Evidence Production in Merger Control: The Role of Remedies[*]

Markus Dertwinkel-Kalt[†]   Christian Wey[‡]

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Abstract

We analyze evidence production in merger control as a delegation problem in an inquisitorial competition policy system. The antitrust agency's incentives to produce evidence on the efficiency of a merger proposal depend critically on its action set. Allowing for a compromising remedy solution reduces information acquisition incentives, and could therefore lower consumer welfare. Requiring a standard of proof for remedies eliminates the effort-frustrating effect of the remedy solution.

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[†]Frankfurt School of Finance & Management. Email: m.dertwinkel-kalt@fs.de

[‡]HHU Düsseldorf, Düsseldorf Institute for Competition Economics (DICE); wey@dice.hhu.de.

1 Introduction

We analyze evidence production in merger control as a delegation problem in an inquisitorial competition system. Depending on its ex-ante uncertain efficiency type, a merger proposal can be anti- or pro-competitive (i.e., consumer welfare reducing or increasing). A principal-agent problem between the legislator—whose objective is to maximize consumer welfare—and the antitrust agency—whose objective is consumer surplus minus effort costs—arises from the fact that effort provision by the agency is non-contractible.

We investigate how different action sets of the agency affect its incentives to exert effort and acquire information on the efficiency type of a proposed merger. We compare the case (1) in which the agency can either approve or prohibit the merger altogether with the case (2) where a merger can also be cleared conditionally on a remedy solution. Throughout our analysis we take the remedy solution as a compromising choice that is optimal from an ex ante perspective; that is, whenever only the a priori information on the merger's efficiency type is available.

Our main result is the following. Suppose that an *extreme* decision, either *approval* or *prohibition*, is always ex post optimal (i.e., when information is complete). Then, incentives are unambiguously reduced through the introduction of the remedy solution when compared to a no-remedy regime which forces the agency to either approve or prohibit the merger. Quite generally, an intermediate option (that is in our setup, the remedy solution) represents a compromising choice that limits the negative effect of a false extreme decision. Because of this, allowing for the remedy solution reduces the agency's incentives to obtain information on the merger's efficiency type. In contrast, in a scenario in which only extreme options are implementable, a false decision bears the risk of making a wrong decision with strong negative effects. Therefore, in the absence of the remedy solution, the agency acquires more information in order to avoid such negative consequences. Thus, it can be overall desirable for the legislator to remove the remedy solution from the agency's choice set.[1]

Finally, we analyze "remedies with a standard of proof." Here, the remedy can only be used if evidence supports its ex post optimality. We show that requiring a standard of proof for the

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[1] This result has to be qualified when the remedy solution can also be ex post efficient. Then, information acquisition incentives increase in a system with a remedy option increase the more likely it is that the remedial solution is the ex post optimal choice.

remedial option leads to higher information (and higher consumer welfare) levels than in the case where remedies cannot be implemented. As a consequence, requiring a standard of proof for the remedial solution is always weakly preferred over a no-remedy regime.

The merger model we use follows Cosnita-Langlais and Tropeano (2012), while our analysis builds on Szalay (2005), who examines a principal-agent model in which the agent collects information and then chooses a verifiable action. The agent's effort is not contractible and the principal cannot design an incentive compatible contract based on ex post outcomes. The critical step in this analysis is to focus on the agent's incentives as a result of the composition of her choice set. It is shown that it can be optimal to remove the intermediate choices from the agent's action set to increase her incentives to acquire information. We apply Szalay (2005) to antitrust.

2   The Model

In our inquisitorial system, the legislator delegates the enforcement of merger control (evidence production and the final decision making) to an agency.[2] Their objectives are aligned in the following sense. The objective of the agency is consumer welfare, but the agency also takes its effort costs for information acquisition into account and therefore maximizes consumer surplus minus its information costs.[3]

Mergers differ in the efficiencies, e, which they generate (see Besanko and Spulber 1993). The distribution of efficiencies is given by the density function $f(e)$ on the interval $e \in [\underline{e}, \overline{e}]$, where $\underline{e}$ denotes the lowest and $\overline{e}$ the highest possible efficiency level. The prior distribution of efficiencies is common knowledge, while the specific efficiency level of a particular merger is the private information of the merging firms. The agency can acquire information on a merger's efficiency level by exerting costly effort to observe the true efficiency type with probability $\beta \in [0, 1]$. If the agency chooses a particular value β, it learns the true efficiency type with

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[2]This definition of an inquisitorial system follows, for instance, the definition given by Dewatripont and Tirole (1998) and applies, as delineated by Neven (2006), to merger control in the European Union.

[3]It is a common assumption that bureaucrats are intrinsically motivated to serve the principal's objectives (Besley and Ghatak, 2005; Prendergast, 2007). Long-run motivation of the bureaucrats may also be provided by the fear of the restructuring of their institution in the case of its failure. Direct financial incentives, however, are almost unfeasible as bureaucrats are not paid according to their performance.

probability β and does not obtain any information on the merger type with counter probability $1 - \beta$.[4] Costs for information acquisition are given by $C(\beta)$, which fulfills the Inada conditions $C(0) = 0$, $C'(\beta) > 0$, $C''(\beta) > 0$, $\lim_{\beta \to 1} C(\beta) = +\infty$.

We investigate the agency's choices of β under two regimes: *NR* (*no-remedy regime*) and *R* (*remedy regime*). Under *NR*, the agency can only approve or prohibit the merger altogether. Under regime *R*, the agency can also condition its approval on a remedy solution. We assume that a unique remedy exists for every merger proposal, and that the implementation of this remedy does not render a proposed merger unprofitable for the proposing firms.[5]

Let X indicate the agency's merger decision, $X \in \{M, N, R\}$, which can be an approval ($X = M$), a prohibition ($X = N$) or an approval conditional on a remedy ($X = R$). Given a merger of a certain efficiency type e, let $W^X(e)$ denote the change in consumer welfare when the agency adopts decision X. The expected change of consumer welfare if decision X is adopted is given by $\overline{W}^X = \int_{\underline{e}}^{\overline{e}} W^X(e) f(e) de$. If a merger proposal is prohibited, consumer welfare does not change, so that $\overline{W}^N = 0$ holds.

We impose the following assumptions on the pre- and the post-merger market outcomes, which are in line with models that analyze structural remedies in oligopolistic markets such as see Cabral (2003), Vergé (2010), Vasconcelos (2010), and Dertwinkel-Kalt and Wey (2016).

A1: *Consumer welfare $W^X(e)$ is continuous and strictly monotonically increasing in e for all $X \in \{M, R\}$. Let $W^M(\underline{e}) < 0$ and $W^M(\overline{e}) > 0$. Furthermore, assume that*

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

Condition (1) is intuitive: the (positive or negative) effect of a merger's efficiency impacts on consumer welfare to a larger degree if the merger is fully implemented than if its effects are

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[4] For brevity, we consider a setting in which gathered information is always correct, but it is straightforward to show that our results also hold if acquired information is false with some probability.

[5] In the case of structural remedies only a specific business unit or production plant may qualify as a remedial divestiture (Vasconcelos, 2010). Moreover, legal requirements reduce the set of possible remedies. For example, the remedy must be easily applicable and a divestiture only qualifies as a potential remedy if it is a "viable business" which can "operate on a stand-alone basis" (EC, 2008). Thus, wider packages may be required in order to satisfy viability (Motta et al., 2003; Davies and Lyons, 2007). In the case of vertical mergers and behavioral remedies, standard obligations not to foreclose outsiders and to supply them at a reasonable price quite naturally single out a remedy for a merger proposal.
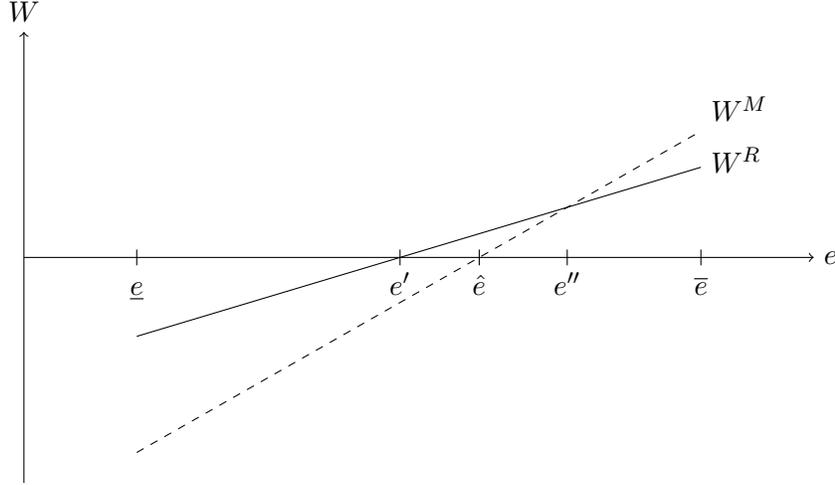
Figure 1: *Thresholds concerning W for a continuous distribution of merger efficiencies.*

mitigated by the remedy solution. This setting is illustrated in Figure 1.

From Assumption A1 it follows that the function $W^M(e)$ has at most one zero. $W^R(e)$ has also at most one zero and intersects with $W^M(e)$ at most once. Without loss of generality, we assume that all three points of intersection exist[6], and are denoted by e' (such that $W^R(e) = 0$), e'' (such that $W^R(e) = W^M(e)$) and $\hat{e}$ (such that $W^M(e) = 0$), respectively. We denote $e_1 := \min\{e', \hat{e}\}$ and $e_2 := \max\{e'', \hat{e}\}$. Thus, from a consumer welfare perspective, a prohibition of the merger is optimal for $\underline{e} < e < e_1$, remedies are optimal for $e_1 < e < e_2$, and a full merger is optimal for $e_2 < e < \overline{e}$. Note that these intervals may be empty, for instance, if $e_2 < e_1$. For brevity, we assume that there is zero probability mass on the threshold values e', e'' and $\hat{e}$.

A2: *Ex ante (i.e., based on the distribution of efficiencies) an approval conditional on a remedy is preferred from a consumer welfare perspective; that is,* $\max\{\overline{W}^M, 0\} < \overline{W}^R$.

According to A2, we invoke a "remedy-favoring assumption." Ex ante, that is, before the acquisition of costly evidence, it is optimal to approve any merger proposal conditional on a remedy. This mirrors our motivation to interpret the decision to approve a merger conditional on remedies as an *intermediate option* which is optimal if no information is available (Szalay, 2005). In contrast, extreme decisions such as an unconditional approval or the outright prohibition of the merger bear the risk of making a "large" mistake with substantial consumer welfare losses. Hence, in the absence of any additional information, the remedy option represents a relatively

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[6]We impose this assumption for notational ease while it does not compromise our analysis.

"safe" choice

We distinguish between two types of remedy regimes: *first*, we analyze the case of remedies without a standard of proof and *second* we examine the case where remedies must meet a certain standard of proof. In the former case, a remedial solution can be implemented without any empirical justification, so that its use will be decided only in terms of expected values. In the latter case, a remedial solution can only be implemented whenever there is hard evidence that the remedy is indeed optimal; that is, information must be gathered and evaluated which proves the optimality of the remedy decision.

3   Analysis

3.1   Remedies without a standard of proof

We analyze the following game. In the first stage, the legislator decides on the agency's action space; that is, it decides whether remedies are feasible (regime R) or not (regime NR). In the second stage, a merger is proposed. In the third stage, the agency decides on the quality of information β it acquires. Finally, in the fourth stage, the agency makes its final judgment on the merger proposal.

We solve this game via backward induction. The agency's decision in the fourth stage depends on the availability of the remedial option and the information β it has acquired in the third stage. Suppose regime R applies. If the agency holds information on the merger's type, then it decides according to the following decision rule: a merger of type $e \in [e_2, \overline{e}]$ is approved approved, a merger of type $e \in [e_1, e_2]$ is approved with a remedy, and a merger of type $e \in [\underline{e}, e_1]$ is prohibited. Thus, with information on the efficiency of the merger at hand, the agency always implements the (ex post) consumer welfare-maximizing solution. If, to the contrary, the agency does not hold any information, then the remedy is implemented due to our remedy-favoring assumption A2.

Next, suppose regime NR applies. Thus, if no information is held, then the merger is prohibited if $\max\{0, \overline{W}^M\} = 0$ and it is approved if $\max\{0, \overline{W}^M\} = \overline{W}^M$. If information is held, a merger of type $e \in [\hat{e}, \overline{e}]$ is fully approved, and a merger of type $e \in [\underline{e}, \hat{e}]$ is prohibited.

In the third stage, the agency chooses the level of information $\beta \in [0, 1]$. Under regime R,

the equilibrium level of information acquisition β_R is given by the maximization of

$$\beta \left(\int_{\underline{e}}^{e_1} f(e)W^N(e)de + \int_{e_1}^{e_2} f(e)W^R(e)de + \int_{e_2}^{\overline{e}} f(e)W^M(e)de \right) + (1 - \beta)\overline{W}^R - C(\beta). \quad (2)$$

Under regime NR, the equilibrium is given by the maximization of

$$\beta \left(\int_{\underline{e}}^{\hat{e}} f(e)W^N(e)de + \int_{\hat{e}}^{\overline{e}} f(e)W^M(e)de \right) + (1 - \beta)\max\{0, \overline{W}^M\} - C(\beta). \quad (3)$$

With $W^N(e) = 0$ the optimal information levels β_{NR}^* and β_R^* follow from the first-order conditions

$$\int_{e_1}^{e_2} f(e)W^R(e)de + \int_{e_2}^{\overline{e}} f(e)W^M(e)de - \overline{W}^R \overset{!}{=} C'(\beta_R^*), \text{ and} \quad (4)$$

$$\int_{\hat{e}}^{\overline{e}} f(e)W^M(e)de - \max\{0, \overline{W}^M\} \overset{!}{=} C'(\beta_{NR}^*), \quad (5)$$

respectively.

To focus our analysis on the agency's effort choice, we now maintain the assumption that the remedial option is never the ex post optimal choice.

A3: *Ex post the remedial option is never optimal, that is $e_1 = e_2 = \hat{e}$.*

We then obtain the following proposition.

Proposition 1. *Under Assumption A3, the agency acquires a higher information level under regime NR than under regime R. Expected consumer surplus is higher under NR if and only if the higher level of information is sufficient to counterbalance the detrimental effects of the remedy's removal in the no-information scenario, that is, if*

$$\underbrace{(\beta_{NR}^* - \beta_R^*) \cdot \int_{\hat{e}}^{\overline{e}} f(e)W^M(e)de}_{\text{positive effect of } NR \text{ due to more information}} > \underbrace{(1 - \beta_R^*) \cdot \overline{W}^R - (1 - \beta_{NR}^*) \cdot \max\{\overline{W}^M, 0\}}_{\text{negative effect of } NR \text{ when no information available}}. \quad (6)$$

Proof. Comparing (4) and (5) under A3 immediately yields that $\beta_{NR}^* > \beta_R^*$. Formula (6) follows from rearranging (2) and (3). □

If remedies are not ex post optimal for any merger proposal, then the removal of the intermediate option increases the agency's incentives to acquire information. This result is driven by the following intuition. If remedies are feasible, it may be optimal for the agency to exert very little effort and to apply remedies as the potential error which accompanies this decision is limited. If, however, remedies are not feasible then the potential error associated with an extreme decision might be so high that exerting more effort, that is, acquiring better information,

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is optimal for the agency. With better information at hand, the agency limits the potentially high costs associated with a false decision.

Besides this positive incentive effect of a removal of the remedy option, it also creates a real cost because the remedy is optimal on average (i.e., in the absence of concrete information concerning a proposal's type). By acquiring more information, remedies become less important since the range where they are optimal (i.e., the number of no-information scenarios) shrinks.

Whether or not the additionally acquired information also gives rise to an increase in consumer surplus depends on the interplay between consumer welfare losses due to the removal of remedies and the gains in consumer welfare due to the higher information acquisition level. In equilibrium, the positive surplus effect of an improved information level may overcompensate the welfare losses which result from the removal of the remedial option. In that case, the legislator optimally decides to remove the remedy option from the agency's action space.

The optimality of the extreme option regime NR depends on the exact shape of the information cost function C. Regime NR is most likely to dominate regime R from a consumer point of view if the difference in information acquisition is sufficiently high between the regimes, which is the case if information acquisitions costs are at an intermediate level (i.e., C being neither too step nor too flat). Then, to spur the information acquisition incentives of the agency and increase consumer welfare thereby, the legislator finds the removal of the remedial option attractive.

Note that Proposition 1 holds qualitatively not only when remedies are not ex post optimal, but also if the range where remedies are ex post optimal is not too large.

3.2 Remedies with a Standard of Proof

We now suppose that the legislator can opt for a third regime (beside approval/denial) in which the remedy option can only be implemented whenever the agency has obtained evidence on its optimality. Let us denote this third regime by R^S. In this case, a remedy cannot be applied if no information on the exact merger type has been acquired, so that it cannot be used as an intermediate option. Rather, the agency must gather information and persuasively argue that the remedial solution is indeed optimal if it wants to implement it.[7]

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[7]In the decision *EDP v Commission* the General court "ruled that if the notifying party submits commitments, the burden of showing that the concentration as amended by the commitments should be prohibited remains on

While under regime NR the agency chooses β_{NR} in order to maximize Condition (3), under regime R^S it chooses β_{R^S} in order to maximize

$$\beta \left(\int_{\underline{e}}^{e_1} f(e)W^N(e)de + \int_{e_1}^{e_2} f(e)W^R(e)de + \int_{e_2}^{\overline{e}} f(e)W^M(e)de \right)$$
$$+ (1-\beta)\max\{0, \overline{W}^M\} - C(\beta). \tag{7}$$

Note that the equilibrium information level according to (7) is always weakly higher under the remedy regime with a standard of proof than under a no-remedy regime, that is, $\beta_{R^S}^* \geq \beta_{NR}^*$ holds, as information becomes more valuable. In fact, should the agency discover that the remedy is the optimal option, it can implement it under regime R^S while it has to implement only a second-best option under regime NR. Consequently, the remedy regime with a standard of proof always induces both a weakly higher information level and a weakly higher consumer welfare level that under NR.

Corollary 1. *If the legislator prefers regime NR over regime R, it prefers regime R^S over regimes R and NR.*

The remedy regime with a standard of proof is appealing to the legislator for the following reasons: while it allows to implement the remedy if this represents the best available option, it eliminates the effort-frustrating effect of a remedy as a relatively safe intermediate option. Therefore, this regime always outperforms a no-remedy regime. Note that this point is not obvious: R^S still has the disadvantage that it does not allow for the ex ante optimal option –the remedy– if no information is available. As we have shown, however, it can be optimal to remove the ex-ante optimal option in order to provide better incentives to the agency. If regime NR outperforms regime R, then R^S is the preferred regime of the legislator.

4 Conclusion

An inquisitorial enforcement system which allows for a remedial clearing of a merger is likely to suffer from an incentive problem as the agency's incentives to spend effort into information gathering and processing can be reduced by the intermediate option. The intermediate decision serves as a save option which avoids the risks associated with extreme rulings, so that

the Commission" (Lindsay and Berridge, 2012, FN 137).

an extreme-option system may lead to higher evidence acquisition incentives and thus possibly higher consumer welfare. While this insight appears to be a simple one, it stands in contrast to the generally optimistic view on merger remedies as, for instance, expressed in the European legislation, which describes remedies as an effective way to restore competition (EC, 2008, Article 22).

Finally, we have also shown that merger control should unambiguously improve even beyond the "no-remedy" regime in the inquisitorial system when a remedy solution is based on hard evidence which proves its optimality. Again, this finding is mirrored in the observation that remedy regulations have been tightened over time in the EU; in particular, the informational burden for remedies has been raised which is reflected in the publication of the "Revised Notice on Remedies" (see EC, 2008, and Lindsay and Berridge, 2012, p. 617).

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