

Competition Policy - Theory and Practice

Lecture Notes

Lecture 6: Market Structure and Market Power

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Prof. Dr. C. Wey

Lecture topics

- Market definition and SNIPP test
- Market power, structure, and concentration
- Social welfare standard vs. consumer surplus standard

Market definition and SNIPP test

Recall:

- first market definition, then market power assessment in comp. pol.
- mkt. def. allows to calculate mkt. shares which indicate mkt. power

§ 19, Absatz 3, GWB: „Es wird vermutet, dass ein Unternehmen marktbeherrschend ist, wenn es einen Marktanteil von mindestens einem Drittel hat. Eine Gesamtheit von Unternehmen gilt als marktbeherrschend, wenn sie 1. aus drei oder weniger Unternehmen besteht, die zusammen einen Marktanteil von 50 vom Hundert erreichen, oder 2. aus fünf oder weniger Unternehmen besteht, die zusammen einen Marktanteil von zwei Dritteln erreichen, es sei denn, die Unternehmen weisen nach, dass die Wettbewerbsbedingungen zwischen ihnen wesentlichen Wettbewerb erwarten lassen oder die Gesamtheit der Unternehmen im Verhältnis zu den übrigen Wettbewerbern keine überragende Marktstellung hat.“

Market definition and SNIPP test

- at the EU level

Commission Notice on the definition of the relevant market for the purposes of Community competition law, OJ C372, 09.12.1997.

„(...) the market definition makes it possible, inter alia, to calculate market shares that would convey meaningful information regarding market power for the purposes of assessing dominance (...).“

Market definition and SNIPP test

SSNIP-Test (small but significant non-transitory increase in price)

(hypothetical monopolist test)

“The question to be answered is whether the parties’ customers would switch to readily available substitutes or to suppliers located elsewhere in response to a hypothetical small (in the range 5% to 10%) but permanent relative price increase in the products and areas being considered. If substitution were enough to make the price increase unprofitable because of the resulting loss of sales, additional substitutes and areas are included in the relevant market. This would be done until the set of products and geographic areas is such that small, permanent increases in relative prices would be profitable.”

Market definition and SNIPP test

Formally:

Question: How many substitutes have to be controlled by a firm (say firm 1) such that its margin $(p_1 - c_1)/p_1$ increases above 5%?

Order all products $j \neq 1$ according to their cross-price elasticities

$$\epsilon_{1j} := (\partial q_1 / \partial p_j)(p_j / q_1)$$

with $\epsilon_{12} > \epsilon_{13} > \dots > \epsilon_{1n}$

(note: $\partial q_1 / \partial p_j > 0$ holds for substitutes)

Market definition and SNIPP test

The profit of firm 1 is

$$(p_1 - c_1)q_1(p_1, p_2, \dots, p_n)$$

Assume firm 1 controls $k \leq n$ products (and adjusts all prices of controlled goods accordingly); then maximization gives FOC

$$(p_1 - c_1) \sum_{j=1}^k \frac{\partial q_1}{\partial p_j} \frac{\partial p_j}{\partial p_1} = -q_1$$

Market definition and SNIPP test

By assumption $\partial p_j / \partial p_i = 1$; hence

$$p_1 - c_1 = \frac{-q_1}{\frac{\partial q_1}{\partial p_1} + \sum_{j \neq i}^k \frac{\partial q_1}{\partial p_j}}$$
$$\Leftrightarrow \frac{p_1 - c_1}{p_1} = \frac{1}{\epsilon_1 - \sum_{j \neq i}^k \epsilon_{1j}(p_1/p_j)}$$

Adding product by product (increasing k) will increase the RHS until a threshold of 5-10% is reached.

Market power, structure and concentration: Theory

Theoretical foundation for using market shares (and concentration measures, in particular the HHI) for assessing market power

Model

- Cournot competition with $i = 1, \dots, n$ firms
- homogeneous goods; quantities, q_i
- constant marginal costs, c_i
- inverse demand $p(Q)$, with $Q := \sum_{i=1}^n q_i$

Market power, structure and concentration: Theory

Definitions:

Market share of firm i : $m_i := q_i/Q$,

Herfindahl-Hirschman index: $HHI := \sum_i m_i^2$,

Own price elasticity: $\epsilon := -(dQ/Q)/(dp/p)$

Note $H := HHI \cdot 10,000$ is the Herfindahl-Hirschman index as used in the US.

Market power, structure and concentration: Theory

Analysis:

Cournot-Nash eq. condition: (q_1^*, \dots, q_n^*) is an eq. if

$$q_i^* = \arg \max_{q_i \geq 0} p(q_1^*, \dots, q_{i-1}^*, q_i, q_{i+1}^*, \dots, q_n^*)q_i - c_i q_i$$

holds for all $i = 1, \dots, n$.

Inspecting the FOCs we obtain firm i 's Lerner index, L_i , and the industrywide Lerner index, L :

$$L_i : = \frac{p^* - c_i}{p^*} = \frac{m_i}{\epsilon}$$
$$L : = \sum_i m_i L_i = \frac{HHI}{\epsilon}$$

Market power, structure and concentration: Theory

Notes on *HHI*:

- Define $\sigma := \sqrt{\frac{1}{n} \sum_i (m_i - \frac{1}{n})^2}$ which is the standard deviation for the distribution of market shares

- note that $1/n = (\sum_i m_i)/n$ (RHS=expected value of distribution)

- A better measure is the variation coefficient: $V := \sigma/(1/n) = n\sigma$ which corrects for the # of firms

- It then holds that

$$HHI = \frac{1 + V^2}{n}$$

- Hence, *HHI* increases in V^2 and decreases in n .

The use of the HHI in the US Horizontal Merger Guidelines

- uses pre-merger market shares to calculate

- pre-merger HHI: $HHI_{pre} = \sum_i (m_i)^2$

- post-merger HHI: $HHI_{post} = \sum_i (m_i)^2 - (s_1)^2 - (s_2)^2 + (s_1 + s_2)^2 = \sum_i (m_i)^2 + 2s_1s_2$

- $\Delta HHI = HHI_{post} - HHI_{pre} = 2s_1s_2$

- a merger is ordered according to three categories:

1) $HHI_{post} < 1000$: typically presumed to raise no competitive concern

2) $HHI_{post} > 1000$ and $< 1,800$: unlikely to be challenged if $\Delta HHI < 100$; otherwise case by case approach

3) $HHI_{post} > 1,800$: unlikely to be challenged if $\Delta HHI < 50$; if $50 < \Delta HHI < 100$, then there are concerns; if $\Delta HHI > 100$, then merger is presumed to be anticompetitive if no other evidence is presented.

Market power, structure and concentration: Theory

Notes:

A market inquiry and the assessment of market power goes beyond market shares:

- structural factors affecting the ease of sustaining collusion
- substitution patterns in the market (a closer look at differentiation)
- substitution patterns between products in and out of the market
- capacity constraints by other firms
- ease of entry
- countervailing power

Market power, structure and concentration: Theory

Substantitive test in the EU for assessing a “dominant position” (former merger EU regulation)

“...a situation where one or more undertakings wield economic power which would enable them to prevent effective competition from being maintained in the relevant market by giving them the opportunity to act to a considerable extent independently of their competitors, their customers, and, ultimately, of consumers”

- for a single firm, a market share of over 50% is presumptively “dominant”
- no distinction between “unilateral” and “coordinated” effects of a merger
- problem: how to deal with large mergers where the dominant firm of the market is not involved?

Market power, structure and concentration: Theory

New substantive test under the new ECMR

SIEC-test

A merger should be prohibited if it would significantly impede effective competition, in particular as a result of the creation or strengthening of a dominant position, in the common market or substantial part of it.

- parallel to the SIC test in the US: significantly lessening competition

Social welfare vs. consumer welfare standard

- Maximization of social welfare should be the standard
- But: competition policy practice comes close to maximizing “consumer welfare”

Why?

- Distributional concerns?
- Creation of a high hurdle for an efficiency defense?
- Theoretical explanations...commitment value...

Besanko/Spulber (1993): Commitment value of CS-standard

- merging firms have private information about their efficiency, θ
- θ is distributed over $[\underline{\theta}, \bar{\theta}] \subset \mathfrak{R}$ according to distribution $F(\theta)$
- a merger results in a change of profits, $\Delta\pi(\theta)$, and consumer surplus, $\Delta CS(\theta)$
- hence, it holds for social welfare that $\Delta SW(\theta) = \Delta CS(\theta) + \Delta\pi(\theta)$
- a higher value of θ leads to higher $\Delta\pi$, ΔCS and ΔSW
- cost of proposing a merger is $k > 0$ (which is not part of SW !)
- only profitable mergers will be proposed

Besanko/Spulber (1993): Commitment value of CS-standard

Assumption 1:

A1: $E[\Delta SW(\theta)] < 0$; i.e., mergers on average reduce SW

Assumption 2:

A2: $\Delta SW(\theta = \bar{\theta}) > 0$; i.e., most efficient mergers strictly increase SW

Besanko/Spulber (1993): Commitment value of CS-standard

The merger review game:

Stage 1) After observing θ , the merging firms decide whether to “propose” a merger or not.

Stage 2) The antitrust authority does not observe the realized θ , and it chooses a probability α that the merger is approved.

An eq. outcome is described by α and the set of firms which propose a merger.

To show: Expected social welfare is higher under a CS-standard when compared with a SW-standard.

Besanko/Spulber (1993): Commitment value of CS-standard

Analysis - preliminaries.

- note that $\alpha = 0$ and “no-merger-proposal” is always an eq. outcome
- if eq. approval prob. is positive $\alpha > 0$, then a cut-off eq. follows where all types with $\theta \geq \theta'(\alpha)$ merge
- $\theta'(\alpha)$ is defined by $\alpha \cdot \Delta\pi(\theta'(\alpha)) = k$ (i.e., at θ' the merging entity is indifferent)
- a mixed strategy eq. requires that the authority is indifferent between allowing a proposed merger with probability α and prohibiting the merger with probability $1 - \alpha$ (we normalize the benefit in the latter case to zero).

Besanko/Spulber (1993): Commitment value of CS-standard

- the interior eq. (with $\alpha^* \in (0, 1)$) is characterized by two conditions

$$E[\Delta\Psi(\theta)|\theta \geq \theta^*] = 0 \text{ with } \Psi = SW, CS \quad (1)$$

and

$$\theta^* = \theta'(\alpha^*) \quad (2)$$

Besanko/Spulber (1993): Commitment value of CS-standard

Case 1) Social welfare standard

- note first: $\alpha^{SW} = 1$ is not an eq. b/o A1
- assume $\alpha^{SW} < 1$; using (1) and (2) we obtain the condition

$$E[\Delta SW(\theta) | \theta \geq \theta^{SW}] = 0$$

where $\theta^{SW} = \theta'(\alpha^{SW})$.

Under the SW-standard the expected net surplus generated by mergers is zero.

But: Each merger leads to proposal costs k , so that overall surplus is negative.

Hence: Banning all merger activity would be better!

Besanko/Spulber (1993): Commitment value of CS-standard

Case 2) Consumer surplus standard

Assume an interior solution α^{CS} and θ^{CS} to conditions (1) and (2) exists.

We then obtain the expected social welfare under the CS-standard as

$$\begin{aligned}
 & \underbrace{(1 - F(\theta^{CS}))}_{\text{Eq. prob. of a merger proposal}} \cdot \underbrace{\{\alpha^{CS} E[\Delta SW(\theta) | \theta \geq \theta^{CS}] - k\}}_{\text{Expected SW-change net of proposal costs}} \\
 &= (1 - F(\theta^{CS})) \{ \underbrace{\alpha^{CS} E[\Delta CS(\theta) | \theta \geq \theta^{CS}]}_{=0! \text{ (cond. 1)}} + \alpha^{CS} E[\Delta \pi(\theta) | \theta \geq \theta^{CS}] - k \} \\
 &= (1 - F(\theta^{CS})) \underbrace{\{\alpha^{CS} E[\Delta \pi(\theta) | \theta \geq \theta^{CS}] - k\}}_{\text{Note: } \alpha^{CS} \Delta \pi(\theta^{CS}) - k = 0! \text{ (cond. 2)}} > 0
 \end{aligned}$$

Hence: CS-standard performs on average better than SW standard.

Besanko/Spulber (1993): Commitment value of CS-standard

Notes:

- general idea appears valid as mergers often involve substantial costs
- but, a fee can do better than “crude” CS-standard-instrument
- analysis neglects outsiders’ profit change:

$$\Delta SW = \Delta CS + \Delta \pi^{\text{Insider}} + \sum \Delta \pi^{\text{Outsider}}$$

Other ideas why a CS-standard increases overall SW

- Firms can lobby, but consumers not: Neven and Röller show that if lobbying is efficient such that all firms transfer their profit differentials (1:1) to the decision maker in the authority, then the decision maker maximizes

$$\Delta CS + \sum_i \Delta \pi_i = \Delta SW !$$

- A CS-standard reduces conflicts in international merger control (Haucap, Müller, Wey); often changes in profits are different across countries but impact on prices are the same.

Literature behind the lecture

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