

Institutional Design and Antitrust Evidentiary Standards

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Abstract

The purpose of this paper is to study the relative impact of public and private competition law enforcement on the substantive doctrine of antitrust liability. In a model with asymmetric information during trial, and where the number of cases filed depends on the amount of the damages awarded and the standard of proof applied upon trial either by the public authority or by the judge, we highlight a crucial trade-off between the number of cases filed and the social cost of judgement errors. Our analysis is useful to discuss the evolution of the future European substantive doctrine of antitrust liability in view of the recent move by the European Commission to facilitate private claims for antitrust damages in Europe.

Keywords: antitrust, public and private enforcement, standard of proof

JEL classification: K21, L41, D82

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1 Introduction

Over the past two decades, the EU and US competition policies appear to have evolved towards greater convergence in the enforcement of cartels and merger control (Kovacic, 2008). In turn, the treatment of abuse of dominant position/market monopolization illustrates the substantive dissimilarity remaining between the two antitrust systems¹. Consider predatory pricing and its three acknowledged elements: sacrifice, elimination, recoupment. Whereas the approach in the EU focuses on the first two (the form of pricing), the US policy on predation emphasizes all three of them, which makes predation harder to prove. More generally, the decisions of the US courts under Section 2 of the Sherman Act such as *Brooke Group*², *Trinko*³ or *Weyerhaeuser*⁴ have shown greater skepticism about abuse of dominance claims and weaker liability for dominant firms than the European judicial decisions in mirror cases such as *France Telecom/Wanadoo*⁵, *Michelin II*⁶ or *British Airways*⁷.

One possible explanation for this visible progression towards a more lenient treatment of dominant firm conduct in the US over the past 30 years may be the role played by private rights and the delegation of the decision to prosecute (Kovacic, 2003). Accordingly, if courts fear that the private party incentives to sue are misaligned with the larger interests of the public, or that the US style of private rights of action (with mandatory treble damages, asymmetric shifting of costs, class actions) excessively deter legitimate business conduct, the courts will use measures within their control to correct the perceived imbalance. In particular and following Kovacic (2008), the courts may “equilibrate” the antitrust system by adjusting evidentiary requirements that must be satisfied to prove violations, or alter substantive liability rules in ways that make it more difficult for the plaintiff to establish the

¹See Larouche and Schinkel (2013) for a review of other differences between Art. 102 TFEU and Section 2 of Sherman Act.

²*Brooke Group Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209 (1993).

³*Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398 (2004).

⁴*Weyerhaeuser Co. v. Ross-Simmons Hard-Wood Lumber Co., Inc.*, 127 S.Ct. 1069 (2007).

⁵Case T-340/03, *France Telecom SA v. Commission*, 2007.

⁶Case T-203/01, *Manufacture Francaise des Pneumatiques Michelin v. Commission*, 2003.

⁷Case T-219/99, *British Airways PLC v. Commission*, 2003.

defendant's liability.

It is our purpose in this paper to devise a model to deal with the relative impact of public and private competition law enforcement on the substantive doctrine of antitrust liability. Our model predicts that the private enforcement procedure always exhibits a higher standard of proof than the public enforcement, and that a higher level of damages awarded is also associated with a higher evidentiary requirement for the plaintiff. Our framework is equally useful to compare the expected welfare from both types of antitrust enforcement.

We develop a model where the court or the antitrust authority sets the standard of proof for antitrust liability. Our model also considers two private parties, the plaintiff and the defendant. The defendant chooses a certain type of market behavior, pro- or anticompetitive. The decision-maker, the public antitrust authority or the judge (depending on the type of enforcement, public or private), does not observe perfectly the defendant's behavior, but has to rule on the defendant's liability and consequently inflicts a fine or awards damages and pronounces an injunction to cease the alleged behavior. A procedure against the defendant is triggered only by a complaint filed by the plaintiff, who observes the defendant's behavior and incurs some cost of gathering evidence. Even after a formal investigation, the evidence gathered does not allow to perfectly discriminate between pro- and anticompetitive behavior. The objective of the decision-maker is to minimize the cost of decision/enforcement errors, and the liability decision is reached based on the standard of proof chosen in the beginning, and to which the decision-maker credibly commits. Private and public antitrust enforcement may actually differ in many respects, but we only focus on one: whereas the plaintiff receives the amount of the damages awarded by the judge, he does not receive the amount of the fine inflicted by the antitrust authority. Consequently, the incentives to bring suit will likely differ between the two procedures, and therefore we expect the optimal choice of a standard of proof to differ as well.

Before turning to the model itself, let us briefly discuss the relevant literature for this topic. For instance, Besanko et Spulber (1990), Briggs et al (1996) and more recently Bourjade et al (2009) have tackled private claims for antitrust damages from the point of view of the

impact of treble damages and asymmetric information between litigants, whereas Rubinfeld (2006), Segal et Whinston (2007), Wils (2009) and Peyer and Hüscherlath (2013) investigated the relationship or optimal mix between public and private enforcement of competition law. McAfee et al (2008) explicitly dealt with this, and reached the conclusion that adding private claims to the already existing public enforcement is welfare improving if the ensuing litigation does not give rise to too many judgment errors. At this point it is worth recalling that the amount of errors may depend on the type of procedure and above all on the standard of proof, the latter being possibly endogenous (Kaplow, 2011). We depart from the previous literature in as much as we undertake a relative performance comparison between the two types of enforcement. More precisely, we determine the impact of a given type of enforcement on the number of cases filed and on the standard or proof (applied either by the public authority or the judge), and thereby ultimately on the expected welfare. In so doing we hope to contribute to the debate on the opportunity of introducing private claims and litigation for antitrust damages in the EU⁸.

The rest of the paper is organized as follows: first we present the model, then discuss the choice of optimal standard of proof with private antitrust enforcement. We go on to highlight how the results may change with public enforcement, and compare the two procedures before concluding.

2 The model

The players and their information

Consider first the two firms, the defendant (D) and the plaintiff (P). The defendant can be of two types. The first, denoted D^A , may adopt an anticompetitive conduct, at a cost K^A , generating an extra profit equal to Δ . The second type of defendant, denoted D^P , has the opportunity to undertake a pro-competitive practice, also leading to an extra profit of Δ ,

⁸On 11 June 2013 the European Commission adopted a package of instruments to facilitate damages claims by victims of antitrust damages. The main element of the package is a proposal for a directive on antitrust damages.

but at a cost K^P . Let $K^P > K^A$. Both types are equiprobable but lead to different welfare outcomes: the welfare loss induced by the practice chosen by D^A is equal to $L > 0$, whereas the welfare gain generated by firm's D^P conduct is equal to $B > 0$, where $B \geq L$. Beyond this welfare effect, the defendant's conduct also leads to a profit loss for the plaintiff, which amounts to Δ . The plaintiff P observes D 's true type, and may file against her a complaint for abusive conduct when D undertakes the practice⁹. To file the complaint, the plaintiff needs to gather evidence, at a cost f . The plaintiff's evidence-processing cost is his private information, and is uniformly distributed over the interval $[0, \bar{f}]$.

The game we consider is a three-player game, to the extent that the plaintiff may bring suit either in front of the antitrust authority (AA) or in front of a civil judge (J). We assume that a formal procedure takes place against firm D only if firm P chooses to file a complaint. Neither AA nor J observe D 's conduct. Firm P provides some evidence on the alleged conduct, but not enough to perfectly discriminate between both practices. Both the AA and the judge receive a signal based on P 's evidence and imperfectly correlated with the true type or behavior of firm D , and this signal is used to establish D 's liability. However, the risk of judgement errors also depends on the standard of proof retained: the higher the standard, the higher the risk not to condemn a firm that undertakes an anticompetitive practice, but also the lower the probability to wrongfully condemn a firm that adopts a pro-competitive behavior¹⁰. Denote s the standard of proof. We thus assume that the probability to receive the signal enabling to establish liability given that the true type is D^A is equal to $a(s)$, whereas the probability of the same signal given that the true type is D^P is only $p(s)$, where $p(s) < a(s)$. Let p and a be convex decreasing in s .

The antitrust enforcement procedure

We consider two polar procedures : a pure private enforcement and a pure public, admin-

⁹Note that we deliberately assume the same profit change for both defendant and plaintiff in order to avoid any exogenous impact on the plaintiff's incentives to file a complaint.

¹⁰A typical example is the standard of proof required for predatory pricing. Under a low standard of proof only the dominance/market power and the cost test are used to establish the liability for predatory pricing. A higher standard of proof would also include the lost profits recoupment test.

istrative, enforcement of antitrust. We assume that the plaintiff may initiate either one or another, meaning it may either claim damages in front of a civil judge for the alleged anti-competitive behavior of the defendant, or file a complaint with the antitrust authority. Both types of antitrust enforcement lead to the obligation for the defendant, if found liable, to stop the alleged anticompetitive practice. We assume that such an injunction to cease involves a profit loss of Δ for the defendant and a profit recovery of Δ for the plaintiff, regardless of the type of procedure.

In practice, the two type of antitrust enforcement differ in several respects. We focus here on one particular aspect, related to linked to the fine or damage paid by the defendant if found liable. Accordingly, the defendant has to pay a damage to the plaintiff in the civil claims/private procedure, whereas he has to pay an administrative fine in case of public enforcement, which will not go to the plaintiff but to the state budget. In what follows we denote x the damage awarded by the judge or the fine inflicted by the public authority, and will discuss the role played by the size of this penalty payment made by the defendant.

The timing of the game

Stage 1 - The decision-maker (judge or AA) credibly commits to a standard of proof s .

Stage 2 - Each type of defendant D chooses whether to undertake or not the conduct.

Stage 3 - The plaintiff P decides to file or not a complaint based on its evidence-processing cost and the observation of the defendant's true type/conduct.

Stage 4 - If the plaintiff did file a complaint, the AA or the judge, depending on the type of enforcement, receive the signal enabling to establish liability. We assume that the decision-maker is credibly bound by the decision rule (set for instance by the law) according to which if the signal of evidence satisfying the standard of proof is received, then liability is established and the defendant has to stop her conduct and pay either damages or an administrative fine.

The objective of either the AA or the judge is to maximize welfare, i.e. minimize the cost of decision/enforcement errors. By assumption, there is no welfare change if at the first stage the defendant does not engage in anti/pro-competitive conduct but maintains the status-quo.

In what follows, we determine the Perfect Bayesian Equilibrium for each type game (public

or private antitrust enforcement) so as to identify the optimal standard of proof under each type of procedure and eventually compare them.

3 Private enforcement of antitrust claims

Solving the game requires us to detail the plaintiff's choice at the third stage, since the final stage merely witnesses the application of the decision rule to which the decision-maker (here, the judge) is legally bound.

If the plaintiff P observes type D^A adopting the anticompetitive conduct, it files a suit whenever the expected profit, equal to $a(s)(x + \Delta)$, exceeds the filing, evidence-gathering, cost. Then, the probability for the defendant D^A to face a suit is equal to $F(a(s)(x + \Delta))$. If the type D^P chooses the pro-competitive behavior, the probability of suit is $F(p(s)(x + \Delta))$. Several remarks are worthwhile. First, although the signal is imperfect, it is informative, therefore the probability for type D^A to face a complaint is always higher than for type D^P . Secondly, this probability is increasing in the amount damage to be paid, x , as well as in the amount of profit recovery Δ induced by the injunction to stop the practice, because these enter the plaintiff's expected gain from filing suit. Finally, and by the same token, a lower standard of proof leads to a higher probability of filing a complaint, since the expected gain from this is more likely.

Going back to the previous stage, we can now determine the defendant's choice to undertake or not the allegedly abusive practice. This choice is based on a cost-benefit analysis, putting into balance the private gain from the practice and the probability to be held liable for it and incur the associated cost. The probability to be found liable of an abusive conduct equals $a(s)F(a(s)(x + \Delta))$ for D^A and $p(s)F(p(s)(x + \Delta))$ for D^P , leading to an expected private gain of $\Delta - a(s)(x + \Delta)F(a(s)(x + \Delta))$ and $\Delta - p(s)(x + \Delta)F(p(s)(x + \Delta))$ respectively.

Given the trade-off that the defendant faces between the private benefit from undertaking the allegedly abusive practice and the expected cost in case she is held liable for it, we deduce the following:

Lemma 1 *A firm D^i undertakes the practice iff $s > s_{priv}^i(x)$, where the standard $s_{priv}^i(x)$ increases with x . In addition $s_{priv}^P(x) > s_{priv}^A(x)$ if K^P is sufficiently high, but $s_{priv}^P(x) - s_{priv}^A(x)$ is decreasing in x if $-p'(s)$ is sufficiently larger than $-a'(s)$.*

Proof. Denote \widehat{K}^i the cost threshold such that for $K^i < \widehat{K}^i$, D^i undertakes the alleged abusive practice. Then $\widehat{K}^P = \Delta - \frac{1}{f}p^2(s)(x+\Delta)^2$ and $\widehat{K}^A = \Delta - \frac{1}{f}a^2(s)(x+\Delta)^2$. Equivalently, one can rewrite to obtain the standard-of-proof thresholds, $s_{priv}^P(x) = p^{-1}\left(\frac{\sqrt{f \times (\Delta - K^P)}}{\Delta + x}\right)$ and $s_{priv}^A(x) = a^{-1}\left(\frac{\sqrt{f \times (\Delta - K^A)}}{\Delta + x}\right)$.

The impact of x is the following: $s_{priv}^P(x) = \frac{\sqrt{f \times (\Delta - K^P)}}{(\Delta + x)^2} \cdot \frac{1}{-p'(x)}$. If $-p'(x)$ is sufficiently high with respect to $-a'(s)$, then we may have $s_{priv}^P(x) < s_{priv}^A(x)$ for x high enough.

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Recall that the cost for the defendant to adopt the possibly abusive conduct depends on the standard of proof that applies in case of litigation. Lemma 1 states that a higher standard of proof provides higher incentives to undertake the practice, since the chances of being held liable for it are lower. Moreover, the critical standard of proof that tips the balance in favor of the adoption of the practice depends on x , the damages payment that the defendant will incur if found liable. Since higher awarded damages lower the defendant's incentive to adopt the practice, whatever its nature, Lemma 1 also stresses the substitutability between the level of damages x and the standard of proof s . As a result, if x increases, then a higher s is required to induce the adoption of the pro-competitive practice by D^P . This will prove crucial for optimal standard choice by the court.

The comparison of both thresholds is crucial. If $s_{priv}^P(x) > s_{priv}^A(x)$, then there is a conflict of incentives since it is not possible to see adopted simultaneously both pro- and anticompetitive practices. Instead, if $s_{priv}^P(x) < s_{priv}^A(x)$, there is a continuum of standards of proof (in the range of $\left[s_{priv}^P(x), s_{priv}^A(x)\right]$) allowing optimal incentives: the anticompetitive practice is deterred whereas the pro-competitive practice is encouraged.

Note that $s_{priv}^P(x)$ is higher than $s_{priv}^A(x)$ as long as the cost of the pro-competitive practice is high enough. Moreover, a higher damage awarded impacts on the comparison of

threshold standards. The role of damages depends on the relative impact of the standard on detection probability. If a higher standard makes it much harder to establish liability for a pro-competitive practice than an anticompetitive one, then a higher damage may lead to $s_{priv}^P(x)$ lower than $s_{priv}^A(x)$. Instead, if a higher standard leads to a convergence between both liability probabilities (p and a), then a higher level of damage keeps $s_{priv}^P(x)$ higher than $s_{priv}^A(x)$. In other words, it becomes easier to conciliate both incentives only if a high standard discriminates better both practices.

The next step of our analysis will be to identify the optimal standard of proof set by the judge at the first stage. Before that we can derive the expected welfare for both types of defendant, and emphasize the ambiguous role of the standard of proof on the expected welfare.

As far as the defendant of type D^P is concerned, the expected welfare is equal to $B \left[1 - \frac{1}{f} p(s)^2 (x + \Delta) \right]$ if the firm actually adopts the pro-competitive practice (if $s > s_{priv}^P(x)$) and 0 otherwise. A higher standard of proof provides higher incentives to adopt the pro-competitive conduct as well as reduces the probability to be wrongly held liable, due to both a lower probability of liability ruling and fewer suits being filed. As a result, the expected welfare from the pro-competitive behavior increases with the level of standard of proof. In turn, the expected welfare when D^A undertakes the anticompetitive practice (if $s > s_{priv}^A(x)$) equals $-L \left[1 - \frac{1}{f} a(s)^2 (x + \Delta) \right]$ and 0 otherwise. It is straightforward to see that a lower standard of proof leads to a higher expected welfare, thanks to higher chances to rightfully hold D^A liable.

In other words, the optimal standard of proof strikes the balance between the associated cost and benefit, namely the welfare loss from not deterring and punishing often enough the anticompetitive practices, and the welfare gain from encouraging the pro-competitive conduct. Below we provide the result of this trade-off, and discuss the impact of the damages awarded on the optimal standard.

Proposition 1 *Denote $s_{priv}^*(x)$ the optimal standard of proof with private enforcement. Then*

$s_{priv}^*(x) \geq s_{priv}^P(x)$ and $s_{priv}^*(x)$ is always increasing in the amount of damages x . The expected welfare may decrease with x iff a higher standard is insufficiently discriminatory ($\frac{a'(s)}{a(s)} > \frac{1}{2} \frac{p'(s)}{p(s)}$).

Proof. If $s_{priv}^A(x) < s_{priv}^P(x)$, the expected welfare (change) can be written as follows:

$$W(s) = \begin{cases} 0 & \text{if } s < s_{priv}^A(x) \\ W^A(s) & \text{for } s_{priv}^A(x) < s < s_{priv}^P(x) \text{ , where :} \\ W^{A+P}(s) & \text{for } s \geq s_{priv}^P(x) \end{cases}$$

$$W^P(s) = B \left[1 - \frac{1}{f} p^2(s)(x + \Delta) \right],$$

$$W^A(s) = (-L) \left[1 - \frac{1}{f} a^2(s)(x + \Delta) \right],$$

$$W^{A+P}(s) = B \left[1 - \frac{1}{f} p^2(s)(x + \Delta) \right] + (-L) \left[1 - \frac{1}{f} a^2(s)(x + \Delta) \right].$$

The highest expected welfare is obtained for the optimal standard of proof, given by $s = \text{Max}(s_{priv}^P(x), \tilde{s})$ where \tilde{s} maximizes $B \left[1 - \frac{1}{f} p^2(s)(x + \Delta) \right] + (-L) \left[1 - \frac{1}{f} a^2(s)(x + \Delta) \right]$. For a low level of x and a high level of B , we have $s_{priv}^P(x) < \tilde{s}$, whereas for higher x we have the opposite.

If $s_{priv}^P(x) < s_{priv}^A(x)$, the expected welfare equals:

$$W(s) = \begin{cases} 0 & \text{if } s < s_{priv}^P(x) \\ W^P(s) & \text{for } s_{priv}^P(x) < s < s_{priv}^A(x) \text{ .} \\ W^{A+P}(s) & \text{for } s \geq s_{priv}^A(x) \end{cases}$$

Then, the highest level of welfare is achieved for $s = s_{priv}^A(x) > s_{priv}^P(x)$.

Consider now the case where x is low and $s^* = s_{priv}^P(x)$, and evaluate the welfare for the optimal standard $s_{priv}^P(x)$:

- then the expected welfare from the pro-competitive practice equals $B \left[1 - \frac{(\Delta - K^P)}{\Delta + x} \right]$, since by the definition of $s_{priv}^P(x)$, we have $p^2(s^*) \frac{1}{f} (\Delta + x)^2 = (\Delta - K^P)$.

- whereas the expected welfare for anticompetitive practices equals $a(s^*)^2 \frac{1}{f} (x + \Delta) = \frac{a^2(s^*)}{p(s^*)} \sqrt{\frac{1}{f} (\Delta - K^P)}$.

Therefore total expected welfare equals $(-L) \left[1 - \frac{a^2(s^*)}{p(s^*)} \sqrt{\frac{1}{f} (\Delta - K^P)} \right]$, which is decreasing with x if L is high and $\frac{a^2(s)}{p(s)}$ sufficiently decreasing with s , i.e. $2 \frac{a'}{a} - \frac{p'}{p} < 0$.

■

Proposition 1 first states that the optimal standard of proof necessarily provides incentives for the adoption of the pro-competitive conduct. This is hardly surprising if $s_{priv}^*(x) = s_{priv}^P(x) > s_{priv}^A(x)$, since then it is always possible to set a standard of proof such that the anticompetitive behavior is deterred while the pro-competitive conduct is encouraged. The result is more surprising for $s_{priv}^*(x) = s_{priv}^A(x) > s_{priv}^P(x)$. Then we show that it is more efficient to encourage pro-competitive practices at the cost of also encouraging anticompetitive practices, rather than deter both practices. This is the case because establishing liability for the anticompetitive conduct is more likely than wrongly punishing the adoption of pro-competitive behavior, thanks to the informative, albeit imperfect, signal. Thus it is always welfare improving to have both anticompetitive practices and pro-competitive practices rather than no such practices at all.

Proposition 1 also provides the immediate corollary, dealing with the impact of higher awarded damages: in order to preserve the incentives in favor of pro-competitive practices, the optimal standard must increase whenever the damages payment increases. This is a perfect illustration of how the monetary sanction in the form of damages to be paid is actually expected to work in the private enforcement of antitrust. First, a higher sanction leads to more suits being filed, because the plaintiff stands more to gain. Increased litigation deters the anticompetitive practices, but also chills the pro-competitive ones, because for a given standard of proof liability is ruled more often, both rightfully and wrongfully. This risk of type I errors and resulting chilling of pre-competitive practices will make the judge increase the standard of proof, so as to preserve the incentives encouraging the pro-competitive behavior¹¹.

Higher damages trigger more suits being filed, and this is potentially welfare-improving thanks to the informativeness of the signal received by the judge upon trial in particular for anticompetitive practices. However, and as before argued, in order to preserve the incentives

¹¹As mentioned in the Introduction, this argument serves as a possible explanation for the gradual leniency towards dominant firm conduct in the US over the past 30 years. Accordingly, if the courts fear that the mandatory treble damages excessively deter pro-competitive practices, the judges may "equilibrate" the antitrust enforcement by adjusting the evidentiary requirements that must be satisfied in order for violations to be proved. In other words, they apply a higher standard of proof to avoid type I errors.

to undertake pro-competitive practices, the judge is also constrained to increase the standard of proof. This has a negative impact for the detection of anticompetitive practices. The net outcome of both effects depends on the impact of the higher standard on the liability probabilities. If the higher standard is less able to screen the alleged conduct, then welfare may decrease. Instead, if the higher standard still allows to sufficiently discriminate between both practices, the net effect is positive and welfare will increase.

4 Public vs. private enforcement

We begin this section by the outline of the solution of the game with public enforcement. As before mentioned, the difference between the two procedures that we focus on in this paper is the fact that under the public, administrative procedure involves a monetary sanction for the defendant in the form of a fine, which is therefore not a transfer to the plaintiff. It is nonetheless straightforward to derive the expressions of the relevant variables, such as the standard of proof or the expected welfare. Thus, the standard-of-proof thresholds above which each type of defendant will choose to undertake the practice will be now given by $s_{pub}^P = p^{-1}(\sqrt{\frac{f \times (\Delta - KP)}{(\Delta + x)\Delta}})$ and $s_{pub}^A = a^{-1}(\sqrt{\frac{f \times (\Delta - KP)}{(\Delta + x)\Delta}})$ respectively, whereas the expected welfare from providing incentives to undertake both types of conduct will now equal $B \left[1 - \frac{1}{f} p^2(s)\Delta \right] - L \left[1 - \frac{1}{f} a^2(s)\Delta \right]$. Moreover, all the qualitative results obtained in the case of private enforcement still hold.

We proceed below to compare the two types of antitrust enforcement in terms of optimal standard of proof, so as to shed light on the implications of the difference that we focus on between the two procedures. The following result holds:

Proposition 2 *Denote $s_{pub}^*(x)$ the optimal standard of proof with public enforcement. Then the optimal standard under private enforcement is always higher than under public enforcement: $s_{priv}^*(x) > s_{pub}^*(x)$. For a given level of monetary sanction (fine or damages awarded), the public enforcement leads to a higher expected welfare than the private one if a standard*

increase reduces the ability to discriminate between practices.

Proof. The comparison of optimal standards:

Private enforcement: $s_{priv}^* = Max(s_{priv}^P(x), \tilde{s})$

Public enforcement: $s_{pub}^* = Max(s_{pub}^P(x), \tilde{s})$.

Therefore $s_{priv}^* \geq s_{pub}^*$.

We compare both expected welfares in the case where the optimal standards $s^* = s^P(x)$:

- expected welfares from the pro-competitive practice are: $B(1 - \frac{(\Delta - K^P)}{\Delta + x})$ in the private procedure and $B(1 - \frac{(\Delta - K^P)}{\Delta})$ in the public procedure.

- expected welfares from the anticompetitive practice are: $(-L) \left[1 - \frac{a^2(s_{priv}^*)}{p(s_{priv}^*)} \cdot \sqrt{\frac{1}{f}(\Delta - K^P)} \right]$ with private enforcement and $(-L) \left[1 - \frac{a^2(s_{pub}^*)}{p^2(s_{pub}^*)} \cdot \frac{1}{f} \frac{(\Delta - K^P)}{\Delta + x} \right]$ with public enforcement.

Because $s_{priv}^* > s_{pub}^*$, the public procedure is better if the ratio $\frac{a(s)}{p(s)}$ is sufficiently low for the low standard s_{pub}^* and L high enough.

■

Proposition 2 compares the optimal standards set under each type of enforcement. We show that the optimal standard is always higher under the private enforcement procedure. This result is due to the incentive objective of the court or the AA. For a given amount of monetary sanction inflicted to the defendant, either administrative fine or awarded damage, the plaintiff will have always higher incentives to bring suit with private enforcement, simply because he will pocket the payment made by the defendant. Increased litigation decreases the incentive of the defendant to undertake the practice. As a result, the standard of proof required to provide incentive to the pro-competitive defendant must be higher, and so will also be the standard of proof that discourages the anticompetitive defendant. Therefore, whatever the objective of the court or the AA, encourage or discourage a certain type of conduct, the optimal standard of proof is in both cases higher under private enforcement than under public enforcement.

Note that this may provide a possible explanation for the difference in the substantive antitrust doctrine for market power abuses between the EU and the US. So far, the European

antitrust enforcement has been a pure administrative procedure, and as such conducive to fewer complaints being filed. As a result, the risk of chilling the pro-competitive practices is considerably lower compared with American antitrust enforcement, which relies heavily on private claims. Following the above argument, the European substantive doctrine can therefore afford to apply a low standard of proof to establish liability, whereas the American doctrine optimally requires a higher standard of proof, so as to avoid the increase in type I errors and the ensuing chilling of pro-competitive practices on account of the intensive litigation activity.

Proposition 2 also compares the two types of enforcement in terms of expected welfare: the public enforcement may lead to a higher level of welfare, in particular for a relatively high welfare loss from the anticompetitive practice. This may appear surprising given the lower number of complaints under public enforcement, but is explained by the endogenous setting of the standard of proof.

The expected welfare comparison between the two procedures depends on the relative size of the two types of errors ($-B$ and L) and on that of the respective occurrence probabilities, which in their turn depend on the optimal standard endogenously set under either type of enforcement.

Public enforcement triggers fewer complaints. Therefore liability is less often established, for both types of practices, and thus the optimal standard of proof, preserving the incentives to undertake the pro-competitive behavior, does not need to be very high. The contrary holds with private enforcement: as before mentioned, the judge will necessarily set a high standard of proof to avoid chilling the pro-competitive behavior through the more intense litigation.

This high standard of proof increases the expected welfare derived from the pro-competitive practice, by reducing the risk of wrongful conviction of the defendant, but also lowers the expected welfare from the anticompetitive practice, which is less often adopted. However, this higher standard of proof also partially offsets the higher incentives to file a complaint, so in the end a lower risk for the anticompetitive defendant to be found liable. The net effect depends, again, on the impact of a higher standard on the liability probabilities. If a

higher standard is less able to screen the alleged conduct, then the expected welfare may very well be lower with private enforcement. To sum up, for a relative high welfare loss from the anticompetitive practice (or a low welfare cost from chilling the pro-competitive conduct), and provided that a standard increase reduces the ability to discriminate between practices, the public enforcement yields a higher expected welfare, because it preserves the incentive to undertake pro-competitive behavior at a lower opportunity cost in terms of anticompetitive behavior.

5 Concluding remarks

This paper proposes a model to deal with the relative impact of public and private competition law enforcement on the substantive doctrine of antitrust liability. We compare the two types of antitrust enforcement, public/administrative and private, in terms of number of complaints filed, optimal standard of proof, and also expected welfare. Our results provide a possible explanation for the likely evolution of the European substantive doctrine of antitrust liability, given the near-future introduction of private claims for antitrust damages. Our analysis may further be improved by additional assumptions that have been left aside for the time being, such as the respective enforcement costs of the public and private procedures, or the unique possibility of the public authority to open a case independently from a private claim, which a judge cannot do.

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