Economics 302
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Monopolistic Competition, Cost-Markup Pricing,
Inflationary Pressures and Globalization

Suppose we think of a representative firm, with price *P*, output *Q*. Total revenue, *TR*, is given by

$$TR = PQ \tag{1}$$

Marginal revenue is the change in *TR* for a change in *Q*; using the product rule,

$$MR = \frac{\partial(PQ)}{\partial Q} = P + (\partial P/\partial Q)Q = P - sQ \tag{2}$$

Then the slope of the demand curve is given by: $-s \equiv \partial P/\partial Q$

Define the demand elasticity *e* as:

$$-e = \left(\frac{\partial Q}{\partial P}\right)\left(\frac{P}{Q}\right) = \left(\frac{1}{s}\right)\left(\frac{P}{Q}\right)$$

which is the same as:

$$s = \left(\frac{1}{e}\right)\left(\frac{P}{Q}\right)$$

Then substituting *s* into the expression for *MR* in (2) yields:

$$MR = P - sQ = P[1 - s\left(\frac{1}{P}\right)Q]$$

$$= P[1 - \left(\frac{1}{e}\right)\left(\frac{P}{Q}\right)\left(\frac{1}{P}\right)Q]$$

which, after substituting in for *e*, is:

$$MR = P(1 - 1/e) = \left(\frac{e-1}{e}\right)P$$

Setting *MR* = *MC*:

$$MC = MR = P(1 - 1/e)$$

and solving for *P* yields:

$$P = \left(\frac{e}{e-1}\right) MC \qquad (3)$$

Hence the price-cost markup is a function of the demand curve elasticity. Notice what happens if *e* is infinite; and if *e* is substantially less than infinite.

Now let the following describe marginal cost,

$$\left(\frac{e}{e-1}\right) = \lambda$$

$$MC = \left[\left(\frac{W}{APL}\right)^{\Gamma} \times P_{input}^{1-\Gamma}\right]$$

and think of this firm representing the whole economy: Then (3) can be rewritten as:

$$P = \lambda \left[\left(\frac{W}{APL}\right)^{\Gamma} \times P_{input}^{1-\Gamma}\right] \qquad (4)$$

where *APL* is average labor productivity, *Q/N*. Log this equation,

$$p = \ln(\lambda) + [\Gamma w \;\; \Gamma apl + (1-\Gamma)\, p_{input}]$$

Taking the derivative with respect to time, and holding constant the price-cost markup and *APL* yields:

$$\pi = \Gamma(\Delta W/W) + (1-\Gamma)\,\pi_{input}$$
$$= f(\hat{Y}_{-1}) + \pi^{e} + Z$$

where

$$\Gamma(\Delta W/W) \equiv f(\hat{Y}_{-1}) + \pi^{e}$$
$$(1-\Gamma)\,\pi_{input} \equiv Z \qquad (5)$$

Notice that in (5), the familiar equation one obtains from the textbook requires several assumptions, including a constant price-cost markup, and constant APL.

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