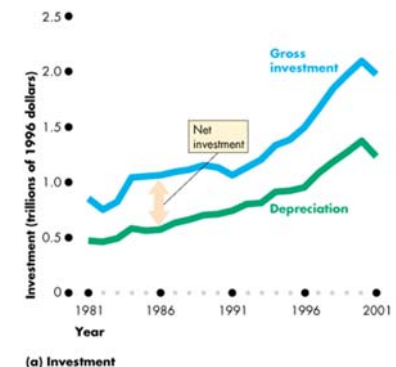
- The **capital stock** is the total amount of plant, equipment, buildings, and inventories, or physical capital.
- **Gross investment** is the purchase of new capital.
- **Depreciation** is the wearing out of the capital stock.
- **Net investment** equals gross investment minus depreciation, and net investment is the addition to the capital stock.

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Capital and Interest

- Figure 1(a) shows gross investment and depreciation for the period 1981–2001.
- The amount of gross and net investment decreases during recessions and increases during expansions.



(a) Investment

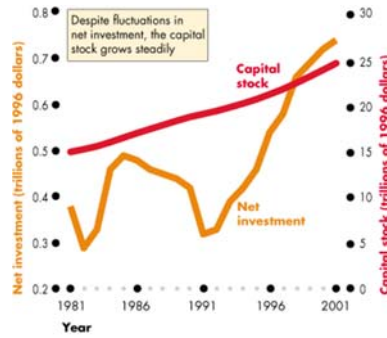
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Capital and Interest

- Figure 1(b) shows net investment and the capital stock for the period 1981–2001.

- The capital stock has increased every year since 1981 by an amount that fluctuated between \$0.3 trillion and \$0.7 trillion per year.



(b) Capital stock and net investment

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Savings

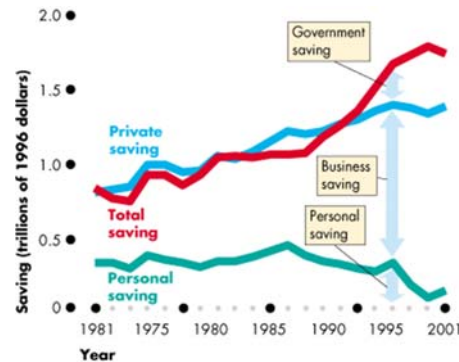
- Saving is current income minus current expenditure, and in part finances investment.
- Personal saving** is personal disposable income minus consumption expenditure.
- Business saving** is retained profits and additions to pension funds by businesses.
- Government saving** is the government's budget surplus.
- Any of these components can be negative.

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Capital and Interest

- Figure 2 shows the three components and the total for 1981–2001.

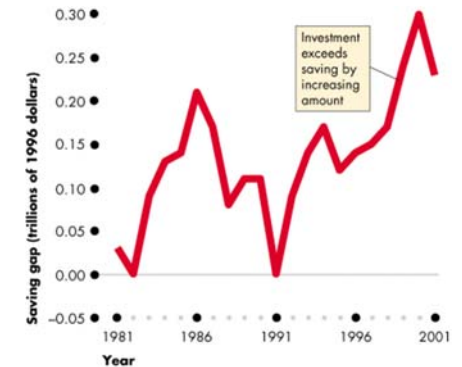


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The Savings Gap

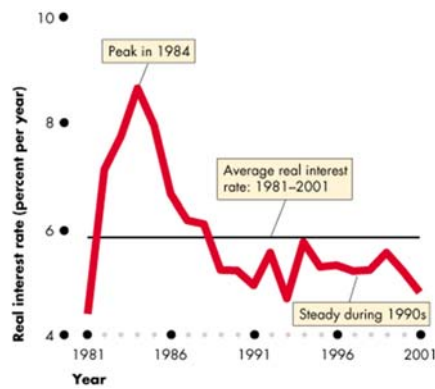
- Figure 3 shows investment minus saving, the saving gap, for the United States over 1981–2001, illustrating how the gap is near zero in recessions but otherwise positive, and grew during the 1990s.



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The Real Interest Rate

- The return on capital is the **real interest rate**, which (approximately) equals the nominal interest rate minus the inflation rate.
- Figure 4 shows the real interest rate from 1981 to 2001, which fluctuates around an average close to 6 percent a year.



Note: These lecture notes are incomplete without having attended lectures

Investment Decisions

- Business investment decisions are influenced by
 - The expected profit rate
 - The real interest rate

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The Expected Profit Rate

- The expected profit rate is relatively high during business cycle expansions and relatively low during recessions.
- Advances in technology can increase the expected profit rate.
- Taxes affect the expected profit rate because firms are concerned about after-tax profits.

Note: These lecture notes are incomplete without having attended lectures

The Real Interest Rate

- The real interest rate is the opportunity cost of the funds used to finance investment.
- Regardless of whether a firm borrows or uses its own financial resources, it faces this opportunity cost.
- Either it pays the interest or it forgoes interest on its own funds.

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Investment Decisions

Project	Funds needed	Expected profit rate
1	\$200,000	25
2	\$200,000	15
3	\$200,000	10
4	\$200,000	7
5	\$200,000	5
6	\$200,000	3
7	\$200,000	1

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Investment Decisions

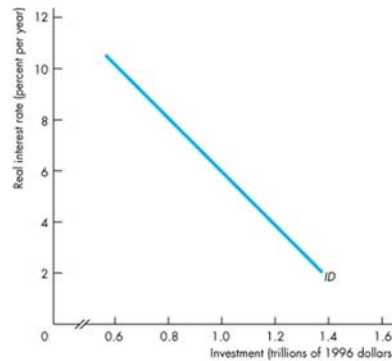
Project	Funds needed	Expected profit rate
1	\$200,000	25
2	\$200,000	15
3	\$200,000	10
3A	Any amount (+/-)	8
4	\$200,000	7
5	\$200,000	5
6	\$200,000	3
7	\$200,000	1

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Investment Demand

- **Investment demand** is the relationship between the level of planned investment and the real interest rate.
- Figure 5.a illustrates an investment demand curve.



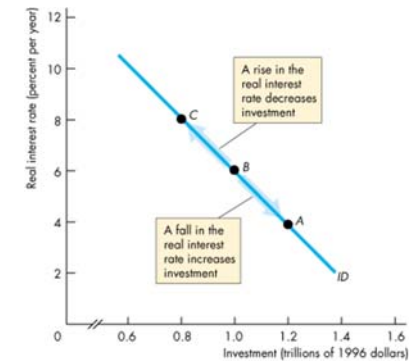
(a) The effect of a change in the real interest rate

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Investment Decisions

- The investment demand curve slopes downward.
- A fall in the real interest rate increases planned investment along the investment demand curve.
- A rise in the real interest rate decreases planned investment along the investment demand curve.



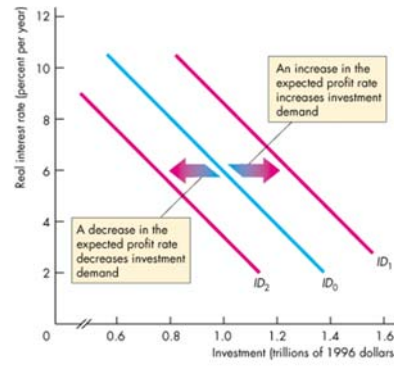
(a) The effect of a change in the real interest rate

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Investment Decisions

- Figure 5(b) illustrates a change in investment demand.
- If the expected profit rate increases, the investment demand curve shifts rightward from ID_0 to ID_1 .
- If the expected profit rate decreases, the investment demand curve shifts leftward from ID_0 to ID_2 .



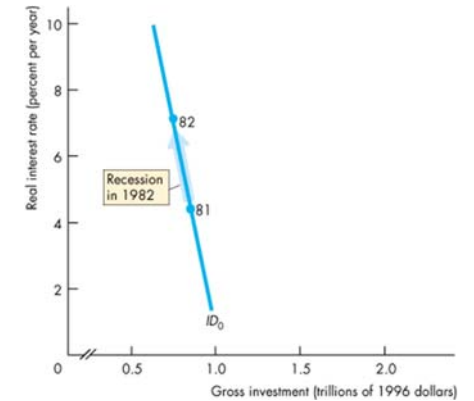
(b) The effect of a change in the expected profit rate

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Investment Demand in the United States

- Figure 6 interprets investment demand in the United States between 1981 and 2001.
- Movements along an investment demand curve show changes in the quantity of investment that result from changes in the real interest rate.

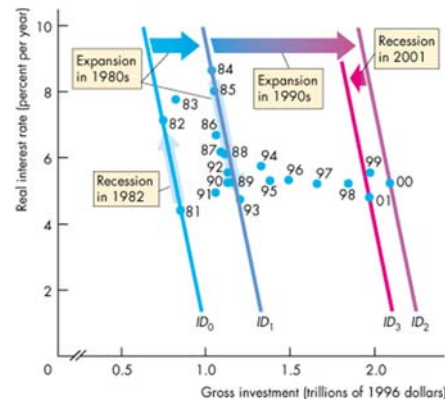


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Investment Decisions

Shifts of the investment demand curve show changes in investment demand that result from changes in the expected profit rate.



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Saving Decisions

- Investment is financed by national saving and borrowing from the rest of the world.
- **National saving** is the sum of private saving and government saving.
- Households divide their *disposable income* between consumption expenditure and saving.

Note: These lecture notes are incomplete without having attended lectures

Saving Decisions

- Saving is influenced by:
 - The real interest rate
 - Disposable income
 - Wealth
 - Expected future income

Note: These lecture notes are incomplete without having attended lectures

Saving Decisions

- Real Interest Rate
 - The higher the real interest rate, the greater is a household's opportunity cost of consumption and so the larger is the amount of saving.
- Disposable Income
 - The higher the disposable income, the greater is a household's saving.

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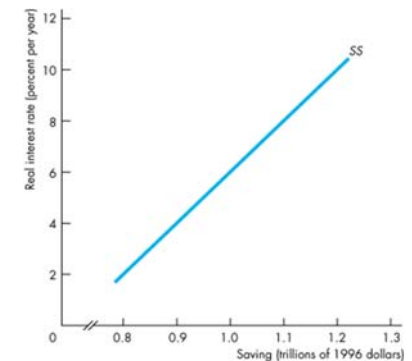
Saving Decisions

- Wealth
 - The greater is a household's wealth, other things remaining the same, the greater is its consumption and the less is its saving.
- Expected Future Income
 - The higher a household's expected future income, the greater is its current consumption and the lower is its current saving.

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Saving Supply

- **Saving supply** is the relationship between saving and the real interest rate, other things remaining the same.
- Figure 7(a) shows a saving supply curve, which slopes upward.



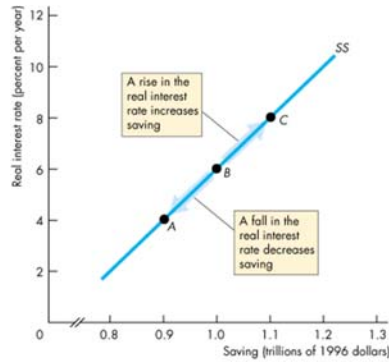
(a) The effect of a change in the real interest rate

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Saving Decisions

- A fall in the real interest rate decreases saving.
- A rise in the real interest rate increases saving.



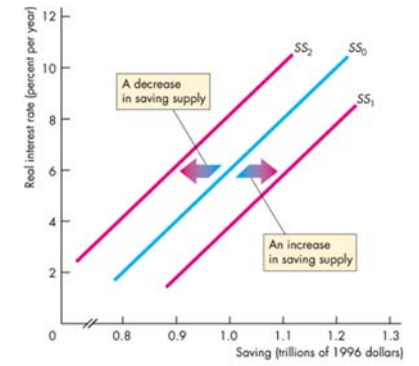
(a) The effect of a change in the real interest rate

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Saving Decisions

Figure 7(b) shows the effect of a change in any other influence on saving, which changes saving supply and shifts the saving supply curve.



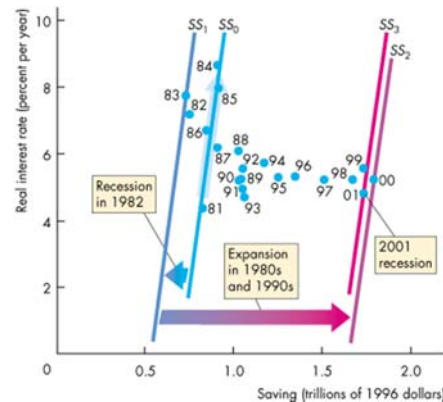
(b) The effects of other influences on saving

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Saving Supply in the United States

- Figure 8 illustrates saving supply in the United States from 1981 to 2001.
- The U.S. saving supply curve has tended to shift rightward, except in recessions, because of growth in disposable income.



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Equilibrium in the World Economy

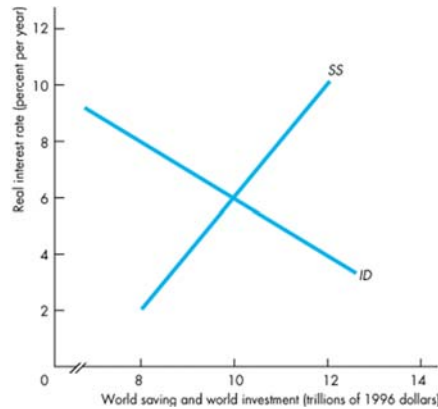
- The real interest rate is determined in the global market because capital can readily move from one country to another
- ... that is, one nation's saving can finance another country's investment.

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Determining the Real Interest Rate

- The real interest rate is determined by the world investment demand and world supply of savings.
- In Figure 9, ID is the world investment demand curve.
- SS is the world supply of saving curve.

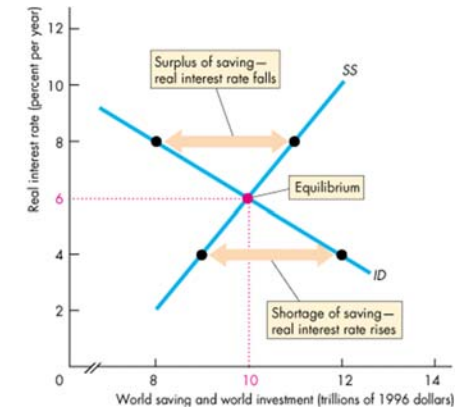


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Equilibrium in the World Economy

- The equilibrium real interest rate is 6 percent.
- At the equilibrium real interest rate, there is neither a shortage nor surplus of saving.



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Equilibrium in the World Economy

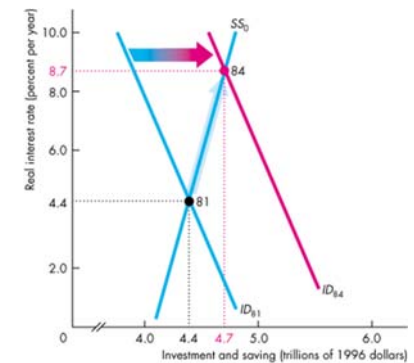
- Explaining Changes in the Real Interest Rate
 - Figure 10 on the next slides shows how investment demand and saving supply in the world economy brought real interest rate fluctuations.

Note: These lecture notes are incomplete without having attended lectures



Equilibrium in the World Economy

- From 1981 to 1984, an increase in the expected profit rate helped by a recovery from a U.S recession increased world investment demand.
- By 1984 the investment demand curve was ID_{84} and the real interest rate reached a peak of almost 9 percent a year.

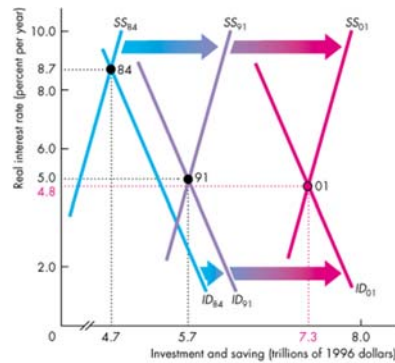


(a) Expansion from 1982 recession

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Equilibrium in the World Economy

- After 1984 saving supply increased by more than investment demand and the real interest rate fell.
- After 1991, saving supply and investment demand increased at similar rates, so the real interest rate did not change much.



(b) Expansion through 1980s and 1990s

Note: These lecture notes are incomplete without having attended lectures

The Role of Government

- Government saving is part of total saving.
- Because funds flow between countries and the real interest rate is determined in the world market, it is the aggregate saving of all governments throughout the world that matters.
- In total, government is large; worldwide, government saving is negative (governments have a deficit) at about 10 percent of total saving.

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Government Budgets

- Although each country has imports and exports, when we sum over all countries to obtain world totals, exports and imports are zero.
- World $GDP = C + I + G$.
- Also, world $GDP = C + S + T$.
- From these two equations, you can see that for the world as a whole $I = S + T - G$.

Note: These lecture notes are incomplete without having attended lectures

The Role of Government

- If net taxes exceed government purchases, $T > G$, the government has a budget surplus and government saving is positive.
- If net taxes are less than government purchases, $T < G$, the government budget is in deficit and government saving is negative.

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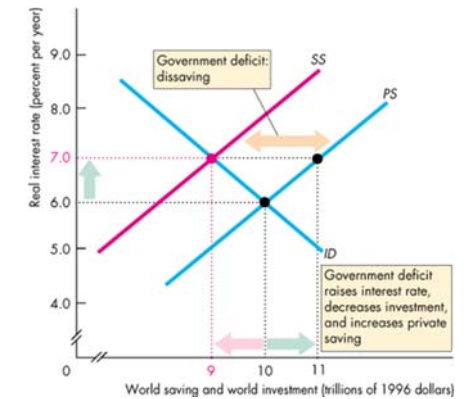
Direct Effect of Government Saving

- Government saving is part of total saving.
- The direct effect of a government budget deficit is a decrease in total saving.
- When total saving decreases, the real interest rate rises and the equilibrium quantity of investment decreases.
- The tendency of a government budget deficit to decrease investment is called a **crowding-out effect**.

Note: These lecture notes are incomplete without having attended lectures

The Role of Government

Figure 11 illustrates the crowding-out effect of an increase in the government budget deficit.



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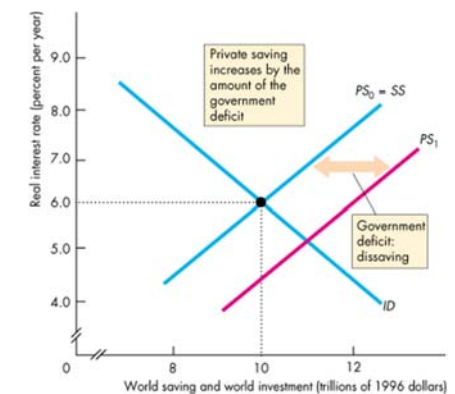
Indirect Effect of Government Saving

- A government budget deficit also has an indirect effect that offsets the direct effect.
- The Ricardo-Barro effect is an increase in private saving by an amount equal to the government budget deficit.
- This effect occurs if households recognize that a government budget deficit must be paid for by higher taxes in the future.

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The Role of Government

- If the Ricardo-Barro effect operates, a government budget deficit has no effect on the real interest rate and hence does not decrease the quantity of investment.
- Figure 12 illustrates the Ricardo-Barro effect.



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The Role of Government

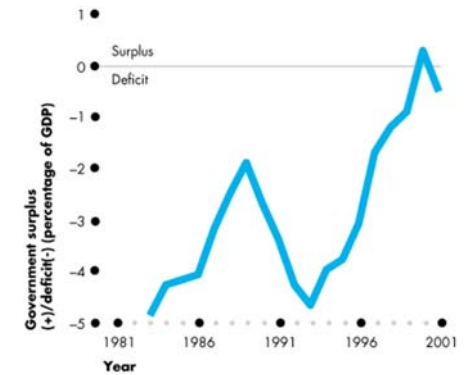
- Reality probably lies between total crowding out and a complete Ricardo-Barro effect.
- That is, an increase in the global government budget deficit crowds out some investment and raises the real interest rate.

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Government Deficits Today

Figure 13 shows estimates of total government surplus and deficit for the advanced economies over 1983–2001, as a percentage of GDP.



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Saving and Investment in the National Economy

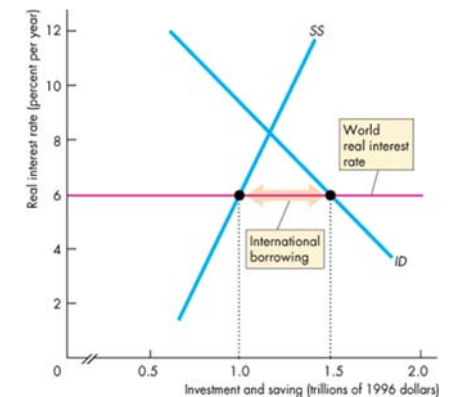
- The world real interest rate determines the quantity of a nation's saving and investment.
- If, at the world real interest rate, the quantity of a nation's investment exceeds that of its saving, the country borrows from the rest of the world.
- If, at the world real interest rate, the quantity of a nation's investment is less than that of its saving, the country lends to the rest of the world.

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Saving and Investment in the National Economy

Figure 14 illustrates the case of a nation that borrows from the rest of the world.



Note: These lecture notes are incomplete without having attended lectures



Saving and Investment in the National Economy

- When a nation borrows from the rest of the world, its net exports are negative—it imports more than it exports.
- When a nation lends to the rest of the world, its net exports are positive—it exports more than it imports.
- International Borrowing and Lending in the World Today
 - For the past 20 years, the United States has been a borrower and Japan has been a lender.

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Government Deficit and International Borrowing

- An increase in the government deficit decreases the nation's total saving and increases international borrowing.
- U.S. net exports have been negative for the past 20 years because national saving has been less than investment.
- The government budget deficit in past years has helped decrease national saving and has contributed to international borrowing.

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Saving and Investment in the National Economy

- Because it is the world real interest rate that determines investment, a U.S. government budget deficit has a smaller effect on U.S. interest rates, and smaller crowding-out effect, than often popularly believed.

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