

start

(23)

14

Chp 11
Doon, F & S
(11e)

From the desk of

"FISCAL POLICY"

DATE

51

$G \rightarrow A \rightarrow B$
 $TA \rightarrow Y_d \rightarrow C \rightarrow S$

"The fiscal policy consists of gout exp. & taxation" gout exps. affect the overall level of spending (exp.) in the economy & thereby influences the level of GDP. Tax affects disposable incomes thereby affecting part. spending & part. saving. Further, tax affects the level of Inv. & potential income. corporate taxes

The use of fiscal policy changes the gout budget, stimulate the level of agg dd & in turn the level of overall eco. act

"Let's now see how changes in the fiscal policy shift the IS curve, the curve that describes eqm in the gds mkt. And also study the relative effectiveness of the fiscal policy in influencing the level of income."

Shifts the IS curve
Effectiveness of FP

IS slopes down
 $\downarrow i$
 $\uparrow Inv.$
 $\uparrow AD$
 $\uparrow Y$

We know that the IS curve slopes down $\because$ a $\downarrow$ in the int. rate increases Inv. spending, thereby $\uparrow$ agg dd & the level of opp at wh. the gds mkt is in eqm. Also, changes in fiscal policy shift the IS curve. eg a fiscal expansion shifts the IS curve to the right.

Expand F.P.
 $\rightarrow$ shift IS curve to the right
& contract F.P.
 $\rightarrow$ shift IS curve to the left

The eqm of the IS curve is

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Sequence: $\uparrow G$, $\uparrow \bar{A}$, IS shifts to the rt.
 $Y \uparrow$, But $D_m \uparrow$, $D_m > S_m$, $i \uparrow$
 $I \downarrow$, $AD \downarrow$, $Y \downarrow$ (move from E'' to E')

(24)

$$Y = \alpha_G (\bar{A} - bi) \quad \text{auton. spending}$$

$$\alpha_G = \frac{1}{1 - c(1-t)} \quad (3)$$

$$\bar{A} = \bar{C} + \bar{C}TR + \bar{I} + \bar{G}$$

Note: $\bar{G}$, the level of gout. spending, is a component of auton. spending, $\bar{A}$. The inc. tax rate, t , is a part of the mult.. Thus, both gout. spending & the tax rate affect the IS Schedule.

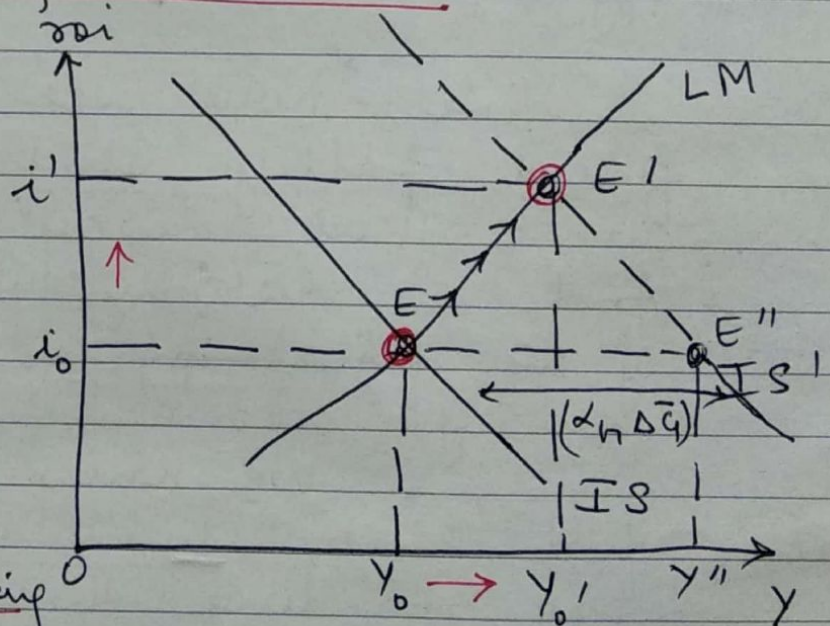
($\bar{G}$ affects the position of the IS, t affects slope of the curve)

"Effects of an ↑ in gout. spending"

Let me show you how a fiscal expansion raises eqm income & the interest rate.

Initial position of eqm is at E where IS & LM curves intersect.

The initial eqm level of inc. = Y_0 & $rai = i_0$. A fiscal expansion brought abt by red gout. spending



res the level of agg dd (at unresd rai). (AD $\uparrow$) (Inc, O/P)
 Pdr & opp res to meet this red dd.

This shifts the IS curve from IS to IS'.

The magnitude of shift in the IS curve is given by $(\alpha_G \Delta \bar{G})$. At each level of int. rate, eqm inc. must ↑ by α_G times the ↑

(At each pt on IS, $Y = AD$.)

$$Y'' - Y_0 = 2 \Delta \bar{G} > Y'_0 - Y_0 = \Delta \bar{G}$$

15

From the desk of

(25)

DATE (2) (52)

in govt spending eg if govt spending rises by 100 & the mult is 2, eqm inc. must $\uparrow$ by 200 at each level of int. rate. Thus, the IS curve shifts to the rt by 200.

But the inc. doesn't expand by this magnitude ($2 \Delta \bar{G}$) = $Y_0 Y''$. The new position of eqm is established at E' where IS' intersects LM curve. The new eqm level of inc. = Y'_0 & the new eqm $ssi = i'$. The expansion in inc. is only $Y_0 Y'_0$ (& not $Y_0 Y''$).

If the int. rate had remained unchanged at i_0 and there was an $\uparrow$ in govt spending, then the eqm wld've moved to E'' on IS'_2 & the inc. wld've expanded from Y_0 to Y'' .

However at E'' , the gds mkt is in eqm as we're on IS' curve as planned spending $(C+I+G)$ is equal to $D_p (=Y)$. But the money mkt is not in eqm. E'' lies to the

lt of the LM curve. At E'' , there is excess dd for real balances (money) as inc. has $\uparrow$ ed.

The int. rate i_0 is too low & the level of inc. Y'' too high for the money mkt to clear. The excess dd for real balances

causes int. rates to $\uparrow$ from i_0 to i' . This $\uparrow$ in int rates reduces the level of Inc.

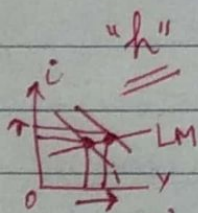
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26 * After the complete adjustment, taking into a/c the expansion effect of $\uparrow$ in govt exp & the dampening effect of rise in rai the new eqm is at E' where both the govt & the money market are in eqm. ($\Delta G \rightarrow EDG \rightarrow Y \uparrow \rightarrow D_{mt} \rightarrow rai \uparrow \rightarrow Inv \downarrow \rightarrow Y \downarrow$)
 At E' corresponds to the Keynesian eqm in wh. the impact of on rai is ignored.
 But with the rai adjustment & its effect on AD, eqm moves to E'.

Spending & agg dd falls.* Inc, instead of $\uparrow$ g to Y'' rises only to Y' . Thus, expansionary fiscal policy causes int. rates to rise thereby reducing put Inv. Thus, $\uparrow$ in govt spending "crowds out" (put Inv) put invt spending.
 crowding out occurs when expansionary fiscal policy causes int. rates to rise thereby reducing ^{Inv^t} put spending; particularly Inv^t. the govt spending crowds out the interest sensitive put Inv^t.

* Factors or efficiency of FP // What factors determine the extent or magnitude of crowding out?
 In other words, what determines the extent to wh. int. rate adjustments dampen the expansion induced by $\uparrow$ ed govt spending?

The magnitude of the crowding depends on $\rightarrow$
 (1) The $\uparrow$ in rai due to $\uparrow$ in govt spending $\rightarrow$ It is the interest sensitivity of the dd for money (sep'd by coeff. 'h') wh. determines the $\uparrow$ in the rai, wh. results from expansion in govt spending. When the dd for money is int. sensitive there is only a small $\uparrow$ in the rai from $\uparrow$ ed govt spending.
 (so Inv. doesn't fall much --)



larger is 'h' flatter is LMC $\rightarrow$ rai $\uparrow$ inc less crowding out

(2) The int sensitivity of Inv^t (sep'd by 'b')
 - A given $\uparrow$ in the rai has a larger crowding out effect when put sector Inv. is highly

From the desk of 27

Efficiency of FP depends on slope of ISC, slope of the LM curve (k & h) and extent of the shift of the ISC (ΔC)

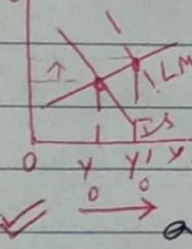
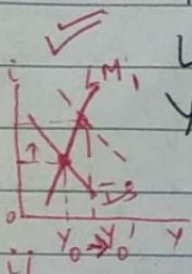
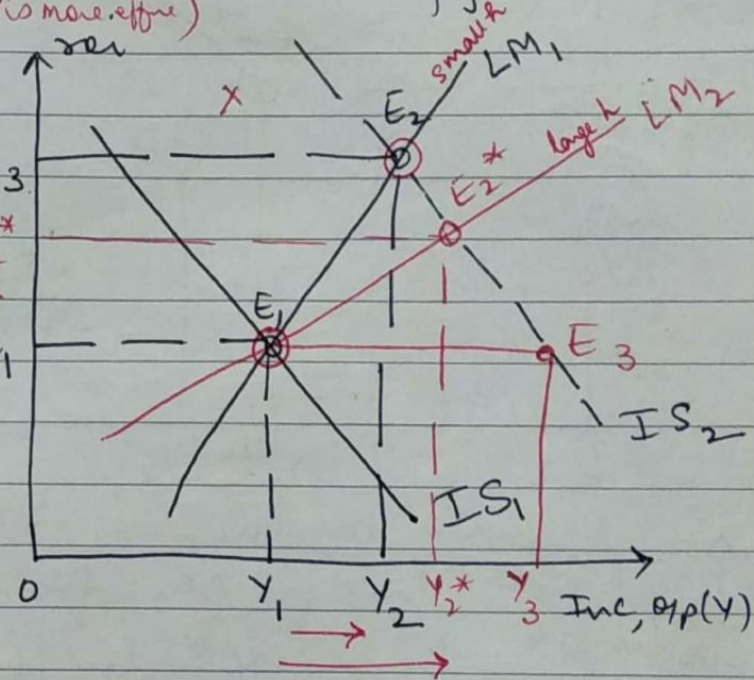
DATE 3

(53)

sensitive to the rai. (ie b is large)

(I) Larger We can say
The flatter the LM curve, the rai less & vice versa more. Shown in the fig.

When govt spending rises by ΔC , IS shifts right to IS_2 . Equi inc. rises from i_1 to i_2 for LM_1 & from i_1 to i_2^* for LM_2 .



The dd for money is less int sensitive for LM_1 (steeper LM). Hence the shift of IS causes a greater $\uparrow$ in rai from i_1 to i_2 i_2^* i_3 .

However, if the dd for money is more int. sensitive (LM_2 - flatter LM). The shift of IS causes a small $\uparrow$ in rai from i_1 to i_2^* . It can be stated that "red govt spending" crowds out" more Invst along LM_1 (steeper) than LM_2 (flatter). (so in case of LM_2 , extent of crowding out is smaller, $\therefore$ there is lesser $\uparrow$ in the rai).

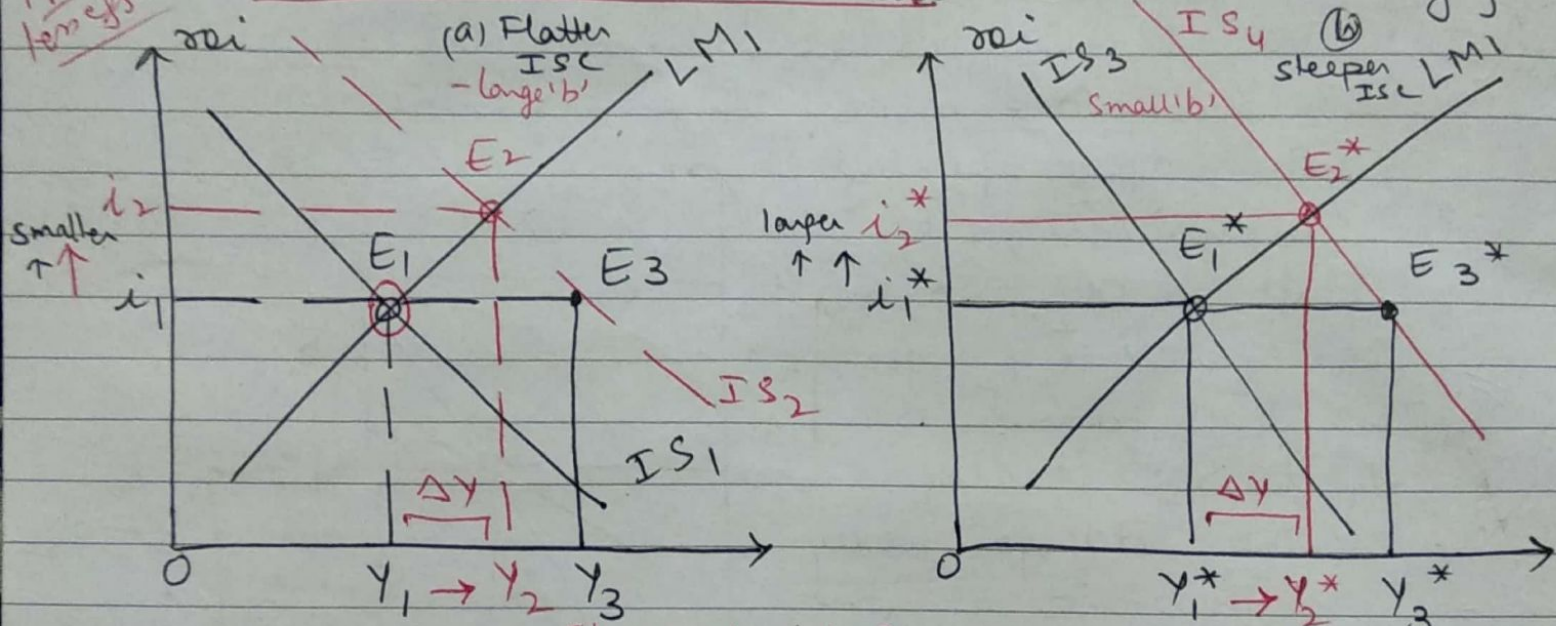
$\rightarrow$ Thus, when h is v-small ie LM is steep, FP is less effne & when h is v-large, or LM is flat, then FP is more effne

slope of ISC = $\frac{1}{b \Delta c}$

(28)

* (larger is 'b')

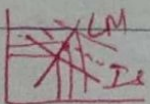
II The flatter the IS curve*, the int. rate rises less & income rises less. Shown in the fig.



(Smaller) {dampening effect is large} (larger)
Eqm inc. rises from Y_1 to Y_2 only in fig (a) & from Y_1^* to Y_2^* in (b). There is a larger $\uparrow$ in inc. in (b) wh. has a steep IS curve, altho' the $\uparrow$ in the rri is greater from i_1^* to i_2^* in (b).
* rri $\uparrow$ Inv $\downarrow$

This is 'o' mvt is more sensitive to rri in (a) leading to a flatter IS curve; altho' the $\uparrow$ in the rri is smaller from i_1 to i_2 in (a) the ΔG $\uparrow$ in govt. spending crowds out a large amt of Inv't & the inc. rises only from Y_1 to Y_2 . Thus FP is less effne, larger is the value of b. {if b=0, no crowding out?}

III The larger the mult. $\Delta c = \left[\frac{1}{1-c(1-t)} \right]$, the larger is the shift of the IS curve,



2nd pt ✓ Before 2nd pt: // why, larger is k , it wld $\Rightarrow$ that a v. large $\uparrow$ in md wld result when Y rises & hence a larger $\uparrow$ in rai wld be needed to maintain money mkt eqm. Thus, a large k wld make FP less effne. (large $\uparrow$ in $rai \Rightarrow$ large fall in inc) $\Rightarrow$ large fall in income.

check? $Y \uparrow, TSD \uparrow, EDM, large \uparrow in rai, Inv \downarrow, Y \downarrow$

From the desk of (29) DATE

impact of shift to larger FP is most effne

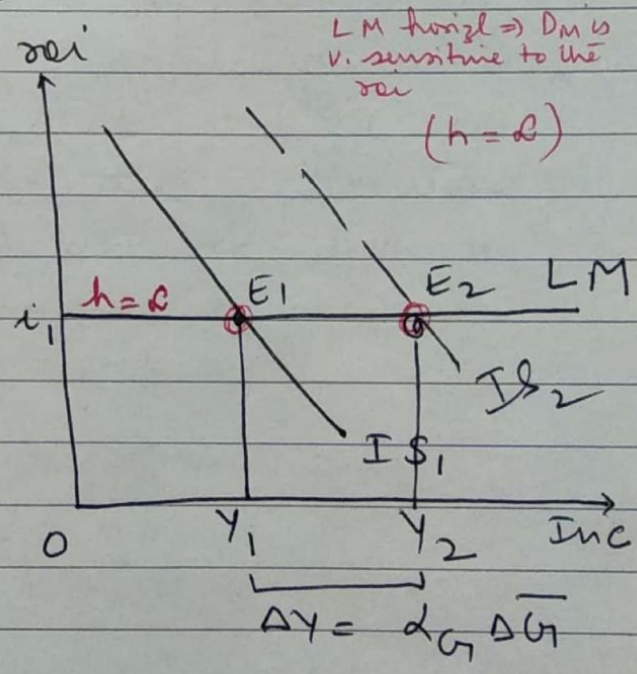
the more the int. rate $\uparrow$ & inc. $\uparrow$ (i.e. $\Rightarrow$ & int rates $\uparrow$ more). (This is given the slope of the "TWO EXTREME CASES" ISC^∞ with Δ in slope of ISC also ses

"Effectiveness of the Fiscal policy in the Pure Keynesian Range of the LM curve"

"The Liquidity TRAP"

- In the pure Keynesian range of the LM curve the eco' is in the liq. trap & the LM curve is horizontal.

In this case, an $\uparrow$ in govt spending has its full mult effect on the eqm level of income. Shown here $\rightarrow$



An $\uparrow$ in govt spending shifts IS curve from IS_1 to IS_2 and the inc. rises from Y_1 to Y_2 . $Y_1, Y_2 = \Delta G / \Delta b$. This $\Rightarrow$ 3

that the $\uparrow$ in inc. = the magnitude of the shift of the IS curve

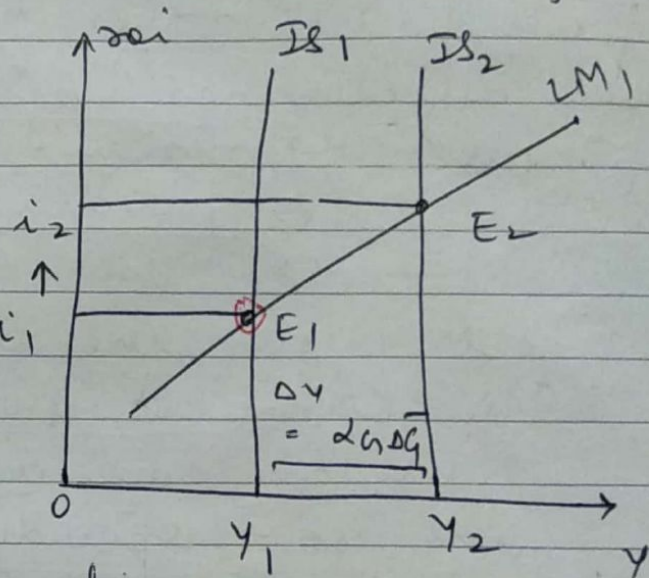
This is $\because$ there is no Δ in the rai when govt spending rises. There is $\because$ no $\uparrow$ in the rai & the full mult effect on the eqm level of inc. is there. Thus, there is no crowding out effect (Δ in govt exp $\rightarrow$ no Δ in $rai \rightarrow$ no Δ in gov spending $\rightarrow$ there is $\because$ no dampening of the effects of Δ in govt exp on income). FP is most effne. (EMP has no effect on eqm)

No Δ in rai
No crowding out

$h=0, b=0$ — ~~Maximum~~ No crowding out
 horiz LM $\leftarrow$ vertical ISC $\Delta Y = \Delta G / \Delta i$
 $b=0$ (30)

Not there in book
 FP is most effne

There is another case in wh. no crowding out takes place. shown $\rightarrow$
 Here, ISC is vertical.
 The $\Delta \bar{G} \uparrow$ in govt spending shifts the ISC stward. Altho' the r_{oi} rises from i_1 to i_2 , r_{ic} rises from y_1 to y_2 , ΔY equals $\Delta \bar{G}$ shift of the IS. There is no crowding out $\because$ inv. spending is not related to the r_{oi} .
 so $\uparrow$ in r_{oi} doesn't reduce inv. spending.



(ie $b=0 \therefore \text{slope} = \infty$)
 $\Rightarrow \text{slope} = \frac{1}{b \Delta i} = \frac{1}{0} = \infty$

(Told you: Larger is $b \Rightarrow$ flatter is LM $\&$ FP is more effne
 Smaller is $b \Rightarrow$ steeper $\rightarrow$ FP is more effective
 If $b=0$, FP is most effne
 no crowding out)

$\left\{ \begin{array}{l} \uparrow \bar{G}, \uparrow \bar{A}, \uparrow AD, Y \uparrow \\ Y \uparrow, \underline{D_m \uparrow}, i \uparrow \text{res} \\ Inv \downarrow, Y \downarrow \end{array} \right\}$

$$AD = \bar{A} + C(1-t)y - bi \quad \checkmark$$

$$(31) \quad Y = \bar{A} + C(1-t)y - bi$$

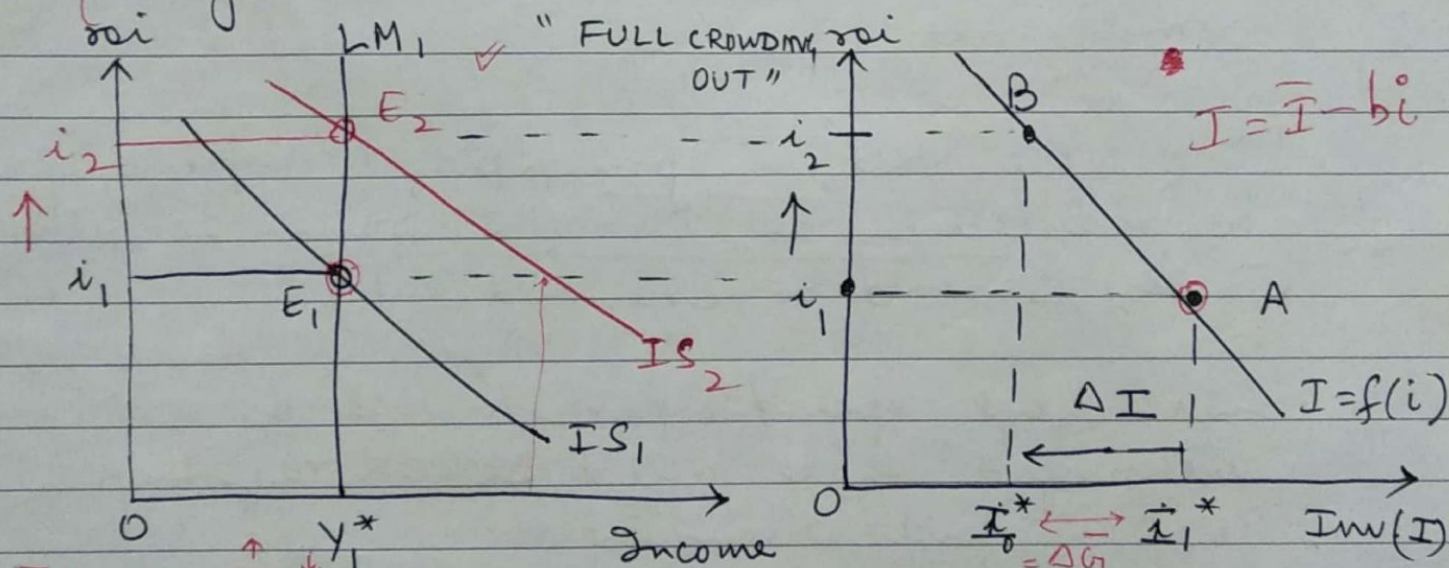
SS 18

From the desk of

Effectiveness of the Fiscal Policy DATE (5)

in the classical range of the LM curve:
"The Classical case & full crowding out"

If the dd for money is interest inelastic we shall have a vertical LMC. In this case, an $\uparrow$ in govt spending has no effect on the eqm level of income & increases only the int. rate. Shown here $\rightarrow$



$$\bar{A} = \bar{C} + C\bar{TR} + \bar{G} + \bar{I}$$

$\uparrow$ in $\bar{G}$ leads to $\uparrow$ in $\bar{A}$ (no Δ in income) $\Rightarrow \bar{A}$ is same $\Rightarrow \uparrow$ in $\bar{G}$ must be $= \downarrow \bar{I}$

when the LMC is vertical, say, LM_1 , & there is an $\uparrow$ in govt spending, the ISC shifts from IS_1 to IS_2 . Eqm pt shifts from E_1 to E_2 with no Δ in the eqm in c . (It stays at Y_1^*), but the rai rises from i_1 to i_2 . This $\uparrow$ in the rai from i_1 to i_2 crowds out the int. sensitive Inv, wh. falls from I_1^* to I_0^* . This $\downarrow$ in Inv. is equal to the $\uparrow$ in govt spending $\Delta \bar{G}$. Thus, there is full (since there is no change in income/output, $\uparrow \bar{G} = \downarrow \bar{I}$).

(32)

crowding out. (shown in fig(b))

So we've seen that in case of a vertical LMC, the $\uparrow$ in G shifts the IS curve to the rt, but has no effect on income. If the dd for money is not related to the r implied by a vertical LMC, there is a unique level of inc Y_1^* at wh. the money mkt is in eqm.

(* Note that, in principle, C^r spending cld be reduced by an $\uparrow$ in the r - so both I & C^r wld be crowded out).

Since govt spending is $\uparrow$ & g^p is unchanged, there must be an offsetting redn in $priv$ spending.

In this case, $\uparrow$ in r crowds out an amt of $priv$ invt spending (can reduce C^r also). equal to $\uparrow$ in govt spending.

Thus, there is full crowding out if the LMC is vertical.

$G \uparrow$, Y same

same

$$\bar{A} = \bar{C} + c \bar{T}R + \bar{I} + \bar{G}$$

$\downarrow$ $\uparrow$

I can now summarize the effectiveness of the fiscal policy (in the 3 ranges of the LM) in raising the level of income. - explained in fig.

i, A → Key range

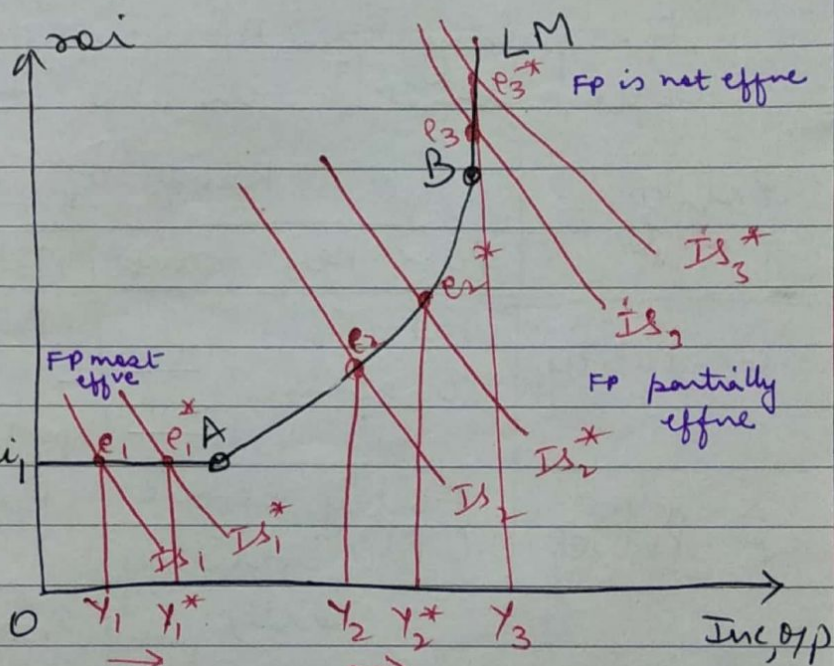
AB → Intermed "

BLM → Classical range

Initial IS Cs are

IS_1 , IS_2 & IS_3 .

↑ in govt spending causes ISC to shift to IS_1^* , IS_2^* & IS_3^* .



The fiscal policy is fully effve in the Key" range as inc res from Y_1 to Y_1^* ($= d_G \Delta G$). Thus, the full effect of mult is realized. (Since r, i doesn't rise, Inv doesn't fall, no crowding out)

The FP is partially effve in the intermed range as inc. res only from Y_2 to Y_2^* . There is an ↑ in the int rate from $e_2 Y_2$ to $e_2^* Y_2^*$ leading to a crowding out effect.

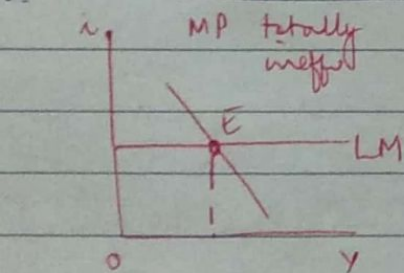
The FP is totally ineffve in the classical range as inc. remains at Y_3 . There is an ↑ in the r, i from $e_3 Y_3$ to $e_3^* Y_3^*$ which fully

(34)

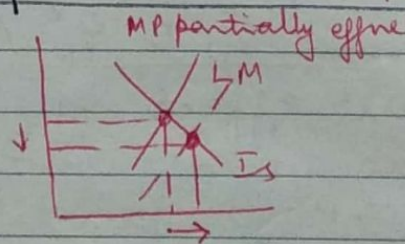
crowds out pub Inv. There is thus full crowding out in the classical range

Thus, the relative effectiveness of mon. & F. policy in the 3 ranges of the LMC is summarised in the table:

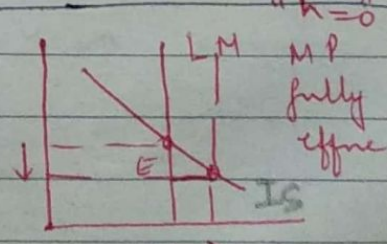
Policy	<u>Range of the LM curve</u>		
	Pure Key ⁿ range	Intermed range	Classical range
Mon. Policy	Totally ineffective <i>LMC is horizl</i>	Partially effne <i>LMC is upwd sloping</i>	Fully effective <i>(LMC is vertical)</i>
F. Policy	Fully effne (NO crowding out) <i>LMC is horizl</i>	Partially effne Fully is not <i>LMC is upwd sloping</i>	Totally ineffective (full crowding out)



$$\Delta i = 0, \Delta Y = 0$$



$$\Delta Y < \frac{1}{k} \Delta \left(\frac{\bar{M}}{\bar{P}} \right)$$



$$\begin{aligned} \textcircled{2} \Delta Y &= \Delta \left(\frac{\bar{M}}{\bar{P}} \right) \\ \Delta Y &= \frac{1}{k} \Delta \left(\frac{\bar{M}}{\bar{P}} \right) \\ &= \text{shift of the LM C} \end{aligned}$$

Q1) Numerical illustr (of effuence of the FP in the intermed. range) — Partial crowding out
 given

$$L = 0.20Y - 5i$$

$$M = 100$$

$$C = 40 + 0.8YD$$

$$TA = 50$$

$$G = 50$$

$$I = 140 - 10i$$

Det. the IS-LM eqns. Find the eqm level of inc & rei. Sup the govt spending res from 50 to 80. Det. the new eqm level of inc & rei. Show graphically. Comment on the ↑ in inc & the magnitude of the shift of the IS curve.

Ans. Equate $L = M$ to det. the LM eqn.

$$0.20Y - 5i = 100$$

$$0.2Y = 100 + 5i$$

$$Y = 500 + 25i \quad \text{--- LM, eqn}$$

Equate $Y = C + I + G$ to det. IS, eqn.

$$Y = 40 + 0.8(Y - 50) + 140 - 10i + 50$$

$$0.2Y = 190 - 10i$$

$$Y = 950 - 50i \quad \text{--- IS,}$$

Det. Eqm inc & rei.

In eqm, $IS_1 = LM$

(36)

$$950 - 50i = 500 + 25i$$

$$450 = 75i$$

$$i_1 = 6\%$$

$$\text{when } i = 6\%, Y_1 = 950 - 50(6) = 650$$

$i_1 = 6\%$

$Y_1 = 650$

LM curve is repd by $Y = 500 + 25i$
IS₁ " " $Y = 950 - 50i$

Eq^m is at E₁ (intersec. pt)

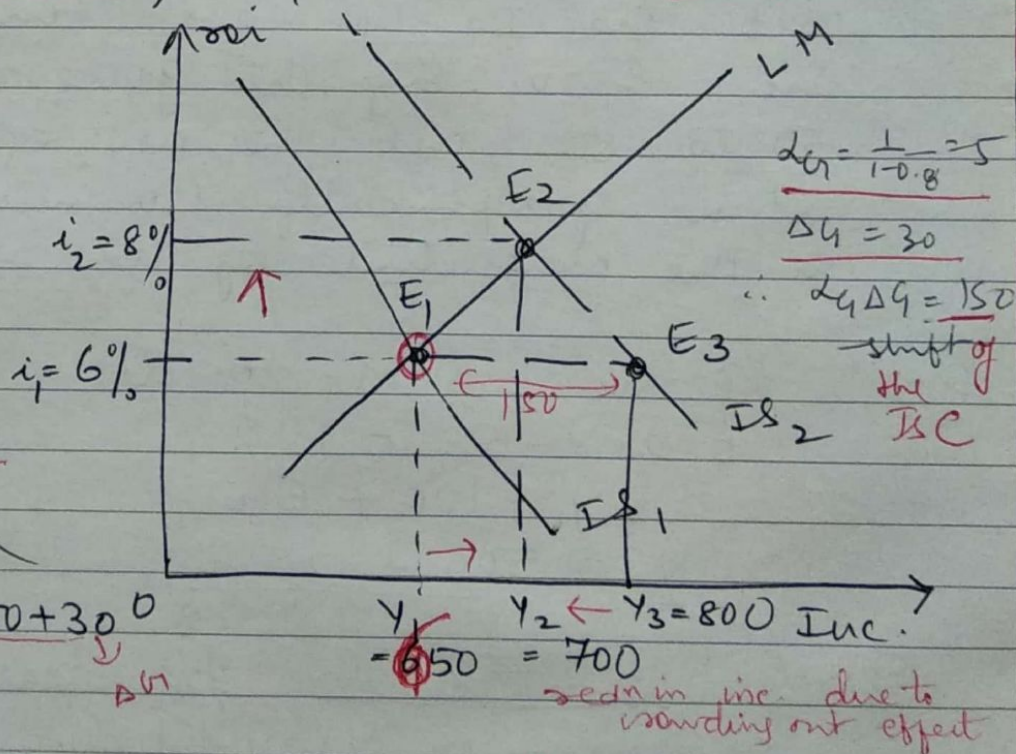
Eq^m w.r.t $i_1 = 6\%$, eq^m inc. = $Y_1 = 650$

when the G. spending res from 50 to 80, the new IS₂ curve is repd by

$$Y = C + I + G + AG$$

$$Y = 40 + 0.8(Y - 50)$$

$$+ 140 - 10i + 50 + 30 \Delta G$$



$$0.2Y = 220 + 10i$$

$$Y = \frac{220}{0.2} - \frac{10}{0.2}i$$

$$Y = 1100 - 50i$$

IS₂

LM curve: $Y = 500 + 25i$

To get new eq^m w.r.t 8% inc, equate IS₂ = LM (same) New eq^m at E₂

(37)

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(LM)

DATE

(58)

21

(8)

ie

$$1100 - 50i = 500 + 25i$$

$$75i = 600$$

$$i_2 = \underline{8\%}$$

$$Y_2 = 1100 - 50(8) = \underline{700}$$

$$k_g = \frac{1}{1-c}$$

$$= \frac{1}{1-0.8} = \frac{1}{0.2}$$

$$= \frac{10}{2} = 5$$

Thus, the $\uparrow$ in govt spending has been

able to $\uparrow$ the inc from 650 to 700.

The $\uparrow$ in rri is from 6% to 8%. This $\uparrow$ in

the rri has crowded out part sector Inv.

The inv. falls from 80 to 60.

$$\text{Extent of crowding out} = \text{Shift of } IS_c - \Delta Y = \frac{150}{150} - \frac{50}{50} = \underline{100}$$

$$I_1 = 140 - 10i_1 \Rightarrow 140 - 10(6) = \underline{80}$$

$$I_2 = 140 - 10i_2 \Rightarrow 140 - 10(8) = \underline{60}$$

The $\downarrow$ in invt ($-\Delta I$) reduces inc. to

the extent of

$$-(k_g \Delta I) = - \left[\left(\frac{1}{1-0.8} \right) \Delta I \right]$$

$$\Delta Y = k_g \Delta G$$

$$k_g = \frac{\Delta Y}{\Delta I}$$

$$\Rightarrow \Delta Y = k_g \Delta I$$

$$\Delta Y = (5) \Delta I$$

In case, the rri hadn't $\uparrow$ ed from 6% to 8% ie rri had remained at 6%, & given the IS_2 curve, the $\uparrow$ in income

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(38)

wld've been $Y = 1100 - 50(i_1)$ — D_2
(ie $650 + 150 = 800$) $\Rightarrow Y = 1100 - 50(6) = \underline{800}$

Thus, the inc. wld've been $800 (Y_3)$ &
 $\uparrow$ in inc. wld've been $Y, Y_3 (=150)$.

However, the partial crowding out reduces
inc. to the extent of 100. ($Y_2 Y_3$ is the redn
in inc. due to crowding out effect).

Thus, inc. rises only from Y_1 to Y_2
ie from 650 to 700.

(39)

Classical cases full crowding out

$$\frac{\Delta L}{\Delta i} = 0$$

$$(h=0)$$

(59)

DATE

(9)

22

Q2) Numerical illustn (of effneness of FP in the classical range).

given $L = 0.20 Y$

$$M = 200$$

$$C = 90 + 0.8 Y_D$$

$$TA = 50$$

$$G = 50$$

$$I = 140 - 5i$$

Derive IS_1 & LM eq^s

Find eq^m inc & i . Sup the govt spending rises from 50 to 70. Det. new eq^m inc & i . Show graphically. Comment on the $\uparrow$ in inc & the magnitude of the shift of the IS curve

Here $h=0$
 $R=0.2$

Ans: Equate $L = M$ to det LM eqⁿ.

$$0.2 Y = 200$$

$$\Rightarrow Y = 1000$$

LM eqⁿ

Equate $Y = C + I + G$ to det. IS_1 eqⁿ

$$Y = 90 + 0.8 Y_D + 140 - 5i + 50$$

$$Y = 90 + 0.8(Y - 50) + 140 - 5i + 50$$

$$0.2 Y = 240 - 5i$$

$$Y = 1200 - 25i$$

 IS_1

In eq^m, $IS_1 = LM$

$$\Rightarrow 1200 - 25i = 1000 \Rightarrow 200 = 25i$$

$$\Rightarrow i = 8\%$$

(40)

$i_1 = 8\%$
 $Y_1 = 1000$

when $i = 8\%$, $Y_1 = 1200 - 25(8) = 1000$.
LM C is repd by $Y = 1000$.

IS_1 is repd by $Y = 1200 - 25i$. E_{pm} is
at E_1 . $E_{pm} \text{ rate} = 8\%$ & $E_{pm} \text{ inc} = 1000 = Y_1$

when G rises from 50 to 70,
new IS_2 is given $i_2 = 12\%$
by $\rightarrow$

$Y = C + I + G + \Delta G$

$Y = 90 + 0.8(Y - 50)$

$+ 140 - 5i + 50 + 20$

$G = 70$

$0.2Y = 260 + 5i$

$IS_2: Y = 1300 + 25i$ — — IS_2

LM $\rightarrow$ LM C $\rightarrow$ $Y = 1000$

New E_{pm} at E_2 , New $i = 12\% = i_2$

new $Y = 1000 = Y_1$

$\left[\begin{array}{l} i_2 = 12\% \\ Y_2 = 1000 \end{array} \right]$

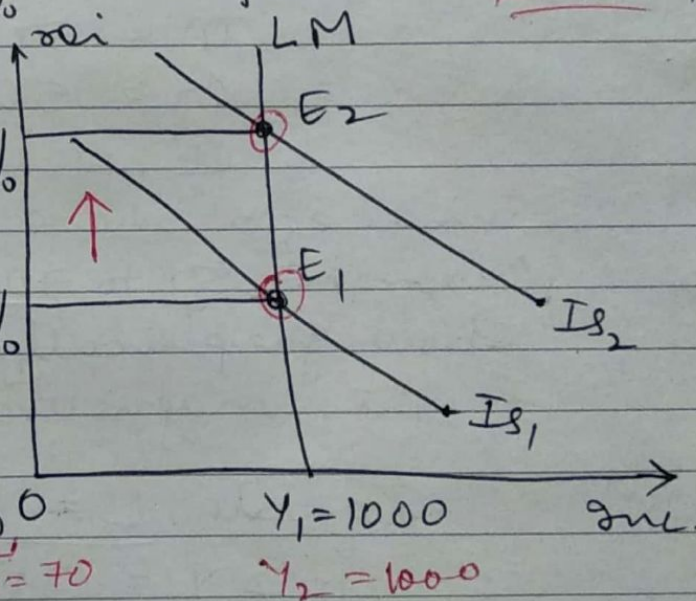
In E_{pm} , $IS_2 = LM$

$\Rightarrow 1300 - 25i = 1000$

$25i = 300$

$i_2 = 12\%$

$Y_2 = 1300 - 25(12) = 1000 = Y_1$



Thus, the ↑ in G_1 hasn't been able to ↑ the 'mic. level'. The ↑ in the oai is from 8% to 12% has completely crowded out the pub sector Inv. The Inv. falls from 100 to 80.

$$I = 100, \text{ when } i = 8\% \\ I = 80, \text{ " } i = 12\%$$

$$I_1 = 140 - 5i_1$$

$$= 140 - 5(8) = 100$$

$$I_2 = 140 - 5i_2 = 140 - 5(12) = 80$$

The ↓ in Inv ($-\Delta I$) reduces inc. to the extent of

$$\Delta Y = -(\alpha_G(\Delta I)) = -\left[\left(\frac{1}{1-0.8}\right) \cdot \Delta I\right]$$

reverse multiplier will operate

$$\frac{\Delta Y}{\Delta I} = \frac{1}{1-c} = \frac{1}{1-0.8} = \frac{1}{0.2} = 5$$

$$= -(1) \times 20 = -100$$

The ↑ in govt sp. shdine caused an ↑ in mic. eqn to

$$\Delta G_1 \cdot \Delta G_1 = 5 \times 20 = 100$$

Thus, there is full crowding out.

The Inv falls from 100 to 80 as G_1 rises from 50 to 70.

The Δ in mic. is '0'

$$(-\Delta I) \alpha_G = (+\Delta G_1) \alpha_G = -20 \times 5$$

$$= +20 \times 5$$

↓ in mic. due to ↓ in Inv

↑ in mic. due to ↑ in G_1

(42)

In this case, the complete crowding out occurred because the demand for money was totally unrelated to the real interest rate (i.e. demand for money was fully inelastic).
 $ie k = 0$

$k = 0$? $\frac{\Delta L}{\Delta i} = 0$
 what does it $\Rightarrow$ here?

$$\uparrow \bar{G} \rightarrow \uparrow AD \rightarrow \uparrow Y$$

$$\uparrow Y \rightarrow \uparrow M_d \xrightarrow{EDM} \uparrow r_{oi} \rightarrow \downarrow I \quad \left(\begin{array}{l} \uparrow I \\ = \uparrow G \end{array} \right)$$

$$\uparrow Y = \downarrow Y$$

$$\uparrow M_d \Rightarrow EDM \Rightarrow \text{Sell bonds}$$

$$\Rightarrow S_B \uparrow \Rightarrow P_B \downarrow \Rightarrow r_{oi} \uparrow$$

$$\Rightarrow I \downarrow \Rightarrow Y \downarrow$$

$$\text{Since } \downarrow I = \uparrow G$$

$$\Delta Y = 0$$

lot of $\uparrow$ in r_{oi} is needed to reduce D_M & $D_M = C_M$ & money mkt to clear

(43)

(61)

From the desk of

Is Crowding out Likely?

DATE

(11)

OR "the possibility of crowding out"

An economy at full emp't level of O/P

Case I: So far we have been assuming that the economy is operating at less than full emp't level or the O/P is below the full emp't level & that the prices are given & remain unchanged. In these cond'ns, when fiscal expansion increases AD , firms can $\uparrow$ the level of O/P by hiring more workers. But in a fully emp'd economy, firms cannot $\uparrow$ the level of O/P.

2 FE
Prices und'cd

$\uparrow AD$
 $\uparrow O/P$
hire more workers

Fully employed economy

$\uparrow D \rightarrow \uparrow P$

$\uparrow G$

①

given pc level P_1 , $[\uparrow in G, \uparrow A, IS \text{ shifts to } i_1]$

As the pc level rises,

real money balances in the economy fall,

(ie An $\uparrow$ in $\bar{P}$ reduces the ratio $\bar{M}/\bar{P}$). This causes LM Curve to shift leftward,

leading to hr. interest rates, reduced Inv't which in turn fully

(Process: $\uparrow in G, \uparrow AD, \uparrow P, \bar{M}/\bar{P} \downarrow, LM \text{ shifts (left)}, i \uparrow, IS \downarrow, \Delta Y$

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②

Fiscal Expansion leads to a shift of the IS curve

($\uparrow AD$)

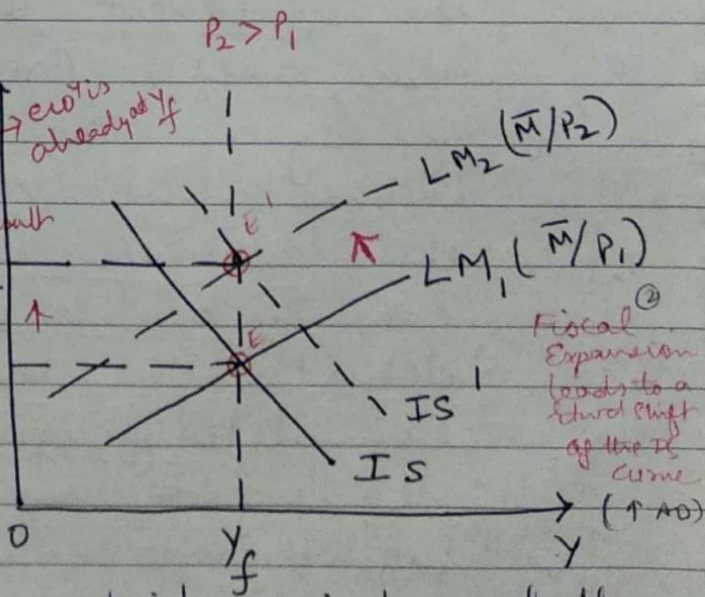
$P_2 > P_1$

$LM_2 (\bar{M}/P_2)$

$LM_1 (\bar{M}/P_1)$

IS'

IS



crowding out becomes a much more realistic possibility in fully empd economies $\therefore$ firms cannot then $\uparrow$ O/P

(44)

crowds out the initial $\uparrow$ in agg dd

[LM curve shifts leftward raising the r_{oi} until the initial increase in Agg. dd gets completely crowded out.]

Full crowding out

So, shown that: $\uparrow$ in $G \rightarrow$

$\uparrow$ in AD $\Rightarrow \uparrow$ in $P \Rightarrow \downarrow \bar{M}/\bar{P}$

$\Rightarrow$ LM shifts left $\Rightarrow \uparrow$ in $r_{oi} \Rightarrow \downarrow$ in AD

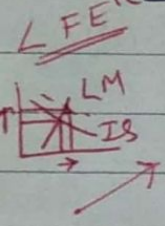
& no Δ in income $\rightarrow$ full crowding out

Above case is like where LM curve is vertical & there is full crowding out

Case II: An economy at less than full-empt

we've seen if LM is vertical there is full crowding out

In an economy with unemployed resources (i.e. working at less than full emp level), there will not be full crowding out $\because$ the LM schedule is not, in fact, vertical. A fiscal expansion does raise the interest rates but eqm level of income also rises. Crowding out $\therefore$ is a matter of degree. The increases in Agg dd raises income, but with the rise in income the level of saving rises. The savings can $\therefore$ be used to finance the budget deficit. The budget deficit need not be completely financed by sale of bonds leading to an $\uparrow$ in the r_{oi} , wh is not significant enough to completely crowd out put investment. In simple words, budget



Fiscal Expansion
 $\rightarrow \uparrow Y$
 $\rightarrow \uparrow r_{oi}$

$\uparrow AD \rightarrow \uparrow Y$

$\rightarrow$ Sav $\uparrow$

Excess $\uparrow \rightarrow \uparrow Md$

$\rightarrow EDM \rightarrow \uparrow r_{oi}$

$\rightarrow P_b \downarrow \rightarrow \uparrow Y$

$I \downarrow$

ie put inv $\downarrow$

45 From the desk of

$\uparrow G, \uparrow AD, \uparrow Y, D_m \uparrow, S_B \uparrow$ (govt sells bonds to finance the budget deft), $P_B \downarrow, i \uparrow, I \downarrow, Y \downarrow$
 But as $Y \uparrow$, Sav. also $\uparrow$ wh. can be used to finance the deft. The budg. deft need not be completely financed by sale of bonds. So complete crowding out is not there. i doesn't $\uparrow$ much. Inv doesn't fall much. $\therefore$ of int. responsive money dd - Large deficits when financed thru red savings from red incomes will not cause complete crowding out i.e. Inv. will not fall ^{too} much.

DATE - (12)

we have seen earlier that in a 3 sector economy, (in eqn)

$$\uparrow S = I \downarrow + (G + TR - TA) \uparrow$$

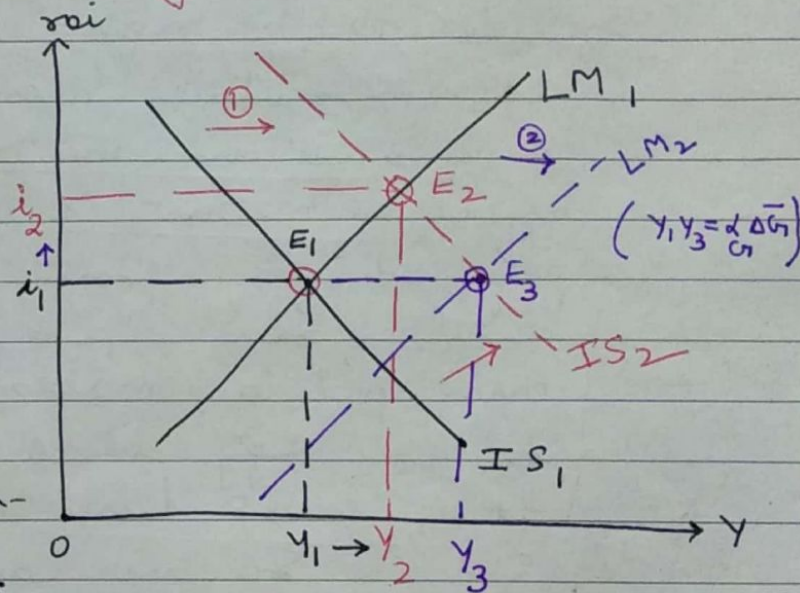
Here, the term $G + TR - TA$ is the budget deft (i.e. $Exp - Rev$). Now from above eqn, an $\uparrow$ in the deficit, given saving, must lower investment. In simple terms, when the deficit rises, the govt has to borrow to pay for its excess spending. That borrowing uses part of household's savings, leaving less avail. for firms to borrow to finance their Inv. spending. (But if saving rises with a govt spending increase because income rises then $\therefore$ there need not be a one for to one decline in investment. (In an economy,

with unempt, crowding out is incomplete because the red dd for gds raises real income & $Y \uparrow$; saving rises & interest rates do not rise so much (because of interest-responsive money dd) that they choke off investment.

(crowding out is less when $S \uparrow$ with $\uparrow$ in income i.e. $\uparrow G \rightarrow \uparrow Y \rightarrow \uparrow S$) $\therefore$ Govt spending $\therefore$ doesn't $\uparrow$ much $\therefore$ Inv. doesn't fall much

$k = \frac{\Delta h}{\Delta i}$
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✓ Monetary Accommodation of Fiscal Expansion or monetizing Budget deficits.



we know that a rise in the interest rate can reduce the effectiveness of an expansionary fiscal policy then the crowding out effect. ($\uparrow G$, $\uparrow AD$, $\uparrow Y$ $\uparrow$ dd for real balances, EDM, $\uparrow$ interest rates as $P_B \downarrow$, $Inv \downarrow$, $Y \downarrow$) (Excess supply Bonds)

when authorities use only the fiscal policy, the IS curve shifts from IS_1 to IS_2 & the eqm level of income rises only from Y_1 to Y_2 . This is because $\uparrow$ interest rates dampen investment, reducing the full multiplier effect of the fiscal policy. (The $\uparrow$ in the r or i crowds out invt spending).

The central bank can however prevent the crowding out effect by preventing the interest rate from rising as $\uparrow$ in the money supply is by printing more money. It can accommodate the fiscal expansion by an $\uparrow$ in the money supply i.e. by printing more money. (Fiscal expansion is financed by the C bank by printing more money to buy the bonds with wh. the govt pays for its dft.) Printing more money increases

(47)

the nominal ss of money^(M) shifting the LM Curve to the right from LM_1 to LM_2 . The accommodative monetary policy thus prevents a change in the rr (& there is no adverse effect on Inv. & no crowding out). The eqm pt. shifts from E_2 to E_3 & eqm income $= Y_3$, rr i_1 . Thus, in this case, the mon. policy makes a significant contribution to the Agg dd & income. The int. rates remain at i_1 & the level of G.P. rises to Y_3 . There is no

Same
 $rr = i_1$
 $Y = Y_3$

crowding out

$\Delta Y = \Delta G, \Delta M$

So we can say that a "monetary policy is accommodating when, in the course of a fiscal expansion, the money ss is $\uparrow$ ed in order to prevent interest rates from increasing."

An accommodating mon. policy is also called monetizing budget deficits, because the central bank prints money to buy the bonds with which the govt. pays for its deficit // (or govt finances its deficit)

we have seen that when central bank accommodates a fiscal expansion both IS & LM curves shift to the right. G.P. will clearly $\uparrow$ but int. rates need not rise at all. Accordingly, there need not be any adverse effects on Inv.

So it's possible that with unemp^t, when there is a possibility for op to expand, int rates need not rise at all when govt spending rises, & there need not be any crowding out.

So when there is monetary accommodation of fiscal expansion, int rates don't rise at all when $G \uparrow$ & there is no crowding out.

Case I $\rightarrow$ Eco^y at Full emp^t level of op
— there is complete crowding out

Case II $\rightarrow$ Eco^y at $<$ FE level
& Partial crowding out

Case III $\rightarrow$ Eco at $<$ FE level
but no crowding out of monetary accomⁿ of Fiscal Expansion.