LECTURE OF March 24, 2014

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INTRODUCTION

This lecture is an illustration of Chapter 12 of the Textbook: "Macroeconomic Dimensions of international finance".

The chapter examines the role of monetary & fiscal policies in an open economy under different exchange rate regimes.

This type of macroeconomics goes under the name of "open economy macro-economics" (OEM).

OEM looks at a single economy that is open to trade & capital flows, whereas International Economics looks at the global system.

LEVI concentrates on the effectiveness of fiscal policy VS monetary policy.
By "effectiveness" we mean the extent to which policies can influence aggregate demand and production.

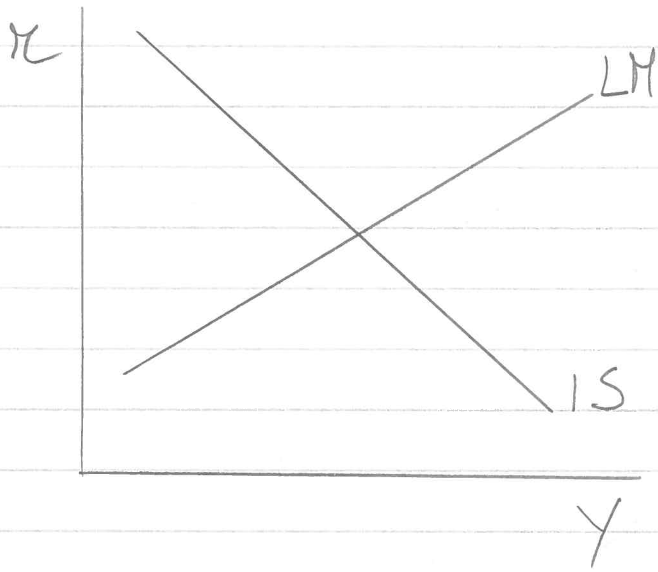
We will see, however, that the results are difficult to assess and that they are not always "robust".

This being said, answering how fiscal and monetary policies can affect and are affected by trade and capital flows, as well as by the ex. rate, is fundamental to understand how economies work in reality.

The discussion will develop around an extension of the IS-LM model. Such model can serve only as a first approximation to the way a real economy works and has several limitations. However, it is still useful to gain some insight into the macroeconomics of open economies.

Especially when looking at the short run, the model can be useful to understand how monetary & fiscal policies can be used to "fine tune" the cycle. But creating sustainable growth, i.e. growth that can persist over the long-run is a much more difficult endeavor.

BASIC IS-LM MODEL



r = interest rate
Y = income
G = fiscal expenditure
T = Taxation
C = consumption
I = investment
$M^{s/d}$ = money ~~supply~~ demand

THE MODEL

$$M^s = M^d(\underset{+}{Y}, \underset{-}{r})$$

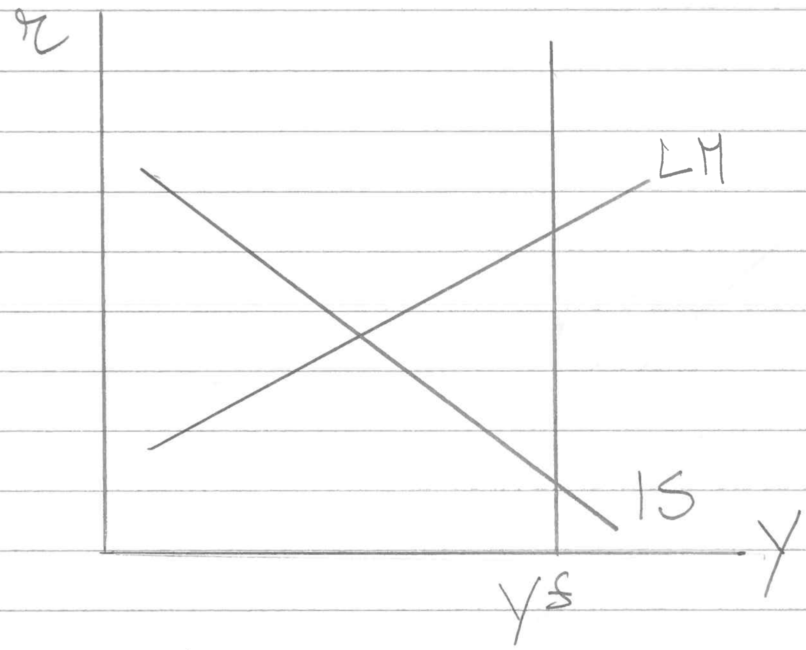
$$Y = C(\underset{+}{Y-T}) + I(\underset{+}{r}) + G$$

This is a closed-economy model that can serve only as a first approximation of how a real economy works.

Note that in such model you can use fiscal and monetary policies at pleasure to raise income and employment since:

- there is no budget constraint
- prices/inflation are not treated explictly

A slightly more realistic version of the model is the following.



Y^f = level of income at full-employment

Note that Y = real income • prices = nominal income

Hence when $Y > Y^f$ excess demand is inflationary!

We can make another step to make the model more realistic by considering the case of an open-economy that exchanges goods and services with the rest of the world and is open to international capital flows.

To do this we need to add the BoP (Chapter 7 in LEVI)

Extending the basic IS-LM model to the case of an open economy.

Extension of the model implies consideration of:

- Trade flows, i.e. the flows of exports and imports with the rest of the world;

Exp
Imp

- Capital flows, i.e. the flows of savings that is allocated in national and/or foreign assets as well as the flows of savings from the rest of the world;

K

- the exchange rate, for obvious reasons, since we deal with a multiplicity of currencies, and the way it is determined;

$\mathcal{E}$

- the level of official reserves, i.e. the stock of foreign currencies owned by the country's central bank that is useful to buy imports;

R

- The interest rate level in comparison to that of the rest of the world since this affects the flows of capital.

r

To accomplish all this we will have

⑥

to introduce in the model the balance of payments (BoP).

The BoP is explained in detail in Chapter VII of LEVI, but here it will suffice to retrieve some key notions.

Exchange rate definition:

"Units of national currency necessary to buy 1 unit of foreign currency on the mkt".

Hence $\mathcal{E} = \dfrac{\text{Units of national currency}}{\text{Units of foreign currency}}$

When $\mathcal{E}\uparrow$ → the national currency depreciates

$\mathcal{E}\downarrow$ → the national currency appreciates

In LEVI the national currency is the US $!

THE BALANCE OF PAYMENTS

The BoP records all real and financial transactions that a country has with the rest of the world. To this aim it consists of a number of accounts / sub balances.

1 The "commercial balance" (CB)

Exports - Imports (of good and services)

A US exporter will price and sell his goods/services in \$. Hence his clients will have to buy \$ on the exchange mkt. in exchange for their currencies.

Hence we can conclude that

Exports $\rightarrow$ R↑ (increase int. reserves)

The opposite happens with imports

When CB > 0 it means that the inflow of foreign exchange exceeds the outflow Hence R↑

2 The "current account" balance (CA)

It is the commercial balance plus a number of other items:

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- Income receipts (net)
The net income that the country's residents receive on their investments abroad
(stocks, bonds, dividends, rent on properties etc)
- Unilateral transfers
The net inflow of private donations, development aid, remittances of migrants

3 The capital account balance (KA)

The KA records all inflows and outflows related to financial transactions.

A capital "inflow" occurs when a foreigner buys domestic assets. Since the latter are denominated in the national currency, foreign investors will have to exchange foreign currency with $

$\Rightarrow$ capital inflows increase foreign reserves ($R\uparrow$)

In the case of capital outflows the scheme works the other way round

$\Rightarrow$ capital outflows reduce foreign reserves ($R\downarrow$)

A surplus in KA $\Rightarrow R\uparrow$

LEVI Table 7.1 Pag. 148 A list of all the items that are recorded in the BoP

The accounting principle adopted in BoP accounting is "double entry"

→ all items sum up to zero!

Therefore in accounting terms:

$$\text{BoP balance} = 0$$

As we are interested in the "economics" of the BoP, we will be using the following identity

$$\Delta R = \text{Current Account} + \text{Capital Account}$$

or $$\Delta R = CA + KA$$

ΔR: change in the stock of official reserves

CA: Net inflow of payments related to transactions in goods & services (+ unilateral transfers)

KA: Net capital inflow

- Note that under perfectly flexible exchange rates, $\Delta R = 0$ since the ex. rate (which is a "price") adjustes to balance inflows and outflows.

Otherwise $\Delta R \neq 0$

- Note also that $\Delta R > 0 \rightarrow M^S$

An increase in official reserves implies an increase in money supply, since the central bank gives domestic currency in exchange for foreign currency.

- A surplus in the BoP, that is $CA+KA > 0$ implies both $\Delta R > 0$ (an accumulation of reserves) <u>and</u> $MS > 0$ (an increase in money supply)

- The "dynamics" of the BoP is the following

If $CA+KA > 0 \longrightarrow \Delta R > 0$ and/or $\varepsilon \downarrow$ (tendency to appreciation)

If $CA+KA > 0 \longrightarrow \Delta R < 0$ and/or $\varepsilon \uparrow$ (tendency to depreciate

In essence:

- An inflow of foreign reserves leads to an appreciation of the domestic currency hence of the ex. rate

- An outflow of foreign reserves leads vice versa to an ex. rate depreciation

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Before integrating our BOP identity into the IS-LM model we need to make more explicit the economics behind it:

$$\Delta R = CA\left(\underset{+}{\varepsilon}, \underset{-}{Y}\right) + KA\left(\underset{+}{r}, \underset{\overset{?}{+}}{\varepsilon}\right)$$

$\frac{\Delta CA}{\Delta \varepsilon} > 0$ is clear since we assume the Marshall Lerner condition holds. Hence there is a (net) increase in export (a depreciation makes domestic goods cheaper)

$\frac{\Delta CA}{\Delta Y} < 0$ since the higher income stimulates imports from abroad

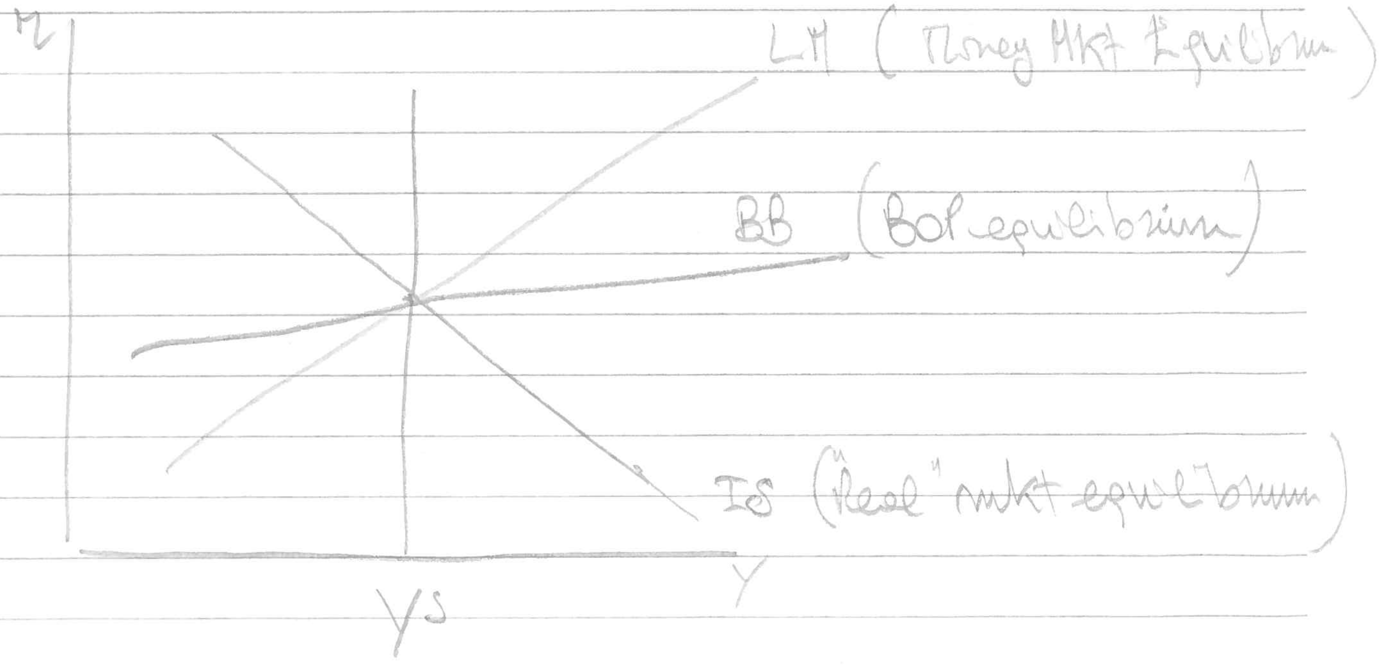
$\frac{\Delta KA}{\Delta r} > 0$ The higher the return on domestic assets, the more I attract foreign inflows

$\frac{\Delta KA}{\Delta \varepsilon}$? When $\varepsilon \uparrow$ (a depreciation) domestic assets become cheaper to foreign investors. However a depreciation might induce the expectation of further depreciations in the future, which can lead to "capital" losses.

→ It's a complex causal relationship
For simplicity we'll assume that

$$\frac{\partial KA}{\partial \varepsilon} > 0$$

The expanded model: IS-LM-BB (Levi's Child)



The expanded model sets us in the world of OPEN-ECONOMY MACROECONOMICS the branch of intn. economics that concentrates on a single country (more than on the system) in order to assess the effectiveness of macroeconomic policy.

What is the meaning of the BB curve?

The BB curve is simply the combination of Y & r that warrants that the BoP is "on balance" (economically), which means that $\Delta R = 0$ (no change in reserves)

[When BoP is in balance, there is no need for the CB to buy or sell foreign ex. reserves.]

Hence: $CA(\underset{-}{Y}, \mathcal{E}^0) + KA(\underset{+}{r}, \mathcal{E}^0) = 0$

BB curve is positively inclined

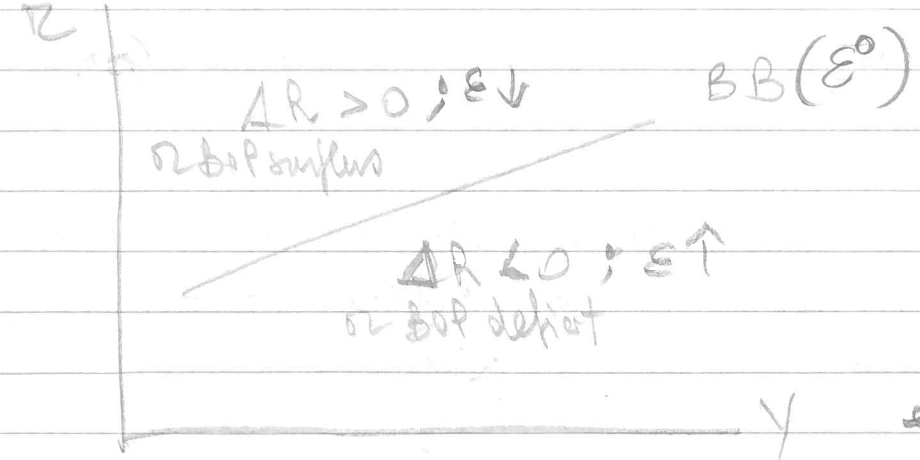
When $Y\uparrow \rightarrow$ CA worsens since Imp $\uparrow$

hence to assure equilibrium you need

$r\uparrow \rightarrow$ raise more capital inflows

This means that the BB curve is positively sloped.

The BB curve works under both fixed & flexible ex. rate regime.

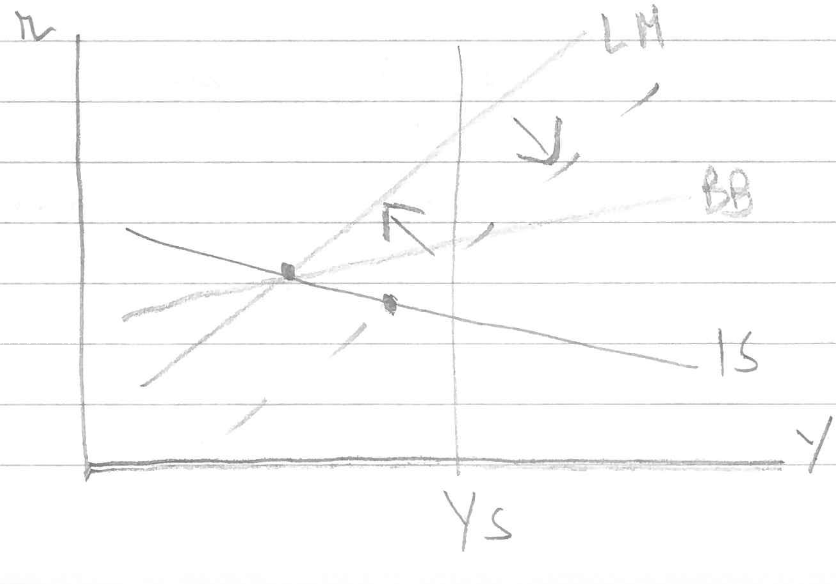


The BB line for a given level of the exchange rate $\varepsilon = \bar{\varepsilon}$ (where $\bar{\varepsilon}$ can be either fixed by monetary authorities or the mkt).

At this point we are able to assess the impact of fiscal & monetary policy under different ex rate regimes.

The most interesting case is that: FIXED Ex. RATE

1) When the ex. rate is set at a given level, monetary policy is not "independent" any longer. By this we mean the MP must be targeted to the ex. rate parity and cannot be adjusted freely to stimulate the economic cycle.



If I try to raise Y by expanding money supply, the BoP worsens, hence $\varepsilon \uparrow$

To ensure that $\varepsilon = \bar{\varepsilon}$ (PARITY condition)
∂ must get M^s.

If the Central Bank (CB) expands money supply via open-mkt operations (buys bonds on the secondary mkt), then

$$\begin{cases} r \downarrow \rightarrow KA \downarrow \rightarrow \varepsilon \uparrow \\ I(r) \uparrow \rightarrow Y \uparrow \rightarrow CA \downarrow \rightarrow \varepsilon \uparrow \end{cases}$$

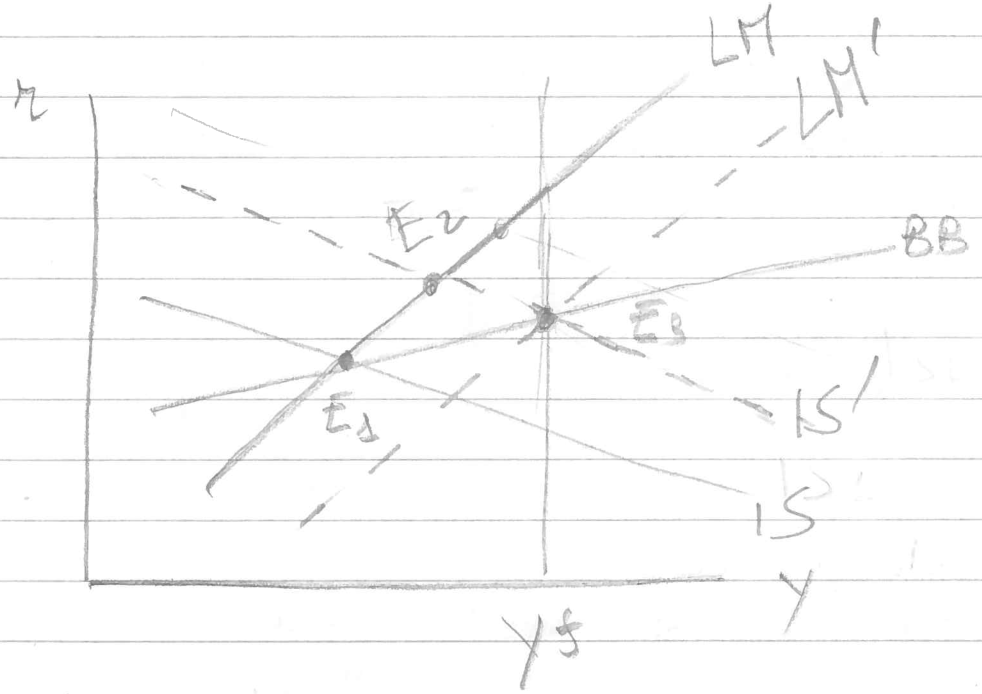
To counteract the "downward" pressure on ε, the CB will have to buy its currency on the mkt in exchange for R. Hence M^s gets back to its previous level.

The composition of the CB's balance sheet has changed (more securities than reserves) but M^s must be unchanged at the end of the process.

Conclusion: with fixed ex rate monetary policy cannot be used to stimulate income & employment.

This is a fundamental conclusion and is also the reason why sometimes countries introduce capital controls, as we'll see in the next class.

2 let's now consider fiscal policy



Example
∃ expansionary G
in order
to raise Y
closer to
full employment
level
(move IS
from IS' to IS2)

In E_2 we are in a BoP surplus
hence there will be pressure on the *
exchange rate to appreciate ($E\downarrow$).

These pressures on E must be
offsed by the CB that will sell
the national currency on the mkt
in ex. for foreign currency.

$\Rightarrow M^S\uparrow$, $R\downarrow$

The LM moves to the right & we can
achieve full employment in E3

* Note that if the BB curve is steeper than the LM curve,
there will be a deficit & E will tend to depreciate.

Addendum

More on fiscal policy under fixed E.

When G↑ this implies also Y↑ which produces two effects

- CA worsens since IMP↑
- $M^d(Y, r)$, money demand goes up and will push r↑ with M^s given.
- Since r↑, KA improves

Thus, an expansionary fiscal policy will
(i) worsen the current account
(ii) improve the capital account

The net effect on E is thus undetermined a priori & will depend on which account is dominant in the BOP.

If the effect on KA dominates, the BOP will go in surplus. Viceversa when the effect on CA dominates

The two different cases can be depicted in our model by changing the slope of the BB curve.

Fixed rate

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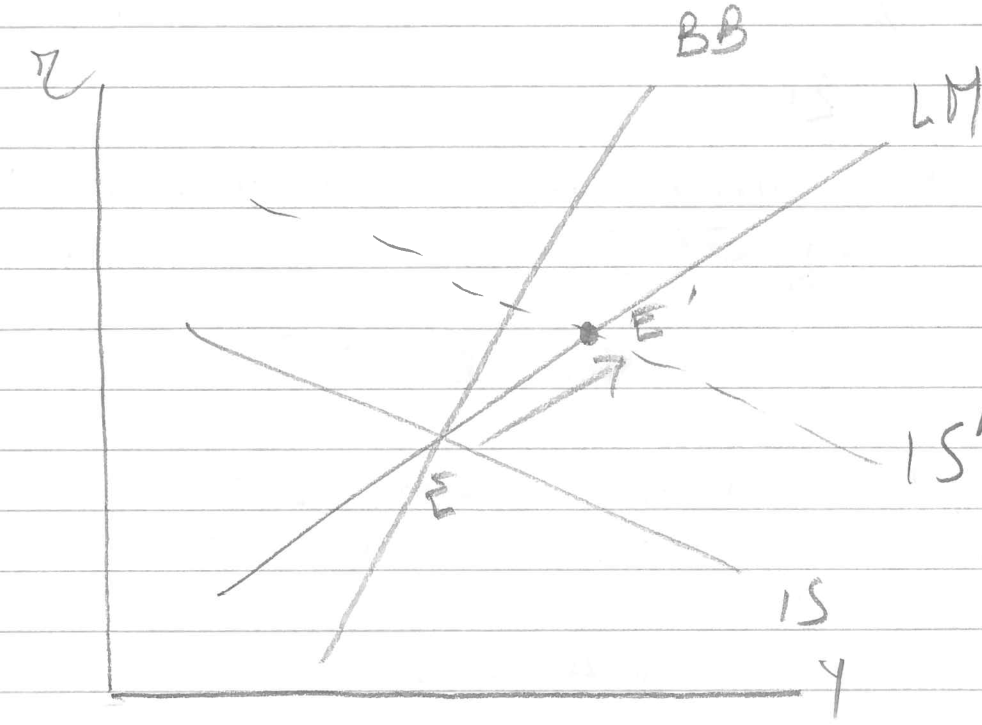
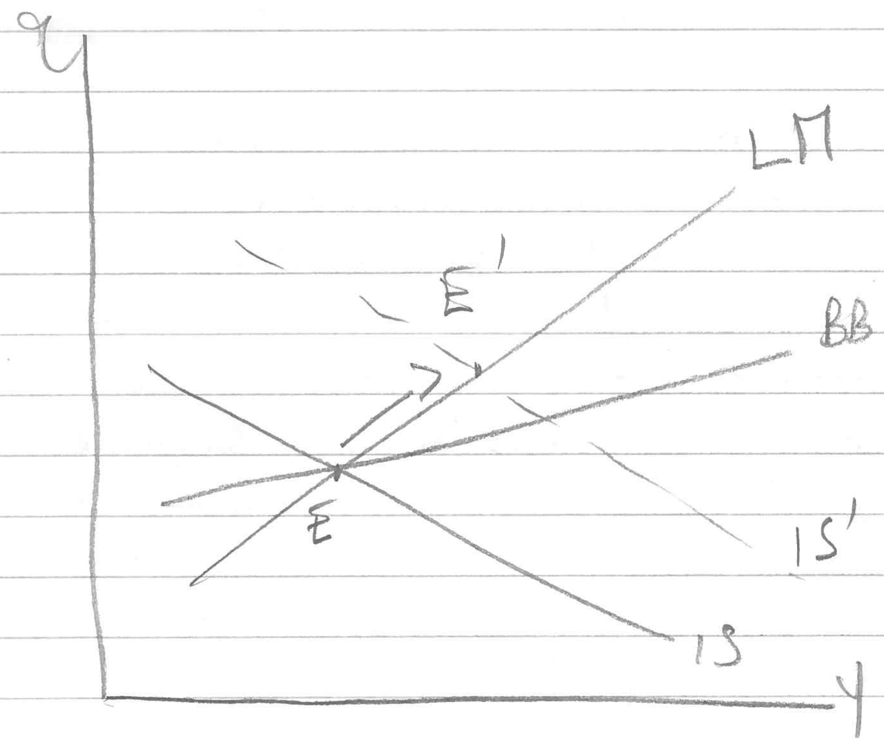


Case (1)
BB steeper than the LM line.

(1) An expansionary fiscal policy leads to a BoP deficit (CA dominates KA)



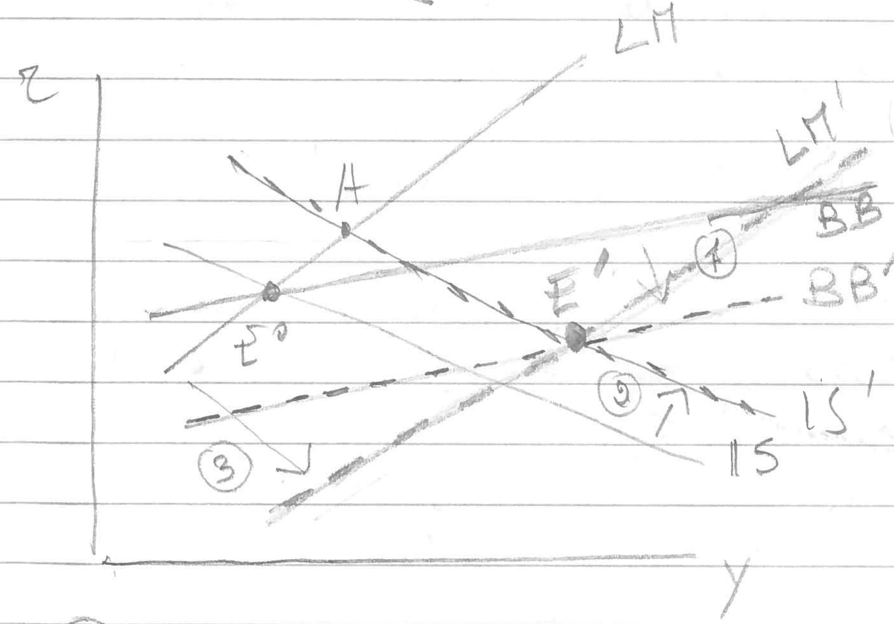
Case (2)
BB line less steep than LM line

(2) An expansionary fiscal policy leads to a BoP surplus (KA dominates CA)

Conclusion: under fixed ex rate fiscal policy can be even more effective than in a closed economy, since any fiscal stimulus will have to be accompanied by a monetary stimulus to keep $\mathcal{E}$ unchanged!

(3) CURRENCY DEVALUATION

Another policy option under the fixed ex. rate regime is a "devaluation", which means to reduce the value of the national currency vis-à-vis the reference currency, thus setting a new parity ($\mathcal{E}'$, with $\mathcal{E}' > \mathcal{E}^0$)



(1) The BB curve shifts downward since at $\mathcal{E}'$ the capital account improves hence need a lower r to achieve equilibrium

(2) With the devaluation exports also improve hence the IS shifts rightward

(3) Monetary policy will have to adjust

to defend the new parity. In A the BoP is in surplus, which means that the national currency will be under pressure to revaluate. The CB will offset these pressures by selling its currency (MST) in exchange for reserves.

Inflationary effect of devaluation

In some cases a devaluation may be the right choice to stimulate the economy. For an economy where growth is lead by exports, it may be helpful to keep the currency undervalued.

However, a devaluation is normally inflationary, as it raises the cost of imports and may give rise to inflationary spirals (cost-push inflation)

Another caveat to keep in mind is that a devaluation may give rise to reactions by trading partners that may decide to devalue their own currencies thus offsetting the loss of competitiveness.

In extreme cases this may result in a "currency war"

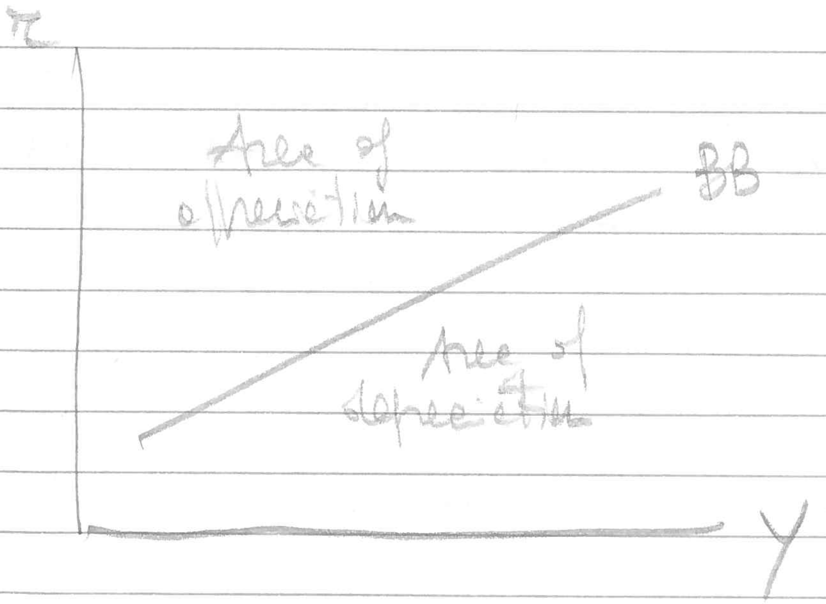
The model under flexible rates

Under flexible rates the interpretation of the BB curve changes slightly:

Definition of BB line: combinations of Y & r at which the demand for the currency equals supply at the market prevailing ex. rate

$$CA(Y, \varepsilon) + KA(r, \varepsilon) = 0$$

with ε determined by mkt forces.

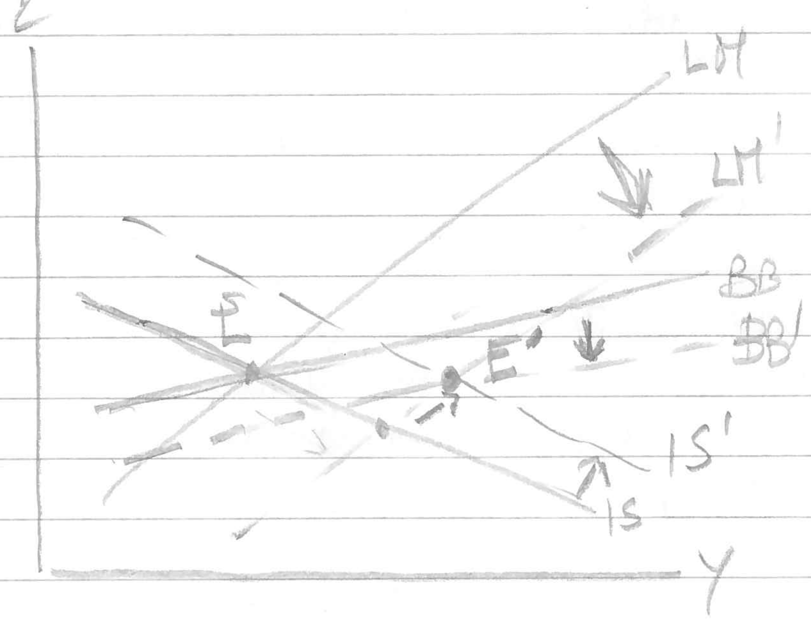


The BB moves with the IS & LM

The effectiveness of fiscal & monetary policy reverses, as we'll see.

Also, we do not have devaluation as a third policy option.

(20) Flexible rates



Monetary policy

MP is free to move regardless of the ex rate.

An expansionary MP lowers r and in turn causes a depreciation ($E \uparrow$)

When $E\uparrow$ this stimulates exports, hence the IS curve shift rightward

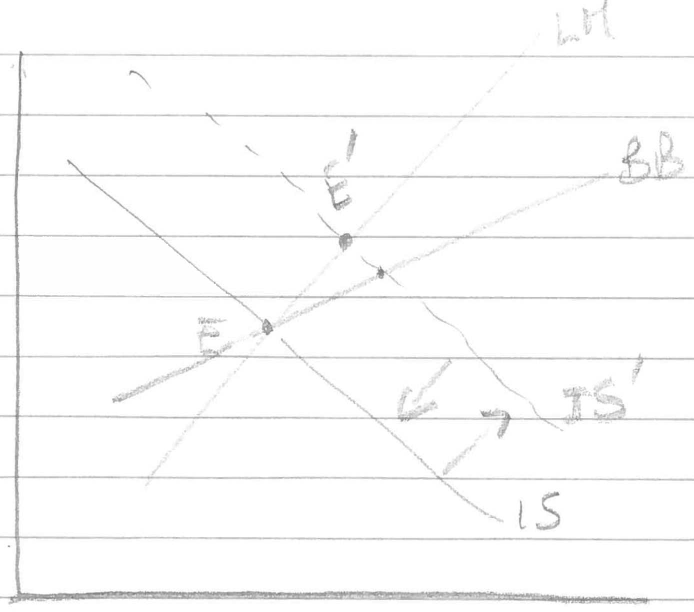
The BB line will move to the new equilibrium ex rate (the macro equilibrium moves from E to E')

In summary

$M^S \uparrow \rightarrow r \downarrow \rightarrow E \uparrow \rightarrow CA \uparrow \rightarrow Y \uparrow$

Income will be higher in the new eq. due to higher exports (net).

Note: the increase in Y is also due to a rise in investment, since $r\downarrow \rightarrow I(r)\uparrow$ but this is a movement along the IS line.



Fiscal policy

When $(G-T)\uparrow$ the IS line moves to the right.

The BoP goes in surplus which implies $E\downarrow$, currency appreciation (since $r\uparrow$)

When $E\downarrow$, the current account will worsen and this effect will continue moving the IS line backward till we go back to previous equilibrium.
(but we'll end up with higher fiscal deficit & current account deficit)
Conclusion: under flexible rates fiscal policy is ineffective

Note 1 Note that in reality when the fiscal position worsens this more often leads to currency depreciation since the debt rises and so the risk of default.

Note 2 As in the fixed rate case, we can have a steeper BB line, so that, after the fiscal stimulus, we move to a point of BoP deficit hence E will depreciate.