Microeconomics 1. TD7 October 9, 2023

C17

$$\boxed{x(p,w) = \begin{pmatrix} \frac{p_2}{\sum_i p_i} \frac{w}{p_1} \\ \frac{p_3}{\sum_i p_i} \frac{w}{p_2} \\ \frac{\beta p_1}{\sum p_i} \frac{w}{p_3} \end{pmatrix}}.$$

$$p \cdot x(p,w) = \frac{(p_2 w + p_3 w + \beta p_1 w)}{\sum_i p_i}$$

$= w$ iff $\beta = 1$.

$\boxed{\text{Walras' law} \Longleftrightarrow p \cdot x(p,w) = w.}$ but $< w$ when $\beta < 1$...

~~Homogeneity of deg. 0 means:~~

$$\boxed{x(tp, tw) = \underbrace{t^0}_{=1} x(p,w) \quad \forall t}.$$

$\longrightarrow$ OBVIOUSLY YES $\forall \beta$ ...

C19 Let $x(p,w)$ s.th. $p \cdot x = w$ (Walras' law), and $x_1(p,w) = \alpha \frac{w}{p_1}$.

$\xrightarrow{\text{Walras' law}}$ $x_2(p,w) = \frac{w}{p_2} - \frac{p_1}{p_2} x_1(p,w) = (1-\alpha)\frac{w}{p_2}$.

These are the demand fct for the Cobb-Douglas pref!

& homogeneity of deg 0? $\longrightarrow$ OBVIOUSLY YES ...

(C20)

$\boxed{\begin{array}{l}\text{Consumer living for 2 periods, 1 and 2.}\\ \text{one good per period. } c_1, c_2.\\ \text{wealth at 1 } w_1 \text{, at 2 } w_2 \geq 0 .\\ \text{that can be transferred at interest rate } r \geq 0 \text{ between periods.}\\ p_1 = p_2 = 1.\\ \text{a) What is the consumer's Walrasian (lifetime) budget set?}\\ \text{b) Provide a graphical representation of the budget set.}\end{array}}$

a)

- If at period 1, I am consuming $x_1 \leq \frac{w_1}{p_1}$, with $x_1 = \alpha \frac{w_1}{p_1}$ with $0 \leq \alpha \leq 1$.

$\Longrightarrow$ then, at period 2, I am left to consume at most.

$$p_2 x_2 = w_2 + \underbrace{(1-\alpha) w_1}_{\text{remaining wealth at period 1.}} e^{+r}$$

$+$ because I'm being paid interest for saving. (2)

$$\Downarrow$$

$$p_2 x_2 = w_2 + w_1 e^{+r} - x_1 p_1 e^{+r}$$

$$\boxed{p_2 x_2 = w_2 + \underbrace{(w_1 - x_1)}_{\geq 0 \text{ by hypothesis}} e^{+r}.}$$

$\Longrightarrow$ thus. $x_2 \geq \frac{w_2}{p_2}$.

- If, on the contrary,

$x_2 = \beta \frac{w_2}{p_2} \leq \frac{w_2}{p_2}$. ie I'm consuming less than my wealth at 2.

but more at 1,

$\Longrightarrow$ then I am left with the possibility to consume at max., at period 1

$$\boxed{p_1 x_1 = w_1 + \underbrace{(w_2 - p_2 x_2)}_{\geq 0 \text{ by hyp.}} e^{-r}}$$

$\ominus$ because borrowing to the future has a cost.

$\Longrightarrow$ so $p_1 x_1 \geq w_1$.

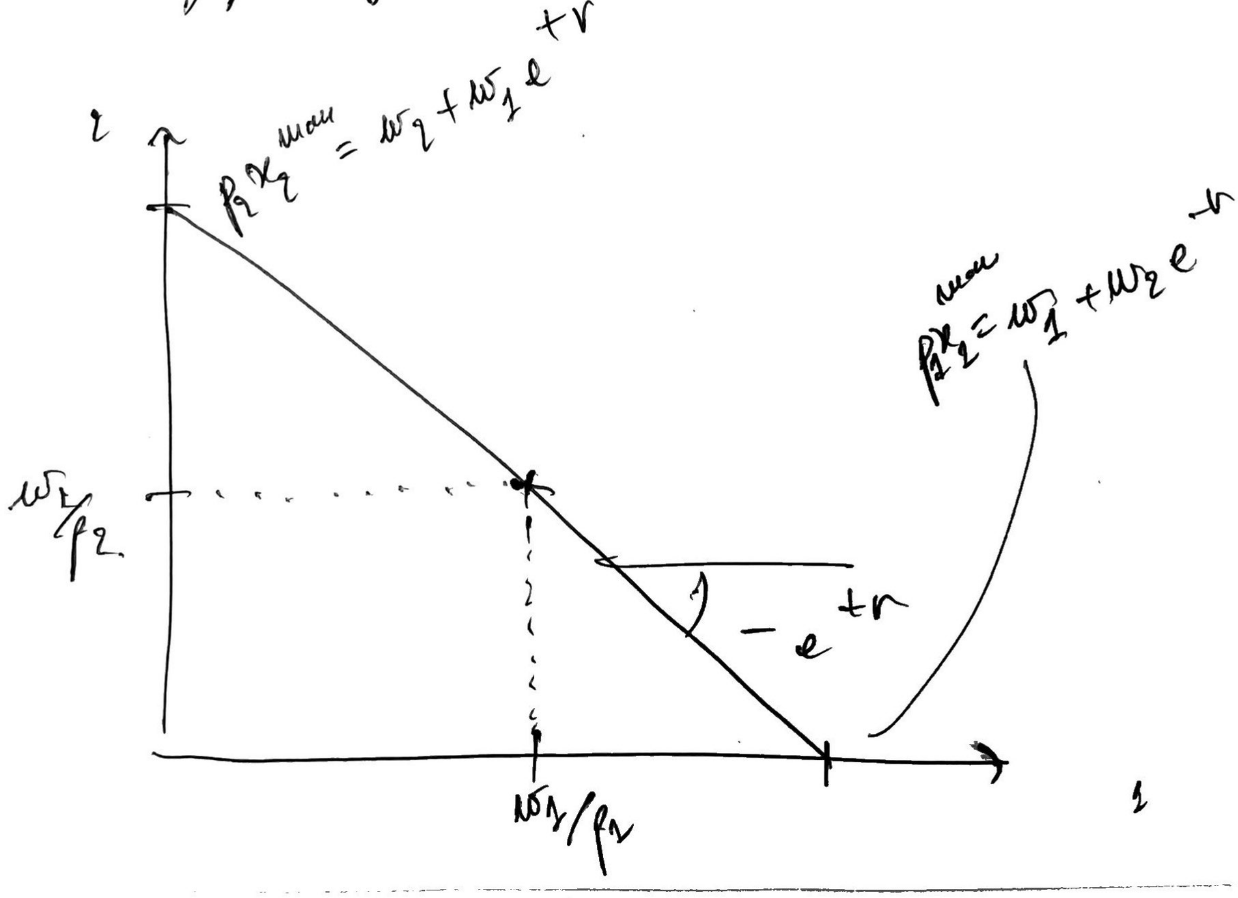
b)

$$\Updownarrow$$

$$p_2 x_2 = w_2 + (w_1 - p_1 x_1) e^{+r}.$$

i.e. we got the same equation on both sides !

So... graphically.



(C21) x R. T.

a) $$\boxed{s(T-R) = w = px.}$$

$$\Updownarrow$$

$$px + sR = sT.$$

as if they had a total endowment sT, which is maximal.

but leisure had a "cost" s (Chancity). ...

Walrasian budget set:

$$\boxed{B_{p,w} = \{(x,R)\ ;\ px + sR \leq \underbrace{sT}_{a \text{ given}}\}.} \quad =: w$$

b). Cobb-Douglas utility pref.

$$u(x,R) = x^\alpha R^{1-\alpha} \quad \alpha > 0$$

$\Rightarrow$ sol to the UMP.

$$x^* = \frac{\alpha\, sT}{p} \quad \text{and} \quad R^* = \frac{(1-\alpha)\, sT}{s}.$$

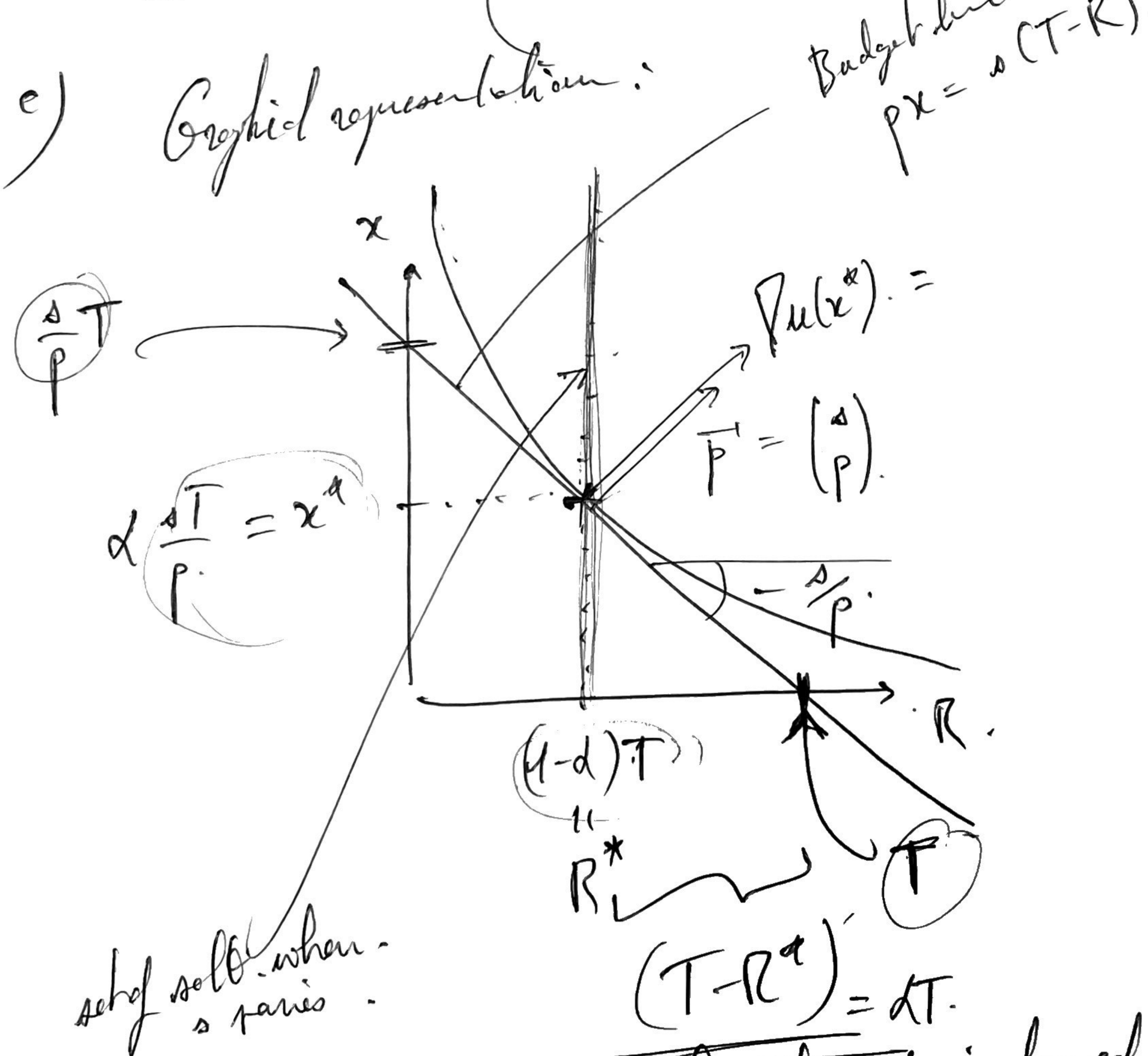
$\bar{w}$ $\bar{w}$

$\longrightarrow$ so. $(T-R^*) =$ Work supply.

$$
\begin{aligned}
&\quad\;\; \| \\
&T - (1-\alpha)\frac{\cancel{s}T}{\cancel{s}} \\
&= \big(1-(1-\alpha)\big)T.
\end{aligned}
$$

$$\boxed{T-R^* = \alpha T.}$$

e) Graphical representation:



$$\underline{(T-R^*) = \alpha T.}$$

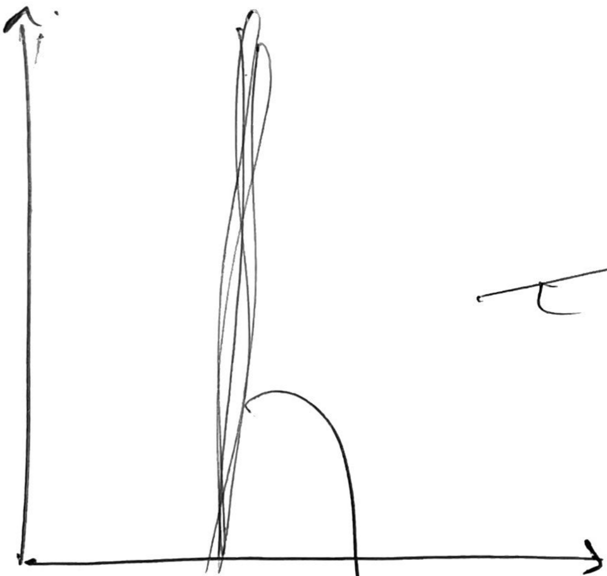
The work supply is observed there!!

what if s changes ??

→ $(T - R^a) = \alpha T$

is not a fct of s.

→ so it does not influence ~~the~~ labor supply.



see previous diagram.

x of solⁿ when ~~s~~ varies

When salary increases .. so does the "price cost" of leisure.

~~INCOME EFFECT.~~

→ $\boxed{\text{The "real income" is } x^a = \frac{sT}{P} \rightarrow \text{augments linearly with the salary } s}$

□.