

Structure-Conduct-Performance Paradigm.

Was the dominant paradigm in industrial organization from 1950 till the 1970s.

Structure: refers to market structure defined mainly by the **concentration of market shares** in the market.

Conduct: behavior of firms - competitive or collusive

(pricing, R&D, advertising, production, choice of technology, entry barriers, predation...)

Performance: social efficiency: mainly defined by extent of **market power**

(greater market power \Rightarrow lower efficiency).

The paradigm was based on the following hypotheses:

i) Structure influences Conduct:

Lower concentration \Rightarrow more competitive the behavior of firms.

(Illustration: In repeated Bertrand game, smaller the number of firms, more likely it is to be collusive.)

ii) Conduct influences Performance.

More competitive behavior \Rightarrow less market power (i.e., greater social efficiency).

(Illustration:

Bertrand pricing with no capacity constraints - severest form of competition - leads to zero market power

Different from Cournot - less competitive - some positive level of market power

Collusion: leads to high market power

i) & ii) implies that: STRUCTURE \Rightarrow CONDUCT \Rightarrow PERFORMANCE

i.e., STRUCTURE \Rightarrow PERFORMANCE

iii) Structure influences Performance directly:

lower concentration leads to lower market power

[Illustration: Cournot symmetric n-firms oligopoly:

As number of firms increase (i.e., market concentration falls), market power declines (i.e., price gets closer to marginal cost).

i), ii) & iii) imply that directly and indirectly, structure determines performance

STRUCTURE \Rightarrow PERFORMANCE

i.e.,

CONCENTRATION \Rightarrow MARKET POWER

Structure (Concentration) is exogenous, the explanatory variable

Performance (Market power) is the dependent variable.

When comparing industries, we should observe that industries with lower concentration have less of market power.

Measurement of Concentration:

If firms identical (symmetric), with n firms, each firm has $\frac{1}{n}$ market share, concentration is inversely related to number of firms.

If firms hold unequal market shares, number of firms is not likely to capture concentration.

Ex.

Industry I : Two firms each with 50% market share

Industry II: Three firms - one with 90% and the other two with 5 % market share

Arguably, industry II is more concentrated in terms of distribution of market shares, though it has more firms than Industry I.

Herfindahl index of market concentration:

Suppose there are n firms in an industry.

For each firm i , let q_i be the output produced by firm i .

Total output in the industry: $q = q_1 + q_2 + \dots + q_n$

The market share of each firm i is denoted by $s_i = \frac{q_i}{q}$

Herfindahl index:

$$H = s_1^2 + s_2^2 + \dots s_n^2$$

In the earlier example:

$$\text{Industry I: } n = 2, s_1 = s_2 = \frac{1}{2}, H = \frac{1}{4} + \frac{1}{4} = 0.5$$

$$\text{Industry II: } n = 3, s_1 = 0.9, s_2 = s_3 = 0.05, H = (0.9)^2 + (0.05)^2 + (0.05)^2 = 0.815$$

So, the Herfindahl index tells us that industry II is more concentrated.

Measurement of market power (Lerner Index):

Market power usually measured by the relative mark-up of price above marginal cost, called the Lerner index.

If all firms have identical marginal cost of production then

$$L = \frac{p - MC}{p}$$

What if firms have different MC of production?

Then, the Lerner index looks at the weighted average of each firm's mark-up of price above marginal cost where the weight is the market share of each firm.

If there are n firms and s_i is the market share of firm i , MC_i is the marginal cost of firm i , then

$$L = s_1\left(\frac{p - MC_1}{p}\right) + s_2\left(\frac{p - MC_2}{p}\right) + \dots + s_n\left(\frac{p - MC_n}{p}\right)$$

The SCP paradigm implies that

$$H \Rightarrow L$$

Differences in H explains differences in L .

A Relationship Between H & L Based on Cournot Oligopoly.

Let ξ = price elasticity of demand.

$$L = \frac{H}{\xi}$$

In a monopoly, $H = 1$ and in that case we have seen that this rule holds.

It can also be shown to hold for a general n -firm Cournot oligopoly (but requires a bit of calculus).

The relationship argues that:

Market power is directly related to market concentration and the strength of their relationship is affected by the elasticity of demand.

If market demand is very elastic, changes in concentration won't have very large effects on pricing and hence market power.

If demand is very inelastic, changes in concentration can have big effects.

Results of Empirical Investigations on Cross-sections of Industries:

Weak statistical relationship.

One reason: data problem.

Lerner index requires information on marginal cost of production that is not readily observable by outsiders.

Investigators used the weighted average of profit rates (ratio of profit to revenue) as a proxy for Lerner index.

Why? Because if firms have constant marginal cost for all levels of output say, c_i for firm i , then

$$\begin{aligned}\frac{p - c_i}{p} &= \frac{pq_i - c_i q_i}{pq_i} \\ &= \frac{\text{Profit of firm } i}{\text{Revenue of firm } i}\end{aligned}$$

But data on accounting profits reported by business does not correspond to the economic concept of profit.

More serious problem: Endogeneity.

Basic hypothesis treats market structure as an exogenous explanatory variable.

But in reality, market structure (concentration) is itself affected by firms' conduct (and hence by performance).

That is because entry and exit of firms in the industry responds to how collusive or competitive firms are, what kind of entry barriers they create, how larger firms predate small firms etc.

Entry and exit, in turn, affect market concentration.

In others, both concentration & market power are determined endogenously, each affecting the other.

The correlation between concentration and market power need not always be positive.

For example, the more collusive an industry is, higher the price and hence market power, but at the same time, higher prices and profits can attract new entry so that concentration may decline.

So you would observe greater market power and smaller concentration.

Finally, even if one does hypothetically observe that higher concentration always leads to market power, there remains an interpretation problem. What does it tell us?

If you believe the statistical result arises greater concentration creates collusion, then this suggests antitrust intervention, pro-competitive public policy - in industries with high values of H .

If you believe on the other hand that the statistical result arises because industries with rapid technological innovation & Schumpeterian competition (creative destruction) will always have high concentration and market power (in order to compensate firms for their innovation & investment), then no intervention is suggested.

We should be happy about industries with high H .

Current industrial organization: tries to explicitly capture conduct of firms instead of sweeping it under the carpet.

Uses firm level rather than industry level analysis.