

On Optimal Legal Standards for Competition Policy - A General Analysis *

by

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Abstract

We present a new welfare-based framework for the optimal choice of legal standards. By formally capturing the quality of the underlying economic/legal analysis and information available to a regulatory authority, we formalise the decision-theoretic considerations widely discussed in the existing literature and obtain a precise set of conditions for determining when a **Rule of Reason** approach would be able to effectively discriminate between benign and harmful actions and consequently dominate **Per Se** as a decision-making procedure. We also show that in a welfare-based approach the choice between legal standards must additionally take into account (i) the *indirect (deterrence) effects* of the choice of standard on the behaviour of all firms when deciding whether or not to adopt a particular practice; and (ii) the effects of certain features of the administrative procedure employed by the decision-making authority in particular *delays* in reaching decisions; and the *coverage rate* of the actions taking place (*procedural effects*). We therefore derive necessary and sufficient conditions for adopting discriminating rules (such as Rule of Reason). We also examine what **type** of discriminating rule will be optimal under different conditions. We apply our framework to two recent landmark decisions – *Microsoft vs. EU Commission* (2007) and *Leegin Vs. PSKS* (2007) – in which a change in legal standards has been proposed, and show that it can powerfully clarify and enhance the arguments deployed in these cases.

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Section 1 Introduction

In its landmark decision on *Leegin Vs. PSKS*, of June 28th 2007, the USA Supreme Court overturned a nearly century old precedent of treating Resale Price Maintenance as *Per Se* Illegal under Section 1 of the Sherman Act³. The Court, following the advice of the Brief of Amici Curiae Economists in support of Petitioners, decided that all vertical price restraints should be judged by the *Rule of Reason*⁴. By adopting this change in the Decision Rule, or Legal Standard, used in assessing the practice of RPM, the Supreme Court essentially ruled that in the future in the USA, with the exception of hard-core (horizontal) cartels, no business practice will be treated under a *Per Se* illegality standard⁵.

In another recent landmark case, the European Court of First Instance (CFI) delivering on September 17th 2007 its decision on Microsoft's appeal on *Microsoft vs. Commission* concurred with the Commission that Microsoft's refusal to share with its competitors interoperability information for Windows (protected by IPRs) has adverse effects on innovation and ultimately on consumers and has to be addressed by compulsory licensing. To reach this conclusion, the Commission (and the CFI) proposed and adopted a new Legal Standard, one that significantly alters certain aspects of the "exceptional circumstances" standard for handling refusals to license IP prevailing until then⁶.

Needless to say, in both these landmark cases the change in the proposed legal standard has raised substantial opposition. In the *Leegin* case, the Supreme Court decision was taken by a slim majority of four to three voting against. The American Antitrust institute filed an amicus brief urging that the *Per Se* illegality standard be upheld emphasizing that procompetitive uses of RPM are not common and that the harm from anticompetitive uses is relatively substantial, and in addition pointed to the greater legal uncertainty and administrability disadvantages of *Rule of Reason*⁷. In the *Microsoft* case it has also been very forcefully argued that the change in the legal

³ Supreme Court of USA (2007) "Leegin vs. PSKS Inc." Decision No. 06-480, June 28th 2007.

⁴ Ab.cit. p. 1.

⁵ The tendency towards Rule of Reason or a more "economics-(or effects-) based" approach is in recent years also evident in Europe. See for example, EAGCP Report (2005) and Vickers (2005). For an early analysis see Markham (1955).

⁶ See for example J. Killick (2004) and Ahlborn et.al. (2005).

⁷ See for a summary Vickers (2007), p.10.

standard will increase the cost of decision errors as well as, again, involving greater legal uncertainty and administrability costs⁸.

These two examples demonstrate that the issue of the appropriate Legal Standard is extremely important in Competition Law and Policy, as it is in many other contexts⁹, and over the years it has been the subject of considerable debate and analysis. Following the seminal contribution of judge Easterbrook (1984) it has been recognized that the Decision Theoretic approach¹⁰ provides a useful framework for organizing the discussion. He put forward a decision error-cost framework – proposing the idea that legal standards should minimise the sum of the welfare costs caused by decision errors of type I (false positives or false acquittals) and type II (false negatives or false convictions)¹¹.

In applying this Decision Theoretic approach it has come to be recognised that there are two important considerations to be taken into account.

- (i) The first is the fraction of harmful actions in all possible circumstances, or what is sometimes referred to as the “base-rate probability of anticompetitive harm”¹². Thus it has been argued that when harmful actions are very rare a *Per Se Legality* rule should be applied¹³.
- (ii) Secondly “Decision theory (also) implies that it is not just the relative frequency of pro- and anti-competitive consequences that matters to the assessment of a *Per Se* rule, but the severity of resulting harm in either case”.¹⁴

However despite the widespread recognition of the value of the Decision Theoretic analysis in the optimal choice of legal standards, it suffers from at least four major shortcomings.

1. No formal model of the optimal choice of decision rules has emerged in the literature that takes into account the above decision-theoretic considerations **and** relates them systematically to the underlying quality of the information

8 See Ahlborn, Evans and Padilla (2005) and Killick (2004). For opposing views see Ritter (2005) and Leveque (2005).

⁹ See also below.

10 See for example Hylton and Salinger (2001), Hylton and Salinger (2004), Ahlborn, et.al (2004, 2005) and Salinger (2006).

11 See Beckner and Salop (1999), Tom and Pak (2000), Joskow (2002), Evans and Padilla (2004, 2005), Hylton and Salinger (2001), Ahlborn, Evans and Padilla (2005), Christiansen, A. and W. Kerber (2006), Salinger (2006).

12 As Whinston (2006) mentions “the justification of the Per Se rule is really nothing more than an application of optimal statistical decision making”.

13 Vickers, ab.cit. p.4, quoting Easterbrook in US Court of Appeals case *Schor vs. Abbott Labs.*

14 Vickers, ab. cit. p.10.

and economic models/analysis available to the Competition Authority (CA) and to various important aspects of the CA's administrative procedure. So there is no clear test of when the analysis available to the authority is sufficiently good to enable it to *effectively discriminate* between harmful and benign actions and so make decisions that are better than those produced by a *Per Se* standard.

2. The Decision Theoretic approach focuses solely on the impact of different rules on the outcome of cases coming before the authority. It ignores the ***Indirect (or deterrence) Effects*** caused as all firms anticipate the potential consequences of different legal standards were they to come to the authority's attention and adjust their behaviour accordingly. This has been recognised by, among others, Joskow (2002) who argues that these indirect 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"¹⁵.
3. In taking account of indirect effects, it is clear that it is not just the outcomes of the CA's decisions that matter to firms, but also other administrative/procedural aspects of the CA's *investigation and enforcement* processes. Three important such aspects are:
 - a. the proportion of firms taking the action who come before the authority – the *coverage* rate;
 - b. delays in reaching decisions;
 - c. the level and structure of any penalties, reputational costs, or costs of reversing the action that a firm might face if found to have acted in an anti-competitive fashion.
4. The above dimensions of the administrative procedure are also very important for the CA in making optimal choices between different standards. Thus a satisfactory model has to specify how these are determined – it has to specify precisely the *investigation process* in relation to its notification, verification and analysis aspects.

¹⁵ Page 98.

The aim of this paper is to address these weaknesses of the existing Decision Theoretic approach by providing a systematic *welfare-based framework* for choosing between legal standards which:

- (i) formally captures the quality of the information/analysis available to the authority in reaching a decision, and uses this to develop an explicit test for when this analysis is sufficiently good to enable the authority to effectively discriminate between actions that are likely to be harmful or benign;
- (ii) incorporates *indirect effects*;
- (iii) incorporates the *administrative/procedural effects* mentioned above.

Though our focus will be on legal standards for Competition Policy it should be immediately clear that the *framework we propose has far more general applicability*. In particular it can be applied in many other contexts (such as those faced by Sectoral Regulators, environmental agencies, tax authorities etc) in which (a) agents are taking actions that are privately beneficial but from a wider social viewpoint may be harmful or beneficial (b) the degree of social harm/benefit varies with the circumstances under which the action is taken (c) the authority/regulator *cannot observe the precise circumstances* under which any given action is taken.

The key results / messages of the paper are as follows:

1. There is a simple but powerful condition for determining when the quality of the information and analysis available to the authority is good enough to enable it to effectively discriminate between actions that are likely to be harmful and actions that are likely to be benign. The test depends on comparing a measure of the quality of the analysis/models available to the authority with what we call the *strength of the presumption of legality (or illegality)* which in turn depends on the two factors identified by the existing decision-theoretic approach :
 - (i) The frequency of harmful actions in the overall population (base probability)
 - (ii) The economic harm (benefit) that arises from harmful (benign) actions.
2. *Indirect/deterrence effects* influence the choice between *Per Se* Rules and *Discriminating Rules*¹⁶, such as **Rule of Reason**, in two ways which operate in different directions. Thus, compared to *Per Se*, discriminating rules:

¹⁶ That is, rules that attempt to discriminate between benign and harmful actions on the basis of the circumstances under which the actions are taken. Expressions such as “rebuttable per se (il)legality”, “modified per se

- a. generate (absolute) deterrence effects that are too weak for actions which are on balance harmful (presumptively illegal) and so should be deterred, but are too strong in the case of actions that are on balance benign (presumptively legal), and so should not be deterred;
 - b. generate a *differential deterrence effect* whereby harmful actions are more heavily deterred than benign actions.
3. The magnitude of Type I and Type II errors – interpreted more widely now as the failure to prevent harmful actions and the wrongful prevention of beneficial actions – depend on the factors identified above - decision-making quality; deterrence and administration effectiveness – but in a different way for each type of error. In particular administrative errors increase Type I errors but reduce Type II errors.
4. **How** one improves the quality of the information/analysis that underpins discriminating rules, or the *type* of discriminating rule chosen, matters in two crucial ways.
- (i) By affecting the cost of decision errors. For actions that are *presumptively illegal* it is important to reduce Type I decision errors and the most effective way to do this is to use “low-false acquittals” rules. Indeed only such rules will be effectively discriminating if the presumption of illegality is strong. For actions that are *presumptively legal* it is important to reduce Type II decision errors and the most effective way to do this is to use “low-false convictions” rules. Indeed only such rules will be effectively discriminating if the presumption of legality is strong. When the presumption of legality (illegality) is **not** strong “low-false-convictions” **and** “low-false-acquittals” rules can be equally effective in reducing costs of decision errors: purely decision theoretic considerations are then not very helpful in choosing between alternative discriminating standards.
 - (ii) By affecting deterrence. The impact of “low-false convictions” and “low-false acquittals” rules on deterrence effects is different. For *presumptively legal* actions, reducing false convictions unequivocally improves deterrence effects and raises welfare, while reducing false acquittals may actually worsen deterrence effects and lower welfare. For *presumptively illegal* actions it is not

(i)legality”, “structured rule of reason”, and “rule of reason”, that are found in the literature, refer to different types of discriminating rules.

possible to make unequivocal predictions about the effect of reducing false convictions **or** false acquittals on deterrence.

We proceed as follows. In Section 2 we set out our model and in particular we describe our assumptions on the economic context and on the investigation and enforcement procedure followed by the authority. We also examine how firms' decisions are affected by the authority's analysis, decisions and procedures. In Section 3, we provide a welfare comparison of discriminating and *Per Se* rules and between various types of discriminating rules. We start with a comparison to the first best that allows us to define clearly the various errors involved in the use of any given decision rule. We begin with a decision-error comparison that allows us to establish a central result that determines when a discriminating rule produces lower costs of decision errors than a *Per Se* rule. We then turn to a full welfare comparison of different rules. In Section 4 we outline a methodology for applying our framework to the choice of legal standards for specific business practices and provide a brief application of this methodology to the cases of *Leegin* and *Microsoft*. Section 5 provides concluding remarks and suggestion for future research.

Section 2 The Model

2.1 The Economic Context

There is a population of firms, whose size is normalised to 1, who could potentially take an action¹⁷. If a firm does take the action there is a possibility that this could become the subject of an investigation by a CA, which could disallow it and could then require the firm to reverse it and/or impose a penalty. Anticipating this firms have to decide whether or not to take the action¹⁸.

If there were no intervention, the action would confer on the firm taking it a positive private benefit which we take to be the present value of the expected change

¹⁷ An action is defined sufficiently narrowly that it makes sense to think of CAs potentially operating a *Per Se* Rule. Thus we have in mind that an action is a horizontal merger rather than just a merger or an action is "price cutting below (some measure of) cost" not "competitive price cutting". On the other hand, as we will see (Section 4), a strength of our framework is indeed that the tests we propose direct the analyst in deciding how narrowly the action should be defined.

¹⁸ Note that this is an *ex-post* investigation process. An alternative decision process involving *ex ante* intervention by the Competition Authority is a *prior clearance* process whereby firms contemplating taking an action (e.g. to merge) have to get prior approval before proceeding. We leave the investigation of this set-up to future work.

in profits from the action over its “natural” lifetime¹⁹. Let $b > 0$ denote the benefit accruing to a typical firm. However, the action can also cause wider social harm, which we take to be measured by the negative of the present value of the change in consumer surplus. The extent of the harm caused by any firm will depend on its environment which encompasses various characteristics of both the firm and of the markets in which it operates. For simplicity we assume that there are just two environments – Harmful and Benign – and that if the action is taken by a firm from the Harmful environment it will generate harm $h_H > 0$ - while if the action is taken by a firm from the Benign environment it will generate harm $h_B < 0$ - i.e. will be socially beneficial. Let the fraction of firms in the underlying population of firms who could take the action that come from the Harmful environment be γ , $0 < \gamma < 1$. We assume that the values of γ, h_H and h_B are common knowledge, as is therefore the value of average harm/benefit $\bar{h} = \gamma h_H + (1 - \gamma) h_B$. We will say that the action is *presumptively legal* if $\bar{h} < 0$ and *presumptively illegal* if $\bar{h} > 0$.

In principle the distribution of private benefits could be different in each of the two environments. However in this paper we will impose the **symmetry assumption** that the two distributions are identical²⁰. So we suppose that the private benefit has a positive continuous probability density $f(b) > 0$ on $[0, \infty)$, with cumulative distribution function $F(b)$, $0 \leq F(b) \leq 1$; $F'(b) = f(b) > 0$.

2.2 *The Investigation Process*

We assume that if all actions are allowed – that is the CA uses a *Per Se Legal* decision procedure – then no actions are investigated. However the CA can only ban an action if there has been some process of investigation, which comprises a number of stages.

Stage 1 *Notification and Verification*

¹⁹ This captures the idea that firms operate in a changing environment and that an action taken at a particular time might be modified or even reversed at some later date.

²⁰ In the absence of compelling evidence to the contrary this assumption may be thought to be quite reasonable.

We assume that a fraction π , $0 < \pi < 1$ of firms who have taken the action come to the attention of the CA, and that these represent a random sub-sample of the population of firms taking the action²¹. We refer to π as the *coverage rate*.

Before taking any decision the CA must first verify whether or not the firms coming to its attention have indeed taken the action. We assume that the CA can do so accurately. Under a *Per Se Illegal* procedure decisions are made solely on the basis of the nature of the action, so once it has been verified that the firm has taken the action, the action will be banned and this will be the end of the investigation process. For simplicity we assume that the process of verification is costless, but recognise that it might still take time, which we capture by assuming that under a *Per Se Illegal* process firms taking the action will get a fraction ϕ^{PSI} , $0 \leq \phi^{PSI} \leq 1$ of their private benefit before the action is terminated, while society gets the corresponding fraction of the harm/benefit.

Stage 2 Analysis

If the CA operates a *Discriminating* decision rule then it will try to form a view about the potential pro- or anti-competitive effects of any action it investigates before deciding whether or not to disallow it. That is it will try to determine from which environment the action has come. The CA does not know this, so it uses whatever information and data it can gather, and applies to this a variety of tests and analytical techniques as a result of which it puts the action in one of just two categories:

- (i) on balance likely to be pro-competitive (potentially benign);
- (ii) on balance likely to be anti-competitive (potentially harmful).

We assume that under a *Discriminating Rule* it allows all actions in the first category and disallows all actions in the second²².

Of course the data, tests and analysis available to the authority will typically be imperfect and lead it to classifying some genuinely harmful actions as pro-competitive and some genuinely benign actions as anti-competitive. So we suppose

²¹ There are a number of ways in which firms might come to the attention of the CA. There could be third-party reports. In this case the assumption that they are a random subset could reflect the fact that third parties are not very skilled at judging social harm but base their decision to report the action on the harm done to their own interests. If the CA selects cases then the assumption that they are a random sub-sample reflects the assumption that their risk-based selection rules are extremely poor. The case where they have good risk-based selection rules is essentially an example of a two-stage rule that we will investigate in future research.

²² Later on we will briefly consider the implications of the CA's using a more sophisticated *Discriminating Rule* in which it first calculates the expected harm conditional on getting a pro- anti- competitive determination on an action and disallows (resp allows) if this expected harm is positive (resp. negative).

that there is a probability p_{BB} , $0 < p_{BB} \leq 1$ that if an action is Benign it is identified as being (potentially) benign, and a probability p_{HH} , $0 < p_{HH} \leq 1$ that an action that is truly Harmful is classified as (potentially) harmful. In what follows the quality of the information/analysis available to the CA is characterised by the two parameters (p_{BB}, p_{HH}) . We will sometimes refer to (p_{BB}, p_{HH}) as the CA's model.

If $p_{BB} + p_{HH} = 1$ then the probability of pro/anti-competitive classification is exactly the same whether an action comes from a Harmful or Benign environment and so the CA's information/analysis has no discriminatory power. If $p_{BB} = 1$; $p_{HH} = 1$ then the CA's information/analysis allows it to perfectly identify the environment from which any firm taking the action comes. In the more general case where $p_{BB} + p_{HH} > 1$, but $p_{BB} < 1$, $p_{HH} < 1$ then firms from the Benign environment are more likely to have their actions classified as pro-competitive than are firms from the Harmful environment, while firms from the Harmful environment are more likely to have their actions classified as anti-competitive than are firms from the Benign environment, so the information/analysis available to the CA has genuine discriminatory power.

As noted in the literature²³, there is not a single discriminating rule, something that we capture in this framework by thinking of the CA as having a continuum of models available to it. We suppose that at any given time the quality of available data and of Economic/Legal knowledge that can be implemented by way of effective tests is such that there is a maximum quality model: $(\bar{p}_{BB}, \bar{p}_{HH})$ available to the authority where $(0,0) \ll (\bar{p}_{BB}, \bar{p}_{HH}) \leq (1,1)$; $\bar{p}_{BB} + \bar{p}_{HH} > 1$. We will call this Discriminating Rule that uses this maximum quality model *Rule of Reason*. We therefore suppose that the set of models available to the CA is

$$\Sigma = \left\{ (p_{BB}, p_{HH}) \mid (0,0) \ll (p_{BB}, p_{HH}) \leq (\bar{p}_{BB}, \bar{p}_{HH}); p_{BB} + p_{HH} \geq 1 \right\}.$$

Now as also emphasized in the literature²⁴ there are costs involved in collecting and analysing the information needed to form the judgments necessary to implement a *Discriminating Rule*. These costs would not need to be incurred under a *Per Se Rule*. It follows that before deciding to use a *Discriminating Rule* in

²³ See also the Introduction above.

²⁴ Christiansen et.al. (2006) p. 223/224, 231

preference to a *Per Se Rule*, it is important to ensure that whatever advantages it has in other respects are sufficient to outweigh these additional costs. However since this point is well understood and we have nothing new to add, in what follows we will simply ignore these costs.

Further, as noted by Ehrlich and Posner (1974), the choice between decision rules “affects the speed, and hence indirectly the costs and benefits, of legal dispute resolution...”²⁵. To capture this idea we assume that if the authority disallows the action under a *Discriminating Rule* procedure then the firm gets only a fraction ϕ^D , $0 < \phi^D \leq 1$ of the private benefit b – and society gets the corresponding fraction of the harm/benefit. Since a Discriminating Rule requires both verification plus analysis while a Per Se Illegal procedure requires only verification, it follows that a Discriminating Rule has a longer *litigation cycle* and so $\phi^D > \phi^{PSI}$. The fact that ϕ^D does not depend on (p_{BB}, p_{HH}) reflects the assumption that factors that lead to an improved model need not lead to a lengthier decision process²⁶.

Stage 3 Enforcement

If an action is investigated and disallowed, then there are two possible consequences for the firm. It may have to pay a fine/penalty $f \geq 0$ ²⁷ and it may have to reverse the action which could cause the firm to incur significant costs²⁸ which we denote by $c \geq 0$. We assume that at least one of these sanctions is in force so $f + c > 0$

2.3 Firms’ Decisions

In deciding whether or not to take an action, firms anticipate the possibility that they might be investigated and that, if investigated, the action may be disallowed, possibly after a delay, and, if disallowed they face the sanction $(f + c)$. We assume that firms know:

²⁵ Page 265-6.

²⁶ For example using a more powerful theory may improve discriminatory power but may not increase the length of time to collect, process and analyse the data and then deliberate on the findings.

²⁷ In practice, CAs impose fines on the basis of imperfect criteria related to revenue or profit which are likely to bear little relation to the amounts suggested by the literature on optimal fines. Wils (2006) discusses the possibility of estimating optimal fines. Commissioner Kross’s speech on “Developments in Competition Policy in 2006” of 20/3/2007 gives an indication of the current emphasis on the deterrent effects of fines.

²⁸ These include many sunk costs involved in implementing an action potentially including R&D costs, costs in unbundling products, rearranging contractual commitments, modifying price lists, as well as the managerial effort involved in redirecting the firm’s strategy. Such costs can be quite substantial as they may involve difficult to reverse technological, marketing and/or other contractual commitments.

- the environment $e = H, B$ from which they come;
- what type of decision rule the CA employs;
- if the CA uses a Discriminating Rule, the quality of the model (p_{BB}, p_{HH}) ;
- the coverage rate π ;
- the delay factors (ϕ^D, ϕ^{PSI}) ;
- the sanctions (f, c) .

Now, generically, we can think of any decision rule/procedure being characterised by the four parameters $r = (\rho, \delta_H, \delta_B, \phi)$ where:

- ρ , $0 \leq \rho \leq 1$ is the risk of being investigated;
- δ_e , $0 \leq \delta_e \leq 1$, $e = B, H$ is the probability that, if investigated, a firm from environment e will have its action disallowed;
- ϕ is the delay in reaching a decision.

So, *Per Se Legality* is characterised by $r = (0, 0, 0, 0)$; *Per Se Illegality* by $r = (\pi, 1, 1, \phi^{PSI})$; and any *Discriminating Rule* by $r = (\pi, 1 - p_{BB}, p_{HH}, \phi^D)$.

For any given rule the expected value of profits of a firm with private benefit b that comes from environment e will be

$$[1 - (\rho \cdot \delta_e)]b + (\rho \cdot \delta_e) \cdot [(\phi b) - (f + c)]. \quad (1)$$

A firm will take the action if the expected value of profits is positive, i.e. if

$$b > \underline{b}_e = \frac{(\rho \cdot \delta_e) \cdot (f + c)}{1 - (\rho \cdot \delta_e)(1 - \phi)} \quad (2)$$

Consequently the fraction of firms from environment e who will be deterred under a generic rule will be

$$F_e = F(\underline{b}_e). \quad (3)$$

Given (2) and our assumptions, it follows that, in an obvious notation:

Lemma 1:

$$0 = F_B^{PSL} = F_H^{PSL} < F_B^D < F_H^D < F_B^{PSI} = F_H^{PSI} < 1. \quad (4)$$

There are two important features of this result:

- Under *Per Se* rules the deterrent effect is the same for firms from each of the two environments, while under a *Discriminating Rule* there is a **differential**

deterrence effect whereby the fraction of firms from the harmful environment that is deterred is greater than for firms from the Benign environment;

- A *Discriminating Rule* generates greater deterrence than a *Per Se Legal Rule* but weaker deterrence than a *Per Se Illegal Rule*, and the latter for two reasons: (i) there is a smaller risk of having the action disallowed; (ii) the decision will take longer to reach.

Section 3 Welfare Comparison of the Rules

3.1 Comparison with the First Best

We begin by establishing as point of reference the outcome that would arise in the first best world, and then undertake a full welfare comparison of a generic decision rule against the level of welfare in the First Best. We show how to define Type I and Type II errors in this complete welfare framework and demonstrate that they no longer depend on just decision errors, but on how good a decision rule/procedure is in terms of:

- decision-making effectiveness;
- deterrence;
- administrative effectiveness.

In regard to the latter dimension of the comparison it will be useful to define as a measure of **administrative effectiveness** for any generic rule the variable

$$a = \rho(1 - \phi) \quad (5)$$

so administration is more effective the greater is the likelihood of investigation and the shorter the delay in reaching a decision. Formally we are going to compare decision rules in terms of $(\delta_B, \delta_H, F_B, F_H, a)$.

Now a First Best decision procedure is characterised by

- perfect administration: all firms are investigated and decisions are instant - $\hat{\rho} = 1, \hat{\phi} = 0 \Rightarrow \hat{a} = 1$;
- perfect discrimination: $\hat{p}_{BB} = \hat{p}_{HH} = 1 \Rightarrow \hat{\delta}_B = 0, \hat{\delta}_H = 1$.

From (2) and (3) this implies

$$\hat{F}_B = 0; \hat{F}_H = 1 \quad (6)$$

We can then measure any given decision rule by looking at the deviations from the First-Best namely:

$$\begin{aligned}\Delta\delta_B = \delta_B \geq 0; \quad \Delta\delta_H = 1 - \delta_H \geq 0; \\ \Delta F_B = F_B \geq 0; \quad \Delta F_H = 1 - F_H \geq 0; \\ \Delta a = 1 - a \geq 0\end{aligned}\tag{7}$$

Now social welfare under any generic rule is:

$$W = \gamma \cdot (-h_H) \cdot (1 - F_H) \cdot [1 - \rho \cdot \delta_H \cdot (1 - \phi)] + (1 - \gamma) \cdot (-h_B) \cdot (1 - F_B) \cdot [1 - \rho \cdot \delta_B \cdot (1 - \phi)]\tag{8}$$

that is, social welfare is the social harm (plus the social gain) from harmful (from benign) actions not deterred and not detected and disallowed. In particular, welfare in the First Best is:

$$\hat{W} = (1 - \gamma) \cdot (-h_B) > 0\tag{9}$$

If we compare the level of welfare under any rule to that under the first best we get a welfare loss that is the sum of two types of error:

- Type I - failure to prevent harmful actions;
- Type II - erroneously preventing benign actions.

Thus, from (8) and (9):

$$L = \hat{W} - W = L_I + L_{II}\tag{10}$$

where

$$L_I = \gamma h_H \cdot \Delta F_H \cdot [1 - (1 - \Delta\delta_H) \cdot (1 - \Delta a)]\tag{11}$$

$$L_{II} = (1 - \gamma) \cdot (-h_B) \cdot \{1 - (1 - \Delta F_B) \cdot [1 - \Delta\delta_B \cdot (1 - \Delta a)]\}.\tag{12}$$

The key points that emerge from these formulae are:

- (i) Type I and Type II losses no longer depend on just decision errors – they also depend on deterrence errors and administrative errors. Put differently, Type I and Type II errors reduce to decision errors only in the case where there is no deterrence – so $\Delta F_B = 0$; $\Delta F_H = 1$ - and perfect administration.
- (ii) L_I is an increasing function of:
 - the decision error $\Delta\delta_H$ for harmful actions – the rate of false acquittals;
 - the deterrence error ΔF_H for harmful actions – the failure to deter;
 - the administrative error: Δa - the failure to detect and rapidly enough close down harmful actions.

While L_{II} is also an increasing function of :

- the decision error $\Delta\delta_B$ - the rate of false convictions of benign actions;
- the deterrence error ΔF_B - the wrongful deterrence of benign actions;

it is a *decreasing* function of the administrative error, Δa - because failing to detect and rapidly disallow benign actions is a bonus.

(iii) The way the various errors combine to give the overall error varies significantly depending on whether we are dealing with Type I or Type II errors.

- Type I losses will be zero if *either* there is no indirect/deterrence error (because if there is no deterrence error then no one takes the action and so the other errors are irrelevant) *or* if both the decision error and the administrative error are zero – because then no one is allowed to take the action and it doesn't matter how many people try to (though none will).
- Type II errors are zero if *either* both the indirect/deterrence error and the decision error are zero *or* if the indirect/deterrence error is zero and the administrative error is unity.

3.2 Comparison of *Discriminating Rules* with *Per Se Rules*

We now undertake a full welfare comparison between *Per Se* and *Discriminating Rules*. As pointed out above, an important difference between a *Discriminating Rule* and a *Per Se Rule* is that the former has a **differential deterrence effect** – deterring more firms from the Harmful environment than from the Benign environment – while the latter does not. In what follows we will first of all strip this effect out of the welfare comparison by assuming that the proportion of firms deterred from both the Harmful and Benign environments under a *Discriminating Rule* is $F_B^D = F_H^D$ and then we will add the effect back in. In this way, when we compare the two types of rule in terms of their decision-making effectiveness we are comparing how they treat a population of firms coming before the CA that has the same proportion of firms from the Harmful environment – namely γ .

We begin therefore by establishing a central result that determines when a *Discriminating Rule* produces lower decision error costs than a *Per Se Rule*.

3.2.1 Decision-Error Comparison of Discriminating vs Per Se Rules

Let us define \bar{h}_B as the expected harm that would be done by an action that, following the analysis and use of its model, the CA has classified as pro-competitive (potentially benign). Similarly we define \bar{h}_H as the expected harm that would be done by an action that, following the analysis and use of its model, the CA has classified as anti-competitive (potentially harmful). Formally these are defined by:

$$\bar{h}_B = \frac{(1-\gamma) \cdot p_{BB}}{\gamma \cdot (1-p_{HH}) + (1-\gamma) \cdot p_{BB}} \cdot h_B + \frac{\gamma \cdot (1-p_{HH})}{\gamma \cdot (1-p_{HH}) + (1-\gamma) \cdot p_{BB}} \cdot h_H \quad (13)$$

$$\bar{h}_H = \frac{(1-\gamma)(1-p_{BB})}{\gamma p_{HH} + (1-\gamma)(1-p_{BB})} \cdot h_B + \frac{\gamma p_{HH}}{\gamma p_{HH} + (1-\gamma)(1-p_{BB})} \cdot h_H. \quad (14)$$

Intuitively we would expect that as long as the decision rule has any discriminating ability (i.e. as long as $p_{BB} + p_{HH} > 1$) then the expected harm conditional on classifying an action as pro-competitive, \bar{h}_B , should be less than the unconditional expected harm, \bar{h} , which in turn is less than the expected harm conditional on classifying an action as anti-competitive, \bar{h}_H . Moreover if the CA's model is poor, so $p_{BB} + p_{GG} \approx 1$ then $\bar{h}_B \approx \bar{h} \approx \bar{h}_H$, while, as the model gets better, then \bar{h}_B will fall and approach $h_B < 0$ as the power to correctly identify Benign actions improves, while \bar{h}_H will increase and approach $h_H > 0$ as the power to correctly identify Harmful actions improves. These ideas are captured formally in the following

Lemma 2:

- (i) If $p_{BB} + p_{HH} = 1$ then $\bar{h}_B = \bar{h}_H = \bar{h}$;
- (ii) if $p_{BB} + p_{HH} > 1$, then $h_H \geq \bar{h}_H > \bar{h} > \bar{h}_B \geq h_B$;
- (iii) if $p_{BB} + p_{HH} > 1$ and $p_{BB} = 1$ then $\bar{h}_H = h_H > 0$
- (iv) if $p_{BB} + p_{HH} > 1$ and $p_{HH} = 1$ then $\bar{h}_B = h_B < 0$
- (v) if $p_{BB} + p_{HH} > 1$ and both $p_{BB} < 1$ and $p_{HH} < 1$ then an increase in either p_{BB} or p_{HH} will increase \bar{h}_H and lower \bar{h}_B .

Notice the following important implication. Consider the case of an action that is Presumptively Legal – so $\bar{h} < 0$. If the quality of the model used to underpin a *Discriminating Rule* is low, it follows from parts (i) & (ii) of Lemma 2 that the expected harm will be negative whatever classification the CA makes of an action coming before it – $\bar{h}_B < \bar{h} < \bar{h}_H < 0$. So using a *Discriminating Rule* whereby actions that are classified as pro-competitive (potentially benign) are allowed, while those that are classified as anti-competitive (potentially harmful) are disallowed will be introducing a variation in decision that is unwarranted by the harm that can be expected given the information available to the CA. The *Discriminating Rule* will therefore make greater decision errors than the *Per Se Legal Rule*.

On the other hand if the quality of the model available to the CA is sufficiently good that, while the expected harm conditional on an action's being classified as pro-competitive is negative – i.e. $\bar{h}_B < \bar{h} < 0$ – the expected harm conditional on an action's being classified as anti-competitive is positive – i.e. $\bar{h}_H > 0$ – then using a *Discriminating Rule* will produce a variation in decision that is warranted by the information available to the CA, while the *Per Se Legal Rule* will produce a constancy of decision that is unwarranted by the available information and analysis. So in this case the decision errors produced by a *Discriminating Rule* will be lower than those produced by a *Per Se Rule*.

We can apply an analogous argument in the case of a *Presumptively Illegal* action, and obtain the following:

Proposition 1

- (i) A necessary and sufficient condition for a *Discriminating Rule* to give lower decision errors than the corresponding *Per Se Rule* is that $\bar{h}_B < 0 < \bar{h}_H$;
- (ii) For a *Presumptively Legal* action this condition is equivalent to $\bar{h}_H > 0$;
- (iii) For a *Presumptively Illegal* action this condition is equivalent to $\bar{h}_B < 0$.

We will say that if $\bar{h}_B < 0 < \bar{h}_H$ then a discriminating rule is an *Effectively Discriminating Rule (ED-Rule)*.

Now for a *Presumptively Legal* action $\bar{h} = \gamma h_H + (1 - \gamma)h_B < 0$ which implies that $s_L \equiv \frac{(1 - \gamma) \cdot (-h_B)}{\gamma h_H} > 1$, where s_L is what we call the *strength of presumption of legality*. Notice that the strength of presumption of legality depends on all the factors that have been identified in the existing literature as being relevant to decision as to whether or not to use *Per Se Rules* – base-line probability of anti-competitive harm, and the magnitudes of the associated harms. On the other hand it follows from (14) that $\bar{h}_H > 0$ if and only if:

$$q_H \equiv \frac{p_{HH}}{1 - p_{BB}} > \frac{(1 - \gamma) \cdot (-h_B)}{\gamma h_H} = s_L > 1. \quad (15)$$

where q_H is a measure of the quality of the model available to the authority reflecting as it does the relative propensity to classify as anti-competitive (potentially harmful) actions that are genuinely Harmful and actions that are genuinely Benign.

By an analogous argument, an action is *Presumptively Illegal* if and only if $s_I \equiv \frac{\gamma h_H}{(1 - \gamma) \cdot (-h_B)} > 1$ where s_I is what we call the *strength of presumption of illegality*. Moreover it follows from (13) that $\bar{h}_B < 0$ if and only if

$$q_B \equiv \frac{p_{BB}}{1 - p_{HH}} > \frac{\gamma h_H}{(1 - \gamma) \cdot (-h_B)} = s_I > 1. \quad (16)$$

where q_B is a measure of the quality of the model available to the authority reflecting as it does the relative propensity to classify as pro-competitive (potentially benign) actions that are genuinely Benign and actions that are genuinely Harmful. So we have established:

Proposition 2

- (i) A necessary and sufficient condition for a *Discriminating Rule* to be able to *effectively discriminate* and so give lower decision errors than a *Per Se Rule* is that the appropriate measure of the quality of the rule is greater than the strength of the presumption of legality (for a *Presumptively Legal* action) or illegality (for a *Presumptively Illegal* action).
- (ii) For a *Presumptively Legal* action the appropriate measure of quality is the relative propensity to classify as anti-competitive (potentially harmful) actions that are genuinely Harmful and actions that are genuinely Benign, while the strength of the

presumption of Legality is the ratio of the expected benefit of the action to its expected harm.

(iii) For a *Presumptively Illegal* action the appropriate measure of quality is the relative propensity to classify as pro-competitive (potentially benign) actions that are genuinely Benign and actions that are genuinely Harmful, while the strength of the presumption of illegality is the ratio of the expected harm of the action to its expected benefit.

This proposition provides a systematic framework for evaluating the *decision effectiveness* of Discriminating and *Per Se Rules*, and so improves on the existing approaches in two respects:

- It combines the underlying factors that have often been recognised as relevant to the comparison²⁹ into a formula for the strength of the presumption of legality/illegality. This both ensures that all these factors are taken into account and shows how they should be combined.
- However it goes beyond all of the existing analysis by explicitly considering the quality of the model available to the CA and showing how this should be introduced into the considerations.

Finally notice that it follows from (15) and (16) that:

Lemma 3:

$$\frac{\partial q_H}{\partial p_{BB}} = \frac{p_{HH}}{1-p_{BB}} \cdot \frac{1}{1-p_{BB}} > \frac{1}{1-p_{BB}} = \frac{\partial q_H}{\partial p_{HH}}; \quad (17)$$

and

$$\frac{\partial q_B}{\partial p_{HH}} = \frac{p_{BB}}{1-p_{HH}} \cdot \frac{1}{1-p_{HH}} > \frac{1}{1-p_{HH}} = \frac{\partial q_B}{\partial p_{BB}}. \quad (18)$$

So we have established:

Proposition 3

- If an action is *Presumptively Legal* then, to be able to *effectively discriminate*, the authority's model has to make $\bar{h}_H > 0$ and the most effective way of doing so is to choose a model that minimises false convictions by ensuring that those

²⁹ Namely the baseline probability of anti-competitive harm and the levels of harm/benefit from the action

actions that it classifies as *potentially anti-competitive* genuinely are so i.e. by better identifying Benign actions (increasing p_{BB}).

- If an action is *Presumptively Illegal* then, to be able to *effectively discriminate* the authority's model has to make $\bar{h}_B < 0$ and the most effective way of doing so is to choose a model that minimises false acquittals by ensuring that those actions that it classifies as *potentially pro-competitive* really are so i.e. by better identifying Harmful actions (increasing p_{HH}).

3.2.2 Full Welfare Comparison of *Discriminating* vs *Per Se Rules*

Let us finally turn to a full welfare comparison of the two types of rule. Since the relevant *Per Se Rule* is different depending on whether the action is *Presumptively Legal* or *Presumptively Illegal* the precise formula is somewhat different in the two cases, though the elements are precisely the same. If we substitute all the relevant variables into (8) we get the following results.

- (i) If the action is *Presumptively Legal* ($\bar{h} < 0$) then

$$\begin{aligned}
 W^D - W^{PSL} = & \\
 & \left[\gamma h_H p_{HH} - (1-\gamma)(-h_B)(1-p_{RR}) \right] \cdot (1-F_B^D) \cdot a^D \\
 & + F_B^D \bar{h} \\
 & + (F_H^D - F_B^D) \gamma h_H \cdot (1-p_{HH} \cdot a^D)
 \end{aligned} \tag{18}$$

- (ii) If the action is *Presumptively Illegal* ($\bar{h} > 0$) then

$$\begin{aligned}
 W^D - W^{PSI} = & \\
 & \left[(1-\gamma)(-h_B) p_{BB} - \gamma h_H (1-p_{HH}) \right] \cdot (1-F_B^D) \cdot a^D \\
 & - \bar{h} \left[(1-a^D)(1-F_B^D) - (1-a^{PSI})(1-F_B^{PSI}) \right] \\
 & + (F_H^D - F_B^D) \cdot \gamma h_H \cdot (1-p_{HH} \cdot a^D)
 \end{aligned} \tag{19}$$

These expressions enable us to establish

Proposition 4

The welfare difference between a *Discriminating Rule* and a *Per Se Rule* comprises three separate terms.

- The first is the **decision error difference** between the two rules. The term in square brackets is positive if and only if the quality of the CA's model enables it to effectively discriminate, and is larger the better is the quality of the rule. The magnitude of this term is modified to take account of the fact that only a fraction of firms take the action and for these the administration is imperfect.
- The second term is the (absolute) **deterrence difference** between the two rules and is always negative – i.e. *Per Se* is welfare superior to a *Discriminating Rule*³⁰. This is because a *Discriminating Rule* has too strong a deterrence effect when the action is *Presumptively Legal* and so on balance benign, while it has too weak a deterrence effect and is too slow in reaching a decision for actions that are *Presumptively Illegal* and so on balance Harmful.
- The third term is the **differential deterrence effect** and is always positive. This reflects the fact that the *Discriminating Rule* has a greater deterrence effect on Harmful actions than on Benign actions – a feature that is not shared by a *Per Se Rule*.

A number of corollaries follow from Proposition 4.

Corollary 1:

In many cases it may be reasonable to assume that firms do not know whether their action is socially harmful or beneficial. This assumption implies that firms perceive a common probability of been convicted if investigated equal to $\lambda = (1 - \gamma)(1 - p_{BB}) + \mathcal{P}_{HH}$ i.e. equal to the frequency with which actions are disallowed³¹. In this case $F_B^D = F_H^D$, so the differential deterrence effect is zero. Whenever this is true, an *effectively discriminating* rule will be welfare superior to *Per Se* only if it is *much better* in reducing decision error costs than *Per Se*: the improvement in decision errors must be large enough to compensate for the negative (absolute) deterrence effect.

Corollary 2:

Generally, the stronger the presumption of legality (illegality), relative to the measure of the quality of the model available to the CA as specified in (15), (16), the more likely that *Per Se* rules will be welfare superior to discriminating rules. On the other

³⁰ This is true for both (18) and (19) given $a^D < a^{PSI}$ and (4).

³¹ See Katsoulacos & Ulph (2007) for an analysis based on this. The assumption that firms do not know whether their action is socially benign or harmful may be reasonable one for many unilateral practices, such as refusal to license IP, the implications of which, for welfare, depend on a complex weighing of anticompetitive and precompetitive effects.

hand, when the presumption of legality is weak, many discriminating rules are likely to improve on *Per Se*, for two reasons. The first is that then \bar{h} will not be significantly different from zero thus weakening the (absolute) deterrence effect and the second is that ED- rules are then likely to reduce significantly the costs of decision errors.

Corollary 3:

How one improves the quality of discriminating rules (i.e. which *type* of discriminating rule one uses) is very important. Specifically:

- (a) For presumptively legal actions **only** “low-false-convictions” (high- p_{BB}) rules are likely to be *effectively discriminating* when the presumption of legality is strong, while for presumptively illegal actions **only** “low-false-acquittals” (high- p_{HH}) rules are likely to be *effectively discriminating* when the presumption of illegality is strong.
- (b) When the presumption of legality (illegality) is not strong “low-false-convictions” **and** “low-false-acquittals” rules can be equally effective in reducing costs of decision errors. Thus, purely decision theoretic considerations are not very helpful in choosing between alternative discriminating standards when the presumption of legality (illegality) is not strong³².
- (c) For presumptively legal actions “low-false-convictions” rules are more likely to be *welfare superior* to “low-false-acquittals” rules. If the presumption of legality is strong this will be the case as then, from (a) above, only “low-false-convictions” rules will be effectively discriminating and the following considerations will also apply. Even if the presumption of legality is not strong, and so both types of rule could reduce equally costs of decision errors relative to *Per Se*, “low-false-convictions” rules are more likely to be *welfare superior* to “low-false-acquittals” rules because the former generate optimal deterrence effects. A high- p_{BB} rule reduces $F(\underline{b}_B)$ and thus unequivocally increases the positive differential deterrence effect but **also** reduces the negative absolute deterrence effect **and** increases $1-F(\underline{b}_B)$, i.e. the population of firms not deterred on which the advantage of lower costs of decision errors

³² This implies that the conclusions in a number of recent contributions (mentioned above) on legal standards, using a DT approach, may be in need of reconsideration by explicitly exploring how the quality of alternative standards compares to the strength of the presumption of (il)legality. For example, the criticism of Ahlborn et.al (2005) of the Commission’s standard in *Microsoft* is certainly not warranted – see also below.

applies. On the other hand, while a high- p_{HH} rule increases $F(\underline{b}_H)$ and thus tends to increase the positive differential deterrence effect this is mitigated by the effect of a higher p_{HH} on the administrative cost: overall a higher p_{HH} may actually *reduce* welfare under the ED-rule when we abstract from its impact on the cost of decision errors.

- (d) For presumptively illegal actions, when the presumption of legality is not strong, from (b) both types of rule can reduce equally costs of decision errors and, further, there is no clear superiority of one or the other rule in terms of their deterrence effects. Thus, in these cases, the optimal legal standard can only be approximately determined by contrasting all the decision, deterrence and administrative procedure aspects of alternative rules.

Section 4 Applying the Framework

The following methodology is suggested for applying the framework set out in the previous sections to the choice of legal standard for specific business practices.

1. The first step is to examine whether actions associated with the practice should be considered as presumptively legal or presumptively illegal and to establish the strength of the presumption in either case. This would involve examining what economic theory tells us regarding how often actions are likely to be anticompetitive and about the potential harm/benefits of anticompetitive/precompetitive actions³³. Note that if the practice under consideration contains more than one category of potential actions and for each of these it is considered that the strength of the presumption of (il)legality is very different then that indicates that the practice is too widely defined and that a potentially different legal standard should be considered for each action category³⁴.

³³ See also Salinger (2006) – who advocates a decision theoretic approach and stresses taking into account these considerations. As he notes “No one seriously supposes that we can objectively measure all of these factors. In particular, there is no practical way to take a random sample of instances of a particular practice ... and assess the relative frequency of ... anticompetitive instances. Still, any policy implicitly rests on judgments about these factors, so it is useful to form subjective estimates of the answers when objective measures are not available”. See also his paper with Hylton (2001).

³⁴ A good example may be that of refusals to license IPRs when IPRs are defined as encompassing patents, copyrights, trademarks, and data/information subject to protection as trade secrets.

2. If the presumption of legality (illegality) is considered quite strong then the second step is to establish whether economic theory can suggest effectively discriminating rules. Our analysis indicates that, in the first case, these must be very “low-false-convictions” rules, while in the second case these must be very “low-false-acquittals” rules. Unless differential deterrence affects are very large, the existence of such rules is a necessary condition for potentially using discriminating standards rather than *Per Se*. Differential deterrence effects will be absent if, for example, firms perceive a common probability of been convicted if investigated, equal to the frequency with which actions are disallowed³⁵.
3. If the presumption of legality is not very strong then effectively discriminating rules are likely to be welfare superior to *Per Se* rules as they can reduce substantially the costs of decision errors. The important issue then becomes which is the optimal discriminating rule. To answer this we must explore first whether theory suggests both “low-false-convictions” **and** “low-false-acquittals” rules that can be equally (or almost equally) good in reducing costs of decision errors. If this is the case then the optimal discriminating rule will be the one that produces the best deterrence effects. If the action is presumptively legal then “low-false-convictions” are most likely to generate the best deterrence effects (Corollary 3 of Proposition 4 above).

Examples

A. *Leegin vs. PSKS (2007)*

In this case the US Supreme Court decided that the lower Court was wrong to adopt a ***Per Se Illegality*** standard to deal with RPM and remanded the case so that it is re-examined under ***Rule of Reason***, thus overturning nearly a century old tradition.

Certain aspects of the decision are characteristic of the confusion that the lack of a formal model for thinking about decision rules can cause. Thus it is argued (p. 3) that “A ***Per Se*** rule should not be adopted for administrative convenience alone. Such rules can be counterproductive, increasing the antitrust system’s total cost by prohibiting procompetitive conduct the antitrust laws should encourage”. But, as the model above shows one cannot judge the relative appropriateness of a rule on the

³⁵ See above Corollary 1 to Proposition 4.

basis of its relative rate of false convictions. Indeed, all discriminating rules will lower the rate of false convictions relative to *Per Se Illegality*, though it may well be that none of these reduces the total cost of decision errors – i.e. it may well be that none of these is effectively discriminating. This is more likely to be the case if the presumption of illegality for RPM is quite strong.

Consider an illustrative example. First, despite the Supreme Court’s decision, it may nevertheless still be safe to assume that most economists would consider the practice of RPM as presumptively illegal i.e one for which $\bar{h} > 0$. For example, while Vickers (2007) argues that it is “hard to see how Per Se treatment of RPM is justified in economic logic” he declares himself “no great fan of RPM”,³⁶. If this is true, a discriminating rule would be effective and thus superior to *Per Se* illegality in

minimising the cost of decision errors if $q_B \equiv \frac{p_{BB}}{1 - p_{HH}} > \frac{\gamma \cdot h_H}{(1 - \gamma) \cdot (-h_B)} = s_I > 1$. Though

those arguing for a PSI rule would propose that the value of γ is very large, assume for the sake of argument, and given what recent advances in economic theory suggest, that quite a large proportion of RPM cases (about one third) is benign, or that $\gamma = 0.7$. Also, let the gain from disallowing a harmful action be just one and half time as large as the loss from wrongly convicting a benign action. The latter can be justified as harmful RPM acts are likely to be associated with collusive horizontal practices. Then the presumption of illegality (at 3.5) is quite strong but not very strong.

Coming to the quality of models that a CA can use to discriminate, critics of the decision, such a Judge Breyer have pointed out (p. 8-10) that given available evidence it is very difficult to be able to recognise when an RPM practice might be on balance benign. But again for the sake of argument assume that $p_{BB} = 0.5$. Even under these conditions there would still be no effectively discriminating rule for as long as $p_{HH} \leq 0.86$. That is, our models, criteria and empirical evidence must be as good as to be able to identify correctly harmful RPM actions and classify them as harmful in 86% of the cases examined, for an *ED-rule* to be superior to *Per Se* in decision error terms.

And even this is not enough for the ED-rule to be welfare superior. A low p_{BB} value suggests that a large fraction of benign actions will be deterred by the ED-rule. This plus the delaying effect of the ED-rule can greatly mitigate the decision

³⁶ Ab.cit. p. 11. The views of Comanor and Scherer mentioned by Vickers (footnote 20) are also consistent with this interpretation.

error advantage of the rule (reducing the first term on the RHS of (19)). If, also, the differential deterrence effect were sufficiently small and thus dominated by the absolute deterrence effect of the ED-rule, it would be highly unlikely, even without taking into account its higher implementation costs that *Rule of Reason* would be the optimal rule.

B. *Commission vs. Microsoft (2007)*

In the *Microsoft* case the Commission has been criticized for altering the legal standard for dealing with Refusals to License IPRs. Specifically, Ahlborn, Evans and Padilla (2005) have argued that the “Exceptional Circumstances” decision rule that was adopted in previous cases such as *Magill* (1995) and *IMS Health* (2004) is superior to the new rule³⁷. They identify a number of differences between the two rules in terms of the criteria that need to be satisfied for establishing that refusal is abusive³⁸. Perhaps the most novel aspect of the new rule concerns the part dealing with “objective justification”. In the new rule the Commission suggests that this should be based on “an incentives to innovate for the whole industry” test. While the ‘exceptional circumstances’ test is, in our terms, a “low-false-convictions” rule, the Commission proposed a rule that lowers the likelihood of false acquittals – a “low-false-acquittals” rule.

Now, economic theory suggests that refusals to license IP rights are on average benign, and thus presumptively legal, taking into account both long-run and short-run considerations. However as the opposing views of the contributions by Ahlborn et.al (2005) and Ritter (2005) suggest this presumption is not unequivocally accepted as being very strong.

Our analysis suggests that if the presumption of legality is quite strong, the optimal discriminating legal standard will be a “low-false-convictions” standard such as EU’s ‘exceptional circumstances’ one: it is most effective in reducing the cost of decision errors and generates optimal deterrence effects. However, even such a standard may be welfare inferior to *Per Se* Legality: the latter should then be adopted, as the US authorities did in *Xerox* (2000).

If, on the other hand, the presumption of legality is not very strong - the Commission’s point of view regarding interoperability information in *Microsoft*,

³⁷ See also Killick (2004) and Geradin (2005). For counterarguments see Ritter (2005).

³⁸ Ahlborn et.al. (2005), p. 1110.

endorsed recently by the CFI - then as we have shown above, both “low-false-convictions” and “low-false-acquittals” discriminating rules are likely to be welfare superior to *Per Se* Legality. Contrary to what Ahlborn, Evans and Padilla (2005) suggest, the “low-false-acquittals” standard adopted by the Commission in *Microsoft* is **not** inferior to ‘exceptional circumstances’ in costs of decision error terms. The latter **is**, however, likely to be optimal in welfare terms. The reason is that “low-false-convictions” rules generate optimal deterrence affects for presumptively legal actions while “low-false-acquittals” rules may actually reduce welfare due to their deterrence effects³⁹.

Section 5 Conclusions and Directions for Future Research

This paper provides a systematic formal analysis for choosing legal standards taking into account decision error, deterrence and procedural considerations. It is motivated by a number of very important recent decisions in US and the EU questioning established legal standards, and by the emphasis that has been placed in recent years by academics, policy makers and practitioners on the use of a more effects- or economics-based approach in Competition Policy.

A number of interesting results and insights emerge and a number of areas for further future research are suggested by our framework. The main results were summarised in the introductory section. An important policy lesson of our analysis is that due to the lack of a systematic framework for comparing legal standards in practice, there could be many cases where CAs may be using the wrong standard. Thus they could be using *discriminating rules* when in fact they should be using *Per Se* rules and vice versa. Another important general implication, that emerges once procedural aspects of the investigation process are taken into account, aspects which are likely to vary between institutions/countries, is that it will not be wise to assume that the same legal standard is always optimal irrespective of the context in which or of the institution by which it will be applied. **Directions for future research** include:

- Allowing for a total welfare standard for reaching decisions
- Allowing for asymmetric distributions of benefits in the two environments – essentially recognising the correlation between private benefit and social harm.

³⁹ See Corollary 3 of Proposition 4 above. For details on applying the above framework to optimal standards for refusals to license IP see also Katsoulacos (2008).

- Examining the comparison of different decision rules in a pre-clearance context where firms have to get permission from a CA before taking action.
- Examining two-tier rules, multi-error stages and, more generally, the issue of case selection.
- Examining the design of optimal policy packages (such as fine-tuning antitrust penalties and remedies to the decision rules).

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