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The Monopolistic Competition Model

Below are several questions about the Monopolistic Competition Model in the context of a trade liberalization between the US and Mexico. Take some time and please discuss them with your classmates.

Some information about the widget industry in the US and Mexico: Both countries share the same technological characteristics with consultants from Bain & Company reporting that the fixed cost associated with producing a widget are 75,000$, the variable costs associated with producing a widget are 5$.

Bain also reports demand characteristics of the US and Mexico market: The demand elasticity parameter ``b'' was estimated to be 1/300. Total widget demand in the US was estimated to be 16,000 units and total widget demand in Mexico was estimated to be 9,000 units.

1. Suppose the US market is segmented from the Mexico market (i.e. there is no trade between markets), how many firms operate in the US market? How many firms operate in Mexico? At what prices do they sell their products? How does the US market compare to the Mexican market

First, the way we solve this is to ~~use~~ find n^*, where $P = AC$, i.e. there are zero profits in equilibrium.

The way we did this was,

$$\underbrace{c + \frac{1}{b \times n}}_{P} = \underbrace{c + n \times \frac{F}{S}}_{AC}$$

Then solving for n gave...

$$n^* = \left(\frac{1}{b} \times \frac{S}{F}\right)^{\frac{1}{2}}$$

Then we find the price these firms sell their product at, by just plugging n^* into P,

$$p^* = c + \frac{1}{b \times n^*}$$

Doing so gives....

US

$$n^* = \left(\frac{1}{1/300} \times \frac{16{,}000}{75{,}000}\right)^{\frac{1}{2}} = 8$$

$$p^* = 5 + \frac{1}{1/300 \times 8} = 42.5$$

Mexico

$$n^* = \left(\frac{1}{1/300} \times \frac{9{,}000}{75{,}000}\right)^{\frac{1}{2}} = 6$$

$$p^* = 5 + \frac{1}{1/300 \times 6} = 55$$

So notice how the larger market (the US) can sustain more firms. And b.c. their are more firms, this means, there is more competition, resulting in lower markups and prices relative to the smaller Market.

2. Suppose the widget market now becomes integrated between the US and Mexico. Calculate the price and average cost for a firm assuming the same number of firms in (1.) operated in the combined market. What does this suggest about how the industry will evolve in the future and why?

This question is asking to compute P and AC, as if the total number of firms from 1 ~~economic~~ are in the market. This will then illustrate the point that some firms must exit....

$$P = 5 + \frac{1}{\frac{1}{300} \times (8+6)} = 26.4$$

$$AC = 5 + (8+6) \times \frac{75{,}000}{(16{,}000 + 9{,}000)} = 47$$

Now notice $P < AC$, which means firms are losing economic profits. This implies that in the future, the ("Long-Run"), ~~St~~. some firms will eventually exit.

3. Compute the long-run equilibrium number of firms and prices charged in the integrated US-Mexico market. How does this situation compare to (1) and (2) above? Why might labor unions be opposed the integration of the US-Mexico widget market?

The long-run equilibrium looks like this...

$$n^{g} = \left(\frac{1}{1/300} \times \frac{(16{,}000 + 8{,}000)}{75{,}000}\right)^{\frac{1}{2}} = 10$$

$$p^{g} = 5 + \frac{1}{1/300 * (10)} = 35$$

Relative to (1), integration resulted in a larger number of total firms servicing the market. B.C. Firm = variety, this means consumers have access to more variety — This is a welfare gain. Also, prices go down. This is a second source of gains.

Relative to (2), integration forced some firms to exit. As we saw, the integrated market with 14 firms resulted in firms losing profits. Eventually, 4 firms would have to have exited to get us to the long-run equilibrium we have here.

Labor unions would presumably be opposed due to the short-run job loss as firms exit the industry.

4. Fast forward to five years later, Bain & Company reports that average productivity of Mexican firms increased substantially after the US-Mexican trade liberalization. What does this suggest about how the Mexican part of the industry changed?

This is how to think about the question...

Mexico Firm Productivity Pre-liberalization

3
3
2
2
1
1

Average = 2, ← This says industry productivity on average is 2, pre-liberalization

These, low productivity firms exit, so

Mexico Firm Productivity, Post-Liberalization

3
3
2
2

Average = 2.5

So b.c. the worst performing firms exited, Avererage industry productivity improved. This is how trade "selects" only the most competitive firms.