

Optimal Antitrust Fines: Theory and Practice

Wouter P.J. Wils*

forthcoming in

World Competition
Vol 29, No 2, June 2006

* Member of the Legal Service of the European Commission, Visiting Professor at King's College London. This article is based on lectures given at the Finnish Competition Authority on 7 March 2003, at the University of Bologna on 28 November 2003 and at King's College London on 21 October 2004. I am grateful to Kirsi Leivo, Pietro Manzini, Margaret Bloom and Richard Whish for having invited me for these lectures, as well as to Margaret Bloom, Fanis Christoforou, Leo Flynn, Damien Geradin, Erling Hjelmeng, Peter Oliver, Kirti Mehta, Walter Mölls, Anthony Whelan and Geert Wils for having shared with me their views on optimal antitrust fines and for having commented on drafts of this article. All views expressed in this article are strictly personal, and should not be construed as reflecting the opinion of the European Commission, its Legal Service or any of the above mentioned persons. The author can be reached at Wouter.Wils@cec.eu.int.

This article discusses the use of fines imposed on companies or other corporate entities to enforce antitrust or competition law prohibitions such as Articles 81 and 82 of the EC Treaty or Sections 1 and 2 of the Sherman Act. The article addresses more specifically the questions in what ways these fines contribute to competition law enforcement, on the basis of which factors the amount of antitrust fines should be fixed in theory, and whether it is feasible in practice to calculate or measure such optimal fines. It is argued that the imposition of fines can contribute in three ways to the prevention of antitrust violations: through deterrent effects, through moral effects, and by raising the cost of setting up and running cartels. For violations committed by a single offender, a necessary condition for deterrence to work is that the expected fine, discounted for the probability of detection and punishment, exceeds the gain which the offender expected to obtain from the violation. Because of overconfidence bias, prospective offenders are likely to overestimate the gain and underestimate the probability of detection and punishment. Administrative costs could be saved by adopting an enforcement strategy of very high fines and low probability of punishment, but the possibility to impose high fines is limited by inability to pay, by the social and economic costs of high fines, and by requirements of proportional justice. Cooperation with the competition authority's investigation should be rewarded through reduced fines. For collective violations, it is a sufficient but not a necessary condition for deterrence to work that the expected fine, discounted for the probability of detection and punishment, exceeds the expected gain, either for all the cartel members taken together or for each of them separately. The cost of setting up and running cartels can be raised by modulating the amount of the fine for each cartel member depending on the active role played in the functioning of the cartel, as well through a leniency policy. To avoid a deterioration of the market structure as a result of the imposition of fines, where high fines are imposed and where there is a significant difference in the ability to pay of the various cartel members, the amount of the fines imposed on the different companies should be differentiated so as to reflect their respective ability to pay. In practice, it does not appear feasible to measure econometrically the theoretically optimal fine for a given antitrust violation. The theory on optimal fines remains however useful as general guidance for the practice of fixing the amount of antitrust fines.

TABLE OF CONTENTS

I.	THE ROLE OF FINES IN ANTITRUST ENFORCEMENT	5
A.	The three tasks of competition law enforcement.....	5
1.	Clarifying the content of the prohibitions.....	5
2.	Preventing violations	6
a.	Reducing the opportunities to commit violations.....	7
b.	Reducing business people's willingness to commit violations	7
c.	Altering the balance of expected benefits and costs of violations.....	8
3.	Dealing with the consequences of violations	9
B.	The role of fines.....	10

II. OPTIMAL FINES FOR SINGLE OFFENDERS.....	12
A. The basic logic of deterrence.....	12
1. The deterrence approach as opposed to the internalization approach.....	12
2. Subjective estimates of the gain, the probability of detection and punishment and the amount of the fine.....	15
a. Availability bias.....	16
b. Overconfidence bias	16
B. The trade-off between the level of fines and the probability of detection and punishment	17
1. The standard economic argument and its limits	17
2. The limits to high fines.....	18
a. Inability to pay.....	18
b. The social and economic costs of high fines	20
c. Proportional justice.....	20
C. Rewarding cooperation and efforts at compliance	22
1. Cooperation with the competition authority's investigation	22
2. Compliance programmes	23
III. OPTIMAL FINES FOR COLLECTIVE VIOLATIONS	24
A. Additional possibilities for using fines to prevent violations.....	25
1. Raising the cost of setting up and running cartels	25
2. Leniency	26
B. Additional aspects to consider.....	27
1. The impact of high fines on the market structure	27
2. Equal treatment.....	28
IV. CAN THE OPTIMAL FINE BE CALCULATED IN PRACTICE?.....	30

This article discusses the use of fines imposed on companies or other corporate entities (hereafter also: “corporate fines”) to enforce antitrust or competition law prohibitions such as Articles 81 and 82 of the EC Treaty or Sections 1 and 2 of the Sherman Act. I will particularly focus on the enforcement of Articles 81 and 82 EC,¹ not only because these prohibitions are the ones I am most familiar with, but also because corporate fines play a particularly important role in EU antitrust enforcement.²

The article addresses more specifically the questions in what ways corporate fines contribute to competition law enforcement, on the basis of which factors the amount of antitrust fines should be fixed in theory, and whether it is feasible in practice to calculate or measure such optimal fines.

Throughout most of the article, I assume that corporate fines are the only sanctions used to deter antitrust violations, i.e. that they are not combined with fines on individuals, imprisonment or other individual sanctions, nor with private damages. This assumption is still broadly realistic for the existing situation in the EU.³ The article does not address the question whether it would be desirable to combine corporate fines with such other sanctions,⁴ nor the question whether or how

¹ Article 81 EC prohibits agreements or concerted practices which restrict competition and lack redeeming virtue, whereas Article 82 prohibits abuse of a dominant position; see generally R. Whish, *Competition Law* (5th ed, Lexis Nexis Butterworths, 2003).

² See R.H. Pate, ‘Antitrust in a Transatlantic Context – From the Cicada’s Perspective’, address at the “Antitrust in a Transatlantic Context” Conference (Brussels, 7 June 2004), accessible at <http://www.usdoj.gov/atr/public/speeches/203973.htm>, at 3: “It is a fact I do not like to advertise that, during Commissioner Monti’s tenure, the EC has surpassed the United States in terms of monetary penalties levied against cartellists.”; see also immediately below as to the limited importance of other penalties or sanctions (fines on individuals, imprisonment, private damages) in the enforcement of EU competition law.

³ On individual sanctions, see D. Cahill (ed.) and J.D. Cooke (General Rapporteur), *The Modernisation of EU Competition Law Enforcement in the EU – FIDE 2004 National Reports* (Cambridge UP, 2004); on private actions for damages, see Ashurst, *Study on the conditions of claims for damages in case of infringement of EC competition rules* (August 2004), accessible at http://europa.eu.int/comm/competition/antitrust/others/private_enforcement/index_en.html#damages.

⁴ On the question whether individual sanctions should be added, see my papers ‘Does the Effective Enforcement of Articles 81 and 82 EC Require Not Only Fines on Undertakings, But also Individual Penalties, and in Particular Imprisonment?’, published in C.D. Ehlermann and I. Atanasiu (eds), *European Competition Law Annual 2001: Effective Private Enforcement of EC Antitrust Law* (Hart Publishing 2003), 411-452, and also in my book *The Optimal Enforcement of EC Antitrust Law* (Kluwer Law International, 2002), 188-237, and ‘Is Criminalization of EU Competition Law the Answer?’ (2005) 28 *World Competition* 117-159, also forthcoming in K.J. Cseres, M.P. Schinkel and F.O.W. Vogelaar (eds), *Remedies and Sanctions in Competition Policy: Economic and Legal Implications of the Tendency to Criminalize Antitrust Enforcement in the EU Member States* (Edward Elgar, 2005); on the question whether private actions for damages should be encouraged in Europe, see my article ‘Should Private Antitrust Enforcement Be Encouraged in Europe?’ (2003) 26 *World Competition* 473, reprinted in my book *Principles of European Antitrust Enforcement* (Hart Publishing, 2005), 111-127.

the presence of these other sanctions should affect the fixing of the amount of fines on companies.

I also assume throughout the article that fines are imposed in only one jurisdiction. The article does therefore not deal with any questions related to the simultaneous or successive imposition of fines in different jurisdictions.⁵

I. THE ROLE OF FINES IN ANTITRUST ENFORCEMENT

A. The three tasks of competition law enforcement

Considered broadly,⁶ the enforcement of antitrust prohibitions such as Articles 81 and 82 EC could be said to entail three tasks: (1) clarifying the content of the prohibitions, (2) preventing violations of these prohibitions, and (3) dealing with the consequences when violations have nevertheless happened.

1. Clarifying the content of the prohibitions

The first task of antitrust enforcement is to clarify the content of the antitrust prohibitions. Indeed, Articles 81 and 82 EC, like Sections 1 and 2 of the Sherman Act, only contain generally worded standards.⁷ Their content is clarified through

⁵ On the relevance of fines imposed in the US for the imposition of fines in the EU, see the judgments of the EC Court of First Instance of 9 July 2003 in Case T-224/00 *Archer Daniels Midland v Commission* [2003] ECR II-2597, paragraphs 85 to 103, and of 29 April 2004 in Joined Cases T-236/01 a.o., *Tokai Carbon a.o. v Commission*, not yet published in ECR, accessible at http://curia.eu.int/fr/content/juris/index_form.htm, paragraphs 130 to 155 and 195 to 204. On the imposition of fines by several competition authorities or courts within the EU, see my article 'The Principle of *Ne Bis in Idem* in EC Antitrust Enforcement: A Legal and Economic Analysis' (2003) 26 *World Competition* 131, and chapters 1, sections 1.2.5 and 1.2.6, and 3 of *Principles of European Antitrust Enforcement*, as note 4 above.

⁶ In this broad sense, 'enforcement' of Articles 81 and 82 EC covers the whole of the 'implementation' of these provisions, the latter being the term used in the title of Council Regulation (EC) No 1/2003 of 16 December 2002 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty [2003] OJ L1/1, the basic regulation laying down the rules on the enforcement of Articles 81 and 82 EC.

⁷ On the economics of rules versus standards, see generally I. Ehrlich and R.A. Posner, 'An Economic Analysis of Legal Rulemaking' (1974) 3 *Journal of Legal Studies* 257 and L. Kaplow, 'Rules versus Standards' (1992) 42 *Duke Law Journal* 557.

judgments or decisions in individual cases,⁸ as well as through guidelines issued by the competition authorities.⁹ This also allows the content of the prohibitions to evolve over time, following the development of economic theory,¹⁰ and the fluctuations of political or societal preferences as to the bounds of legitimate private and public power.¹¹

2. Preventing violations

The second and central task of antitrust enforcement is to prevent violations of the antitrust prohibitions. To see the different ways in which one could try to prevent violations from occurring, one could start by asking under what conditions companies, or the individuals taking the decision within the companies, are likely to commit antitrust violations.¹² The first condition is that they need an opportunity to commit a violation. Secondly, they need to be willing to commit a violation. Corporate managers are not necessarily just maximizers of profits for themselves and their principals. They may feel a moral responsibility to live within the law whether or not they are likely to be caught, and this normative commitment could trump their interest calculus.¹³ Indeed, psychological research suggests that normative commitment is generally an important factor explaining compliance with the law.¹⁴ Thirdly, the companies or individual decision-makers need incentives to commit violations, in that the expected benefits to them of the violations exceed the expected costs. One could thus try to prevent antitrust violations by influencing any of these three conditions.

⁸ For examples of such judgments and decisions clarifying the content of Articles 82 and 81 EC, see: Judgment of the EC Court of Justice of 26 November 1998 in Case C-7/97 *Bronner v Mediaprint* [1998] ECR I-7817, and Decision 98/531/EC of the European Commission of 11 March 1998 in Case IV/34.073 *Van den Bergh Foods*, [1998] OJ L246/1 and Judgment of the EC Court of First Instance of 23 October 2003 in Case T-65/98 *Van den Bergh Foods v Commission*, [2003] ECR II-4653; see also Article 10 of Regulation No 1/2003, as note 6 above, and European Commission Notice on informal guidance relating to novel questions concerning Articles 81 and 82 of the EC Treaty that arise in individual cases (guidance letters), [2004] OJ C101/78.

⁹ See for instance the European Commission's Guidelines on vertical restraints, [2000] OJ C291/1, and Guidelines on the applicability of Article 81 EC to horizontal co-operation agreements, [2001] OJ C3/2.

¹⁰ A good example is the evolution of economic thought on predatory pricing; see *United States v AMR Corporation*, 335 F.3d 1109 (10th Cir.) (2003).

¹¹ See G. Amato, *Antitrust and the Bounds of Power* (Hart 1997).

¹² See *The Optimal Enforcement of EC Antitrust Law*, as note 4 above, section 8.2.

¹³ C.D. Stone, 'Sentencing the corporation' (1991) 71 *Boston University Law Review* 383 at 389.

¹⁴ See T.R. Tyler, *Why People Obey the Law* (Yale University Press 1990).

a. *Reducing the opportunities to commit violations*

First, one could try to reduce the opportunities to commit violations. This can be done through anticipatory (*ex ante*) intervention. Under the EC Merger Regulation,¹⁵ the prohibition of concentrations which significantly impede effective competition is enforced through a system of mandatory prior notification and authorisation.¹⁶ Most jurisdictions have similar *ex ante* enforcement mechanisms for mergers.¹⁷ Before 1 May 2004, a (half-hearted) system of prior notification also existed for Article 81 EC, but this proved unworkable and has therefore been abolished by Regulation No 1/2003.¹⁸ Injunctions, ordering impending or on-going violations to be stopped, are also a form of anticipatory intervention.¹⁹

b. *Reducing business people's willingness to commit violations*

Secondly, one could try to prevent antitrust violations by reducing business people's willingness to commit violations, through a strengthening of their normative commitment to the antitrust rules.²⁰ Competition authorities could try to do this through competition advocacy. The imposition of punishment for violations

¹⁵ Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation), [2004] OJ L24/1.

¹⁶ Legally speaking, the EC Merger Regulation does not contain a prohibition of concentrations which significantly impede effective competition. It rather contains an obligation to notify proposed concentrations and a prohibition to put them into effect before the notification, during the Commission procedure and thereafter if the procedure results in a decision finding that the concentration will significantly impede effective competition. These obligations are the reflection of the choice of an enforcement system based on mandatory prior notification and advance clearance, to enforce the underlying substantive prohibition of concentrations which significantly impede effective competition.

¹⁷ On the economics of *ex ante* versus *ex post* enforcement, see *The Optimal Enforcement of EC Antitrust Law*, as note 4 above, chapter 5 and section 6.2.2.

¹⁸ See chapter 1 of *Principles of European Antitrust Enforcement*, as note 4 above. Prohibitions such as Articles 81 and 82 are by their nature unsuited for *ex ante* enforcement, because of the very high number of agreements and business decisions the legality of which would have to be checked, and because of the ease of concealing violations; see chapter 5 and section 6.2.2 of *The Optimal Enforcement of EC Antitrust Law*, as note 4 above.

¹⁹ See note 28 below.

²⁰ See generally K.G. Dau-Schmidt, 'An Economic Analysis of the Criminal Law as a Preference-Shaping Policy' (1990) *Duke Law Journal* 1, C.R. Sunstein, 'On the Expressive Function of the Law' (1996) 144 *University of Pennsylvania Law Review* 2021, D.M. Kahan, 'Social Influence, Social Meaning, and Deterrence' (1997) 83 *Virginia Law Review* 349, N.K. Katyal, 'Deterrence's Difficulty' (1997) 95 *Michigan Law Review* 2385, G.E. Lynch, 'The Role of Criminal Law in Policing Corporate Misconduct' (1997) 60 *Law and Contemporary Problems* 23, D.M. Kahan, 'Social Meaning and the Economic Analysis of Crime' (1998) 27 *Journal of Legal Studies* 609, and K.G. Dau-Schmidt, 'Preference shaping by the law', in P. Newman (ed.), *The New Palgrave Dictionary of Economics and the Law* (Macmillan 1998) 84.

also plays an important role. Indeed, the public punishment of those who violate the antitrust prohibitions not only has a deterrent effect, in that it helps creating a credible threat of punishment for those who would be willing to commit violations on the basis of a profit calculation,²¹ but also has moral effects, in that it sends a message to the spontaneously law-abiding, reinforcing their moral commitment to the rules.²²

c. Altering the balance of expected benefits and costs of violations

Thirdly, one can try to prevent antitrust violations by altering the balance of expected benefits and expected costs of violations. This can be done by prosecuting and punishing violations, creating a credible threat of penalties which weighs sufficiently in the balance of expected costs and benefits so as to deter calculating companies from committing antitrust violations. Apart from such deterrence, other methods could also be used to alter the balance of expected costs and benefits. To be successful from the cartelists' perspective, price-fixing or similar cartel agreements require effort to determine the agreed price or other factors, to allocate the joint profit through quotas or otherwise, and to monitor and punish cheating by the cartel members.²³ Antitrust enforcement can increase the cost of setting up and running cartels in different ways. One very important measure is to make cartel agreements legally unenforceable, as Article 81(2) EC does. As will be explained further in this article,²⁴ the cost of setting up and running cartels can also be increased through leniency policies and through the use of other aggravating or attenuating circumstances affecting the amount of the penalty imposed on those violations which are detected and punished. Finally, the possible use of injunctions to stop continuation of violations which are detected when still on-going also has an impact on the expected benefits of violations.²⁵

²¹ See below, text following note 22.

²² See J. Adenaes, 'The Moral or Educative Influence of Criminal Law' (1971) 27 *Journal of Social Issues* 17, and 'General prevention revisited: research and policy implications' (1975) 66 *Journal of Criminal Law & Criminology* 338, at 341-343, G.E. Lynch, as note 20 above, at 46-47, and the other literature referred to in note 20 above.

²³ See G.S. Stigler, 'A Theory of Oligopoly' (1964) 72 *Journal of Political Economy* 44, D.K. Osborne, 'Cartel Problems' (1976) 66 *American Economic Review* 835, and W. Kolasky, 'Criminalizing Cartel Activity: Lessons from the U.S. Experience', address at the Fifth Lunch Talk of the Global Competition Centre (Brussels, 29 September 2004), accessible at <http://www.gclc.coleurop.be/lunchtalk20040929.htm>, at 14-15.

²⁴ See below, text accompanied by notes 88 to 93.

²⁵ See note 28 below.

3. *Dealing with the consequences of violations*

Attempts to prevent violations of antitrust prohibitions such as Articles 81 and 82 EC are unlikely ever to lead to the total elimination of all violations. The reasons for this are both economic and psychological.

The economic reason is that the enforcement measures to prevent violations are normally not without cost. The detection, prosecution and punishment of violations has a significant administrative cost, which includes both the cost borne by the public sector (cost of competition authorities, prosecutors and courts) and the cost borne by the businesses and individuals concerned (cost of lawyers and experts, management time). Apart from administrative costs, the pursuit of deterrence could also have undesirable side-effects. For instance, errors or the risk of errors in the imposition of sanctions could lead to lawful and economically desirable conduct being deterred. Given the existence of these costs, it is unlikely to be optimal to pursue full prevention of antitrust violations. Depending on the one hand on the cost of achieving different degrees of prevention, and on the other hand on how much value society attaches to the avoidance of antitrust violations, the optimum will be to pursue a certain degree of prevention, which in all likelihood will be less than 100 %.²⁶

The psychological reason, which is further explained below,²⁷ is that, in the probability estimates they make, people tend to rely disproportionately on those incidents which can easily be brought to mind. This implies that, even if the competition authorities managed at some point in time to detect so many violations and to impose such high fines that all companies will be deterred from committing new violations, this situation will not last, as over time the memory of those successful prosecutions will fade, and violations will thus again be committed.

If it is thus unrealistic to achieve total prevention of all violations of the antitrust prohibitions, there can be a further task for antitrust enforcement in dealing with the consequences of violations that have taken place.

In cases where the anticompetitive harm caused by the violation is still unfolding, it may be possible to limit or mitigate the harm through the use of injunctions.²⁸

²⁶ See generally, with regard to deterrence, G.J. Stigler, 'The Optimum Enforcement of Laws' (1970) 78 *Journal of Political Economy* 526 and K.G. Elzinga and W. Breit, *The Antitrust Penalties: A Study in Law and Economics* (Yale UP 1976) at 9-15.

²⁷ Text accompanied by notes 56 and 57.

²⁸ As indicated above (text accompanied by notes 19 and 25), injunctions can also be an instrument of *ex ante* prevention, and their possible use may also effect the expected benefits of contemplated infringements.

Even if the harm has fully unfolded, there could still be a task for antitrust enforcement in the pursuit of corrective justice. Two (partly overlapping) aspects could be distinguished. First, corrective justice could be pursued through disgorgement, by taking from the antitrust violator any benefits from the violation.²⁹ Secondly, corrective justice could be pursued through compensation, by making the party which wrongfully committed the violation compensate other parties who innocently suffered the consequences of the violation.³⁰

If one takes the view that the sole goal of antitrust is to enhance total economic efficiency,³¹ the pursuit of corrective justice is by assumption a waste of resources. However, if one considers that antitrust is, at least in part, concerned with avoiding wealth transfers from consumers to firms with market power, as I do and I believe most people do,³² the pursuit of corrective justice through compensation can be a legitimate task for antitrust enforcement. The pursuit of this goal, like the pursuit of the goal of preventing antitrust violations, is of course again not without cost.³³ How much compensation is worth the cost of obtaining it depends on the one hand on how high the cost is, and on the other hand on how much value society attaches to the pursuit of corrective justice through compensation in this area.³⁴

B. The role of fines

With regard to the first task of clarifying the content of the antitrust prohibitions, fines do not appear to play a significant role.³⁵

²⁹ See US Federal Trade Commission, Policy Statement on Monetary Equitable Remedies in Competition Cases (25 July 2003), accessible at <http://www.ftc.gov/os/2003/07/disgorgementfrn.htm>.

³⁰ See K. Roach and M.J. Trebilcock, 'Private Enforcement of Competition Laws' (1996) 34 *Osgoode Hall Law Journal* 461, at 496.

³¹ See below, text accompanied by note 44.

³² See below, text accompanied by note 45.

³³ See above, text accompanied by note 26.

³⁴ In my article 'Should Private Antitrust Enforcement Be Encouraged in Europe?', as note 4 above, I have argued, at 486-488, that, because there does not appear to be a clear social need, and because truly achieving corrective justice in the antitrust context is in practice a very difficult task, an increased focus of EC antitrust enforcement on compensation may be difficult to justify.

³⁵ Indeed, in those cases where a competition authority would take a decision or bring a prosecution so as to clarify that a certain behaviour, the illegality of which was previously not clear, violates the antitrust prohibitions, the imposition of a fine would legally not be possible. In the case of fines imposed by the European Commission for violation of Articles 81 or 82 EC, the 'intent or negligence' required by Article 23(2) of Regulation No 1/2003, as note 6 above, would be lacking; see also Judgment of the EC Court of First Instance of 30 September 2003 in Joined Cases T-191/98 etc. *Atlantic Container Line and Others v Commission* [2003] ECR II-3275, paragraphs 1611 to 1633, and European Commission

Fines are however an important instrument in the prevention of violations. As already indicated,³⁶ the imposition of fines on companies that are found to have breached the antitrust prohibitions could in three ways contribute to preventing such violations. First, it may have a deterrent effect, by creating a credible threat of being prosecuted and fined which weighs sufficiently in the balance of expected costs and benefits to deter calculating companies from committing antitrust violations. Secondly, it may at the same time have a moral effect, in that it sends a message to the spontaneously law-abiding, reinforcing their moral commitment to the antitrust prohibitions. Thirdly, through leniency policies and through the use of other aggravating or attenuating circumstances affecting the amount of the fine imposed, the cost of setting up and running cartels can be raised. These different effects will be analysed in more detail below.³⁷

Finally, whereas fines will normally have disgorgement of the unjust enrichment as one of their effects,³⁸ the proceeds of fines normally go to into the public budget rather than to the victims of the antitrust violations, and fines could thus at most be said to contribute to the pursuit of corrective justice through compensation in an abstract and indirect way.³⁹

Decision of 24 June 2004 in Case COMP/38.549 *Belgian Architects' Association*, [2005] OJ L4/10, full text accessible at <http://europa.eu.int/comm/competition/antitrust/cases/>, paragraph 137. As explained in Section 2.4.1.3 of *The Optimal Enforcement of EC Antitrust Law*, as note 4 above, requiring intent or negligence also makes perfect economic sense. Fining companies for conduct they cannot avoid at reasonable cost will have no deterrent effect, while it may generate wasteful expense.

³⁶ See above, text accompanied by notes 20 to 24.

³⁷ Corporate fines are of course not unique in having these effects, which may also, and maybe even better, be obtained through or in combination with other types of penalties; see note 4 above.

³⁸ Indeed, as explained below (text accompanying note 41), in order to deter, fines must exceed the expected gain from the violation, multiplied by the inverse of the probability that a fine will be imposed. Fines thus set will therefore normally exceed the unjust enrichment, and will thus automatically have disgorgement as one of their effects.

³⁹ See however Decision 2003/675/EC of the European Commission of 30 October 2002 in Case COMP/35.587 *Nintendo*, [2003] OJ L255/33, paragraphs 440 and 441, granting a reduction of the fine imposed on Nintendo for a violation of Article 81 EC in recognition of the fact that it had “offered substantial financial compensation to third parties identified in the Statement of Objections as having suffered financial harm as a result of [Nintendo’s violation]”; according to A. Van Haasteren and M. Peña Castellot, ‘Commission fines Nintendo and seven of its European distributors for colluding to prevent parallel trade in Nintendo products’, *EC Competition Policy Newsletter* (Spring 2003), accessible at http://europa.eu.int/comm/competition/publications/cpn/cpn2003_1.pdf, 50, at 53, “the reduction was lower than the actual amount paid” to the third parties; see also US Department of Justice, *Corporate Leniency Policy* (2003), accessible at <http://www.usdoj.gov/atr/public/guidelines/0091.pdf>, which mentions, under A.5 and B.6, as a requirement for leniency that “[w]here possible, the corporation makes restitution to injured parties”.

II. OPTIMAL FINES FOR SINGLE OFFENDERS

In order to examine on the basis of which factors the amount of fines should be fixed, it may be useful to concentrate first on the relatively simple case of fines for antitrust violations committed by a single offender, such as abuses of a dominant position within the meaning of Article 82 EC committed by a single dominant company. The case of fines for collective violations, such as price-fixing or market-sharing cartels, will be examined afterwards.

A. The basic logic of deterrence

The idea of deterrence is to create a credible threat of penalties which weighs sufficiently in the balance of expected costs and benefits to deter calculating companies from committing antitrust violations. Deterrence through the use of fines will work if, and only if, from the perspective of the company contemplating whether or not to commit a violation, the expected fine exceeds the expected gain from the violation. The expected fine equals the nominal amount of the fine discounted by the probability that a fine is effectively imposed. Certain types of violations are more easily detectable than others. Some companies may also be better in avoiding apprehension than others, possibly because they are more experienced.⁴⁰ The probability of actually being fined obviously also depends on the competition authorities' enforcement priorities and their available resources. If, for instance, the probability of detection and punishment is one out of five, the expected fine is only one fifth of the nominal amount. In order to deter, the nominal amount of the fine must then be at least five times larger than the expected gain. The minimum fine for deterrence to work thus equals the expected gain from the violation multiplied by the inverse of the probability of a fine being effectively imposed.⁴¹

1. *The deterrence approach as opposed to the internalization approach*

Under the deterrence approach set out just above, the optimal fine should exceed the expected gain from the violation multiplied by the inverse of the probability of a fine being effectively imposed, so as to eliminate all violations.⁴² A different

⁴⁰ See L.A. Bebbchuk and L. Kaplow, 'Optimal Sanctions and Differences in Individuals' Likelihood of Avoiding Detection' (1993) 13 *International Review of Law and Economics* 217.

⁴¹ Interest should also be added to the fine to cover the delay between the point in time at which the gain was (expected to be) obtained and the point in time at which the fine is paid.

⁴² See however above (text accompanied by notes 26 and 27) as to the economic and psychological reasons why deterrence is unlikely ever to be complete.

approach has been advocated by Gary Becker and by William Landes.⁴³ Under their internalization approach, the optimal fine equals the net harm caused to persons other than the offender, again multiplied by the inverse of the probability of a fine being effectively imposed. The optimal fine thus set makes the offender internalize all the costs and benefits of the violation, thus leading the offender to commit the 'efficient violations' whose total benefits exceed the total costs while deterring 'inefficient violations' whose total costs exceed the total benefits.

The difference between the deterrence approach and the internalization approach to antitrust fines mainly reflects, I believe, a difference in views about the primary goal of the antitrust prohibitions.

The internalization approach to antitrust fines fits the Chicago School view that the primary goal of the antitrust prohibitions is to maximize total economic welfare or total economic efficiency, i.e. the sum of the economic welfare of both buyers and sellers (consumers and producers).⁴⁴ If one adheres to this view about the primary purpose of antitrust, one would logically also embrace the internalization approach to antitrust fines, as it ensures that the welfare of antitrust violators and that of their victims are given equal weight.

The internalization approach to antitrust fines appears however unsuited if one has a different or broader view about the primary purpose of antitrust, as I do and I believe most people do. If one takes the view that the primary goal of the antitrust prohibitions is to prevent extractions of consumers' wealth by firms with market power, i.e. to prevent wealth transfers from consumers to producers,⁴⁵ one would naturally opt for the deterrence approach to antitrust fines, as it aims at deterring all antitrust violations, irrespective of whether the offender's gain exceeds the harm caused to consumers. If one considers that the primary goal of the antitrust

⁴³ G.S. Becker, 'Crime and Punishment: An Economic Approach' (1968) 76 *Journal of Political Economy* 169 and W.M. Landes, 'Optimal Sanctions for Antitrust Violations' (1983) 50 *The University of Chicago Law Review* 652.

⁴⁴ As has been pointed out by R.H. Lande, 'Chicago's False Foundation: Wealth Transfers (Not Just Efficiency) Should Guide Antitrust' (1989) 58 *Antitrust Law Journal* 631, at 638, this view has been somewhat deceptively presented in terms of maximizing 'consumer welfare', a term which rather corresponds to the view, mentioned just below, that the primary goal of antitrust is to prevent wealth transfers from consumers to producers. For a recent example of this confusing use of the term 'consumer welfare' see K.N. Hylton, *Antitrust Law – Economic Theory and Common Law Practice* (Cambridge UP, 2003), at 43-44.

⁴⁵ See R.H. Lande, 'Wealth Transfers as the Original and Primary Concern of Antitrust: The Efficiency Interpretation Challenged' (1982) 34 *Hastings Law Journal* 67, and 'Chicago's False Foundation', as note 44 above; see also the European Commission's Guidelines on the application of Article 81(3) of the [EC] Treaty, [2004] OJ C101/97, at paragraph 43: "Negative effects on consumers in one geographical market or product market cannot normally be balanced against and compensated by positive effects for consumers in another unrelated geographic market or product market", such compensation only being possible "provided that the group of consumers affected by the restriction and benefitting from the efficiency gains are substantially the same".

prohibitions is more broadly to protect consumer choice or consumer sovereignty,⁴⁶ or to preserve competitive structure and open market values,⁴⁷ the deterrence approach to fines would similarly be indicated.

The difference between the deterrence approach and the internalization approach to antitrust fines also reflects a difference in views as to the degree of moral condemnation to be attached to antitrust violations. Borrowing terms used by Robert Cooter and by John Coffee,⁴⁸ the internalization approach merely seeks to ‘price’ antitrust violations, whereas the deterrence approach seeks to ‘sanction’ or ‘prohibit’ such violations. Under the deterrence approach, the antitrust fine is ‘a sanction for doing what is forbidden’, whereas it is ‘the price of doing what is permitted’ under the internalization approach.

The difference between the deterrence approach and the internalization approach to antitrust fines does not only reflect philosophical differences as to the primary goal of the antitrust prohibitions and the degree of moral condemnation to be attached to antitrust violations. It also makes a practical difference for the administrative cost and the effectiveness of antitrust enforcement.

First, the internalization approach appears more difficult to apply in practice.⁴⁹ Indeed, to determine the optimal fine in a concrete case, one has to quantify the harm to parties other than the offender, which includes not only the monopoly transfer but also the portion of the deadweight loss borne by consumers,⁵⁰ as well as the probability of a fine being imposed. These factors are very hard to quantify in

⁴⁶ See R.H. Lande, ‘Consumer Choice as the Ultimate Goal of Antitrust’ (2001) 62 *University of Pittsburgh Law Review* 503 and N.W. Averitt and R.H. Lande, ‘Consumer Sovereignty: A Unified Theory of Antitrust and Consumer Protection Law’ (1997) 65 *Antitrust Law Journal* 713.

⁴⁷ See E.M. Fox, ‘What is Harm to Competition? Exclusionary Practices and Anticompetitive Effect’ (2002) 70 *Antitrust Law Journal* 371; see also Judgment of the Court of Justice of 21 February 1973 in Case 6/72 *Europemballage and Continental Can v Commission* [1973] 215, paragraph 26: “[Article 82 EC] is not only aimed at practices which may cause damage to consumers directly, but also at those which are detrimental to them through their impact on an effective competition structure”; Order of the President of the Court of Justice of 11 April 2002 in Case C-481/01 P(R), *NDC Health v Commission* [2002] ECR I-3401, paragraph 84: “the reasoning [...] cannot be accepted without reservation, in so far as it could be understood as excluding protection of the interests of competing undertakings from the aim pursued by Article 82 EC, even though such interests cannot be separated from the maintenance of an effective competition structure”; and Judgment of the EC Court of First Instance of 17 December 2003 in Case T-219/99 *British Airways v Commission*, not yet published in ECR, accessible at http://curia.eu.int/fr/content/juris/index_form.htm, paragraph 311: “Article 82 is aimed at penalising even an objective detriment to the structure of competition itself”.

⁴⁸ R. Cooter, ‘Prices and Sanctions’ (1984) 84 *Columbia Law Review* 1523 and J.C. Coffee, ‘Paradigms Lost: The Blurring of the Criminal and Civil Law Models – And What Can Be Done About It’ (1992) 101 *Yale Law Journal* 1875.

⁴⁹ See also E. David, *Les sanctions des pratiques anticoncurrentielles en droit comparé*, Doctoral Dissertation (Université Robert Schuman, Strasbourg III, 10 December 2004), paragraph 1732.

⁵⁰ See W.M. Landes, above note 43, and K.N. Hylton, above note 44, at 44-45.

practice,⁵¹ which means that the imposition of fines will be administratively costly and/or that errors will be made, which will weaken deterrence. On the other hand, the deterrence approach also requires some quantification of the expected gain and of the probability of a fine being imposed, but the need for precision is much lower, because it is only required that the fine exceeds the expected gain discounted by the probability of a fine being imposed.⁵²

Secondly, the deterrence approach also appears more effective because the imposition of fines under this approach is likely to have stronger moral effects. As explained above,⁵³ the imposition of punishment for antitrust violations has not only a deterrent effect, in that it helps creating a credible threat of punishment for those who would be willing to commit violations on the basis of a profit calculation, but also has a moral effect, in that it sends a message to the spontaneously law-abiding, reinforcing their moral commitment to the rules. This moral effect is weakened, or even eliminated, under the internalization approach, because the antitrust fine is not presented as ‘a sanction for doing what is forbidden’ but rather as the ‘price for doing what is permitted’.⁵⁴

For all these reasons, the deterrence approach appears to me the better one, and I will thus primarily focus on this approach in the remainder of this article.⁵⁵

2. Subjective estimates of the gain, the probability of detection and punishment and the amount of the fine

For deterrence to work, it is required that, from the perspective of the company (or the individual decision-maker deciding for the company) contemplating a possible antitrust violation, the expected fine exceeds the expected gain. What thus counts is the potential offender’s subjective estimate of the gain, of the probability of detection and punishment, and of the amount of the fine in case of detection and punishment. These subjective estimates are not necessarily accurate. Indeed, cognitive psychology suggests two reasons why this may not be the case.

⁵¹ See below, text accompanied by note 107.

⁵² See however below (text accompanied by notes 66 to 80) as the limits on very high fines.

⁵³ Text accompanied by notes 13 to 14 and 20 to 22.

⁵⁴ See above text accompanied by note 48.

⁵⁵ See however notes 61 and 83 and text accompanied by note 107 below, where the internalization approach is also considered.

a. Availability bias

To predict accurately the probability of detection and punishment, and the amount of the fine, potential offenders would have to consider all existing information about the probability of detection and the amount of fines in general, and adjust the statistical probability thus derived with any particularized information about their specific situation. In practice, people tend to rely disproportionately on those incidents which can easily be brought to mind, because they are recent, happened close to them, or were well publicized.⁵⁶

This phenomenon has several implications for the use of fines to deter antitrust violations. First, it confirms the importance for competition authorities to give maximum publicity to the cases in which they successfully discover and punish violations, in particular the cases with the highest fines.⁵⁷ Secondly, it implies that it will never be possible to achieve complete deterrence. Indeed, even if the competition authorities managed at some point in time to detect so many violations and to impose such high fines that all companies will be deterred from committing new violations, this situation will not last, as over time the memory of those successful prosecutions will fade, and violations will thus again be committed.⁵⁸ Thirdly, for the same reason, it also implies that the fact that violations are still discovered does not necessarily justify the conclusion that the level of the fines imposed in the past was insufficient and should thus be raised.

b. Overconfidence bias

It appears that people consistently tend to overestimate the probability of good things happening to them, and underestimate the probability of bad things happening to them, in particular when the event in question is perceived to be controllable.⁵⁹

Applied to deterrence through antitrust fines, this suggests that companies and individual decision-makers within them will tend to overestimate the gain from the

⁵⁶ See R.B. Korobkin and T.S. Ulen, 'Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics' (2000) 88 *California Law Review* 1051, at 1085-1090 and A. Tversky and D. Kahneman, 'Availability: A Heuristic for Judging Frequency and Probability', in D. Kahneman, P. Slovic and A. Tversky (eds), *Judgment under Uncertainty: Heuristics and Biases* (Cambridge UP, 1982), 163.

⁵⁷ Such publicity is also desirable because of the moral effects of punishment; see text accompanied by notes 13 to 14 and 20 to 22 above; see however text accompanied by notes 72 to 80 below as to the requirements of proportional justice.

⁵⁸ See text accompanied by note 27 above.

⁵⁹ See N.D. Weinstein, 'Optimistic Biases About Personal Risks' (1989) 246 *Science* 1232 and R.B. Korobkin and T.S. Ulen, above note 56, at 1091-1095.

antitrust violation and to underestimate the probability of being caught.⁶⁰ *Ex post* estimates of the gain obtained from the violation will thus tend to be systematically below the *ex ante* expectations of potential offenders, and *ex post* estimates of the probability of a fine being imposed will systematically tend to exceed the probability as perceived *ex ante* by potential offenders. If fines are calculated on the basis of *ex post* estimates of gain and probability, they will thus systematically tend to be too low to deter, unless an upward adjustment is made to counter this effect.⁶¹

B. The trade-off between the level of fines and the probability of detection and punishment

1. The standard economic argument and its limits

Given that deterrence requires that, from the perspective of the company contemplating whether or not to commit a violation, the expected fine exceeds the expected gain from the violation, and given that the expected fine equals the nominal amount of the fine discounted by the probability that a fine is effectively imposed, deterrence can be achieved through different combinations of the level of fines and of the probability of detection and punishment. The same result could be achieved either with very high fines and a low probability of such fines being imposed, or with lower fines and a high probability of detection and punishment.

Given that the detection and punishment of antitrust violations has a significant administrative cost, including not only the cost borne by the competition authorities and courts but also the costs borne by the companies concerned (cost of lawyers and other experts, as well as lost management time), basic economic reasoning would plead for a strategy of very high fines which are only rarely imposed.⁶²

There are however two (sets of) reasons why this strategy may not be optimal, or could at least not be carried too far. The first possible reason relates to the availability bias discussed above.⁶³ If companies or individual decision-makers are biased in their estimates of the probability of detection and punishment and of the amount of the fine in that they rely disproportionately on those incidents which can

⁶⁰ See also M.L. Denger, 'Too Much or Too Little', American Bar Association, Section of Antitrust Law, Antitrust Remedies Forum, accessible at <http://www.abanet.org/antitrust/remedies>, at 5: 'most cartel participants don't think they will get caught'.

⁶¹ See text accompanied by note 108 below. It should be noted that the same problem arises under the internalization approach; see text accompanied by notes 44 to 55 above.

⁶² See G. Becker, as note 43 above.

⁶³ Text accompanied by notes 56 to 58.

easily be brought to mind, because they are recent, happened close to them, or were well publicized, a strategy of very high fines which are rarely imposed may on the one hand make sense in that the very high amounts of the fines imposed may give them more publicity and thus make them more memorable. On the other hand, a sufficient frequency of punishment would seem more efficient, assuming that if a company (or the individual decision-maker within the company) knows or knows of a company which has been fined for a comparable antitrust violation, this information is likely to be available and thus to cause an overestimate of the probability of being fined.⁶⁴

The second set of reasons why a strategy of very high fines combined with a low probability of detection and punishment may not be optimal, or could at least not be carried too far, is that very high fines may be problematic in several respects, in particular because they risk exceeding the ceiling of companies' ability to pay, because high fines, even if they do not exceed ability to pay, may have substantial social and economic costs, and because they may be unacceptable from the perspective of proportional justice.⁶⁵

2. *The limits to high fines*

a. *Inability to pay*

For several types of antitrust violations, it would not appear abnormal for the company that is contemplating committing the violation to expect as gain from the violation extra profits of 5 % of turnover in the products concerned during 5 years. In this example, if only one out of ten such violations is detected and punished, the fine required for deterrence would have to exceed 250 % of the annual turnover in the products concerned. If only one out of twenty violations is punished, the fine would have to exceed 500 % of annual turnover.

⁶⁴ R.B. Korobkin and T.S. Ulen, as above note 56, at 1089.

⁶⁵ Apart from these three main problems, which are discussed further immediately below, risk-bearing cost also argues against increasing fines and lowering probability of punishment; see A.M. Polinsky and S. Shavell, 'The Optimal Tradeoff between the Probability and Magnitude of Fines' (1979) 69 *American Economic Review* 881, L. Kaplow, 'The Optimal Probability and Magnitude of Fines for Acts that Definitely Are Undesirable' (1992) 12 *International Review of Law and Economics* 3, and also M.K. Block and J.G. Sidak, 'The Cost of Antitrust Deterrence: Why Not Hang a Price Fixer Now and Then?' (1990) 68 *Georgetown Law Journal* 1131. The question could also be raised whether a strategy of very high fines and low probability of punishment would not pose problems for marginal deterrence, in that antitrust violators, once they are committing the violation, could no longer be deterred from making the violation worse, by expanding its scope, duration or intensity, because they would be no possibility left for threatening them with an ever higher fine if they did so. However, this concern may not be of much practical importance, as the expansion of the scope, duration or intensity would increase the risk of detection and punishment, all the more if one (reasonably) assumes that competition authorities will, in selecting which violations to prosecute, give priority to the most serious ones; see generally S. Shavell, 'A Note on Marginal Deterrence' (1992) 12 *International Review of Law and Economics* 345.

Even if the company had retained the extra profits until the fine is imposed, these profits would only pay for one tenth or one twentieth respectively of the fine. It is more likely that these profits would not have been retained but rather would have been paid out in taxes, dividends, salaries and wages.⁶⁶ Even liquidating the assets of the company concerned will often be unlikely to generate enough revenues to pay the fine. Indeed, many companies' annual turnover exceeds their assets. A fine of 250 % or 500 % of annual turnover in the products concerned by the violation could thus only be paid out of the assets of large, diversified companies or companies with very high asset-to-sales ratios.⁶⁷

What would thus really happen if one were to adopt a policy of detecting and punishing only one out of ten or one out of twenty violations and impose correspondingly high fines? If such high fines were really imposed, many of the companies concerned would be forced into bankruptcy. This would, however, entail undesirable social costs, because, in the absence of perfect markets, it would hurt not only managers and shareholders, on whom the bankruptcy may be considered to have a desirable deterrent effect, but also all other stake-holders in the firm: employees, suppliers, customers, creditors and tax authorities.⁶⁸

Because of the social costs of bankruptcy, the more likely outcome is that the high fines will not be imposed, but rather lower ones, corresponding to the firms' ability to pay. Indeed, both the European Commission and the US Department of Justice do take into account ability to pay when setting the amount of fines.⁶⁹ But this means that the fines really imposed thus end up being lower than those required to deter.⁷⁰

⁶⁶ G.J. Werden and M.J. Simon, 'Why price fixers should go to prison' (Winter 1987) *The Antitrust Bulletin* 917 at 928 note 35, referring to empirical estimates that unions are able to capture most of the monopoly profits earned by US manufacturing firms.

⁶⁷ *Idem* at 928-929.

⁶⁸ R.H. Kraakman, 'Corporate Liability Strategies and the Costs of Legal Controls' (1984) 93 *The Yale Law Journal* 857 at 882.

⁶⁹ The European Commission's guidelines on the method of setting fines mentions the undertaking's 'real ability to pay in a specific social context' as a factor to be taken into account in setting the amount of the fine; see Guidelines on the method of setting fines imposed pursuant to Article 15(2) of Regulation No. 17 and Article 65(5) of the ECSC Treaty, [1998] OJ C9/3, at para 5(b), and judgment of the EC Court of First Instance of 29 April 2004 in Joined Cases T-236/01 *Tokai Carbon a.o. v Commission*, not yet published in ECR, accessible at http://curia.eu.int/fr/content/juris/index_form.htm, paragraph 371. In a number of decisions the Commission appears to have taken into account the undertakings' bad financial situation in setting the amount of the fines; for a recent example, see the Decision of 3 December 2003 in Case COMP/38.359 *Electrical and mechanical carbon and graphite products*, accessible at <http://europa.eu.int/comm/competition/antitrust/cases>, paras 358 to 360.

⁷⁰ It should be noted that even if the social costs of bankruptcy were disregarded and companies were penalised into bankruptcy, effective deterrence is not at all guaranteed. Indeed, the firm's inability to pay the fine means that its shareholders can externalize part of the fine risk, as their liability is limited to their shareholding. The managers' exposure is similarly limited by the ease with which they can find

b. The social and economic costs of high fines

Even if they stay below the level of inability to pay, the imposition of high fines is likely to be costly. High fines may have undesirable side-effects. In the absence of perfect markets, high fines imposed on companies will have an incidence on all the stake-holders in the firm. Bondholders and other creditors will suffer a diminution in the value of their securities. Employees may suffer from cost-cutting campaigns induced by the need to pay the fine. Tax receipts will be reduced. Finally, consumers may end up suffering. Indeed, if the firm competes in a product market characterized by imperfect competition (as will often be the case), the fine may be partly recovered from consumers in the form of higher prices.⁷¹

c. Proportional justice

A strategy of very high fines combined with a low probability of detection and punishment risks being unacceptable in the light of the principle of proportionality of penalties. This principle has been restated recently in Article 49(3) of the Charter of Fundamental Rights of the European Union, which provides that ‘the severity of penalties must not be disproportionate to the criminal offence’.⁷²

The principle of proportionality of penalties reflects the retributive view of punishment. Indeed, the utilitarian conception of punishment, which justifies fines being set at the level required for optimal deterrence at the lowest cost, competes for the allegiance of the legal system with the retributive view of punishment. Under the latter view, punishment is not justified by its future consequence of deterring harmful conduct, but rather on the ground that it is morally fitting that a person who does wrong should suffer in proportion to his wrongdoing.⁷³ The law generally reflects a mixture of both conceptions. This is visible in the EC Court of Justice’s affirmation that the fines imposed by the European Commission for violations of Articles 81 and 82 EC ‘have as their object to punish illegal conduct as well as to

alternative employment. If the probability of detection and punishment is sufficiently low, shareholders and managers may thus decide to run the risk of their firm being fined into bankruptcy.

⁷¹ J.C. Coffee, ‘No Soul to Damn: No Body to Kick’: an Unscandalized Inquiry into the Problem of Corporate Punishment’ (1981) 79 *Michigan Law Review* 387 at 401-402.

⁷² [2000] OJ C 364/1 at 20. The Charter has since been incorporated as Part II in the (signed but not ratified) Treaty establishing a Constitution for Europe, [2004] OJ C 310/41. Article II-109(3) of this Treaty is the (identical) equivalent of Article 49(3) of the Charter. See also D. van Zyl Smit and A. Ashworth, ‘Disproportionate Sentences as Human Rights Violations’ (2004) 67 *Modern Law Review* 541.

⁷³ J. Rawls, ‘Two Concepts of Rules’ (1955) 64 *Philosophical Review* 3 at 4-5.

prevent it being repeated'.⁷⁴ The retributive view imposes a constraint on the pursuit of optimal deterrence in the form of the principle of proportionality of penalties.⁷⁵

Respect for the principle of proportionality of penalties may in fact also make sense within a utilitarian conception of optimal law enforcement. Indeed, as explained above,⁷⁶ the imposition of penalties on antitrust violators not only has a deterrent effect, in that it helps creating a credible threat of punishment for those who would be willing to commit violations on the basis of a profit calculation, but also has a moral effect, in that it sends a message to the spontaneously law-abiding, reinforcing their moral commitment to the rules. The strength of this moral effect is likely to depend on whether the punishment is perceived as just, and in particular not disproportional.⁷⁷

If for instance only one antitrust violation out of ten or only one out of twenty is detected and punished, the deterrent fine has to exceed the expected gain from the violation by a factor of ten or twenty respectively. Such a large multiplication, justified not solely by the need to achieve effective deterrence but also by a desire to save administrative costs, risks being unacceptable from a proportional justice perspective.⁷⁸

⁷⁴ Judgment of 15 July 1970 in Case 41/69 *ACF Chemiefarma* [1970] ECR 661 para 173 (author's translation of the French '*ont pour but de réprimer des comportements illicites aussi bien que d'en prévenir le renouvellement*'). Similarly, the Commission has stated that 'the purpose of fines is twofold: to impose a pecuniary sanction on the undertaking for the violation and prevent a repetition of the offence, and to make the prohibition in the Treaty more effective' (*Thirteenth Report on Competition Policy 1983* at para 62).

⁷⁵ See further H.L.A. Hart, *Punishment and Responsibility – Essays in the Philosophy of Law* (Clarendon 1968), J. Adenaes, 'The Morality of Deterrence' (1970) 37 *The University of Chicago Law Review* 649. J. S. Parker, 'Criminal Sentencing Policy for Organizations: The Unifying Approach of Optimal Penalties' (1989) 26 *American Criminal Law Review* 513 at 563-566, defends the view that there is no real conflict between deterrence and proportionality, because the probability of detection would reflect a second dimension of harm directly related to the offender's culpability. By choosing an offence with a lower probability of detection, the offender would deserve a higher penalty. Parker's argument appears unconvincing to the extent that the low probability of detection results from a policy choice, justified by the saving of administrative costs, to adopt an enforcement strategy of high penalties and low probability of punishment.

⁷⁶ Text accompanied by notes 13 to 14 and 20 to 22.

⁷⁷ On the importance of the perception of punishment being just, see T.R. Tyler, as above note 14. See further also C.R. Sunstein, D. Schkade and D. Kahneman, 'Do People Want Optimal Deterrence?' (2000) 29 *Journal of Legal Studies* 237, providing empirical evidence that people reject law-enforcement policies that increase or decrease penalties because of the probability of detection.

⁷⁸ See also E. David, 'La détermination du montant des amendes sanctionnant les infractions complexes: régime commun ou régime particulier?' (2000) 36 *Revue Trimestrielle de Droit européen* 511 at 526-527, and J. Waldfogel, 'Criminal Sentences as Endogenous Taxes: Are They 'Just' or 'Efficient'?' (1993) 36 *Journal of Law and Economics* 139.

The maximum of twice the gross gain as foreseen in the US under the Criminal Fines Improvement Act,⁷⁹ may reflect the limit of what multiplication is considered acceptable from a proportional justice perspective. In the EU, Regulation No 1/2003 provides that fines imposed by the European Commission cannot exceed 10 % of the total (consolidated) turnover of the company concerned in the preceding business year.⁸⁰ This ceiling appears to reflect more generally concerns with very high fines, not only from the perspective of proportional justice but also as to the risk of inability to pay, and the social and economic costs of high fines.

C. Rewarding cooperation and efforts at compliance

As explained above, antitrust fines should in principle exceed the expected gain from the violation multiplied by the inverse of the probability of a fine being effectively imposed, but the amount may in some cases have to be limited to a lower level because of the economic and social costs of very high fines and because of the requirements of proportional justice. The question I now turn to is whether the amount of the fine should also be affected by the company's cooperation with the competition authority's investigation or by the company's efforts at complying with the antitrust prohibitions.

1. Cooperation with the competition authority's investigation

When the competition authority investigates an antitrust violation, the extent to which the company concerned cooperates with the investigation can make a big difference. If the company does not cooperate at all, the competition authority will have to use its compulsory powers of investigation to collect the evidence of the violation, and will have to go through the entire administrative and judicial proceedings to establish the violation, bring it to an end if it is still ongoing, and impose the fine. At the other extreme, if the company cooperates fully, it will at the outset of the investigation terminate the violation, provide the competition authority with all available evidence and admit the violation, thus dispensing with the need to go through the entire administrative and judicial proceedings.⁸¹

Cooperation with the competition authority's investigation can thus in two ways be advantageous for antitrust enforcement: First, it reduces the administrative cost as

⁷⁹ 18 USC. § 3571(d) (1984) (as amended in 1987).

⁸⁰ Article 23(2), second subparagraph, of Regulation No 1/2003, as note 6 above.

⁸¹ On the law and economics of the collection of intelligence and evidence of antitrust violations, see my article 'Self-Incrimination in EC Antitrust Enforcement: A Legal and Economic Analysis' (2003) 26 *World Competition* 567 and chapter 5 of *Principles of European Antitrust Enforcement*, as note 4 above.

well as the duration of the investigation and prosecution. Secondly, if the violation was still ongoing at the outset of the investigation, the cooperation brings the violation to an end earlier.

Both of these effects justify a lowering of the fine. Indeed, the saving of administrative cost will allow the competition authority to redeploy the resources saved to other investigations, thus increasing the overall probability of detection and punishment, and allowing a corresponding lowering of the general level of fines. The shortening of the delay between the time of the violation and the time of the imposition of the fine reduces the amount of the fine required for deterrence, because of the lesser need for interest to cover the delay.⁸² The shorter duration of the violation itself correspondingly reduces the gain from the violation and thus also lowers the required fine.⁸³

Lowering the fine because of cooperation is of course only justified if and to the extent that the cooperation has the beneficial effects described just above.⁸⁴

2. *Compliance programmes*

Should antitrust fines also be reduced to reward companies that put in place or have put in place compliance programmes? In the US, a well-designed compliance programme may, in some circumstances, help the company qualify for sentence mitigation under the sentencing guidelines, so long as the employees who committed the violation were not “high-level personnel” of the company.⁸⁵ In the

⁸² See note 41 above.

⁸³ Under the internalization approach (see text accompanying notes 42 to 55 above), a similar result is achieved through a different reasoning. Under that approach, the fine should in principle equal the net harm to persons other than the offender. One of the components of this harm is the competition authority's and the courts' costs of investigating and punishing the violation. A lowering of these costs because of cooperation thus automatically lowers the optimal fine. To the extent that the cooperation also limits the duration of the violation, the optimal fine will also be correspondingly go down, as the harm to consumers will be lower.

⁸⁴ See Judgment of the EC Court of Justice of 16 November 2000 in Case C-297/98 P, *SCA Holding v Commission* [2000] ECR I-10101, paragraph 36, confirming the Judgment of the EC Court of First Instance of 14 May 1998 in Case T-327/94: “The Court of First Instance correctly held in that regard, in paragraph 156 of the contested judgment, that a reduction in the fine on grounds of cooperation during the administrative procedure is justified only if the conduct of the undertaking in question enabled the Commission to establish the existence of an infringement more easily and, where relevant, to bring it to an end”; see also J.M.Connor, *Global Price Fixing: Our Customers are the Enemy* (Kluwer Academic Publishers, 2001), at 387-389, on the risk of unnecessarily generous concessions.

⁸⁵ See 2004 US Federal Sentencing Guidelines Manual (November 1, 2004), accessible at <http://www.ussc.gov/2004guid/gl2004.pdf>, §§ 8B2.1 and 8C2.5; and W.J. Kolasky, ‘Antitrust Compliance Programs: The Government Perspective’, address before the Corporate Compliance 2002 Conference (San Francisco, 12 July 2002), accessible at <http://www.usdoj.gov/atr/public/speeches/11534.pdf>.

EU, “the [European] Commission considers that it is not appropriate to take the existence of a compliance programme into account as an attenuating circumstance for a cartel infringement, whether committed before or after the introduction of such a programme”.⁸⁶

If they reflect a genuine commitment to antitrust compliance at the highest levels within the company, and are well-designed, compliance programmes can no doubt be very useful both to prevent antitrust violations and to detect such violations as early as possible.

It is not obvious, however, that this should translate into reduced fines. If fines are set at the level required for deterrence, namely above the expected gain from the violation multiplied by the inverse of the probability that a fine will be imposed, companies will already have all the necessary incentives to prevent the commitment of antitrust violations.

Moreover, as Stephen Calkins has pointed out: “A company has a wide array of ways to increase its compliance with various laws. It can emphasize the quality of its people, by hiring honest employees, encouraging them to lead healthy lives, and taking care of them in times of need. It can create good incentives, by tying compensation to long-term results, by refraining from exerting undue pressure, and by paying supra-competitive wages employees will not want to risk losing. It can teach and remind. It can monitor and audit. And it can threaten with whatever draconian consequences are in its powers [...]. Some companies will be better at one approach, some at another, most at some mix; but it would be surprising were the same approach right for all. Accordingly, it would seem self-evident that government should set out penalties for violating the law and leave it to firms to determine how best to respond to those penalties”.⁸⁷

III. OPTIMAL FINES FOR COLLECTIVE VIOLATIONS

Most of the above analysis concerning fines for single offenders applies equally to fines for collective antitrust violations such as price-fixing or market-sharing cartels. The case of collective violations is however different in some important respects.

⁸⁶ Decision of 3 December 2003 in Case COMP/E-23/38.359 *Electrical and mechanical carbon and graphite products*, accessible at <http://europa.eu.int/comm/competition/antitrust/cases/decisions/38359/en.pdf>; see also Judgments of the Court of First Instance of 20 March 2002 in Case T-31/99 *ABB Asea Brown Boveri v Commission* [2002] ECR II-1884, paragraph 221, and of 9 July 2003 in Case T-224/00 *Archer Daniels Midland v Commission* [2003] ECR II-2597, paragraphs 280-281.

⁸⁷ S. Calkins, ‘Corporate Compliance and the Antitrust Agencies’ Bi-Modal Penalties’ (1997) 60 *Law and Contemporary Problems* 127, at 147.

A. Additional possibilities for using fines to prevent violations

As explained above, in the case of a single offender, the necessary condition for deterrence to work is that, from the perspective of the company contemplating whether or not to commit a violation, the expected fine (being the nominal amount of the fine discounted by the probability that it is effectively imposed) must exceed the expected gain from the violation. How should this be transposed to the case of collective infringements such as price-fixing or market-sharing cartels? Should this condition be fulfilled for each of the offenders? Or for the group of all the offenders taken together? It appears that none of the two conditions is necessary, but each is sufficient. If for each member of the contemplated cartel, the expected fine exceeds the expected gain, the cartel will obviously be deterred. But given that the success of the cartel is likely to require the participation of most if not all of the members, it may be sufficient for deterrence to work that for some of them the expected fine exceeds the expected gain. On the other hand, if for the group of prospective cartel members taken together the sum of expected fines exceeds the expected gain, the cartel will also be deterred, as it will be impossible to distribute the fine risk and the expected gain between the different cartel members in a way which makes participation profitable for all of them. But again, deterrence may even work in some situations where collectively the expected gain exceeds the sum of expected fines, if for a sufficient number of participants the expected fine exceeds the expected gain and the cartel members do not manage to organize the necessary transfers between them so as to make participation profitable for all prospective participants. Deterrence is thus conceptually more complicated in the case of collective violations than in the case of single offenders, but may already be effective at lower overall fine levels, if the added complication of the internal dynamics of the group of violators is well exploited.

1. Raising the cost of setting up and running cartels

Setting up and running a successful cartel takes effort and requires the participation of the different cartel members in various respects. A number of tasks have to be performed: the agreed price or other factors must be determined; the joint profit must be allocated through quotas or otherwise; and measures have to be taken to prevent cheating, by developing a sufficiently strong sense of solidarity and mutual trust and/or by monitoring and punishing deviations. For all these tasks to be carried out, someone has to take the initiative and someone has to do the job: someone has to convene the meeting, someone has to make the price or quota calculations, someone has to do the monitoring and someone has to do the punishing.⁸⁸

⁸⁸ To some extent these tasks can be outsourced to specialist service providers. Hence the need for the activity of such service providers to be covered by the antitrust prohibitions and to be subject to the threat of sufficiently deterrent fines; see for example the role of AC Treuhand in the organic peroxides cartel, European Commission Decision of 10 December 2003 in Case COMP/E-2/37.857 *Organic*

The setting up and running of cartels can be made more difficult (and hence more costly, and cartels thus less profitable, which means they can be deterred at lower overall fine levels) by threatening higher fines for those cartel members who play active roles in setting up and running the cartel, while offering the perspective of reduced fines for those cartel members who are exclusively passive. This makes the setting up and functioning of cartels more difficult, because, faced with the prospect of higher fines, there will be less volunteers to play active roles. Those who nevertheless accept to do so are likely to want compensation in the form of a larger part of the gain, which is likely to be difficult to agree on, and to weaken the sense of solidarity and mutual trust within the group.⁸⁹

Fines are indeed used in this way in the different antitrust jurisdictions. In the EU, for instance, it is well-established in the case law of the EC Court of Justice and the EC Court of First Instance and in the practice of the European Commission that the role of ringleader or instigator, or the fact of having taken retaliatory measures against recalcitrant or deviating cartel members, are taken into account in determining the amount of the fine as aggravating circumstances, regularly resulting in increases of 50 % for ringleaders, whereas an exclusively passive role is treated as an attenuating circumstance.⁹⁰

2. Leniency

The group dynamics of collective violations can be further exploited through a well-designed leniency policy. Following the example of the US Antitrust Division Corporate Leniency Policy,⁹¹ the European Commission's leniency notice⁹² promises immunity from fines to the cartel member that is the first to provide the Commission with evidence allowing the Commission to start a formal investigation or to prove the violation of Article 81 EC, for which the Commission did not yet

Peroxides, accessible at <http://europa.eu.int/comm/competition/antitrust/cases/decisions/37857/en.pdf>; an appeal against this decision is pending before the EC Court of First Instance, Case T-99/04.

⁸⁹ See N.K. Katyal, 'Conspiracy Theory' (2003) 112 *Yale Law Journal* 1307, at 1341-1346 and 1363-1367.

⁹⁰ See Judgment of the Court of First Instance of 29 April 2004 in Joined Cases T-236/01 a.o., *Tokai Carbon a.o. v Commission*, not yet published in ECR, accessible at http://curia.eu.int/fr/content/juris/index_form.htm, paragraphs 301 and 311, referring to earlier judgments; Commission Guidelines on the method of setting fines, as note 69 above, section 2, third and fourth indent, and section 3, first and second indent; Judgment of the Court of First Instance of 9 July 2003 in Case T-224/00 *Archer Daniels Midland v Commission* [2003] ECR II-2597, paragraphs 238 to 245 and 263 to 267; and J.-F. Bellis, 'La détermination des amendes pour infraction au droit communautaire de la concurrence – Bilan de cinq années d'application des lignes directrices de 1998' (2003) *Cahiers de droit européen* 373 at 382-384.

⁹¹ As note 39 above.

⁹² Commission notice on immunity from fines and reduction of fines in cartel cases, [2002] OJ C45/3.

have sufficient evidence, and that continues to cooperate fully with the Commission throughout the whole procedure leading to the imposition of fines on the other cartel members. The Commission's leniency notice also promises fine reductions to those other cartel members who start cooperating later during the procedure and provide additional valuable evidence, the percentage of the fine reduction depending on whether they are the first to do so (reduction of 30 to 50 %), the second (20 to 30 %) or subsequent (up to 20 %).

As in the case of violations committed by a single offender, cooperation with the competition authority's investigation is advantageous for antitrust enforcement in that it reduces the administrative cost as well as the duration of the investigation and punishment, and may bring the violation to an earlier end, if the violation was still ongoing. Leniency moreover makes the setting up and running of cartels more difficult in that it fractures trust within the cartel, thus raising the need for costly monitoring and reducing the cartel members' willingness to share with each other information which could later be used to obtain leniency.⁹³

B. Additional aspects to consider

1. The impact of high fines on the market structure

Concerning fines for single offenders, it has already been pointed out above⁹⁴ that fines which exceed the company's ability to pay would lead to bankruptcy, and that, even below the level of inability to pay, the imposition of high fines may entail substantial social and economic costs. A dimension is added to this possible problem in the case of collective violations for which fines are simultaneously imposed on all or most of the companies competing in a given market.

Imagine by way of illustration that a cartel, which has been functioning very profitably for many years, is discovered in some local market, on which five companies with comparable market shares are active, four of which are not active in other markets and have limited financial reserves, whereas the fifth is a subsidiary of a large, financially strong, international group. All five companies have been equally active in the cartel, and none has cooperated with the competition authority's

⁹³ See N.K. Katyal, as note 89 above, at 1346-1355 and 1382-1384; S.D. Hammond, 'Cornerstones of an Effective Leniency Program', paper presented at the ICN Workshop on Leniency Programs (Sydney, November 2004), accessible at <http://www.usdoj.gov/atr/public/speeches/206611.htm>; OECD, *Fighting Hard-Core Cartels: Harm, Effective Sanctions and Leniency Programs* (2002), accessible at <http://www.oecd.org/pdf/M00036000/M00036562.pdf>; chapter 3 of *The Optimal Enforcement of EC Antitrust Law*, as note 4 above; chapter 5 of *Principles of European Antitrust Enforcement*, as note 4 above; and G. Spagnolo, 'Divide et Impera: Optimal Leniency Programmes', CEPR Discussion Paper No. 4840 (December 2004).

⁹⁴ Text accompanied by notes 66 to 71.

investigation. If one were to focus exclusively on deterrence, one would advocate in such a case the imposition of high fines on all five cartel participants. The risk, however, is that this could lead to the elimination of the four smaller competitors and the domination of the market by the fifth, stronger company.

In a variation on the same example, it could also be that the fifth, stronger company is the one which disclosed the existence of the cartel to the competition authority, and for that reason qualifies for immunity from fines.⁹⁵

To avoid a deterioration of the market structure as a result of the imposition of the fines, one should thus, in all cases where high fines are imposed and where there is a significant difference in the ability to pay of the various cartel members, differentiate the amount of the fines imposed on the different companies so as to reflect their respective ability to pay. This can be done either by reducing the fines imposed on the companies with the lower ability to pay, or by imposing generally lower fines but then increasing them for the companies with a higher ability to pay. In EC fining practice, such differentiation is indeed made, through the capping of fines at the statutory ceiling of 10 % of overall consolidated turnover of the firms concerned, and also through the use of so-called ‘multipliers’ to increase the fines imposed on companies whose size far exceeds that of the other cartel members.⁹⁶

2. Equal treatment

According to well-established case-law of the EC Court of Justice and Court of First Instance, the European Commission, when imposing fines, “is not entitled to disregard the principle of equal treatment, a general principle of Community law which is infringed [...] where comparable situations are treated differently or different situations are treated in the same way, unless such difference is objectively

⁹⁵ This was roughly the situation with the Luxembourg beer cartel; see European Commission Decision of 5 December 2001 in Case COMP/37.800/F3 *Luxembourg Brewers*, [2002] OJ L253/21, and judgment of the EC Court of First Instance of 27 July 2005 in Joined Cases T-49/02 to T-51/02, *Brasserie nationale a.o. v Commission*, not yet published in ECR, accessible at http://curia.eu.int/fr/content/juris/index_form.htm.

⁹⁶ On the 10 % ceiling, see text accompanied by note 80 above; on the ‘multipliers’, see Judgments of the Court of First Instance of 20 March 2002 in Case T-31/99 *ABB Asea Brown Boveri v Commission* [2002] ECR II-1884, paragraph 162, and of 29 April 2004 in Joined Cases T-236/01 a.o., *Tokai Carbon a.o. v Commission*, not yet published in ECR, accessible at http://curia.eu.int/fr/content/juris/index_form.htm, paragraphs 239, 241, 243 and 248, and F. Arbaud, ‘La politique de la Commission en matière d’amendes antitrust: récents développements, perspectives d’avenir’, *EC Competition Policy Newsletter* (Summer 2003), accessible at http://europa.eu.int/comm/competition/publications/cpn/cpn2003_2.pdf, at 4-5. In the *Luxembourg Brewers* case, as note 95 above, only low fines were imposed (without much explanation). Obviously such low fines pose a problem for deterrence. The good solution would have been to send a few managers of the Luxembourg brewing companies to prison, which would have allowed strong deterrence without causing harm to the structure of the Luxembourg beer market, but this option was not available, since prison sanctions are currently not provided for in EC law; see text accompanied by note 4 above.

justified”.⁹⁷ With respect to collective violations, it is thus necessary to examine “the relative gravity of the participation of each [company]”.⁹⁸

This requirement of equal justice is a variation on the requirement of proportional justice discussed above.⁹⁹ Indeed, equal treatment is the “relative’ aspect of the test of proportionality”.¹⁰⁰ As already argued above, respect for the principle of proportionality, including the principle of equal treatment, not only reflects the retributive view of punishment, but also makes sense within a utilitarian conception of optimal law enforcement, in that the strength of part of the effects of punishment is likely to depend on whether the punishment is perceived as just, including non-discriminatory.¹⁰¹

The principle of equal treatment could be considered not only in the case of collective violations, but also in the case of violations committed by a single offender, by comparison between several violations. In practice, however, the issue of respect for the principle of equal treatment arises primarily in cases of collective violations, as the treatment of the different members of the same cartel provides an obvious base for comparison.¹⁰²

Whereas the ‘absolute’ aspect of proportional justice discussed above may constitute a real constraint in the determination of the amount of fines, in that it excludes fines which exceed by a high multiple the gain derived from the violation or the harm caused by it, to compensate for a low probability of detection and punishment,¹⁰³ my impression is that the need to respect the principle of equal treatment when determining the amounts of the fines for a collective violation does usually not modify the outcome which one would anyway reach when modulating the relative amounts of the fines in function of the more or less active role played by the different cartel members, with a view to raising the cost of setting up and

⁹⁷ Judgment of the Court of First Instance of 13 December 2001 in Joined Cases T-45/98 and T-47/98, *Krupp Thyssen Stainless and Acciai Speciali Terni v Commission* [2001] ECR II-3765, paragraph 237.

⁹⁸ Judgment of the Court of Justice of 8 July 1999 in Case C-51/92 P, *Hercules Chemicals v Commission* [1999] ECR I-4235, paragraph 110.

⁹⁹ Text accompanied by notes 72 to 80.

¹⁰⁰ See Opinion of Advocate-General A. Tizzano of 8 July 2004 in Case C-189/02 P *Dansk Rorindustri v Commission*, not yet published in ECR, accessible at http://curia.eu.int/fr/content/juris/index_form.htm, paragraphs 107 to 109.

¹⁰¹ See text accompanied by notes 77 and 78 above.

¹⁰² See also the Opinion of Advocate-General A. Tizzano, as note 100 above, paragraph 108.

¹⁰³ See text accompanied by notes 65 to 80 above.

running cartels,¹⁰⁴ and in function of the relative ability to pay of the different companies, with a view to avoiding a detrimental impact on the market structure.¹⁰⁵

IV. CAN THE OPTIMAL FINE BE CALCULATED IN PRACTICE?

Would it be possible in practice for a competition authority or a court, with the help of the best experts trained in econometrics, to measure or estimate reliably the optimal fine for a given antitrust violation on the basis of the theory explained above?

Consider first an offence committed by a single offender, for instance the abuses of a dominant position committed by Microsoft in that it refused to supply interoperability information and allow its use for the purpose of developing and distributing work group server operating system products, and made the availability of the Windows Client PC Operating System conditional on the simultaneous acquisition of Windows Media Player.¹⁰⁶ According to the theory, in this relatively simple case, where there is no issue of rewarding cooperation with the investigation nor of limiting the amount of the fine because of inability to pay, the fine should be set as exceeding the gain which Microsoft expected, at the time it decided to commit the violation, to obtain from the violation, multiplied by the inverse of what Microsoft at that time expected to be the probability that a fine would be imposed. If Microsoft had itself quantified its estimates at the time, and these calculations had been discovered in the investigation, these could be used. Otherwise it does not appear possible to measure this econometrically.

¹⁰⁴ See text accompanied by notes 88 to 90 above.

¹⁰⁵ See text accompanied by notes 94 to 96 above. As to leniency, the granting of immunity and reductions of fines strictly on the basis of the timing of the cooperation (immunity only for the first; diminishing reductions for the second, third and following) is not contrary to the principle of equal treatment, as all cartel members have equal chances to be the first depending on their own initiative, and as this practice is in any event objectively justified in order to create a race to cooperate and thus fracture the trust within the cartel. The competition authority would however violate the principle of equal treatment if it somehow interfered with the race to be the first, thus altering the time ranking from what it would have been if based only on the own initiative of the cooperating companies; see judgement of the Court of First Instance of 13 December 2001 in Joined Cases T-45/98 and T-47/98, *Krupp Thyssen Stainless and Acciai Speciali Terni v Commission* [2001] ECR II-3765, paragraphs 237 to 249.

¹⁰⁶ See Decision of the European Commission of 24 March 2004 in Case COMP/C-3/37.792 *Microsoft*, accessible at <http://europa.eu.int/comm/competition/antitrust/cases/decisions/37792/en.pdf>, and Order of the President of the EC Court of First Instance of 22 December 2004 in Case T-201/04 R *Microsoft v Commission*, not yet published in ECR, accessible at http://curia.eu.int/fr/content/juris/index_form.htm.

The task would not be any easier if one adopted the internalization approach rather than the deterrence approach.¹⁰⁷ Indeed, under the internalization approach, the optimal fine would be equal to the net harm caused by the violation to all persons other than Microsoft (or rather Microsoft's subjective estimate of this at the time it decided to commit the infringement), again multiplied by the inverse of what Microsoft, at the time it decided to commit the violation, expected to be the probability that a fine would be imposed. The main component of this net harm is the consumer welfare forgone as a result of the innovation which was blocked by Microsoft's violation. It would not seem less difficult to measure this econometrically.

One might argue that it would be easier to calculate the optimal fine for other types of violations, for example price cartels.¹⁰⁸ Unfortunately this does not appear to be the case. It may be true that for a price cartel it is not impossible (though no doubt difficult and thus costly) to provide reliable estimates of the harm caused by the cartel, or the gain for all the cartel members taken together, but this is not the theoretically correct measure. Indeed, not the actual harm or the actual gain is the relevant measure, but the subjectively expected harm or gain, discounted by the subjectively expected probability that a fine would be imposed. Moreover, the fine thus calculated would only be the correct measure if one could assume that the collectivity of all cartel members could be assimilated to a single decision-maker with a single, undivided self-interest, which is manifestly not a realistic assumption. As explained above, cartels are the result of a dynamic interaction between different self-interested cartel members, and there is, even at the level of theory, no single formula of what fines for the different cartel members are optimal to deter the cartel.¹⁰⁹ Regard should be had to the economics and psychology of setting up and running cartels, and fines should correspondingly be modulated in particular so as to discourage companies from playing an active role in the setting up and running of the cartel.¹¹⁰ There is again no way to measure all this econometrically.

Even if it thus appears unfeasible in practice to measure econometrically the theoretically optimal fine for a given antitrust violation, the theory on optimal fines certainly remains useful as general guidance for the practice of fixing the amount of antitrust fines.

In some cases, it may happen that at least part of the factors which determine the theoretically optimal fine, or some reasonably close proxy, can in fact be measured. When such information is available, it should of course be taken into account in fixing the amount of the fine. One should however beware of the risk of giving excessive weight to whatever factor happens to be measurable, while ignoring other

¹⁰⁷ See text accompanied by notes 42 to 55 above.

¹⁰⁸ See K.N. Hylton, as note 44 above, at 47.

¹⁰⁹ See above, following the heading 'Optimal fines for collective violations'.

¹¹⁰ See above, text accompanied by notes 88 to 90.

equally relevant, but less measurable factors. A clear example of this risk is the one decision in the past 40 years in which the European Commission was able to measure exactly the profit derived from the antitrust violation, and then imposed this exact figure as the fine, thus disregarding completely the need to take into account the less than certain probability of detection and punishment.¹¹¹

One should in my view also avoid any system in which the fixing of the amount of the fine is based upon the quantification of the gain obtained by the offender or the harm caused by the antitrust violation. In such a system, the burden of proof will always be on the competition authority or prosecutor.¹¹² Given the inherent difficulty in measuring these quantities, and thus also in proving them to the requisite legal standard, and given also the informational disadvantage which the authority or prosecutor is likely to have in this regard as compared to the defendant companies, what can be proven is likely to be systematically below reality, with too low fines and hence underdeterrence as a result.¹¹³ Even assuming that account will also be taken of the probability of detection and punishment, fixing the amount of the fine on the basis of *ex post* values of the gain or harm and probability of punishment are also likely to lead to underdeterrence because, as explained above, prospective antitrust violators are likely to overestimate the gain and underestimate the probability of detection and punishment, as well as the harm.¹¹⁴

¹¹¹ Commission Decision of 25 March 1992 in Case IV/30.717-A, *Eurocheque: Helsinki Agreement*, [1992] OJ L95/5.

¹¹² In the EU, according to well-established case-law, the European Commission is not obliged to prove any actual impact on the market in order to be able to impose the necessary fines for antitrust violations such as price cartels which are anti-competitive by object, but if it chooses to refer to such effects in setting the amount of the fine, it must prove what it claims; see judgments of the Court of First Instance of 15 March 2000 in Joined Cases T-25/95 a.o., *Cimenteries CBR and Others v Commission* [2000] ECR II-1570, paragraphs 4862-4863; of 19 March 2003 in Case T-213/00, *CMA CGM and Others v Commission* [2003] ECR II-913, paragraph 280; and of 9 July 2003 in Case T-224/00 *Archer Daniels Midland v Commission* [2003] ECR II-2597, paragraphs 148-171. Similarly, the Commission is not required, in order to determine fines, to establish that the infringement brought an unlawful advantage for the undertakings concerned, but if it chooses to refer to such gain in setting the amount of the fine, it must prove what it claims; see judgments in Joined Cases T-25/95 a.o., paragraphs 4881-4882; and in Case T-213/00, paragraphs 340-343.

¹¹³ See also J. Davidow, 'Recent US Antitrust Developments of International Relevance' (2004) 27 *World Competition* 407, at 412, commenting at the increase in the US of the maximum antitrust fine from \$10 million to \$100 million by the Antitrust Criminal Penalty Enhancement and Reform Act of 2003: "At first glance, it is difficult to see why the enforcers need higher fines, since they have imposed fines of up to \$500 million already, by using a "double the damage" approach already set out in US law. Fines such as those, however, were negotiated. Litigation to prove such large figures would be expensive and uncertain of being sustained, so the enforcers wish to obtain authority to set a high fine based on discretion or generalised standards."

¹¹⁴ See text accompanied by notes 59 to 61 above on overconfidence bias.