Remedies vs. Extreme Options in Merger Control

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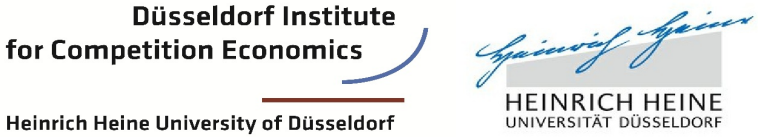

Motivation

Remedies:

- important device used by Antitrust Authorities (AA) to countervail mergers' anticompetitive effects
- structural remedies (divestitures of capital of the merged entity) for horizontal mergers
- behavioral remedies (behavioral obligations for the merged entity) for vertical mergers
- intermediate option between a merger's approval/ denial

Motivation (cont.)

- Observation: remedies are applied in about 50% of all phase-II merger decisions in the EU and the US (Davies and Lyons, 2008; Kwoka, 2015)

→ Remedies may be applied too often by the AA

- Potential reasoning: Intermediate options lower the effect of false decisions; if optimal decisions require costly effort, the AA may have incentives to apply remedies excessively
- investigate the effect of the introduction of remedies for different institutional systems
  - inquisitorial: info acquisition bundled within AA
  - adversarial: advocates for merging firms and outsiders acquire information

Principal-Agent-Setup

- principal (legislator) and agent (antitrust agency, AA/ advocates of the merging firms, AF, and the outsiders [outsider firms and consumers], AC)
- Efficiencies are distributed according to density $f(e)$ with $\underline{e} \leq e \leq \bar{e}$.
  - $\rightarrow$ efficiencies are ex-ante unobservable for leg. and agent
  - $\rightarrow$ agent chooses the quality of information $\beta \in [0, 1]$ (costly!) which is the probability of observing the correct efficiency type

Denotation

- for $X \in \{M,NM,R\}$, let $SW^X(e)$ denote the change in SW following a merger proposal of efficiency type e and decision X
- Expected change in SW for $X \in \{M, NM, R\}$ given by

$$\overline{SW}^X := \int_{\underline{e}}^{\bar{e}} SW^X(e) f(e) de$$

- let $\Pi^X(e)$ and $\overline{\Pi}^X$ denote the difference between the post-merger profit of the merged entity & the sum of pre-merger profits of those firms involved in the merger
- analogously, define the outsider firms' difference in profits as $\Pi_O^X(e)$ and $\overline{\Pi}_O^X$, the difference in consumer surplus as $CS^X(e)$ and $\overline{CS}^X$ and the externalities as $\varepsilon^X(e) := CS^X(e) + \Pi_O^X(e)$ and $\overline{\varepsilon}^X := \overline{CS}^X + \overline{\Pi}^X$

Assumptions

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A1: *The legislator's objective is to maximize overall social welfare, that is, social welfare minus the agency's information costs*

A2$^{\text{inq}}$: *The agency A's objective is the maximization of $SW = \Pi + \varepsilon$ minus α times its information acquisition C_A costs for some $\alpha > 1$.*

A2$^{\text{adv}}$: *The AC's objective is the maximization of $\varepsilon = CS + \Pi_O$ minus α times its information acquisition costs C_{AC}, and the AF's objective is the maximization of Π minus α times its information acquisition costs C_{AF} for some $\alpha > 1$.*

A3: *The information acquisition cost function $C(\beta)$ fulfills the Inada-conditions $C(0) = 0$, $C'(\beta) > 0$, $C''(\beta) > 0$, $\lim_{\beta \to 1} C(\beta) = +\infty$,* where $C \in \{C_A, C_{AC}, C_{AF}\}$

Assumptions (cont.)

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A4: *$SW^X(e)$ is continuous in e for all $X \in \{M, R\}$. Furthermore, assume that $SW^M(\underline{e}) < 0$ and $SW^M(\bar{e}) > 0$ and*

$$\frac{\mathrm{d}SW^M(e)}{\mathrm{d}e} > \frac{\mathrm{d}SW^R(e)}{\mathrm{d}e} > 0 \quad \forall e. \tag{1}$$

(the effect of a merger's efficiency impacts to a larger degree SW if the merger is fully implemented than if its effects are mitigated by remedies.)

$\rightarrow \exists$ *three thresholds* $\underline{e} \leq e_1 \leq \hat{e} \leq e_2 \leq \bar{e}$ *s.t.:*
- *for* $e < e_1$, NM *is optimal concerning* SW,
- *for* $e_1 < e < e_2$, R *is optimal,*
- *for* $e > e_2$, M *is optimal,*
- *for* $e < \hat{e}$, NM *is better than* M, *for* $e > \hat{e}$, M *is better.*

Threshold values: graphical

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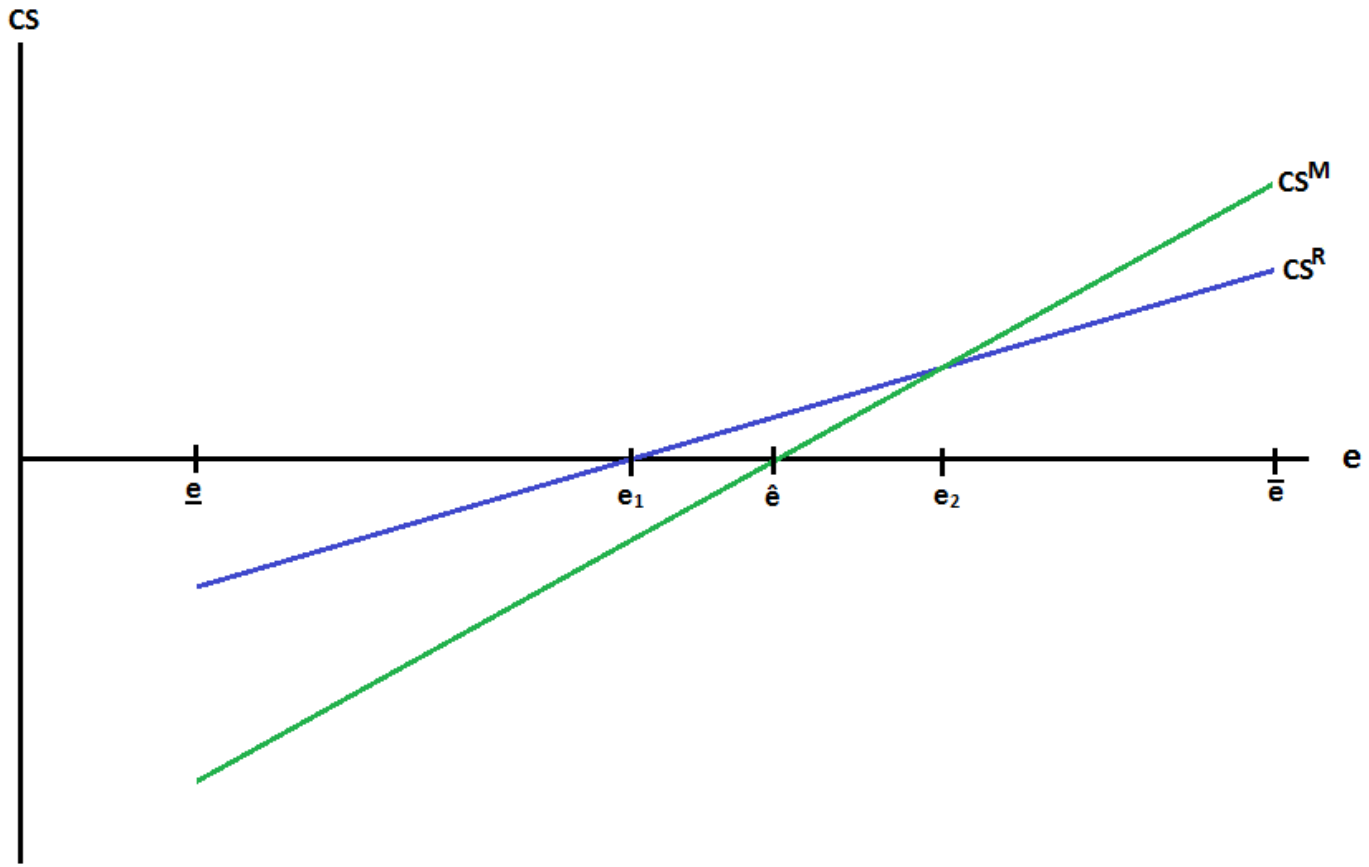

Figure: Efficiency thresholds concerning social welfare

Assumptions

A5: *All mergers are profitable,* $\Pi^X(\underline{e}) > 0 \quad \forall e$*, but* $\Pi^M(e) > \Pi^R(e) \quad \forall e$*. In addition*

$$\frac{\mathrm{d}\Pi^{\mathrm{X}}(\mathrm{e})}{\mathrm{de}} > 0 \quad \forall e,\ X \in \{M, R\}$$

A6: *All mergers have negative externalities,* $\varepsilon^X(e) < 0 \quad \forall e$ and $X \in \{M, R\}$*, but* $\varepsilon^M(e) < \varepsilon^R(e) \quad \forall e$*. In addition,*

$$\frac{\mathrm{d}\varepsilon(\mathrm{e})}{\mathrm{de}} > 0 \quad \forall e,\ X \in \{M, R\}$$

A7: *Ex-ante, the remedial option is optimal, that is,* $\max\{\overline{SW}^M, \overline{SW}^{NM}\} < \overline{SW}^R$

Inquisitorial Regime: the Game

1^{st}: Leg. decides about regime R (*remedies are feasible*) or NR (*remedies are not feasible*).

2^{nd}: a merger is proposed.

3^{rd}: the AA decides on β.

4^{th}: the AA approves (M)/ denies (NM)/ appr. with a (unique!) rem. (R)

$\rightarrow$ how much effort does the AA exert under regimes R and NR ?

$\rightarrow$ can it be optimal to remove the remedial option from the AA's action space?

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Different Special Cases

Special case I: If $\underline{e} = e_1$ and $e_2 = \overline{e}$, then a remedy is optimal for all merger types.

Special case II: If $e_1 = e_2 = \hat{e}$, then a remedy is not optimal for any merger type. [support by empirical literature such as Kwoka (2015)]

Subgame perfect Nash Equilibria

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Proposition

- *remedies are always optimal: first best implemented*
- *remedies are never optimal: the agency acquires more info under regime NR than under R. Legislator prefers NR iff*

$$\underbrace{(\beta^*_{NR,II} - \beta^*_{R,II}) \times \int_{\hat{e}}^{\bar{e}} f(e) SW^M(e) de}_{\text{Gain in SW from more info}}$$

$$> \underbrace{(1 - \beta^*_{R,II}) \times \overline{SW}^R - (1 - \beta^*_{NR,II}) \times \max\{\overline{SW}^M, 0\}}_{\text{Gain through rem. in no-info scenario}}$$

$$+ C_A(\beta^*_{NR,II}) - C_A(\beta^*_{R,II})$$

Subgame perfect Nash Equilibria (cont.)

Thus, in case II (*remedies are never optimal ex post*):

- Under R: very little effort by AA and remedies are applied anyway since the potential error cannot be very high.
- Under NR: potential error is high $\rightarrow$ AA exerts more effort.

$\rightarrow$ Legislator faces trade-off at Stage 1:

introduce valuable intermediate options (remedy)

$\leftrightarrow$

enhance info-acquisition incentives

$\rightarrow$ Leg. may restrict the AA's strategy set (see Szalay, 2005 RES)

$\rightarrow$ NR may be optimal if info costs are at an intermediate level, so that info acquisition is much larger under NR

Adversarial System: Modified Game

Stage 1: Leg. decides about regime NR or R
Stage 2: Merger Proposal
Stage 3: AF and AC decide simultaneously on β_{AF} resp. β_{AC}
Stage 4: AF and AC decide if to reveal their evidence to the court
Stage 5: Court decides in order to max. welfare given info from AF and AC; if no info: implement what is on average best

$\rightarrow$ Leg. gets in eq. info from AC only on $[\underline{e}, \hat{e}]$ and from AF only on $e \in (\hat{e}, \bar{e}]$

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Subgame perfect Nash equilibria (advocates)

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Proposition

- *remedies are always optimal: The first best solution is realized, no incentive problem since no info needed.*
- *remedies are never optimal: the revealed information by the two advocates is lower if remedies are feasible if only if*
  - $F(\hat{e}) \times (\beta_{AC}^{NR} - \beta_{AC}^{R}) > (1 - F(\hat{e}))\beta_{AF}^{R}$ *if* $\overline{SW}^{M} > 0$
  - $(1 - F(\hat{e})) \times (\beta_{AF}^{NR} - \beta_{AF}^{R}) > F(\hat{e}) \times \beta_{AC}^{R}$ *if* $0 > \overline{SW}^{M}$

$\rightarrow$ in contrast to the AA in the inquisitorial system, both advocates are dissatisfied with the prior R: they will exert in order to convince the court not to decide for R

Comparison

Suppose case II and suppose remedies are feasible.

- adversarial system comprises an inherent inefficiency as both advocates will not reveal the full set of information they have. Then, for $\beta_A = \beta_{AF} = \beta_{AC}$, typically, the inquisitorial system is superior
- Which system produces more info on $e \in (\hat{e}, \overline{e}]$? Trade-off:
  - this info is more valuable to AF than to A as, unlike the agency, it does not internalize the merger's negative externalities valuable to the merging firms' advocate as

$$\begin{aligned} & \Pi^M(e) - \Pi^R(e) \\ < \; & SW^M(e) - SW^R(e) = \Pi^M(e) - \Pi^R(e) - (\varepsilon^R(e) - \varepsilon^M(e)) \end{aligned}$$

  - AF's incentive to acquire info is compromised as the acquired piece of information may be the "wrong" kind of info

Comparison (cont.)

- Analogously, it is ambiguous in which system more info on the low-efficient merger types is revealed
- c.p., the more the parties objectives differ the larger the advocate's incentive to acquire info and the more likely it is that the adversarial system provides more info than the inquisitorial one
- for example, suppose two scenarios, where $'$ denotes the second scenario. We have $\Pi'^M(e) = \Pi^M(e) + \gamma(e)$ and $\varepsilon'^M(e) = \varepsilon^M(e) - \gamma(e)$ for a function $\gamma > 0$ c.p. ($SW'(e) = SW(e)$ holds for all e, ...) $\rightarrow$ advocates in scenario II reveal more info than advocates in scenario I

Conclusion

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1) extreme options scenario $\rightarrow$ false decisions may have severe consequences
2) intermediate option $\rightarrow$ weakens effects of false decisions

$\rightarrow$ the introduction of an intermediate option (remedy) may frustrate the Antitrust Authority's incentive to gather valuable, but costly information

$\rightarrow$ remedies, introduced to increase social welfare, may be applied too often if better solutions are possible

$\rightarrow$ opposes the general positive view on remedies

3) however, this depends on the institutional environment
4) Insights can be applied to various setups (horizontal mergers and structural remedies; vertical mergers and behavioral remedies)