Q1 FINAL 2018 W

INTEREST RATES & CURRENT CONSUMPTION

A) $c_1 = y_{d1} + A_1 - S_1$ [1]

Consumption at t=1 is equal to all available resources minus savings.

$c_2 = (1+r)S_1 + y_{d2}$ [2]

Consumption at t=2 equals savings augmented by the interest rate plus the disposable income.

B) Human wealth is the PDV of lifetime labor income. Hence

$$H_1 = y_{d1} + \frac{y_{d2}}{1+r}$$

Total wealth is the sum of both human and non-human wealth in PDV. Hence,

$$W_1 = H_1 + A_1 = y_{d1} + \frac{y_{d2}}{1+r} + A_1$$

c) Putting equations [1] & [2] together, we have

$$S_1 = y_{d1} + A_1 - c_1$$

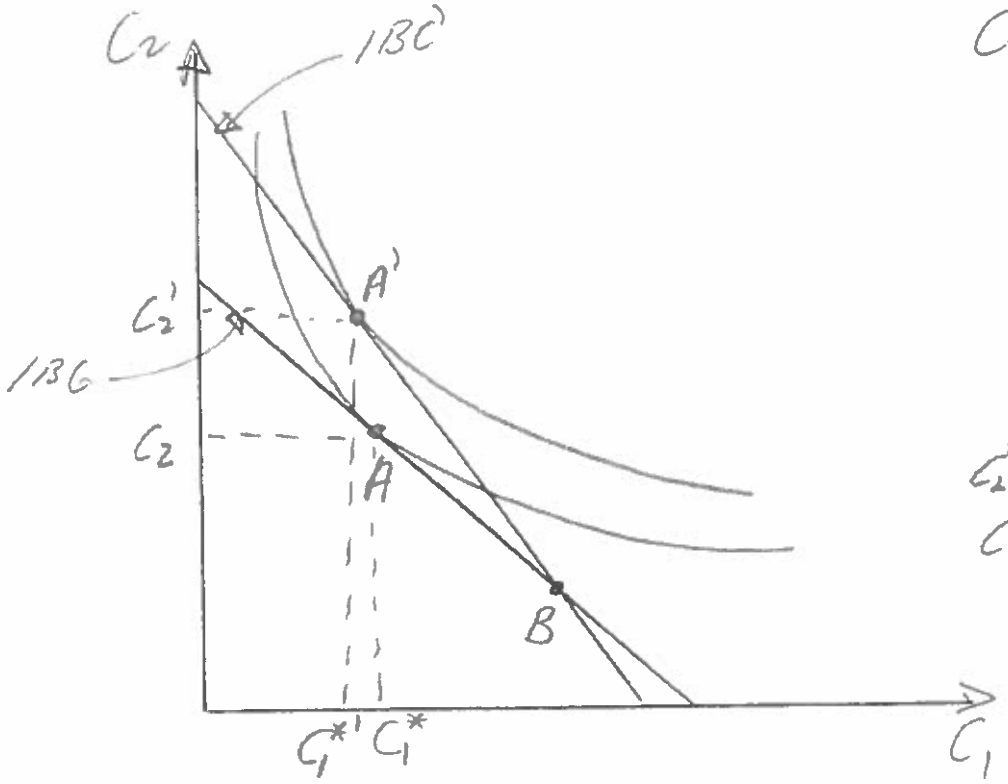
$$\Rightarrow c_2 = (1+r)[y_{d1} + A_1 - c_1] + y_{d2}$$

$$\Rightarrow \underbrace{\frac{c_2}{1+r} + c_1}_{\text{PDV of lifetime consumption}} = \underbrace{y_{d1} + \frac{y_{d2}}{1+r} + A_1}_{\text{PDV of total wealth}}$$

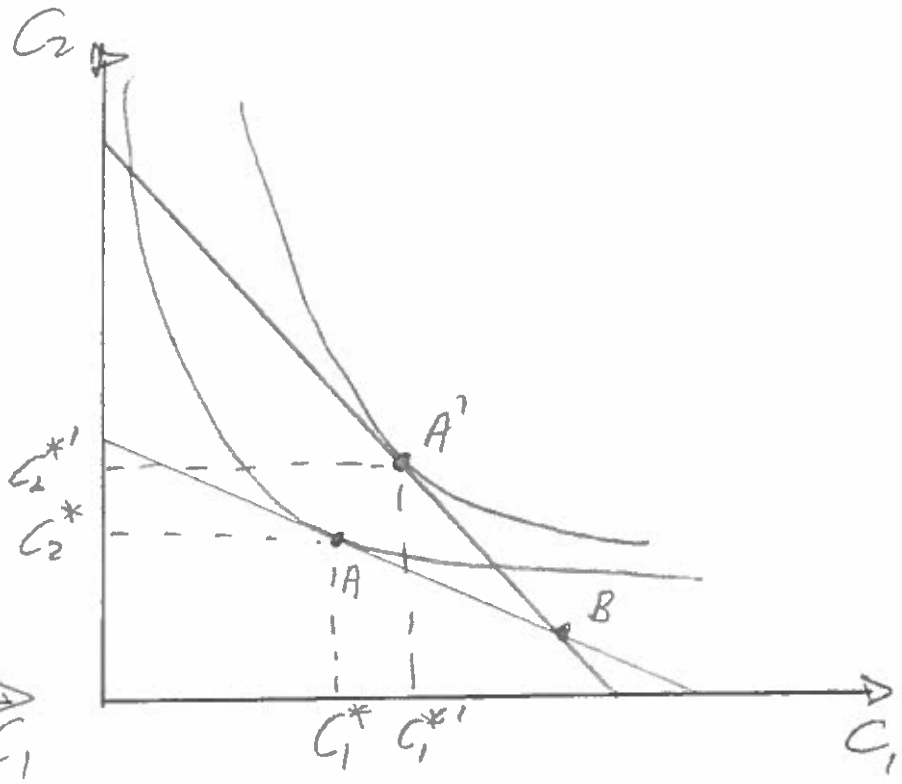
D) (d) With the help of a graphical analysis, concoct an example in which an increase in the rate of interest leads Penelope to *reduce* her present consumption level. AN INCREASE IN THE RATE OF INTEREST LEADS TO A STEEPER IBC. THIS IS ILLUSTRATED IN CASE A OF THE ACCOMPANYING GRAPHICS, WHERE POINT B DENOTES THE NO-SAVINGS, NO-BORROWING CONSUMPTION LEVELS. THE INITIAL CONSUMPTION LEVELS ARE GIVEN BY POINT A. WITH THE STEEPER IBC', THE NEW EQUILIBRIUM CONSUMPTION LEVELS ARE AT POINT A', IN WHICH THE CONSUMPTION LEVEL IN PERIOD 1, C_1^*, DECREASES TO C_1^*.

E) (e) With the help of a graphical analysis, concoct an example in which an increase in the rate of interest leads Penelope to *increase* her present consumption level. THIS IS ILLUSTRATED IN CASE B OF THE ACCOMPANYING GRAPHICS. WITH THE STEEPER IBC', THE NEW EQUILIBRIUM CONSUMPTION LEVELS ARE AT POINT A', IN WHICH THE CONSUMPTION LEVEL IN PERIOD 1, C_1^*, INCREASES TO C_1^*.

CASE A


C_2
IBC'
IBC
C_2'
C_2
A'
A
B
$C_1^{*\prime}$
C_1^*
C_1

CASE B


C_2
$C_2^{*\prime}$
C_2^*
A'
A
B
C_1^*
$C_1^{*\prime}$
C_1

(4)

F) (f) Explain the difference between (6d) and (6c). THE FACT THAT AN INCREASE IN THE RATE OF INTEREST HAS AN AMBIGUOUS EFFECT ON THE PPRESENT CONSUMPTION LEVEL IS DUE TO ITS TWO OPPOSITE EFFECTS. ONE IS CALLED THE *substitution effect*, WHICH HOLDS THAT WITH HIGHER INTEREST RATES, THE OPPORTUNITY COST OF TODAY'S CONSUMPTION INCREASES IN UNITS OF TOMORROW'S CONSUMPTION AND THIS TENDS TO LOWER TODAY'S CONSUMPTION. THE OTHER IS CALLED THE *wealth effect*. UNDER WHICH HIGHER INTEREST RATES RAISES THE TOTAL WEALTH VALUE OF NET SAVERS, WHO WILL TEND TO USE IT TO INCREASE THEIR CONSUMPTION LEVELS AT BOTH PERIODS THROUGH CONSUMPTION SMOOTHING. WHICH OF THE TWO EFFECTS PREVAILS IN PRACTICE IS AN EMPIRICAL QUESTION.

G) (g) Which of the two possible effects of an increase in interest on present consumption levels is typically assumed to hold in the economy regarding the aggregate consumption level C_t? What does this say about the effect of an expansionary monetary policy (i.e., increased money supply through lower interest rates) by the central bank?
IN THE AGGREGATE, THE EMPIRICAL EVIDENCE SUGGESTS THAT THE SUBSTITUTION EFFECT OVERTAKES THE WEALTH EFFECT, I.E., AN INCREASE IN THE INTEREST RATE TENDS TO LOWER PRESENT CONSUMPTION. THIS IMPLIES THAT AN EXPANSIONARY MONETARY POLICY THAT REDUCES INTEREST RATES WILL BE MET WITH AN INCREASE IN THE PRESENT AGGREGATE CONSUMPTION LEVEL.

H) (h) Why are there some economists who have important reservations regarding the use of an expansionary monetary policy to stimulate the economy? AN EXPANSIONARY MONETARY POLICY IMPLIES THAT THERE IS MORE MONEY CIRCULATING AND THIS MAY LEAD TO ADDITIONAL INFLATION THAT MAY GET OUT OF HAND LATER ON.

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EFFICIENCY & PRODUCTIVITY

a) $y = A k^{\alpha} h^{1-\alpha}$, $\alpha = 1/3$

The ratio of outputs between Peru and Mexico is thus

$$\frac{y^P}{y^M} = \frac{A^P}{A^M} \cdot \frac{k^{P\alpha} h^{P(1-\alpha)}}{k^{M\alpha} h^{M(1-\alpha)}}$$

↑ productivity ratio ↖ composite factors ratio

Income differences are thus explained by productivity differences and factor accumulation differences.

We have: $\frac{y^P}{y^M} = \frac{0.2}{0.32} = 0.625$

$$\frac{k^{P\alpha} h^{P(1-\alpha)}}{k^{M\alpha} h^{M(1-\alpha)}} = \frac{.24^{1/3} \cdot .77^{2/3}}{.36^{1/3} \cdot .74^{2/3}} = \frac{.5223}{.58} = 0.9$$

$$\Rightarrow \frac{A^P}{A^M} = \frac{0.625}{0.9} = 0.7$$

TFP in Peru is 70% that of Mexico.

b) Lower TFP in Peru causes income to be 30% lower. Lower capital accumulation causes income to be 10% lower. $T=P$ is thus 3 times more important to explain Peru's lower income level.

c) $A = T \cdot E$

With $E_P = E_M$, we have

$$\frac{A_P}{A_M} = \frac{T_{P,t}}{T_{M,t}} = 0.7$$

Let $T_{P,t} = T_{M,t-G}$ where G is the technological lag of Peru in years.

$$\Rightarrow T_{M,t} = T_{P,t}(1.0081)^{G} \Rightarrow (1.0081)^{-G} = 0.7$$

$$\Rightarrow \ln(0.7) = -G \ln(1.0081)$$

$$\Rightarrow G = 44 \text{ years}$$

If both countries are equally efficient, then Peru must be 44 years behind Mexico in terms of technology. Such a large technological lag is inconceivable. Therefore, efficiency in Peru must be lower than in Mexico.