9-27-11

SPECIFIC FACTOR

TOOLS REVIEW

RATIOS $\frac{X}{Y}$

SUPPOSE $X\uparrow$, $Y\uparrow$ WHAT HAPPENS TO $\frac{X}{Y}$

1) $\frac{X}{Y}\uparrow$ IF $\%\Delta X > \%\Delta Y$

2) $\frac{X}{Y}\downarrow$ IF $\%\Delta X < \%\Delta Y$

3) $\frac{X}{Y}$ CONSTANT IF $\%\Delta X = \%\Delta Y$

LINKED TO CHANGES IN REAL RETURNS

EX: w = WAGES
r_T = RENTAL PRICE OF LAND
r_K = " " OF CAPITAL

} NOMINAL

2 GOODS: AGRICULTURE (A)
MANUFACTURING (M)

$$\frac{w}{p_A} \qquad \frac{w}{p_M}$$

$$\frac{r_T}{p_A} \qquad \frac{r_T}{p_M}$$

$$\frac{r_K}{p_A} \qquad \frac{r_K}{p_M}$$

PRODUCTION FUNCTIONS
MARGINAL PRODUCTS

EX: 2 FACTORS : K, L

OUTPUT : q_M

ASSUME PROD. FUNCTION THAT HAS THE FOLLOWING CHARACTERISTICS:

1) MARGINAL PRODUCTS ARE ONLY FUNCTIONS OF FACTOR RATIOS

2) MARGINAL PRODUCTS CHANGE AS FOLLOWS:

$MPL\left(\frac{K}{L}\right)$: $\uparrow K/L \Rightarrow \uparrow MPL$

$MPK\left(\frac{K}{L}\right)$: $\uparrow K/L \Rightarrow \downarrow MPK$

EXAMPLE:

$$q_M = K^{1/2} \cdot L^{1/2}$$

ANOTHER

$$q_M = K^{1/3} \cdot L^{2/3}$$

$$\boxed{MPL} = \frac{1}{2} \frac{1}{\left(\frac{L}{K}\right)^{1/2}} = \frac{1}{2}\left(\frac{L}{K}\right)^{-1/2} =$$

$$= \boxed{\frac{1}{2}\left(\frac{K}{L}\right)^{1/2}}$$

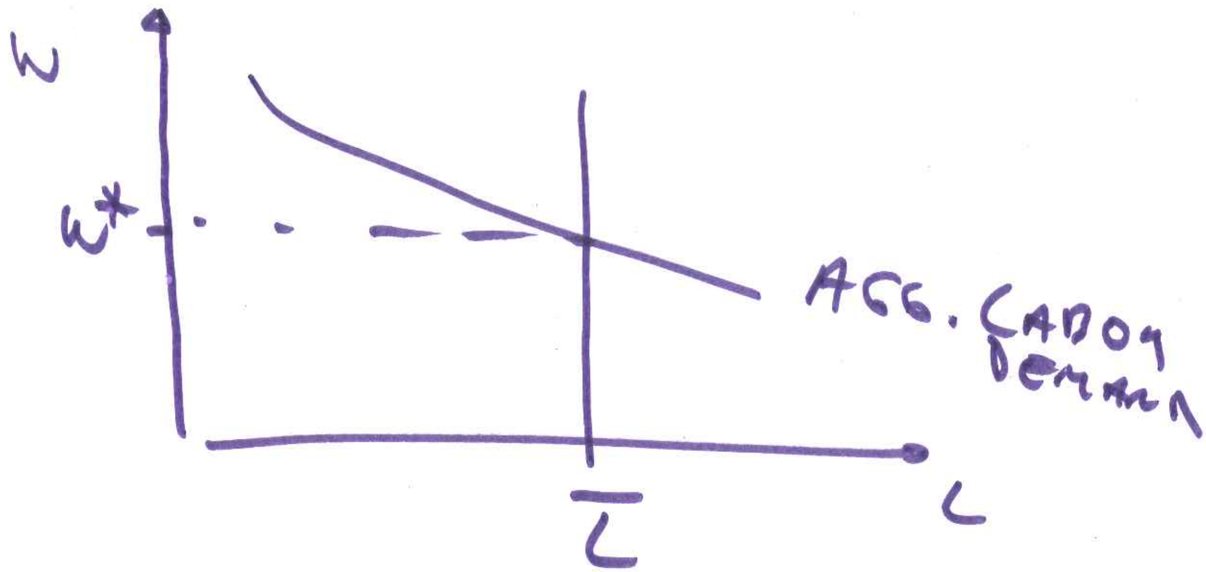
$$MPK = \frac{1}{2}\left(\frac{L}{K}\right)^{1/2} = \frac{1}{2}\left(\frac{K}{L}\right)^{-1/2}$$

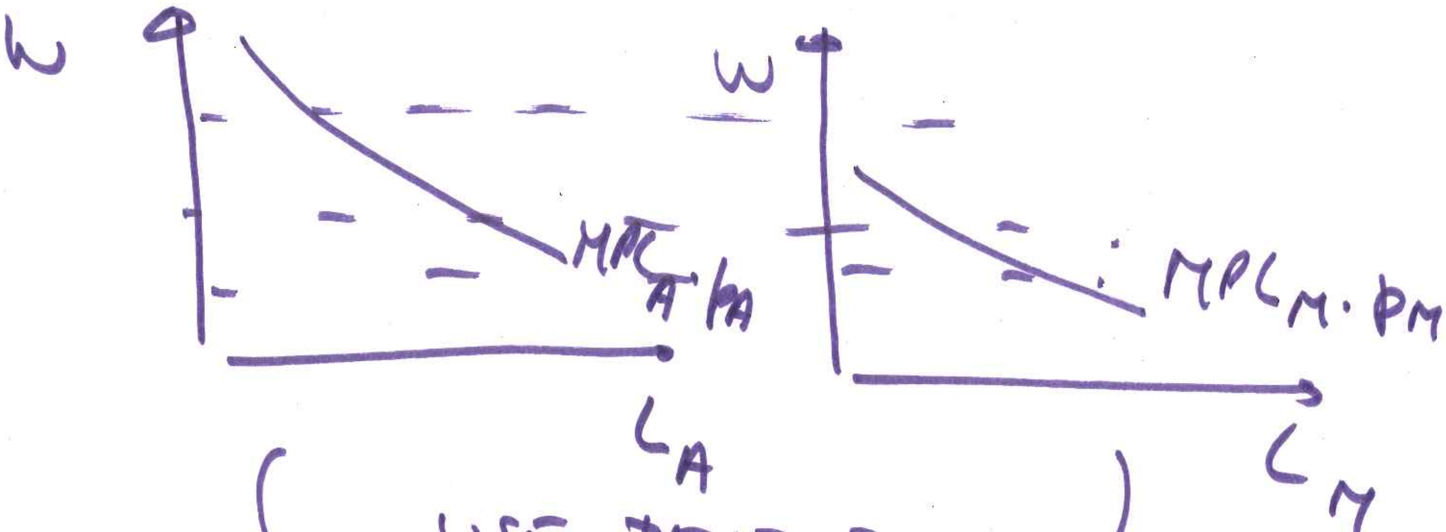
$$= \frac{1}{2} \frac{1}{\left(\frac{K}{L}\right)^{1/2}}$$

PROFIT MAX. DEMANDS

$$w = MPL(\ ) \cdot p_M \Longrightarrow \frac{w}{p_M} = MPL(\ )$$

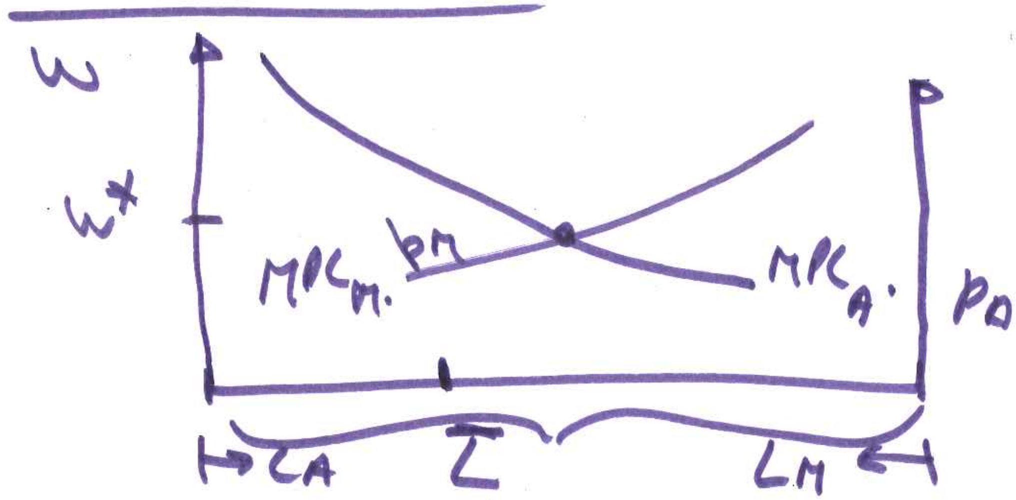
$$r_K = MPK(\ ) \cdot p_M \Longrightarrow \frac{r_K}{p_M} = MPK(\ )$$





USE THESE 2 DIAGRAMS TO GET AGG. LABOR DEMAND

ALTERNATIVE



SPECIFIC FACTORS MODEL

2 SECTORS → AGRIC. (q_A)
→ MANUF (q_M)

3 FACTORS: LABOR (L) → MOBILE
CAPITAL (K), LAND (T) } SPECIFIC

$q_A \to T,\ L_A$

$q_M \to K,\ L_M$

FACTOR ENDOWMENTS:

$\bar{L}, \bar{K}, \bar{T}$

EQUILIBRIUM

$$\bar{L} = L_A(\ ) + L_M(\ )$$

FUNCTIONS OF w & p_A & p_M RESPECTIVELY

ALL LAND AND CAPITAL ARE USED:

$$T = \bar{T}$$
$$K = \bar{K}$$

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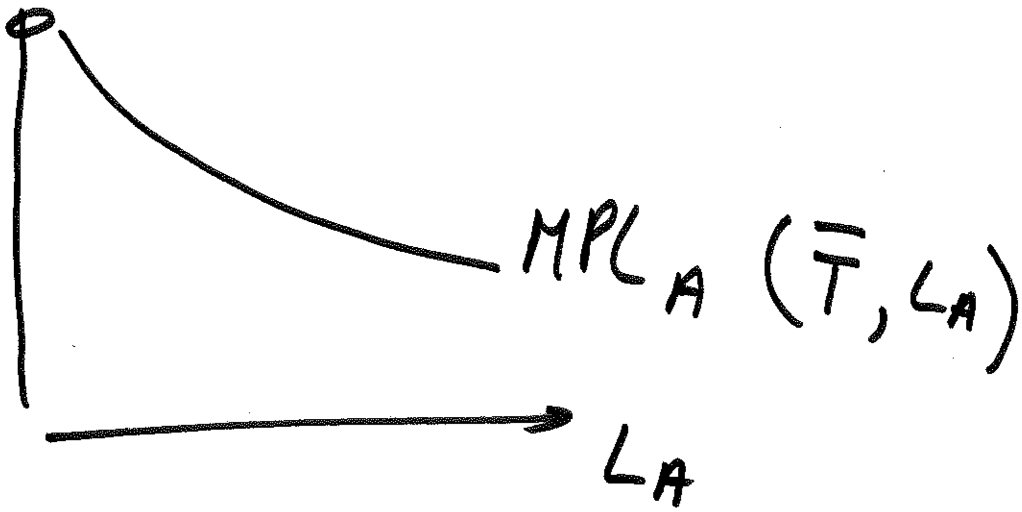
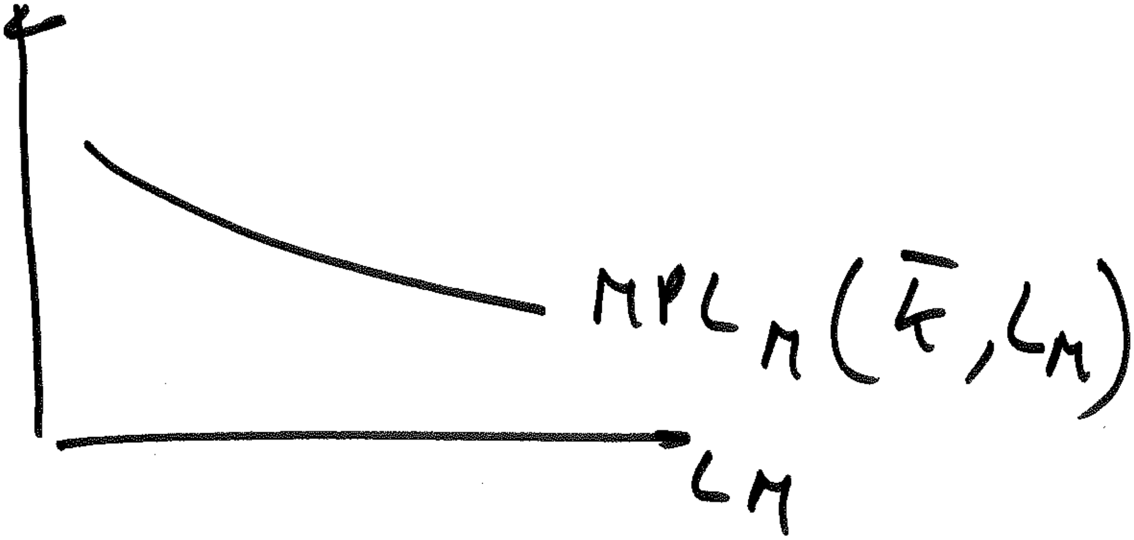


$\uparrow L_A \Rightarrow MPL_A \downarrow$

HERE $MPL_A\left(\frac{\bar{T}}{L_A}\right)$



$\uparrow L_M \Rightarrow MPL_M \downarrow$

HERE $MPL_M\left(\frac{\bar{K}}{L_M}\right)$

PC:

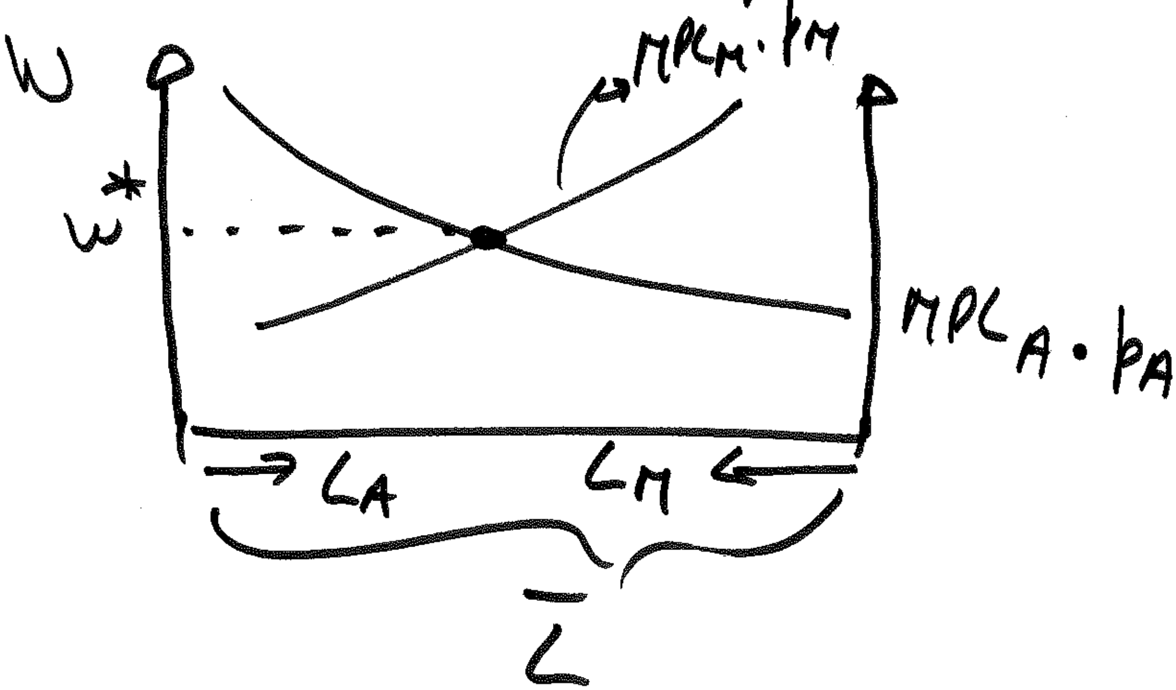
$$w = MPL_A(\bar{T}/L_A) \cdot p_A$$

$$w = MPL_M(\bar{K}/L_M) \cdot p_M$$

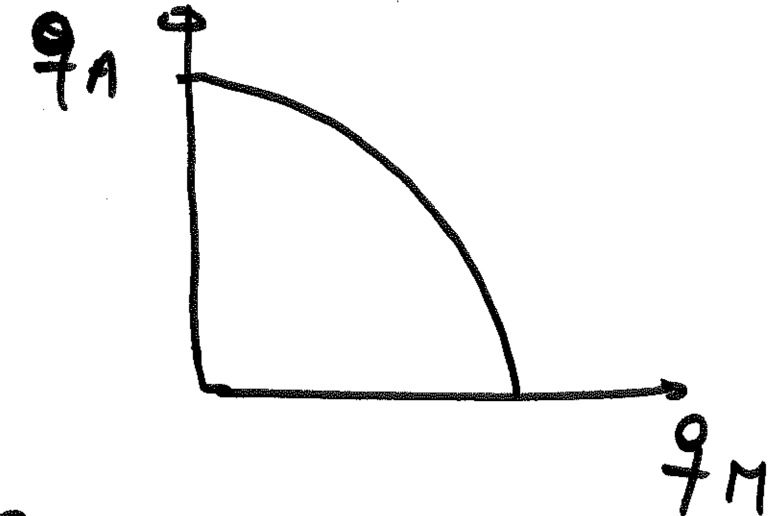
ASSUME p_A, p_M GIVEN

$\Longrightarrow$ NEED TO FIND "w" THAT WILL CLEAR THE LABOR MARKET:

$$\bar{L} = L_A(w, p_A) + L_M(w, p_M)$$



PPF IN THIS CASE IS "NICE"



<u>CLOSED ECONOMY</u> = AUTARKY

<u>COMPETITIVE EQUILIBRIUM:</u>

p_M/p_A AND w SUCH THAT:

1) FIRMS MAX PROFITS
2) CONS. MAX UTILITY ....
3) MARKETS CLEAR (LABOR, q_M, q_A)

WE ALSO DETERMINE RENTAL PRICES OF CAPITAL AND LAND:

$$r_K = MPK \cdot p_M$$

$$r_T = MPT \cdot p_A$$

WELFARE?

$$\frac{w}{p_A} \quad \frac{w}{p_M}$$

$$\frac{r_K}{p_A} \quad \frac{r_K}{p_M}$$

$$\frac{r_T}{p_A} \quad \frac{r_T}{p_M}$$

THEY ARE JUST THE MARGINAL PRODUCTS FOR SOME OF THEM ?

SMALL COUNTRY

CAN TRADE WITH THE REST OF WORLD AT FIXED PRICES

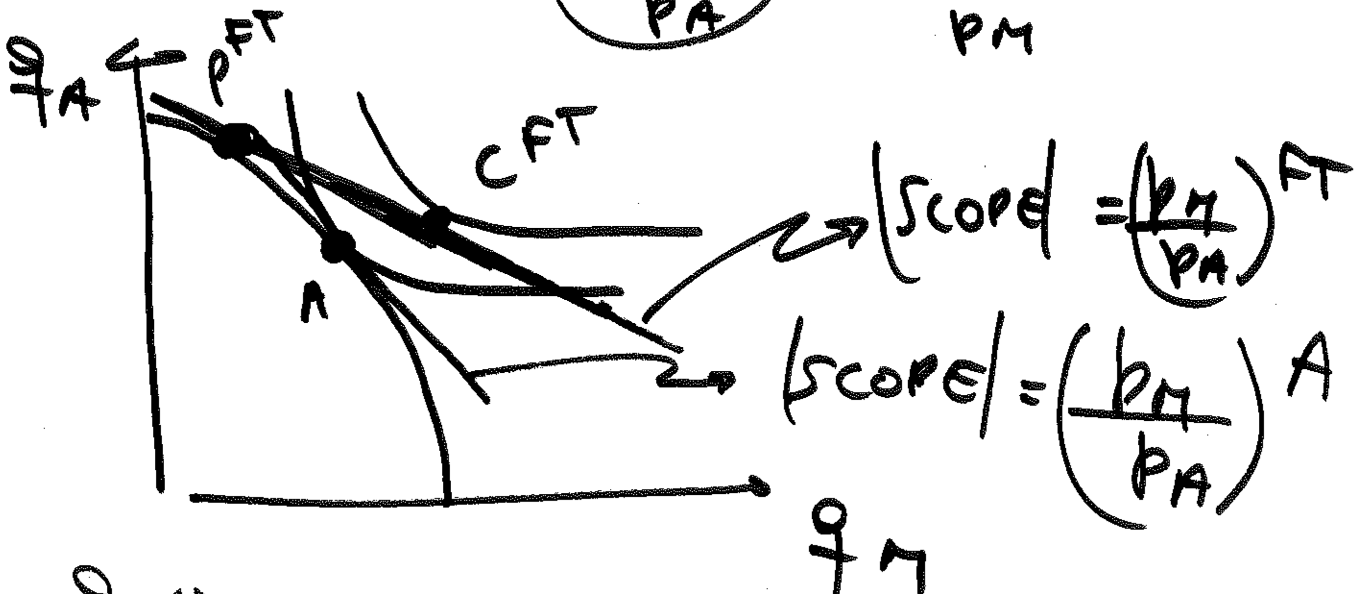
ASSUME :

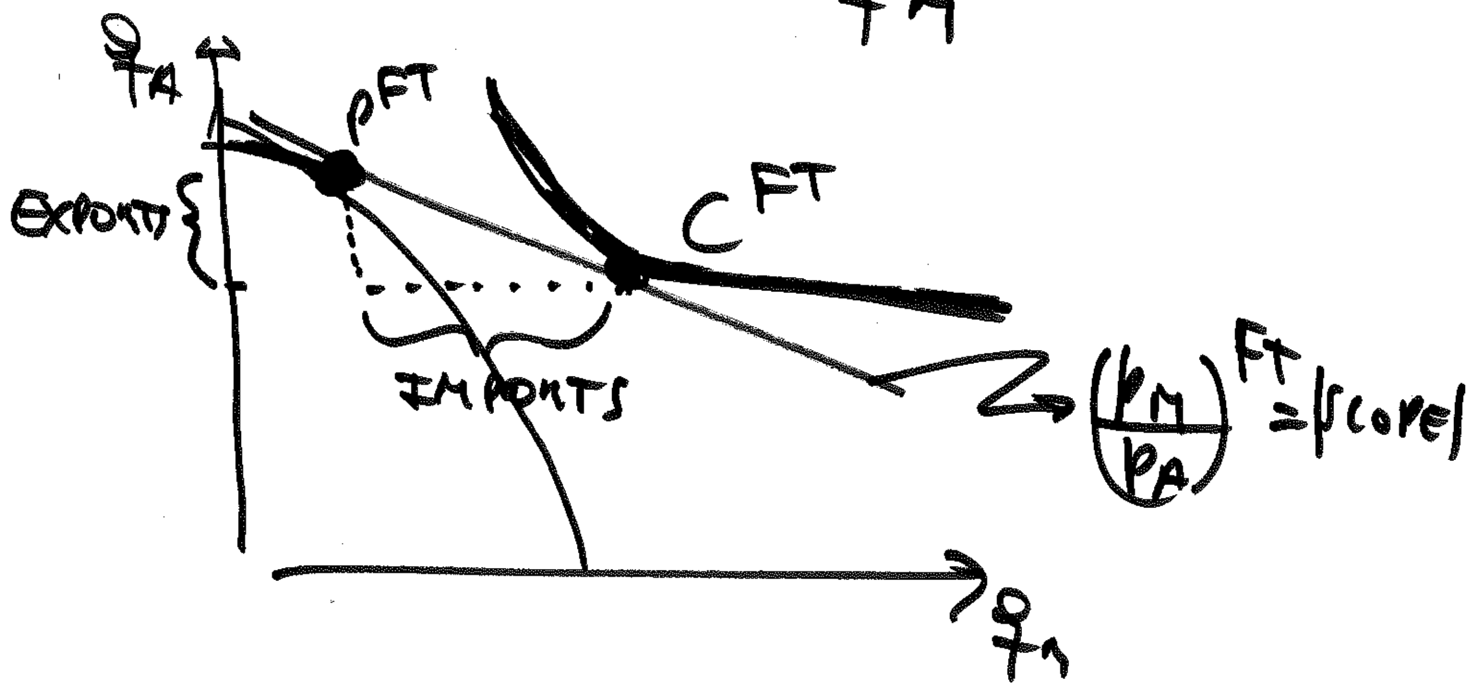
$$\left(\frac{p_M}{p_A}\right)^{FT} < \left(\frac{p_M}{p_A}\right)^{AUTARKY}$$

FOCUS ON FACTOR RETURNS

"REAL" AUT $\rightarrow$ FT

WORKERS	$\frac{w}{p_A}$	$\frac{w}{p_M}$
K-OWNERS	$\frac{r_K}{p_A}$	$\frac{r_K}{p_M}$
T-OWNERS	$\frac{r_T}{p_A}$	$\frac{r_T}{p_M}$

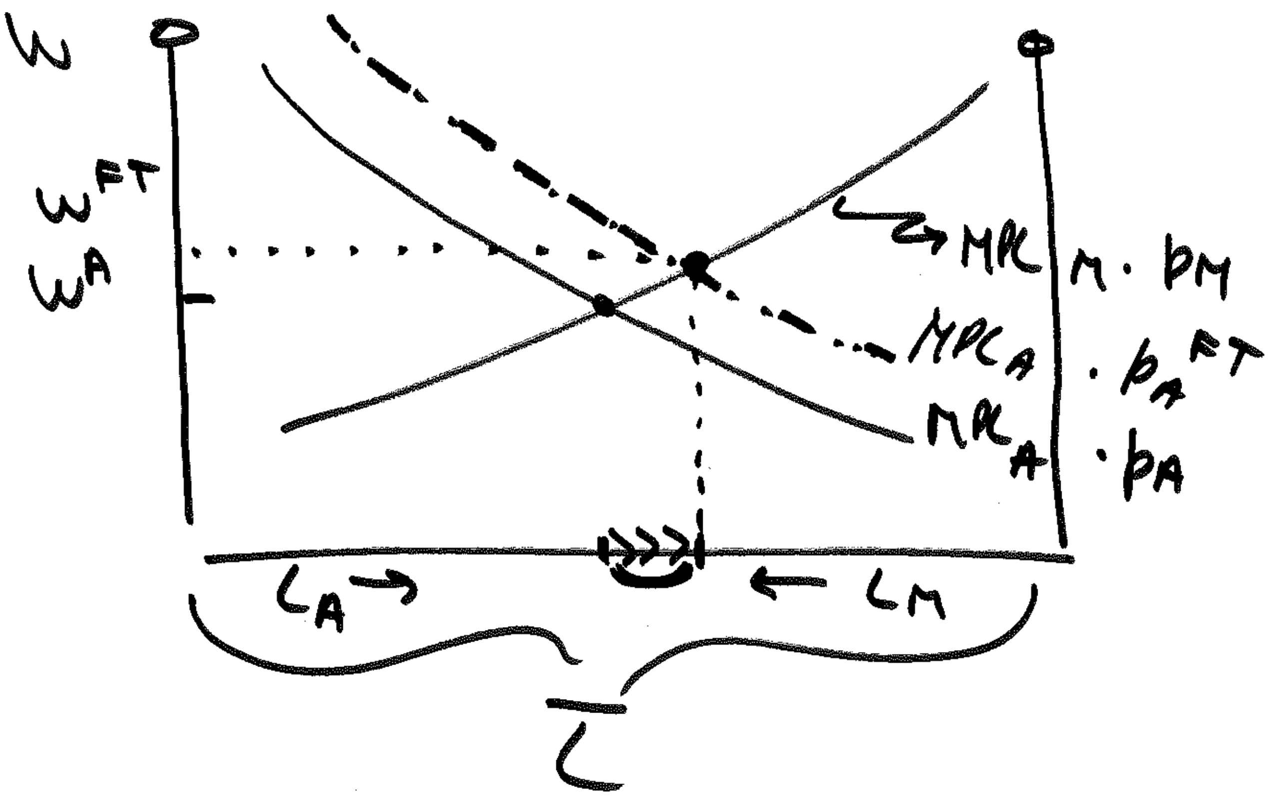




REMARK: AUTARKY → FT

$\frac{p_M}{p_A} \downarrow$ ASSUME $\boxed{\begin{array}{l} p_M \text{ CONSTANT} \\ p_A \uparrow \end{array}}$

NEED TO FIGURE OUT CHANGES AS A RESULT OF $\uparrow p_A$, p_M CONSTANT



$\uparrow W$, $\uparrow L_A$, $\downarrow L_M$

① FROM DIAGRAM: $\boxed{MPL_M \uparrow}$

USING PROPERTIES OF MARGINAL PRODUCTS:

(2) $\uparrow L_A \Longrightarrow MPL_A \downarrow$

SINCE $\bar{T}/L_A \downarrow$

(3) $\uparrow L_A \Longrightarrow MPT \uparrow$

SINCE $\bar{T}/L_A \downarrow$

(4) $\downarrow L_M \Longrightarrow MPK \downarrow$

SINCE $\bar{K}/L_M \uparrow$

WELFARE:

WORKERS:

UNCERTAIN $\frac{w}{p_A} = MPL_A \downarrow$, $\frac{w}{p_M} = MPL_M \uparrow$

LANDOWNERS:

$\frac{r_T}{p_A} = MPT \uparrow$ $\quad \frac{r_T}{p_M}$??

SINCE WE ASSUME A FACTOR IS PAID VALUE OF ITS MARG. PRODUCT: $r_T = MPT \cdot p_A$

SPLIT METHOD

$$\frac{RT}{PM} = \underbrace{\frac{RT}{PA}}_{\uparrow} \; \underbrace{\frac{PA}{PM}}_{\uparrow} \quad \uparrow$$

CAPITAL OWNERS

$$\frac{RK}{PA} \qquad\qquad \frac{RK}{PM} = MPK \downarrow$$

$\downarrow$ SPLIT METHOD