

Can Competition Fines Deter Infringers?

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Gary Becker developed a cost minimisation model of law enforcement, positing that potential infringers evaluate the equation: $Gain > Detectability \times Consequence\ of\ Detection$. While scholarly debate continues regarding the precise parameters of this model, including the optimal fine levels and detectability rates, both academic and public discourse frequently neglect the perspective of potential infringers themselves regarding how they perceive the balance between the gain and potential sanctions. This article presents a literature review that assesses whether potential infringers, based on Gary Becker's model, are able to evaluate the consequences of detection of a competition law violation by assessing the fines, losses, and additional costs incurred upon detection of the violation. Drawing upon the marginalism paradigm, behavioural economics, and prospect theory, the paper argues that authorities, when setting a deterrent fine, should address three questions: (1) what is the gain of the infringement; (2) what proportion of such infringements is detected; and (3) what other negative consequences does the infringer face upon detection. The paper identifies data availability and reliability as the principal obstacles to implementing this framework and expresses optimism that technological developments may facilitate both individual and general deterrence.

Keywords: competition law, cartel, fine calculation, fine differentiation, deterrence.

Ar baudos už konkurencijos teisės pažeidimus gali atgrasyti pažeidėjus?

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Gary Beckerio sukurtas viešojo administravimo subjektų išlaidų minimizavimo modelis paremtas išvada, kad potencialūs pažeidėjai vadovaujasi šia formule: $Nauda > Aptikimo\ tikimybė \times Potenciali\ bauda$. Nors teisės mokslų doktrinoje vis dar diskutuojama dėl tikslų šio modelio reikšmių, įskaitant optimalius baudų dydžius ir aptikimo tikimybę, tiek akademinėse, tiek viešosiose diskusijose dažnai nepakankamai atsižvelgiama į tai, kaip patys potencialūs pažeidėjai vertina galimos naudos ir sankcijų pusiausvyrą. Šiame straipsnyje pateikiama literatūros apžvalga, kurioje vertinama, ar potencialūs pažeidėjai, remdamiesi Gary Beckerio modeliu, sugeba įvertinti konkurencijos teisės pažeidimo aptikimo padarinius, vertinant baudas, nuostolius ir papildomas išlaidas, atsirandančias nustačius pažeidimą. Atsižvelgiant į marginalizmo paradigmą, elgsenos ekonomiką ir perspektyvų teoriją, straipsnyje teigiama, kad valstybės institucijos, nustatydamos baudas, kurios atgraso, turėtų įvertinti tris aplinkybes: (1) kokia yra pažeidimo nauda; (2) kokia dalis tokių pažeidimų yra nustatoma; ir (3) kokie kiti neigiami padariniai gresia pažeidėjui, jei pažeidimas būtų nustatytas. Straipsnyje duomenų prieinamumas ir patikimumas įvardijami kaip pagrindinės kliūtys šiai sistemai įgyvendinti, tačiau optimistiškai vertinama technologijų pažanga, kuri gali palengvinti tiek individualų, tiek bendrą atgrasymą.

Pagrindiniai žodžiai: konkurencijos teisė, kartelis, baudos apskaičiavimas, baudų diferencijavimas, atgrasymas.

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Introduction

Having regulatory institutions, prosecutors and courts comes at a cost. This means that actions of these institutions should result in social welfare benefits, and that maintaining these institutions should cover the costs. In an ideal world, prosecution of infringements should deter potential infringers, thus lowering the costs even further.

Gary Becker identified a cost minimisation model of law enforcement leading to a model where investments in the costs of detection and conviction depend on the way(s) how infringers perceive the equation: $Gain > Detectability \times Consequence\ of\ Detection$ ¹. Scholarly debate persists (e.g., Wils², Combe and Monnier³, Ehmer and Rosati⁴, Connor⁵, Allain⁶ et al., Tokić⁷) regarding precise models, fine magnitudes, and detectability rates. However, both academic and public discussions often overlook the perspective of real-life potential infringers in terms of how and whether they perceive the balance of gain versus potential sanctions. The question arises: *Do potential infringers understand what they should be afraid of, a fortiori, do fines deter the infringers?*

Fines for infringement of competition law are at the top of the list of the most significant fines. However, they still ‘do not deter enough’ – as we see firms infringing, despite the firms’ size, jurisdiction, or even awareness of the competition law regime. This leads to the premise, supported by Veljanovski⁸, that deterrence by fines for competition law infringements is not currently working (or is simply not good enough). Studying the problem from the point of view of the infringer brings us to two conclusions: a) infringers lack the necessary data and knowledge on how to compare the gain from the infringement to the consequences of the detection, and b) the national competition authority does not explain how fines were calculated for them to be a deterrent⁹. We believe that these conclusions are interlinked.

Our aim is to provide guidance to navigate how fining should be approached from the perspective of the deterrence while taking into account the potential or the alleged infringer. The further integration of machine learning and large language model instruments into data collection and analysis decreases

¹ BECKER, S. Gary (1968). Crime and Punishment: An Economic Approach. *Journal of Political Economy*, 76, 199–217.

² WILS, P. Wouter (2006). Optimal Antitrust Fines: Theory and Practice. *World Competition*, 29(2), pp. 1–32.

³ COMBE, Emmanuel and MONNIER, Constance (2011). Fines against hard core cartels in Europe: The myth of overenforcement. *The Antitrust Bulletin*, 56(2) [interactive]. <https://doi.org/10.1177/0003603X1105600203>. COMBE, Emmanuel and MONNIER, Constance (2009). Fines against hard core cartels in Europe: The myth of overenforcement. *SSRN Electronic Journal*, 56(2) [interactive]. 10.2139/ssrn.1431644. COMBE, Emmanuel; MONNIER, Constance; LE-GAL, Renaud (2008). Cartels: The Probability of Getting Caught in the European Union, *BEER paper n° 12*, 1–21 [interactive]. <https://www.coleurope.eu/sites/default/files/research-paper/beer12.pdf>.

⁴ ROSATI, Francesco; EHMER, Christian (2009). Science, myth and fines: Do cartels typically raise prices by 25%? *Concurrences*, 4-2009(28832), [interactive]. <https://www.concurrences.com/en/review/issues/no-4-2009/droit-et-economie/science-myth-and-fines-do-cartels-typically-raise-prices-by-25>.

⁵ CONNOR, M. John (2010). Effectiveness of Antitrust Sanctions on Modern International Cartels. *Journal of Industry, Competition and Trade*, 6(3), 195–223 [interactive]. 10.1007/s10842-006-0028-9.

⁶ ALLAIN, Marie-Laure; BOYER, Marcel; PONSSARD, Jean Pierre (2011). The Determination of Optimal Fines in Cartel Cases: Theory and Practice. *Concurrences*, 4, 32–40 [interactive]. https://www.researchgate.net/publication/228147995_The_Determination_of_Optimal_Fines_in_Cartel_Cases_Theory_and_Practice.

⁷ TOKIĆ, Adnan (2025). Optimal fines in EU competition law – an economic analysis. *Journal of European Competition Law & Practice*, 16(3), 196–207 [interactive]. <https://doi.org/10.1093/jecclap/lpaf042>.

⁸ VELJANOVSKI, Cento (2022). The Effectiveness of European Antitrust Fines. From: *The Cambridge Handbook of Competition Law Sanctions*. Cambridge: Cambridge University Press, pp. 54–85.

⁹ STELMOKAITIS, Henrikas (2024). Konkurencijos tarybos galimybės individualizuoti baudas už Konkurencijos įstatymo 5 straipsnio pažeidimą. *Teisė*, 131, 186–197 [interactive]. <https://doi.org/10.15388/Teise.2024.131.13>.

the generally scarce recourses needed in prosecuting and defending. This should allow the possibility to give more attention to design and consequences of remedies to both defendants and authorities.

We believe that, at the current state, there are too many instances of authorities blindly following guidelines on fining but not taking into account how the fine will deter, either individually or generally. The most absurd example is the fining model of the Law on Alternative Fuels¹⁰, where the fine is calculated based *only* on multiplying the unfulfilled part of the obligation, expressed in energy value (megajoules), by 0.4 EUR with no ability of the authority to adjust the fine to specific circumstances. Thus, understanding how any pre-set fine should affect the potential or the alleged infringer is the crucial part of fines serving their purpose.

We combine several approaches. First, the paper is fundamentally grounded in Gary Becker's cost minimization model of law enforcement and the marginalism paradigm¹¹. To systematically analyse whether potential infringers can estimate the consequences of detection within Becker's framework (notably, $Gain > Detectability \times Consequence\ of\ Detection$), we executed a literature review of scholarly debates on competition law fines, deterrence, and detection rates, drawing on works by Wils¹², Combe and Monnier¹³, Connor¹⁴, Allain¹⁵ et al., Veljanovski¹⁶, and others.

Research Limitations and Scope. Here we focus only on monetary deterrence rather than structural or individual measures, and limit analysis to objective data availability, excluding subjective perception dimensions.

1. The Optimal Deterrence Model and Fine Deterrence Itself

The optimal deterrence model implies the 'less is more' pattern of thinking. However, the fining policy seldom follows this path, and we see that harsher fining is thought to be more deterrent. We argue that deterrence should be proportionate, and that the question of proportionality is rooted in the amount of the fine, compared to the potential gain.

Harsh fines can lead to overdeterrence and that, subsequently, beyond its social costs, could incentivise firms to relocate outside the EU or a specific Member State to jurisdictions with weaker enforcement against cartels or abuse. Therefore, a fine should be proportionate – the objective of fining should *not* be to impose the most significant possible fine a company can endure but, instead, to levy the 'most minor' fine that still deters infringement so that to prevent the said infringement, but not from conducting business.

¹⁰ Lietuvos Respublikos alternatyviųjų degalų įstatymas. 2021 m. kovo 23 d. Nr. XIV-196. TAR, 2021, 7413.

¹¹ BECKER, S. Gary (1968). Crime and Punishment: An Economic Approach. *Journal of Political Economy*, 76, 199–217.

¹² WILS, P. Wouter (2006). Optimal Antitrust Fines: Theory and Practice. *World Competition*, 29(2), p. 30.

¹³ COMBE, Emmanuel and MONNIER, Constance (2011). Fines against hard core cartels in Europe: The myth of overenforcement. *The Antitrust Bulletin*, 56(2) [interactive]. <https://doi.org/10.1177/0003603X1105600203>. COMBE, Emmanuel and MONNIER, Constance (2009). Fines against hard core cartels in Europe: The myth of overenforcement. *SSRN Electronic Journal*, 56(2) [interactive]. 10.2139/ssrn.1431644. COMBE, Emmanuel; MONNIER, Constance; LEGAL, Renaud (2008). Cartels: The Probability of Getting Caught in the European Union. *BEER paper n° 12*, 1–21 [interactive]. <https://www.coleurope.eu/sites/default/files/research-paper/beer12.pdf>.

¹⁴ CONNOR, M. John (2010). Effectiveness of Antitrust Sanctions on Modern International Cartels. *Journal of Industry, Competition and Trade*, 6(3), 195–223 [interactive]. 10.1007/s10842-006-0028-9.

¹⁵ ALLAIN, Marie-Laure; BOYER, Marcel; PONSSARD, Jean Pierre (2011). The Determination of Optimal Fines in Cartel Cases: Theory and Practice. *Concurrences*, 4, 32–40 [interactive]. https://www.researchgate.net/publication/228147995_The_Determination_of_Optimal_Fines_in_Cartel_Cases_Theory_and_Practice.

¹⁶ VELJANOVSKI, Cento (2022). The Effectiveness of European Antitrust Fines. From: *The Cambridge Handbook of Competition Law Sanctions*. Cambridge: Cambridge University Press, pp. 54–85.

In liberal societies, *ceteris paribus*, “sanctions should impose the least cost on human liberty”¹⁷. Stucke¹⁸ has argued that, despite (i) escalating criminal and civil fines in the U.S. (and abroad), (ii) treble private damages, (iii) longer jail sentences, and (iv) a generous leniency program, the United States has not reached the optimal deterrence. Accordingly, we should seek the minimum fine that potential infringers would perceive as determinative when assessing an infringement’s gain-loss balance.

But are the ‘large’ fines rooted not only in a craving for political points? The argument for imposing ‘large’ fines comes from the marginalism paradigm. As Nagin¹⁹ et al. argue, under the marginalism paradigm, rational individuals weigh the expected benefits of committing the infringement against the expected costs of doing so. Thus, economically, the expected gains from competition infringements may outweigh the expected costs of negative consequences (including fines), even when competition law fines are substantial.

Thaler²⁰ proposes an opposing view and advances the behavioural economics proposition that individuals are subject to passions, emotions, and feelings that disrupt rational decision-making; consequently, heuristics and behavioural biases exert significant influence. We see quite a few situations where competition is restricted, believing that it is for the greater good (e.g., Irish beef, C-209/07, where agreement to not to compete was introduced to ‘save’ the market²¹).

Given that both types of infringers – the ones who calculated and the ones who did not calculate the consequences of their actions – exist, both perspectives warrant consideration. Moncuit²² offers a synthesis of both approaches: an increase of the fines may prove less effective than exerting influence on individuals’ beliefs. While the fines must be sufficiently discouraging relative to the potential gains stemming from infringement, beliefs may be more influential at two stages: (1) whether infringing a law is personally acceptable (behavioural economics); and (2) whether the gains exceed the losses when an infringement is being contemplated (marginalism).

In practice, competition law prohibitions are frequently infringed not by firm management (who calculate the consequences) but rather by mid-level employees who lack knowledge of either the law or the negative consequences of infringement, and thus who are unable to calculate. According to behavioural economics, the deterrent message loses its credibility if the rules of law are misunderstood²³. Thus, there is no point in analysing whether a fine serves as a deterrent if the infringer does not know that there actually is a fine for specific actions or does not understand that the fine is substantial²⁴. Additionally, considering that the first question (acceptability of being an infringer) is more a question of morals, sociology, and psychology, we should focus on the questions of whether an alleged infringer

¹⁷ CALVANI, Terry; CALVANI H., Torello (2011). Cartel sanctions and deterrence. *The Antitrust Bulletin*, 56(2), 185–206 [interactive]. <https://doi.org/10.1177/0003603X1105600201>.

¹⁸ STUCKE, E. Maurice (2011). Am I a Price-Fixer? A Behavioral Economic Analysis of Cartels. From: *Criminalising Cartels: Critical Studies of an International Regulatory Movement*. London: Bloomsbury Publishing, pp. 154–168.

¹⁹ NAGIN S., Daniel; CULLEN T., Francis; JONSON, Cheryl Lero (2018). *Deterrence, Choice, and Crime*. New York: Routledge.

²⁰ THALER H., Richard (2016). Behavioral Economics: Past, Present, and Future. *American Economic Review*, 106(7), 1577–1600 [interactive]. https://paulgp.com/speeches/thaler_2016_aea.pdf.

²¹ *Beef Industry Development and Barry Brothers* [CJEU], No. C-209/07, [20.11.2008]. ECLI:EU:C:2008:643.

²² MONCUIT, Godefroy (2020). Relevance and Shortcomings of Behavioural Economics in Antitrust Deterrence. *Journal of European Competition Law & Practice*, 11(5–6), 228–237.

²³ MONCUIT, Godefroy (2020). Relevance and Shortcomings of Behavioural Economics in Antitrust Deterrence. *Journal of European Competition Law & Practice*, 11(5–6), 228–237.

²⁴ We maintain that competition law education is even more important than sanctioning infringers and are glad to be able to notice efforts of the Lithuanian Competition Authority to educate through targeted efforts and its own public training platform. Visit: <https://emokymai.kt.gov.lt/#/> [interactive]; visited on Apr 11, 2026.

can have a belief that there is more to gain than to lose in case of committing to a competition law infringement in a monetary sense. But, even if we presume that the law is known, do the (potential) infringers understand how the fines are calculated?

The most relevant question is the monetary aspect of the fine is supported by the findings of Bos et al.²⁵, which we could simplify to a statement: the perspective of a fine makes it unattractive to form a non-profitable cartel (or abuse) and a very profitable cartel (or abuse) is also unattractive (due to the perception of a higher detectability rate).

Bos et al.²⁶ observed cartel activity under either a regime in which cartels were not illegal or a regime where exemptions were granted and found that overcharge distribution for illegal cartels has less mass in both tails than the overcharge distribution for legal cartels. To put it simply, the ‘medium’ overcharge is more common than the low or high overcharge, i.e., if an ice-cream cartel is formed, then the cartelists are more likely to agree to overcharge 50 cents than 10 cents or a euro. An interpretation of this assumption is that, before committing to the cartel (or abuse), the potential infringers *do* estimate what possible gains they would get from the infringement. Low profits are unattractive, if compared to the potential fine, and high profits are perceived as more likely to attract the authorities’ attention (since, in general, high-profit infringement is more detectable). We interpret this as Bos et al.²⁷ who confirmed that competition law infringements are more often calculated than not – the infringers do calculate the overcharge as such and the overcharge’s profit. And the infringers also *do* weigh them against the fine or at least the possibility/likelihood of a fine.

Thus, we believe that studies on deterrence of fining support the assumption that when an authority sets a fine, the fine’s deterrence power should be evaluated through Becker’s optimal deterrence model set-up.

2. Understanding what Infringers Understand

Gary Becker’s work, supported by William Landes²⁸, is the central premise of this fine deterrence discussion. Becker provided a cost minimization model for law enforcement that is interlinked with the marginalism paradigm. Detecting all infringements and sanctioning all infringers is impossible by default. Given their resource scarcity, authorities cannot receive sufficient funding to detect, investigate, and fine all infringers. To find a right balance between funding and seeking to ensure the best possible welfare, fines must be set at a level that would deter potential infringers from infringements, but, on the other hand, the final sanctions and fines should not exceed what is needed for deterrence. Excessive fines may generate negative social welfare effects, as otherwise competitive firms may end up struggling financially and be forced out from the market.

²⁵ BOS, Iwan; DAVIES, Stephen; HARRINGTON, E. Joseph; ORMOSI L., Peter Jr. (2018). Does enforcement deter cartels? A tale of two tails. *International Journal of Industrial Organization*, 59, 372–405 [interactive]. <https://doi.org/10.1016/j.ijindorg.2018.04.005>.

²⁶ BOS, Iwan; DAVIES, Stephen; HARRINGTON, E. Joseph; ORMOSI L., Peter Jr. (2018). Does enforcement deter cartels? A tale of two tails. *International Journal of Industrial Organization*, 59, 372–405 [interactive]. <https://doi.org/10.1016/j.ijindorg.2018.04.005>.

²⁷ BOS, Iwan; DAVIES, Stephen; HARRINGTON, E. Joseph; ORMOSI L., Peter Jr. (2018). Does enforcement deter cartels? A tale of two tails. *International Journal of Industrial Organization*, 59, 372–405 [interactive]. <https://doi.org/10.1016/j.ijindorg.2018.04.005>.

²⁸ LANDES M., William (1983). Optimal Sanctions for Antitrust Violations. *The University of Chicago Law Review*, 50(2), 652–678 [interactive]. https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=2543&context=journal_articles.

In examining whatever is deterred by fines, Becker suggests that a firm will commit an infringement only if it perceives that the gains from the infringement exceed the potential consequences of detection multiplied by the detectability ratio ($\text{Gain} > \text{Detectability} \times \text{Consequence of Detection}$). Becker's model assumes: a) that there would be social losses if the fines were higher than needed to reach the optimal deterrence levels, and b) that firms decide on whether to commit to an activity in the same way, whether it is legal or illegal, i.e., by comparing what would bring more profit, considering the risks (see, e.g., Nagin²⁹ et al.).

We do not address Becker's concept of optimal deterrence from the perspective of the appropriate funding levels. Notably, Gallo et al.³⁰ found no support for Peltzman's³¹ suggestion that authorities are 'vote-maximisers' who evaluate trade-offs between consumer gains from tax-funded detection and sanctioning activities. Instead, we focus on the welfare dimension of Becker's framework. Let us deconstruct what the model contains so that to help us identify the lowest possible deterrent fines – those that deter infringement without imposing excessive penalties on the infringers.

In Becker's model, we have three factors: a) gain, b) detectability, and c) consequences of detection. We assume, on the grounds of relying on Bos et al.³², that a potential infringer is in a position to estimate the 'but-for' price after committing to the infringement, i.e., the decision-maker knows both the current gain from competitive pricing and the gain from cartel or abusive pricing, thereby enabling extraction of the mean legal gains from mean illegal gains to determine the infringement gains. If the firm cannot estimate the gain of the infringement, then Becker's model already fails at the starting point. While situations exist where cartelists actually miscalculate market reactions or remain unaware that their actions may be illegal, we assume that potential infringers know: (a) the applicable regulation, and (b) the anticipated gains from an infringement.

Regarding detectability, we begin with Gallo et al.³³, who found a positive correlation between competition authority funding and sanctions in criminal antitrust cases – in the sense that greater resources of an authority correspond to higher probabilities of detection and punishment. This supports Becker's model idea that detectability is not a constant mean, and that it can be influenced through funding of the authorities so that to reach the optimal deterrence in the context of the enforcement policy.

The detection rate appears to be the most uncertain factor among Becker's three model elements from the perspective of both the authorities and the infringers. Although Combe et al.³⁴ cite 13–17%, Combe and Monnier³⁵ give a reference to 13% and assume 15%, Connor³⁶ suggests 10–33%, and

²⁹ NAGIN S., Daniel; CULLEN T., Francis; JONSON, Cheryl Lero (2018). *Deterrence, Choice, and Crime*. New York: Routledge.

³⁰ GALLO C., Joseph; CRAYCRAFT L., Joseph; DUTTA, Shantanu (1986). Incarceration and Fines: An Empirical Study of Antitrust Sanctions. *Review of Industrial Organization*, 3(2), 38–66.

³¹ PELTZMAN, Sam (1976). Toward a More General Theory of Regulation. *The Journal of Law and Economics*, 19(2) [interactive]. <https://doi.org/10.1086/466865>.

³² BOS, Iwan; DAVIES, Stephen; HARRINGTON, E. Joseph; ORMOSI L., Peter Jr. (2018). Does enforcement deter cartels? A tale of two tails. *International Journal of Industrial Organization*, 59, 372–405 [interactive]. <https://doi.org/10.1016/j.ijindorg.2018.04.005>.

³³ GALLO C., Joseph; CRAYCRAFT L., Joseph; DUTTA, Shantanu (1986). Incarceration and Fines: An Empirical Study of Antitrust Sanctions. *Review of Industrial Organization*, 3(2), 38–66.

³⁴ COMBE, Emmanuel and MONNIER, Constance (2009). Fines against hard core cartels in Europe: The myth of overenforcement. *SSRN Electronic Journal*, 56(2) [interactive]. 10.2139/ssrn.1431644. COMBE, Emmanuel; MONNIER, Constance; LEGAL, Renaud (2008). Cartels: The Probability of Getting Caught in the European Union. *BEER paper n° 12*, 1–21 [interactive]. <https://www.coleurope.eu/sites/default/files/research-paper/beer12.pdf>.

³⁵ COMBE, Emmanuel and MONNIER, Constance (2011). Fines against hard core cartels in Europe: The myth of overenforcement. *The Antitrust Bulletin*, 56(2) [interactive]. <https://doi.org/10.1177/0003603X1105600203>.

³⁶ CONNOR, M. John (2010). Effectiveness of Antitrust Sanctions on Modern International Cartels. *Journal of Industry, Competition and Trade*, 6(3), 195–223 [interactive]. 10.1007/s10842-006-0028-9.

Allain et al.³⁷ propose 15%, these authors concur that the number of undetected infringements remains unknown. Thus, the actual probability of detection is uncertain. From the infringer's perspective, however, a problem arises regarding how the detection rate should be applied in the equation. The above-mentioned authors take the factor of detectability as a constant throughout the duration of the cartel, as the authority would do, but, in the decision-making of the infringer, it is not only about whether the infringement would be detected but *when*, considering the limitation period for setting a fine. The infringer encounters the need to decide whether to commit and whether to continue to commit to the infringement for each period of the infringement. Therefore, it perceives each period as a new infringement that can be detected for several periods in future due to the period of limitation. A similar logical structure is presented by Veljanovski³⁸.

However, uncertainty extends beyond the detection rate. Buccirosi et al.³⁹ (2011) argue that there are three dimensions of the consequence of detection: “(1) the range of potential sanctions that offending firms may face, (2) the range of potential sanctions that employees of offending firms may face, and (3) whether affected parties can sue for damages”. This suggests that Becker's model's consequences-of-detection factor requires disaggregation, as fines constitute only one element thereof. Due to the limitations of our research, we leave out the second dimension. Both the EU's and Lithuanian fining models provide that the range of the fines is certain (up to 10 per cent of the turnover⁴⁰).

Following the Damages Directive's⁴¹ entry into force, damages have become a major consideration for potential infringers. The principle that the victims' losses should be compensated in full renders damages a highly significant element. If there is no pass-on⁴², damages will be greater than gains of the infringement. Considerable research exists on various aspects of the Damages Directive and damages litigation. A perfect overview and analysis have been provided by Veljanovski⁴³, who conducted an extensive survey and synthesised the literature on the economics and measurement of cartel damages. Veljanovski's⁴⁴ research enables potential infringers to estimate damages, thereby partially supporting the assumption that the potential infringers *can* estimate the negative consequences of the infringement.

Research on whether damages actions provide deterrence remains contested. Wils⁴⁵, among others, states that “private actions for damages perform a supplementary, purely compensatory role”; however,

³⁷ ALLAIN, Marie-Laure; BOYER, Marcel; PONSSARD, Jean Pierre (2011). The Determination of Optimal Fines in Cartel Cases: Theory and Practice. *Concurrences*, 4, 32–40 [interactive]. https://www.researchgate.net/publication/228147995_The_Determination_of_Optimal_Fines_in_Cartel_Cases_Theory_and_Practice.

³⁸ VELJANOVSKI, Cento (2022). The Effectiveness of European Antitrust Fines. From: *The Cambridge Handbook of Competition Law Sanctions*. Cambridge: Cambridge University Press, p. 68.

³⁹ BUCCIROSSI, Paolo; LORENZO, Ciari; DUSO, Tomaso; SPAGNOLO, Giancarlo; VITALE, Cristiana (2011). Measuring the Deterrence Properties of Competition Policy: the competition policy indexes. *Journal of Competition Law & Economics*, 7(1), 165–204.

⁴⁰ In April 2026, amendments of the Law on Competition were proposed to set out a presumption of 10 per cent of sales turnover when calculating damages, similarly to Latvia and Hungary.

⁴¹ European Parliament and the Council 26 November 2014 directive 2014/104/EU on certain rules governing actions for damages under national law for infringements of the competition law provisions of the Member States and of the European Union. *OJ L* 349, 2014, pp. 1–19.

⁴² Direct purchaser transfers (passes on) an overcharge from an illegal practice (e.g., cartel) to its own customers, thus reducing its recoverable damages, i.e., if manufacturers for a cartel to agree on 10 cents increase of price and, subsequently, the reseller increases final price by 10 cents, then the reseller, *ceteris paribus*, has no damages claim against the manufacturers, and only the customer has.

⁴³ VELJANOVSKI, Cento (2022). The Effectiveness of European Antitrust Fines. From: *The Cambridge Handbook of Competition Law Sanctions*. Cambridge: Cambridge University Press, pp. 54–85.

⁴⁴ VELJANOVSKI, Cento (2022). The Effectiveness of European Antitrust Fines. From: *The Cambridge Handbook of Competition Law Sanctions*. Cambridge: Cambridge University Press, pp. 54–85.

⁴⁵ WILS, P. Wouter (2006). Optimal Antitrust Fines: Theory and Practice. *World Competition*, 29(2), pp. 1–32.

following a review of the debate, Juška⁴⁶ concludes that achieving the optimal deterrence requires incorporating private litigation into the deterrence framework.

One of the few examples where additional elements have been considered is that by Nagin⁴⁷, who explores other elements of the consequences of detection: the crime commission cost, the perceived formal sanction cost, the perceived informal sanction cost, and the perceived cost of apprehension. However, analysis of literature shows that authors mainly ignore the fact that there are other costs that appear after the detection of the infringement (Buccirossi et al.⁴⁸).

The majority of research omits most or at least some of Nagin's elements. Nevertheless, they are of top importance to the potential infringer if the firm in question wants to utilize Becker's model. E.g., Karpoff et al.'s⁴⁹ conclusion that reputational costs could be over seven times the fine received shows us that neither fines nor damages are always the decision-tipping element of Becker's model equation. If the potential infringer does not know what elements of the consequences of detection are, then the potential infringer cannot employ Becker's model. *Vice versa*, the fining authority will set an overdeterrent fine if it ignores other elements of the consequences of detection of the infringement.

Summa summarum, if a deterrent fine is to be set, the authority should ask itself three questions: (1) what is the gain of the infringement?; (2) how many infringements of such kind do we detect versus those that go undetected?; and (3) what are other negative consequences to the infringer of the fining decision?

3. Does Behavioural Economics Destroy our Conclusion?

Although the proposed model is so simple *prima facie*, there are little to no examples of such calculations and argumentation. We return to behavioural economics and problem of data availability/reliability.

The principal critique to Becker's model emanates from behavioural economics. Kahneman and Tversky⁵⁰ were among the first to critique Becker's model through their prospect theory. Prospect theory, emerging from behavioural economics, posits that decision-makers are not rational as conceived by Becker's expected utility theory. Potential infringers make decisions that underweight more probable outcomes and overweight low probabilities. If correct, then, despite how certain we would be of all elements of Becker's equation, each element would require adjustment to reflect not only the maximum detection costs, but each element should be multiplied separately by its own mean of perceived probability.

Specifically in the context of antitrust fines, Thaler⁵¹ and Moncuit⁵² present an opposite side of the scale of rational-irrational decision-making. At one end of the spectrum, individuals calculate precise

⁴⁶ JUŠKA, Žygimantas (2017). The Effectiveness of Private Enforcement and Class Actions to Secure Antitrust Enforcement. From: *The Antitrust Bulletin*, 62(3), pp. 603–637. doi: 10.1177/0003603X17719764.

⁴⁷ NAGIN S., Daniel (2013). Deterrence in the Twenty-First Century. *Crime and Justice in America*, 42(1), 199–263.

⁴⁸ BUCCIROSSI, Paolo; LORENZO, Ciari; DUSO, Tomaso; SPAGNOLO, Giancarlo; VITALE, Cristiana (2011). Measuring the Deterrence Properties of Competition Policy: the competition policy indexes. *Journal of Competition Law & Economics*, 7(1), 165–204.

⁴⁹ KARPOFF, M. Jonathan; LEE, D. Scott; MARTIN, S. Gerald. The Cost to Firms of Cooking the Books. *Journal of Financial and Quantitative Analysis*, 43(3), 581–611 [Interactive]. doi:10.1017/S0022109000004221.

⁵⁰ KANHEMAN, Daniel; TVERSKY, Amos (1979). Prospect Theory: an Analysis of Decision under Risk. *Econometrica*, 47(2), 263–292.

⁵¹ THALER, H. Richard (2016). Behavioral Economics: Past, Present, and Future. *American Economic Review*, 106(7), 1577–1600 [interactive]. https://paulgp.com/speeches/thaler_2016_aea.pdf.

⁵² MONCUIT, Godefroy (2020). Relevance and Shortcomings of Behavioural Economics in Antitrust Deterrence. *Journal of European Competition Law & Practice*, 11(5–6), 228–237.

gains and losses and compare them against each other (marginalism). At the opposite end, individuals commit to infringements driven by passions, emotions, heuristics, and behavioural biases (behaviourism). We submit that it is only on exceptional occasions that business decisions are made strictly based on objective motivation (numbers and estimations) or, to the contrary, purely on subjective motivation. Becker's model assumes that potential infringers possess all objective data; however, per Kahneman and Tversky⁵³, the issue concerns not merely data availability but also the way(s) how data are perceived.

Braithwaite⁵⁴ emphasises the non-economic dimension of deterrence, by arguing that moral and ethical considerations are significant, while Chambliss⁵⁵ identifies poverty, lack of education, and systemic discrimination as contributing factors to crime. As Becker⁵⁶ acknowledges, real-world administrative constraints affect the optimal deterrence effectiveness regardless of model precision. These non-economic factors, even those that are not related to the decision-making on whether to infringe or not, are important in the context of optimal deterrence. Schkade⁵⁷ et al. provide a specific example, and end up concluding that the deterrence probability (detection rate) does not affect the proposed punishments, even when this factor is explicitly highlighted. When evaluating the factor of detectability, we can find that a portion of the literature on competition authority fine deterrence compares actual overcharges with actual fines, accounting for detectability. Combe and Monnier⁵⁸ remains among the most cited papers on fine deterrence, and yet it is also among the most criticised due to inflexible estimation assumptions (see Boyer et al.⁵⁹ and Veljanovski⁶⁰). Specifically, Allain et al.⁶¹ discuss deterrence and the evaluation of already imposed fines by including marginal costs in calculations. Combined with the uncertainty surrounding the actual detection rates, such statistical and theoretical analysis merely reveals Becker's model's imperfections – as the adjustment of fines to the actual detectability rates may negatively affect general deterrence, thereby undermining Becker's optimal fine model.

However, when we turn specifically to fines for the infringements of competition law, economic rationale plays the most important role because general deterrence should be perceived much narrower – since the potential infringers are either business owners or managers, who either decide on whether to infringe, or on how much to invest into competition compliance. Even when cartels are

⁵³ KANHEMAN, Daniel; TVERSKY, Amos (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47(2), 263–292.

⁵⁴ BRAITHWAITE, John (1989). *Crime, shame and reintegration*. New York: Cambridge University Press.

⁵⁵ CHAMBLISS J., William (1964). A Sociological Analysis of the Law of Vagrancy. *Social Problems*, 12(1), 67–77 [Interactive] <https://doi.org/10.2307/798699>.

⁵⁶ BECKER, S. Gary (1968). Crime and Punishment: An Economic Approach. *Journal of Political Economy*, 76, 199–217.

⁵⁷ SUNSTEON R., Cass; SCHKADE, David; KANHEMAN, Daniel (1999). Do People Want Optimal Deterrence? *The Journal of Legal Studies*, 29(1), 237–253 [Interactive]. <https://doi.org/10.1086/468069>.

⁵⁸ COMBE, Emmanuel and MONNIER, Constance (2011). Fines against hard core cartels in Europe: The myth of overenforcement. *The Antitrust Bulletin*, 56(2) [interactive]. <https://doi.org/10.1177/0003603X1105600203>.

⁵⁹ BOYER, Marcel; FAYE, Anne Catherine; GRAVEL, Eric; KOTCHONI, Rachidi (2019). Guiding Principles in Setting Cartel Sanctions. *Concurrences* (3-2019), 1–6 [Interactive]. https://awards.concurrences.com/docrestraint.api/pdf/20_guiding_principles_in_setting_cartel_sanctions.pdf.

⁶⁰ VELJANOVSKI, Cento (2023). An Empirical Assessment of the European Commission's Cartel Prosecutions, 2010–2019. *The Antitrust Bulletin*, 68(3), 411–439 [Interactive]. <https://doi.org/10.1177/0003603X231180252>.

⁶¹ ALLAIN, Marie-Laure; BOYER, Marcel; PONSSARD, Jean Pierre (2011). The Determination of Optimal Fines in Cartel Cases: Theory and Practice. *Concurrences*, 4, 32–40 [interactive]. https://www.researchgate.net/publication/228147995_The_Determination_of_Optimal_Fines_in_Cartel_Cases_Theory_and_Practice; ALLAIN, Marie-Laure; BOYER, Marcel; KOTCHONI, Rachidi; PONSSARD, Jean Pierre, (2015). Corrigendum to 'Are Cartel Fines Optimal? Theory and Evidence from the European Union' (April 11, 2016). *International Review of Law and Economics*, 42, pp. 38–47 [interactive]. <https://ssrn.com/abstract=2762167>

formed by employees rather than the management, the current legal regime imposes no responsibility on such employees, and Wils⁶² argues against firms' ability to recover paid fines from managers or employees in the deterrence context. Thus, non-economic factors are not always useful in deciding on deterrence – not the ones that should be deterred carried out the infringement, which means that the one that pays the fine should be motivated (through deterrence) to internally prevent the infringement.

4. The Reality of Data

Yet, although we repudiated to accept behavioural economics, still, the fines are not set out in a way as proposed by Becker. We turn to data availability/reliability. Real-world fines are based on the turnover-based model (put simply: Turnover $\times$ Infringement's gravity).

We should not forget that the turnover-based model is also rooted in optimal deterrence. The basic logic is that the value of sales (turnover connected to the product subject to the infringement) is the first step of calculations, and, in theory, it relates to the effect of the infringement on the market. The entity's 10 per cent general turnover maximum is used only as a safeguard for the fine not to bankrupt the infringer, i.e., no matter how big the entity is, the value of sales reflects the impact of the specific entity on the relevant market. Would it be a trillion-turnover entity, or a million-turnover entity, the basic amount of fine should be the same if the amount of sales is identical. However, turnover-based models fail both to address the restitution of social costs⁶³ and address the question of whether the infringement was profitable, i.e., harmful.

On the other hand, if a firm commits to the infringement and there is a gain-based model regime, the firm could try to adjust its accounting (i.e., it would alter the mean of 'gain'), e.g., by taking on costs that are not beneficial for the overall welfare so that to minimise future fines if the infringement is detected. We believe that, only due to this, the individual deterrence that is based on fines calculated via the turnover model is 'more optimal', and the gains model is left behind in practice. With the turnover-based model regime, the authority does not need to collect correct and precise information on costs and profits but has the ability to calculate fines based on objective and hard-to-alter data – specifically, the revenue (the value of sales related to the infringement).

However, we share the sentiment with Tokić⁶⁴, who bluntly states that neither the turnover-based model, nor the gain-based models are efficient and, instead, proposes a combined model – in which, the turnover is not important but the gains of the infringer and the losses of the victims should be considered. An authority could derive the gain of the infringement through the losses of the victims. Victims could invest into helping the authorities to establish the losses (harm); thus, costs would be lower. Gain-based and loss-based model is more linked with the infringement, and the data are more difficult to alter. In other words, why is an infringement held harmful at all if we do not establish the harm?

Thus, although it is costly to establish gains and/or losses, in the case of competition infringements, quantifying the gains and losses contributes to certainty as to why the actions are considered an infringement for rationally driven decision-makers. The certainty of punishment, as Nagin⁶⁵ states, is a

⁶² WILS, P. Wouter (2023). EU Antitrust Fines and Managerial Liability – A Legal and Economic Analysis. *World Competition*, 46(4), 1–21.

⁶³ NIELS, Gunnar; JENKINS, Helen; KAVANAGH, James (2023). *Economics for Competition Lawyers*. [Interactive]. Oxford: Oxford University Press. <https://doi.org/10.1093/law-ocl/9780198851332.002.0003>.

⁶⁴ TOKIĆ, Adnan (2025). Optimal fines in EU competition law – an economic analysis. *Journal of European Competition Law & Practice*, 16(3), 196–207 [interactive]. <https://doi.org/10.1093/jecclap/lpaf042>.

⁶⁵ NAGIN S., Daniel (2013). Deterrence in the Twenty-First Century. *Crime and Justice in America*, 42(1), 199–263.

much more significant deterrent than the severity of the fine. In the context of the general deterrence and deterrence of recidivism, it is far more important for the authority to establish why something was harmful to society than to impose a larger fine. If the authorities were to quantify the harm, they would be in a position to set a fine that is understandable to both the alleged and potential infringers – then, the former would understand what they have done and why they must pay; the latter would understand why something is prohibited, and what the cost of infringing would be.

Concluding Remarks

1. We have reviewed the Marginalism Paradigm (which suggests that rational individuals weigh the expected benefits of committing an infringement against the expected costs), the Behavioural Economics (which highlights that individuals are subject to passions, emotions, and feelings that disrupt rational decision-making, with heuristics and behavioural biases exerting significant influence), and the Prospect Theory (in which, decision-makers are not rational, and they underweight more probable outcomes while overweighting low probabilities). In each case, we found arguments that infringers should be deterred through explaining to them how the fine is calculated. We have also explained why those fines should be proportionate.

However, authorities seldom explain the calculation of the fine in the context of the legal act that sets out the methodology for calculating it. And even if these legal acts contain provisions that link gains to the amount of a fine, authorities seldom perform the linking. Quite surprisingly, this reality is rooted not in the authorities' biases but rather in the availability and reliability of data. We are optimistic that technological developments will lead to solutions to these problems, at least through the ability of authorities to allocate more resources to the calculation of optimally deterrent fines.

2. The literature review supports the proposition that if a deterrent fine is to be set, the authority should ask itself three questions: (1) what is the gain of the infringement?; (2) how many infringements of this kind do we detect versus those that go undetected?; and (3) what are the other negative consequences to the infringer of the fining decision? Answering these questions brings us closer to achieving the optimal deterrence. If all three questions are answered, we can expect that both alleged and potential infringers should (a) understand what is prohibited and why, and (b) they would be more inclined not to infringe, while simultaneously not being deterred from conducting business. Conducting business is difficult in itself; thus, to enjoy the results of competition, we should all make our best efforts to provide the clearest possible explanations of what actions are legal and permissible.

We conclude with a quote from Veljanovski: “Measuring whether antitrust fines deter cartels is a difficult and complex exercise. Yet it is an exercise ...”.

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