Name of the course - MA Part I & BA (Hons.) Part I

Paper :- I

TOPIC - Relation between MC, ATC & AVC

The AVC is a part of the ATC,

given, ATC = AFC + AVC.

Both AVC and ATC are U shaped, reflecting the law of variable proportions. However the minimum point of the ATC occurs to the right of the minimum point of the AVC (fig. 2.1). This is due to the fact that ATC includes AFC, and the latter falls continuously with increases in output. After the AVC has reached its lowest point and start rising, its rise is over a certain range offset by the fall in AFC, so that the ATC continues to fall (over that range) despite the increase in AVC. However, the rise in AVC eventually becomes greater than the fall in the AFC so that the ATC starts increasing. The AVC approaches the ATC asymptotically as X increases.

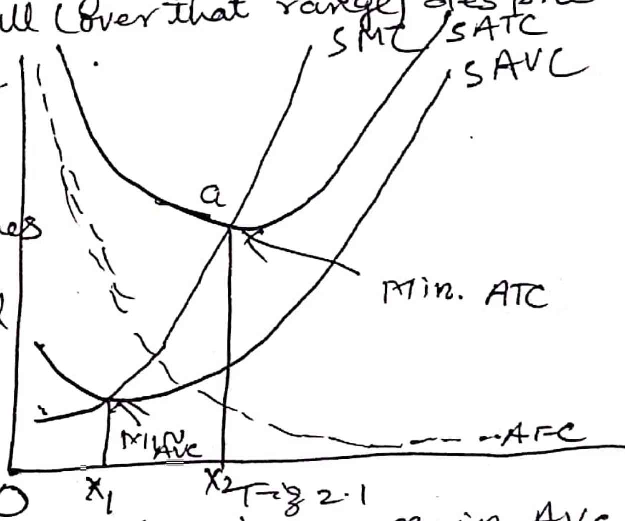

Fig 2.1

In Fig. 2.1 the minimum AVC is reached at X_1 while the ATC is at ~~a~~ X_2. Between X_1 and X_2 the fall in AFC more than offsets the rise in AVC so that the ATC continues to fall. Beyond X_2 the ~~fall in~~ increase in AVC is not offset by the fall in ~~AT~~ AFC, so that ATC rises.

It is the usual marginal average relation.

The relation is summed up as:

when $MC < AVC$, AVC falls
$MC = AVC$, AVC is constant
$MC > AVC$, AVC rises

Same is the relation between MC & ATC

when $MC < ATC$, ATC falls
$MC = ATC$, ATC is constant
$MC > ATC$, ATC rises.

The MC cuts the ATC and the AVC at their lowest point.

MC is the change in the TC for producing an extra unit of output. The AC at each level of output is found by dividing TC by X, Thus the AC at the level of X_n is

$$AC_n = TC_n / X_n$$

and the AC at the level X_{n+1} is

$$AC_{n+1} = \frac{TC_{n+1}}{X_{n+1}}$$

clearly $TC_{n+1} = TC_n + MC$.

The relationship between the MC and AC curves becomes clear with the use of simple calculus. The MC is Given $C = ZX$, where $Z = AC$, clearly $Z = f(X)$,

$$\frac{\partial C}{\partial X} = \frac{\partial (ZX)}{\partial X}$$

Applying the rule of differentiation of a function of a function (which states that if $y = uv$, where $u = f_1(X)$ and $v = f_2(X)$ then $\frac{dy}{dx} = \frac{dy}{du} \cdot \frac{du}{dx}$, we obtain

$$MC = \frac{\partial C}{\partial X} = Z\frac{\partial X}{\partial X} + X\frac{\partial Z}{\partial X}$$

$$MC = Z + X \cdot \frac{\partial (Z)}{\partial x}$$

$MC = AC + X$ (slope of AC) the following results emerge:

Given that $AC > 0$ and $X > 0$,

(a) If the slope of $AC < 0$, then $MC < AC$

(b) If the slope $AC > 0$, then $MC > AC$

(c) If the slope of $AC = 0$, then $MC = AC$

The slope of the AC becomes zero at the minimum point of this curve. Hence MC = AC at the minimum point of the average cost curve.

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