Chapter 1
Intertemporal Trade and the Current Account Balance

The basic small economy model

- Assume a small open economy, with a representative consumer living for two periods, which is the same life-span of the economy.
- Assume there is only one good, tradable, and that there is no investment in physical capital,

The basic small economy model: Consumer problem

- An individual i maximizes lifetime utility $U_1{}^i$, which depends on period consumption levels, denoted c^i:

  $$U_1{}^i = u(c_1{}^i) + \beta u(c_2{}^i), \text{ with } 0 < \beta < 1$$

  β = subjective time preference discount factor

  $u(c^i)$ is strictly increasing in consumption and concave: $u'(c^i) > 0$ and $u''(c^i) < 0$. Moreover

  $$\lim_{c \to 0} u'(c^i) = \infty$$

- Let y^i denote the individual's output. The individual can freely borrow or lend in international market at the constant world interest rate r. Let s^i his net lending (saving) in period 1

The basic small economy model Consumer problem

$$c_1{}^i = y_1{}^i - s^i$$

$$c_2{}^i = y_2{}^i + s^i(1+r)$$

from which, eliminating s^i, we can derive the intertemporal or lifetime budget constraint (IBC)

$$c_1{}^i + \frac{c_2{}^i}{1+r} = y_1{}^i + \frac{y_2{}^i}{1+r}$$

The present value of consumption at the beginning of period 1 is equal to the present value of the individual's output that its his wealth.

- Substitute $c_2{}^i$ from the IBC into the objective function and obtain an unconstrain problem in $c_1{}^i$

The basic small economy model Consumer problem

$$\max_{c_1{}^i} u(c_1{}^i) + \beta u\left[(1+r)(y_1{}^i - c_1{}^i) + y_2{}^i\right]$$

f.o.c. $u'(c_1{}^i) = (1+r)\beta u'(c_2{}^i)$

intertemporal Euler equation

- Interpretation: $\dfrac{\beta u'(c_2{}^i)}{u'(c_1{}^i)} = \dfrac{1}{1+r}$
  - LHS= marginal rate of substitution between present and future consumption, RHS= price of future consumption in terms of present consumption. In equilibrium, the marginal rate of substitution equals the relative price.

The basic small economy model: Consumer problem

- Special case: stationary consumption: $c_1{}^i = c_2{}^i = \bar{c}^i$
  - This occurs when $(1+r)\beta = 1$, i.e. when the subjective discount factor equals the market discount factor:

$$\bar{c}^i = \frac{(1+r)y_1{}^i + y_2{}^i}{2+r}$$

The basic small economy model Equilibrium current account

- We assume that all individuals in the economy are identical and that population size is 1, So we can drop the individual superscript *i* and we can identify per capita quantity variables with national aggregates quantities, which we denote by uppercase.
- The current account balance is the change in a country's net claims on the rest of the world (change in net foreign assets).
- Alternatively, the current account balance can be defined as net exports of a country (of good and services)

The basic small economy model
Equilibrium current account

- Because international borrowing and lending is possible, there is no reason for an open economy's consumption to be closely tied to its current output, Provided that all loans are repaid with interest, the economy's intertemporal budget constraint: $C_1 + \frac{C_2}{1+r} = Y_1 + \frac{Y_2}{1+r}$ is respected. We do not have to balance consumption and output in each period: $C_1 = Y_1$ and $C_2 = Y_2$. The consumption path is independent of the output path.
- Assume that the initial stock of net foreign assets is zero: $B_1 = 0$. Also, in a 2 periods economy, the end of second period foreign assets must be zero: $B_3 = 0$

The basic small economy model Equilibrium current account

- First period current account:

$$CA_1 = Y_1 + rB_1 - C_1 = B_2 - B_1 = B_2$$

- Second period current account:

$$CA_2 = Y_2 + rB_2 - C_2 = Y_2 + r(Y_1 - C_1) - C_2 = B_3 - B_2 = -(Y_1 - C_1) = -B_2 = -CA_1$$

where the third equality follows from the IBC,

The basic small economy model: Equilibrium current account

- Graphical analysis,
  - From IBC: $C_2 = Y_2 - (1+r)(C_1 - Y_1)$
  - In the C_1, C_2 plane, the budget line has slope $-(1+r)$

- The slope of the indifference curves are obtained by total differentiation of $U_1 = u(C_1) + \beta u(C_2)$ for constant value of total utility: $0 = u'(C_1)dC_1 + \beta u'(C_2)dC_2$
  - Therefore the slope of the indifference curves is:

$$\frac{dC_2}{dC_1} = -\frac{u'(C_1)}{\beta u'(C_2)}$$

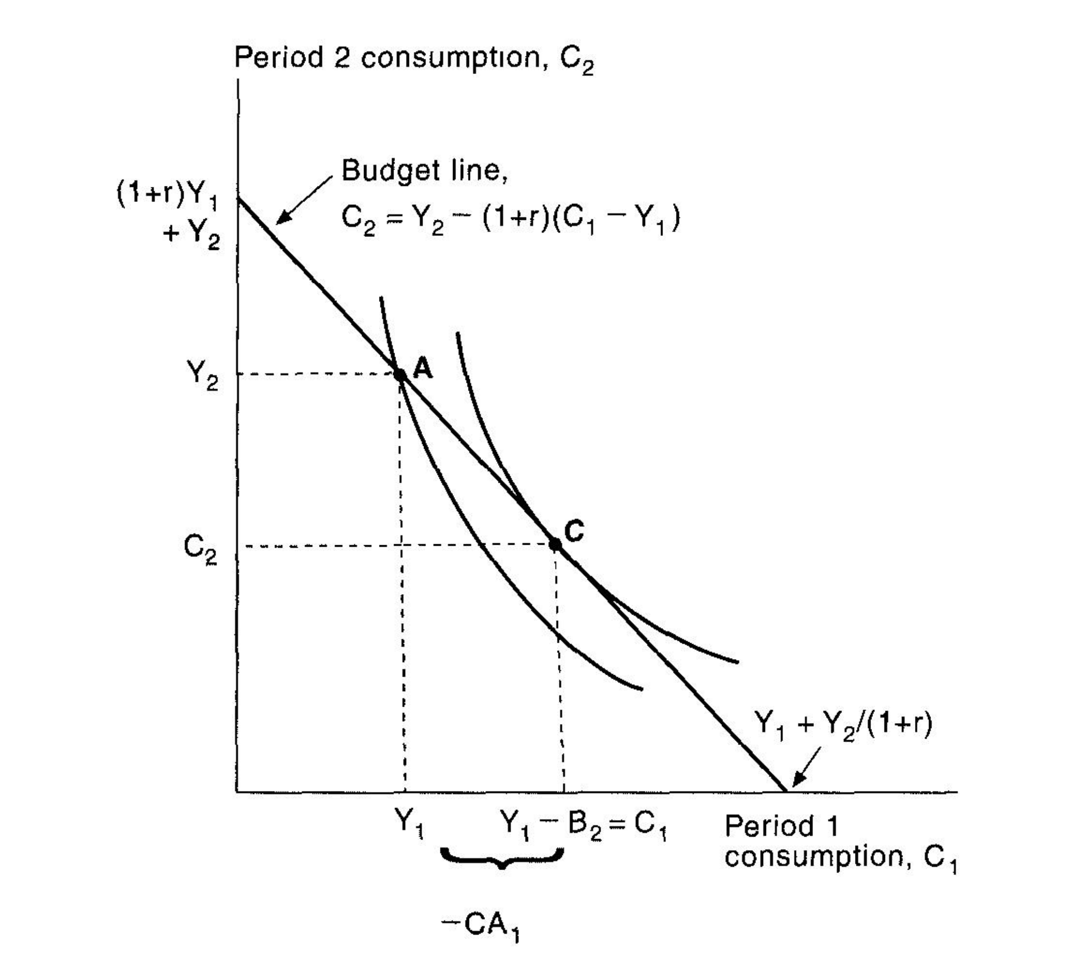
The basic small economy model: Equilibrium current account

- The optimal choice of (C_1, C_2) occurs when the indifference curve is tangent to the budget line, and this implies that the slope of the budget line equals the slope of the indifference curve at the optimum:

$$-\frac{u'(C_1)}{\beta u'(C_2)} = -(1+r), \text{ hence } \frac{u'(C_1)}{\beta u'(C_2)} = (1+r)$$

  - which is the Euler equation

The basic small economy model Equilibrium current account



The basic small economy model Equilibrium current account

- In the figure, one can easily compute the equilibrium current account balance in period 1: $CA_1 = Y_1 - C_1$, with consumption corresponding to point *C*. As $C_1 > Y_1$, there is a current account deficit in the first period and an equivalent current account surplus in period 2.
- We can see that the country clearly does better running an unbalanced current account in both periods than it would if forced to set $C_1 = Y_1$ and $C_2 = Y_2$ (the autarky point *A*), The utility gain between points *A* and *C* illustrates the general and classic insight that countries gain from trade,

The basic small economy model Equilibrium current account

- In the figure, the autarky point, where $C_1 = Y_1$ and $C_2 = Y_2$ and $CA_1 = CA_2 = 0$, is denoted by *A*.
  - At point *A*, the only world interest rate consistent with the Euler equation would be r_A, such that

$$\frac{u'(Y_1)}{\beta u'(Y_2)} = 1 + r^A$$

- When $r^A > r$, the country has a current account deficit.
  - Explanation similar to comparative advantage, whereby a country imports those goods whose relative price is higher in autarky. Higher interest rate means that the relative price of future vs. present consumption is low in autarky. Thus present consumption is "imported" through a current account deficit,

The basic small economy model: Equilibrium current account

- Another interpretation is that as the world rate is below the autarky rate, the country has an incentive to borrow from abroad.

Temporary versus permanent output changes

- A natural benchmark to investigate the effects of output changes, is the stationary equilibrium where $(1+r)\beta = 1$ implies that $C_1 = C_2 = \overline{C}$.
  - We defined the autarky interest r^A rate by: $\frac{u'(Y_1)}{\beta u'(Y_2)} = 1 + r^A$,
  - Then, we have: $\frac{u'(Y_2)}{u'(Y_1)} = \frac{1+r}{1+r^A}$
- Imagine an economy that initially expects its output to be constant over time. The economy will plan on a balanced current account.
  - Then the autarky interest rate is equal to the world interest rate: $r^A = r$.

Temporary versus permanent output changes

- Suppose Y_1 increases (temporary shock).
  - Then the autarky interest rate becomes smaller than the world interest rate: $r^A < r$.
  - Thus, there will be a current account surplus in period 1: people smooth their consumption by lending some of their temporarily high output to foreigners.
- Suppose that Y_1 and Y_2 increase by the same amount (permanent shock).
  - Then the autarky interest rate does not change and there is no current account imbalance.
  - Consumption remains constant through time as people simply consume their higher output in both periods.

Temporary versus permanent output changes

- Permanent changes in output do not affect the current account when $(1+r)\beta = 1$, whereas temporary changes do, temporary increases causing surpluses and temporary declines producing deficits,
- Likewise, a change in future expected output affects the sign of the current account in the same qualitative manner as an opposite movement in current input.

Government consumption

- G_1 and G_2 represent the government consumption in both periods.
  - We assume that the government budget is balanced in each period: thus government expenditure equals taxes,
  - Then, the consumer income in both periods is $Y_1 - G_1$ and $Y_2 - G_2$.
- The consumers IBC is $C_1 + \frac{C_2}{1+r} = Y_1 - G_1 + \frac{Y_2 - G_2}{1+r}$.
- The current account identity becomes:

$$CA_1 = B_2 - B_1 = Y_1 - C_1 - G_1$$

- The Euler equation is the same (G is not chosen by the consumers).

Government consumption

- A natural benchmark to investigate the effects of government consumption, is the stationary equilibrium ($C_1 = C_2 = \overline{C}$) where $(1+r)\beta = 1$. We also assume that output is the same in both periods: $Y_1 = Y_2 = \overline{Y}$.
- Let's look first at: $G_1 > 0,\ G_2 = 0$.
  - We deduce from the IBC: $\overline{C} = \frac{(1+r)(\overline{Y} - G_1) + \overline{Y}}{2+r}$
- The current account in the first period becomes:

$$CA_1 = \overline{Y} - \overline{C} - G_1 = \frac{(1+r)\overline{Y} - (1+r)(\overline{Y} - G_1) + \overline{Y}}{2+r} = \frac{-G_1}{2+r} < 0$$

  - The country will run a deficit in period 1 and a surplus in period 2.

Government consumption

- Now assume $G_1 = G_2 = \overline{G}$.
  - We deduce from the IBC: $\overline{C} = \frac{(1+r)(\overline{Y} - \overline{G}) + (\overline{Y} - \overline{G})}{2+r} = \overline{Y} - \overline{G}$
  - The current account in the first period becomes:

$$CA_1 = \overline{Y} - \overline{C} - \overline{G} = \overline{Y} - (\overline{Y} - \overline{G}) - \overline{G} = 0$$

- Government consumption affects the current account only to the extent that it tilts the path of consumers income.

Investment

- Output is produced with a standard production function

$$Y_t = A_t F(K_t), \text{ with } t = 1,2$$

$$F'(K) > 0, \quad F''(K) < 0$$

  - K_t is the stock of capital at the beginning of period t
  - K_1 is a legacy from the past and is assumed to be given (exogenous)
  - The capital stock at the beginning of period 2 increases with investment in period 1: $K_2 = K_1 + I_1$ (assuming no depreciation)
  - The capital stock at the end of period 2, K_3 has to be equal to zero: $0 = K_3 = K_2 + I_2$. Thus: $I_2 = -K_2$

Investment

- Savings is equal to the change in domestic wealth, and the difference between income and consumption. In period 1 we have:

$$S_1 = (B_2 + K_2) - (B_1 + K_1) = Y_1 + rB_1 - C_1$$

  - As $B_1 = 0$ and $K_2 = K_1 + I_1$, we have:

$$S_1 = B_2 + I_1 = Y_1 - C_1 \text{ or}$$
$$B_2 = Y_1 - C_1 - I_1 = S_1 - I_1$$

  - The current account is:

$$CA_1 = B_2 - B_1 = B_2 = S_1 - I_1$$

Investment

- Savings in period 2 is:

$$S_2 = (B_3 + K_3) - (B_2 + K_2) = Y_2 + rB_2 - C_2$$

  - As $B_3 = K_3 = 0$ and $K_2 =- I_2$ we have:

$$S_2 =- (B_2 - I_2) = Y_2 + rB_2 - C_2 \text{ or}$$

$$-(1 + r)B_2 = Y_2 - C_2 - I_2$$

- We substitute the expression of B_2 given by the first period budget equilibrium in the second period budget equilibrium and get the IBC :

$$C_1 + I_1 + \frac{C_2 + I_2}{1 + r} = Y_1 + \frac{Y_2}{1 + r}$$

Investment

- With $I_2 =- K_2 =- K_1 - I_1,\ Y_1 = A_1F(K_1)$ and $Y_2 = A_2F(K_2) = A_2F(K_1 + I_1)$, we deduce from the IBC the following expression of the consumption in the second period:

$$C_2 = (1+r)[A_1F(K_1) - C_1 - I_1] + A_2F(K_1 + I_1) + K_1 + I_1$$

- We substitute this expression in the consumers utility function $U_1 = u(C_1) + \beta u(C_2)$. The maximisation in C_1 gives the foc that is the Euler equation:

$$u'(C_1) = \beta(1+r)u'\{(1+r)[A_1F(K_1) - C_1 - I_1] + A_2F(K_1 + I_1) + K_1 + I_1\} = \beta(1+r)u'(C_2)$$

Investment

- We also have the equality of the return on capital to the world interest rate (capital and foreign assets must have the same return-arbitrage relation):

$$A_2 F'(K_1 + I_1) = r$$

  - This equation implies that the desired capital stock is independent on consumers preferences! A less patient country, one with a lower value of β, does not wish to invest less, if it has access to perfect capital markets. A country that can borrow abroad at the interest rate r never wishes to pass up investment opportunities that offer a net rate of return above r.

Investment

- Feldstein and Horioka (1980) have claimed that the previous results establishes that if international financial markets were perfect, national investment and national savings should be uncorrelated.
- The following table, taken from Vegh (2010), shows that saving and investment are highly correlated. Feldstein and Horioka conclude that capital mobility is limited at best.
- This interpretation is unconvincing. Extend our model to three periods and assume that productivity in periods 1 and 2 A_1 and A_2 increase, but that productivity in period 3, A_3, is unchanged. Then, investment in period 1 increases. Savings in period 1 also increases to spread the benefits of the temporary bonanza to period 3.

Investment

Table 2. Correlation between saving and investment for selected countries

Developing countries		Industrial Countries	
Argentina	0.70	Australia	0.89
Bolivia	0.11	Austria	0.62
Brazil	0.64	Belgium	0.86
Chile	0.71	Canada	0.63
Colombia	0.16	Denmark	0.07
Costa Rica	0.41	Finland	0.62
Ecuador	0.21	France	0.86
El Salvador	0.40	Germany	0.52
Honduras	0.44	Italy	0.68
Mexico	0.20	Japan	0.97
Paraguay	0.43	Netherlands	0.31
Peru	0.60	New Zealand	0.33
Turkey	0.79	Sweden	0.39
Uruguay	0.77	Switzerland	0.85
Venezuela	0.48	United States	0.58
Average	0.47	Average	0.61

Note: Based on annual data 1970-2007
Source: World Development Indicators 2010 (World Bank)

The saving function

- We continue with the previous model, We remind that saving in the first period is $S_1 = Y_1 - C_1 = A_1 F(K_1) - C_1$, and that K_1 is given (exogenous).
- We differentiate the Euler equation relatively to $C_1,\ \beta,\ A_1,\ A_2\ , I_1$ et r:

$$u''(C_1)dC_1$$
$$= \beta u'(C_2)dr + (1+r)\beta u'(C_2)d\beta$$
$$+ \beta(1+r)u''(C_2)\{(1+r)[F(K_1)dA_1 - dC_1 - dI_1]$$
$$+ [A_1 F(K_1) - C_1 - I_1]dr + [1 + A_2 F'(K_1 + I_1)]dI_1\}$$

As $A_2 F'(K_1 + I_1) = r$, the terms in dI_1 disappear and the equation becomes:

The saving function

$$u''(C_1)dC_1$$
$$= \beta u'(C_2)dr + (1+r)\beta u'(C_2)d\beta$$
$$+ \beta(1+r)u''(C_2)\{(1+r)[F(K_1)dA_1 - dC_1]$$
$$+ [A_1F(K_1) - C_1 - I_1]dr\}$$

- We deduce from this relation and from $S_1 = A_1F(K_1) - C_1$, the response of first period consumption and savings to a change in the world interest rate:

$$\frac{-dS_1}{dr} = \frac{dC_1}{dr} =$$

$$\frac{\beta u'(C_2)+\beta(1+r)u''(C_2)[A_1F(K_1) - C_1 - I_1]}{u''(C_1)+\beta(1+r)^2u''(C_2)} =$$

$$\frac{\beta u'(C_2) + \beta(1+r)u''(C_2)B_2}{u''(C_1) + \beta(1+r)^2u''(C_2)}$$

The saving function

- The sign of the effect of a rise in the interest rate on consumption and savings is in general ambiguous.
- Macroeconomists often assume that the utility function is isoelastic: $u(C) = \frac{C^{1-1/\sigma}}{1-1/\sigma}$, with $\sigma > 0$ denoted the intertemporal substitution elasticity (when $\sigma = 1$, we have: $u(C) = log(C)$).
  - Then, if we use the Euler equation: $u'(C_1) = (1+r)\beta u'(C_2)$ or $\left(\frac{C_2}{C_1}\right)^{\frac{1}{\sigma}-1} \frac{1}{\beta(1+r)} = 1$, we get: $\frac{-dS_1}{dr} = \frac{dC_1}{dr} = \frac{Y_1-C_1-I_1-\sigma C_2/(1+r)}{1+r+C_2/C_1} = \frac{B_2-\sigma C_2/(1+r)}{1+r+C_2/C_1}$

The saving function

- The numerator of $\frac{dC_1}{dr}$ has two terms, which are of opposite sign if the country is a first-period creditor, $Y_1 > C_1 + I_1$, or $B_2 > 0$.
  - A rise in the interest rate increases its income in the next period, this has a positive effect on its consumption, and a negative effect on its savings in the first period.
  - But if the interest rate is higher, the consumers can find in their advantage to consume less in the first period, and more in the second period that is to save more in the first period.
  - We will assume in the rest of the chapter that the economy is in the normal case where savings in the first period increases with the interest rate (that is we exclude the case when the country is a huge creditor on the rest of the world in the first period).

The saving function

- We remind that the current account in the first period is given by $CA_1 = S_1 - I_1$.
- Then, if the autarky interest rate is higher than the world interest rate, $r^A > r$, the opening of the economy induces a decrease in the interest rate, that is a decrease in savings and an increase in investment in the first period, Thus, a current account deficit emerges in the first period.
- We obtain the opposite result if the autarky interest rate is lower than the world interest rate, $r^A < r$.

A two-country model
The case of an endowment economy

- Until now we have focused on a country too small to affect the world interest rate, In the rest of chapter we show how the world interest rate is determined and depends on economic events in each country.
- We assume a world of two countries, called Home and Foreign, that receive exogenously determined endowments on date 1 and 2. Symbols pertaining to Foreign alone are marked by asterisks.
- Equilibrium in the world output market requires:

$$Y_t + {Y_t}^* = C_t + {C_t}^*, t = 1,2$$

A two-country model
The case of an endowment economy

- As $S_t = Y_t - C_t$ and $S_t{}^* = Y_t{}^* - C_t{}^*$, the equilibrium equation can be rewritten:

$$S_t + S_t{}^* = 0$$

- As there are only two markets (one for each period), we can concentrate o the equilibrium of one period, say period 1, because the other market (period 2), will necessarily be in equilibrium (Walras' law):

$$Y_1 + Y_1{}^* = C_1 + C_1{}^*$$

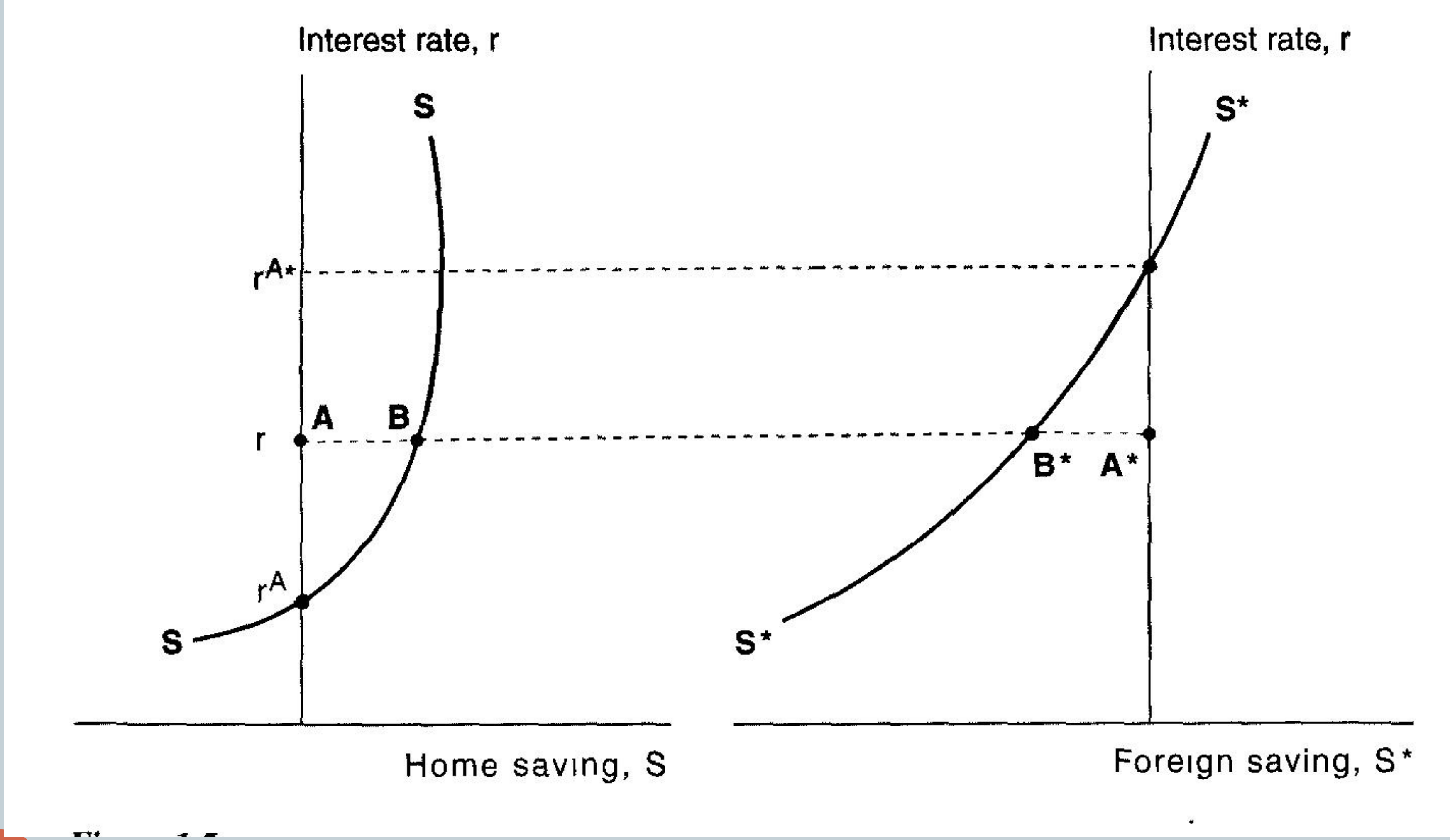
or, equivalently

$$S_1 + S_1{}^* = 0$$

A two-country model
The case of an endowment economy

- As, we saw before, savings in each country are function of the world interest rate. We assume to be in the normal case, where these functions are increasing.
- The figure represents the two functions $S_1(r)$ and $S_1{}^*(r)$.
- The autarky interest rates are given by $S_1(r^A) = 0$ and $S_1{}^*(r^{A*}) = 0$.
- With intertemporal trade the world interest rate is given by:
$$S_1(r) + S_1{}^*(r) = 0$$
  - On the figure we have $AB = B^*A^*$
  - The world interest rate is between the two autarky interest rates: $r^A < r < r^{A*}$

A two-country model
The case of an endowment economy



A two-country model The Metzler diagram

- We come back to the case where production depends on capital and investment, The two production functions are

$$Y = AF(K) \text{ and } Y^* = A^*F(K^*)$$

- The equality of the return on capital to the interest rate in each country gives:

$$A_2F'(K_1 + I_1) = r$$
$$A^*{}_2F'(K^*{}_1 + I^*{}_1) = r$$

- As $F''(K) < 0$, these two equations implicitly define the decreasing investment functions $I_1(r)$ and $I^*{}_1(r)$

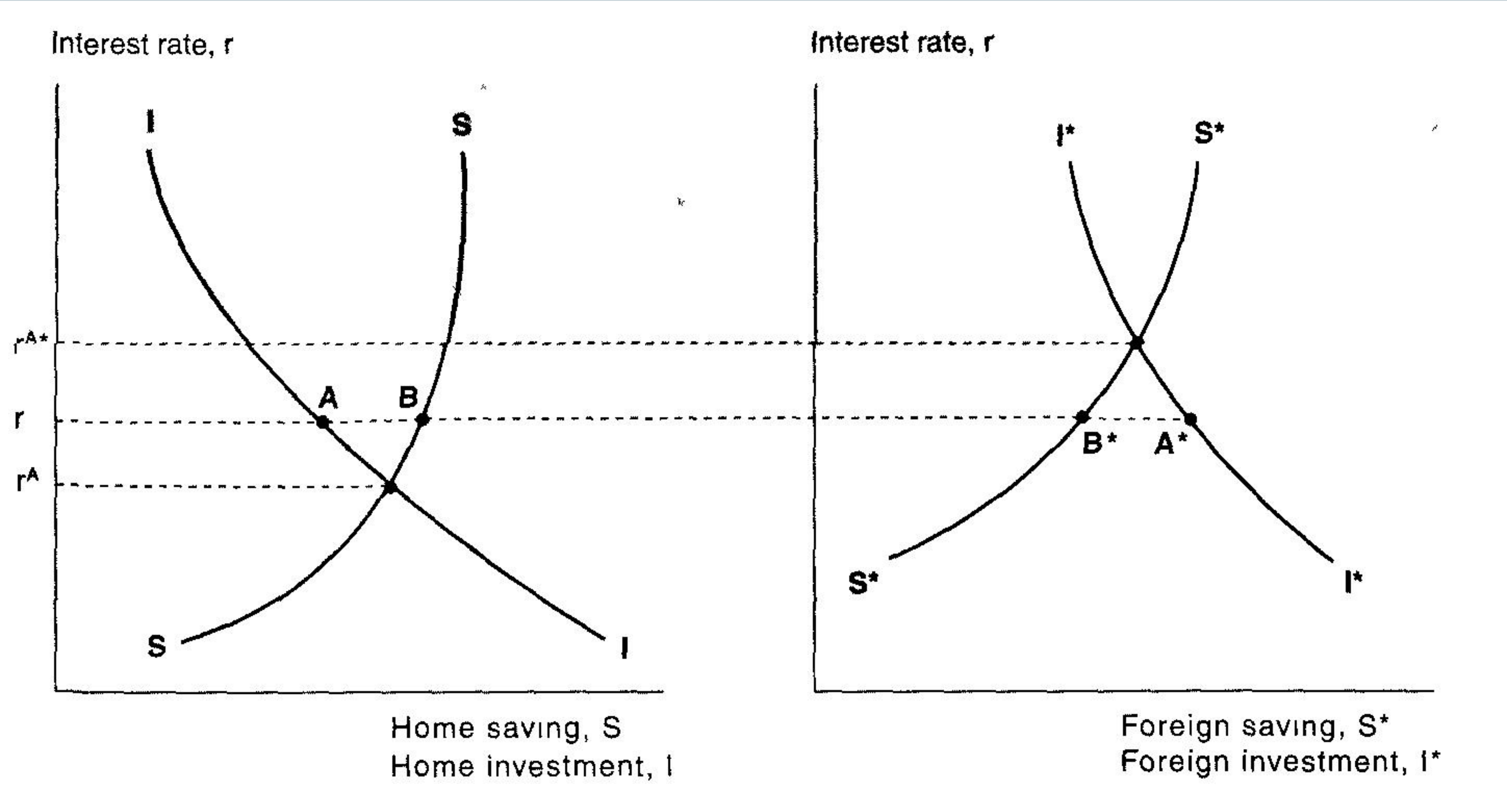
A two-country model
The Metzler diagram

- The Metzler diagram represents the four functions $S_1(r)$, $S_1{}^*(r)$, $I_1(r)$ and $I^*{}_1(r)$.
- The autarky interest rates are given by $S_1(r^A) = I_1(r^A)$and $S_1{}^*(r^{A*}) = I^*{}_1(r^{A*})$.
- With intertemporal trade the world interest rate is given by:

$$S_1(r) + S_1{}^*(r) = I_1(r) + I_1{}^*(r) \text{ or}$$
$$S_1(r) - I_1(r) = S_1{}^*(r) - I_1{}^*(r)$$

  - This equation is easily deduced from the equilibrium in the good market in period 1 $Y_1 + Y_1{}^* = C_1 + C_1{}^* + I_1 + I_1{}^*$
  - On the figure we have $AB=B*A*$
  - The world interest rate is between the two autarky interest rates: $r^A < r < r^{A*}$

A two-country model
The Metzler diagram



A two-country model
The Metzler diagram

- Recall that current account in the first period are

$$CA_1(r) = S_1(r) - I_1(r) = \overrightarrow{AB}$$
$$CA_1{}^*(r) = S_1{}^*(r) - I_1{}^*(r) = \overrightarrow{A^*B^*}$$

  - Thus, the world equilibrium can be rewritten

$$CA_1(r) + CA_1{}^*(r) = \overrightarrow{AB} + \overrightarrow{A^*B^*} = 0$$

  - In the figure, Home has a current account surplus in period 1, whereas Foreign has an equivalent current account deficit.

- The world equilibrium is Pareto optimal.
  - The allocation of capital across the two countries is efficient as the marginal product of capital is the same in the two regions and equal to *r*.

A two-country model
A shock to preference

- Consider an increase in Home impatience, represented by a fall in the parameter β.
  - We established that
    $$\frac{dS_1}{d\beta} = -\frac{dC_1}{d\beta} = -\frac{(1+r)\beta u'(C_2)}{u''(C_1) + \beta(1+r)^2 u''(C_2)} > 0$$
  - In the Metzler diagram Home's saving schedule shifts downward, raising the equilibrium world interest rate and reducing the Home's balance of payment surplus in period 1.
  - Investment falls everywhere as a result.

A two-country model
A productivity shock in the first period

- Productivity A_1 increases in Home in period 1.
  - We established that
$$\frac{dS_1}{dA_1} = \frac{dY_1}{dA_1} - \frac{dC_1}{dA_1} = \mathrm{F}(K_1) - \frac{\beta(1+r)^2 u''(C_2) F(K_1)}{u''(C_1) + \beta(1+r)^2 u''(C_2)}$$
$$= \frac{u''(C_1) F(K_1)}{u''(C_1) + \beta(1+r)^2 u''(C_2)} > 0$$
  - In the Metzler diagram Home's saving schedule shifts rightward, pushing the world interest rate down and improving the Home's balance of payment surplus in period 1.
  - Investment rises everywhere as a result.
- The effect on the equilibrium of the first period of a productivity increase A_2 in Home in period 2 is more complex (see OR, pp,34-35)

A two-country model
Taxation of capital flows

- Until now, we have assumed that the world interest rate was determined on a competitive financial market .
- Assume that we are in the case when the Home country is a borrower and the Foreign country a lender.
  - If the government of the Home country taxes capital inflows, the demand for foreign capital will decrease, and this will drive down the world interest rate. So, this government acts as a monopsony.
  - Then, the individuals of the Home country will borrow less but the cost of this borrowing for the country will also be less. If the government manages well its monopsony power, the welfare of the Home country will be higher.

A two-country model
Taxation of capital flows

- Let's discuss this issue in a pure endowment economy (no investment)
- Suppose that Home is a command economy: the government chooses C_1 and C_2, while foreign is a competitive economy in which individuals choose their optimal consumption
- Preferences are logarithmic: $u(C) = log(C)$, The Euler condition in Foreign gives: $\frac{C_2{}^*}{C_1{}^*} = \beta^*(1+r)$. We substitute the value of $C_2{}^*$ in the IBC and obtain:

$$C_1{}^*(r) = \frac{Y_1{}^*}{1+\beta^*} + \frac{Y_2{}^*}{(1+\beta^*)(1+r)}$$

A two-country model
Taxation of capital flows

- The Foreign savings function is

$$S_1{}^*(r) = Y_1{}^* - C_1{}^*(r) = \frac{\beta^* Y_1{}^*}{1+\beta^*} - \frac{Y_2{}^*}{(1+\beta^*)(1+r)}$$

- The world interest rate is given by:

$$Y_1 + Y_1{}^* = C_1 + C_1{}^*(r)$$

  - We substitute the expression of $C_1{}^*(r)$ and get

$$1 + r = \frac{Y_2{}^*}{(1+\beta^*)(Y_1 - C_1) + \beta^* Y_1{}^*}$$

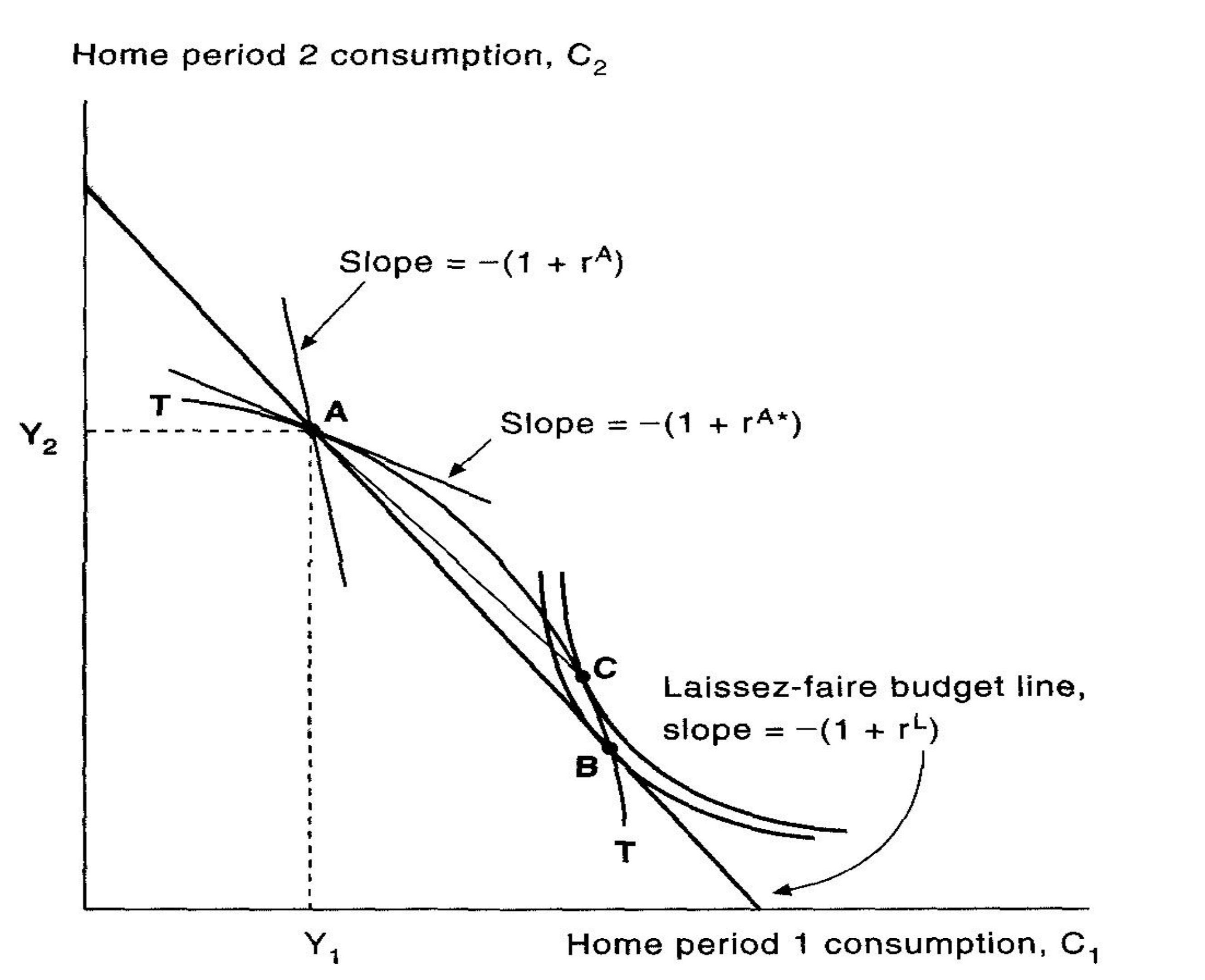
- The IBC of Home is $C_1 + \frac{C_2}{1+r} = Y_1 + \frac{Y_2}{1+r}$. Substitute the expression of $1 + r$. We obtain

A two-country model
Taxation of capital flows

$$C_2 = Y_2 + \frac{{Y_2}^*}{(1+\beta^*)(Y_1 - C_1) + \beta^* {Y_1}^*}(Y_1 - C_1)$$

- The government of Home chooses C_1 and C_2, under this constraint, to maximizes the intertemporal welfare of its consumers.
- The figure illustrate Home position in the case $r^A > r^{A*}$.
- The heavier straight line passing through the endowment point A has slope $-(1 + r^L)$, where r^L is the equilibrium world interest rate that would prevail were both governments to follow laissez-faire principles and allow free trade.

A two-country model Taxation of capital flows



A two-country model
Taxation of capital flows

- The curve ***TT*** passing through ***A*** is the graph of the last equation.
  - This curve also passes by the Home's laissez-faire choice ***B***
  - Part of ***TT*** lies strictly outside the laissez-faire budget line: its slope in ***A*** is $-(1 + r^{A*}) > -(1 + r^{L})$.
  - The government of Home, will pick point ***C***, which is feasible and yields higher national utility.
- In a decentralized economy, the home government can impose a quota to limit resident's borrowing to the amount corresponding to point ***C*** (capital control).

A two-country model
Taxation of capital flows

- The world economy is no more in a competitive equilibrium, and so its situation is not Pareto optimal,
- This means that the gain of Home is less than the loss of Foreign.
- Capital controls can induce reprisals from the Foreign government, and finally, all countries will lose. This efficiency loss is an important (overstated?) argument for the freedom of international capital flows.