Brigham Young University

Economics 459 - International Monetary Theory

based on lecture notes written by Torsten Persson

PART ONE

International Borrowing & Lending for Trade over Time

A. Basic Concepts

Start by writing down budget constraint for an open economy in period t.

$$GDP_t + U_t + (1+r_t)B_{t-1} = C_t^p + I_t^p + G_t + B_t \quad (1)$$

$$GNP_t = GDP_t + r_t B_{t-1} \quad (2)$$

$$Y_t = GNP_t + U_t = GDP_t + r_t B_{t-1} + U_t \quad (3)$$

Y = income

U = net transfer payments from abroad

B = holdings of Foreign Assets (can be positive or negative)

C = consumption

I = investment

G = goverment purchases

CA = current account

r = real interest rate

^{p} = private

^{g} = government

right-hand side of (1) is sources of funds:

production, transfers, return on past foreign investment

left-hand side is uses:

consumption, domestic investment, gov't spending,

foreign investment

The Current Account

using (1) and (3)

$$Y_t - (C_t^p + I_t^p + G_t) = B_t - B_{t-1} \quad (4)$$

current account is LHS of (4): difference between an economy's income and expenditure equals the current account surplus in the balance of payments

using (3) the surplus in CA can be broken up into the trade account, investment service, and transfers

$$CA_t = [GDP_t - (C_t^p + I_t^p + G_t)] + r_t B_{t-1} + U_t \quad (5)$$

Capital Account

capital account is RHS of (4): economy's net accumulation of foreign assets equals capital account deficit. by definition, equal to net lending to rest of the world.

surplus of current account is deficit of capital account; two accounts sum to zero. CA deficit means a country is borrowing from the rest of the world and is selling off its assets.

National Savings and Investment

let us split government purchases into consumption and investment

$$G_t = C_t^g + I_t^g$$

rewrite the CA surplus as:

$$CA_t = Y_t - (C_t^p + C_t^g) - (I_t^p + I_t^g) = S_t - I_t \quad (6)$$

current account is the difference between national savings and national investment

alternatively, we may write

$$S_t = I_t + CA_t \quad (7)$$

national savings can take the form either of investment in domestic capital or foreign investment

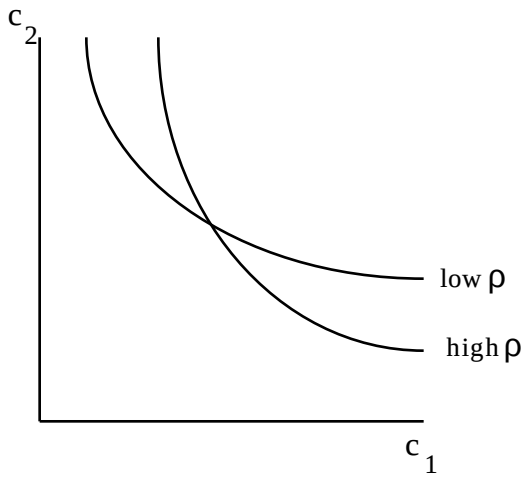
B. Private Consumption

very simple model to focus on consumer choice over time as a cause of borrowing or lending (CA deficit or surplus). one good, two periods

Preferences

$$U = u(c_1) + \frac{1}{1+\rho} u(c_2) \quad (8)$$

we can draw indifference curves with the normal shape to illustrate



the slope of the indifference curve illustrates the MRS between present and future consumption. the higher the value of ρ the more preference for present consumption; be more precise later.

Budget Constraints

assume no debt or assets in the beginning. budget constraints in the two periods are:

$$C_1 + B_1 = Y_1 \qquad (9a)$$

$$C_2 = Y_2 + (1+r_2) B_1 \qquad (9b)$$

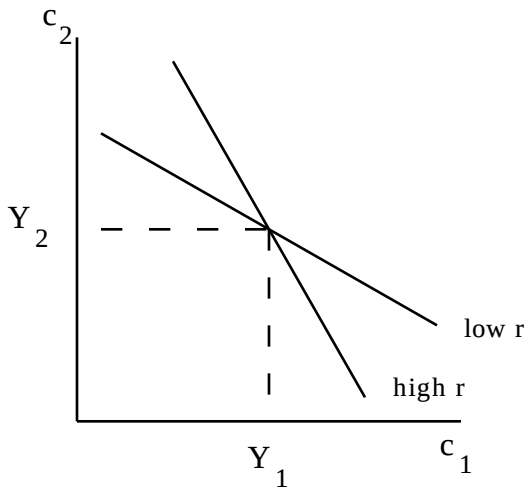
consolidate by dividing (9b) by $(1+r_2)$ and add to (9a):

$$C_1 + \frac{1}{1+r_2} C_2 = Y_1 + \frac{1}{1+r_2} Y_2 = W \qquad (10)$$

i) $1/(1+r_2)$ is the price of future consumption

ii) RHS sum of current income and present value of future income is defined as wealth

iii) wealth constraint can be illustrated as below:

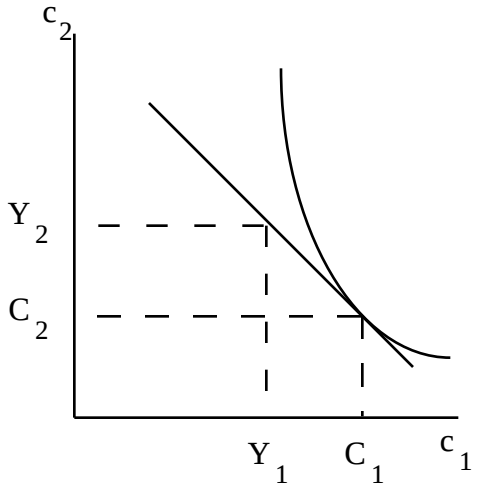


consumption can be chosen anywhere along the wealth constraint (trading over time). slope of wealth constraint is $-(1+r_2)$ higher r_2 increases the return to savings or cost of borrowing and makes c_2 cheap relative to c_1.

Consumer Equilibrium

next step, put preferences and wealth constraint together

in equilibrium MRS equals relative price between present and future consumption



in this example consumer borrows now against future income [see (9a)]
$B_1 = Y_1 - C_1 < 0$

Current Account

interpret this consumer as a representative consumer in our economy. the preferences and income profile are typical or average for the country. r_2 is the real interest rate in the world capital market. thus the current account in the first period is given by:

$$CA_1 = Y_1 - C_1 < 0 \qquad (11)$$

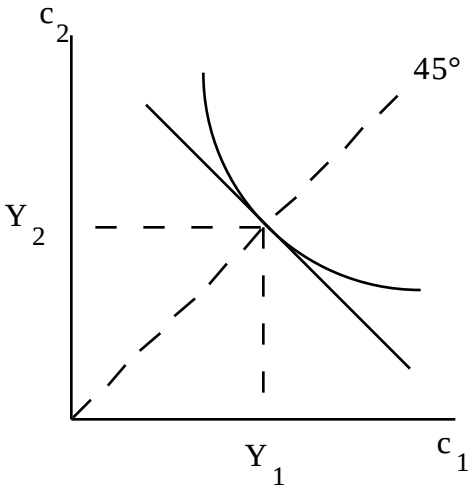
national expenditure is C_1 since we are abstracting from government and investment in this model, recall (4). so, the current account balance depends on whether the consumer borrows or lends. we will find conditions under which we can say what happens more precisely. basically, there are two issues: preferences, relative to the real interest rate; and the time profile of real income.

Consumption Tilting

relate borrowing and lending to preferences. the basic argument is simple: more preference for future consumption increases the probability that borrowing occurs. let's make this a bit more precise.

assume $Y_1=Y_2$ (we will see what inequality does shortly)

ask, "under what conditions will the consumer neither borrow nor lend?"



here $C_1=C_2$ consumption point on 45° line is the optimal choice. the slope of the indifference curve must be equal to the slope ot the wealth constraint. from (8) we know that the slope of the indifference curve when $C_1=C_2$ is $-(1+\rho)$.

in the above graph, then, $r_2=\rho$!

had ρ been higher (greater preference for current consumption) there would have been borrowing

had ρ been lower there would have been lending

this gives the following results:

if $Y_1=Y_2$ then:

if $r_2>\rho$ then $C_1<C_2$ and $CA_1<0$

if $r_2=\rho$ then $C_1=C_2$ and $CA_1=0$

if $r_2<\rho$ then $C_1>C_2$ and $CA_1>0$ (12)

Consumption Smoothing

what if the income profile were altered? since we already know what preferences do, assume $r_2=\rho$ which implies $C_1=C_2$. assume that the wealth has not changed, only its distribution over time. we get the following results:

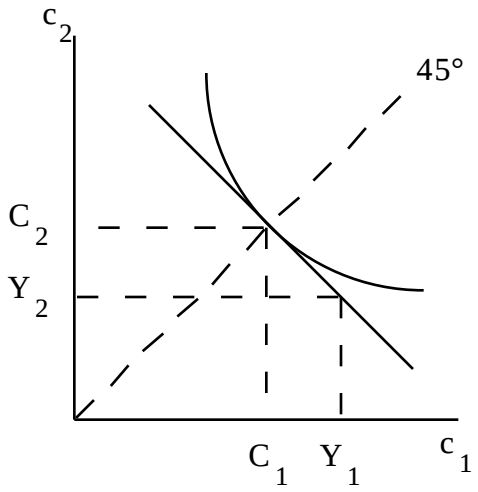
if $r_2=\rho$ then $C_1=C_2$ and:

if $Y_1>Y_2$ then $CA_1>0$

if $Y_1=Y_2$ then $CA_1=0$

if $Y_1<Y_2$ then $CA_1<0$ (13)

the case where $CA_1>0$ is illustrated below:



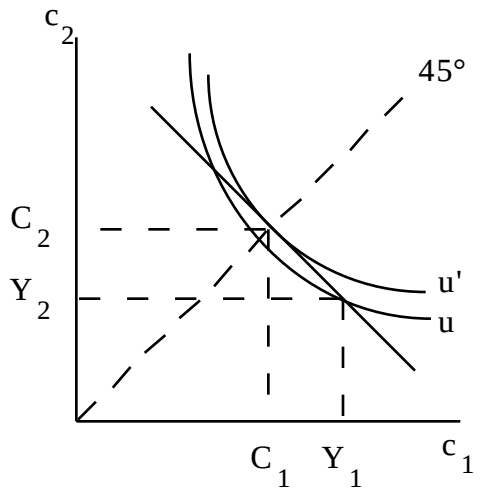
with consumption based on wealth and a preference for smooth consumption, fluctuations in income are smoothed out by borrowing and lending.

Summary

high (low) rate of time preference and/or higher (lower) relative future income may lead to borrowing (lending), which is a deficit (surplus) on the current account.

one can show that the domestic interest rate would be higher (lower) than the world rate if the country were sealed off from world capital markets

gains from capital mobility can be easily illustrated in our simple model.



in autarky agents consume their endowment each period and get utiltiy level u. with trade over time they may run a CA surplus and get utility level u'

points to consider:

what is the country's interest rate in autarky?

suppose the world interest rate were below the autarky rate,

would there still be gains?

C. Private Investment

let's extend out simple two-period model to include investment

Technology

current output is fixed, as before. but future production is determined by the stock of capital.

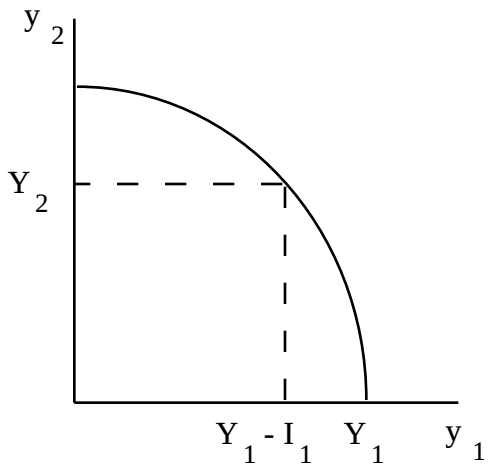
$$Y_2 = \alpha F(K_2) + I_1 \qquad (14)$$

$$K_2 = I_1 \qquad (15)$$

F( ) is a production function with diminishing marginal product of capital.

α is a productivity factor.

illustrate this with a transformation curve:

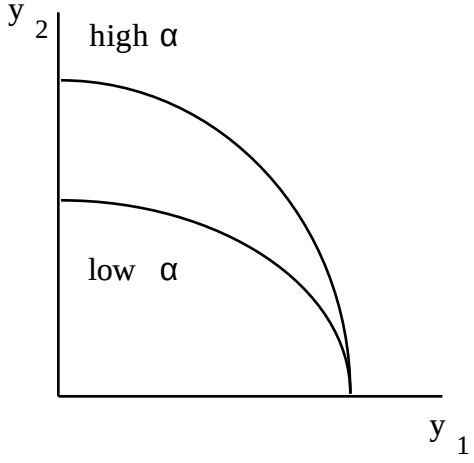


the slope of the transformation curve is given by:

$-[1+\alpha F'(K_2)]$

the return to investment is the amount of investment itself, plus the marginal rate of transformation

higher levels of α correspond to better investment opportunities



Firm Equilbibrium

firms invest until:

$$\alpha F'(K_2) = r_2 \qquad (16)$$

firms may either invest in domestic production or invest in international assets in the international capital market

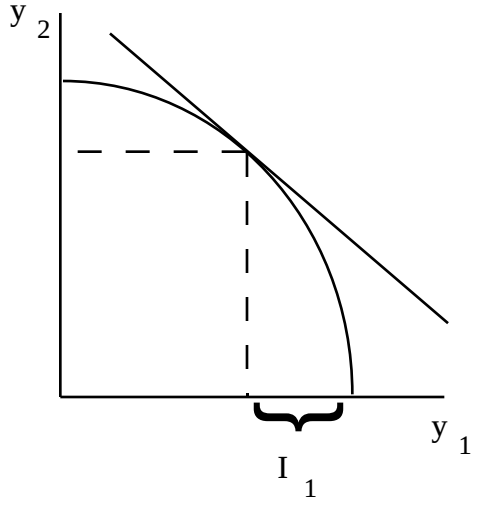
two equivalent interpretations:

1) invest as long as marginal return on physical capital is higher than the return in the capital market

2) invest as long as marginal investment has positive present value, investing one unit now yields the marginal product discounted by the interest rate:

$\frac{1+\alpha F'(K_2)}{1+r_2}$ - 1 = net present value of marginal investment

the optimal investmet choice is illustrated below:



in equilibrium the intertemporal price line is tangent to the transformation curve.

Current Account

now put consumers and firms together. assume that investment is financed out of current output. consumer's wealth is:

$$Y_1 - I_1 + \frac{1}{1+r_2} Y_2 = W \qquad (17)$$

recall from (10):

$$C_1 + \frac{1}{1+r_2} C_2 = W$$

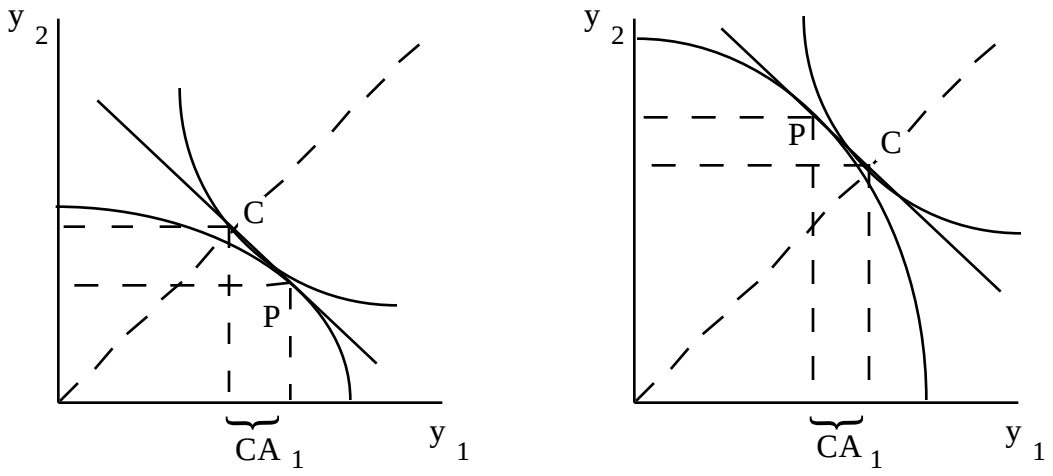
(17) determines production point and (10) determines consumption point

current account is now given by

$$CA_1 = Y_1 - C_1 - I_1 \qquad (18)$$

now current account is detrmined by investment prospects as well as by preferences

look at the case where $r_2=\rho$ so $C_1=C_2$:



CA>0 CA<0

in the first case, α is low, which leads to low I and a CA surplus

in the second case, α is high, which leads to high I and a CA deficit

Summary

the better the investment opportunities in a country the more likely it will run a CA deficit, all else equal.

A Note

there is a crucial difference between CA deficits that finance high current consumption and those that finance high current investment

in the first case, borrowing necessarily lowers future consumption because total wealth is fixed over time

in the second case, borrowing can increase future consumption because wealth increases as long as investment is profitable

International Borrowing & Lending for Trade over Time

D. Government Spending and Taxes

extend the model with consumers and firms to include government expenditure on goods and services, G, and taxes, T.

Government Budget

the gov't may borrow or lend in the capital market today at interest rate r_2. assume there are no initial gov't holdings of assets.

$$G_1 + B_1^g = T_1 \qquad (19a)$$

impose a long-run budget balancing condition; the gov't must eventually repay all the money it borrows.

$$G_2 = T_2 + (1+r_2)\, B_1^g \qquad (19b)$$

Thus, the gov't's wealth constraint is given by:

$$G_1 + \frac{1}{1+r_2} G_2 = T_1 + \frac{1}{1+r_2} T_2 \qquad (20)$$

note the similarity with the consumer's budget constraint

Consumers

we must now alter the definition of consumer's wealth to include the effect of taxes

$$W = (Y_1 - I_1 - T_1) + \frac{1}{1+r_2} (Y_2 - I_2 - T_2) \qquad (21)$$

this takes into account the fact that the relevant measure of wealth is based on after-tax income. in this simpel model it does not matter if taxes are paid by consumers or firms. (21) gives the constraint on consumer consumption plans, replacing (10).

Assume that G does not substitute for C. there are only wealth effects of G and T on C.

Current Account

can now be written as:

$$CA_1 = Y_1 - I_1 - G_1 - C_1 \qquad (22)$$

let us try to show how G and T affect CA. simplify by assuming that Y_1-I_1 and Y_2 are given; that is, we stay at the same point on the transformation curve regardless of the time profiles of G and T. this is a very stong and requires two assumptions: 1) there are no incentive effects of T on consumers or firms (no capital taxes, for example), and 2) there are no effects of G on production.

we will discuss whether the country as a whole borrows or lends in two steps:

first, assume that the gov't balances the budget every period, G_1=T_1 & G_2=T_2 and look at the consequences of time profile of G for CA

second, assume G_1 & G_2 are given and vary the time profile of T. this allows us to look at the consequences of budget deficits on CA

it is crucial to see how C interacts with G and T

Time Profile of G

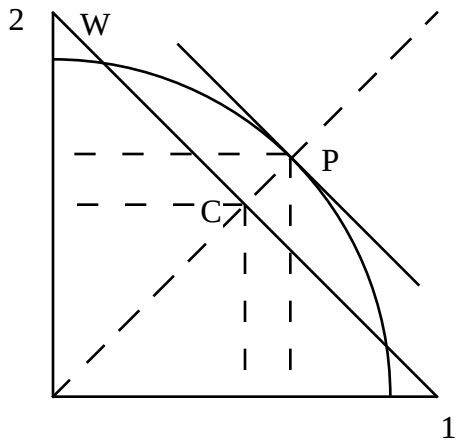
$G_1=T_1$ & $G_2=T_2$

the higher G_1 is relative to G_2, the more likely is a CA deficit. it is not the level of G_1, but the time profile that matters

to illustrate this point, consider a special case where CA would be balanced if there were only a private sector.

i) technology and r_2 determine Y_1-I_1 and Y_2

ii) $\rho=r_2$ implies $C_1=C_2$



point P is $\{Y_1-I_1, Y_2\}$

point C is $\{C_1, C_2\}$

the distance between P and the wealth constraint, line W, is determined by the net present value of taxes. holding this constant one can increase today's taxes (and correspondingly decrease tomorrow's) and move up and to the left along W.

regardless of the profile of taxes the cosumer is at point C and this we have the following:

if $r_2=\rho$, $G_1=T_1$ & $G_2=T_2$ then:

if $G_1>G_2$ then $CA_1<0$

if $G_1=G_2$ then $CA_1=0$

if $G_1<G_2$ then $CA_1>0$

more generally, when i) and ii) above do not hold:

the higher (lower) is G_1 relative to G_2

the more likely is a CA deficit (surplus)

Time Profile of T

treat G_1 and G_2 as given; let T_1 andf T_2 vary, this means letting the budget defict rise or fall in the present (and correspondingly fall or rise in the future, so the long-run budget remains baslanced)

in this model the size of G_1-T_1 does not affect the consumption choice at all and hence does not affect CA either

this is an open economy version of "Ricardian Equivalence" i.e. is is the amount of gov't spending that is important and not the method by which that spending is financed.

why does this result come about?

if the long-run budget must balance, then G_1 and G_2 determine the present value of the taxes consumers must pay, this fixes W and thus, consumption

if T_1 falls and the gov't issues bonds instead, consumers will hold those bonds as savings in order to pay the higher expected taxes in the future. any amount of bonds the gov't issues will be held by consumers and wealth is not affected.

Controversial Result

there is much discussion among economists about the validity of Ricardian Equivalence. the result that today's deficit does not affect today's consumption will brak down if:

i) there are other consumers added which are around in period 2, but not in period 1. these will bear some portion of the increased tax next period, but thier utility is not reflected in the choices made in the first period. agents that are around in the first period will view a deficit as an increase in net wealth as they get lower taxes now, but do not need to pay the full burden of repayment next period.

ii) there are imperfect capital markets such that consumers and the government borrow and lend at different rates. if the gov't can borrow at rates that are significantly different from the rates consumers face, then the present value of taxes to be paid next period during a deficit, will be different from the value of the tax cut. for example, suppose the gov't borrows at 15% and consumers lend at 10%; if taxes are cut \$100, the gov't must raise \$115 next period to pay off the additional debt. the present value of the increase in taxes is \$115/1.1 = \$104.55 and a deficit is viewed as a net loss in wealth. note that in order for a deficit to be viewed as a net gain in wealth, the gov't must borrow at an interest rate lower than the one at which consumers lend.

for a more detailed (and slightly biased) discussion of Ricardian Equivalence see Barro's textbook, Macroeconomics 2nd ed. ch. 14

E. Adjustment to Shocks

what is a shock? macroeconomic jargon of drastic and unexpected changes in the economic environment. (i.e. the 1970's "oil shocks")

we are considering a model of a small open economy (SOE). it is small in the sense that any actions it takes on the world capital market will have insignificant effects on the world interest rate. it is open in that it does trade assets on this world market.

what are the effects of different shocks on the country's current account? we will answer this question by considering our two-period model. we will first consider an initial equilibrium, then we will change some key economic variable and see how the new equilibrium compares with the old.

Shock 1 - Increase in the World Interest Rate

$\uparrow r_2$; there are three effects to consider.

i) investment becomes less profitable $\downarrow I_1$

ii) consumption in the future becomes cheaper $\downarrow C_1$

iii) if the country is a net borrower ($CA<0$) higher interest payments means lower wealth $\downarrow W$

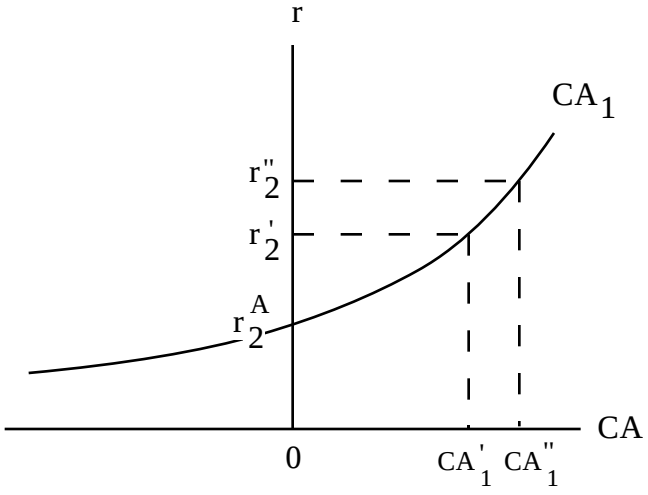
if the country is a net lender ($CA>0$) higher interest payments means higher wealth $\uparrow W$

assume for now that effect iii) never outweighs the first two effects

recall the current account identity:

$CA_1 = Y_1 - I_1 - C_1 - G_1$

thus, $\uparrow r_2$ $\uparrow CA$; the current account improves



the extent to which CA improves depends on the elasticity of C_1 and I_1 to r_2. the less elastic the steeper the CA curve and the less of an improvement in CA

remember this figure as we will use it alot later

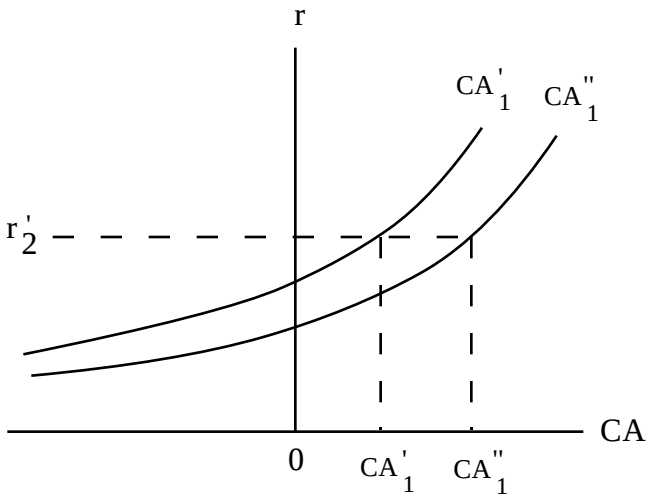
notice that there is an interest rate (labeled r_2^A) that makes the CA go to zero. this is the rate that would clear the domestic capital market under autarky.

Shock 2 - Temporary Positive Supply Shock

$\uparrow Y_1$; productivity increases in the present, but not the future;

higher output means higher wealth; part of this wealth will be consumed now and part later $\uparrow$CA

thus, $\uparrow Y_1$ $\uparrow$CA; the current account improves



note: in autarky the interest rate would've fallen

consider: what would the results be if output had fallen?

Shock 3 - Temporary Positive Supply Shock in the Future

$\uparrow \alpha$; productivity is expected to increase in the future, but not the present;

investment rises as it has a higher marginal product. W rises due to higher future output and part of this is consumed now and part later $\downarrow$CA

thus, $\uparrow \alpha$ $\downarrow$CA; the current account deteriorates

consider: how would this be illustrated on the graph from the previous example? what would happen to the interest rate in autarky?

Shock 4 - Permanent Positive Supply Shock

$\uparrow Y_1$ & $\uparrow \alpha$; add the effects of two previous examples

the net effect on CA is ambiguous, why?

General Comments

note: in the examples above the timing of the shocks is as important as the direction. we get opposite results from current and future shocks

note: temporary shocks affect borrowing and lending more than permanent shocks

consider: can you think through what would happen if we considered shocks to gov't spending? how would these be different from productivity shocks? given the discussion in section D, what effect do you expect shocks to tax revenues to have?

F. Overall Lessons

Welfare Economics

we have seen how a country may gain from having access to international financial markets. in particular, running a CA surplus or deficit can make a country better off.

it follows that policies that use the CA balance as a target may diminish welfare by diminishing the gains from borrowing and lending

in addition, policies which regulate capital flows directly may diminsh the gains from portfolio diversification

nonetheless we still see that policy-makers around the world regularly impose these types of restrictions, why?

i) the costs of the policies my not be well understood

ii) tradition, in the 50's and 60's deficits meant losing reserves abroad (capital markets were not as well developed)

iii) deficits in CA may be symptoms of other problems. i.e. too expansive a fiscal policy

there are some cases where the concern about CA is warranted in its own right. the case of the debt crisis is less developed countries is one example we will discuss later.

Issues of Positive Economics

we have discussed explanations for CA imbalances in a one-good world. this is different from some popular theories in the media. let's look briefly at two popular explanations for CA imbalances

i) low "competitiveness" - there are problems with low productivity in U.S. industry. this is basically an empty argument (unless one is speaking of a temporary

productivity shock). as we have seen a permanent drop in productivity (or its level of growth) will not effect CA balances, but it will effect the standard of living. if this argument were true how could we explain CA surpluses in poor sub-Saharan countries?

ii) value of the dollar is too high - could be part of the explanation, but which is the cause and which is the effect is not clear. we observed a high value of the dollar in the early 1980's and a lower one in the late 1980's, but the CA over this period changed very slowly and with little apparent correlation with the exchange rate. we will discuss thsi explanation in more detail in the second half of the course. note, that we have a model which does not need swings in the exchange rate to drive CA imbalances.

PART TWO
Worldwide Borrowing & Lending

previously we looked at a small open economy. now let us abandon the assumption of smallness and see how countries interact in world capital markets when they are large enough to influence interest rates and other variables.

A. The World Capital Market

we will model the world as consisting of two large countries. one could intrepret this several ways: i) the U.S. and the rest-of-the-world, ii) developed and undeveloped countries, iii) oil-producing and oil-consuming countries, etc. the choice of interpretation will depend on the problems we wish the model to address

we will allow for a home and foreign country and will define variables for both countries. for the home country we will simply write a symbol, and for the foreign country let us write the same symbol with a *. for example home output will be Y and foreign output will be Y*.

we will continue to use out two-period analysis as before

Domestic Interest Rates in Autarky

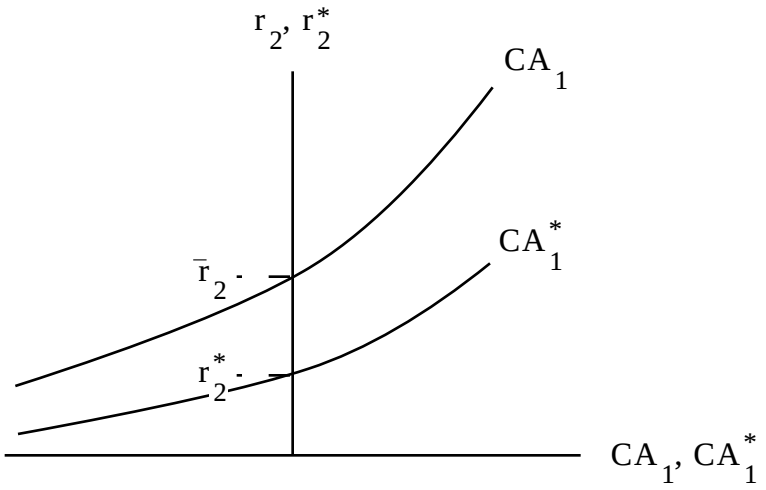
suppose that both countries have binding capital controls prohibiting international borrowing and lending. thus, each country deals only in a domestic capital market. in these closed economies domestic savings and doemstic investment must balance. that is:

$$CA_1 = S_1^p - I_1^p + (T_1 - G_1) = 0 \quad (1)$$

$$CA_1^* = S_1^{*p} - I_1^{*p} + (T_1^* - G_1^*) = 0 \quad (2)$$

(from now on if we have tow equations that hold for both countries like the above I will write the first one and then //* to denote an identical equation with *'s)

to balance demand and supply for funds the domestic interest rate adjusts in each of the markets. domestic interest rates will typically be different in the two countries.



the country with the highest demand for funds relative to supply has the highest autarky interest rate. as drawn above this is the home country: $\bar{r}_2 > \bar{r}^*_2$

convince yourself that the factors which lead a country to have a higher autarky interest rate are the same factors which will lead it to borrow on the world market if the world interest rate is lower than the autarky rate.

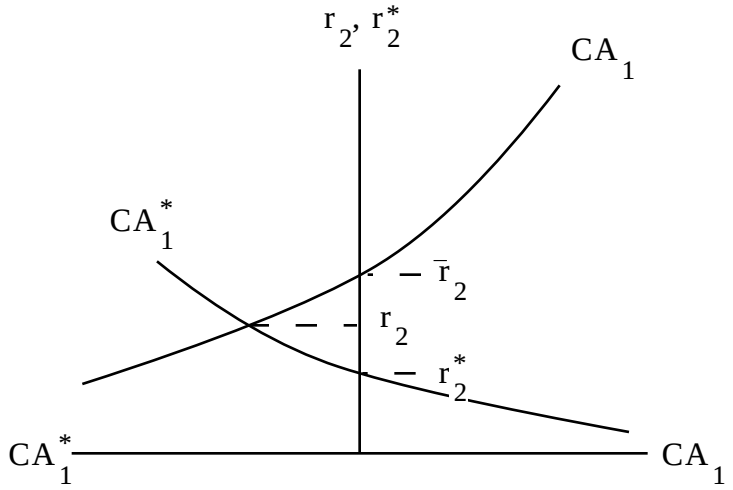
compare two closed economies and see how the autarky interest rates compare if one has higher Y_1, α, ρ, etc. than the other.

Open International Capital Market

now suppose we allow these to countries to trade financial assets with each other. arbitrage opportunites will lead to a common world interest rate. while it is no longer the case the domestic savings and investment balance in each country, it is the case that total world savings and investment must balance. this means that:

$$CA_1 + CA^*_1 = 0 \qquad (3)$$

now draw the above figure differently: measure the home CA rising to the right and the foreign CA rising to the left. the world interest rate is on the vertical axis. (3) is satisfied where the two CA curves intersect.



there are several important features to note:

i) the world interest rate is somewhere between the two autarky rates

ii) the country with the higher autarky rate (home) ends up being a borrower and running a CA deficit. the country with the lower autarky rate (foreign) ends up being a net lender and runs a CA surplus.

iii) there are efficiency gains from a world standpoint. world savings has been channeled to investments with a higher yield (from the foreign to the home country) both countries share this gain.

example: developing countries are capital poor and have a low supply of savings, relatively speaking. developed countries are capital rich and have a high supply of savings

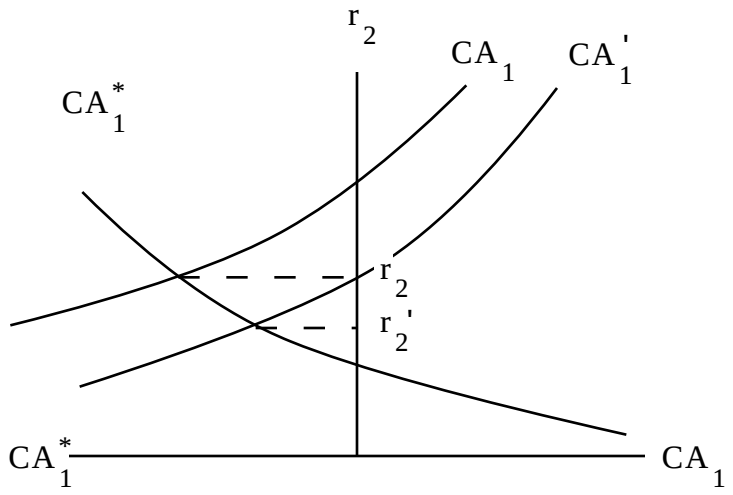
the above analysis shows why it is natural to expect developing countries to borrow; as was the case in the late 19th century and in the 1970's, two periods of open international financial markets.

B. Adjustment to Shocks

in the SOE case we made a distinction regarding the timing of shocks: temporary, future, permanent. the timing is important here as well. we will highlight other distinctions now regarding the origin of the shocks (i.e. which country experiences the shock).

Country-Specific Shocks

let's examine the temporary positive supply shock which produced a CA improvement in the SOE case. we will let the shock occur in the home country.



as home income in period 1 increases the CA schedule shifts out as it did in the SOE case. savings of the home country would be higher at the initial world interest rate, r_2.

results:

i) the world interest rate falls; world savings is higher relative to world investment than before.

ii) home CA improves; but less than in the SOE case. this is because the lower interest rate encourages more borrowing than in the SOE case.

iii) foreign CA deteriorates; foreign country borrows some portion of the shock to home income.

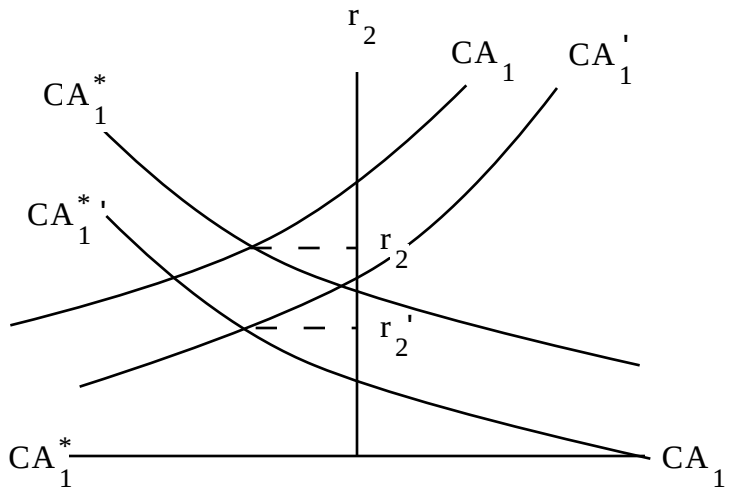
the results are qualitiatively the same as the SOE case, but different quantitatively. this result generalizes to other shocks as well.

consider: what would happen if it was the foreign country that experienced the temporary shock? does the interest rate rise of fall? the home CA? the foreign CA?

consider: what happens to the home CA schedule if there is a shock to future productivity in the home country? what happens to the world interest rate and the two countries' CA's? how do these results differ if it is the foreign country that has the future productivity shock?

Global Shocks

suppose there is a temporary improvement in income in both countries



both countries would save more at the initial world interest rate.

results:

i) r_2 falls and falls by more than if only one country experienced the shock

ii) unclear which CA improves and which deteriorates

consider: how would things differ here if the shock were one to global productivity in the future?

General Results

i) global shocks affect the world interest rate more than country-specific shocks do.

ii) global shocks affect borrowing and lending of countries less than country-specific shocks do.

the second result should be intuitive. it is the difference between countries that gives them the incentive to trade financial assets in the first place

in summary, it is not only the direction and timing of shocks which is important, but also the origin.

C. Explaining Some Facts

Which Facts?

let us examine some "stylized" facts regarding the wolrd real interest rate and CA imbalances between different groups of countries. we will look at the 1970's and the 1980's

Real Interest Rates

i) how are they measured?

if we observe the nominal rate and we know what the rate of inflation is expected to be, we can observe the expected real interest rate. this is basically an adjustment made to tell us if we saved a dollar how many more goods we could purchase next period.

$r_t = R_t - \pi^e_t$

where R is the nominal interest rate and π^e is the expected rate of inflation.

obviously, the calculation of π^e is important. there are several ways to do this: survey people and ask them, use the ex post value, use the current value, forecast the value, construct a measure based on rational expectations.

the last method is the one used in table 1.

ii) which real interest rate is the correct one?

the theory is based on a single world rate. in reality there are various rates within and across countries based on levels of riskiness, time to maturity, etc. still, we would expect the forces to cause these different rates to move together over time.

iii) despite these qualifications, we get the following set of stylized facts from table 1.

r was low in 1970's

r was high in early 1980's

Table 1

Real Short-Term Interest Rates using Statisitical Forecasts of Inflation

period	USA	France	Germany	UK	Italy	Japan
1965-72	1.5	1.7	3.0	1.5	n.a.	1.0
1973-77	1.5	-0.3	1.4	-3.9	-2.5	-3.3
1978	0.3	0.7	0.8	-0.9	-2.5	-5.0
1979	1.3	-0.7	1.2	-4.3	-4.4	0.4
1980	0.4	0.3	3.2	0.9	0.0	3.4
1981	7.0	3.6	6.0	1.1	2.0	1.7
1982	6.5	4.9	3.8	1.5	2.8	2.7
1983	4.7	4.5	1.4	2.3	3.2	2.9
1984	4.6	4.0	2.6	1.4	3.4	4.6

Table 2

Current Account Balances

period	Industrial	USA	other six	oil export.	developing
1970-72	7.0	0.4	9.3	2.0	-12.8
1973	10.3	9.1	0.6	6.5	-9.1
1974	-14.6	7.6	-10.4	55.9	-21.0
1975-78	12.1	1.2	19.0	33.8	-39.5
1979	-5.6	2.6	4.6	61.9	-31.7
1980	-38.8	6.6	-18.7	99.6	-68.0
1981	3.1	10.7	8.8	56.3	-105.1
1982	1.2	-3.8	17.7	3.3	-99.2
1983	2.2	-35.5	39.0	-11.1	-56.7
1984	-34.2	-96.4	53.2	-6.0	-35.6

Table 3
Investment and GNP

period	Investment		% of world investment		% of world GNP	
	LDC	dev.	LDC	dev.	LDC	dev.
1960	8.3	160.8	4.9	17.8	5.6	15.7
1965	12.2	252.7	4.6	19.2	5.0	17.7
1970	24.9	399.1	5.9	20.0	5.6	20.9
1973	91.4	677.5	5.8	21.8	5.9	21.4
1974	58.1	725.5	7.4	21.1	6.9	22.8
1975	70.9	829.9	8.5	20.0	7.1	24.2
1976	76.4	957.1	8.4	20.0	7.4	23.1
1977	81.2	1175.3	7.8	20.4	7.2	22.4
1978	101.6	n.a.	8.0	20.9	7.1	23.6

CA Imbalances

i) less of a measuremtn problem than interest rates, but the relevant measure is real interest payments which requires an inflation adjustment

ii) table 2 shows wide swings in CA balances
1970's - OPEC major lenders, LDC's major borrowers
1980's - Japan, Germany major lenders, US major borrower

The 1970's

in 1974 the price of oil increased by a factor of five

in 1979-80 the price of oil again doubled

we will use a model of the international capital market for discussion. allow for two groups of countries; O, oil producers and N, oil-consumers.

hold the real interest rate constant temporarily

savings:

the oil price increase was like a tax, it transfered income from N to O.

if the shock is permanent: savings are unaffected, no incentive to smooth consumption. total world savings is constant

if the shock is temporary: savings go down in N and up in O, but total world savings rises (gov't in O mandates higher MPS than in N)

investment:

increase in the price of oil is like a negative productivity shock for all goods except oil.

if permanent: investment down alot in N, up somewhat in O, total world investment falls alot.

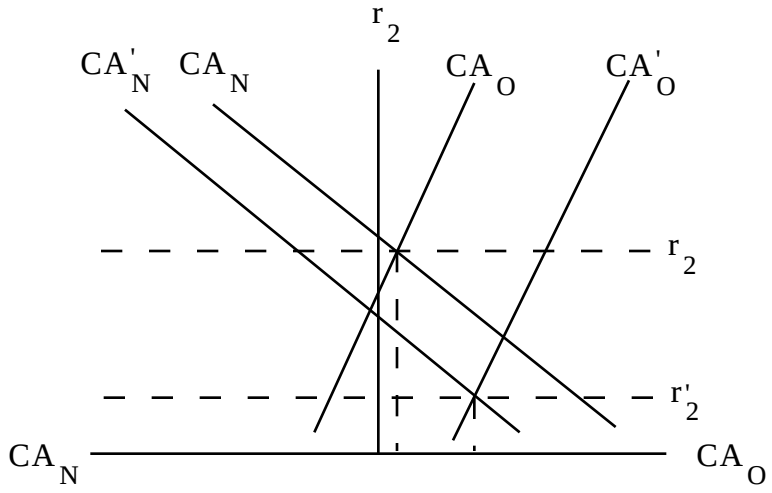
if temporary: investment down in N, up a little in O, total world investment falls.

net effect:

if permanent: CA improves alot in N, deteriorates in O, excess supply of savings in the world market

if temporary: CA uncertain in N, improves in O, excess supply of savings

the above effects for both the temporary and permanent cases can be roughly illustrated as shifts in the CA schedules in the graph below:



at the old interest rate there is an excess supply of savings, which puts downward pressure on the interest rate.

as the interest rate falls the amount of investment rises and savings declines until the two are equal again at the new world interest rate. this adjustment process would be illustrated as movements along the new CA schedules. note that as drawn the CA schedule for O is less sensitive to the interest rate than N; this is to be expected if the gov't in O is targeting savings and investment.

in reality much of OPEC savings was recycled to US and Eruopean banks. there was a large expansion international bank deposits and lending in this period.

most of the impact of the shocks fell on LDC's; their effective interest rates fell by more. table 3 shows that investment rose in LDC's and fell in developed countries.

Summary

the model seems palusible in face of the evidence

interest rates fell, OPEC developed large CA surpluses, other countries (especially LDC's) developed CA deficits.

The Early 1980's

the approach is different here. we are looking for explanations for high interest rates that are consistent with the observed changes in CA balances.

we cannot simply reverse the arguement and say that oil prices fell. this would explain declining CA deficits in LDC's and declining CA surpluses in OPEC, but it cannot explain rising CA deficits in the US and rising surpluses in other developed countries as shown in table 2.

we need an explanation of why the US borrowed so much from other developed countries. what might the incentives be?

i) suppose that people in the US expect their future tax burden to be lower. that is gov't spending in the future is expected to fall. this makes US consumers fell richer and they will borrow to smooth consumption

ii) an income tax is distortionary and can be viewed as a productivity shock. that is if the income tax falls people can keep a larger proportion of the marginal product of the capital they own than before. if people in the US expect a future shock to productivity that will not be manifest in other countries then they will borrow now against that higher expected income. foreigners will lend money in order to get a higher rate of return in the US than in their own countries.

net effect is for the US to run a CA deficit and other developed countries to run CA surpluses. this will also drive the world interest rate up.

consider: the US continues to run CA deficits even today. real interest rates have also fallen considerably since the mid-1980's. what could be the reason for this?