PUBLIC AND PRIVATE ANTITRUST ENFORCEMENT FOR CARTELS: SHOULD THERE BE A COMMON APPROACH TO SANCTIONING BASED ON THE OVERCHARGE RATE?[1]

BY YANNIS KATSOULACOS[2], EVGENIA MOTCHENKOVA[3] & DAVID ULPH[4]

2 Department of Economic Science, Athens University of Economics and Business, Patission 76, Athens 104 34, Greece. Email: ysk@hol.gr.

3 Department of Economics, Vrije Universiteit Amsterdam, TILEC and Tinbergen Institute, De Boelelaan 1105, 1081 HV Amsterdam, The Netherlands. Email: emotchenkova@feweb.vu.nl.

4 School of Economics and Finance, University of St Andrews, KY16 9AR, Scotland. Email: du1@st-andrews.ac.uk.

Visit www.competitionpolicyinternational.com for access to these articles and more!

I. INTRODUCTION

The imposition of sanctions has been regarded as the most important *ex-ante* public enforcement instrument that Competition Authorities (hereafter "CAs") can use in response to antitrust and, more specifically, cartel violations.[5] It is complemented by private enforcement in the form of private damage actions. In principle, by imposing sanctions for infringements, public enforcement's main objective must be to deter violations (*deterrence effect*) and to induce non-deterred colluding firms to charge lower prices (*price effect*), while private damages focus on compensating those who have suffered harm. Clearly, each method can contribute to the objectives of the other. Public enforcement can facilitate and stimulate private damage actions and private damage actions can contribute to deterrence and provide incentives for customers to discover and report price-fixing. This paper reviews the recent literature pointing to the ineffectiveness, in terms of their welfare

---

5 The theory of sanctioning on dominant firm abuses is still undeveloped. Other important *ex-ante* instruments of competition law enforcement in the area of cartels are the prohibition of *facilitating practices* (which can increase the viability of cartels) and the use of merger policy (to reduce the likelihood of cartels emerging after mergers). *Ex-post* measures include the improvement of detection and prosecution rates, the adoption of measures to prevent recidivism and the application of leniency policies.

impact,[6] of monetary penalty schemes currently used by CAs[7] and argues the case for CAs switching to a more effective penalty regime in which the *penalty base* continues to be the currently dominant penalty base of cartel revenue but where, in contrast to current practice, the *penalty rate* is based on the cartel overcharge – which is often estimated in order to calculate damages in private damage actions.

The extensive and still growing literature by economists on monetary penalty regimes[8] examines and contrasts alternative types of such regimes, concentrating on a comparison of their welfare properties. It is nevertheless recognized that, while this comparison is very important, in order for it to have practical policy significance a number of other policy-relevant dimensions have to be assessed and compared. Specifically, a more complete comparison must take into account the following three dimensions/assessment criteria:

(i)   **Implementability**. This involves considerations relating to the administrative cost of the penalty regime,[9] the extent to which it minimizes delays in the CA enforcement process[10] and the extent to which it minimizes the costs of appeals in the judicial review process.[11] The latter will be higher the more the appeals are induced against the CA's penalty decisions by a penalty regime. The number of appeals will be greater the more likely it is that the penalty regime can lead to estimation errors and/or when penalty decisions can be easily challenged as discriminatory.

(ii)   **Transparency/Certainty**. Penalty regimes differ in terms of how easily and accurately firms can predict the fine they will be facing IF they are prosecuted and are found to have violated the law. When firms cannot predict or estimate the penalties that the CA will set were

---

6 The continuing high prevalence of cartels across markets, confirmed by extensive empirical evidence also testifies to this. See e.g. Levenstein & Suslow (2011), "Breaking Up Is Hard to Do: Determinants of Cartel Duration," *Journal of Law and Economics* 54, 455-92; Levenstein & Suslow (2012), "Cartels and Collusion - Empirical Evidence," Ross School of Business Paper No. 1182, available at http://ssrn.com/abstract=2182565; Levenstein & Suslow (2014) "Price fixing hits home: an empirical study of price fixing conspiracies in the US," mimeo, University of Michigan, Jan. 2014; Schinkel M.P. (2007), "Effective Cartel Enforcement in Europe", *World Competition* 30(4), 539-572; Veljanovski, C. (2007), "Cartel Fines in Europe: Law, Practice and Deterrence", *World Competition* 29; Connor & Lande (2008), "Cartel Overcharges and Optimal Cartel Fines," in S.Waller (ed), Issues in *Competition Law and Policy*, Vol 3, AMA Section of Antitrust Law, Chapter 88; Allain et al. (2011), "The determination of optimal fines in cartel cases: Theory and practice," *Concurrences - Competition Law Journal* 4-2011, 32-40; Boyer & Kotchoni (2015), "How Much Do Cartel Overcharge?," *Review of Industrial Organization*, 47, 119-153; or Spagnolo G. and C. Marvão (2016), "Cartels and Leniency: Taking stock of what we learnt", in *Handbook of Game Theory and Industrial Organization*, by L. C. Corchón, and M. A. Marini (Eds.), Edward Elgar Publishing, 2016, for an overview. This, of course, is not the only potential inadequacy in public enforcement and recent literature has also pointed to the ineffectiveness of monetary penalties, as currently applied, in inducing desirable price effects – see Bageri et al. (2013), "The Distortive Effects of Antitrust Fines Based on Revenue," *The Economic Journal*, 123 (572), 545-557; Katsoulacos & Ulph (2013), "Antitrust Penalties and the Implications of Empirical Evidence on Cartel Overcharges," *The Economic Journal*, 123 (572), 558-581; Katsoulacos et al (2015), "Penalizing Cartels: The Case for Basing Penalties on Price Overcharge," *International Journal of Industrial Organization*, 42, pages 70-80.

7 There is a variety of different types of sanctions with different emphasis placed on each type over time and in different countries. Here we concentrate on monetary penalties on corporations. The other main types of sanctions in public enforcement are: financial penalties on managers involved in price-fixing, criminal sanctions/imprisonment of individuals involved in price-fixing, debarment of individuals involved in price-fixing, from further employment in a position from which they could again violate antitrust laws. See for a review Katsoulacos et al. (2017), "Penalizing on the basis of the severity of the offence: a sophisticated revenue-based policy for sanctioning cartels," Tinbergen Institute Discussion Paper Series; vol. 17, no. 120/VII.

8 See e.g. Harrington (2004), "Cartel Pricing Dynamics in the Presence of an Antitrust Authority," *The Rand Journal of Economics* 35, 651-673; Harrington (2005), "Optimal Cartel Pricing in the Presence of an Antitrust Authority," *International Economic Review* 46, 145-170; Buccirossi & Spagnolo (2007), "Optimal Fines in the Era of Whistle blowers - Should Price Fixers Still Go to Prison?," in *The Political Economy of Antitrust*, by V. Goshal and J. Stennek (Eds.), Elsevier: Amsterdam; Harrington (2010), "Comment on Antitrust Sanctions", *Competition Policy International*, 6, 41-51; Houba et al. (2010), "Antitrust enforcement with price-dependent fines and detection probabilities," *Economics Bulletin*, 30(3), 2017-2027; Bageri et al. (2013), *supra* note 6; Katsoulacos & Ulph (2013), *supra* note 6; Dargaud et al. (2015), "Cartel deterrence and distortive effects of fines," Journal of Competition Law and Economics; Katsoulacos et al. (2015), *supra* note 6; Katsoulacos et al. (2018), "Sophisticated revenue-based cartel penalties vs overcharge-based penalties," Amsterdam: School of Business and Economics, Research Memorandum; vol. 2018-1 2018); Bos et al. (2018), "Does enforcement deter cartels? A tale of two tails," *International Journal of Industrial Organization*, 59, 372-405.

9 The cost required in order to collect the necessary information and to undertake the estimation of the penalty by the CA and the firms.

10 The more the information required and the more difficult it is to obtain reliable data on this information the more lengthy will be the process of estimation and hence the greater the delay in reaching decisions.

11 That is, the cost for the CA of defending its decisions in Courts of Appeal and the cost that the firms have to incur when appealing against the CA's decisions.

it to investigate and condemn their conduct, this represents a level of uncertainty and lack of transparency.[12] We consider transparency/certainty to be a desirable feature in a penalty regime, taking the position of a large number of jurisdictions (including the EC, U.S., Canada and Brazil), that to reach deterrence targets agencies must rely on the threat of severe penalties coupled with a significant fear of detection. While it is known that in a few cases agencies have adopted the view that some uncertainty can improve deterrence, when detection rates are low and the severity of penalties is constrained, this approach is recognized as having serious downsides.[13]

(iii)   **Welfare properties**. As noted above, it is on these properties that the economic literature has concentrated. While the traditional literature identified first-best optimal penalties (Becker, 1968; Lande, 1983),[14] emphasizing their deterrence properties, the more recent literature has focused on comparing penalty regimes in a second-best world. It is then assumed that, as is true in practice, penalties cannot be set so as to deter all or even most cartels.[15] It is therefore important, in addition to the deterrence effect, to address the *price effects* of penalty regimes on cartels that are *not* deterred. An extensive recent comparison of the welfare properties of most of the penalty regimes described below is contained in Katsoulacos et al. (2015).

Clearly a penalty regime is better than another one if it easier to implement, generates less uncertainty, and has a superior overall welfare impact. Unfortunately, regimes that are superior in terms of their welfare properties are not superior (and may in fact be inferior) in terms of other assessment criteria. This makes it difficult to translate results regarding the welfare properties of different regimes into proposals concerning which of these regimes should be adopted and implemented by CAs in practice.

Most CAs throughout the world have advocated for "simple"[16] revenue-based monetary penalties for cartels.[17] Many countries also explicitly provide in their statues for the imposition of penalties based on illegal gains (9 out of the 17 countries that participated in the ICN survey in 2008, including the US and China[18]). Penalties based on illegal gains can either take the place of revenue-based penalties (as in the U.S.) or they can be an additional penalty that is combined with the revenue-based penalty in order to reach the overall figure imposed on law violators (as in China). However, illegal gains-based penalties are rarely implemented – for example in U.S. in only one case has the imposition of a penalty based on illegal gains been implemented.[19] Nevertheless, in some younger jurisdictions in which competition law is formulated in relation to

---

12 Since penalties are generally calculated as a fraction of a *"penalty base"* (such as revenues or profits) and since penalty guidelines only specify that this fraction (the *"penalty rate"*) will fall within a range that will depend on a large number of mitigating and aggravating circumstances, there is always some uncertainty in predicting the CA's penalty estimate in any specific case. This uncertainty increases as it becomes more difficult to obtain accurate estimates of the "penalty base" and to calculate the appropriate "penalty rate".

13 Thus, it may lead to under deterrence when lower penalties are mistakenly anticipated by potential offenders or over deterrence when innocent agreements are deterred by overestimating fines. Further, and very importantly in practice, the less *discretion* an agency has (limiting uncertainty) the less the degree of litigation on the amount of the fine by companies fined and the lower the risk of been accused of discrimination and public criticism of subjectivity and arbitrariness. See for details on this ICN Report (2008). ICN Report (2008) "Setting Fines for Cartels in ICN Jurisdictions" Report to the 7th Annual Conference, Kyoto, April 2008.

14 Becker (1968), "Crime and Punishment: An Economic Approach," Journal of Political Economy, 76, 169-217; Landes (1983), "Optimal Sanctions for Antitrust Violations," *The University of Chicago Law Review*, 50, 652-678.

15 For example, due to bankruptcy considerations and in order not to violate the legal "*proportionality principle*" most countries have legal ceilings on antitrust fines set as a percent of annual turnover. These may well make penalties insufficient and antitrust policies either completely ineffective or at best partially effective in such a way that only low prices are deterred, while high prices are still sustainable. For details, see e.g. Buccirossi & Spagnolo (2007), *supra* note 8; Harrington (2010), *supra* note 8; Bageri et al. (2013), *supra* note 6; Katsoulacos & Ulph (2013), *supra* note 6; Houba et al. (2018), "Legal Principles in Antitrust Enforcement," The Scandinavian Journal of Economics, 120(3), 859-893.

16 By "simple" we mean here not just that the penalty base (revenue) is easy to calculate but also and mainly that the penalty rate applied to the revenue is not related in a systematic way to the gravity of the specific offence.

17 See for example Bageri & Katsoulacos (2014), "A Simple Quantitative Methodology for the Setting of Optimal Fines by Antitrust and Regulatory Authorities," *European Competition Journal*, Volume 10, 2014, 253-278. As noted in the ICN Report (2008) "the general view been that turnover/volume of affected commerce provides a good proxy for assessing the gravity of the behavior, both in terms of damage to consumers and illegal gain. Furthermore, such data is relatively easy to obtain" (p. 19).

18 See ICN Report (2008), p. 19. For an earlier detailed overview of the penalty structures implemented in OECD countries see the OECD Report (2002), "Fighting Hard-Core Cartels: Harm, Effective Sanctions and Leniency Programs".

19 As we have been informed in a private communication with Greg Werden. This is generally true as also found in the survey of the ICN (Report 2008).

the imposition of sanctions, CAs have opted for including illegal gains-based penalties as a potential additional element that can be taken into account when calculating monetary penalties.[20] However, this has not improved the implementation record of these illegal gains-based penalties due to the difficulties in their estimation and the uncertainty they create.[21]

Most of the literature on the optimal design of antitrust monetary penalties has focused on four main regimes: a damages-based regime, an illegal gains-based regime, a revenue–based regime and an overcharge–based regime. In a recent paper, (Katsoulacos et al., 2017), the authors also examine a fifth alternative regime, the *sophisticated revenue-based penalty regime*, in which the penalty *base* is the revenue of the cartel, but the penalty *rate* depends on (and increases with) the cartel overcharge rate. Finally, we should recognize that the literature on estimating private damage claims notes that this is based on a *simplified version of the damages-based penalty*. Therefore such a simplified version could also be used under public enforcement (by CAs). Finally, a *simplified version of an illegal gains-based regime*,[22] has to be included for a full comparison. Below, we compare and contrast these seven potential penalty regimes.

II. BRIEF DESCRIPTION AND COMPARISONS OF THE MAIN MONETARY PENALTY REGIMES

Let us assume a market in which (p^c, Q^c) represent the cartel price and output while the (potentially imperfectly competitive) "but-for" price and output are (p^B, Q^B) and c is the marginal cost ("but-for" price under perfect competition). $R^c = p^c Q^c$ is the cartel revenue (turnover) while $R^B = p^B Q^B$ is the but-for revenue.
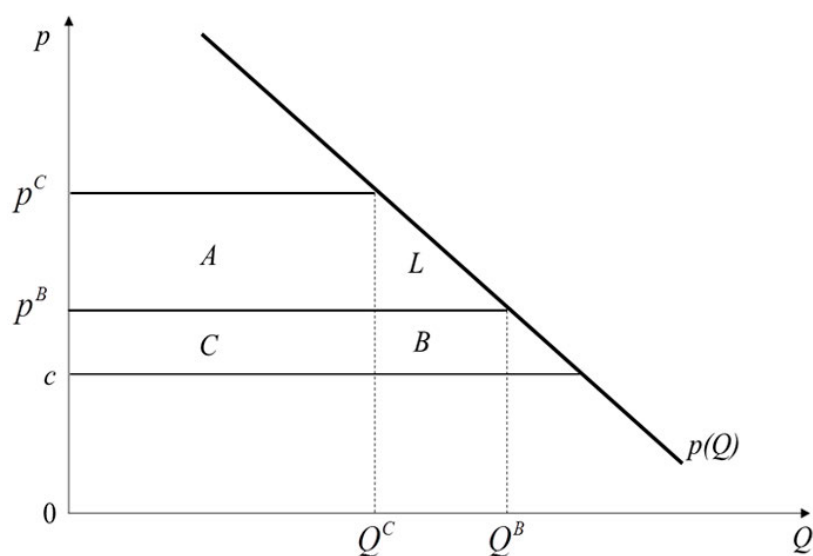
This is illustrated in Figure 1 below.

Figure 1

---

20 For example, on June 17, 2016, the Chinese CA enforcing law in the area of price-related anticompetitive conduct ("NDRC") published "Draft Guidelines on the Determination of Illegal Gains and Fines in Relation to Undertakings' Monopoly Conduct which are expected to be introduced formally this year. With these the NDRC attempts to make illegal-gains an important part of penalty setting in China - this has been commended by Wong-Ervin et al. (2016) – though in the past, the Chinese authorities have tried to calculate illegal gains in setting penalties in only about 10 percent of the cases. Also the Chilean Competition Authority ("FNE") has adopted penalties based on illegal gains in 2014. See Wong-Ervin et al. (2016), "Monetary Penalties in China and Japan," GMU Antonin Scalia Law School, DP 16 – 40.

21 "Difficult to be estimated" and "Easy to be challenged" is the standard way of explaining why penalties based on illegal gains are rarely used. Appendix 1 also provides more formal analysis to support these arguments. See, for the case of China, Deng & Katsoulacos (2017), "Anti-trust sanctioning in China: how can the NDRC guidelines be further improved?," *Competition Policy International Antitrust Chronicle*, August 2017.

22 If a simplified version of a damages-based regime is admitted in the comparison, it is hard to justify not to include also a simplified version of the illegal gains-based regime.

Let $\Delta\pi$ be the increase in profit if a cartel is formed and let the expected penalty be $\beta\varphi B(p)$ where β is the probability that the cartel is detected, φ is the *penalty rate* and $B(p)$ is the *penalty base* – that is usually the cartel revenue, but can be a measure of the increase in profits or of the damages caused by the cartel. Generally, any anticompetitive action that increases profit for the firm taking it by $\Delta\pi$ will be undertaken depending on whether

$$\Delta\pi \gtrless \beta\varphi B(p)$$

The following penalty regimes (indicated by F), $F_i, i = D, G, R, O, SR$, have been discussed in the literature – and some have also been used in practice, to varying degrees.

1.   <u>Damages-based penalties</u> (F_D). Generally, if an anticompetitive action causes damages (or harm) to others (D), a damages-based penalty is one for which:

$$\beta\varphi_D B_D(p) = D$$

This ensures that when $\Delta\pi > D$ the action will be taken while if $\Delta\pi < D$ the action will not be taken. It is in this sense that total welfare is maximized with damages-based penalties. To achieve this outcome we can set the penalty rate $\varphi_D = (1/\beta)$ in above equation and:

$$F_D = B_D(p) = D = (p^C - p^B)Q^C + L = \left(\frac{\theta}{1+\theta}\right) R^C + L \qquad (1)$$

where $\theta = (p^C - p^B) / p^B$ is the proportional overcharge.

2.   <u>Illegal gains (or profit)-based penalties</u> (F_G). With cartels, it is always the case that $\Delta\pi < D$[23] so a CA can use illegal gains-based penalties (illegal gains, $\Delta\pi$, being the cartel's profits over and above the counterfactual level of profits[24]) to deter all cartels.[25] This requires that:

$$\beta\varphi_G B_G(p) = \Delta\pi$$

which can be done by setting $\varphi_G = (1/\beta)$ and:

$$F_G = B_G(p) = \Delta\pi = (p^C - p^B)Q^C - m\Delta Q = \left(\frac{\theta}{1+\theta}\right) R^C - m\Delta Q \qquad (2)$$

where ΔQ is the reduction in output caused by the cartel and m is the absolute profit margin in the but-for situation, that is, the difference between but-for price and marginal cost.

Alternatively, the CA can use:

3.   <u>Revenue–based penalties</u> (F_R). As already mentioned, these are the penalties most often adopted and implemented by CAs throughout the world. They are given by:

---

23 Where $D = A+L$, refers to the *total consumer welfare harm* caused by the cartel price increase over the (counterfactual or) but-for competitive level, including, that is, the deadweight welfare loss triangle (L) associated with the reduction in the volume of output by the cartel.

24 In the special case where the counterfactual price is the marginal cost (competitive price), the illegal gains are the same as the cartel profits.

25 In terms of Figure 1, illegal gains are equal to area A-B.

$$F_R = \beta\varphi_R B_R(\text{p}) = \rho_R R^c \qquad\qquad (3)$$

so penalty rate $\varphi_R = (\rho_R / \beta)$ and the penalty base $B_R(\text{p}) = R^C$ $\qquad$ (3')

In practice, the rate ρ_R falls within a range that depends on a large number of mitigating and aggravating circumstances.

4. <u>Overcharge-based penalties</u> (F_o). These are calculated as a multiple of the "but-for" revenue R^B. Specifically:

$$F_O = \beta\varphi_O B_O(\text{p}) = \rho_O \theta R^B \qquad\qquad (4)[26]$$

so the penalty rate $\varphi_O = (\rho_O \theta / \beta)$ and the penalty base $B_O(\text{p}) = R^B$ $\qquad$ (4')

5. <u>Sophisticated revenue-based penalties</u> (F_{SR}). These use as their base the revenue obtained by the cartel (as in (3)), but the penalty rate depends on (and increases with) the cartel overcharge rate (as in (4)). Thus:

$$F_{SR} = \beta\varphi_{SR} B_{SR}(\text{p}) = \rho_{SR}(\theta)R^C \qquad\qquad (5)$$

so the penalty rate $\varphi_{SR} = (\rho_{SR}(\theta) / \beta)$ and the penalty base $B_{SR}(\text{p}) = R^C$ $\qquad$ (5').

Katsoulacos et al. (2017) examine in detail the simple case in which $\rho_{SR} = \theta$ and the penalty rate $\varphi_{SR} = \theta / \beta$.

6. <u>Simplified versions of damages-based and illegal gains-based penalties</u> $(\tilde{F}_D, \tilde{F}_G)$. Note that a "simplified" version of the damages-based penalty can be obtained by assuming that *damages, are estimated as in private damage claims*[27] - obtained by neglecting L in (1), so:

$$\tilde{F}_D = \tilde{B}_D(\text{p}) = \tilde{D} = \left(\frac{\theta}{1+\theta}\right) R^C \qquad\qquad (6)$$

with penalty rate $\varphi_D = (1/\beta)$.

Similarly, a simplified version of the illegal gains-based penalty can be obtained by neglecting ΔQ (the reduction in output), in which case the illegal-gains based penalty will be:

$$\tilde{F}_G = \tilde{B}_G(\text{p}) = \widetilde{\Delta\pi} = \left(\frac{\theta}{1+\theta}\right) R^C \qquad\qquad (7)$$

again with penalty rate $\varphi_G = (1/\beta)$.

Table 1 shows the information required for calculating the above penalties. The information is categorized as Observable (O) or Unobservable (U) and in accordance with the difficulty in getting the information, as H: High, M: Medium and L: Low. This allows us to compare different penalty regimes in terms of the criteria of implementabilty and transparency.

---

26 In the special case in which the counterfactual / competitive price is the marginal cost (c) this is given by:

$$F_O = \rho_O \frac{Q(c)}{Q(c(1+\theta))} \left(\frac{\theta}{1+\theta}\right) R^C.$$

27 See Brander & Ross (2006), "Estimating Damages form Price-Fixing," Canadian Class Action Review, 3(1): 335-369; Brander & Ross (2017), "Estimating Damages to Direct and Indirect Purchasers in Price-Fixing Actions," Canadian Competition Law Review, Vol. 30, No. 1, 2017, pp 1-39.

Penalty (equation) Information Required	Damages-based (1)	Illegal gains-based (2)	Revenue based (3)	Over charge-based (4)	Sophisticated revenue-based (5)	Simplified damages- and illegal gains-based (6) and (7)
Cartel revenue $p^C Q^C = R^C$ (O; L)	X	X	X		X	X
Cartel volume of sales, Q^C (O; L)	X (for L)	X (for ΔQ)				
Counterfactual price and, hence, Overcharge $\theta =(p^C - p^B)/ p^B$ (U; M)	X	X		X	X	X
Counterfactual volume of sales Q^B (U; H)	X (for L)	X (for ΔQ)		X		
Cost Information (c) (U; H)		X (for m)				
Information about Demand Structure (U; H)	X	X		X		

Table 1: Information required for the calculation of alternative penalties

Comparisons: Implementability and Transparency

As can be seen in Table 1, other than cartel revenue (which is the only information required by the simple revenue-based penalty regime) and the cartel's volume of sales, which are observable and obtainable at low cost, all other information required for implementing the other penalty regimes is unobservable and only obtainable at a medium to high cost. The following comments can be made regarding the properties of implementability and transparency:

Damages-based penalties: these include the deadweight welfare loss (L) and clearly are very difficult to estimate accurately. This is because the calculation of L requires knowledge of the but-for price and volume of sales and further information about the structure of demand. Thus, their estimation is likely to be subject to quite significant errors. Hence, such penalties have very significant implementability problems and a low degree of transparency, raising significantly the probability of them being challenged as false or discriminatory. For these reasons they very rarely form the basis for antitrust enforcement in practice.

Illegal gains-based penalties: these are also very difficult to estimate accurately through (2), as their estimation requires knowledge of the but-for price and volume of sales and hence about the structure of demand, as well as cost information (to estimate m). Thus, their estimation is likely to be subject to quite significant errors, which implies that such penalties also have significant implementability problems and can result in a low degree of transparency/significant amount of uncertainty.[28]

(Simple) revenue-based penalties: as is clear from Table 1, these owe their popularity to the fact that they score high in terms of ease of implementation and also high on transparency (low uncertainty[29]).

---

28 Nevertheless, because they are thought to have good deterrence properties, as already noted, they are sometimes included in the penalty regimes adopted, though they are very rarely implemented in practice. Concerning their welfare properties, it should be stressed that, in terms of price effects, they are inferior to overcharge-based and damages-bases penalties (Katsoulacos et al. (2015), *supra* note 6; Katsoulacos et al. (2017), *supra* note 7.

29 On the other hand, as mentioned below, these penalties are very weak in terms of their welfare properties.

Overcharge-based penalties: their calculation is based on obtaining estimates of the price overcharge and, more importantly, the *counterfactual* volume of sales, in other words, information about the structure of demand.[30] This implies that this regime also scores low in terms of its implementability and transparency.

Sophisticated revenue-based penalties: these require for their calculation data on the cartel's revenue, as well as estimates of the price overcharge. Thus, these penalties score as "moderate" in terms of ease of implementation and transparency. *We should note that they have exactly the same ease of implementation and transparency as for obtaining standard estimates of damages in private damage claims.* We will elaborate on this in greater detail in the sections below.

Simplified damage-based and illegal gains-based penalties: Exactly the same remarks as for sophisticated revenue-based penalties apply here.

Thus we are led to the following:

Remark 1: The above discussion demonstrates that sophisticated revenue-based penalties are clearly superior when judged *in terms of ease of implementation and in terms of transparency (low uncertainty)* to the overcharge-based, the illegal gains-based, and the damages-based penalties. They are equivalent to the simplified damages-based and the simplified illegal gains-based penalties, although these do not perform as well, in terms of these criteria, as the simple revenue-based penalties.

Corollary to Remark 1: Competition authorities which, as we believe is true in reality, value ease of implementation and transparency over welfare impact will never adopt overcharge-based, or illegal gains-based or damages-based penalties because they score very low in terms of the two primary criteria.

The question is whether CAs might adopt one of the other penalty regimes (sophisticated revenue-based, simplified damages-based, or the simplified illegal gains-based), which are equally attractive in terms of ease of implementation and transparency, rather than the currently used simple revenue-based regime. Before answering this question we note that in their recent paper Katsoulacos et al. (2018a) show that, in terms of welfare impact, a linear sophisticated revenue-based penalty in the form of $F_{SR} = \rho_{SR}(\theta)R^C$ where $\rho_{SR}(\theta) = \theta$ is superior to the simplified damages-based or the simplified illegal gains-based regimes, as it leads to superior price effects.[31] Thus, we have:

Remark 2: Sophisticated revenue-based penalties should be considered superior to the simplified damages-based or the simplified illegal gains-based penalties because they are better in terms of welfare impact and equivalent in terms of ease of implementation and transparency.

This leaves only the comparison between the simple and the sophisticated revenue-based regimes.

Katsoulacos et al. (2017) show that a sophisticated revenue-based regime, given by (5) with $\rho_{SR}(\theta) = \theta$, is welfare superior in terms of *both* deterrence and price effects to a simple revenue-based regime in ensuring cartel prices below the monopoly level. Given that the sophisticated revenue-based regime is superior to the simple revenue-based regime in terms of both its price effects and its deterrence effects, it is likely that these beneficial effects outweigh any drawbacks in terms of ease of implementation and transparency and so we conclude that serious consideration should be given to switching the monetary penalty regime under public enforcement to a sophisticated revenue-based regime. We consider this recommendation in more detail in the next section.

---

[30] It is the product of these that forms the "penalty base" of this regime. Note that providing estimates of the overcharge (or the but-for price), as is done for private damage claims, is much easier than doing this *and* also providing an estimate of the but-for volume of sales, which, exactly in order to avoid the difficulties, is avoided in the standard approach used to calculate damages in private damage claims in which (6) is used. See also discussion on implementation below.

[31] Katsoulacos et al. (2018a), "Cartel penalties and private damage actions: An integrated assessment," mimeo, paper presented at CRESSE 2018 conference.

III. WHY SHOULD COMPETITION AUTHORITIES SERIOUSLY CONSIDER SWITCHING TO THE SOPHISTICATED REVENUE-BASED PENALTIES?

Given the current state of knowledge, as reviewed in the previous sections, the only argument that can be used in order to justify the continued use of simple revenue-based monetary penalties in public enforcement against cartels, despite their poor welfare properties, is that by doing so we avoid the implementability and transparency problems associated with getting estimates on the overcharge. Here, we take a closer look at these problems.

The implementability and transparency concerns raised by the need to calculate the price overcharge, as under the sophisticated revenue-based regime, are very often vastly overstated. To explain why we consider this to be the case we note that the overcharge in cartel cases has been a magnitude that has been routinely estimated for many years in private damage claims to calculate damages, as given by expressions (6) or (7) above. These have been a very important feature of North American jurisdictions and have been introduced in EU competition policy since 2014, gradually becoming popular within EU countries too. It is now broadly recognized that there are many mature alternative methodologies for estimating the overcharge in damages claims that range from a low to a high degree of sophistication and so, as two prominent authors in this area wrote recently "Overall, we feel that a great deal of progress in damage estimation and related topics has been made in the past two decades. In addition, data availability has significantly improved and computing power has increased greatly. Therefore, good estimates of damages from price-fixing and related anticompetitive practices can often be obtained."[32]

An additional concern, often raised regarding the issue of having to calculate the overcharge in order to take it into account in setting monetary penalties, is that CAs would be overburdened if they became responsible for this. As the argument goes, in private damages claims those claiming damages undertake the estimation and the Courts just have to balance the evidence presented and choose between these and the counter estimates made by the defendants. However, a moment's thought indicates that this is certainly not a strong argument. This is because there is nothing to stop the CAs from requesting the parties (defendants and plaintiffs) to make available their own estimates of price overcharge, with detailed justification, *together* with all the other documents that they are asked to produce during the investigative procedure. Indeed, such a request, if mandatory, would likely have beneficial welfare effects since it would increase the costs of detection for cartel offenders – having to try to show low overcharge rates before this is required for dealing with private damage claims, and will incentivize plaintiffs not to make false claims of law violation. Of course, there will be cases where there are no claimants and the CA opens an investigation *ex-officio*. But in these cases too, it is certainly possible, as has been the standard practice in *ex-officio* investigations, for the CA to call on those that it recognizes as being harmed by the cartel and to request for them to provide evidence of the extent to which they were harmed – hence, of the overcharge rate. Clearly, these third parties will have ample incentives to provide this information since this will also be used in private damages claims.

---

32 Brander & Ross (2017), *supra* note 25. See also Brander & Ross (2006), *supra* note 25.

IV. CONCLUDING REMARKS

Taking into account the above arguments it seems very strange that, if paying damages is so widely accepted (as estimated in practice, using (6) or (7)) under private enforcement, there is opposition[33] to basing the calculation of monetary penalties on an expression like (5) - under public enforcement. One possibility for this opposition is that the case has not been adequately articulated in the past, taking into account all the considerations discussed above and, in particular, the welfare distortions caused by the currently used penalty regime as stressed in recent economic literature.

Another consideration that may be relevant concerns what the acceptable *burden of proof* is under private and public enforcement. To use the U.S. as an example, U.S. Courts have held that, while for claiming damages plaintiffs must show the existence of an injury with a "reasonable degree of certainty," the proof of the amount of a plaintiff's damages is subject to *a lower burden of proof* (*J Truett Payne Co v. Chrysler Motors*, 1981). The Supreme Court has held that damages may be shown using a "just and reasonable estimate, based on relevant data, including both "probable and inferential as well as direct and positive proof" (*Zenith Radio Corp. v. Hazeltine Research Inc.*, 1969). Thus, Courts have recognized the inherently lower ability to estimate damages and have accepted damage estimates based on reasoned analysis and partial information. Is there a reasonable reason why what is accepted by the Courts as burden of proof for private damages claims, should not or cannot be accepted by CAs? This is a legal rather than an economic question: should the burden of proof be higher for estimating penalties to punish and deter wrong-doing than for estimating them in order to compensate those that have been harmed by said wrong-doing? This point has nowhere been explicitly argued and justified. For as long as this remains the case, it does not seem possible to provide a convincing case for maintaining the current policy on monetary penalties in public antitrust enforcement.

---

33 Beyond that associated with normal and to some extent understandable institutional inertia.

CPI Subscriptions

CPI reaches more than 20,000 readers in over 150 countries every day. Our online library houses over 23,000 papers, articles, and interviews.

Visit competitionpolicyinternational.com today to see our available plans and join CPI's global community of antitrust experts.