
Consumption, Saving, and Investment, Part 1

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Agenda

- Consumption and Saving
 - Determinants of National Saving
 - Investment
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Consumption and Saving

- Consumption and saving decisions :
 - **Desired consumption** is the consumption amount desired by households
 - **Desired national saving** is the level of national saving when consumption is at its desired level:

$$S^d = Y - C^d - G$$

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Consumption and Saving

- Consumption and saving decisions:
 - A person can consume less than current income, i.e., saving is positive.
 - A person can consume more than current income, i.e., saving is negative.
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Consumption and Saving

- Consumption and saving decisions:
 - There is a trade-off between current and future consumption:
 - The price of 1 unit of current consumption is $1 + r$ units of future consumption, where r is the real interest rate.
 - **Consumption-smoothing motive**: the desire to have a relatively even pattern of consumption over time.

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Consumption and Saving

- Effect of changes in **current income**:
 - Increases in current income increase both consumption and saving.
 - Because the **marginal propensity to consume**—the fraction of additional income consumed—is less than 1.
 - When current income (Y) rises, C^d rises, but not by as much as Y , so S^d also rises.

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Consumption and Saving

- Effect of changes in **expected future income**:
 - Higher expected future income raises current consumption even at the same current income level, so current saving declines.

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Consumption and Saving

- Effect of changes in **wealth**:
 - Increase in wealth raises current consumption even at the same current income level, so current saving declines.

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Consumption and Saving

- Effect of changes in the **real interest rate**:
 - A higher real interest rate has 2 effects.
 - **The Substitution effect** on saving is positive because a higher rate of return is a greater reward for saving.
 - **The Income effect** on saving is mixed:
 - It is negative for a net saver because it takes less saving to achieve a given amount in the future (target saving).
 - It is positive for a net borrower because a higher real interest rate represents a loss of wealth.

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Consumption and Saving

- Effect of changes in the **real interest rate**:
 - Taxes and the real return to saving.
 - The expected after-tax real interest rate is given by:

$$r_{a-t} = (1 - t)i - \pi^e$$

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Consumption and Saving

- Effect of changes in **fiscal policy**:
 - Changes in fiscal policy affects desired consumption through changes in both current and expected future income.
 - They directly affect desired national saving:

$$S^d = Y - C^d - G$$

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Consumption and Saving

- Effect of changes in **fiscal policy**:
 - **Government purchases**:
 - Higher G financed by higher current taxes reduces after-tax income, lowering desired consumption.
 - Higher G financed by higher future taxes also lowers desired consumption if people realize that future after-tax income will be lower.

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Consumption and Saving

- Effect of changes in **fiscal policy**:
 - **Government purchases**:
 - However C^d declines by less than G rises because the marginal propensity to consume is less than 1.
 - Consequently, national saving ($S^d = Y - C^d - G$) declines.
 - An increase in government purchases reduce both desired consumption and desired national saving if it is financed by higher (current or expected future) taxes.

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Consumption and Saving

- Effect of changes in **fiscal policy**:
 - **Taxes**:
 - A reduction in current taxes will increase current (disposable) income and desired consumption.
 - However, consumers may realize that a tax cut today will result in higher taxes in the future, which will reduce future expected income.

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Consumption and Saving

- Effect of changes in **fiscal policy**:
 - **Taxes**—3 possible situations:
 - If the decline in future expected income is less than the increase in current income, desired consumption will rise.

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Consumption and Saving

- Effect of changes in **fiscal policy**:
 - **Taxes**—3 possible situations:
 - If the decline in future expected income is more than the increase in current income, desired consumption will fall.

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Consumption and Saving

- Effect of changes in **fiscal policy**:
 - **Taxes**—3 possible situations:
 - If the decline in future expected income exactly offsets the increase in current income, desired consumption will not change.
 - This is an example of **Ricardian equivalence**.
 - The tax change affects only the timing of taxes, not their ultimate (present value) amount.

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Consumption and Saving

- Effect of changes in **fiscal policy**:
 - **Taxes**:
 - In practice, people do not fully see that future taxes will rise if taxes are cut today.
 - Consequently, a tax cut today leads to increased desired consumption and reduced desired national saving.

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Application: A Ricardian Tax Cut?

- The Economic Growth and Tax Relief Reconstruction Act (EGTRRA) of 2001 gave rebate checks to taxpayers and cut tax rates substantially.
 - From 2001 Q1 to 2001 Q3:
 - Government saving fell \$277 billion (at an annual rate).
 - Private saving increased \$180 billion (at an annual rate).
 - National saving declined \$97 billion (at an annual rate).
 - About 2/3 of the tax cut was saved.

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Application: A Ricardian Tax Cut?

- Results of the tax rebates:
 - Most consumers saved their tax rebates and did not spend them.
 - As a result, the tax rebate and tax cut did not stimulate much additional spending by households.

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Determinants of Desired National Saving

- Desired national saving will:
 - Increase with a rise in **current income** because part of the extra income is saved.
 - Decrease with an increase in **expected future income** because a higher expected future income raises current desired consumption and reduces current desired saving.

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Determinants of Desired National Saving

- Desired national saving will:
 - Decrease with an increase in **wealth** because some of the extra wealth is consumed, which reduces saving for a given current income.
 - Probably increase with an increase in **expected (after-tax) real interest rates** because the increased return to savings probably outweighs that less must be saved to reach a savings target.

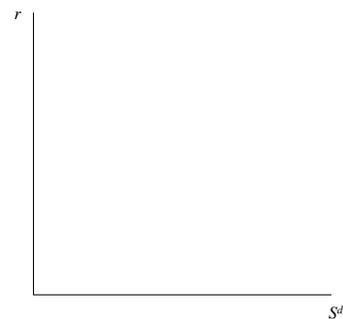
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Determinants of Desired National Saving

- Desired national saving will:
 - Decrease with an increase in **government purchases, G**, because higher G directly lowers desired national saving.
 - Probably rise with an increase in **taxes, T**, because consumers don't take full account for future taxes and so reduce current consumption.
 - But saving won't change if consumers fully account for a offsetting future tax cut.

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Desired Saving & the Real Interest Rate



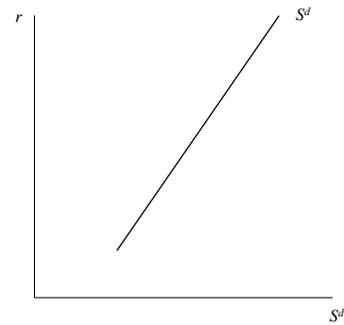
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Desired Saving & the Real Interest Rate

- Shifts of the saving curve:
 - The saving curve will shift right because of:
 - A rise in current output,
 - A fall in expected future output,
 - A fall in wealth,
 - A fall in government purchases, or
 - A rise in taxes (unless Ricardian equivalence holds, in which case tax changes have no effect)

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Effect of an increase in current output



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Investment

- Why is investment important?
 - Investment fluctuates sharply over the business cycle.
 - Need to understand investment to understand the business cycle.
 - Investment plays a crucial role in long-term growth.

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Investment

- Investment is determined by changes in the desired capital stock.
 - The **desired capital stock** is the amount of capital that allows firms to earn the largest expected profit.
 - Depends on benefits and costs of additional capital.

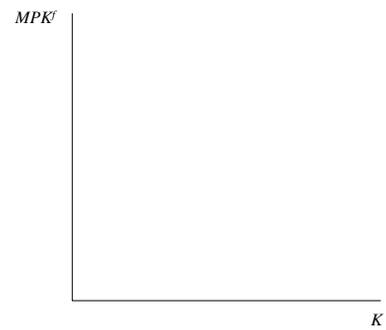
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Investment

- The desired capital stock:
 - The **benefit** associated with additional capital depends on the future marginal product of capital, MPK^f .
 - Because the marginal productivity of capital falls a K increase, the MPK^f also falls as K increases.

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Expected Future Marginal Product of Capital



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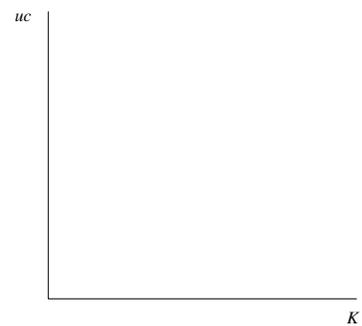
Investment

- The desired capital stock:
 - The **cost** associated with additional capital is the real cost of using a unit of capital per year.
 - This is called the **user cost of capital, uc** , which equals the sum of the real interest cost and depreciation.

$$uc = rp_K + dp_K = (r + d)p_K$$

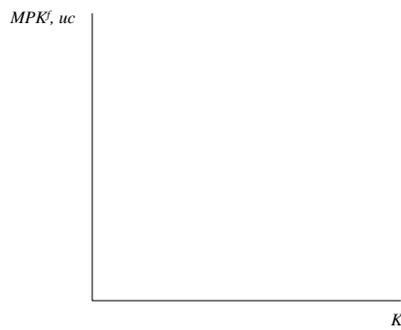
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User Cost of Capital



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Determining the Desired Capital Stock



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Investment

- Determining the desired capital stock:
 - If $MPK^f > uc$, profits rise if K is added, i.e., the marginal benefits $>$ the marginal costs.
 - If $MPK^f < uc$, profits rise if K is reduced, i.e., the marginal benefits $<$ the marginal costs.
 - Profits are maximized where $MPK^f = uc$

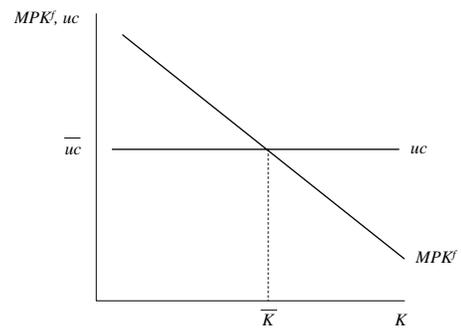
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Investment

- Changes in the desired capital stock:
 - Any factor that changes the user cost of capital will also cause a change in the desired capital stock:
 - The real interest rate,
 - The depreciation rate, or
 - The price of capital.

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An increase in the user cost of capital



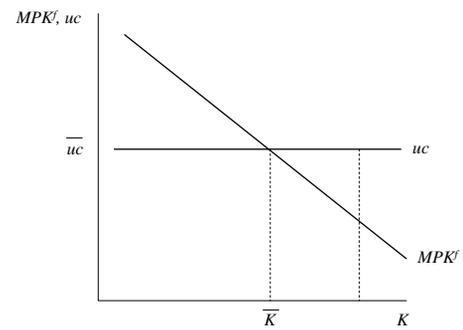
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Investment

- Changes in the desired capital stock:
 - Any factor that shift the MPK^f curve will also cause a change in the desired capital stock:
 - Technology, or
 - The labor force.

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An increase in MPK^f



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Investment

- Changes in the desired capital stock:
 - **Taxes** and the desired capital stock:
 - With taxes, the return to capital is $(1 - \tau) MPK^f$
 - The desired capital stock is where the after tax return equals the user cost:

$$(1 - \tau)MPK^f = uc$$

$$MPK^f = uc/(1 - \tau) = (r + d)p_K/(1 - \tau)$$

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Investment

- Changes in the desired capital stock:
 - **Taxes** and the desired capital stock:
 - Tax-adjusted user cost of capital is $uc/(1 - \tau)$.
 - An increase in τ raises the tax-adjusted user cost of capital and reduces the desired capital stock.

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Investment

- Changes in the desired capital stock:
 - **Taxes** and the desired capital stock:
 - There are complications to the tax-adjusted user cost.
 - In reality, **profits**, not revenues, are taxed.
 - **Depreciation allowances** reduce the tax paid by firms, because they reduce profits.
 - **Investment tax credits** also reduce taxes when firms make new investments

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Investment

- Changes in the desired capital stock:
 - **Taxes** and the desired capital stock:
 - These complications to the tax-adjusted user cost can be captured by the **effective (corporate) tax rate**.
 - This is the tax rate on the firm's revenue that would have the same effect on the desired capital stock as do the actual provisions of the tax code.

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Effect of taxes on investment

- Do changes in the tax rate have a significant effect on investment?
 - One study found that after major tax reforms, investment responded strongly with an elasticity of investment to changes in the user cost of capital about -0.66 .

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