

TUTORIAL 8 - FISCAL POLICY

1. 'IF A COUNTRY HAS POSITIVE GOVERNMENT DEBT, IT MUST RUN A ~~DEFICIT~~ PRIMARY BUDGET SURPLUS.' IS THIS ALWAYS TRUE?

WE COULD INTERPRET "MUST" AS MEANING "IN ORDER TO ACHIEVE ~~A SUSTAINABLE~~ SUSTAINABLE DEBT POSITION"

LET US FIRST CONSIDER AN ECONOMY WITH ZERO REAL GROWTH AND ZERO INFLATION (IE PRICE STABILITY). IN THAT CASE, SUSTAINABLE DEBT WOULD REQUIRE THAT THE NOMINAL DEBT STOCK (B) IS NOT INCREASING. IF WE LET i BE THE NOMINAL INTEREST RATE, G BE NOMINAL GOVERNMENT SPENDING, T BE NOMINAL TAXES THEN THE TIME DERIVATIVE OF B WILL BE:

$$\dot{B} = G - T + iB - H$$

WHERE H IS THE STOCK OF NOMINAL HIGH POWERED MONEY. IF THE DEFICIT CANNOT BE FINANCED BY PRINTING MONEY, THEN (SINCE $H = 0$):

$$\dot{B} = G - T + iB$$

$$\Rightarrow \dot{B} \leq 0 \Rightarrow G - T + iB \leq 0 \Rightarrow (T - G) \geq iB$$

SO SINCE $(T - G)$ IS THE PRIMARY SURPLUS, IT IS THEN TRUE THAT IF $B > 0$ AND $i > 0$ THEN $(T - G) > 0$ ^{IS REQUIRED} IN ORDER TO STABILIZE DEBT.

NOW CONSIDER AN ECONOMY WITH INFLATION AND REAL GDP GROWTH. DEFINE b AS THE DEBT TO GDP RATIO OR IN OTHER WORDS THE DEBT BURDEN:

$$b = \frac{B}{PY}$$

P = NOMINAL PRICE LEVEL
 Y = REAL GDP.

LET $\pi = \frac{\dot{P}}{P}$ AND $g = \frac{\dot{Y}}{Y}$. ALSO $r = i - \pi$ (FISHER EQUATION.)

NOW WE CAN USE THE PRODUCT RULE TO DERIVE AN EQUATION FOR \dot{b} , THE TIME DERIVATIVE OF THE DEBT BURDEN:

$$B = b P_y \Rightarrow \dot{B} = (\dot{b})(P_y) + b(\dot{P}_y + \dot{P}_y)$$

$$\Rightarrow \frac{\dot{B}}{P_y} = \dot{b} + b \left(\frac{\dot{P}_y}{P_y} \right) + b \left(\frac{\dot{P}_y}{P_y} \right)$$

$$\Rightarrow \frac{\dot{B}}{P_y} = \dot{b} + b g + b \pi \quad [2]$$

DIVIDING EQUATION [2] BY P_y GIVES US:

$$\frac{\dot{B}}{P_y} = \frac{G-T}{P_y} + i \left(\frac{B}{P_y} \right)$$

$$\Rightarrow \frac{\dot{B}}{P_y} = d + i b \quad [3] \text{ WHERE } d = \frac{G-T}{P_y}$$

(THE PRIMARY DEFICIT TO GDP RATIO).

NOW, EQUATING [2] AND [3]:

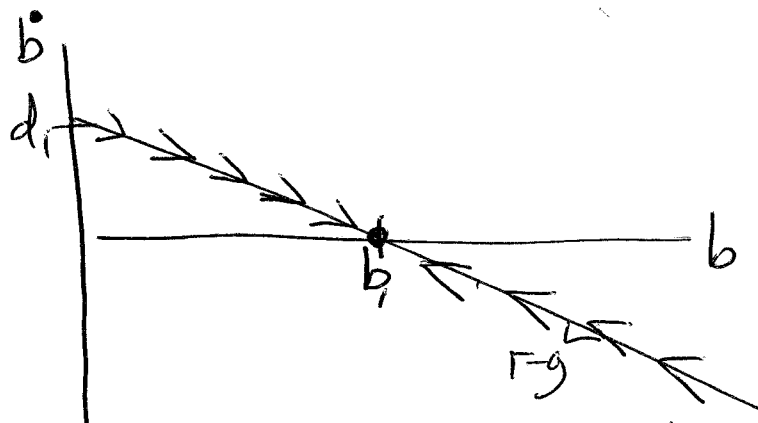
$$\dot{b} + b g + b \pi = d + i b$$

$$\Rightarrow \dot{b} = d + b(i - \pi - g)$$

$$\Rightarrow \dot{b} = d + b(r - g)$$

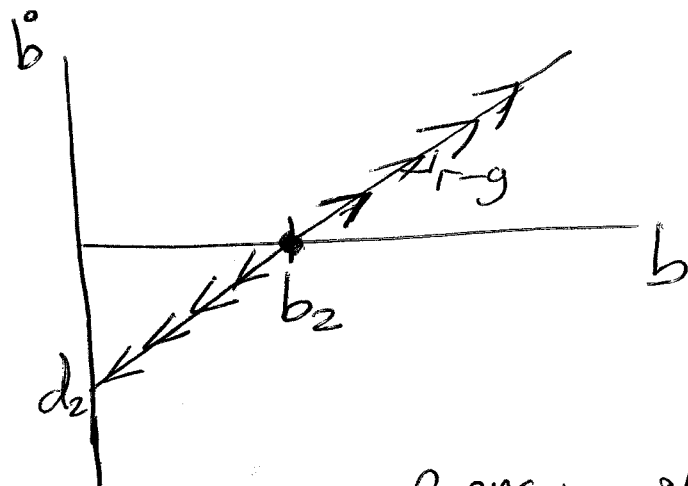
THERE ARE 2 CASES TO CONSIDER!

$[g > r]$:



POSITIVE PRIMARY DEFICIT d_1 LEADS TO STEADY STATE DEBT BURDEN OF \bar{b} . IN THIS CASE, THE TIME STATEMENT WOULD NOT BE TRUE!

$$\boxed{r > g}$$



GIVEN CURRENT DEBT BURDEN OF b_2 , A PRIMARY SURPLUS OF SIZE $|d_2|$ MUST BE RUN IN ORDER TO ACHIEVE $\dot{b} \leq 0$.

ALGEBRAICALLY, THE SUSTAINABLE DEBT RULE IS NOW:

$$\begin{aligned} \dot{b} \leq 0 &\Rightarrow d + b(r-g) \leq 0 \\ &\Rightarrow \frac{G-T}{P_Y} \leq -b(r-g) \end{aligned}$$

WE MIGHT LIKE TO CONVERT G AND T TO REAL GOVERNMENT SPENDING $g = \frac{G}{P}$ AND $t = \frac{T}{P}$. ALSO, TO ENABLE AUTOMATIC STABILIZERS TO OPERATE, WE MIGHT WANT TO CYCLICALLY ADJUST G AND T (SEE QUESTION 3). SO, THE SUSTAINABLE DEBT RULE WOULD THEN BECOME:

$$\begin{aligned} \frac{\bar{G} - \bar{T}}{\bar{P}_Y} &\leq -b(r-g) \\ \Rightarrow \frac{\bar{g}_P - \bar{t}_P}{\bar{P}_Y} &\leq -b(r-g) \Rightarrow \frac{\bar{g}}{\bar{g}} \leq \frac{\bar{t}}{\bar{g}} - b(r-g) \end{aligned}$$

SO, IF $b > 0$ AND $r > g$ THEN ~~SOME~~ SOME OF THE GDP THAT IS TAXED MUST BE SPENT ON SERVING THE DEBT INSTEAD OF ON GOVERNMENT SPENDING.

FINALLY, WE MIGHT ONLY WANT TO COUNT CURRENT GOVERNMENT SPENDING. THEN WE HAVE: $\boxed{\frac{\bar{g}_c}{\bar{g}} \leq \frac{\bar{t}}{\bar{g}} - b(r-g)}$ WHERE $\bar{g} = \bar{g}_c + \bar{g}_f$

2 WHAT IS PERFECT BIAS, AND WHY IS IT A PROBLEM?

LET US FIRST CONSIDER A WORLD WHERE REARDIAN EQUIVALENCE HOLDS, AND THEN THE RESULTS OF PROPARNG THE ^{REQUIRED} VARIOUS ASSUMPTIONS:

- ① PERFECT CAPITAL MARKETS
- ② ALL TAXES LUMP SUM
- ③ INFINITELY-LIVED CONSUMERS (OR "DYNASTIES")
- ④ ALL GOVERNMENT DEBT HELD BY DOMESTIC CONSUMERS

⑤ GOVERNMENT BORROWS AT SAME INTEREST RATE AS PRIVATE SECTOR.

⑥ (HOMOGENOUS CONSUMERS - SIMPLIFYING ASSUMPTION.)

IN THIS WORLD, TAX CUTS / RISES CAUSE NO CHANGE IN THE WELFARE OR CONSUMPTION DECISIONS OF THE REPRESENTATIVE CONSUMER. HENCE THERE WOULD BE NO PERFECT ^{BIAS} ~~BIAS~~ BUT IT ALSO WOULDN'T MATTER ANYWAY IF THERE WAS!

NOW CONSIDER DROPPING THE LUMP SUM TAXATION ASSUMPTION. THE TIMING OF TAXES NOW DOES AFFECT THE REAL ECONOMY. THE GOVERNMENT'S DECISION OF WHETHER TO TAX OR BORROW IN ORDER TO FUND CURRENT SPENDING WILL NOW REFLECT THE PREFERENCES OF THE REPRESENTATIVE CONSUMER. IF THEY ARE ~~LESS~~ MORE IMPATIENT THEY WILL BE WILLING TO SPEND MORE NOW WITHOUT RAISING TAXES, HENCE THERE WOULD BE A FORM OF DEFICIT BIAS, BUT THIS WOULD BE EFFICIENT AND WELFARE-MAXIMISING (MAKES

THE ~~ONLY~~ REPRESENTATIVE CONSUMER IS "MYOPIC" SO THAT THE SOCIAL PLANNERS SHOULD "OVERRIDE" THEIR PREFERENCES.)

CONSIDER NOW DROPPING ASSUMPTION (3). THERE WILL NOW BE AN INTERGENERATIONAL EXTERNALITY

SINCE A TAX CUT TODAY WILL LEAD TO ~~HIGHER~~ CONSUMPTION TODAY AND SO REDUCED INVESTMENT AND CROWDING OUT:

$$T \downarrow \Rightarrow Y = C + \underset{\substack{\uparrow \\ \cdot}}{I} + \underset{\substack{\downarrow \\ \cdot}}{G} \Rightarrow K \downarrow$$

THE FUTURE CAPITAL STOCK, AND HENCE FUTURE PRODUCTIVITY WILL BE REDUCED, THUS HARMING FUTURE GENERATIONS.

IF TAXES ARE NON-LUMP-SUM, FUTURE TAX RISES ALSO ~~CREATE~~ CREATE A NEGATIVE EXTERNALITY VIA THE ADDITIONAL SUPPLY-SIDE DISTORTION.

FINALLY, CONSIDER DROPPING ASSUMPTION (6) AS WELL. IF CONSUMERS ARE AFFECTED IN DIFFERENT WAYS BY ^{TAXES AND} GOVERNMENT SPENDING THEN THE FACT THAT ANY SPENDING OR TAX CUT TODAY BENEFITS A ~~FINITE~~ GROUP AT THE EXPENSE OF MANY MORE CURRENT AND FUTURE TAXPAYERS CREATES ADDITIONAL POLITICAL DISTORTIONS AWAY FROM ^{SOCIALLY} OPTIMAL FISCAL POLICY DUE TO THE FACT THAT POLITICAL ACTION (EG. IN THE FORM OF LOBBYING TO INFLUENCE THE GOVERNMENT) IS A COLLECTIVE PUBLIC GOOD TO THOSE WHO BENEFIT AND A COLLECTIVE "PUBLIC BAD" TO THOSE WHO ARE HARMED. SMALLER CONCENTRATED GROUPS ARE MORE EASILY ABLE TO OVERCOME THE FREE-RIDER PROBLEM AND ENSURE PROVISION OF A GROUP PUBLIC GOOD THAN ARE LARGER MORE DIFFUSE GROUPS.

3. WHAT ARE AUTOMATIC STABILIZERS, AND WHY MIGHT THEY BE PREFERABLE TO DISCRETIONARY ACTION?

AUTOMATIC STABILIZERS ARE FISCAL PROVISIONS / POLICIES THAT ~~THE~~ OFFSET SHOCKS TO CONSUMPTION AND/OR GOVERNMENT SPENDING AND THUS REDUCE THE VARIABILITY OF OUTPUT DUE TO DEMAND FLUCTUATIONS. THEY WOULD BE UNNECESSARY IN A WORLD OF PERFECT CAPITAL MARKETS SINCE CONSUMERS COULD BORROW OR SAVE TO PROVIDE PRIVATE "AUTOMATIC STABILIZERS". UNLIKE DISCRETIONARY FISCAL POLICY, AUTOMATIC STABILIZERS HAVE A ZERO INSIDE LAG SINCE THEY ARE ALREADY "BUILT IN" TO EXISTING FISCAL POLICY. THE CLASSIC EXAMPLE OF AN AUTOMATIC STABILIZER WHICH OPERATES ON CONSUMPTION VIA CHANGES IN TAXES IS THE PROPORTIONAL INCOME / CONSUMPTION TAX BUT THE BENEFITS SYSTEM AND PROGRESSIVE TAX BANDS ALSO AUGMENT THE AUTOMATIC STABILIZERS FROM TAXES / TRANSFERS (WHICH ARE NEGATIVE TAXES). TO THE EXTENT THAT GOVERNMENT SPENDING ON GOODS AND SERVICES IS COUNTERCYCLICAL (E.G. SPENDING ON UNEMPLOYMENT OFFICE SERVICES AND FREE SCHOOL MEALS FOR LOW INCOME CHILDREN) THEN ~~THE~~ AUTOMATIC STABILIZERS ALSO OPERATE THROUGH G AS WELL AS C . TAKING THE SIMPLEST CASE OF A FLAT RATE PROPORTIONAL INCOME TAX, WE CAN SHOW HOW SHOCKS ARE "DAMPENED" USING A KEYNESIAN MULTIPLIER MODEL.

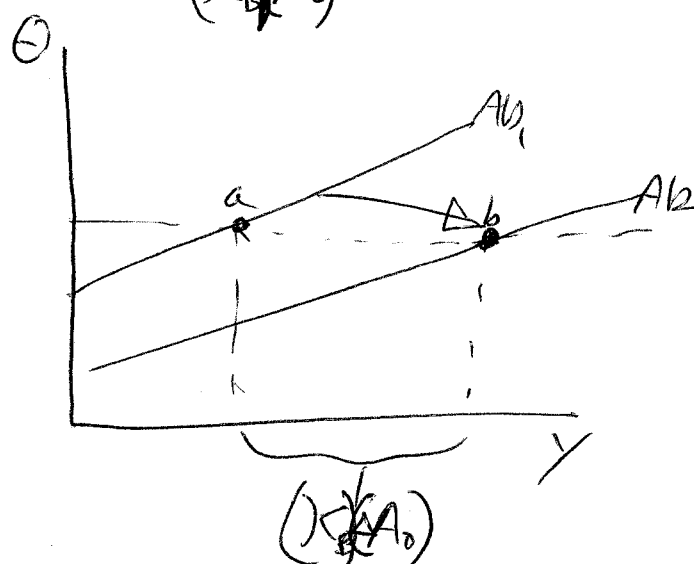
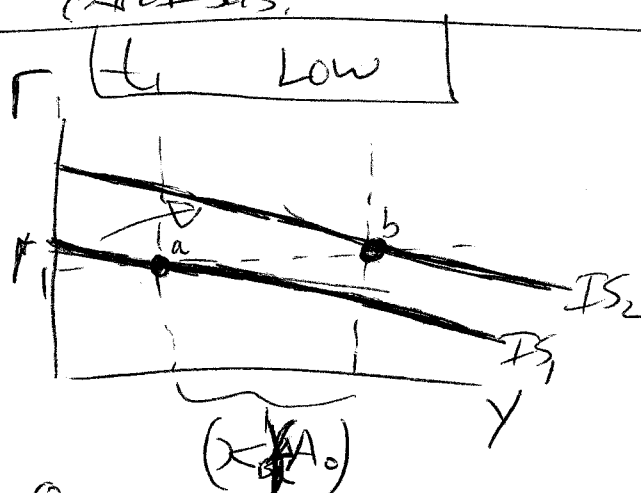
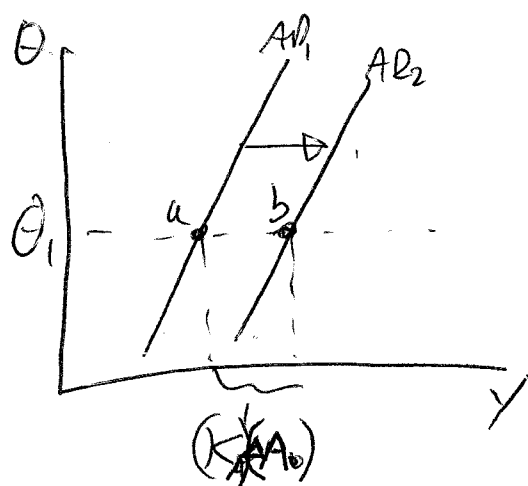
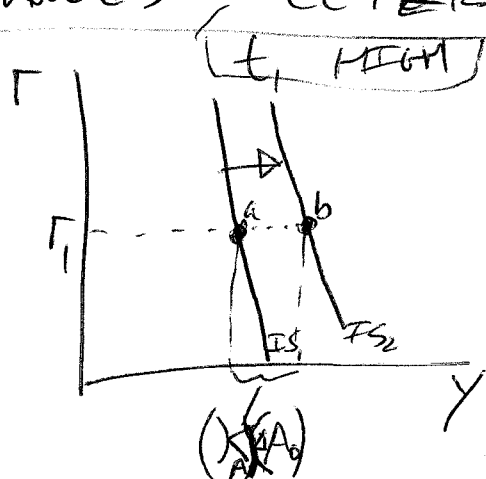
$$Y = C_0 + c_1 (Y - t_0 - t_1 Y) + I_0 + G_0 + X_0 - M_1 Y$$

WHERE THE SHORT RUN REAL INTEREST RATE AND REAL EXCHANGE RATE ARE ASSUMED TO BE CONSTANT;

$$\Rightarrow Y(1 - c_1 + t_1 c_1 + m_1) = (C_0 + I_0 + G_0 + X_0 - c_1 t_0)$$

$$\Rightarrow Y = \left(\frac{1}{s_1 + t_1 c_1 + m_1} \right) (A_0) \Rightarrow Y = K A_0$$

A HIGHER VALUE OF t_1 MEANS A LOWER VALUE OF K AND A STEEPER IS/AD CURVE. THIS IMPLIES A SMALLER SHIFT WHEN A_0 CHANGES, CETERIS PARIBUS:



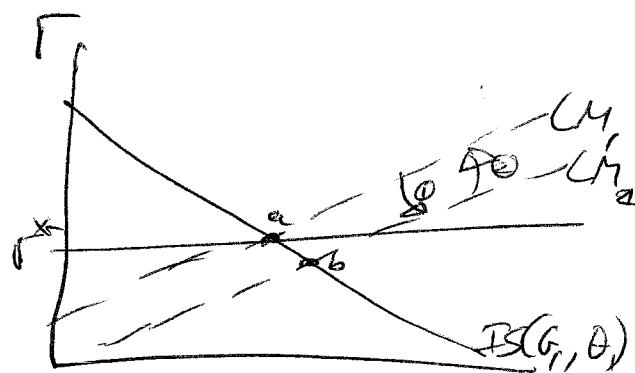
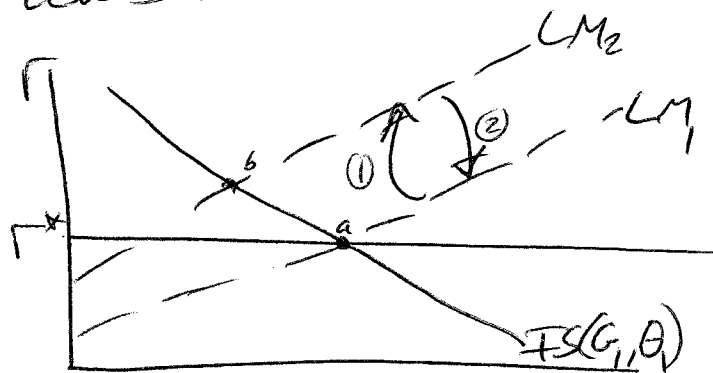
WHEN, IF AT ALL, SHOULD FISCAL POLICY BE USED ALONGSIDE MONETARY POLICY IN THE SHORT TERM STABILIZATION OF THE ECONOMY? WHAT ROLE DOES THE EXCHANGE RATE REGIME PLAY IN YOUR ANSWER? HOW WOULD YOUR ANALYSTS BE AFFECTED IF AN ECONOMY WERE TO JOIN A CURRENCY UNION?

FIRSTLY WE SHOULD DISTINGUISH BETWEEN DISCRETIONARY FISCAL POLICY AND AUTOMATIC STABILIZERS. AUTOMATIC STABILIZERS HAVE ZERO INSIDE LAG AND USUALLY A MINIMAL OUTSIDE LAG SINCE THEY PUT MONEY "STRAIGHT INTO PEOPLE'S POCKETS". DISCRETIONARY FISCAL POLICY, ON THE OTHER HAND, TENDS TO BE CUMBERSOME IN HAVING LONG INSIDE LAGS AND OFTEN SIGNIFICANT OUTSIDE LAGS. ON THE OTHER HAND, MONETARY POLICY HAS QUITE A SHORT INSIDE LAG (SINCE CENTRAL BANKS SET INTEREST RATES EVERY MONTH) BUT QUITE LONG OUTSIDE LAGS (SINCE IT TAKES ~~ABOUT~~ ABOUT 2 YEARS FOR INTEREST RATE CHANGES TO HAVE THEIR MAXIMUM EFFECT ON OUTPUT).

THUS WE CAN ARGUE THAT DISCRETIONARY FISCAL POLICY SHOULD ONLY BE USED IN EXTREME SITUATIONS (SUCH AS AT THE ZERO LOWER BOUND FOR NOMINAL INTEREST RATES) WHEREAS MONETARY POLICY AND AUTOMATIC FISCAL STABILIZERS SHOULD BE USED FOR MORE "EVERYDAY" DEMAND MANAGEMENT.

CLEARLY IN A CLOSED ECONOMY, THE INTERACTION BETWEEN FISCAL AND MONETARY POLICY IS IMPORTANT IN DETERMINING INTEREST RATES, OUTPUT, INFLATION AND THE PATH OF GOVERNMENT DEBT.

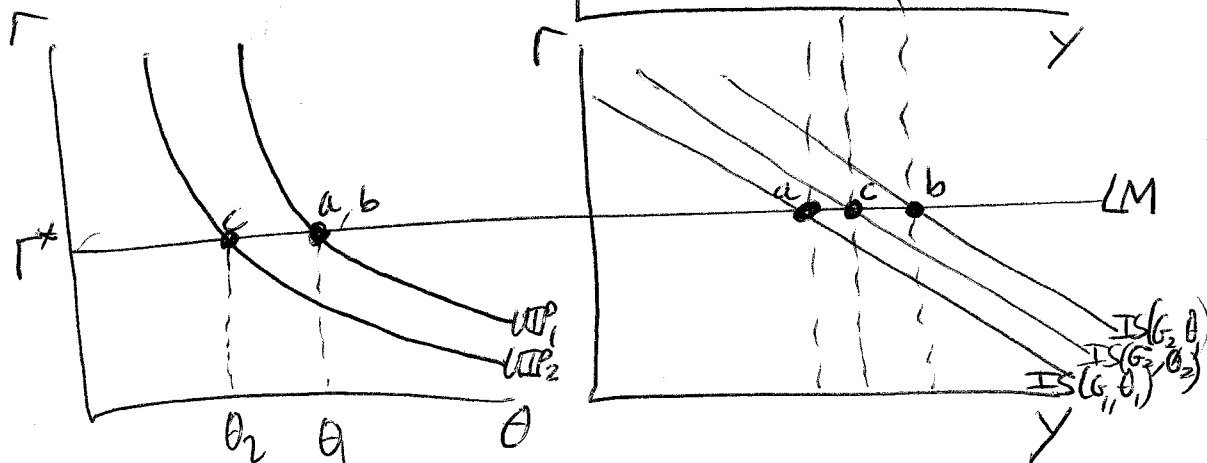
IN AN OPEN ECONOMY WITH PERFECT CAPITAL MOBILITY, THE MUNDELL-FLEMING / SALTER-SWAN MODEL SHOWS THAT ~~THE~~ MONETARY POLICY WILL BE COMPLETELY INEFFECTIVE ~~UNDER~~ UNDER A FIXED EXCHANGE RATE REGIME SINCE THE CENTRAL BANK WILL BE FORCED TO EXPAND / CONTRACT THE MONEY SUPPLY IN ORDER TO PREVENT NOMINAL APPRECIATION / DEPRECIATION DUE TO MASSIVE CAPITAL INFLOWS / OUTFLOWS:



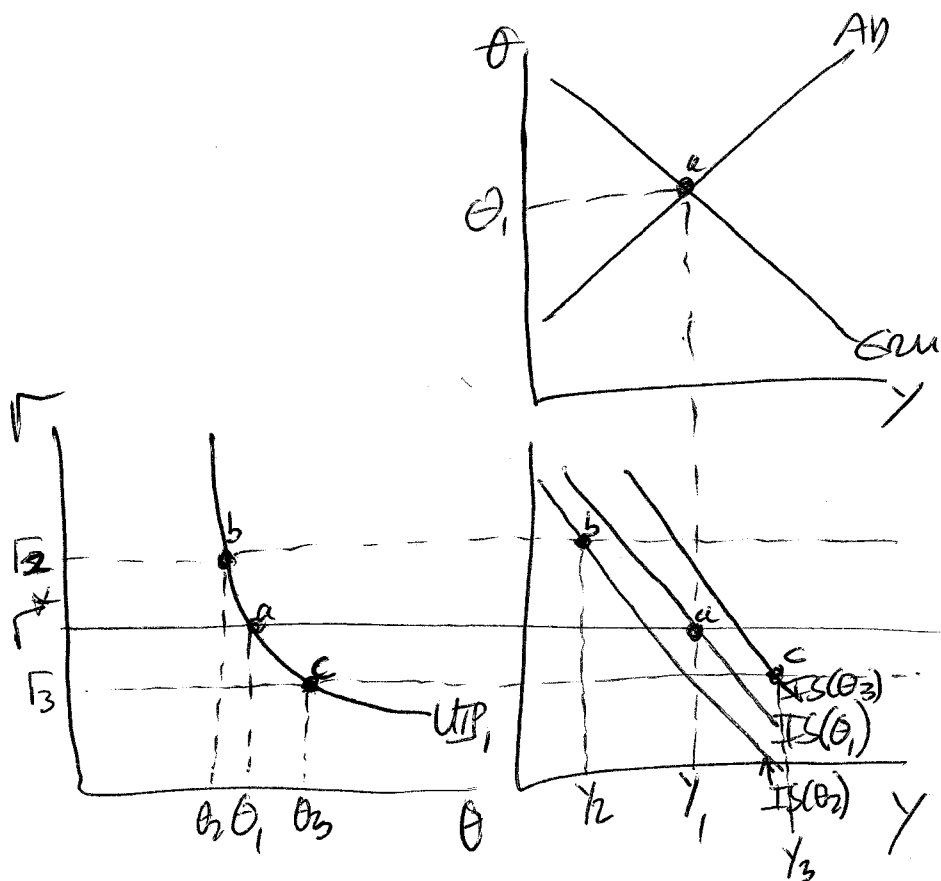
UNDER A FLOATING EXCHANGE RATE REGIME, ALTHOUGH THE MUNDELL-FLEMING MODEL SUGGESTS THAT FISCAL POLICY WILL BE COMPLETELY INEFFECTIVE, THE UIP MODEL SHOWS OTHERWISE. THE PRECISE IMPACT ON OUTPUT, THE REAL EXCHANGE RATE AND THE INTEREST RATE OF A FISCAL EXPANSION DEPENDS UPON ① WHETHER IT IS PERMANENT OR TEMPORARY ② WHETHER THE CENTRAL BANK CHANGES THE INTEREST RATE OR NOT. ③ WHETHER THE IS CURVE IS "SLUGGISH" IN RESPONSE TO CHANGES IN COMPETITIVENESS.

IN THE DIAGRAM OVERLEAF, ASSUMING THE DOMESTIC REAL INTEREST RATE STAYS AT THE WORLD RATE r^* , THEN A TEMPORARY FISCAL EXPANSION TAKES THE ECONOMY TO POINT 'b', WHEREAS A PERMANENT FISCAL EXPANSION TAKES THE ECONOMY STRAIGHT

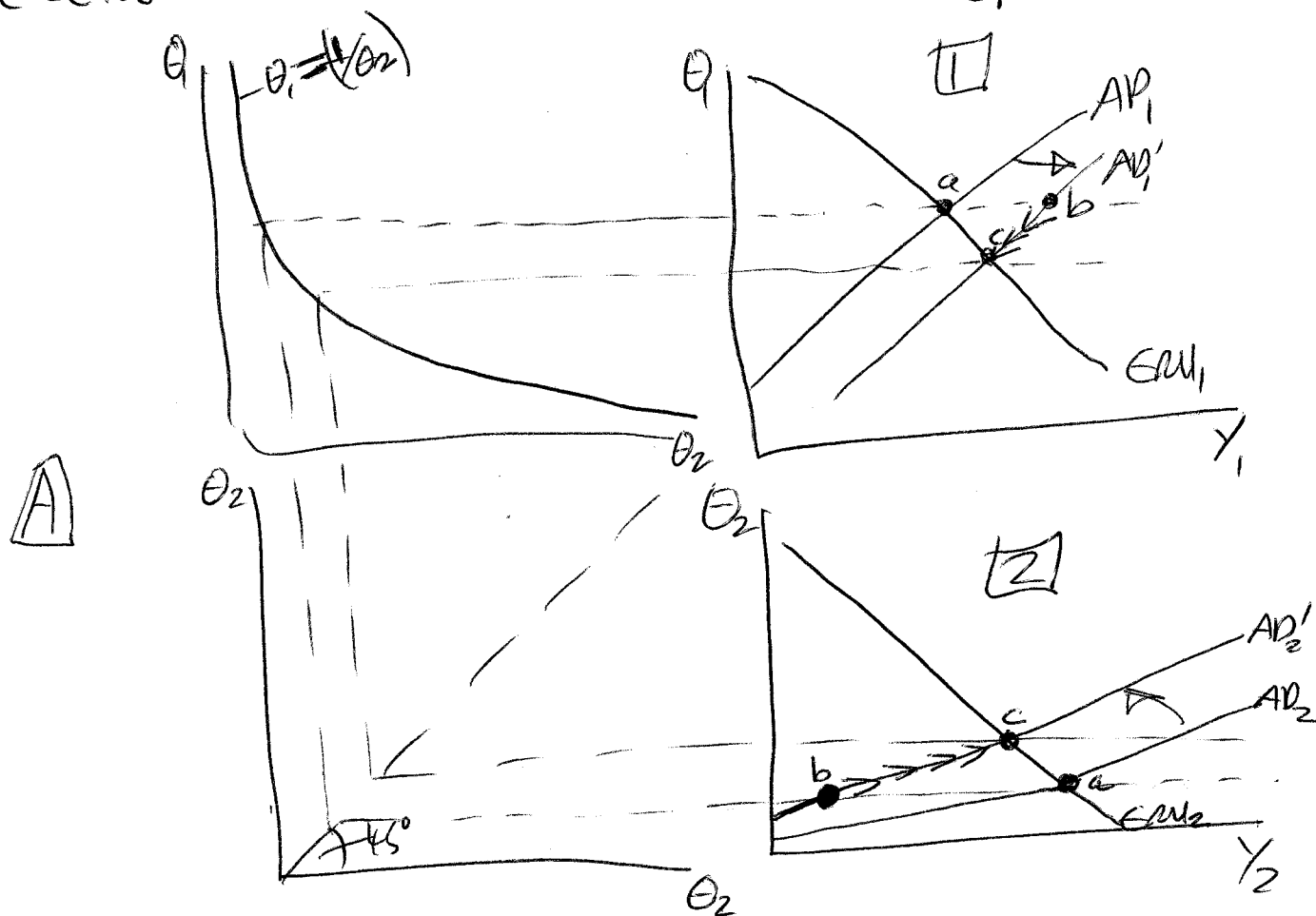
TO POINT C. IF THE IS CURVE IS "SUGGESTED", HOWEVER THEN EVEN A PERMANENT FISCAL EXPANSION TAKES THE ECONOMY TO POINT B IN THE SHORT RUN.



THE MIXTURE OF FISCAL AND MONETARY POLICY ALSO MATTERS UNDER A FLOATING EXCHANGE RATE REGIME, SINCE A TEMPORARY CHANGE IN DOMESTIC REAL INTEREST RATES AWAY FROM THEIR EQUILIBRIUM VALUES WILL NOW CAUSE OVERSHOOTING / UNDERSHOOTING.



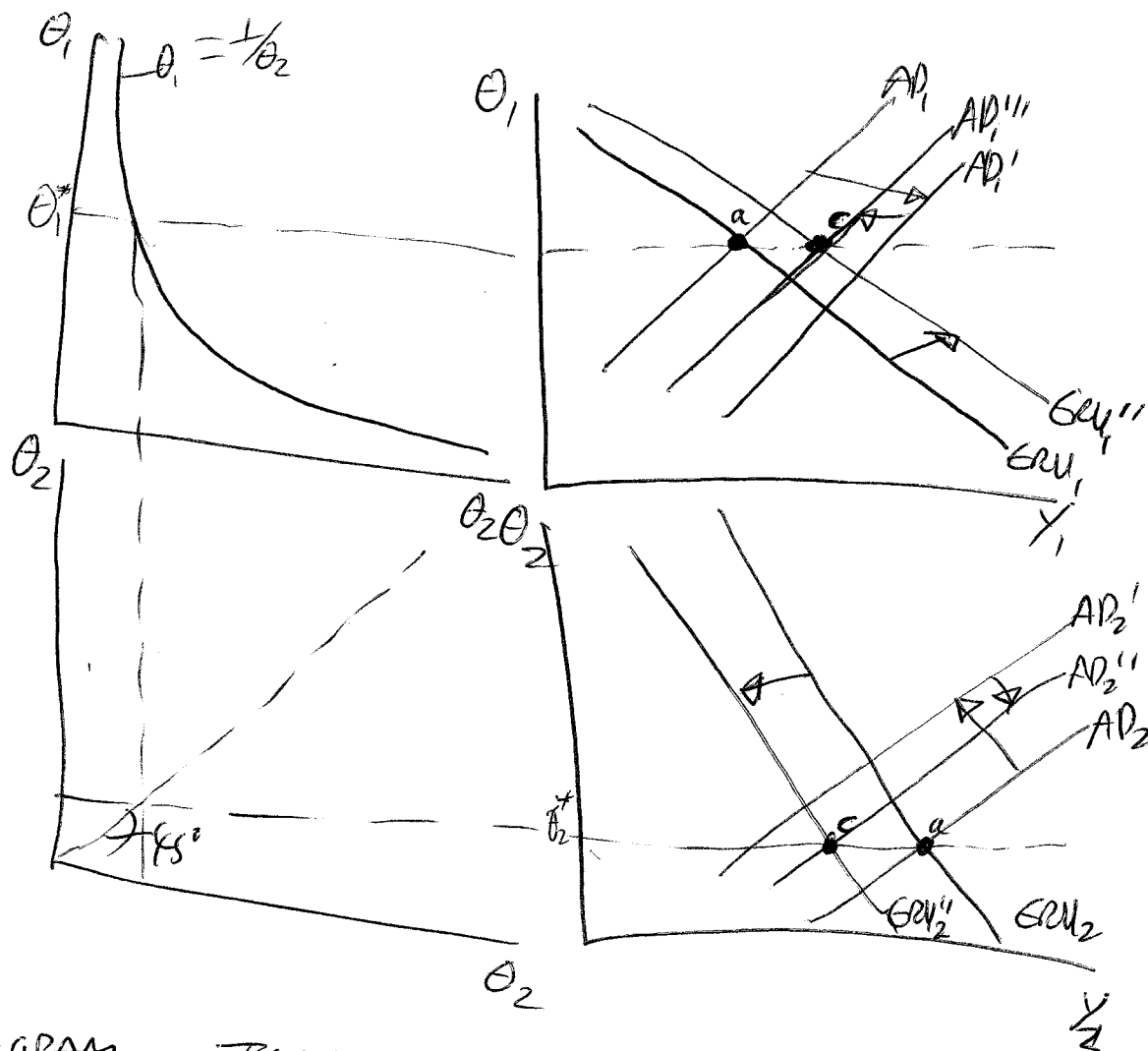
A CURRENCY UNION IS ESSENTIALLY A FIXED EXCHANGE RATE REGIME WHERE THE CURRENCY CANNOT BE REVALUED / DEVALUED THROUGH A CHANGE IN THE NOMINAL PEG. THE FLEXIBILITY COST BY HAVING A FIXED EXCHANGE RATE SYSTEM CAN BE ILLUSTRATED USING A SIMPLE MODEL OF AN ASYMMETRIC IS SHOCK (DEMAND SHOCK) OF TWO INTERDEPENDENT OPEN ECONOMIES SO THAT $\theta_2 = \frac{1}{\theta_1}$:



WHEN THE SHOCK HITS, AN ADJUSTMENT OF THE REAL EXCHANGE RATE IS NEEDED IN ORDER TO RETURN BOTH ECONOMIES TO MEDIUM RUN EQUILIBRIUM. UNDER FIXED EXCHANGE RATES THIS CAN ONLY OCCUR VIA A BOUT OF INFLATION IN ECONOMY [1] AND DISINFLATION IN ECONOMY [2]. ECONOMY [2] MUST SUFFER A RECESSION TO BRING DOWN RELATIVE PRICES AND RESTORE COMPETITIVENESS. THIS IS COSTLY AND PAINFUL.

A DEVALUATION OF ECONOMY 2 WOULD ENABLE A JUMP FROM b TO c BY REPEGGING FROM $\theta_2 = (E_2)(\frac{P_1}{P_2})$ TO $\theta_2 = (E_2')(\frac{P_1}{P_2})$ WHERE $E_2' > E_2$ (E IS THE PRICE OF CURRENCY 1 IN TERMS OF CURRENCY 2).

IN A CURRENCY UNION, REPEGGING IS NOT POSSIBLE SO THE ONLY WAY TO AMELIORATE THE SITUATION IN ECONOMY 2 WOULD BE MOBILITY OF LABOUR (TO SHIFT GRU_2 INWARDS AS WORKERS MOVE TO ECONOMY 1) OR FISCAL TRANSFERS:



THIS PROGRAM ILLUSTRATES A COMBINATION OF LABOUR MOVEMENT AND FISCAL TRANSFERS TO AVOID THE NEED FOR REAL EXCHANGE RATE ADJUSTMENT.

AS WELL AS THE RESPONSE TO ASYMMETRIC SHOCKS, CENTRAL FISCAL COORDINATION WILL ARGUABLY BE NECESSARY! ALSO BECAUSE!

① AT THE ZERO LOWER BOUND, FISCAL POLICY WILL HAVE POSITIVE EXTERNALITIES* AND SO WILL BE UNDERPROVIDED IN A DECENTRALIZED SET-UP.

(* DUE TO INTERCONNECTED AGGREGATE DEMAND)
NOTE THAT THIS APPLIES IN ALL EXCHANGE RATE REGIMES.

② FISCAL POLICY MAY ALSO BE ~~UNDER~~ OVER-PROVIDED DUE TO NEGATIVE EXTERNALITIES SINCE

A DEBT CRISIS IN ONE COUNTRY AFFECTS THE OTHER COUNTRIES WHICH TRADE WITH IT. ALTHOUGH THIS IS A PROBLEM IN ALL EXCHANGE RATE ^{SYSTEMS} IT IS WORSE IN A

~~CURRENCY~~ CURRENCY UNION SINCE ASYMMETRIC SHOCKS CAN "TRAP" WEAKER MEMBER ECONOMIES IN SITUATIONS OF LOW GROWTH AND HENCE A WORSENING DEBT POSITION. HENCE IT IS MORE LIKELY IN A CURRENCY UNION THAT A PROFLIGATE ^{OR WEAK} MEMBER WILL NEED TO BE BAILED OUT TO PREVENT "COLLATERAL DAMAGE" TO OTHER MEMBER ECONOMIES (I.E. GREECE, IRELAND).

SO, IN A SITUATION LIKE THE ONE ILLUSTRATED IN DIAGRAM A, BOND PRICES FOR ECONOMY 2 ARE LIKELY TO FALL, MAGNIFYING THE DEBT CRISIS AND FORCING IT TO LEAVE THE CURRENCY UNION AND DEFAULT ON ITS DEBTS SINCE IF IT LEAVES IT WILL DEPRECIATE RELATIVE TO THE CURRENCY UNION AND SO ITS REAL DEBT BURDEN WILL RISE SINCE IT OWES MONEY DENOMINATED IN THE SINGLE CURRENCY OF THE UNION.

AS A SIDE POINT NOTE THAT ALTHOUGH
DEBT CRISES WOULD BE LESS OF A PROBLEM
IN A ~~FIXED~~ EXCHANGE RATE SYSTEM
(AS OPPOSED TO A CURRENCY UNION)
BUT TO THE POSSIBILITY OF "REPEGGING"
TO ENABLE A "SOFT DEFAULT" AND A READJUSTMENT
OF REAL EXCHANGE RATES, THE PROBLEM
THOU INSTEAD BECOMES CURRENCY / FOREIGN
EXCHANGE CRISES SINCE IF SPECULATORS
IN FOREIGN EXCHANGE MARKETS EXPECT
A DEVALUATION, THEY WILL SELL THE
CURRENCY IN ANTICIPATION OF A CAPITAL
LOSS, AND THIS WILL PUT PRESSURE
ON FOREIGN EXCHANGE RESERVES AS THE
CENTRAL BANK BUYS ^{UP} DOMESTIC ^{CURRENCY} AND SELLS
FOREIGN CURRENCY IN ORDER TO RESIST
DEVALUATION. IN GENERAL, YOU CAN ONLY
CREDIBLY PEG TO ANOTHER CURRENCY IF

① YOU ARE WILLING TO ALWAYS SET THE
INTEREST RATES
SAME NOMINAL (AND REAL INTEREST RATES
IN THE MEDIUM RUN) ^{DESIRE THE IMPACT ON YOUR REAL ECONOMY}
AND ② THE CENTRAL
BANK WHOSE CURRENCY YOU ARE PEGGING
TO IS WILLING TO LEND YOU AN
UNLIMITED AMOUNT ^{OF THEIR CURRENCY IN ORDER} TO PROTECT THE
NOMINAL PEG. THE U.K.'S EXPERIENCE OF
PEGGING TO THE DOLLAR UNDER ^{THE} BRETTON WOODS
SYSTEM AND THE DEUTSCHMARK UNDER THE
E.R.M. IS THAT NEITHER OF THESE
CONDITIONS HAD IN PRACTICE!