

OVERVIEW OF FLEXIBLE PRICE OPEN ECONOMY - TUTORIAL 3

1. (a) WHAT IS THE RELATIONSHIP BETWEEN THE IS_{XM}/AD AND BT CURVES IN OUTPUT-COMPETITIVENESS SPACE?

THE AD CURVE IN THE SALTER/SWAN FRAMEWORK IS DERIVED FROM THE KEYNESIAN MULTIPLIER MODEL IN THE OPEN ECONOMY:

$$Y = C_0 + c_1(1-t_1)Y + I(r^*) + G_0 + Y^* + \theta\alpha - m_1Y$$

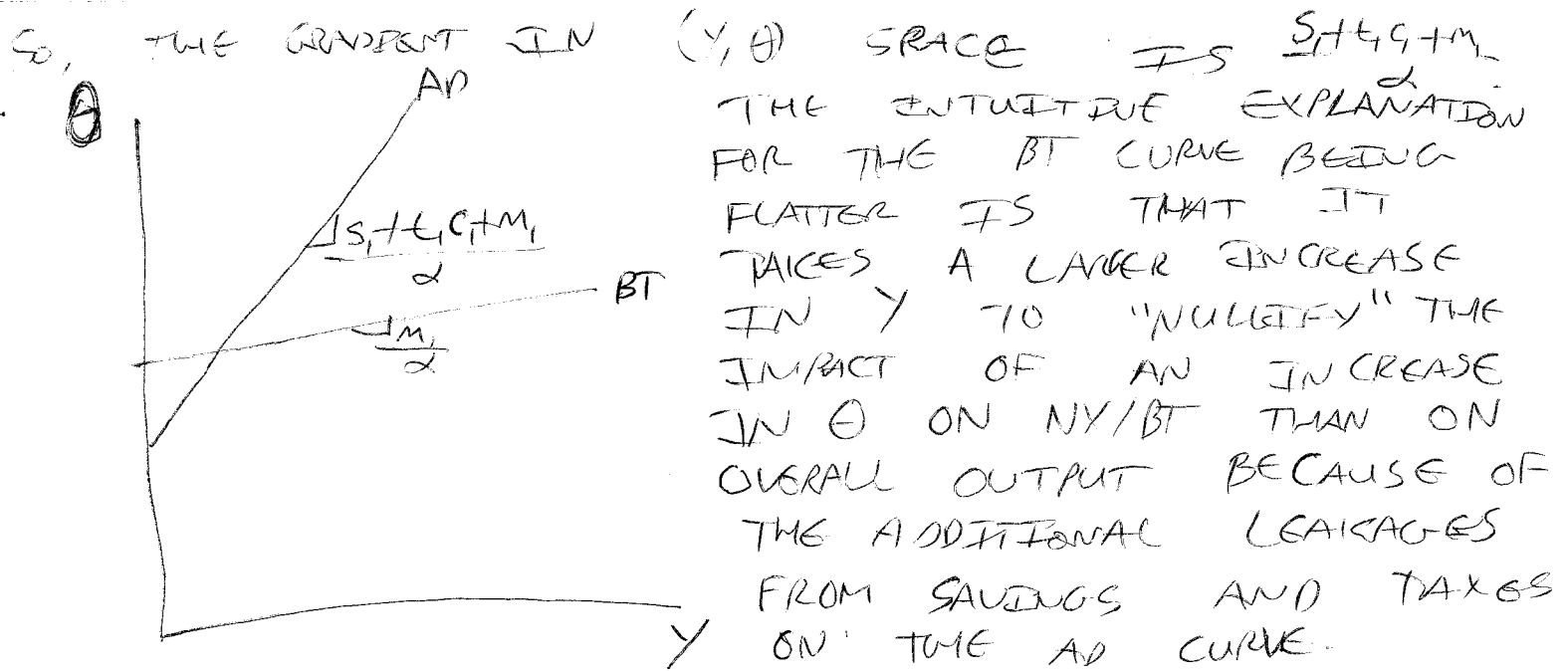
NOTE THAT $BT = NX = \theta\alpha - m_1Y$ (MPI) WHERE m_1 IS THE MARGINAL PROPENSITY TO IMPORT, $\alpha > 0$ IS A CONSTANT PARAMETER MEASURING THE SENSITIVITY OF OUTPUT AND EXPORTS TO THE REAL EXCHANGE RATE / COMPETITIVENESS.

$\theta = E\left(\frac{P^*}{P}\right)$ WHERE P^* IS THE FOREIGN PRICE LEVEL, P THE DOMESTIC PRICE LEVEL AND E IS THE PRICE OF FOREIGN CURRENCY IN TERMS OF DOMESTIC CURRENCY (E.G. $\frac{1}{1.6} = 0.625$ POUNDS TO BUY A DOLLAR). BY ASSUMING SUCH A LINEAR BT FUNCTION WITH A CONSTANT M.P.I. THEN WG GUARANTEE THAT THE MARSHALL-LERNER CONDITION HOLDS AND, MORE PRECISELY, THAT THE BT CURVE IS AN UPWARD-SLOPING STRAIGHT LINE, WITH Y^* (FOREIGN DEMAND) AS A SHIFT PARAMETER:

$$\begin{aligned} \text{BT CURVE} \Rightarrow BT=0 &\Rightarrow Y^* + \theta\alpha - m_1Y_{BT} = 0 \\ &\Rightarrow Y_{BT} = \frac{Y^* + \theta\alpha}{m_1} \end{aligned}$$

THUS WE CAN SEE THAT IN (Y, θ) SPACE, THE BT CURVE HAS GRADIENT $\frac{1}{m_1}$. MEANWHILE, THE AD CURVE $\Rightarrow Y(1 - c_1(1-t_1) + m_1) = (C_0 + I(r^*) + G_0 + Y^* + \theta\alpha)$

$$\Rightarrow Y = \frac{1}{s + 4c + m_1} (C_0 + I(r^*) + G_0 + Y^* + \theta\alpha)$$



Changes in Y^* also shift the AD curve (see below for more detail on these changes). In r^*, G_0, C_0 only shift the AD curve, not BT. Increases in t_1 or M , increase the gradient of AD. Increases in C_1 / decreases in S decrease the gradient of AD.

6) What determines the slope of the Aggregate Supply (AS) curve in output competitiveness space?

For simplicity let's assume that firms' pay a real wage which is fixed ^{in value} by the mark-up in terms of domestic currency: $\frac{W}{P} = \frac{1}{1+\alpha}$ (see notes for tutorial 4 on how to derive this).

However, workers spend a fraction ϕ of their ~~wages~~ wages on imports, so the price level they face is in fact $\phi P^* + (1-\phi)P$.

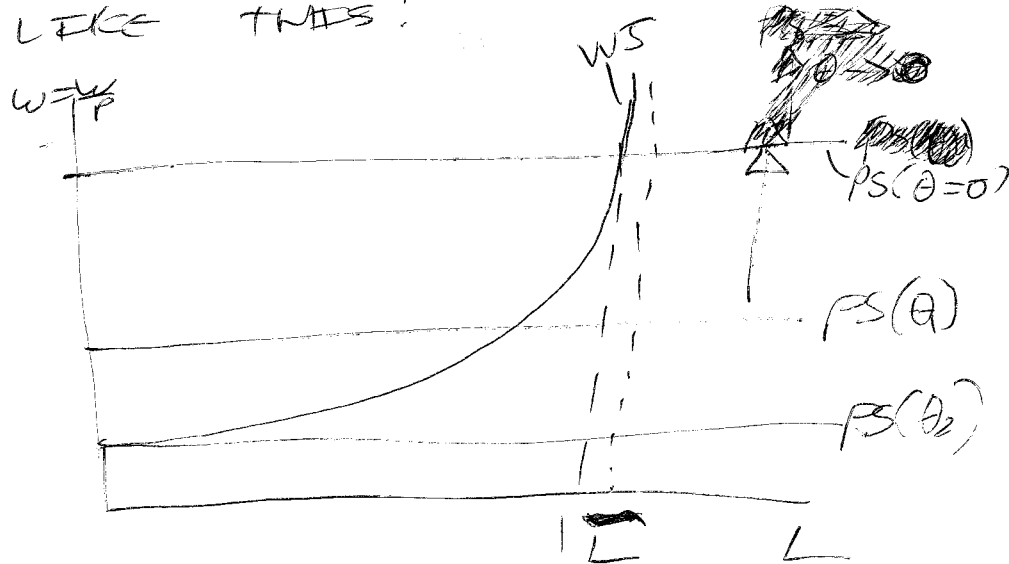
~~Because~~ because P^* is the nominal price of foreign goods in terms of domestic currency. Therefore their actual real wage is

$$\frac{W}{\phi P^* + (1-\phi)P} = \frac{W}{P} \left(\frac{1}{\phi \theta + (1-\phi)} \right).$$

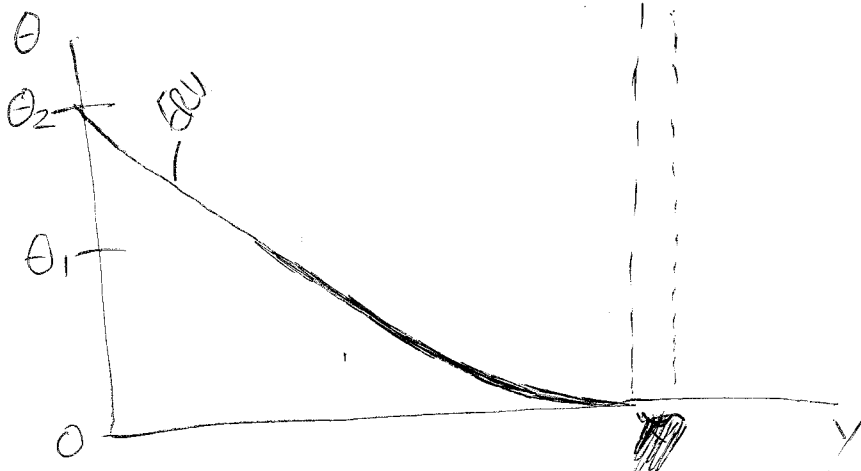
Hence the AS curve is in fact given by

$$\bar{w}_{PS} = \left(\frac{w}{p} \right)_{PS} = \left(\frac{|E| - 1}{-|E|} \right) (\gamma) \left(\frac{1}{\phi\theta + (1-\phi)} \right) \quad \text{IF WE ALSO}$$

ASSUME A ~~WEIRD~~ WS CURVE ~~BEHAVIOUR~~ WITH A TOTAL POTENTIAL LABOUR SUPPLY \bar{L} AS AN ASYMPTOTE THEN THE PRICE/WAGE SETTING DIAGRAM WILL LOOK LIKE THIS:



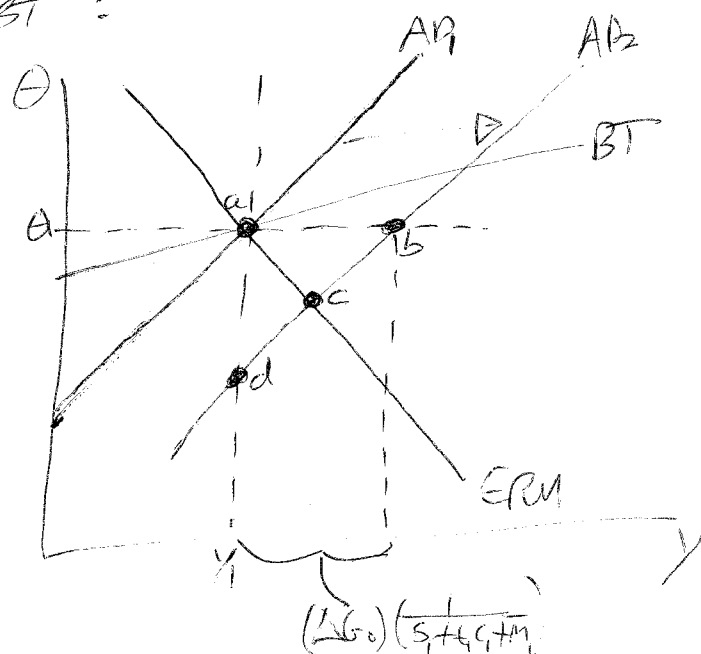
SO THE ERU CURVE WILL LOOK LIKE THIS



~~THE TWO SITUATIONS~~ IN WHICH THE ERU CURVE WILL BE VERTICAL ARE (1) $\phi = 0$ SO THAT CHANGES IN θ NO LONGER MOVE THE PS CURVE OR (2) VERTICAL WS CURVE ~~AT~~ \bar{L} SO THAT LABOUR SUPPLY IS FIXED. PROBABLY FOR AN OPEN ECONOMY QUESTION THE SECOND ONE IS THE MORE APPROPRIATE ONE SINCE A SWAN, DIAGRAM IS UNNECESSARY IN A CLOSED ECONOMY.

2 USE THE SWAN DIAGRAM TO ANALYSE THE IMPACT OF A COUNTRY SPECIFIC EXPANSIONARY FISCAL POLICY ON THE EXCHANGE RATE.

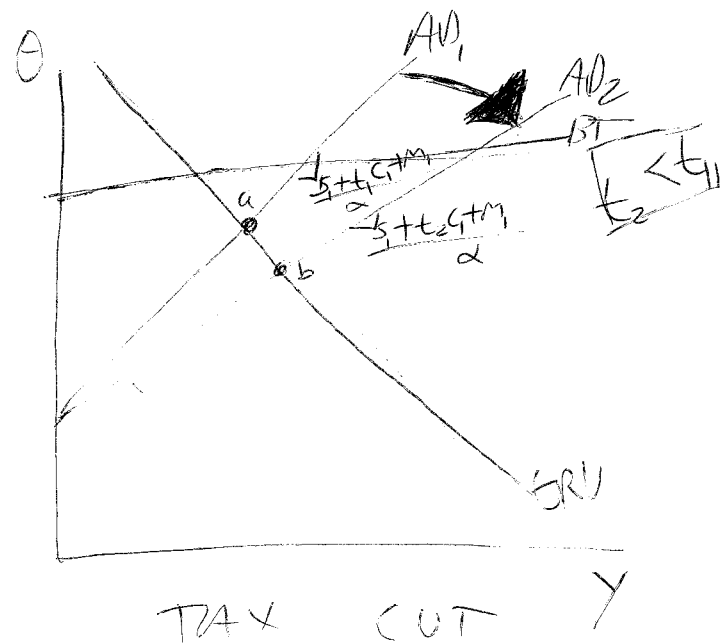
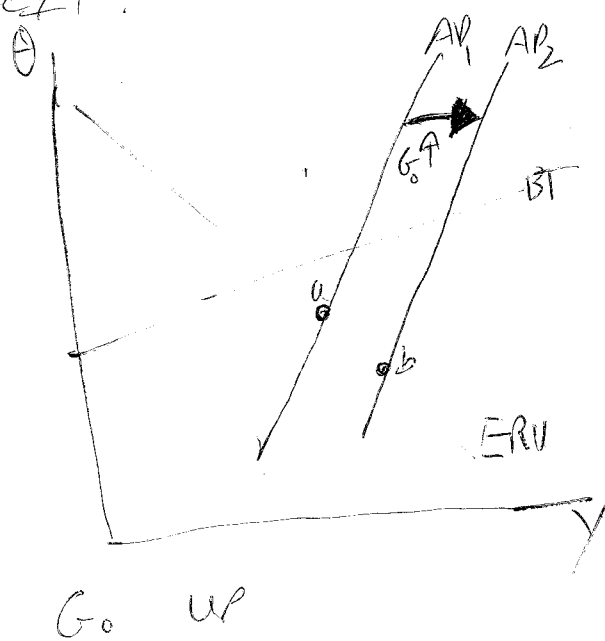
AS ALREADY SHOWN AN INCREASE IN G_0 WILL SHIFT THE AD CURVE PARALLEL RIGHTWARDS AND NOT MOVE BT:



THE SHORT RUN EFFECT (IE WHEN PRICES ARE COMPLETELY STICKY / FIXED) DEPENDS UPON THE EXCHANGE RATE REGIME. IN A FIXED EXCHANGE RATE REGIME, SINCE E , P AND P^* ARE ALL FIXED IN THE S-R, THE ECONOMY GOES FROM a TO b AND THE INCREASE IN Y IS ΔG_0 MULTIPLIED BY THE KEYNESIAN MULTIPLIER $\left(\frac{1}{s+g+m}\right)$. IN A FLOATING EXCHANGE RATE REGIME, THE MUNDALL-FLOATING MODEL IMPLIES THAT (SINCE THIS IS A SMALL OPEN ECONOMY) THE EXCHANGE RATE IMMEDIATELY APPRECIATES DUE TO MASSIVE CAPITAL OUTFLOW AND SO THE ECONOMY GOES TO POINT d . IN THE MEDIUM RUN, INFLATIONARY / DEFLATIONARY PRESSURE MOVES THE ECONOMY TO POINT c . WHETHER POINT c IS SUSTAINABLE IN THE

LONG RUN DEPENDS ON WHETHER THERE IS A CURRENT ACCOUNT DEFICIT OR SURPLUS. THE CURRENT ACCOUNT IS THE NET FLOW OF FOREIGN EXCHANGE FROM ^{NET} EXPORTS, INTEREST PAYMENTS ON NET ASSETS AND TRANSFERS. IGNORING TRANSFERS, AND LETTING A BE THE ECONOMY'S NET ASSETS: $CU = BT + r^*A$. SO, IF $r^*A > -BT$ SO THAT INTEREST PAYMENTS COVER THE TRADE DEFICIT THEN POINT C COULD BE SUSTAINABLE. OTHERWISE ULTIMATELY LONG RUN WEALTH EFFECTS WILL PULL THE AD CURVE INWARDS.

IT IS ALSO WORTH NOTING AT THIS POINT THAT THE SALTER-SWAN MODEL IMPLIES A POSITIVE RELATIONSHIP BETWEEN THE TRADE DEFICIT AND GOVERNMENT BUDGET DEFICIT. A RISE IN G_0 OR CUT IN t_1 WILL BOTH WORSEN THE BUDGET DEFICIT AND TRADE DEFICIT.

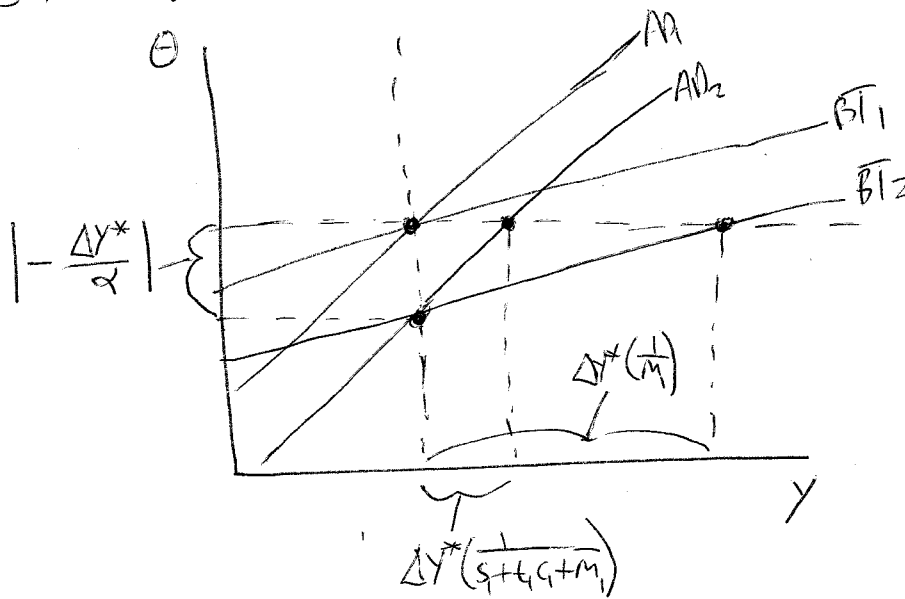


IN BOTH CASES, THE MOVEMENT FROM a TO b UNAMBIGUOUSLY WORSENS THE TRADE DEFICIT BECAUSE COMPETITIVENESS DECREASES ($\theta \downarrow$) AND OUTPUT INCREASES ($Y \uparrow$).

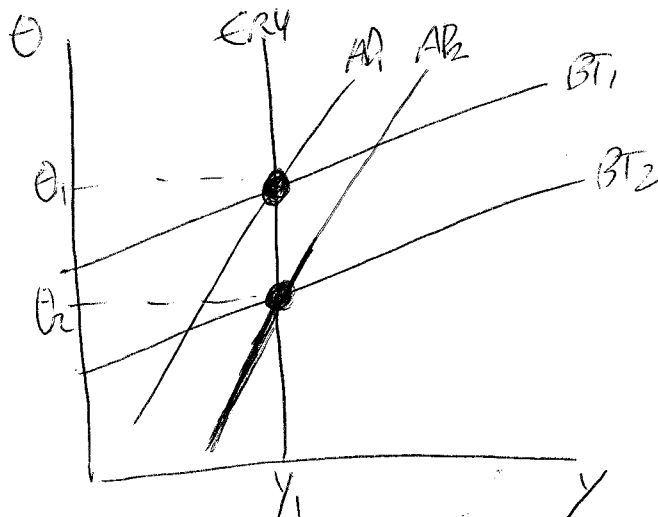
3. IF THE ERU CURVE IS VERTICAL, ANALYSE THE IMPACT OF AN ~~EXPANSION~~ EXPANSION OF WORLD DEMAND ON THE TRADE BALANCE USING EQUATIONS.

FIRST LET US USE EQUATIONS TO PREDICT THE SHIFTS IN AD AND BT CAUSED BY A TRADE SHOCK, THEN WE CAN COMPARE THE OUTCOME WITH VERTICAL AND DOWNWARD-SLOPING ERU CURVES.

SUPPOSE THAT Y^* ~~CHANGE~~ AND θ CHANGE SO THAT $Y^* + \theta \alpha$ REMAINS UNCHANGED. SO $\Delta Y^* + \alpha \Delta \theta = 0 \Rightarrow \Delta \theta = -\frac{\Delta Y^*}{\alpha}$. FROM THE EQUATIONS FOR AD AND BT, WE CAN SEE THAT THEY REMAIN UNCHANGED, THUS BOTH AD AND BT SHIFT DOWNWARDS BY AN EQUAL VERTICAL DISTANCE:

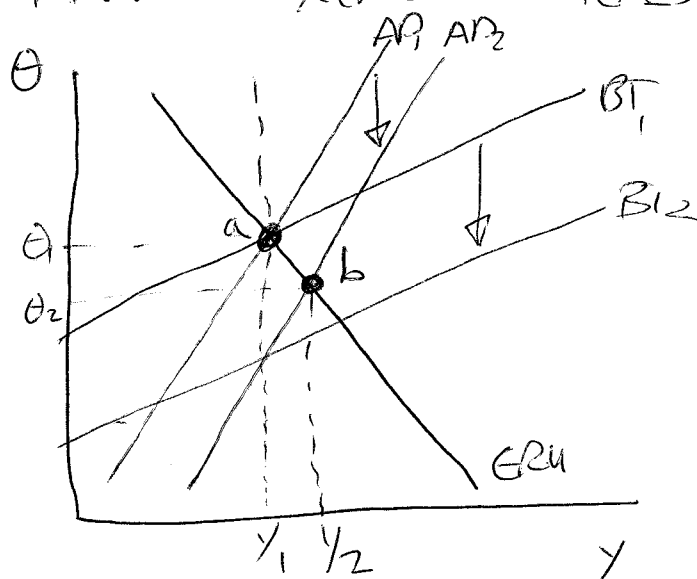
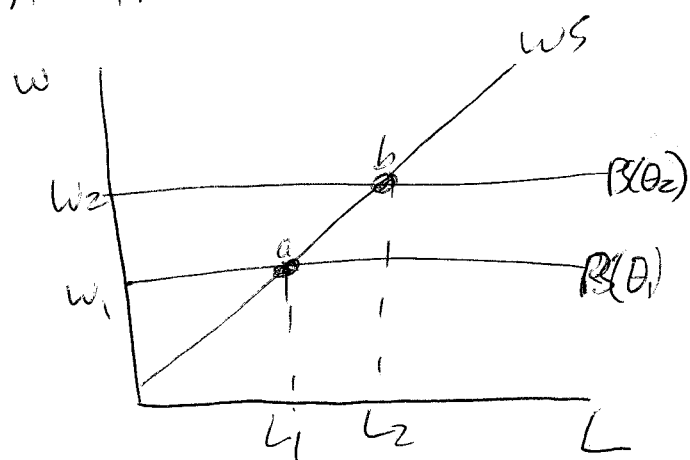


HENCE, IF THE ERU CURVE IS VERTICAL, AND THE ECONOMY STARTS AT BALANCED TRADE, WE HAVE:



IN THE NEW MEDIAN RUV EQUILIBRIUM, TRADE BALANCE HAS RETURNED TO ZERO, BUT THE CURRENCY HAS APPRECIATED (FROM θ_1 TO θ_2). THIS MEANS DOMESTIC CONSUMERS ARE MADE BETTER OFF (ALTHOUGH REAL WAGES REMAIN UNCHANGED, SO ALL GAINS ACCRUE TO CAPITAL).

IN THE MORE USUAL CASE WHERE THE ECU CURVE IS DOWNWARD SLOPING, THE NEW MEDIAN RUN EQUILIBRIUM INVOLVES HIGHER REAL WAGES AND A TRADE SURPLUS.



ESSAY QUESTION - DOES MACROECONOMIC THEORY SUGGEST THAT THERE WILL BE A STABLE RELATIONSHIP BETWEEN THE GOVERNMENT BUDGET DEFICIT AND THE CURRENT ACCOUNT DEFICIT?

THE FUNDAMENTAL ACCOUNTING IDENTITY ~~IS CERTAINLY~~ CAN BE REARRANGED TO GIVE:

$$(Y - C - T) + (T - G) = I + NX$$

$$\Rightarrow S + (T - G) = I + NX$$

THIS MEANS THAT ALL DOMESTIC INVESTMENT (I) OR INVESTMENT ABROAD (NX) (SINCE A ~~TRADE~~ SURPLUS MEANS THAT FOREIGN ASSETS ARE BEING ACCUMULATED EITHER BY DOMESTIC RESIDENTS OR BY THE CENTRAL BANK) MUST BE FUNDED BY DOMESTIC PRIVATE (S) OR PUBLIC (T - G) SAVING. THIS CAN BE FURTHER REARRANGED AS

$$(S - I) - (G - T) = NX$$

THIS MEANS THAT, IF S - I IS FIXED, THEN AN INCREASE IN G - T (THE GOVERNMENT'S PRIMARY

BUDGET DEFICIT) WILL CAUSE AN EQUAL
~~DECREASE~~ DECREASE IN NX (AND HENCE A REDUCED
 CURRENT ACCOUNT SURPLUS OR INCREASED DEFICIT
 SINCE $CU = A^* + NX$. THE GOVERNMENT'S

ACTUAL BUDGET DEFICIT IS $G - T + r^*B$
 WHERE B IS THE OUTSTANDING DEBT ISSUED
 AS GOVERNMENT BONDS. HOWEVER, SINCE B AND A ARE
 FIXED AT ANY ONE TIME BY PAST ^{INVESTMENT/} BORROWING,
 ANY GOVERNMENT DEFICIT INCREASE WILL BE EXACTLY
 MATCHED BY A WORSENER CURRENT ACCOUNT IF
 $(S - I)$ IS STABLE.

OF COURSE, S DOES IN FACT CHANGE IN
 RESPONSE TO A CHANGE IN G OR t BUT
 THE SALTER - SWAN MODEL SHOWS THAT $(S - I)$
 IS NONETHELESS ALWAYS SUFFICIENTLY STABLE
 (DUE TO LEAKAGES FROM THE KEYNESIAN MULTIPLIER /
 SLOPES OF AD / BT) THAT IN A KEYNESIAN OPEN
 ECONOMY FRAMEWORK THE POSITIVE RELATIONSHIP
 BETWEEN GOVERNMENT BUDGET AND TRADE DEFICITS
 REMAINS.

INTERTEMPORAL MODELS OF THE CURRENT
 ACCOUNT WORK SOMEWHAT DIFFERENTLY IN
 THAT IF RICARDIAN EQUIVALENCE HOLDS
 THEN A LUMP SUM TAX CHANGE WOULD
 HAVE NO EFFECT ON NX BECAUSE A TAX
 CUT / RISE WOULD BE SAVED / PAID FOR
 BY BORROWING.

~~WELFARE~~

$$(S - I) - (G - T) = NX$$

$\downarrow \quad \cdot \quad \cdot \quad \uparrow \quad \cdot$
 $\uparrow \quad \cdot \quad \cdot \quad \downarrow \quad \cdot$

DUE TO CONSUMPTION SMOOTHING AND THE WEALTH

EFFECT, HOWEVER, AN INCREASE IN G WOULD STILL CAUSE A WORSENER CURRENT ACCOUNT (SEE NOTES FOR TUTORIAL 2 FOR DETAILED MODEL)

$$(S - I) - (G - T) = NX$$

↑ ↑ ↓

SAVING DOES NOT INCREASE BY ENOUGH TO FULLY OFFSET RISE IN G SO NX FALLS. GIVEN THAT THE ASSUMPTIONS FOR RICARDIAN EQUIVALENCE (OUTLINED BELOW) ARE UNLIKELY TO HOLD, IT IS REASONABLE TO CONCLUDE THAT SOME POSITIVE CONNECTION REMAINS BETWEEN $(G - T)$ AND $(-NX)$ IN INTERTEMPORAL MODELS, BUT THAT IT IS MUCH LESS STABLE DUE TO THE REACTION OF RATIONAL CONSUMERS.

RICARDIAN EQUIVALENCE ASSUMPTIONS

- ① CONSUMERS / DYNASTIES LIVE AT LEAST AS LONG AS GOVERNMENT
- ② PERFECT CAPITAL MARKETS — NO CREDIT CONSTRAINTS
- ③ GOVERNMENT BORROWS AT SAME INTEREST RATE AS CONSUMERS
- ④ LUMP SUM / NON-DISTORTIONARY TAXES
- ⑤ PATH OF ANTICIPATED GOVERNMENT SPENDING IS UNAFFECTED BY TAX CHANGES
- ⑥ RATIONAL FORWARD-LOOKING CONSUMERS
- ⑦ CERTAINTY (OR QUADRATIC UTILITY TO PREVENT PRECAUTIONARY SAVING EFFECTS)
- ⑧ ALL DEBT ISSUED MUST EVENTUALLY BE PAID OFF WITH INTEREST OVER SOME FINITE TIME HORIZON.