

UWTSD MBA HKBM7009
(UWMBA-30013-2024-1-SS)

Global Business Challenges) (3-1)

Microeconomics Foundations I: Understanding Interest Rates

Che Cheong POON
18 January 2025; Saturday 13:00pm to 16:00pm

Lecture Agenda :

- Introduction
- The Pure Consumption Loan Model of Households
- The Investment Opportunity
- Theory of Interest Rate Determination
- Nominal versus Real Interest Rates

Introduction

Wednesday, December 18, 2024: The FOMC has voted to lower the target range for the fed funds rate to 4.25% - 4.50%. Therefore, the United States Prime Rate is now 7.50%. The next FOMC meeting and decision on short-term interest rates will be on January 29, 2025.

Monday, October 21, 2024: As authorities intensified monetary support to bolster the economy, the People's Bank of China (PBC), China's central bank, has lowered its benchmark lending rates by 25 basis points (0.25 percentage point). The one-year loan prime rate dropped from 3.35% to 3.1%.

International prime and Central bank benchmark lending interest rates (% p.a.)

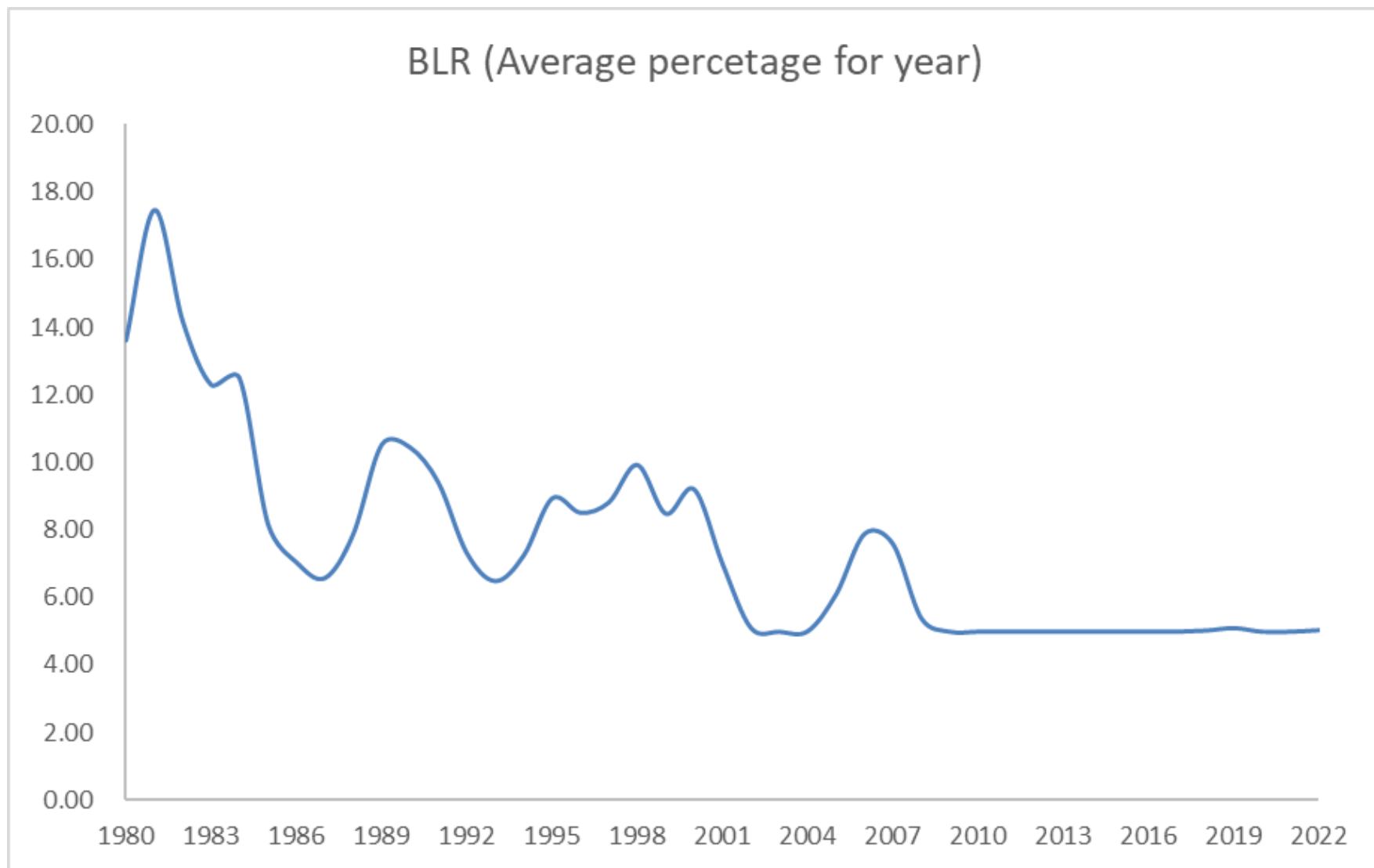
	Jan 2023	Jan 2024	Jan 2025
Hong Kong	5.35	5.88	5.25
China	3.65	3.55	3.10
US	7.5	8.50	7.50
Japan	4.48	1.48	1.48
Eurozone	2.00	4.5	3.15
UK	3.50	5.25	4.75

Sources:

https://www.fedprimerate.com/non-us_foreign_primerates.htm

http://www.fedprimerate.com/wall_street_journal_prime_rate_history.htm#current

https://www.censtatd.gov.hk/en/web_table.html?id=122



Sources:

https://www.censtatd.gov.hk/en/web_table.html?id=340-45021

Hong Kong Interbank Offered Rate (HIBOR %)—end of period figures

	2 Jan	3 Jan	6 Jan	7 Jan	8 Jan	9 Jan	10 Jan
2025	4.20	4.10	4.11	4.16	4.015	4.010	4.05
	2 Jan	3 Jan	4 Jan	7 Jan	8 Jan	9 Jan	10 Jan
2019	1.84	1.78	1.81	1.66	1.61	1.38	1.30

The Hong Kong Interbank Offered Rate, known by its abbreviation HIBOR, is the benchmark interest rate, stated in Hong Kong dollars, for lending between banks within the Hong Kong market.

Sources:

<https://www.hsbc.com.hk/mortgages/tools/hibor-rate/>

<https://api.hkma.gov.hk/public/market-data-and-statistics/monthly-statistical-bulletin/er-ir/hk-interbank-ir-daily?segment=hibor.fixing>

What factors determine the level of interest rates?

What factors determine the interest rate for each different type of loan?

What is the difference between real and nominal interest rates?

“The real rate of interest is the price of a loan, which is paid not in the present but in the future.”

“Interest is paid at the end of the interest period.”

Source:

Fisher, I. (1930). Theory of interest: as determined by impatience to spend income and opportunity to invest it. Augustusm Kelly Publishers, Clifton. pp. 100

http://files.libertyfund.org/files/1416/Fisher_0219.pdf

“In modern economics, interest is defined as the rental price of money.”

Source:

Persky, J. (2007). Retrospectives: From usury to interest. Journal of Economic Perspectives, 21(1), 227-236.

The origins of interest

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graph LR; A[The origins of interest] --- B[On the impatience's side: Interest must be paid because most men suffer a disutility in saving.]; A --- C[On the opportunities' side: Interest can be paid because capital is productive];
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On the impatience's side: Interest must be paid because most men suffer a disutility in saving.

Assumption: Positive time preference

(Commodities available in the present are typically evaluated at higher prices than subjectively certain prospects of the same commodities available in the future --- Bohm Bawark.)

On the opportunities' side: Interest can be paid because capital is productive

The Pure Consumption Loan Model of Households

Let us consider one individual who knows with certainty that he will live only two period. He also knows with certainty the incomes to be received in each of the two period. These incomes are M_1 and M_2 . The individual is free to borrow or lend in the first period at a given market rate of interest r subject only to the constraint that any borrowing in the first period must be repaid with interest out of income received in the second period. The individual is assumed to choose the levels of consumption in the first and second periods, C_1 and C_2 so as to maximize his utility subject to the constraints imposed by the fixed incomes and the market rate of interest.

The Present Value of the individual's income stream

$$V_m = M_1 + \frac{M_2}{1+r}$$

The diagram illustrates the present value formula $V_m = M_1 + \frac{M_2}{1+r}$ with annotations indicating which variables are given:

- A blue arrow points from the word "Given" to V_m .
- A red arrow points from the word "Given" to M_1 .
- A red arrow points from the word "Given" to M_2 .
- A red arrow points from the word "Given" to r .

The Present Value of the individual's consumption stream

The diagram shows the equation $V_c = C_1 + \frac{C_2}{1+r}$ with four annotations. A blue arrow labeled 'Given' points to V_c . A red arrow labeled 'Unknown' points to C_1 . Another red arrow labeled 'Unknown' points to C_2 . A red arrow labeled 'Given' points to r .

$$V_c = C_1 + \frac{C_2}{1+r}$$

Deriving the budget equation

The individual's present value of consumption cannot exceed present wealth. Assuming that no income is left unspent at the end of the second period, we must have

$$V_c = V_m$$

By substituti on, we get $V_m = C_1 + \frac{C_2}{1+r}$

Constant

or $C_2 = (1+r)V_m - (1+r)C_1 \dots\dots\dots(1)$

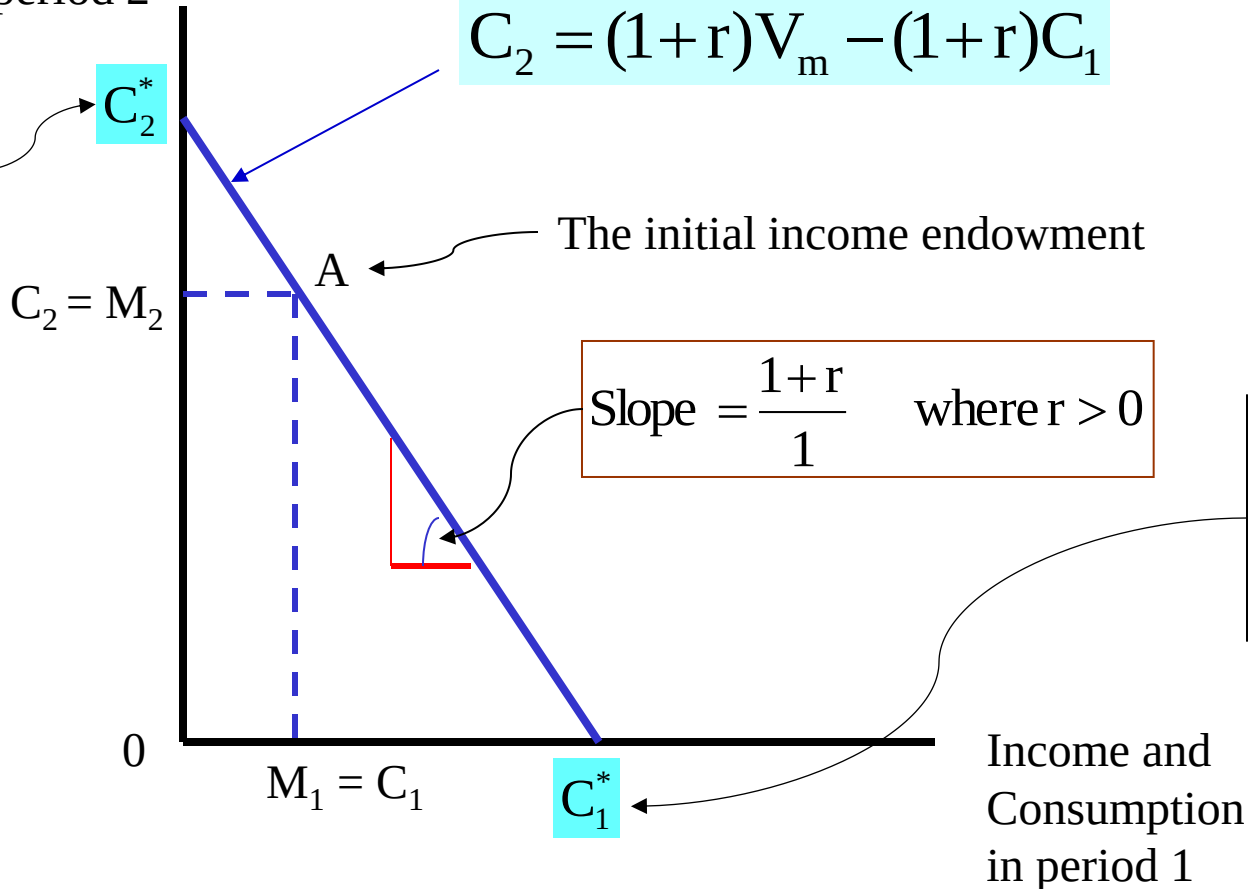
C_1 is the dependent variable and C_2 is the independent variable

The slope of the budget line

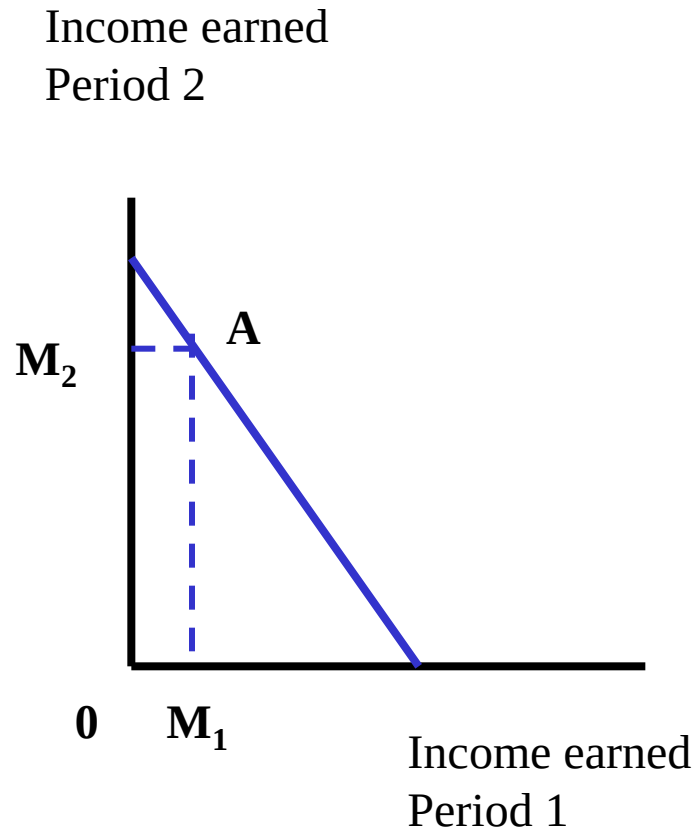
The budget line: no exchange between present and future consumption

Income and
consumption
in period 2

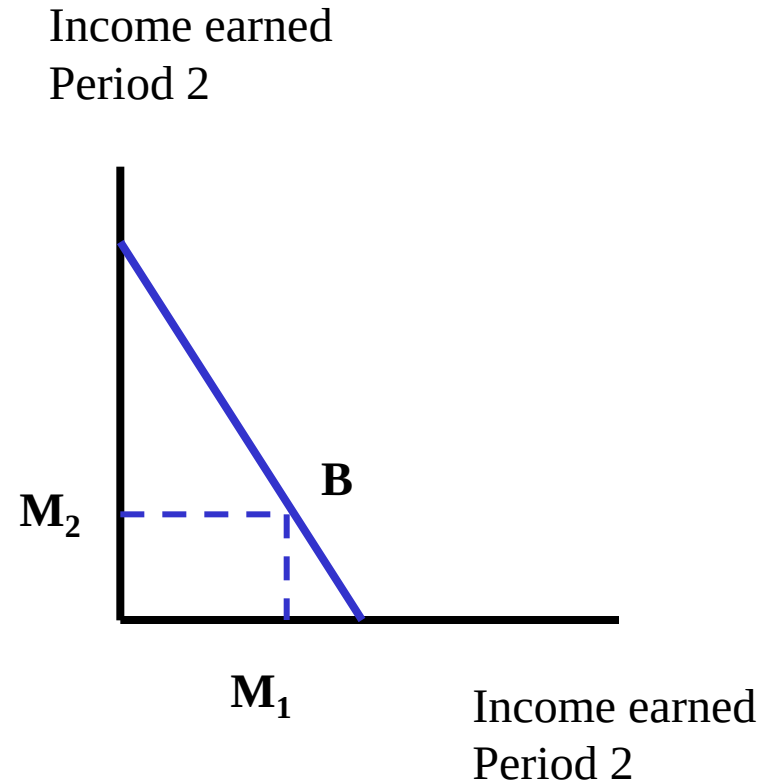
Maximum
consumption
in period 2 if no
consumption in
period 1



Who would be the lender and who would be the borrower?

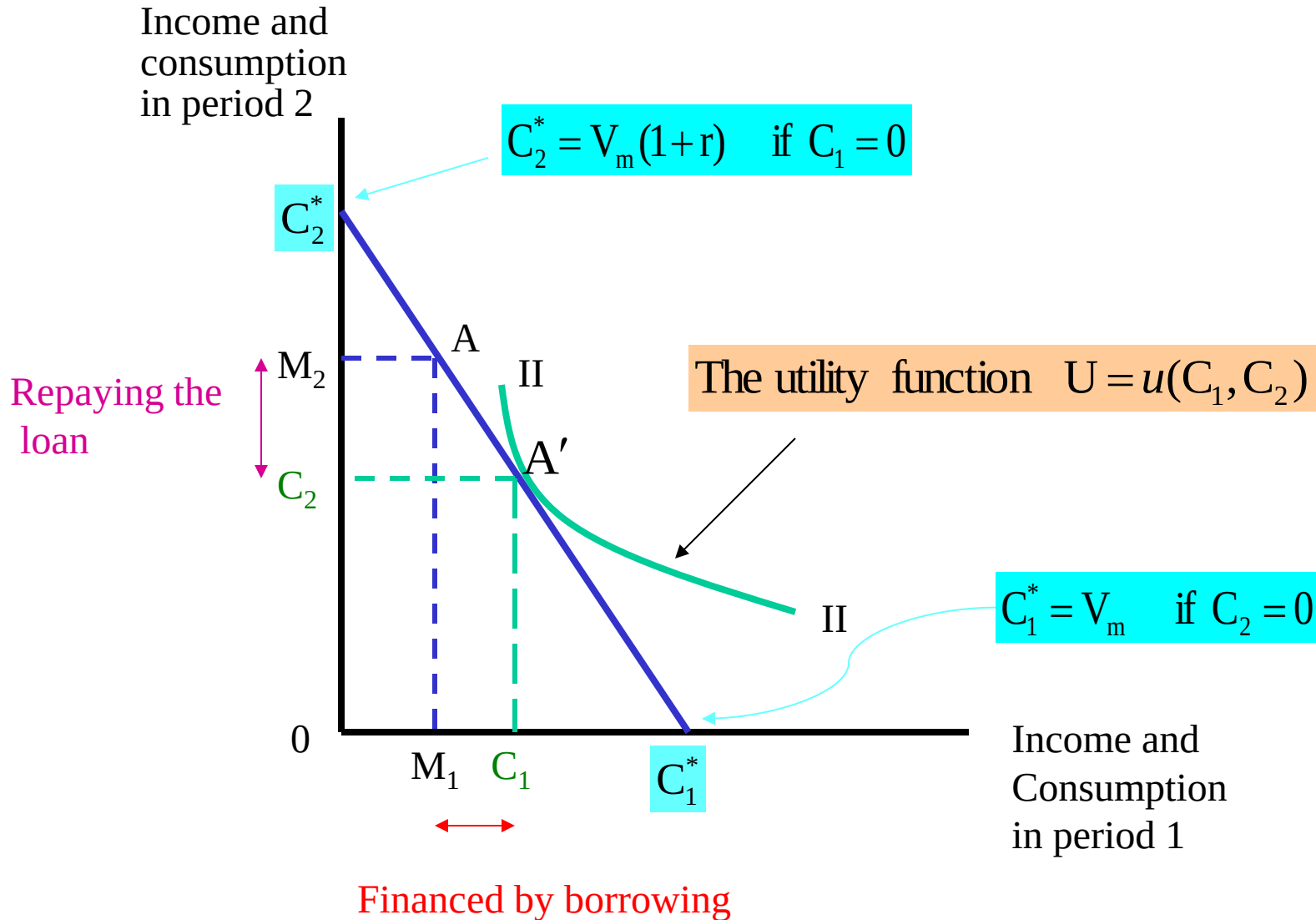


Individual A

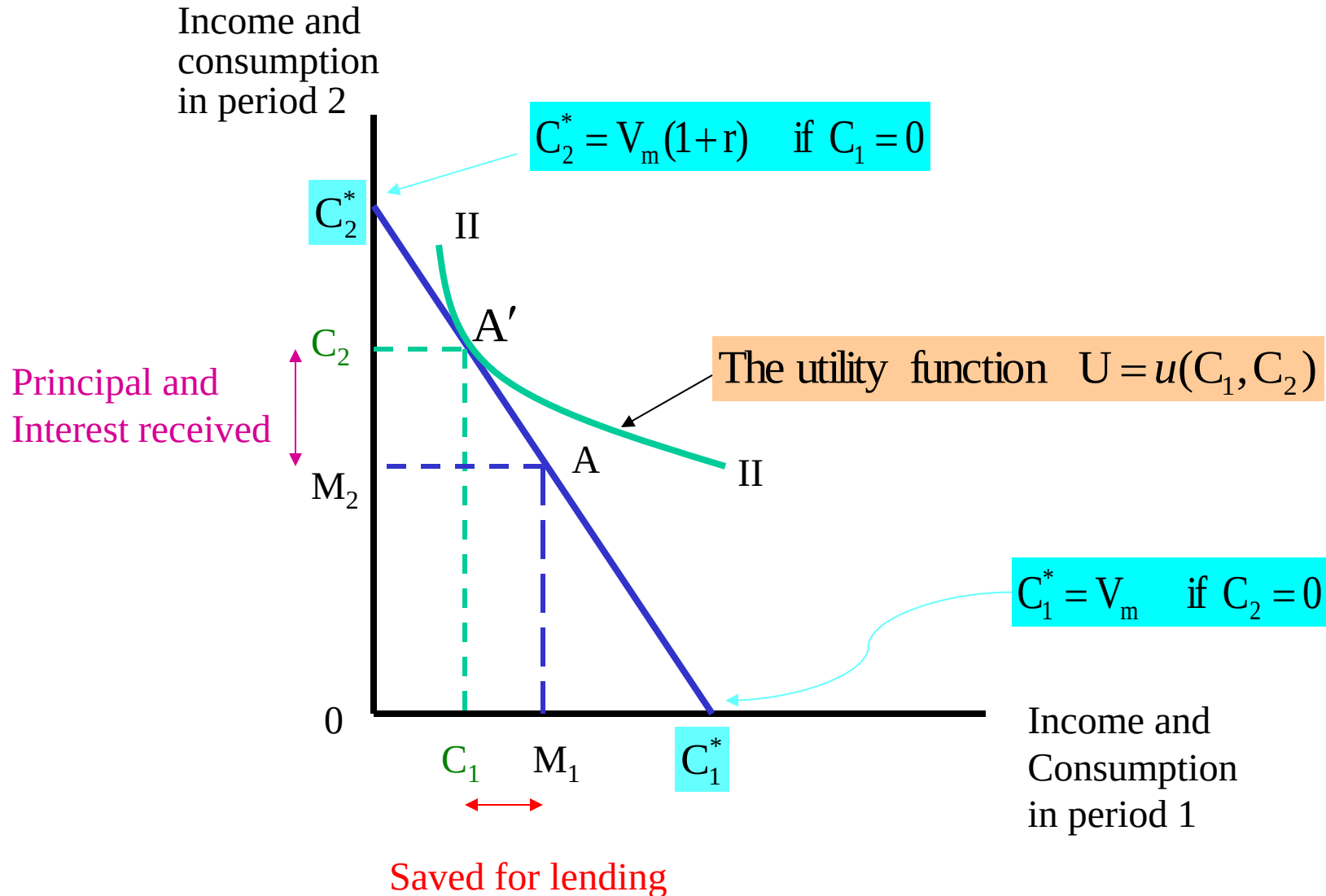


Individual B

Allowing for exchange between present and future consumption: The case of a borrower

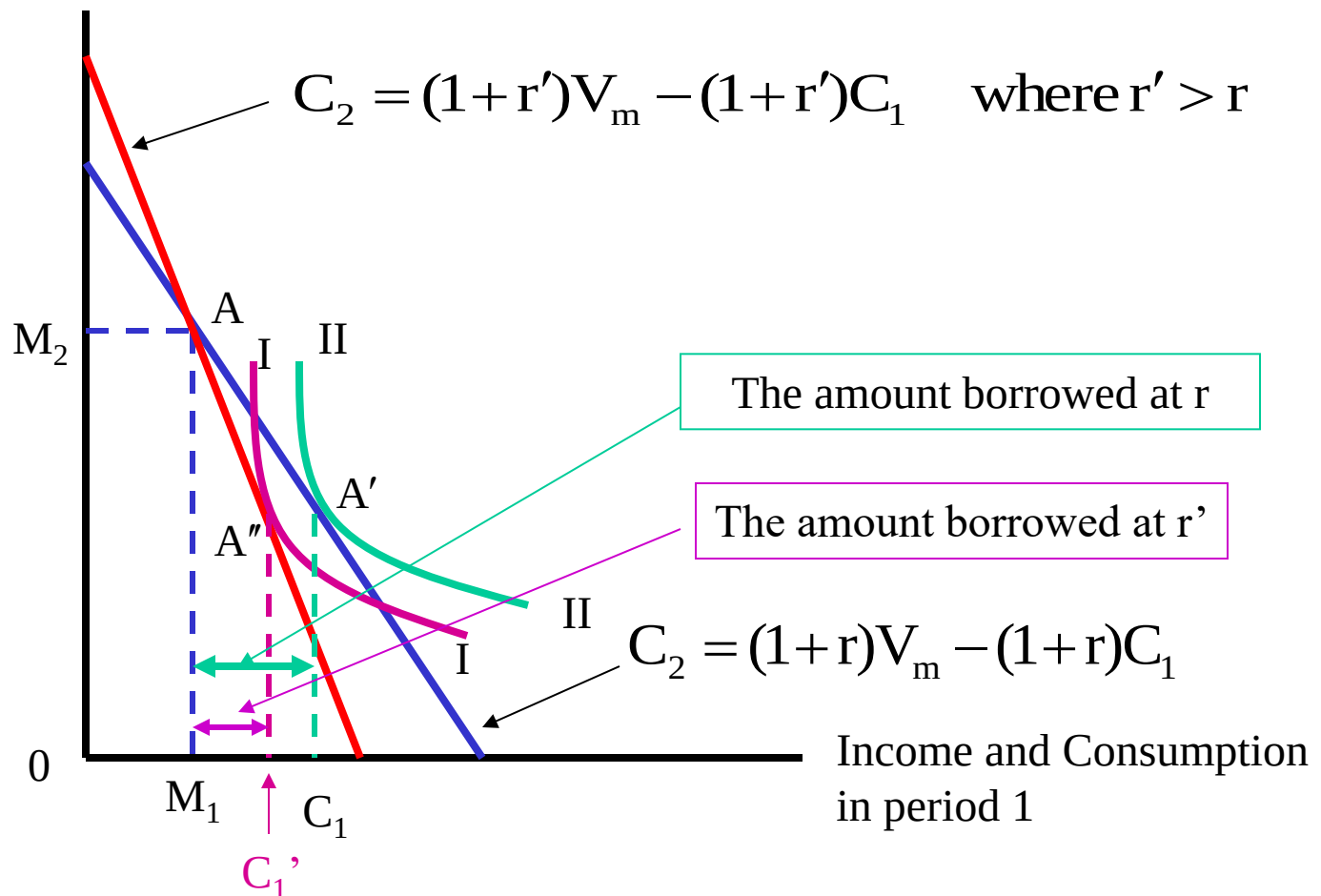


Allowing for exchange between present and future consumption: The case of a lender



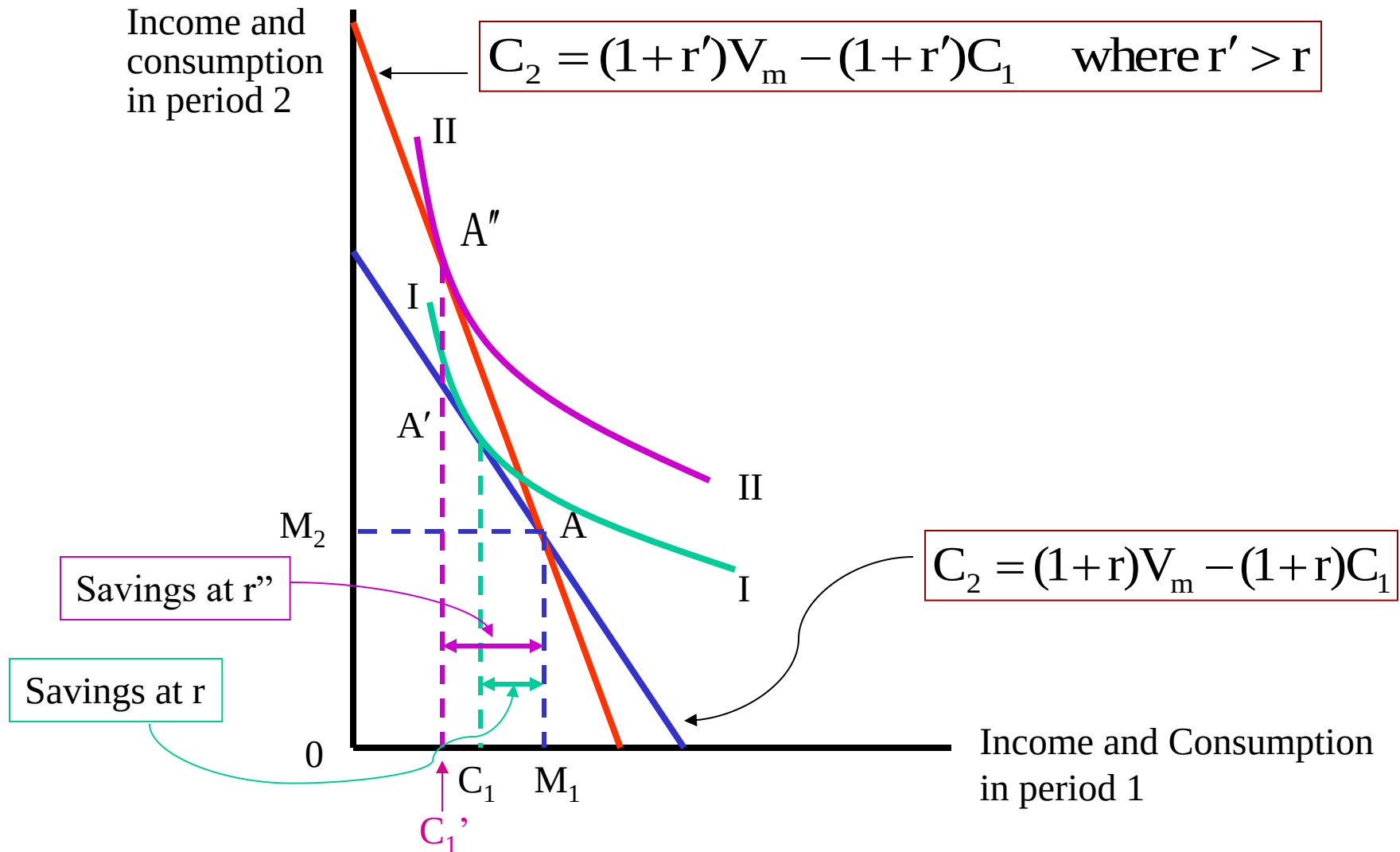
The effect of an increase in interest rate on borrowing behavior

Income and consumption in period 2



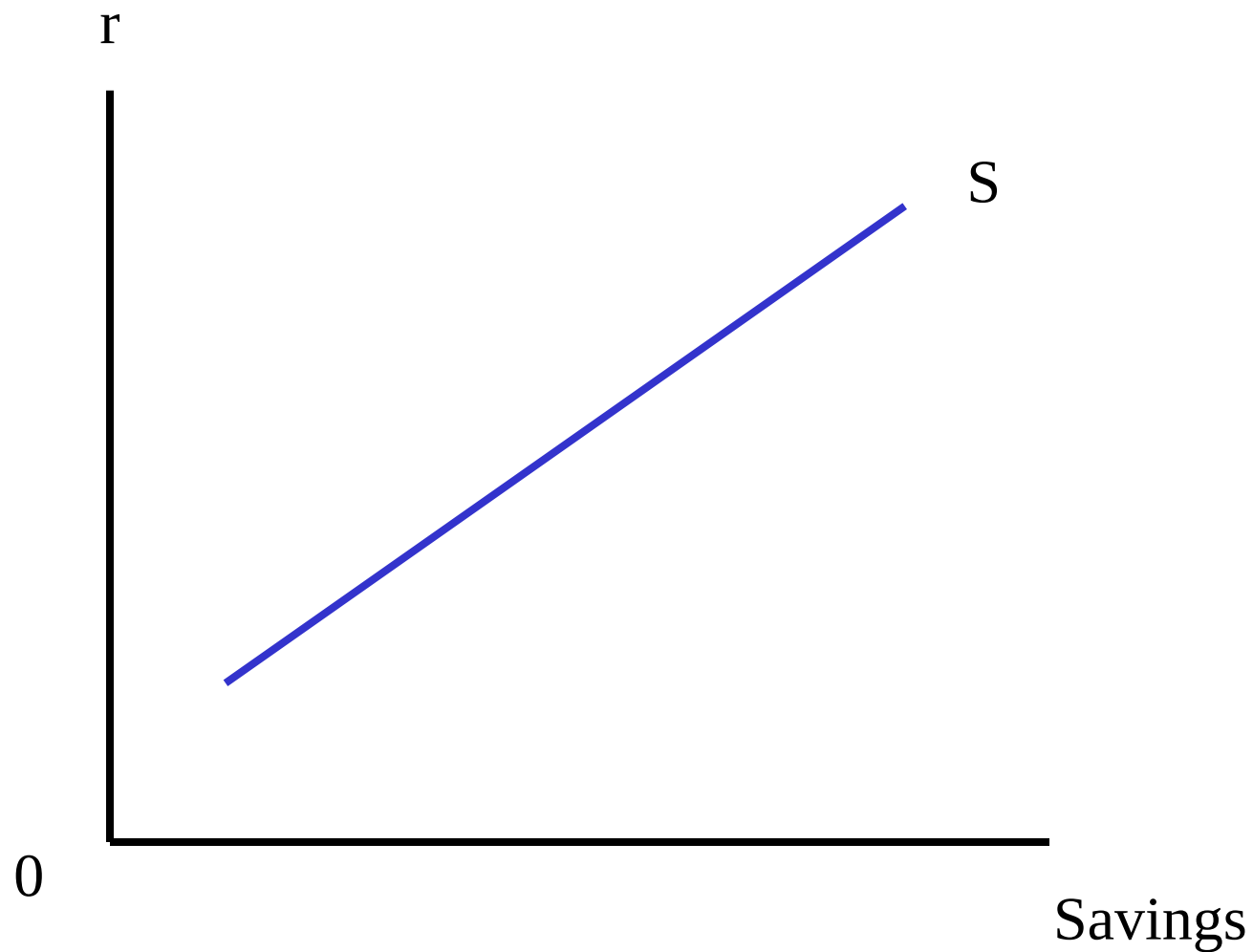
An increase in the market interest rate rotates the budget line clockwise: that is, it becomes more steeply sloped

The effect of an increase in interest rate on lending behavior



An increase in the market interest rate induces the individual to save more

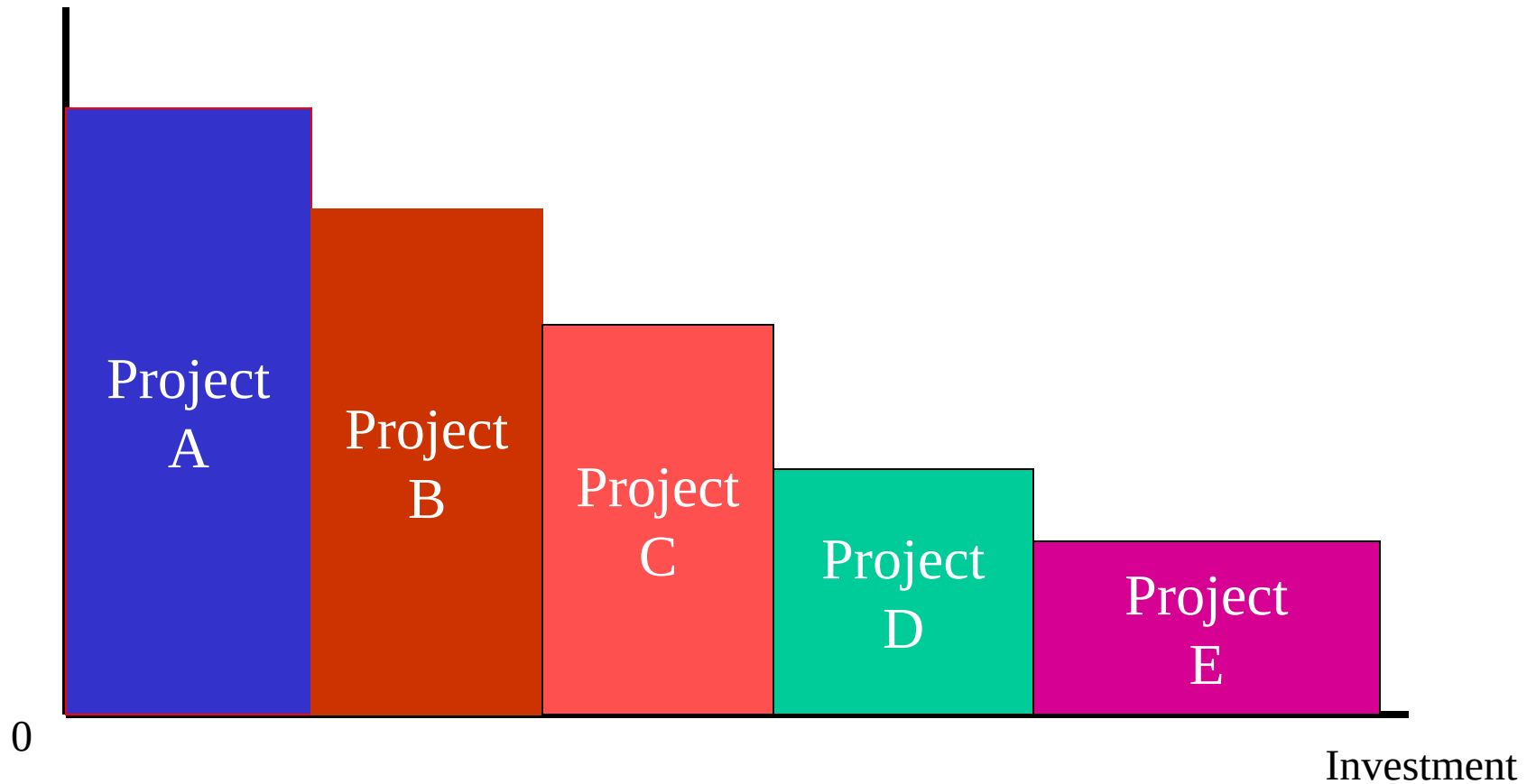
The Saving Function



The Investment Opportunity

Expected Investment return

Expected rate
of return (%)

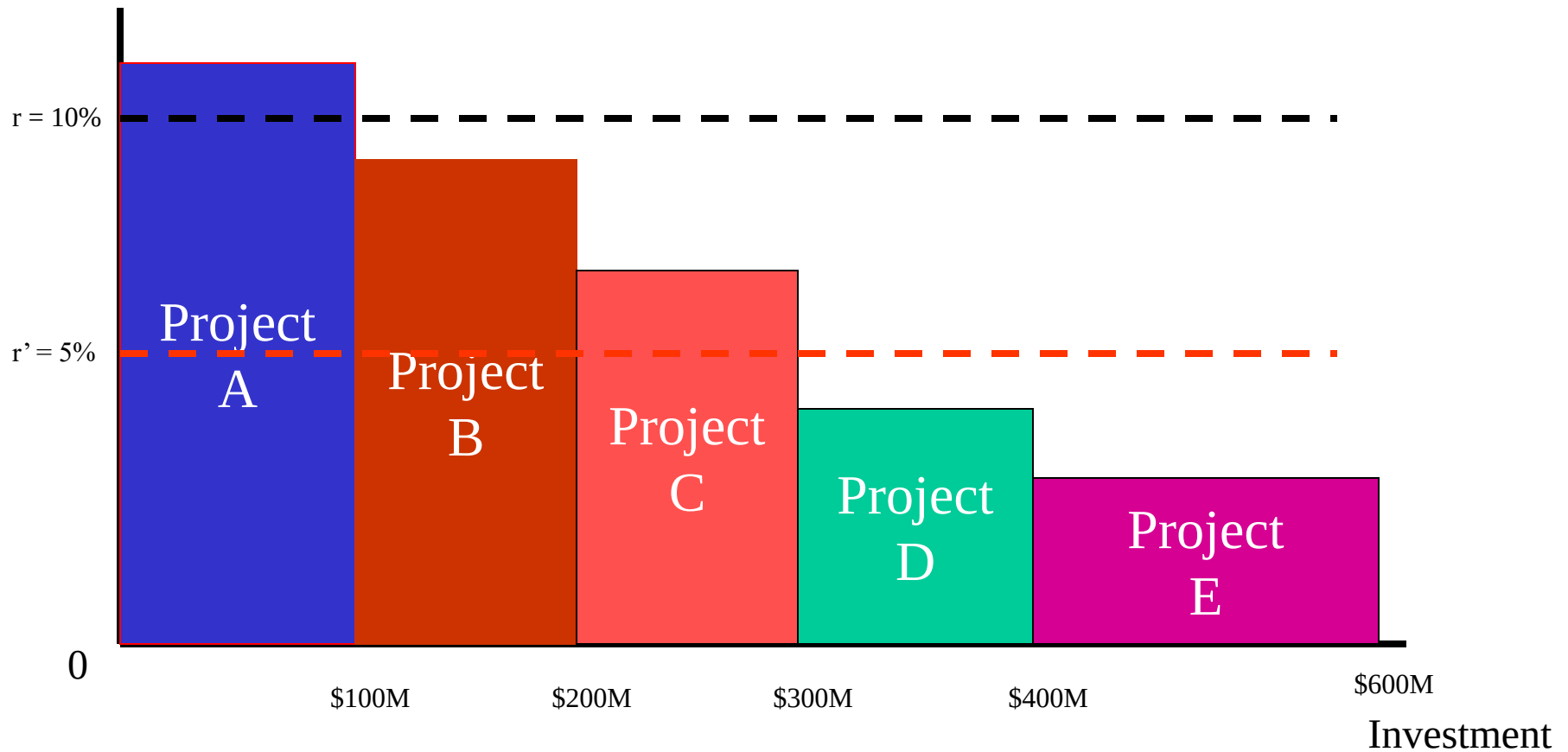


Expected Investment return

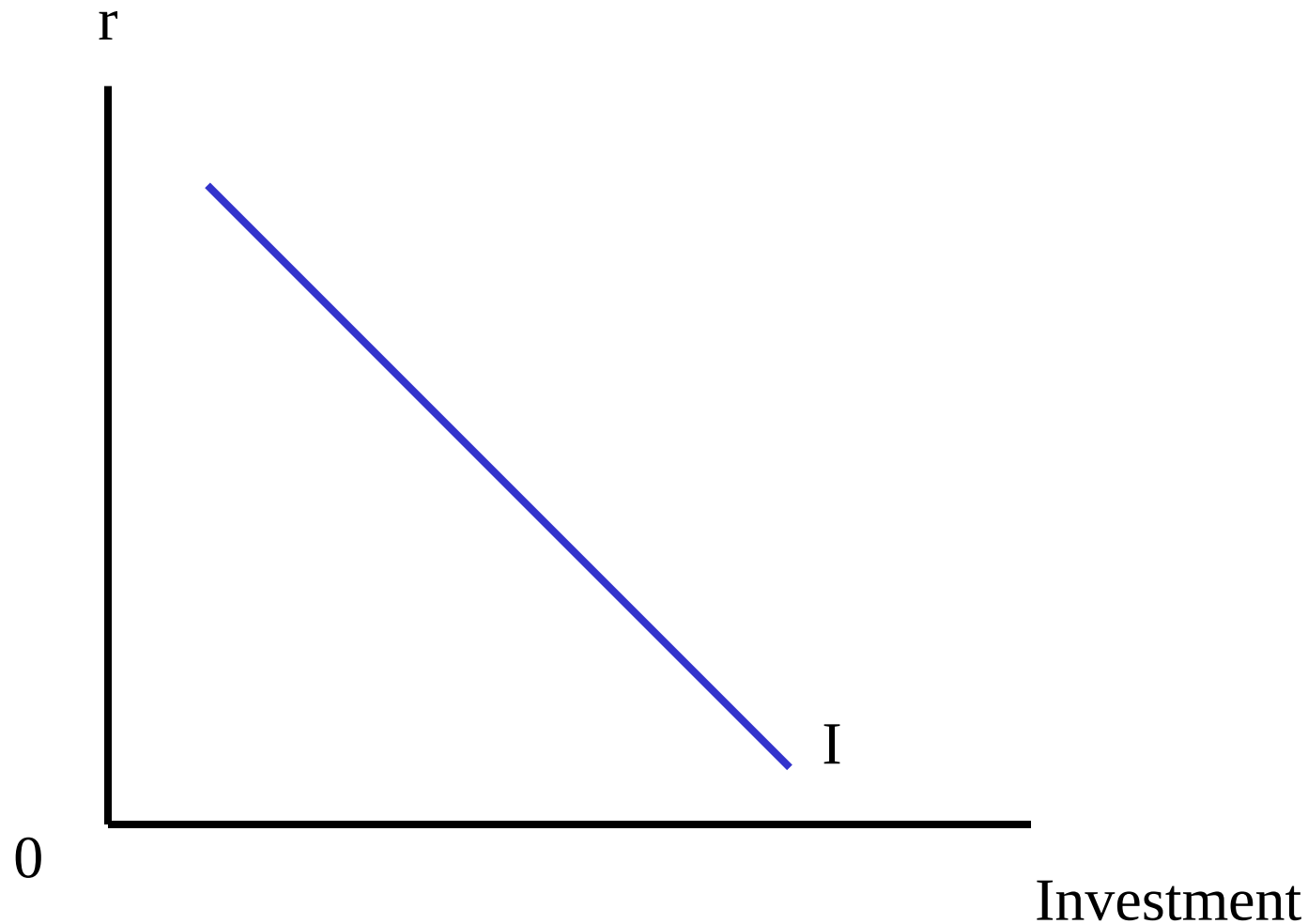
Expected rat of return

Market interest rate

(%)



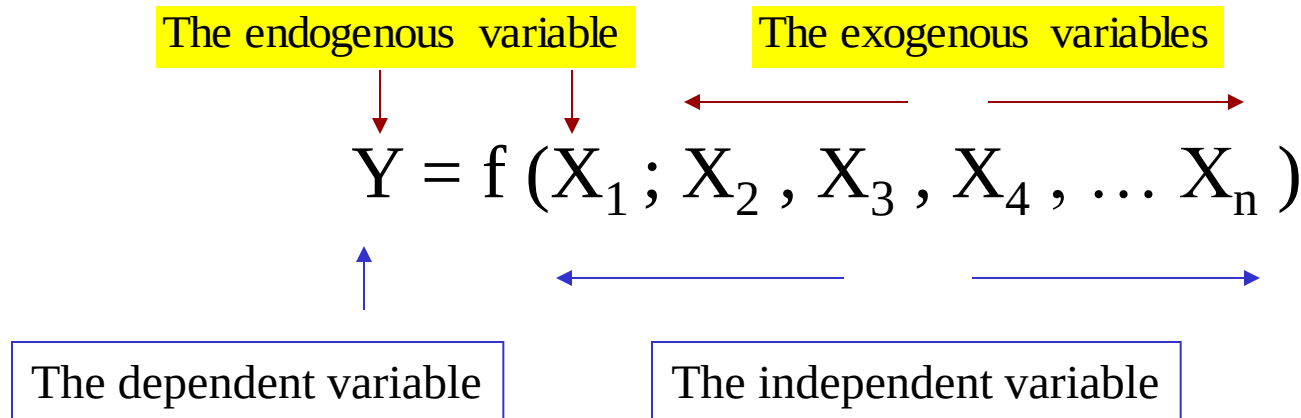
The Investment Function



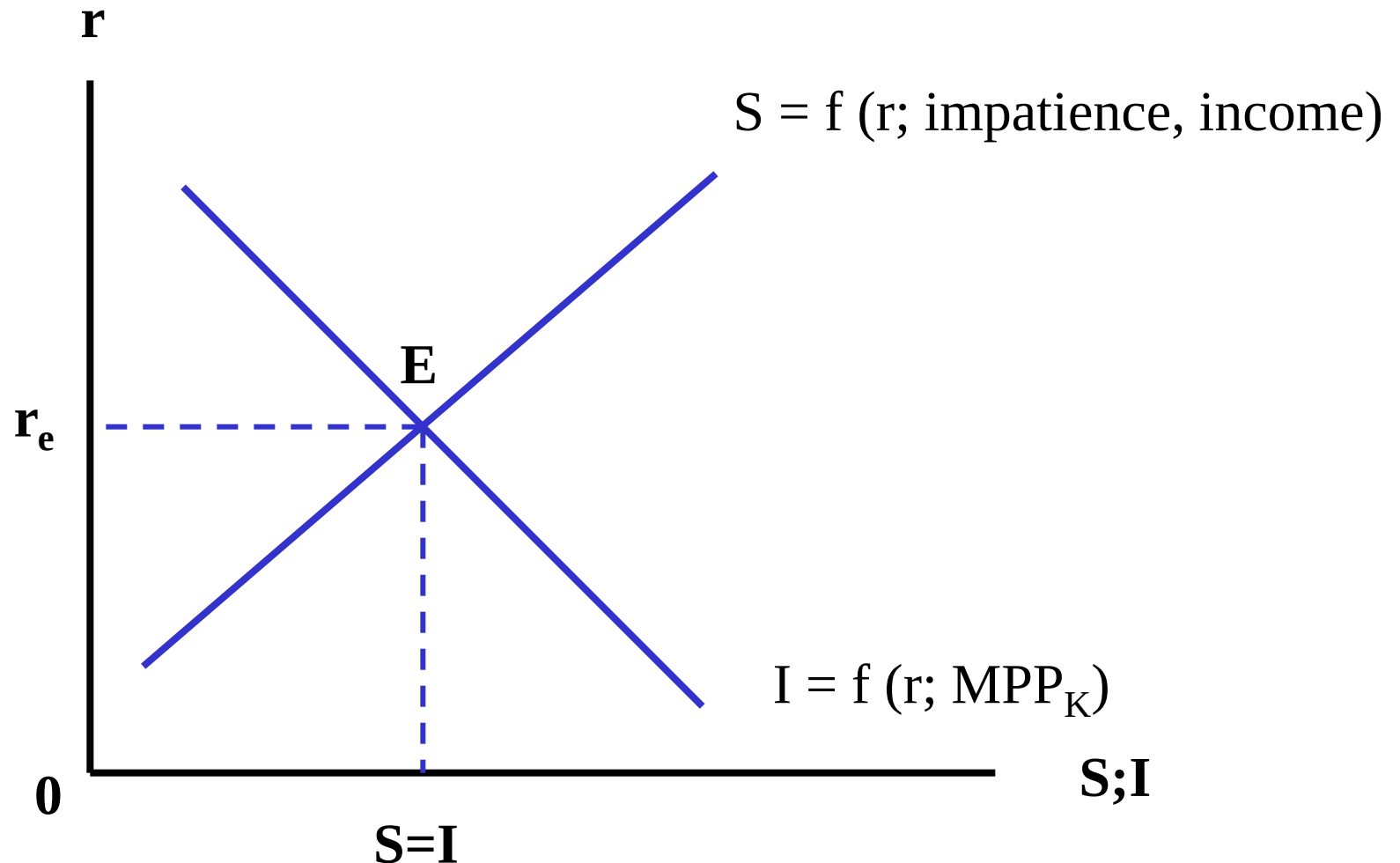
Theory of Interest Rate Determination

Endogenous and exogenous variables

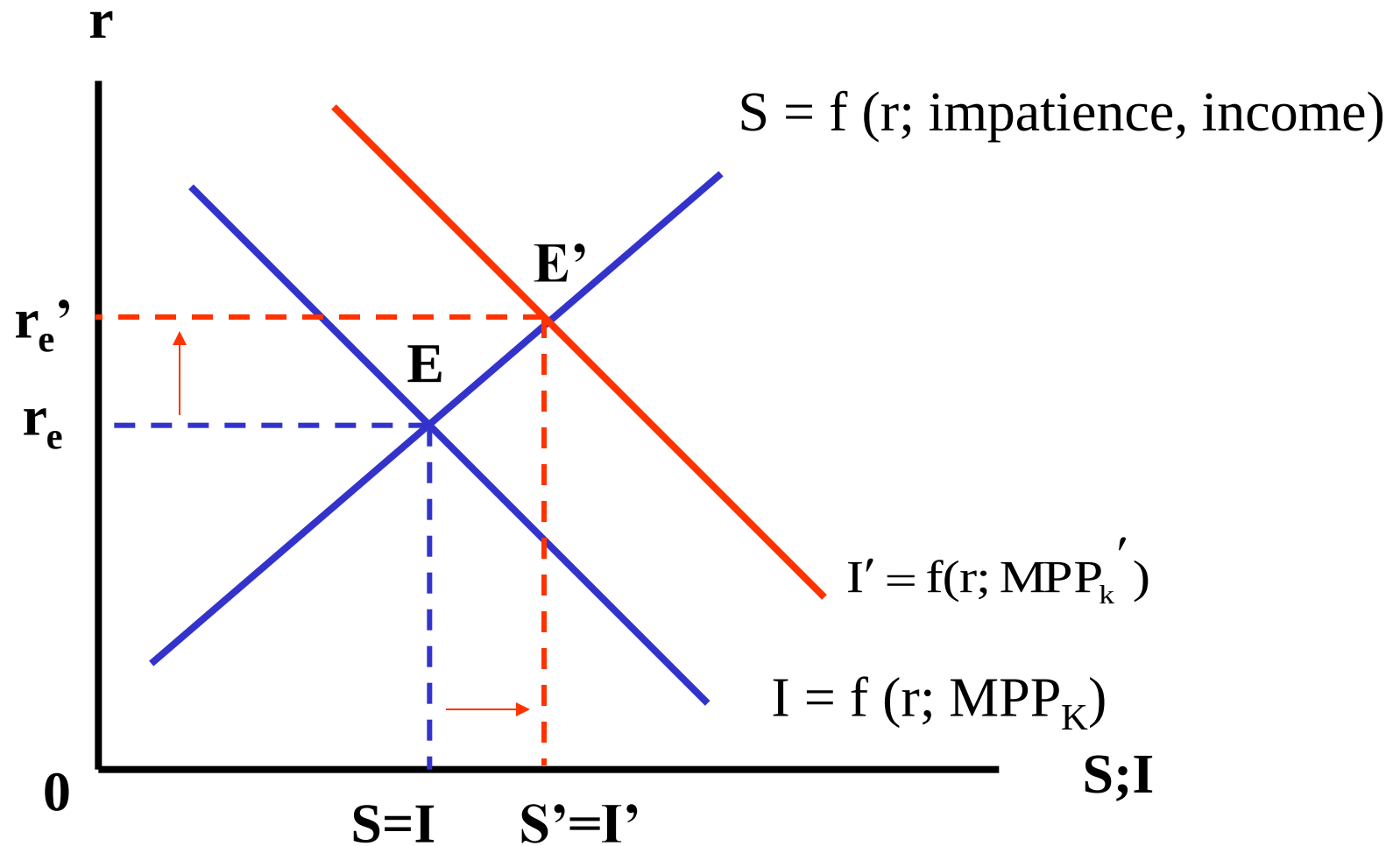
- An endogenous variable is a variable whose value is determined by forces within the model.
- An exogenous variable is a variable whose value is determined by forces outside the model, it always be an independent variable. (A change in an exogenous variable is classified as an autonomous change.)



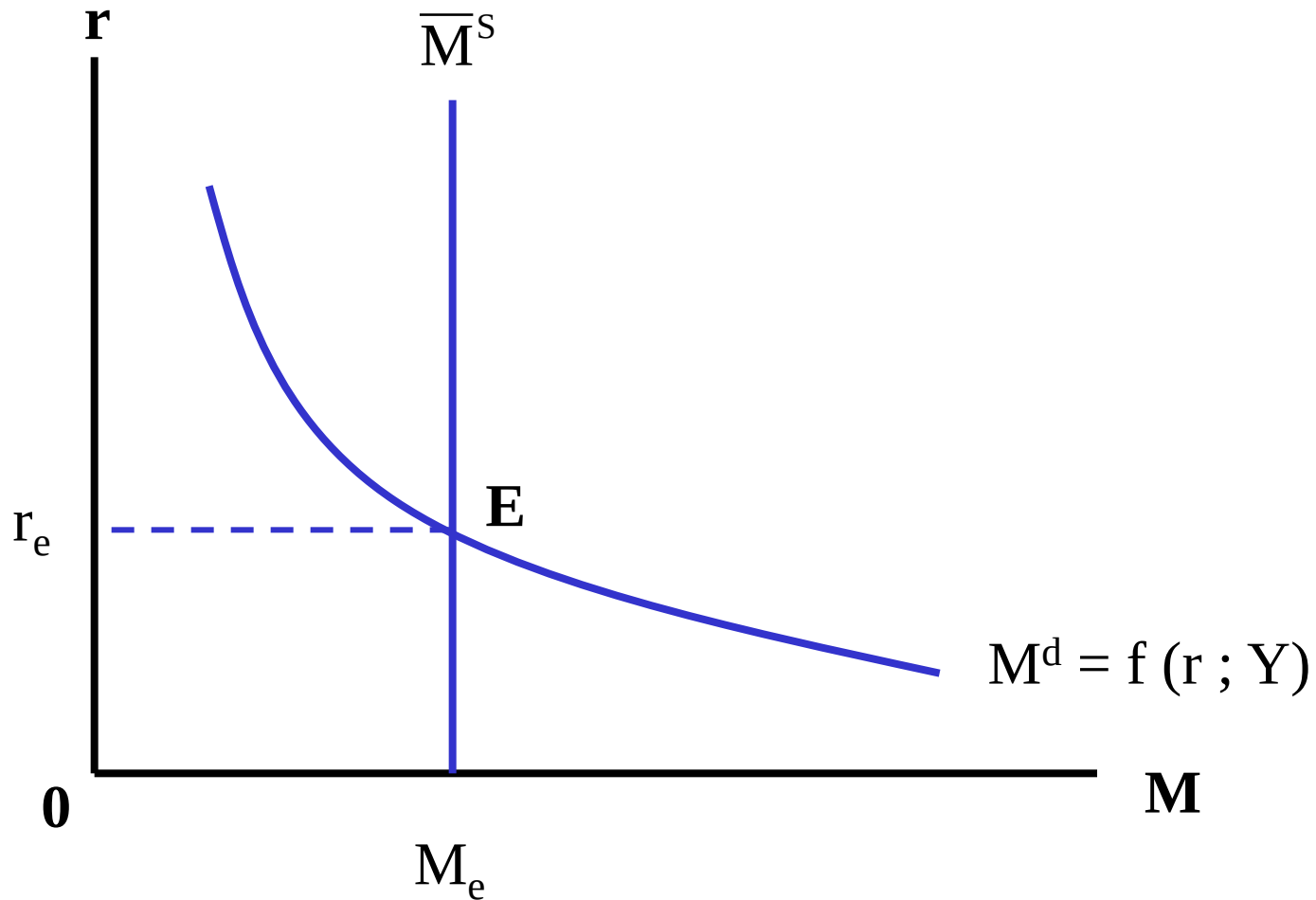
Classical Model of Real Interest Rate



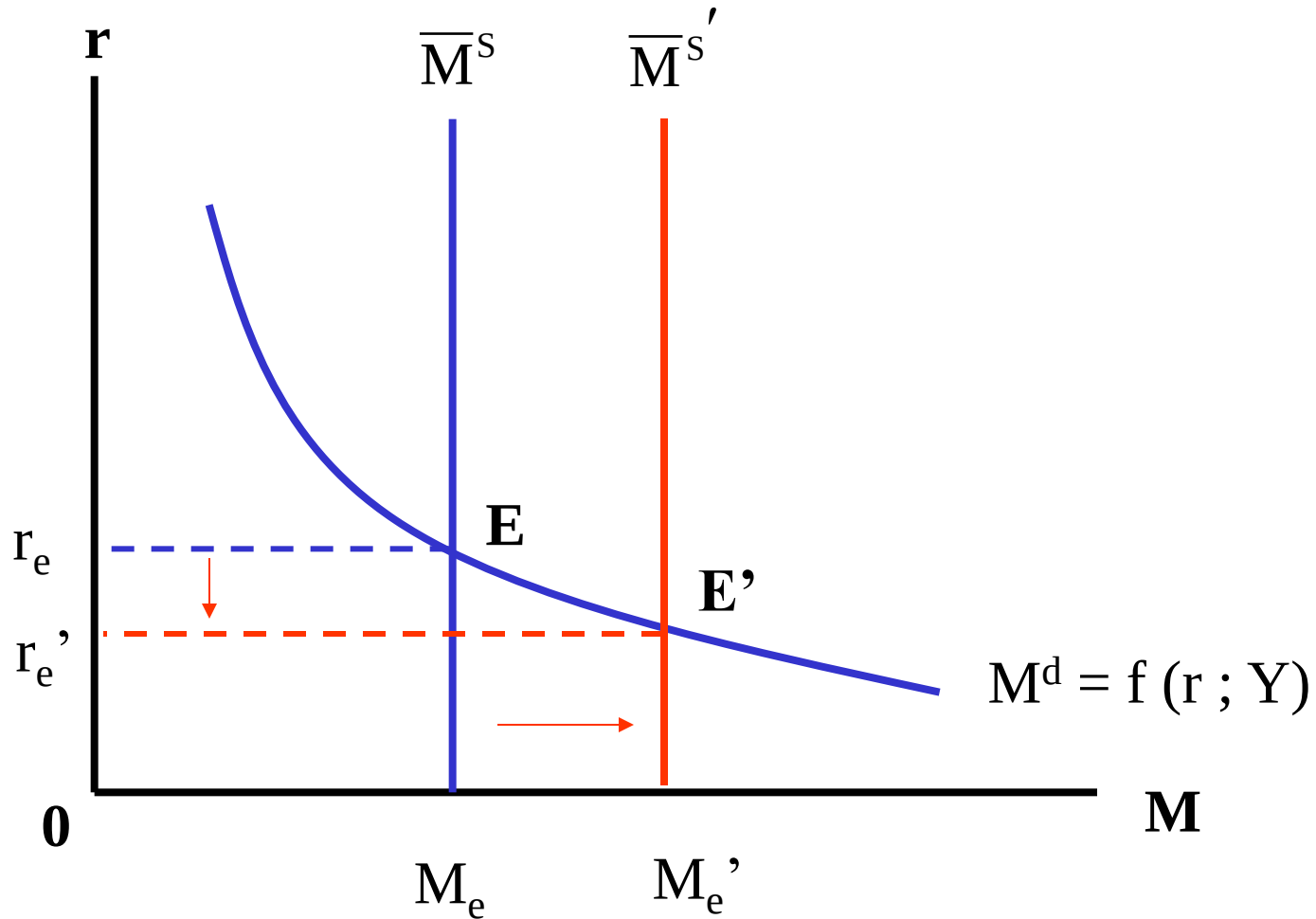
Classical Model of Real Interest Rate: An increase in productivity



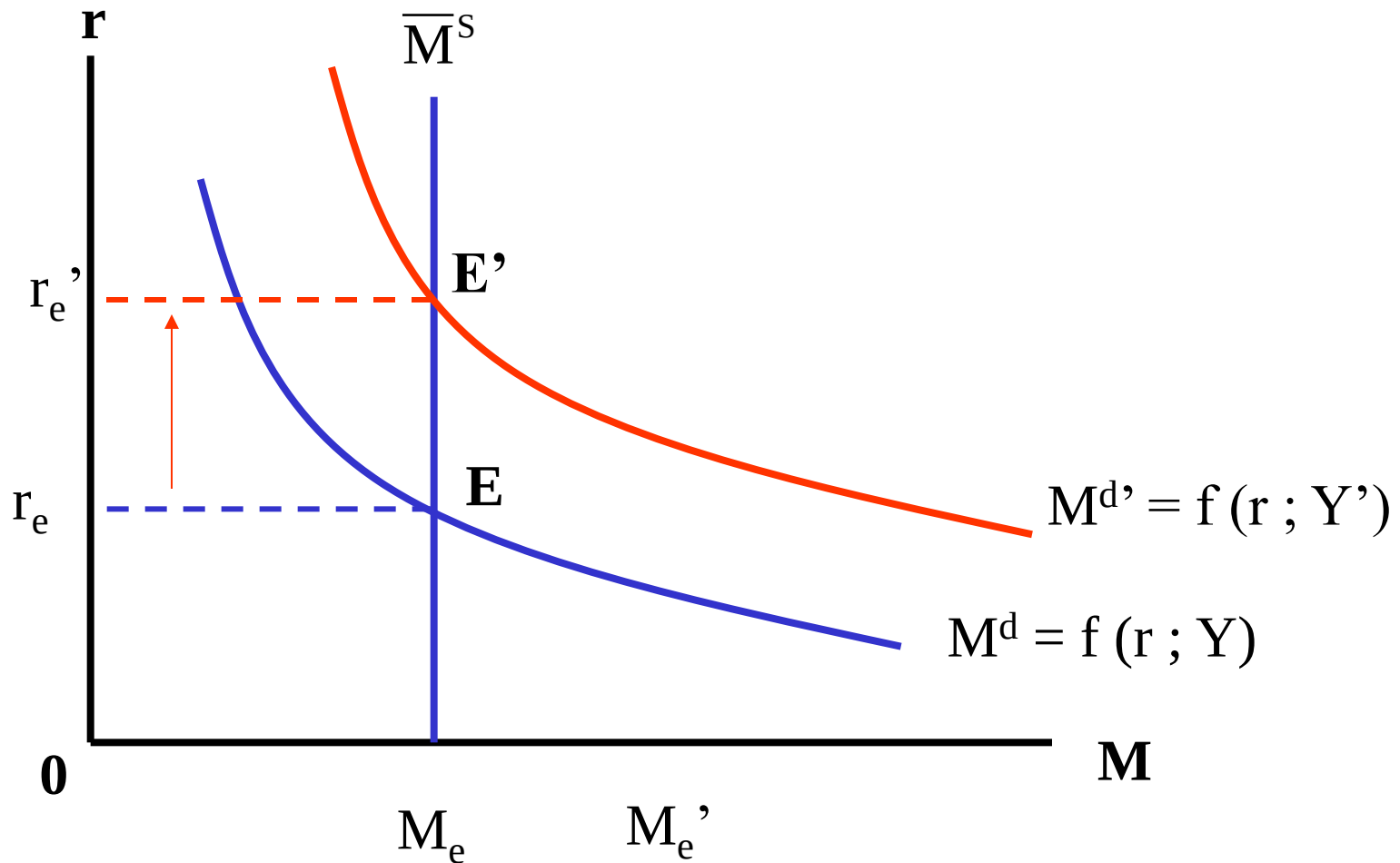
Keynesian Money Market Model



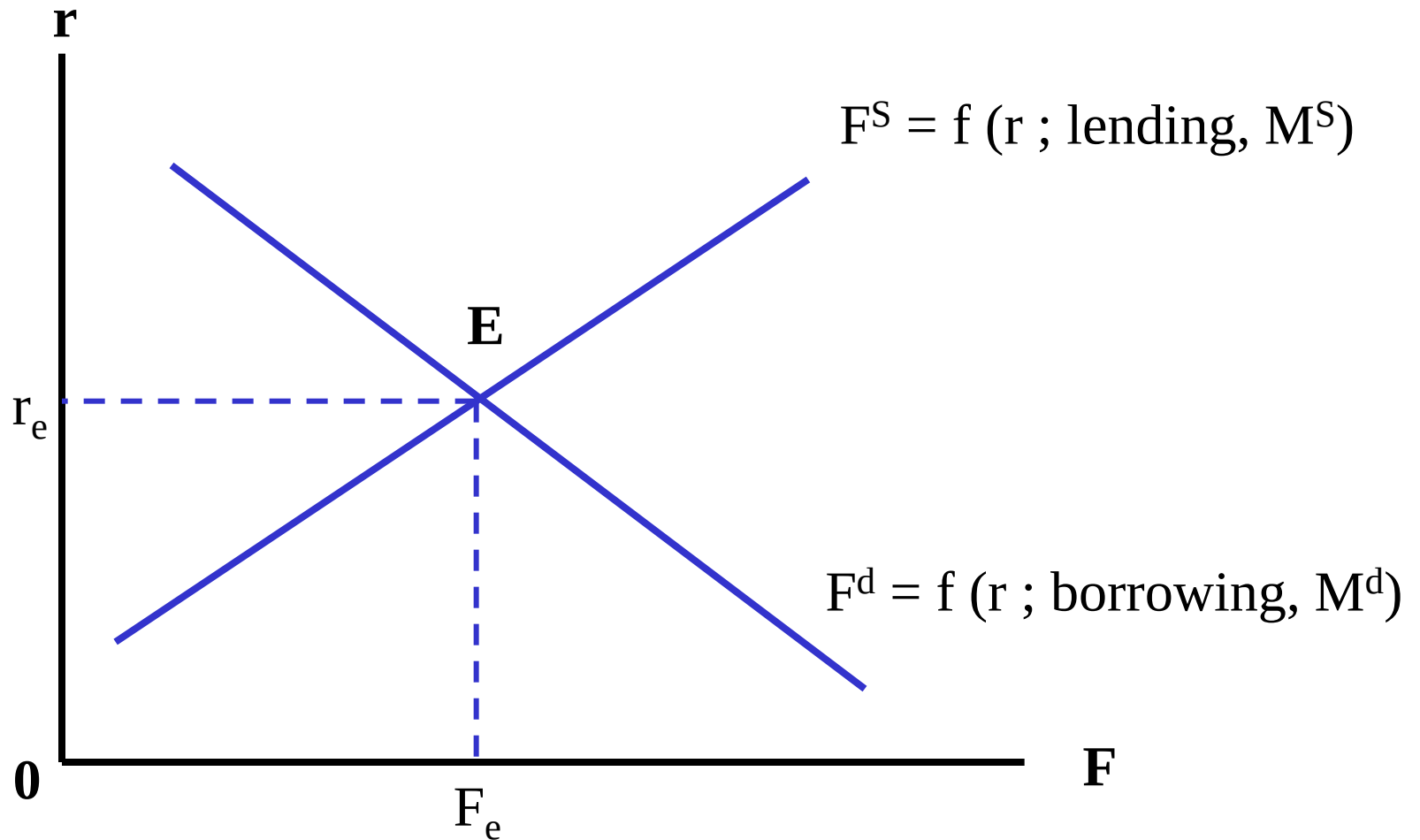
Keynesian Money Market Model: An increase in money supply by the central bank



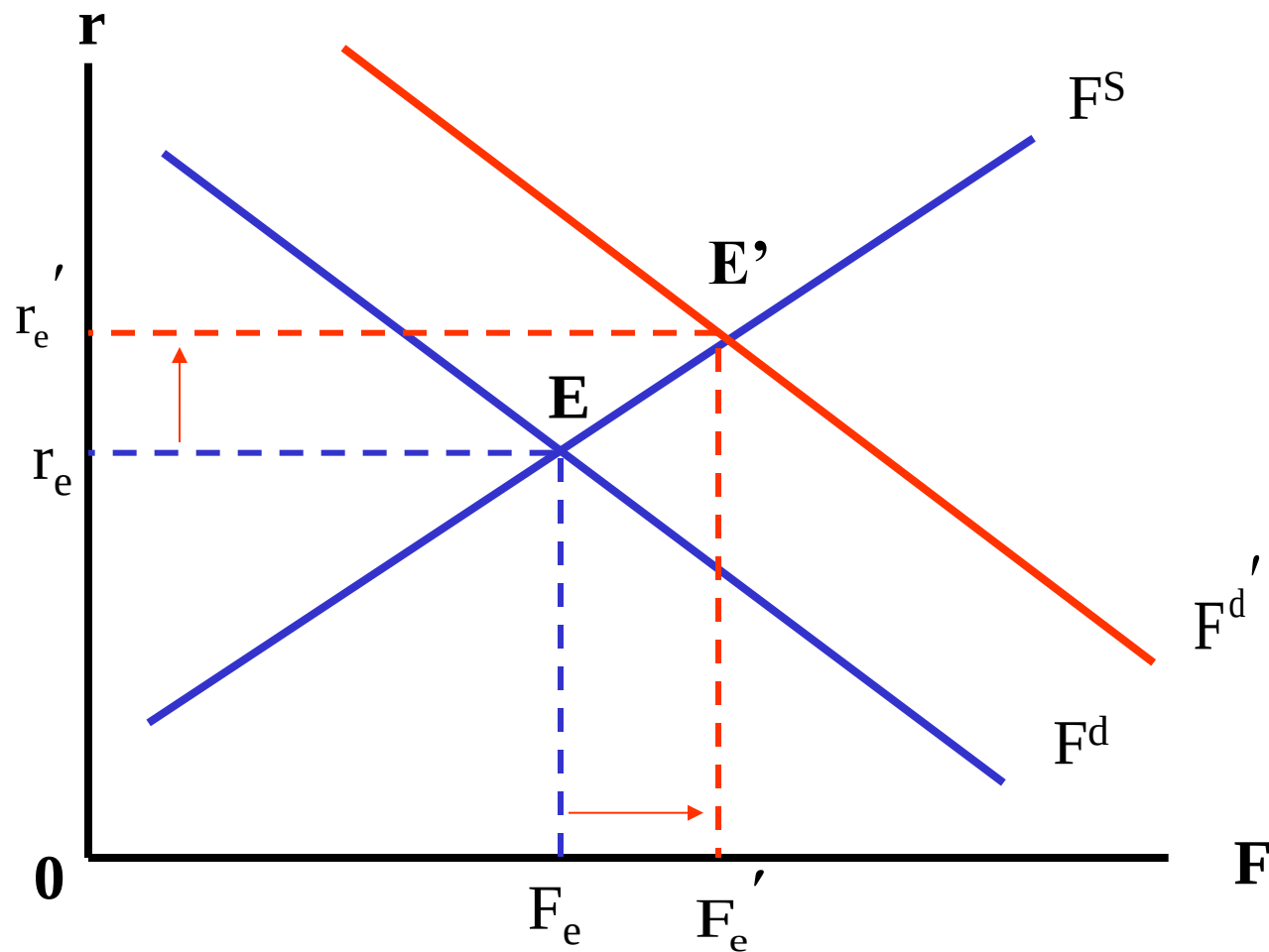
Keynesian Money Market Model: An increase in money demand resulting from a higher income level



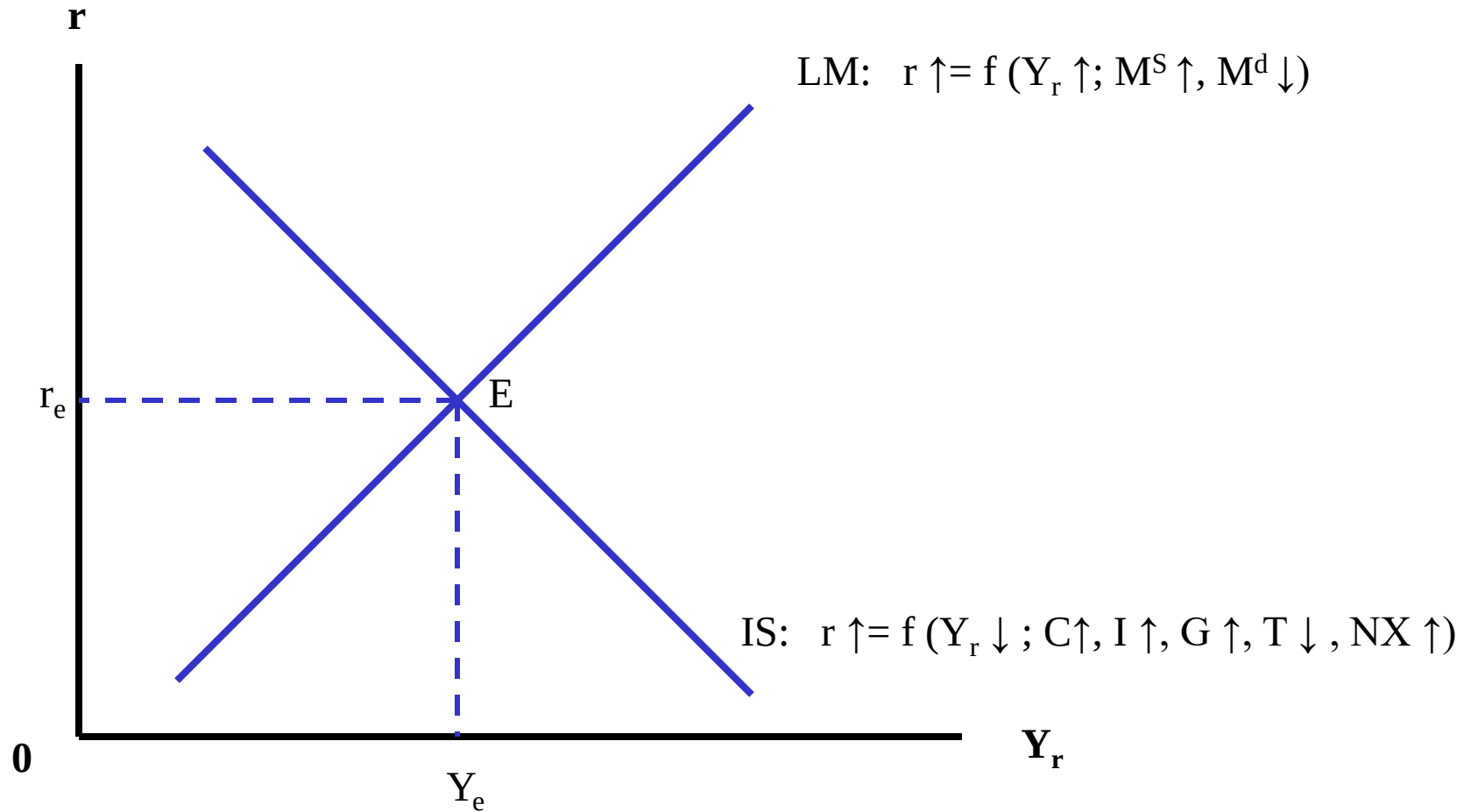
The Loanable Fund Model



The effect of a government bond issue on the level of market interest rates

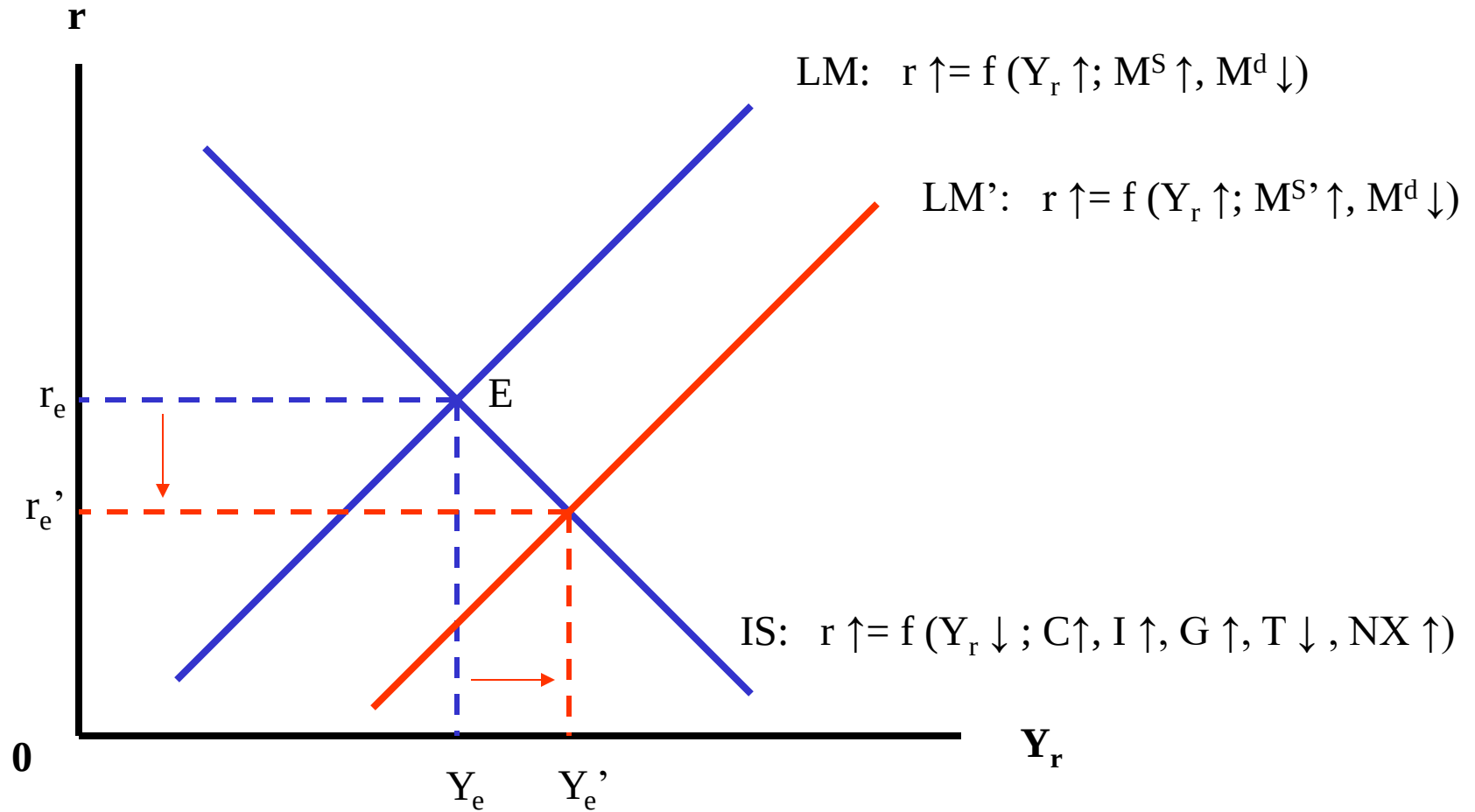


The Hicksian IS/LM Model



Hicks: Under full employment situations, we shall not attempt to use the IS/LM analysis.

The Hicksian IS/LM Model: An increase in money supply



Nominal versus real Interest Rates

Definition

The Fisher Equation of Interest:

$$\begin{array}{|c|} \hline \text{Nominal} \\ \text{interest rate} \\ \hline (r) \\ \hline \end{array} = \begin{array}{|c|} \hline \text{Real} \\ \text{interest rate} \\ \hline (r_r) \\ \hline \end{array} + \begin{array}{|c|} \hline \text{Expected} \\ \text{inflation rate} \\ \hline (\pi^e) \\ \hline \end{array}$$

Example: If both the borrower and lender to a loan (Maturity = one year, Principal = HK\$100, and interest rate = 10%) expect that inflation rate will be 10%. At the end of the interest period, in addition to repaying the principal of \$100 and paying the \$10 interest, the borrower must pay \$10 to compensate for the loss of purchasing power of the principal by 10%.

The real bank interest rates in Hong Kong

Bank deposits

Time period	Interest rate	Expected inflation rate	Real interest rate
1 Jan 2023 to 31 Dec 2023	3%	4%	-1%

Loss: The creditors (Savers: deposited their savings with Banks) who want to earn interest.

Benefit: The debtors (Banks: received deposits from savers to pay interest) who need to pay interest.

Bank loans

Time period	Residential mortgage interest rate	Expected inflation rate	Real interest rate
1 Jan 2024 to 31 Dec 2024	4%	3%	1%

Loss: The creditors (Banks: lent money to their clients) who want to earn interest.

Benefit: The debtors (Borrowers: borrower money from banks) who need to pay interest.

Thank you
for your attention!