Judicial Review, Economic Evidence and the Choice of Legal Standards
by Utility Maximizing Competition Authorities

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Abstract
For most of the various types of business conduct that can potentially violate Competition Law, excluding hard-core collusive conduct and horizontal mergers, the issue of which legal standard (or decision rule) a Competition Authority (CA) should adopt for assessing the conduct has been hotly debated for many years. In the EU, while about 10-15 years ago there were many voices arguing for a movement towards effects-based standards, as many commentators recognize at present, this movement never seriously took off, so much so that currently the main question concerns whether we are actually moving towards its demise. This is opposed to the situation in countries such as US and Canada and contradicts a growing body of economic theory using a welfare-based approach to show the superiority of effects-based standards in many circumstances.

In contrast to the traditional normative approach for examining the choice of legal standards by CAs, we propose a framework that does not associate this choice exclusively with error-cost minimization or welfare maximization. Rather, in our framework, the CA maximizes its utility, which depends positively both on the expected welfare benefits of its activities but also on its reputation and public image. Within this framework we are able to identify the fundamental role of the judicial review process in explaining why CAs may favor Per Se type standards, why the extent of economic analysis and evidence used by CAs can be severely limited, how the characteristics of the jurisdiction system influence these outcomes, how the choice of standard affects the optimal choice of the number of investigations undertaken and how these choices depend on the type of conduct examined.

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1. Literature Review, Motivation and Objectives

Literature review and motivation

Economic analysis has been extensively applied for many years in Competition Law (CL) enforcement in order to provide analytical tools and models for understanding cartel behavior, types of monopolization and the impact of vertical and horizontal mergers. More recently, it has been playing an increasingly important role in the assessment and optimal choice of legal standards and the shaping of tools of enforcement, such as leniency programs, commitments and settlements, determination of fines and alternative sanctions.

Nevertheless, the issue of the appropriate role and extent to which economic analysis and evidence should be applied in the enforcement of CL has always been very controversial. How widely divergent the opinions have been and how dominant specific points of view become, in terms of their influence on enforcement practice, has varied over time and across countries and continents. Thus, while not without dissenting voices that even become dominant at certain periods over the last hundred or so years, the US (or North America) point of view has tended to give economic analysis and evidence a much more important role to that which the dominant point of view has assigned to economic analysis in Europe.

The debate concerning the appropriate role and extent of economic analysis and evidence in CL enforcement is usually couched in terms of what is the best legal standard or decision rule (or "enforcement procedure") that should be used in order to be able to proclaim liability or violation of CL.

Broadly speaking, there are two types of decision rule that can be used, those (to use the terminology common in the EU) that are effects-based and those that are object-based, which in US are referred to as rule of reason and Per Se rules, respectively, though the terms are not, strictly speaking, exactly equivalent. Of course, there are variations in these rules and it is probably best to think of legal standards as forming a continuum at the extremes of which are the Per Se (or object-based)...

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2 For discussions and empirical information concerning the use and usefulness of economics in competition law enforcement see Baker (2003), Gavil (2008), Neven (2006), Schinkel (2008) and Lianos (2012).

3 Both at the level of the EU Commission and that of Member States. For an excellent overview of the application of economics in a century of antitrust enforcement in US see Kovacic and Shapiro (2000). Also Gual and Mas (2011) for the use of concepts and tools from modern Industrial Organization theory and Fisher (1989) for an early skeptical view. For an exchange that encapsulates quite perfectly the controversy raging presently again in Europe, see articles of Wils (2014) and Rey and Venit (2015) discussing the recent EU Intel decision.

4 By "legal standard" below we will always mean the "decision rule" used by the CA in order to undertake its assessment of any given conduct that potentially violates the CL. The decision rule prescribes the type of evidence that the CA will seek and consider, the presumptions on which it will rely and the series of tests and economic argumentation that will take into account in making the assessment and reaching a decision. The decision rule can differ for different conducts: sometimes relying on presumptions and proving certain behavior will be all that is required; in other cases proving likely or actual effects will be required. Also, below we will treat "effects-based" as more or less synonymous to "economics-based" (a term that has also become very popular in Europe in recent years).
based) and the (“full”) rule of reason (or full effects-based) standards (see for details below). Further, while in US a Per Se offence concerns conduct that is necessarily and irretrievably unlawful, this is not necessarily the case in EU where the object-based standard may refer to a “rebuttable Per Se” rule and an effects-based standard is usually thought of as falling short of the full-blown rule of reason in terms of how discretionary is the Authority’s case-by-case decision making approach.

Of course, the choice of legal standard may also be affected by the *substantive standard* of the CA. Thus, generally, the application of an effects-based standard, interpreting the term in the usual way where “effects” refers to effects on consumer or total welfare, may be excluded by, for example, the fact that the Authority’s objective is just to “protect the economic freedom of market participants”, or, the pursuit of a “system of undistorted competition” (Wils, 2014), without obligation to show adverse effects on consumer welfare or efficiency (Rey and Venit, 2015) – which would imply that any conduct that puts one or more competitors at a disadvantage would be considered unlawful, irrespective of the ultimate consequences of the conduct for consumer or total welfare.

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5 Alexander Italianer, ab.cit. p. 2, referring to Justice Stevens who was probably the first to point out that one should think of legal standards (for dealing with restraints under US Section 1) as forming a continuum with Per Se and Rule of Reason being at the opposite ends of this continuum. As Italianer notes, the US Supreme Court has explicitly recognized that “the categories of analysis cannot pigeonhole into terms like “per se” or .... “rule of reason”. No categorical line can be drawn between them. Instead, what is required is a situational analysis moving along what the Court referred to as a “sliding scale”.

6 Below we will use the term “higher” legal standard to refer to a standard closer to rule of reason, while by “lower” standard we mean a standard closer to Per Se.

7 See Katsoulacos Y and D Ulp (2009). Also, Gavil (2008), ab.cit. p.141. In EU, agreements under Art.101 are rebuttable. There are however cases in EU CL which are strictly Per Se prohibited: RPM, Parallel Trade restrictions and restrictions on cross-sales in vertical contracts. We return to some of these distinctions below.

8 That is, the objective of the CA, or the criterion on the basis of which its decisions are reached.

9 It should be noted that Wils’ (2014) use of the term “welfarist” for the objective he associates with the effects-based standard is misleading. As argued in a discussion of the point by Farrell and Katz (2006) “antitrust is not welfarist in the sense that, whether the antitrust law allows a particular conduct depends not just on the consequences of that conduct but also on the nature of the conduct or the process that generates the consequences. Thus conduct that creates harm or lowers welfare will normally not be disallowed, under antitrust law, if it does not involve anticompetitive actions”.

10 The meaning of “preserving undistorted competition” was actually made clear by the EU General Court which, upholding in its entirety the Commission’s Decision on Intel, argued that making it more difficult for a rival to compete “in itself suffices for a finding of infringement”.

11 Rey and Venit (2015) note that the effects-based standard starts with a showing of a distortion of the competitive process but, in order to assess this distortion and find liability, one “should look at the actual or likely effects of the conduct”, on consumer welfare or efficiency (p. 17, italics ours) which (a) includes assessing impact on prices but also on all other factors that influence consumer welfare such as consumers’ choice, product variety and product quality and (b) does not imply a focus on just the short-run effects. Note that in this paper we will not try to examine the pros and cons of using “consumer welfare” or “total welfare / efficiency” as the right substantive standard. Some CAs are already using a total welfare standard (e.g. in Canada, Australia and New Zealand) though in EU and US the CAs lean towards the «consumer welfare» standard (and in EU often a weaker standard – such as that concerning the «competitive process» - is used). There is currently quite an intense debate on this issue, with some eminent economists arguing for a total welfare standard, e.g. D. Carlton (2007). For a recent contribution also containing a review of the recent debate see Katsoulacos et.al. (2016).
But we will assume here that the ultimate criterion of the CA for finding liability is that of consumer welfare\(^{12}\), hence prohibiting conduct that impacts adversely on price, quality, variety or innovation, which are the main dimensions affecting consumer welfare. Given this, a conduct’s potential implications for consumer welfare can in principle be decided by adopting either of the legal standards mentioned above: in both cases, the objective “is to form a judgment about the competitive significance of the restraint”\(^{13}\). Or, to put it otherwise, to try to reach “a sufficiently high standard of proof”\(^{14}\) that violation has occurred.

Under a pure or “full” effects-based standard the effect of the specific conduct on at least one of the factors that influence consumers’ welfare must be explicitly examined and established – usually the emphasis is on showing that the conduct results in a substantial increase in price relative to a counterfactual in which the conduct would be absent. Under object–based, on the other hand, it is not necessary to examine the effects on competition in the sense just mentioned: “Rather, it is sufficient to show\(^{15}\) that the restraint is capable of resulting in a distortion of competition”\(^{16}\).

\(^{12}\) As we will argue below, Authorities will give weight to the implications of their decisions on welfare but will also be concerned with their reputation and public image. Also, emphasizing the protection of consumer welfare does not contradict the presence of “public interest concerns” that may, in some cases, affect enforcement.

\(^{13}\) See Gavil (2008), ab.cit., p. 139 and Alexander Italianer ab.cit., p. 2.

\(^{14}\) We should also stress that we will be using the term «standard of proof» rather loosely. To explain: formally, by «standard of proof» is meant the degree of evidence required in order to establish proof, or for the Authority to discharge its ultimate contention (that welfare will be adversely affected). Or, it is the threshold, in terms of the probability that must be met, for the Authority or Court to discharge its burden of proof. Common standards (associated with a progressively higher probability) include: “substantial evidence”, “Preponderance of the evidence” (or “balance of probabilities”) – it is demonstrated, with at least 51% probability, that contention is true – mostly applied in civil cases), “clear and convincing evidence” and “beyond reasonable doubt” (mostly applied in criminal cases). While, however, these concepts are well understood and widely applied in common law systems, “in other jurisdictions, particularly in (EU) continental legal systems, such “probabilistic” standards of proof generally do not exist.” The amount of evidence required is rather a question of the personal conviction of the judge (intime conviction). That is to say, a party who bears the burden of proof must satisfy the judge to the point of persuading him of the existence of a pertinent fact. The concept of intime conviction does not require courts to apply any specific standard of proof, nor does it refer to the rules of legal proof (i.e. the rules determining, in general and binding terms, the probative force of specific items of evidence). Instead, the courts in continental legal systems are vested with the power to determine the weight of evidence on the basis of a discretionary evaluation, even though the extent of the so-called principle of free evaluation may differ from one legal system to another” (see Per Hellstrom, 2009; p. 2; our emphasis). We should stress that our use of the term “standard of proof” in this article does not necessarily rely on a “probabilistic” interpretation; we may interpret it as “sufficiency in the evidence required to convince a judge”.

\(^{15}\) For reaching the appropriate standard of proof.

\(^{16}\) Italianer, ab.cit. p.5. Note that the word “capable” in EU decisions is very often replaced by the word “likely” or the word “probable”: here we interpret these terms as synonyms to identify a middle ground between purely hypothetical effects and actual effects. For certain cases, e.g. cartels, showing a “distortion of competition” by object analysis is sufficient to also infer negative effects on consumer welfare with a high probability. For many other cases, e.g. many (other) article 101 and article 102 business practices, such an inference is usually not possible. We have already commented on the probabilistic interpretation of the notion of the standard of proof above. In the context of EU Competition Law it is worth mentioning that there are “no rules on proof or evidence in the Treaty” and that “Regulation 2003 seems deliberately to leave the definition of the standard of proof at a national level to the laws of the Member Stares” (Hellstrom, ab.cit., p. 3). As Gippini – Fournier (2010) concludes by examining the applicable standard of proof in competition litigation before the EU Courts, the latter “seem more influenced by the predominant conception in civil law countries - the vast majority of EU Member States - where the judge decides according to the persuasiveness of the evidence without being bound by pre-determined evidentiary or probability ‘thresholds’”. However, in relation to cases under articles 101 and 102
We can think of the difference between these two types of standards as follows. While for certain conducts a sufficiently high standard of proof of anticompetitive harm\(^{17}\) can be reached by applying an object-based legal standard, purely on the basis of identifying the exact nature of the conduct, for many other conducts this will not be the case. In these latter cases, where the standard of proof reached by adopting object-based is too low, effects-based legal standards, relying on more extensive investigation of firm and market characteristics and the application of economic analysis and evidence, are needed in order for the Authority to be able to identify whether it can reach its threshold for discharging its burden of proof and establishing its ultimate contention that the conduct will result in a reduction in consumer welfare. The exact variant of object-based or effects-based rule that is required will depend on the conduct under consideration. While of course this implies that the extent and sophistication of the economic analysis and evidence utilized under an effects-based rule is greater than that under an object-based rule, how much greater will depend on the exact variant of Per Se / object-based or effects-based rule that is used.

Between these extremes one finds “modified Per Se (or modified object-based)” legal standards where the application of the object rules can require application of quite extensive contextual analysis of market and firm characteristics and “structured rule of reason” where conduct is assessed through a specific series of screens to distinguish lawful from unlawful cases, in contrast to the (unstructured or) “full” or “open” rule of reason where all potentially anti-competitive and pro-competitive effects are assessed and compared\(^{18}\). This has the important implication that the object-based approach might not require much less in analysis than witnessed in cases determined via an effects-based approach.

Thus, in the context of our analysis here the question is, assuming that the substantive standard is consumer welfare or efficiency, what is the optimal choice of legal standards along the continuum, and hence of the role of economics in CL enforcement. Existing literature has examined this question by using a minimization-of-costs of decisions errors framework and, more recently, a more general maximization-of-welfare framework (that incorporates the former). The main factors that then need to be taken into account and have been discussed quite extensively in the literature can be summarized as follows:

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\(^{17}\) We abstract from the issue of establishing or verifying, at a sufficiently high standard of proof, what is the exact nature / form (or characteristics) of the conduct under investigation and assume that this has been achieved.

\(^{18}\) See Feme Alese, 2008 (page 129); R O'Donohue and A J Padilla, 2008 (page 183 – 184); Kai Huschelrath, 2009 (p. 241). The term “quick look” as another intermediate standard falling short of the “full” rule of reason is also sometimes used – see Italianer (ab.cit., 2013) and Gavil (ab.cit., 2008).
- the cost of decision errors (of Type I and Type II) under the alternative standards
- the deterrence or indirect (or incentive) effects of the standards
- predictability and legal certainty
- other enforcement costs (including administrative costs of enforcement and costs to firms of self-assessing their position or of reducing legal uncertainty).

In a series of papers, Katsoulacos and Ulph (2009, 2011, 2015 and 2016) have attempted, by using a maximization-of-welfare framework to provide answers on how the factors above, in conjunction with other aspects of enforcement, affect the choice of the (optimal) legal standard\textsuperscript{19} and hence, indirectly, about the appropriate role and extent of economic analysis in CL enforcement. Below we provide a brief summary of the main conclusions.

A formal analysis of decision errors under alternative legal standards\textsuperscript{20} suggests that this involves a comparison of the quality of the models/analysis available to the CA in undertaking an effects-based investigation of a specific conduct type with the strength of presumption of legality/illegality of that conduct type\textsuperscript{21}. The quality of the models/analysis depends on their ability to discriminate accurately between harmful and benign occurrences of the conduct, that is, on the propensity to make Type I (false convictions) and Type II (false acquittals) errors. The strength of the presumption of legality/illegality depends on the frequency with which actions are anticompetitive, the degree of harm they cause if they are, and the degree of benefit they create if they are pro-competitive. It is certainly not true in general that under effects-based legal standards the welfare costs of decision errors will be lower than under Per Se legal standards but this is likely to be true in a large number of cases. Specifically, there will be an improvement in the overall welfare effect, by lowering the costs of decision errors of enforcement, whenever the type of conduct potentially violating the law cannot be \textit{a priori} considered as overwhelmingly harmful\textsuperscript{22} or overwhelmingly benign\textsuperscript{23} to the welfare of those affected. Then, relying on legal standards that identify liability on the basis of the estimated effects on welfare of each case examined, where the estimated effects are assessed on the basis of economic evidence and economic modeling related to the

\textsuperscript{19} Extensive references and reviews of the literature related to these issues are contained in these papers. See also J Padilla (2013), page 435.
\textsuperscript{20} See Y. Katsoulacos and D. Ulph (2009).
\textsuperscript{21} A measure of how far conduct is from being borderline legal/illegal – Katsoulacos and Ulph (2009).
\textsuperscript{22} Such as explicit horizontal price fixing agreements. For this type of actions a Per Se Illegality legal standard should be (and, indeed, it is) used – that is, a standard according to which all such agreements are deemed as Per Se violating the law, without a need to examine, using economic analysis, the welfare implications of each case detected and investigated.
\textsuperscript{23} Such as certain information exchanges between firms which by their very nature and characteristics are highly unlikely to have adverse effects and hence a Per Se Legality legal standard should be used - that is, a standard according to which all such exchanges are deemed as Per Se legal, without a need to examine, using economic analysis, the welfare implications of each case. Note that in EU conduct regarded as Per Se legal can still be rebutted by the Authority.
specific case, rather than on object-based or Per Se legal standards, will lower the costs of decision errors.

Decision errors affect only the welfare consequences of the CA’s procedures on the cases that come to its attention and investigated. A CA’s procedures could also affect firms, which do not come to its attention, for example by influencing the decision of a firm to engage in potentially efficiency enhancing or anticompetitive actions. These indirect/deterrence effects could potentially have much more significant welfare effects than the direct/decision error effects. So the indirect effects on the behavior of firms, when the latter are deciding whether or not to take a business action, should be a very important consideration when selecting among alternative standards. A welfare analysis of these indirect effects shows that effects-based standards by discriminating better between harmful and benign conduct can improve deterrence relative to Per Se standards and this is most likely to be the case when the strength of the presumption of legality or illegality is not large (i.e. exactly for the type of conduct we have in mind here which cannot be a priori considered as overwhelmingly harmful or overwhelmingly benign).

Finally, the argument that economics or effects-based standards are inferior because they generate Legal Uncertainty does not seem to stand-up well to analytical scrutiny (Katsoulacos and Ulph, 2015 and 2016). Effects-based does not necessarily imply Legal Uncertainty, Per Se does not always guarantee Legal Certainty and, especially when the CA can adjust its penalty policy under alternative information structures, the superior deterrence effects of effects-based standards will make them the optimal choice even if they involve Legal Uncertainty whilst Per Se does not.

Given the above brief review, it may come as a surprise that in many jurisdictions including those of the EU (DGCOMP) and of many EU Member States the preferred legal standard for many practices continues to be much closer to Per

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24 As Joskow (2002) argues the deterrence effects are more important than the costs of decision errors as they include the (cost of) the responses and adaptations that target firms as well as other ‘firms and markets in general make to antitrust rules . . . ’. Kuhn (2011) stresses the importance of deterrence effects (which he terms incentive effects) in the context of the debate of optimal standards for information exchanges between firms. See in particular page 416 of his contribution to the OECD (2011) report.
25 This is the partial deterrence effect, described in detail in Katsoulacos and Ulph (2009). Though effects-based standards produce also an adverse absolute deterrence effect, the former can dominate the latter producing the result mentioned here.
26 The importance of deterrence and procedural factors is shown in Katsoulacos (2009) who applies the above framework to the analysis of legal standards for refusals to license intellectual property rights. Applying a full welfare analysis, he shows that the Per Se Legality standard should be used to handle such refusals. It also shows that it is important to take account of certain other procedural features of a CA’s operations—the coverage rate (i.e. the fraction of actions investigated by the CA), delays in decision-making, and the penalty regime. These procedural factors enter explicitly into the welfare comparison of different legal standards.
27 Katsoulacos and Ulph (2016) make the important distinction between uncertainty generated by decision errors which always reduces welfare and uncertainty because firms do not know the assessment which the CA will make were their actions to be investigated. The latter is what is usually considered to be the legal uncertainty associated with effects-based standards.
Se than effects-based even though the economics literature in the last twenty years or so has shown that while in principle these practices can be anti-competitive the circumstances for this to be true cannot be considered as very common and, most importantly, they often generate substantial efficiencies that can also enhance consumer welfare. While Competition Authorities and policy makers did show signs in the previous decade of greater sympathy for moving towards effects-based standards, the actual implementation practice shows that infringement decisions still (and even increasingly in recent years) are nothing but effects-based, as testified by the arguments put forward on the one side by Wils (2014), favoring Per Se, and on the other side by Rey and Venit (2015), favoring effects-based, in the context of the recent European Intel decision.

In the meantime, the importance of effects-based standards and of the role of economic evidence and relying on the predictions of sound economic analysis in CL enforcement has been stressed by OECD not just in the context of developed countries but equally and perhaps more importantly in developing ones. For example, in its recent report evaluating the Russian competition authority, that has in the last few years become the largest competition authority in the world, the OECD (2013) makes as its top recommendation that the authority must “improve the quality of economic analysis and its application to competition enforcement throughout the competition authority and in support of improved judicial decisions”.

Objectives and main results

The primary objective of this paper is to contribute to a better understanding of the choice of legal standards by CAs, and hence of the extent of economic analysis and evidence utilized in reaching their decisions, by considering the behavior of not pure welfare-maximizing Authorities. Specifically, we propose a framework for examining the choice of legal standards by CAs that does not associate these choices exclusively with error-cost minimization or welfare maximization (taking into account, under the latter, also of deterrence effects). Rather, in our framework, a CA maximizes its utility, which depends positively both on the expected benefits that its activities bring to society but also on its public image or reputation. This is consistent with the widely recognized fact that, in many cases, CAs operate under performance criteria that are not related to the effects of enforcement on welfare. Within this framework we are able to identify the fundamental role of the judicial review process in explaining why the extent of economic analysis and evidence used by CAs, can be severely limited, even though the CAs have access to suitable expertise.

30 Practices that have been associated with this debate are mainly those associated with article 102 in EU (abuse of dominance), or concerted practices and information exchange or some vertical restraints.
32 The decision concerned Intel’s practices involving exclusivity contracts and rebates.
33 For other important attributes of this process see Katsoulacos and Ulph (2011) and Shavell (1995).
More specifically, in our framework the CA’s public image and reputation is measured by an indicator of “Enforcement Success” which is affected negatively when the number of cases that the CA opens and brings to conclusion falls and when the reversals of its decisions in Courts of Appeal are increased. It is affected positively by the welfare impact of its decisions. Using this framework, we analyze the CA’s optimal application of economic analysis and evidence in Competition Law investigations and its optimal choice regarding the number of investigations undertaken and decisions reached.

Our main result is that the CA may well find it optimal to use legal standards that are significantly lower than those associated with full effects-based, thus applying economic analysis and evidence that is significantly less than the analysis and evidence associated with full effects-based, even though the latter can reduce decision errors and can be optimal in terms of its deterrence effects. As we show, a pure welfare-maximizing CA will choose higher standards and to apply economic analysis and evidence to a greater extent. Also, we show that adopting higher standards in investigations of a specific conduct may lead a reputation-maximizing CA to choose to investigate less cases of that specific conduct type. Our conclusions are useful for drawing lessons and making recommendations for improving the extent to which economic analysis is applied and hence the performance of CAs in terms of the quality of CL enforcement.

The explanation behind our main results is that adopting higher standards and increasing the extent of economic analysis and evidence utilized, can lead, after a certain point, to an increase in the probability that infringement decisions will be annulled in Courts of Appeal. Moving towards more effects-based standards can increase the probability of annulment (or decision reversal) by Courts, because this move may well imply that the CA and Courts cannot devise decision rules for assessing conduct that are based on a succinctly defined pre-specified set of easily identifiable and unanimously (or, more or less unanimously) accepted criteria or conditions, on the basis of which the assessment leads to conclusions that are very difficult to dispute. This implies an increase in the disputation of the conclusions reached by the CA – as the Courts can consider appropriate to take into account less or additional or different tests, models, explanations and interpretations to those adopted by the CA and may decide that a finding of law violation is only warranted at an even lower standard of proof than was thought warranted when a lower legal standard was used. Applying more economic analysis of increased complexity also implies an increase in the likelihood of misalignment in the perceptions between the

34 Independently of the influence on the cost per investigation of adopting higher standards.
35 Irrespectively of whether these criteria are right or wrong, sufficient or deficient, and thus satisfactory or not in discriminating truly harmful from truly benign conduct. Such well defined pre-specified sets of criteria are, on the other hand, associated with object-based standards. The example of information exchanges discussed below illustrates the point.
CA and Courts about what is, or exactly how to specify in detail, the right decision rule

It is important to note that the extent to which the judicial review process will be associated with this effect will be dependent on the conditions related to the institutional and legal/cultural context of the jurisdiction/country considered. Thus, the effect is expected to be stronger in jurisdictions in which there is no tradition in the application of economic analysis and evidence in legal proceedings and, specifically, in competition law enforcement, especially when the latter surpasses a certain amount of sophistication and complexity. Also, in jurisdictions or legal traditions in which judges lack any formal training in economics and the necessary relevant experience in assessing economic arguments. These are likely to hold in the relatively newer jurisdictions like those of for example the BRICS and other developing countries but may well hold too, at least to some extent, in more mature jurisdictions (e.g. of the EU) in which the legal tradition is not one that is receptive to economic arguments in substantive evaluations of CL cases.

The structure of the paper is as follows. Section 2 sets out the model while Section 3 derives our main results concerning the optimal application of economic analysis and choice of legal standards and the optimal choice regarding the number of investigations/decisions reached. Section 4 provides concluding remarks offers some recommendations and discusses opportunities for future research.

2. The Model

Our model of CA behavior is based on the basic premise that the CA is a government agency and as such it will typically have a certain freedom to choose among different possible courses of action. Its objective (or, the CA head’s objective) is concerned with society’s benefits from the agency’s overall performance, but also with the organization’s public image or reputation

Thus, while the head is concerned with the expected benefits that the CA’s activities bring to society

36 Of course, differences between the CA and Courts can be of various kinds and can relate to the appropriate Substantive Standard, to the Standard of Proof (SoP) required to be established, to the Legal Standard or to the appropriate analysis needed under any given legal standard. In the EU Intel case, the Court and the Commission seemed to differ on what exactly should be the substantive standard and also on the appropriate SoP and legal standard adopted. However, the Court did not annul the Commission’s decision because it considered that a more appropriate (lower) legal standard would be enough to show liability and the decision would be the same – as it adopted a non-welfarist substantive standard. Or, Courts may agree with the SoP of the CA but to disagree / consider mistaken the legal standard adopted or that the CA’s analysis do not substantiate its conclusions. In the US Leegin case, the Supreme Court considered that the Per legal standard was inappropriate and an effects-based rule should be applied in RPM cases. Indeed, it is worth stressing that Courts may request a higher legal standard even if it is expected that this may increase decision reversals. In this article we concentrate on cases where the main basis of decision reversals by the Courts concerns the legal standard adopted by the CA and hence questioning the significance assigned to, or the interpretation given to, the economic analysis and tests of the CA for finding liability.

37 See for an extensive discussion of these assumptions and of empirical evidence, as well as for a review of related theoretical work, Schinkel, et. al. (2014). They construct a model to examine the behavior of government agencies by assuming the same overall objective as we advocate here.
directly, she is also attaching value to how the CA’s activities impact on its reputation. We formalize this objective through a utility function that depends on a composite indicator of Enforcement Success (S) that in turn depends positively on the benefits that society derives from CA’s activities, and on the number and type of cases that the authority opens and brings to conclusion in any given period and negatively on the number of the CA’s decisions that are reversed (or annulled) by Courts of Appeal.

Thus, we consider a CA that maximizes a utility function (U) where utility depends on the reputation (R) of the CA, specifically we assume that utility $U = U(R)$ is a monotonically increasing strictly concave function of R. Below, we start with a discussion of the factors that affect reputation.

**The reputation function**

We assume that the fundamental indicator of the CA’s performance, which determines its reputation (R), is the Enforcement Success (S) of the CA, which is influenced by two factors:

(i) The difference between the Decisions (D) that the CA expects to reach in each period on cases opened and investigated and the expected (final) reversals ($r$) of its decisions in Courts of Appeal. Decisions can be reached on the basis of some variant of Per Se (PS, or object-based) or effects-based legal standard (EB) and they concern conduct that is not deterred, by firms anticipating the enforcement procedure and sanctions that they will face if investigated and convicted. Parties found to violate the law can appeal against the CA’s decisions. If they do, the CA will have to defend its decisions in the Courts of Appeal.

(ii) The impact of the CA’s decisions, on society – i.e. on the welfare of those affected adversely by the law violations in the cases investigated.

So, assuming that the CA’s enforcement efforts concern K potential conduct types, the enforcement success (S) of the CA is a function of enforcement success in investigations of these different conducts:

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38 This is also the assumption made in Harrington (2011), in the context of anti-cartel policy enforcement.

39 Leaver (2009) considers distortions imposed by negative external assessment on public officials’ incentives – the more they are exposed to the risk of such assessment the more they refrain from actions with a risk of making a mistake as judged by the external assessor. Schinkel et.al (2014) point to a number of contributions in the area of objectives of government agencies and their behavior starting from Niskanen (1968). In our model the CA’s utility depends on the welfare effects of intervention and also on public image and career concerns.

40 Appeals will normally be made to a Court of First Instance and then to a Higher (up to the Supreme) Court. Note that the specification in (1) assumes, we believe reasonably, that appeals do not have a direct influence on the CA’s reputation though they of course have an indirect influence through their effect on reversals. That is, we assume that the CA’s reputation is damaged from appeals only to the extent that these appeals lead to reversals of its decisions by the courts of appeal.

41 We assume that the probabilities of detection and of conviction are common knowledge.

42 It is important to bear in mind here that this defense is standard to be undertaken by the Authority’s Legal Service, though if the CA has used an effects-based legal standard, the decision could be based on sophisticated economic arguments and evidence prepared by the CA’s economics team of experts.
\[ S = S(S_1, S_2, ..., S_K) \]
and
\[ R = R(S), R_{S_k}(S) > 0 \quad (1) \]

(1)

that is reputation increases as enforcement success \( S_k \) increases. Further, the increase in reputation may depend on \( k \): this captures the fact that investigations regarding different conduct types may affect differently the CA’s public image – e.g. because investigations of conduct \( k \) are more likely to involve high-profile cases than investigations of other conducts.

Enforcement success from decisions on conduct \( k, k = 1, ..., K \), is given by
\[ S_k = [D_k - r_k(e_k, y)]\bar{w}_k, k = 1, ..., K \quad (2) \]

with \( \bar{w}_k \) = CA’s estimate of the size of the average identifiable welfare impact (or gain in welfare) of non-reversed decisions\(^{44}\) on conduct \( k \), which is assumed to be positive.

The size of \( \bar{w}_k \) will depend on:
(i) the true welfare impact on average of non-reversed decisions,
(ii) the extent to which the true welfare impact can be identified and estimated by the CA\(^{45}\).

Note that, in standard treatments, a welfare maximizing authority, in making its choices, would not take into account how its choice of legal standards (and hence of \( e_k \) ) will affect the appeal and judicial review process and thus it will maximize the welfare impact of its decisions treating as an exogenous parameter the decision reversals (or, the probability that Courts of Appeal will reverse its decisions). On the other hand, such a CA, will take into account how its choices affect \( \bar{w}_k \), while here the welfare impact of the CA’s decisions are treated as a parameter. We can refer to the case described by (2) as the case of a “pure reputation-maximizing” CA. Below (section 3.1.3) we will generalize the analysis to the case of a CA which takes into account, in making its choices, both the impact of its choices on the probability that decisions will be reversed and on their welfare impact (\( \bar{w}_k \)).

We assume that decision reversals \( r_k(e_k, y) \), by Courts of Appeal, depend on
\( e_k \) = indicator of the extent of economic analysis and evidence used in investigations of conduct of type \( k = 1, ..., K \). For an approach to constructing these indicators for undertaking empirical work, see Katsoulacos et.al (2016).
\( y \) = other factors that affect reversals of the CA’s decisions (e.g. the experience of judges in courts of appeal and type of violation etc).

---

\(^{43}\)For the simple cases where there is no danger of confusion, we will use subscripts to indicate derivatives, otherwise we will write them explicitly.

\(^{44}\)Or, average harm avoided.

\(^{45}\)This point and the point (iii) that follows essentially make explicit the presumption that a CA’s reputation (and “rewards”) will depend on observable measures of performance. See Harrington (2011), p. 40, making the same point in the context of anti-cartel policy enforcement.
Reversals by Courts of Appeal of decisions reached by the CA will be a fraction of the expected Appeals (A) against decisions. Assuming for simplicity and without loss of generality that appeals are just against decisions in which there is conviction by the CA\textsuperscript{46} and that convictions are a fraction of the cases investigated and a decision is reached, we have:

\[ r_k(e, y) = \varphi_k^r(e, y)A_k(e, x), \quad k = 1, \ldots, K \]  

(3)

where

\[ \varphi_k^r(e, y) \] = probability that a decision reached on conduct k that is appealed is finally reversed in Courts of Appeal.

\[ A_k(e, x) \] = expected appeals per period against decisions reached on conduct k, in which there is conviction, where:

\[ x \] = other factors that affect appeals (e.g. level of penalties etc) - see for further discussion below (section 3.2.2).

We can write (3) as:

\[ r_k(e, y, x, z) = \varphi_k^r(e, y)\varphi_k^A(e, x)\beta_k(e, z)D_k, \quad k = 1, \ldots, K \]  

(4)

where:

\[ \beta_k(e, z) \] = probability that an investigation leads to conviction.

\[ \varphi_k^A(e, x) \] = probability that a conviction leads to an appeal.

\[ z \] = other factors that affect convictions.

That is, expected reversals for decisions reached on conduct k, depend on three probabilities: the probability that a decision will be one of conviction, the probability that a conviction will be appealed against and the probability that an appealed decision will be reversed by an appeal court\textsuperscript{47}.

Letting

\[ \Phi_k = \varphi_k^r(e, y)\varphi_k^A(e, x)\beta_k(e, z), \quad k = 1, \ldots, K \]  

(5)

(4) can be re-written as

\[ r_k(e, y, x, z) = \Phi_k(e, y, x, z)D_k, \quad k = 1, \ldots, K \]  

(4')

So, using (4'), we can also write (2) as:

\[ S_k = D_k(1 - \Phi_k)w_k, \quad k = 1, \ldots, K \]  

(2')

The cost function

Coming to the CA’s cost constraint, we assume that the CA utilizes its resources to detect and investigate cases and reach decisions and to defend its decisions in the Courts of Appeal. In practice the authority will use resources for a number of other activities, such as advocacy and preventing recidivism, but we will

\textsuperscript{46} Including decisions in which non-conviction is subject to the adoption of remedies. This is a very realistic assumption – appeals do tend to come almost entirely from parties whose conduct has been condemned.

\textsuperscript{47} We return to a full discussion of the determinants of these probabilities below.
not model these other activities here and we will also assume for simplicity that the CA will always be able to implement the optimal number of decisions and utilize the optimal amount of economic evidence per case, as determined below, and just allocate the rest of its resources to these other activities\(^4\).

The cost constraint can be written as:

\[
\sum_{k=1}^{K} C_k + C_{other} \leq \overline{C}
\]  
(6)

\[C_k = C_k(D_k, A_k(e_k, z)), \quad k = 1, \ldots, K
\]

where

\[C_{other} = \text{cost of all “other” activities}
\]

\[\overline{C} = \text{total resources available to the CA}
\]

More specifically, we assume that:

\[C_k = D_k c_k^D(e_k, l) + A_k c_k^A(e_k, l)
\]  
(7)

Given (4) and (5), we can also write (9) as:

\[C_k = D_k c_k^D(e_k, l) + \phi_k^A(e_k, z) \beta_k(e_k, z) D_k c_k^A(e_k, l)
\]  
(7')

where

\[c_k^D(e_k, l) = \text{cost per decision reached on conduct k}
\]

and

\[c_k^A(e_k, l) = \text{cost per appeal against decisions reached on conduct k}
\]

\[l = \text{indicator of the “other” (non-economic, e.g. legal and other) resources used by the CA to carry out investigations and to defend its decisions in appeal courts.}
\]

We will take it that:

\[(\partial c_k^D / \partial e_k)(c_k^A / \partial e_k) > 0, \quad k = 1, \ldots, K
\]  
(8)

that is, the cost per decision increases with the amount of economic evidence used in reaching the decision and the cost per appeal also increases with the economic evidence used in reaching the decision.

From (7'), the marginal cost (MC) of decisions of type k are equal to the cost per decision (AC) of type k, or:

\[AC_k^D = \frac{C_k^D}{D_k} = MC_k^D = c_k^D(e_k, l) + \phi_k^A(e_k, z) \beta_k(e_k, z) c_k^A(e_k, l)
\]  
(9)

Having described the CA’s reputation and cost functions we can proceed to examine its optimal choices.

### 3. Optimal economic evidence and optimal choice of decisions

#### 3.1 Optimal economic evidence

\(^4\) This is essentially the same assumption as that made by Harrington (2011, p. 2), who considers the number of cartels successfully prosecuted by a CA, neglecting the issue of the allocation of resources to this relative to other activities that the CA undertakes. See his footnote 2 for a justification of not endogenising the amount of resources allocated to different activities.
3.1.1 The optimality conditions for a reputation-maximizing CA

As noted above, we will refer to the case described by (2) or (2') as the case of a pure reputation-maximizing CA. From (2') i.e.

\[ S_k = D_k (1 - \Phi_k) w_k, \quad k = 1, \ldots, K \]  

(2')

and also from

\[ \Phi_k = \varphi_k^e (e_k, y) \varphi_k^x (e_k, x) \beta_k (e_k, z), \quad k = 1, \ldots, K \]  

(5)

the (unconstrained) optimality condition with respect to the economic evidence per case is, given (1):

\[ \frac{dR}{de_k} = -R_s D_k \frac{\partial \Phi_k (e_k, y) w_k}{\partial e_k} = \frac{dC_k}{de_k}, k = 1, \ldots, K \]  

(10)

so given (7'), i.e.

\[ C_k = D_k c^D_k (e_k, l) + \varphi_k^x (e_k, x) \beta_k (e_k, z) D_k c^A_k (e_k, l) \]  

(7')

the optimality condition can be written as:

\[ -R_s \frac{\partial \Phi_k (e_k)}{\partial e_k} D_k w_k = \frac{\partial c^D_k}{\partial e_k} + (\varphi_k^A \beta_k) \frac{\partial c^A_k}{\partial e_k} + \frac{\partial (\varphi_k^A \beta_k)}{\partial e_k} c^A_k, \quad k = 1, \ldots, K \]  

(11)

or, simplifying:

\[ -R_s \frac{\partial \Phi_k (e_k)}{\partial e_k} D_k w_k = \frac{\partial c^D_k}{\partial e_k} + (\varphi_k^A \beta_k) \frac{\partial c^A_k}{\partial e_k} + \frac{\partial (\varphi_k^A \beta_k)}{\partial e_k} c^A_k, \quad k = 1, \ldots, K \]  

(12)

where assumptions (8) hold. We can re-write (12) as:

\[ -R_s \frac{\partial \Phi_k (e_k)}{\partial e_k} D_k w_k = \frac{dMC_k^D (e_k)}{de_k}, \quad k = 1, \ldots, K \]  

(12')

In order to determine the optimal value of \( e \), we need to investigate further the expressions (12) or (12'). The second partial derivative on the LHS of (12') measures how \( e \) affects the probability that a decision is finally reversed by a court of appeal.

If \( \frac{\partial \Phi_k (e_k)}{\partial e_k} = \frac{\partial \varphi_k^A \beta_k}{\partial e_k} > 0 \) then, given \( R_s > 0 \), the LHS of (12) is negative and (unconstrained) optimal \( e \) would of course be zero. But, for \( e \) sufficiently small we would expect that increasing \( e \) will affect negatively all of \( \varphi' \), \( \varphi^A \) and \( \beta^49 \), so we will have:

\[ \frac{\partial \Phi_k (e_k)}{\partial e_k} = \frac{\partial (\varphi_k^A \beta_k)}{\partial e_k} < 0 \]  

(13)

and therefore the LHS of (12) will be positive and the unconstrained optimal \( e \) would be positive. We will, however, assume that as \( e \) increases the partial derivative in (13) will become smaller i.e.

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49 At least for presumptively illegal conduct. For details on the effect of \( e \) on these probabilities see discussion below.
\[
\frac{\partial^2 \Phi_k(e_k)}{\partial e_k^2} < 0
\]  

(14)

and therefore,

\[
\frac{d^2 R}{de_k^2} < 0
\]  

(14’)

More specifically, it is reasonable to assume that for any conduct type \( k \) there is a value of \( e_k = \tilde{e}_k \) for which \( \frac{\partial \Phi_k(e_k)}{\partial e_k} = 0 \), so (13) becomes zero and turns positive for higher \( e \), and hence for \( e_k > \tilde{e}_k \) the value of \( \frac{dR}{de_k} \) becomes negative. That is:

\[
\frac{dR}{de_k} = \begin{cases} 
> 0, & 0 \leq e_k < \tilde{e}_k \\
\leq 0, & e_k \geq \tilde{e}_k
\end{cases}
\]  

(15)

That, after some point, increasing economic analysis and evidence may increase the probability that decisions are annulled in Courts of Appeal can be explained as follows. Increasing the standard (i.e., shifting the legal standard towards more effects-based\(^{50}\)) in investigations of conduct of some type \( k \), will require increasing the amount and, usually, the complexity and sophistication of economic analysis and evidence used by the CA. This can increase the probability of annulment by Courts, because it may well imply that the CA and Courts may not be able then to devise decision rules for assessing the conduct that are based on a succinctly defined pre-specified set of easily identifiable and, more or less, unanimously accepted criteria or conditions and tests on the basis of which the assessment leads to conclusions that are very difficult to dispute\(^{51}\). Thus there is an increase in the disputability of the conclusions reached by the CA – as the Courts can, when evaluating the CA’s decision, consider additional or different criteria, tests, models and interpretations to those used by the CA, or, at least, enquire whether the CA’s analysis “is capable of substantiating the conclusions drawn from it”\(^{52}\). The Court may decide in the face of the additional analysis and evidence that law violation is only warranted at an even lower standard of proof than was thought when a lower legal standard was used and thus decide to annul the CA’s decision. Note that this is

\(^{50}\) It is useful to be reminded that, as noted in the Introduction, throughout, we refer by an “increase” in the standard or moving to a “higher” standard” to a shift in legal standard towards full effects-based.

\(^{51}\) Thus applying more economic analysis of increased complexity is likely to imply an increase in the misalignment in the perceptions between the CA and Courts about exactly how to specify in detail, the right decision rule.

\(^{52}\) Hellstrom (2009), ab.cit. p.7. While this may be more common under the standard of judicial review applied in, for example, USA, it is also important in EU. Thus, as noted by Hellstrom (2009), the CFI in JFE Engineering stated that “the Commission must produce sufficiently precise and consistent evidence to support the firm conviction that the alleged infringement took place”. Also, as CFI stated in the more recent Microsoft judgment: “The Community Courts must not only establish whether the evidence put forward is factually accurate, reliable and consistent but must also determine whether that evidence contains all the relevant data that must be taken into consideration in appraising a complex situation and whether it is capable of substantiating the conclusions drawn from it” (ab.cit. p. 6 – 7).
in no sense contradicted by the fact that historically Courts have sometimes asked for a higher legal standard in assessing specific conducts\textsuperscript{53}. Requiring a move towards an effects-based standard as a prerequisite for establishing whether the required standard of proof can be reached, does not mean that the increased economic evidence associated with the higher legal standard will not be challenged with a higher probability than the evidence associated with a lower standard.

The value of $\tilde{e}_k$ is expected to be small in jurisdictions, in which there is no tradition in the application of economic analysis and evidence in legal proceedings and, specifically, in competition law enforcement, especially when the latter surpasses a certain amount of sophistication and complexity. Also in jurisdictions or legal traditions in which judges lack any formal training in economics and the necessary relevant experience in assessing economic arguments. These will certainly tend to hold in the relatively newer jurisdictions like those of for example the BRICS and other developing countries but may well hold too, at least to some extent, in more mature jurisdictions (e.g. of the EU) in which the legal tradition is not one that is receptive to economic arguments in substantive evaluations of CL cases\textsuperscript{54}. In these cases we expect that as e is raised this will tend to lead to an increase in the probability of appeal reversals quite quickly, that is, we expect that $\tilde{e}_k$ will be small.

Concerning the expression on the RHS of (12), i.e. of

$$\frac{dMC_k^D(e_k)}{de_k} = \frac{\partial c_k^D}{\partial e_k} + (\phi_k^A \beta_k) \frac{\partial c_k^A}{\partial e_k} + (\phi_k^A \beta_k) c_k^A$$

the first two terms are positive (from (8) above). The third term depends on the effect of economic evidence on the probability that a decision leads to conviction that is appealed against. This depends on whether an increase in e increases the expected reversals of appealed decisions. If the latter holds, then appeals will also increase with economic evidence and the third term will reinforce the effect on MC of the first two terms on the RHS of the above expression. Even for values of e for which the third term is negative we will assume that the first two positive terms outweigh this and so, as we would expect, $dMC_k^D / de_k$ is unambiguously positive. Though not important for the analysis that follows we also assume that $dMC_k^D / de_k$ is increasing in $e_k$, that is, we assume that an increase in the application of economic analysis when this is already high will produce a greater effect on the marginal impact of $e_k$ on the MC of investigation and reaching a decision. Given these remarks, we have:

\textsuperscript{53} A famous recent example is that concerning RPM in the Leegin case in which the US Supreme Court asked that a Per Se assessment cannot be accepted and a more -based approach should be applied.

\textsuperscript{54} It is worth stressing that there is significant variation even between countries within each of these two categories. Thus, in the jurisdictions in which enforcement of competition law is quite new the above argument is likely to hold less in a country like South Africa where the legal institutions and traditions have been under Anglo-Saxon influence for a long time and, among mature jurisdictions, it is much more likely to hold in European continental countries than in the USA, UK or Canada.
Lemma 1: The unconstrained optimal value of \( e = \hat{e}_k, k = 1, ..., K \) is determined by (12') and is given by \( \hat{e}_k < \hat{e}_k \).

Given the above analysis and assumptions, we can illustrate the LHS and the RHS of (12') and the optimal (unconstrained) choice of \( e_k = \hat{e}_k \) in Figure 1.

![Figure 1](image)

Figure 1. The optimal choice of \( e_k \)

Of course, the optimal choice of \( e_k \) will be constrained by the minimum (but positive) amount of economic analysis and evidence that will have to be used (even) if a strict Per Se standard is used. We will indicate this by \( e = \xi_{k,PS} > 0 \). When the CA chooses to apply a strict Per Se (or object-based) procedure it will be able to reach decisions without applying economic analysis and evidence beyond this limited threshold. This will depend on the type of conduct under consideration - the minimum level of economic evidence will have to be consistent with the law or what is specified in Guidelines that may exist (and may have even been incorporated into the law\(^{55}\)), concerning the economic considerations that the CA will address in making its strict object-based assessment for different conduct types\(^{56}\). \( \xi_{k,PS} \) will be positive given that in all cases a certain amount of economic evidence will be needed in order to investigate, for example, the market power (or dominance) requirement,

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\(^{55}\) Even when this is not true, as for the European Commission, the Authority will still be taking seriously into account its own Guidelines in its assessment standards or procedures. In new jurisdictions, such as that of Russia, with a very active CA, important Guidelines are incorporated into the Law (see Avdasheva et.al., 2015).

\(^{56}\) This will include economic evidence relating to whether the conduct could be potentially satisfying exemptions, e.g. under “objective justification”.

18
to define markets and assess market shares etc, though in certain cases, such as hard-core cartels, the economic evidence required will be very limited. So we assume that:

\[ e_k \geq \xi_{k,PS} \]

The optimal choice of \( e_k \) will also be constrained by the maximum amount of economic analysis and evidence that the CA would need to apply under a full-blown EB legal standard in investigations of conduct k. As already noted, in order to apply such a standard, the CA will have to apply additional, often significantly greater, economic analysis and evidence. Below we will indicate by \( \tilde{e}_{k,EB} > \xi_{k,PS} \) the amount of economic evidence that the CA will have to apply under a full EB (rule of reason) procedure, having utilized in the best possible way economic thinking and evidence on the matter under investigation. We can assume too that the CA will not have incentives to increase \( e \) beyond \( e_k \), as additional evidence beyond this level is unlikely to affect the Court’s decision to annul or not to annul the CA’s decision (but will increase the CA’s costs). That is, we assume that:

\[ e_k \leq \tilde{e}_{k,EB} \]

The values of \( \xi_{k,PS} \) and of \( \tilde{e}_{k,EB} \) are shown also in Figure 1 above where it is assumed also that \( \tilde{e}_{k,EB} > e_k \). Given this assumption and the discussion above:

**Lemma 2:** The probability, \( \Phi_k = \varphi_k'(e_k, y) \varphi_k^A(e_k, y) \beta_k(e_k, z) \), \( k = 1, \ldots, K \), that an investigation on conduct of type k will lead to a decision that will be reversed in Courts of Appeal decreases for \( \xi_{k,PS} \leq e_k < \tilde{e}_k \) and increases for \( e_k \leq \tilde{e}_k \leq \tilde{e}_{k,EB} \).

**Lemma 3:** the more quickly is \( \frac{\partial \Phi_k(e_k)}{\partial e_k} \) reduced with \( e_k \) the steeper the downward sloping curve in Figure 1 and the lower, ceteris paribus, the value of \( \tilde{e}_k \). Indeed we may have that for conduct k, relative to conduct j, \( \tilde{e}_k < \tilde{e}_j \) even if \( \tilde{w}_k, R_{kj} \) are greater than \( \tilde{w}_j, R_{kj} \), if \( \frac{\partial \Phi_k(e_k)}{\partial e_k} \) is reduced much faster than \( \frac{\partial \Phi_j(e_j)}{\partial e_j} \).

### 3.1.2 Optimal \( e \) for conduct of type k

Using Figure 1 and the Lemmas above, we can now determine the optimal choice of \( e_k \) for conduct of type k.

**Proposition 1:**

(i) Given that \( e_k \leq e_{k,PS} \) and that \( e_k < e_k \) the optimal amount of economic evidence and hence the CA’s optimal choice of standard, that it will apply in investigations of conduct k, is given by:

\[ e_k^* = \max[\xi_{k,PS}, \min(e_k, \tilde{e}_{k,EB})] \quad (16) \]
We can distinguish between three cases:

(a) \( \varepsilon_{k,PS} < \hat{\varepsilon}_k < \hat{\varepsilon}_{k,EB} \Rightarrow \varepsilon^*_k = \hat{\varepsilon}_k \), as in Figure 1.

(b) \( \varepsilon_{k,PS} < \hat{\varepsilon}_{k,EB} < \hat{\varepsilon}_k \Rightarrow \varepsilon^*_k = \hat{\varepsilon}_{k,EB} \)

(c) \( \hat{\varepsilon}_k < \varepsilon_{k,PS} < \hat{\varepsilon}_{k,EB} \Rightarrow \varepsilon^*_k = \varepsilon_{k,PS} \)

Thus, it is clear that the CA may well find it optimal to apply economic analysis and evidence that is below \( \hat{\varepsilon}_{k,EB} \), the analysis and evidence associated with full effects-based in assessing conduct \( k \), even though the latter can reduce decision errors and can be optimal in terms of its deterrence effects (see also section 3.1.3). A sufficient condition for this is given by (ii):

(ii) A sufficient condition for the optimal application of economic analysis and evidence to be less than that associated with effects-based, that is, for \( \varepsilon^*_k < \hat{\varepsilon}_{k,EB} \)

is that \( \hat{\varepsilon}_k \leq \hat{\varepsilon}_{k,EB} \), that is, an increase in \( \varepsilon_k \) beyond the maximum economic evidence required for full effects-based will increase the probability of decision reversals.

We finally note that, in principle, it could also be the case that \( \varepsilon_{k,PS} > \hat{\varepsilon}_k \) which implies that \( \varepsilon^*_k = \varepsilon_{k,PS} \).

(iii) The optimal economic evidence for conduct \( k \) will be greater than for conduct \( j \) when, ceteris paribus, the welfare impact of decisions on conduct \( k \) is on average higher than for conduct \( j \) and when cases of conduct \( k \) are higher profile cases, \( R_{Sk} > R_{Sj} \).

**Corollary 1:** When, as is often likely to be the case, increasing the legal standard requires discrete (often significant) increases in the amount of economic evidence, the CA will be reluctant to adopt an increased standard as this may result in a level of \( \varepsilon_k \) to the right of \( \hat{\varepsilon}_k \) that increases the probability of decision annulment. For example, we may have that \( \varepsilon_{k,PS} < \hat{\varepsilon}_k \) for strict Per Se but for Modified Per Se (MPS) we have that \( \varepsilon_{k,MPS} > \hat{\varepsilon}_k \). The CA may be reluctant to move from Per Se to MPS because this move increases the likelihood that its decisions will be reversed (if \( \varepsilon_{k,MPS} \) is sufficiently to the right of \( \hat{\varepsilon}_k \)). Similarly for comparisons of, for example, \( \varepsilon_{k,MPS} \) and \( \hat{\varepsilon}_{k,EB} \). As noted above, such increases in legal standard may be suggested by developments in economic theory and evidence that indicate that a shift to higher standards would reduce decision errors substantially.

**Corollary 2:** Given Lemma 3, the likelihood that Corollary 1 will hold is greater the more quickly is \( \frac{\partial \Phi_k(e_k)}{\partial \varepsilon_k} \) reduced with \( \varepsilon_k \), i.e., the steeper the downward sloping curve in Figure 1 and the lower, ceteris paribus, the value of \( \hat{\varepsilon}_k \).
3.1.3 Optimal e for conducts of type k in the general case: comparison of welfare-maximizing and reputation-maximizing authorities

Let us now generalize the CA’s utility function and assume that, in making its choices, the CA will also take into account the impact of its choices on (consumer) welfare, so \( \bar{w}_k \) will not be treated as a parameter and has to be considered as a function of \( e \). Thus:

\[
S_k = D_k[1 - \Phi_k(e_k)]\bar{w}_k(e_k), k = 1, \ldots, K
\]

(17)

We will assume that:

\[
\frac{\partial \bar{w}_k}{\partial e_k} \geq 0, \frac{\partial^2 \bar{w}_k}{\partial e_k^2} < 0, k = 1, \ldots, K
\]

(18)

that is, we assume that for the type of conducts we have in mind here, as \( e_k \) increases decision errors fall and deterrence effects improve\(^{57}\) and this increases (or leaves unaffected) the average welfare gain of non-reversed decisions (\( \bar{w}_k \)).

Differentiating with respect to \( e_k \) and indicating by \( F_{\alpha_k}(e_k) \) the first derivative, we get:

\[
F_{\alpha_k}(e_k) = R_{\alpha_k} D_k[- \frac{\partial \Phi_k(e_k)}{\partial e_k} \bar{w}_k(e_k) + (1 - \Phi_k(e_k)) \frac{\partial \bar{w}_k}{\partial e_k}], k = 1, \ldots, K
\]

(19)

In determining the optimal \( e_k \), \( D_k \) will drop out since it also appears as a factor in the expression on marginal costs (see (11)). We can therefore write the two terms of (19) as:

\[
F_{\alpha_k}(e_k) = R_{\alpha_k} (1 - \Phi_k(e_k)) \frac{\partial \bar{w}(e_k)}{\partial e_k}, k = 1, \ldots, K
\]

(20)

and

\[
F_{\alpha_k}(e_k) = R_{\alpha_k} [- \frac{\partial \Phi_k(e_k)}{\partial e_k} \bar{w}_k(e_k)], k = 1, \ldots, K
\]

(21)

Thus:

\[
F_{\alpha_k}(e_k) = F_{\alpha_k}(e_k) + F_{\alpha_k}(e_k) = \frac{dMC^D_k(e_k)}{de_k}, k = 1, \ldots, K
\]

(22)

determines the optimal value of \( e_k \) in the general case, where \( F_{\alpha_k}(e_k) \), \( F_{\alpha_k}(e_k) \) are the first derivatives with respect to \( e_k \) for, respectively, a pure-welfare maximizing and a pure-reputation maximizing CA.

\(^{57}\) As noted in the review provided in the Introduction this will be true for conducts for which the presumption of illegality is not very strong and for which higher standards improve discriminatory quality.
So we can distinguish between a pure reputation maximizing CA, that treats $w_k$ as an exogenous parameter, for which optimal $e_k$ is given by (12') or:

$$F_{e_k,u}(e_k) = \frac{dMC_k(e_k)}{de_k}, \ k = 1, \ldots, K$$

(23)

and a pure welfare maximizing CA that treats the probability of reversals as an exogenous parameter, for which optimal $e_k$ is given by:

$$F_{e_k,w}(e_k) = \frac{dMC_k(e_k)}{de_k}, \ k = 1, \ldots, K$$

(24)

**Lemma 4:** $F_{e_k,w}(e_k)$ and $F_{e_k,u}(e_k)$ and hence $F_{e_k}(e_k)$ decline continuously with $e_k$ for as long as $\frac{\partial w_k}{\partial e_k}$ and/or $\frac{\partial \Phi_k(e_k)}{\partial e_k}$ are sufficiently small, which we will assume from now on.

**Proof:** follows by differentiating (20) and (21) w.r.t. to $e_k$.

Given (18), let $e_k'$ be the value of $e_k$ for which

$$\frac{\partial w_k}{\partial e_k} = 0$$

It is natural to assume that this will occur at the level of economic evidence associated with full effects-based and also, as in part (ii) of Proposition 1, we will assume that:

**Assumption 1:**

$$\tilde{e}_k < e_{k,EB} = e_k'$$

(25)

where $\tilde{e}_k$ is the value of $e_k$ for which

$$\frac{\partial \Phi_k(e_k)}{\partial e_k} = 0 = F_{e_k,u}(e_k)$$

(26).

We have:

**Lemma 5:**

Given Assumption 1 and Lemma 4, if $e_k = e_k^*$ is the value of $e_k$, for which $F_{e_k}(e_k)$ is equal to zero then:

$$\tilde{e}_k < e_k^* < \tilde{e}_{k,EB} = e_k'$$

(27)

**Proof:**

Given Lemma 4, Assumption 1, the definitions of $\tilde{e}_k$ and of $e_k'$ and (21) – (21):
For $e_k < \tilde{e} (< e_k)$, $F_{e_k,w}(e_k) < 0$ and $F_{e_k}(e_k) = F_{e_k,w}(e_k) + F_{e_k,u}(e_k) > F_{e_k,w}(e_k), F_{e_k,u}(e_k)$

For $e_k = \tilde{e}$, $F_{e_k}(e_k) = F_{e_k,w}(e_k) > 0, F_{e_k,u}(e_k) = 0$

For $e_k, e < e_k < \bar{e}_{k,EB}, F_{e_k,w}(e_k) > 0, F_{e_k}(e_k) < F_{e_k,w}(e_k), F_{e_k,u}(e_k) < 0$

For $e_k = e_k = \bar{e}_{k,EB}, F_{e_k,w}(e_k) = 0, F_{e_k}(e_k) = F_{e_k,u}(e_k) < 0$

(28)

Thus, $F_{e_k}(e_k)$ is positive for $e_k \leq \tilde{e}$, continuously declining in $e_k$ and negative for $e_k = \bar{e}_{k,EB}$. So it must be zero at some value $e_k = e_k^*$ for which $\tilde{e}_k < e_k^* < \bar{e}_{k,EB} = e_k^*$.

The relations in (28) and Lemma 4 are illustrated in the Figure 2 below where we use the following notation: $F_w = F_{e_k,w}, F_u = F_{e_k,u}$.

Figure 2
We therefore get the following result:

**Proposition 2:** For as long as the effect of $e_k$ on the marginal cost of decisions is not very large, the optimal value of $e_k$ by a pure welfare-maximizing CA ($e^*_w$) will be certainly greater than the optimal value by a pure reputation-maximizing CA ($e^*_r$), while the optimal value of a CA that takes into account both the welfare and the reputation impact of its choices $e^*_c$ will be less than the former and larger than the latter. That is:

$$e^*_w > e^*_c > e^*_r$$

(29)

More specifically, as is evident from Figure 2 (which shows the optimal choices for $(dMC^D_k(e_k)/de_k)_m$):

(i) When the effect of $e_k$ on the marginal cost of decisions is small, or in Figure 2, $(dMC^D_k(e_k)/de_k)_m$, then $e^*_w = e > e^*_c > e^*_r$

(ii) When the effect is medium, or in Figure 2, $(dMC^D_k(e_k)/de_k)_m$, then $e^*_c = e' > e^*_w > e^*_r$ (we depict these optimal values in Figure 2).

(iii) When the effect is large, $(dMC^D_k(e_k)/de_k)_m$, then $e^*_r = e' > e^*_c > e^*_w > e^*_r$

**Corollary 3:** It follows from Proposition 2 and by inspection of Figure 2 that for as long as the effect of $e_k$ on the marginal cost of decisions is not very large, the optimal value of $e_k$ will be greater than $\tilde{e}_k$ when the CA is a pure welfare-maximizer or when it takes into account both the welfare and the reputation impact of its choices, that is:

$$e^*_w > e^*_c > e^*_r > \tilde{e}_k$$

(30)

**Discussion**

To clarify further the results above, remember that beyond $\tilde{e}_k$, increasing economic evidence increases the likelihood of decision reversals by Courts of Appeal (i.e., $\frac{d\Phi_k(e_k)}{de_k} > 0$). We assume throughout that the CA correctly anticipates this effect of increasing economic evidence, that is, that the Courts will reverse a greater fraction of its decisions as it increases $e$ beyond $\tilde{e}_k$. Nevertheless, as the results above indicate, a CA that takes into account the effect of economic evidence on $w_k$ may wish to increase $e$ beyond $\tilde{e}_k$ because the increase in the probability of reversals is compensated by the perceived welfare increase of its decisions.

**3.2 Optimal choice of decisions in investigations of type k**

**3.2.1 Optimality conditions**
To examine the optimal choice of investigations of, or decisions on, conduct k we start by noting that optimality requires that:

$$\frac{dR}{dD_k} = \frac{dC_k}{dD_k} = MC_k^D(e_k) = AC_k^D(e_k), k = 1, \ldots, K$$  \hspace{1cm} (31)

that is, at the optimum, the marginal cost of investigations / decisions reached on conduct k must equal the marginal impact of the decision on the reputation of the CA. Reverting for the moment, to the case of a pure reputation-maximizing CA and simplifying notation (not using the full functional expressions for the probabilities and the average costs), from (1), (2') and (9):

$$R_{S_k}(D_k)(1 - \Phi_k)\bar{w}_k = c^D_k + c^A_k\varphi^A_k\beta_k = MC_k^D(e_k) = AC_k^D(e_k), k = 1, \ldots, K$$  \hspace{1cm} (32)

where $$R_{S_k} = (\partial R / \partial S_k) > 0$$, and we assume that:

$$\partial^2 R / \partial S^2_k < 0$$  \hspace{1cm} (33)

i.e. diminishing “marginal utility” as decisions (D) and, hence, S increase.

We can use (32) to obtain and compare the optimal choice of the number of investigations and decisions reached on conducts of type k. The optimal number of decisions depends on several factors that influence the marginal impact on reputation of additional decisions reached on conduct k and the marginal cost of these. These factors may pull in opposite directions. Thus:

(i) The higher the probability of reversals $$\Phi$$ for decisions reached on conduct k, the lower the marginal impact of decisions on reputation and hence, ceteris paribus, the lower the optimal number of decisions reached on conduct k.

(ii) The higher the average identifiable welfare impact of decisions, the higher the marginal impact of decisions on reputation and hence the higher the optimal number of decisions.

(iii) The higher the marginal cost of decisions and appealing, as determined by $$(c^D_k, c^A_k)$$ the lower, ceteris paribus, the optimal number of decisions of this type. The values of $$(c^D_k, c^A_k)$$ will depend on the value of e and the other resources required to reach decisions and, as noted above, will of course increase with e.

(iv) The higher the probability $$(\varphi^A_k\beta_k)$$ that investigations into decisions of conduct k lead to convictions and appeals, the higher the marginal cost of these investigations and the lower, ceteris paribus, the number of decisions of this type.

Figure 3 below illustrates the optimal (unconstrained) number of decisions reached on conducts of type k ($$\hat{D}_k$$).
Proposition 3: The optimal number of investigations on conducts of type k will be greater:

(i) The smaller the probability that decisions on these investigations will be reversed in Courts of Appeal.

(ii) The greater \(\bar{w}_k\), that is, the greater the anticipated identifiable impact of decisions on welfare.

(iii) The greater the impact on the CA public image of increasing investigations on conducts of type k – which we capture through \(R_{\tilde{s}_k}\).

(iv) The lower the cost per investigation of conduct of type k.

(v) The lower the expected cost per appeal of conduct of type k.

Proof: Obvious from condition (32) – which, for convenience, we re-write here as (32‘):

\[
R_{\tilde{s}_k}(D_k)[1 - \Phi_k(e_k)]\bar{w}_k = MC_k^{\partial}(e_k)
\]

The next question we wish to investigate is the following: how does the CA’s choice of standard in type k decisions, and associated extent of economic analysis and evidence applied in investigations of conducts k, affect its optimal choice of the number of investigations of this type?

Proposition 4: when \(e_{\text{\tilde{e}_k},PS} < \tilde{e}_k\) choosing a higher legal standard and increasing the extent of economic analysis and evidence between \(e_{\text{\tilde{e}_k},PS}\) and \(\tilde{e}_k\) has an ambiguous effect on the optimal number of investigations.
Proof: increasing the extent of economic analysis and evidence between \( e_{k,PS} \) and \( \hat{e}_k \) when \( e_{k,PS} < \hat{e}_k \) reduces the probability of annulment \( \Phi_k(e_k) \), hence shifting upwards to the right the LHS of (32') and tending to increase the optimal number of investigations of conduct \( k \). However, this also increases the marginal cost of investigations, shifting up the RHS of (32'). The potential effect is illustrated in Figure 2a.

In Figure 2a, it is assumed that economic evidence increases from \( e_{k,1} \) to \( e_{k,2} \), \( e_{k,PS} \leq e_{k,1} < e_{k,2} \leq \hat{e}_k \). Thus \( \Phi_k(e_{k,2}) < \Phi_k(e_{k,1}) \) and this would increase optimal investigations from \( D_{k,1} \) to \( D_{k,2} \) if marginal costs do not increase very much but would reduce optimal investigations from \( D_{k,1} \) to \( D_{k,2} \) if marginal costs increase quite a lot.

Figure 3a

**Proposition 5:** When \( e_{k,PS} \geq \hat{e}_k \), or, more importantly, when a higher legal standard than that associated with \( \hat{e}_k \) is needed to establish a mandatory (minimum) standard of proof for conduct \( k \) (that may be set by Courts), requiring discrete increases in the amount of economic evidence, this may well reduce the optimal number of investigations of conduct \( k \) by the CA.

Proof: There may be cases, for example cases associated with newer jurisdictions with small enforcement experience, in which \( \hat{e}_k \) will be so low that \( e_{k,PS} \geq \hat{e}_k \) and \( e^*_k = e_{k,PS} \) (from Proposition 1(ii)). In this case increasing the amount of economic analysis and evidence increases the probability of decision reversals. Also, as noted above, in many cases (see also for an example below) increasing the legal standard
from, for example, strict Per Se to a higher standard (such as a Modified Per Se), requires a discrete often substantial increase in economic analysis and evidence. This may lead to a shift in the value of $e_{k, PS}^* < \tilde{e}_k$ for strict Per Se to a value, for Modified Per Se (MPS), that is $e_{k, MPS}^* > \tilde{e}_k$. If $e_{k, MPS}^* > \tilde{e}_k$ becomes the minimum amount of economic evidence for discharging the CAs burden of proof, at this level of economic evidence the probability of reversal may well be higher than it would be at $e_{k, PS}^* < \tilde{e}_k$.

In both of these cases, we get the situation shown in Figure 3b below. Increasing economic evidence from $e_{k,1}$ to $e_{k,2}$, $e_{k, PS}^* < e_{k,1} < e_{k,2}$ leads to a significant reduction in optimal decisions of conducts k from $D_{k,1}$ to $D_{k,2}$, as both the increase in MC and the effect on reputation tend to reduce optimal decisions.

Figure 3b

The case where the CA takes into account the welfare impact of its choices

From Corollary 3 above, in cases where the CA is not pure reputation-maximizing the optimal value of $e_k$ will be greater than $\tilde{e}_k$. On the other hand, the optimal value of $e_k$ will be less than $\tilde{e}_k$ in the case of a pure reputation-maximizing CA. From Proposition 5, this would seem to suggest that a switch from reputation maximization to welfare maximization would result in a reduction in the optimal number of decisions that the CA would reach (as the probability of reversals is increased). However, this is not correct. In making its optimal decisions a welfare-maximizing CA will take into account how its choices affect welfare. Its choice of a
higher standard and higher $e_i$ will imply that it will perceive a higher $w_k$ - which in turn implies that, *ceteris paribus*, the effect on reputation in Figure 3b above will be to shift the curve upwards. Thus, this effect will tend to counteract the effect of an increase in the probability of reversals. It follows that the final effect on optimal decisions is ambiguous.

*An Example: Information Exchanges*

There are three potential legal standards each with a more extensive application of economic analysis that can be used to assess information exchanges\(^{58}\). The lowest standard (strict object-based assessment) requires just a careful analysis of the nature and characteristics of the information exchanged. If this involves future prices then this is considered, more or less unanimously, as sufficient evidence (establishing a sufficiently high standard of proof) that the information exchange is part of a cartel or concerted practice. Otherwise, the CA may on the basis of all other information on the characteristics of the information exchange decide that there is object-determined violation or adopt a higher legal standard.

A somewhat higher standard (modified per se assessment), when the information exchanged does not involve future prices, is based on examining market characteristics in an effort to establish whether concerted practices are indeed sustainable, even if the information exchanged increased considerably market transparency and allowed firms to monitor each other’s behavior (thus reducing strategic uncertainty).

The highest standard (effects-based assessment) involves analysis of the counterfactual: that is, analysis of what market data would look like if there was no information exchange or examining structural breaks in data during and in the aftermath of the information exchanges.

Each increase in the standard leads to a substantial increase in the amount, technical sophistication and complexity of the economic analysis and evidence that has to be used and an increase in the disputability of the conclusions reached. The latter, in turn, implies an increase in the probability of annulment – see also discussion of this point in previous sections.

### 3.2.2 Discussion: the determinants of the probability of expected decision reversal ($\Phi$)

The probability of expected reversals of the investigations undertaken by the CA ($\Phi$) depends on three probabilities: $\beta$, $\varphi^A$ and $\varphi^r$. Here, we examine each of these in turn.

#### 3.2.2.1 The probability that an investigation leads to conviction ($\beta$)

\(^{58}\) See, for example, discussion in OECD (2011) especially papers by KU Kuhn and by J Padilla in this report.
This will depend on whether the conduct examined is presumptively legal or illegal. If, as \( e \) increases, decision errors are reduced then for:

\[
\text{Presumptively illegal conduct: } \frac{\partial \beta_k}{\partial e_k} < 0 
\]

(34)

On the other hand, for:

\[
\text{Presumptively legal conduct: } \frac{\partial \beta_k}{\partial e_k} > 0 
\]

(34’)

### 3.2.2.2 The relative probability that a conviction is appealed (\( \varphi^A \))

The decision to appeal depends on a number of factors, the most important of which are the following:

- The probability that the decision will be reversed by a court of appeal.
- The size of penalties.
- The cost of adopting the remedies requested by the CA.
- Adverse reputation effects if there is no appeal.
- The fact that appealing delays compliance with the CA’s decision and (sometimes) the payment of penalties\(^{59}\).
- The costs of appealing.

Firms will compare the expected gain from appealing (influenced by the first five factors above) against the cost (the last factor). The expected gain from appealing may differ depending on \( e_k \) because of the first factor above, the probability that the decision will be reversed by the courts of appeal (discussed below too), which can be different depending on \( e_k \). Concerning the expected cost of appealing this is not likely to be sharply increasing in \( e_k \) for the defendants\(^{60}\).

Thus, we have that, ceteris paribus, the effect of \( e_k \) on the probability that a decision is appealed against is likely to have the same sigh as that of the effect of \( e_k \) on the relative probability (\( \varphi^r \)) that an appealed decision is reversed by the Courts of Appeal. If the latter is positive, i.e. \( \varphi^r \) is higher the higher is \( e_k \), then:

\[
\frac{\partial \varphi_k^r(e_k)}{\partial e_k} > 0 
\]

(35)

### 3.2.2.3 The relative probability that an appealed decision is reversed by the Courts of Appeal (\( \varphi^r \))

How does the type of legal standard used by the CA to reach its decisions affect the likelihood that decisions are reversed by a court of appeal?

As already noted, more effects-based legal standards, if properly applied, will require a significant extra amount of economic analysis and evidence and will have a

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\(^{59}\) See eg. Azevedo (2014) for case of Brazil. It is not clear how important this is more generally. It is clearly not important for the case of Russia, for example (Avdasheva et.al, 2015), because the overall length of judicial review is quite short.

\(^{60}\) During appeals the defendants have to argue that the economic analysis, already proposed by them to the CA during the latter’s investigation, was appropriate and sufficient for a conclusion of no violation.
significant extra element of complexity than Per Se cases, requiring the assessment of the impact of actions on competition first and then, if/when it is decided that competition is negatively affected, of whether, how and the extent to which this impacts adversely welfare (i.e., articulation of a model of harm and providing supporting economic evidence). As discussed above, this implies that there is much greater opportunity and scope with effect-based legal standards to challenge the CA’s analysis as there is greater opportunity and scope by the court to reformulate, re-interpret and evaluate differently the economic analysis and evidence presented or to consider that different/further economic evidence was required in order for the CA to discharge appropriately its burden of proof. Thus, we expect that, after some point, or for sufficiently large $e_k$:

$$\frac{\partial \varphi_k^*(e_k)}{\partial e_k} > 0$$  \hspace{1cm} (36)

4. Concluding remarks, recommendations and future research

The model presented in this article can be used to explain how factors related to the judicial review process can lead CAs that place some weight on their public image or reputation, to apply economic evidence in antitrust investigations to a limited extent\textsuperscript{61} and to favor legal standards closer to Per Se than to effects-based. This in turn, reconciles evidence indicating the unpopularity of standards with significant economic analysis content, with the fact that such standards seem likely to be superior on the basis of traditional error-cost minimization or welfare-maximization arguments. As we have seen above, when CAs take into account these arguments and incorporate them into their optimal choices then they will generally favor higher legal standards with enhanced economic analysis.

In our framework where CAs make choices in order to maximize their utility, given that the reputation of an authority depends negatively on the extent to which its decisions are annulled by the Courts of Appeal, if after a point the use of additional economic evidence affects positively the probability of annulment then the CA will have incentives to restrict its use. The main reason for this impact of economic analysis is that it limits the indisputability of correctness of the decisions made and allows Courts to question (and consider as even lower) the standard of proof than the level which can be established by adopting lower legal standards. Indeed, the ambiguity often introduced by assessing potential liability in competition cases on the basis of economic arguments and models is responsible for the uneven utilization of economics over the last 100 years in US antitrust enforcement (Kovacic and Shapiro, 2000). Even modern economics will usually provide competing explanations and assessments depending on the context characterizing the facts on

\textsuperscript{61} Even though they are well-staffed with trained scientific personnel.
any given case (Fisher, 1989). This is particularly true when trying to interpret the implications of conduct using an effect-based approach.

It is important to note here that, often, explicit performance assessment of competition authorities relies on indicators measured by the ratio of non-reversed decisions to the overall number of decisions made. This is the case in younger jurisdictions such as, for example, that of Russia (currently with the largest CA in the world) where the share of infringement decisions of competition authorities coming to legal force is explicitly included in the performance measurement of regional CAs.

Our model highlights that important features of competition law enforcement, such as the type of legal standards applied by CAs, are a result of interrelations between different institutional and legal preconditions, the motivation of CAs to satisfy performance criteria that may not be linked to the effects of enforcement, substantive law provisions related to Guidelines, and the background and the experience of judges that review the decisions if appealed.

Institutional adjustments and other measures could facilitate the expansion in the use of modern economic and econometric analysis and techniques in competition law enforcement. Among these we would put priority on the following:

(i) Explicitly incorporating into Competition Law provisions, substantive standards for CAs that are related to consumer welfare and efficiency.

(ii) Providing incentives to CAs through appropriate performance criteria, related to the welfare effects of enforcement activities, to make assessments of the welfare effects of their decisions on the basis of the state-of-the art theories of harm proposed by the recent economic literature and to provide empirical substantiation of the predicted effects. The criteria should incorporate considerations related to error-cost minimization and deterrence/incentive effects when the CAs are making choices between different legal standards.

(iii) Setting up specialized tribunals for dealing in the first instance with competition infringement appeals, some of the members of which should be, ideally, economists. The Competition Appeals Tribunals of UK or of South Africa provide good examples of such tribunals.

(iv) Even when specialized tribunals are not set-up, taking measures to improve the expertise of judges in handling economic evidence through training programs (similar to the programs that have been advocated for EU countries by the European Commission recently). Also and most importantly, these programs should aim to develop commonly recognized and accepted

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62 At least in cases where the perceived anticipated welfare impact of pursuing such investigations is likely to compensate for the extra enforcement costs.
63 See for example, Katsoulacos, Motchenkova and Ulph (2016).
64 This would reduce the degree to which decisions are reversed on appeal because the judges are unable to discriminate, in terms of their quality, between sophisticated economic or econometric arguments.
65 See also Baye and Wright (2011) and Avdasheva et.al. (2015).
procedures for taking into account economic analysis and evidence in substantive conduct assessments by Court judges and the Competition Authority.

The paper offers a conceptual framework for thinking about the choice of legal standards and the extent to which economic analysis is applied in investigations, by utility maximizing Competition Authorities. The basic conditions for reaching our predictions can be empirically tested using information on decisions made by Competition Authorities that went through the appeal process. This information allows the testing of whether increasing economic analysis and evidence is associated with an increase in the probability that appealed decisions are reversed by Courts of Appeal. Indeed, a statistical analysis of this condition has already been undertaken using a large data set of Russian decisions made by the Russian CA (FAS) between 2008 – 2012. The conclusion of the statistical analysis is that there is a statistically significant strong positive impact of economic analysis on the probability of reversals. Available data sets of appealed decisions of DGCOMP, other EU countries and of other BRICS can be utilized in the future to test whether the Russian results can be generalized.

References


See Avdasheva et.al (2015) and Katsoulacos, Avdasheva and Golovanova (2016). The level of economic analysis applied is measured by a number of different indicators constructed on the basis of the information contained in the decisions.


34. OECD, 2011 report on “Information Exchanges Between Competitors under Competition Law”.


