

The Reasonable Person Standard: Trading Off Static and Dynamic Efficiency

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Abstract

This paper shows that holding injurers which differ in precaution costs to the same due care level, the reasonable person standard, may be better than holding injurers to precaution cost-specific due care in a dynamic setting. This result is established in a framework in which injurers can reduce their precaution costs via investment in progressing care technology. We show that the reasonable person standard may invoke better investment incentives, pointing to a potential trade-off between static and dynamic efficiency.

Keywords: endogenous care technology, due care standards, reasonable person, liability law

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1 Introduction

The economic analysis of tort law argues that potential injurers ought to take efficient precaution measures. No doubt, different actors may very well differ regarding the costs they incur when taking care. For example, riders of older bicycles tend to have more difficulties in coming to an immediate stop. The traditional analysis suggests that optimal care will depend on the level of precaution costs. As a consequence, holding potential injurers with different levels of care-taking costs to the same due care implies inefficiencies. The argument in the literature for the widespread use of the reasonable person standard then relies on the difficulty of courts in telling different precaution-cost levels apart (e.g., Diamond 1974, Landes and Posner 1987, Shavell 1987). If it is relatively easy to observe precaution costs applicable in the case at hand, then courts should use care standards tailored to precaution costs. In contrast, if precaution costs are costly to assess, a uniform standard may minimize the total costs which also comprise administrative costs.

This paper provides a rationale for the use of the reasonable person standard without referring to the difficulty of observing precaution costs. We establish that the static inefficiency due to using the reasonable person standard may sometimes be worth tolerating because of the incentives the uniform due care level induces with respect to investments in progressing care technology. That is, we identify a potential trade-off between static and dynamic efficiency. The framework we use to establish this finding can be characterized as follows: Potential injurers may invest in innovative activities to lower precaution costs. Parties differ in their costs of innovating. Given knowledge on precaution costs of potential injurers, the policy maker can decide on imposing either a uniform due care standard or due care tailored to the care costs of the party at hand.

At this point, we would like to offer some intuition for our finding. It is by now well established that the reasonable person standard is disadvantageous because it holds parties with different levels of precaution costs to the same level of care. In our setting, the policy maker may impose standards of care which are tailored to precaution costs. However, this latter option may freeze incentives to progress care technology. If potential injurers are successful in lowering precaution costs, policy makers consequently increase due care standards. This represents an additional marginal cost of innovating for the injurer which is not present in the setting with a uniform due care level. The latter holds because the impact of the decision of a specific type on the optimal uniform due care level is negligible given many injurer types. In the end,

both possibilities available to the policy maker, tailored and uniform due care standards, entail distortions and it will be a matter of their relative size which regime is better. Consequently, our argument for the reasonable person standard is dependent on the context, as is the case for the standard argument referring to unobservable precaution cost functions.

In the literature on the economics of tort law, the rationalization for applying the reasonable person standard by referring to unobservable precaution costs is well established and basically continues to be the sole explanation (see, e.g., Shavell 2007). In order to deal with injurer heterogeneity in precaution costs, Miceli (2006) proposes a negligence rule in which the due standard of care is maximal and liability increases gradually as injurers depart further from this standard. Somewhat along similar lines is the argument by Rubinfeld (1987). In another line of inquiry, there are contributions that have shown that care standards may serve some additional function. For instance, Feess and Wohlschlegel (2006) highlight that due care may transmit information about the harm potential and Friehe (2009) establishes that care standards directed at victims under the liability rule strict liability with the defense of contributory negligence may help to screen heterogeneous victims. Bhole (2007) allows for the policy instruments due care and penalty multiplier and analyzes the ranking of due care and a given desired care level. The interest of our study, i.e. whether potential static inefficiencies due to the application of the reasonable person standard may be rectified by an improvement in dynamic efficiency, has to the best of our knowledge not been the subject of study yet.

Our framework takes into account that care technology may be affected by innovative activities. The standard model of tort law instead takes the costs of taking care as given. The consideration of endogenous care costs has only recently been introduced by Endres and Bertram (2006), and Endres et al. (2007, 2008). These studies establish that both predominant liability rules, strict liability and negligence, may induce first-best investment and care choices. However, the introduction of deviations from the setting without any complications tends to argue for negligence. The reason is that the wise use of the due care level can usually improve on the outcome which results under strict liability. The papers which allow for endogenous care technology all assume homogeneous potential injurers. In contrast, in the analysis at hand, heterogeneity of injurers will be of central concern.

The structure of the paper is as follows. Section 2 presents the social optimum. Particularly, we characterize the socially optimal levels of investment into progressing care technology and the level of care. Decision-making is decentralized in Section 3. Subsection 3.1 (3.2) analyzes the case in which the policy maker uses type-specific standards of care (a uniform due care

level) and Subsection 3.3 compares the regimes. Section 4 concludes.

2 The Social Optimum

We consider a two-period model of a risk-neutral society without discounting. In period 1, the investment in promoting care technology α is determined. This investment comes at cost $g(\alpha, \theta)$, where θ represents injurer type. Type θ is distributed on $[\underline{\theta}, \bar{\theta}]$ according to cumulative distribution function F . For investment costs, it holds that $g_\alpha, g_\theta, g_{\alpha\theta} > 0$, $g_{\alpha\alpha} \geq 0$.¹ This implies that firms with a large θ have higher investment costs in levels and at the margin. In period 2, decision-makers decide on the level of precaution x which lowers expected harm $D(x)$ at a decreasing rate, $D' < 0 < D''$. The level of investment deterministically affects care costs $C(x, \alpha)$, where $C_x, C_{xx}, C_{\alpha\alpha} > 0 > C_\alpha, C_{x\alpha}$. Consequently, investment lowers the level of care costs at a diminishing rate and decreases marginal costs of care.

The policy maker minimizes total social costs which consist of investment and care costs as well as expected harm with respect to care and investment for each type.

$$SC = \int_{\underline{\theta}}^{\bar{\theta}} [D(x(\theta)) + C(x(\theta), \alpha(\theta)) + g(\alpha(\theta), \theta)] dF(\theta) \quad (1)$$

The set of first-order conditions which gives socially optimal care and investment for type θ , $x^*(\theta)$ and $\alpha^*(\theta)$, is given by

$$\frac{\partial D(x^*(\theta))}{\partial x} + \frac{\partial C(x^*(\theta), \alpha^*(\theta))}{\partial x} = 0 \quad (2)$$

$$\frac{\partial C(x^*(\theta), \alpha^*(\theta))}{\partial \alpha} + \frac{\partial g(\alpha^*(\theta), \theta)}{\partial \alpha} = 0 \quad (3)$$

With regard to the optimal level of care, we obtain the standard result that the marginal reduction in expected harm is equal to marginal costs of care, where the latter are evaluated at optimal investment. The marginal benefit from additional investment is the decrease in costs of care and comes at marginal investment costs. The first of the two first-order conditions does not contain the type parameter θ in a direct way. However, given that investment costs are type-specific, we obtain type-specific optimal investment which in turn makes optimal care type-specific due to type-specific marginal costs of care.

¹Subscripts denote partial derivatives.

The comparative statics of the socially optimal levels can be stated as

$$\frac{dx}{d\theta} = \frac{g_{\alpha\theta}C_{x\alpha}}{H} < 0 \quad (4)$$

$$\frac{d\alpha}{d\theta} = -\frac{g_{\alpha\theta}(D_{xx} + C_{xx})}{H} < 0 \quad (5)$$

where H represents the determinant of the Hessian matrix.

As intuition suggests, potential injurers with a higher θ , i.e. higher investment costs, should invest less in progressing care technology and consequently, due to higher marginal costs of care, less in precaution.

3 Decentralization Using Legal Liability

Achieving first-best outcomes by applying liability rules often relies on strict assumptions regarding information available to policy makers (see, e.g., Endres 1989). In the framework delineated, it can be established that first-best behavior can be induced if policy makers know the innovation cost function of each individual party and the cost of care function for each level of investment. In that case, due care would be dependent on the level of investment cost. Certainly, these assumptions regarding the knowledge of the policy maker are very idealistic. In the following, we therefore assume that the policy maker is somewhat less generously equipped with information. Particularly, we assume that the policy maker knows (i) the different innovation costs possible and their respective likelihood, i.e. the distribution of types and the innovation cost function dependent on type, (ii) precaution costs as a function of innovation, and (iii) the actual choice of innovation by a given actor. However, the policy maker cannot observe innovation costs of the party considered.² The information of the policy maker ensures the knowledge of precaution costs of a given potential injurer. Note the marked contrast to the other literature on the reasonable person standard in which regulators do not have information on the level of precaution costs (see, e.g., Shavell 2007). Regarding the information of potential injurers our assumptions are very conventional: we assume that each potential injurer has perfect information on the own type and the cost functions dealt with.

The policy maker may select between two avenues available concerning the standard required to make negligence work. The first option is the application of a due care standard which is

²In line with the bulk of the literature heretofore, we restrict our analysis to the regime of a uniform standard and to a standard tailored to observed precaution costs. In particular, we refrain from designing incentive mechanisms which allow the regulator to solicit information on innovation costs.

tailored to the costs of care of the party at hand. The other possibility is the use of a uniform care standard for all different types. The next subsections present the outcomes under respective options before we come to a comparison in Subsection 3.3.

3.1 Tailored Due Care

In this section, we will consider the following sequence of decisions: At the first stage, potential injurers determine how much to invest in progressing care technology to affect precaution costs. At the second stage, the regulator decides on the due care level tailored to the type knowing the cost of care function. Finally, potential injurers determine the care level which minimizes individual costs. This care level may or may not be equal to the tailored due care level. The game just described will be solved by backward induction.

At the third stage, potential injurers seek to minimize individual costs XC by choosing precaution, given their own determination on the investment α and the policy maker's determination of tailored due care $x_T(\alpha)$.

$$XC_T(\theta) = \begin{cases} C(x, \alpha) + D(x) + g(\alpha, \theta) & \text{if } x < x_T(\alpha) \\ C(x, \alpha) + g(\alpha, \theta) & \text{if } x \geq x_T(\alpha) \end{cases} \quad (6)$$

From this follows that potential injurers will either choose x_T or some $\tilde{x} \leq x_T$ where

$$\tilde{x} = \arg \min \{C(x, \alpha) + D(x) + g(\alpha, \theta)\} \quad (7)$$

The latter is cost-minimizing if

$$C(\tilde{x}, \alpha) + D(\tilde{x}) + g(\alpha, \theta) < C(x_T, \alpha) + g(\alpha, \theta) \quad (8)$$

which can also be stated as

$$D(\tilde{x}) < C(x_T, \alpha) - C(\tilde{x}, \alpha) \quad (9)$$

At the second stage, the policy maker is confronted with the task to minimize social costs by setting a due care level under negligence. We assume in contrast to the literature heretofore that the information on costs of care is publicly available. The decision on innovation has already been made on the first stage and can no longer be affected by the determination of the planner. The objective function of the policy maker when regulating some type θ can be formulated for a given level of innovation α .

$$SC_T = D(x) + C(x, \alpha) + g(\alpha, \theta) \quad (10)$$

The care level which minimizes the given expression will be denoted by $x_T(\alpha)$ and solves

$$\frac{\partial D(x_T(\alpha))}{\partial x} + \frac{\partial C(x_T(\alpha), \alpha)}{\partial x} = 0 \quad (11)$$

The standard of care is a function of the level of investment as the investment affects precaution costs. It holds that

$$\frac{dx_T}{d\alpha} = -\frac{C_{x\alpha}}{(C_{xx} + D_{xx})} > 0 \quad (12)$$

As intuition suggests, the policy maker will apply stricter standards to potential injurers with higher levels of investment, i.e. lower marginal costs of care. This variation is the reason why the literature argues against the reasonable person standard which cannot vary in accordance with the level of precaution costs.

The way in which the policy maker sets the due care level allows to forecast that all actors will adhere to the behavioral standard on Stage 3. The weak inequality (9) cannot be fulfilled if x_T is set to fulfill (11).

The level of investment is determined at the first stage. Potential injurers are in the pursuit of minimal individual costs, anticipating the subsequent stages of decision-making. This means that the potential injurer anticipates the due care level set by the regulator at the second stage and the actual choice of due care at the third stage. This allows to give the objective function of injurer of type θ on Stage 1 as

$$XC_T = C(x_T(\alpha), \alpha) + g(\alpha, \theta) \quad (13)$$

The first-order condition with respect to the level of investment is

$$\frac{\partial XC_T}{\partial \alpha} = \frac{\partial C(x_T(\alpha), \alpha_T)}{\partial x} \frac{\partial x_T(\alpha)}{\partial \alpha} + \frac{\partial C(x_T(\alpha), \alpha_T)}{\partial \alpha} + \frac{\partial g(\alpha, \theta)}{\partial \alpha} = 0 \quad (14)$$

and is solved by α_T for every type θ . The marginal benefit of investment is given by the decrease in the costs of care. This is analogous to the social optimization (see (3)). However, the potential injurer perceives a higher marginal cost due to investment than the policy maker does. This holds due to the fact that the due care standard, which is adhered to, is increased as a consequence of higher investment, i.e. as a consequence of lower marginal costs of care. This has a dampening effect on investment and has first been established in Endres and Bertram (2006).

Proposition 1 *The use of tailored due care standards implies that all potential injurers choose investment and care which is less than socially optimal investment and care.*

Proof. It is obvious from (14) together with (12) and $C_x > 0$ that injurers choose less than first-best investment for any level of care. Given less than socially optimal investment, the due care level which will be chosen by the policy maker and subsequently taken by the actor falls short of the level of care which is first-best for the type at hand, however, is an optimal response to the smaller level of investment. ■

It is important to note that the application of tailored due care incites potential injurers to choose optimal care, given the investment level. Consequently, the application of tailored due care standards performs optimal in this regard given the decisions on the first stage. This optimality of care choices will contrast with care-taking under the reasonable person standard in the next section.

The above describes behavior under tailored due care standards. We obtain a social cost level of

$$SC_T = \int_{\theta}^{\bar{\theta}} [D(x_T(\alpha_T(\theta))) + C(x_T(\alpha_T(\theta)), \alpha_T(\theta)) + g(\alpha_T(\theta), \theta)] dF(\theta) \quad (15)$$

3.2 Uniform Due Care

In this section, we will consider the following sequence of decisions: At the first stage, injurers determine investment in improving care technology. Next, the regulator decides on the due care level applicable to all injurers, i.e. the reasonable person standard. At the third stage, injurers determine the care level which minimizes individual costs. This care level may or may not be equal to the uniform due care level. The game just described will be solved by backward induction.

At the third stage, injurers of type θ minimize individual costs XC by choosing precaution, given their own determination on the investment α and the regulator's determination of uniform due care x_U .

$$XC_U(\theta) = \begin{cases} C(x, \alpha) + D(x) + g(\alpha, \theta) & \text{if } x < x_U \\ C(x, \alpha) + g(\alpha, \theta) & \text{if } x \geq x_U. \end{cases} \quad (16)$$

From this follows that potential injurers will either choose x_U or \tilde{x} as defined above (see (7)). The latter is cost-minimizing if

$$C(\tilde{x}, \alpha) + D(\tilde{x}) + g(\alpha, \theta) < C(x_U, \alpha) + g(\alpha, \theta) \quad (17)$$

which can also be stated as

$$D(\tilde{x}) < C(x_U, \alpha) - C(\tilde{x}, \alpha) \quad (18)$$

This reasoning is analogous to that in Subsection 3.1. However, whereas in equilibrium all potential injurer complied with the tailored due care standard, this need not necessarily hold if due care is uniform across different care cost functions.

Negligence is often understood as a failure to do what the reasonable person would do (see, e.g., Miceli 1997). The derivation of the reasonable person standard minimizes the sum of precaution costs and expected harm against the distribution of precaution costs under the hypothesis that all different injurers take standard care and usually results in the optimal level of care for the person with the mean cost parameter (see, e.g., Shavell 2007). The regulator in our setting knows the different cost functions that occur and their relative frequency and will thus proceed similarly. Social costs to be minimized by setting uniform due care are

$$SC_U = D(x) + \int_{\underline{\theta}}^{\bar{\theta}} [C(x, \alpha(\theta)) + g(\alpha(\theta), \theta)] dF(\theta) \quad (19)$$

The uniform due care standard x_U solves the first-order condition

$$\frac{\partial SC_U}{\partial x} = \frac{\partial D(x_U)}{\partial x} + \int_{\underline{\theta}}^{\bar{\theta}} \frac{C(x_U, \alpha(\theta))}{\partial x} dF(\theta) = 0 \quad (20)$$

This level of care expected from the reasonable person is not affected by changes in the level of investment of some type θ . Consequently, this contrasts with the case outlined in Subsection 3.1 where the standard closely follows the investment decision at Stage 1.³

The uniform due care level is equal to the first-best level of care for only one type θ^+ in the interval $[\underline{\theta}, \bar{\theta}]$. It is higher (lower) than the first-best level of care for potential injurers characterized by $\theta > (<) \theta^+$. Therefore, distortions in the care dimension can be expected.

The extent to which care technology is progressed via investment is not affected by concerns about induced marginal changes in due care as was the case in Subsection 3.1. From this follows that investment in improving care technology will always be greater under the uniform standard of care than under tailored due care standards given that the potential injurer plans to undertake some given level of precaution.

When determining the individually optimal level of investment, the injurer takes as given the due care level and whether taking x_U is cost-minimizing or not. Consequently, the minimization task of the potential injurer on Stage 1 can be stated succinctly as

$$\min\{\min_{\alpha}\{C(x_U, \alpha) + g(\alpha, \theta)\}, \min_{\alpha}\{C(\tilde{x}(\alpha), \alpha) + D(\tilde{x}(\alpha)) + g(\alpha, \theta)\}\} \quad (21)$$

³Obviously, our analysis restricts itself to two extreme cases in this regard. If we were to allow for an intermediate case in which there are only few types so that the choice of a type would impact the reasonable person standard, the advantage of uniform due care would be weakened in an obvious fashion.

Note that the level of the second term is equal to the first-best level of costs for the given type. Given the definition of \tilde{x} stated above (see (7)), the optimal level of investment in order to minimize the second term is $\alpha^*(\theta)$. At the third stage, it holds true that $\tilde{x}(\alpha^*(\theta)) = x^*(\theta)$. This implies that potential injurers will stick to the reasonable person standard and choose investment accordingly if the resultant level of individual costs is below the first-best level of social costs for the type at hand.

In general, we can distinguish three groups and consider two critical types which split respective groups:

(A) For all potential injurers with $\theta \leq \theta^+$, it holds that $x^*(\theta) \geq x_U$ so that it is individually optimal to comply with the uniform due care level. This results because adherence to due care allows for saving expected harm, investment, and precaution expenditures. The individually optimal level of investment follows as $\alpha_U(\theta) = \arg \min\{C(x_U, \alpha) + g(\alpha, \theta)\}$. This level is smaller than the first-best investment level for all injurers with $\theta \in [\underline{\theta}, \theta^+)$.

(B) For all potential injurers with $\theta^{++} \geq \theta > \theta^+$, it also holds that

$$C(x^*(\theta), \alpha^*(\theta)) + D(x^*(\theta)) + g(\alpha^*(\theta), \theta) > C(x_U, \alpha_U) + g(\alpha_U, \theta) \quad (22)$$

For the critical type θ^{++} , the left-hand side and the right-hand side of (22) are equal. In contrast to what holds for individuals from group A, the behavioral standard demands more care of these individuals than accords with the respective first-best levels of care. However, the outlook of circumventing the bearing of expected harm is sufficiently attractive. In order to ameliorate the burden of higher care, these potential injurers also set their investment above the first-best level. As a consequence, members of this group exert care and invest to an excessive extent when seen from the social perspective.

(C) For all potential injurers with $\theta > \theta^{++}$, the standard of care is too demanding. For all of these individuals, it holds that

$$C(x^*(\theta), \alpha^*(\theta)) + D(x^*(\theta)) + g(\alpha^*(\theta), \theta) < C(x_U, \alpha_U) + g(\alpha_U, \theta) \quad (23)$$

The level of care and the level of investment determined by members of group C is first-best, $x^*(\theta)$ and $\alpha^*(\theta)$.

Summarizing, we obtain the following behavior in this regime

Proposition 2 *The use of a uniform due care standard x_U implies that*

- (i) *potential injurers with $\theta \leq \theta^{++}$ take x_U and α_U ,*
- (ii) *potential injurers with $\theta > \theta^{++}$ take $x^*(\theta)$ and $\alpha^*(\theta)$.*

Proof. The proof follows from the above. It is not necessarily the case that indeed all groups and critical types emerge, however. If the variation in innovation costs is very small, it may be that indeed all potential injurers take standard care so that group C collapses. ■

The above describes behavior under uniform due care standards. We obtain a social cost level of

$$\begin{aligned}
SC_U = & \int_{\underline{\theta}}^{\theta^{++}} [D(x_U) + C(x_U, \alpha_U(\theta)) + g(\alpha_U(\theta), \theta)] dF(\theta) \\
& + \int_{\theta^{++}}^{\bar{\theta}} [D(x^*(\theta)) + C(x^*(\theta), \alpha^*(\theta)) + g(\alpha^*(\theta), \theta)] dF(\theta)
\end{aligned} \tag{24}$$

3.3 Comparison of Regimes

We start our comparison of regimes by contrasting behavioral implications. The level of investment always falls short of the first-best level under tailored due care standards. In contrast, the investment level may be too low, optimal or excessive under the uniform due care standard. The same picture emerges with regard to the level of precaution. The suboptimal level of investment induces suboptimal precaution under tailored due care standards. However, potential injurers choose socially optimal care, given the investment levels. Under the regime in which regulators apply a uniform standard of care, the precaution level may again be too low, optimal or excessive for the given type. The choice of precaution is made in a first-best fashion by potential injurers with a sufficiently high θ , i.e. $\theta > \theta^{++}$, but otherwise distorted by the opportunity to avoid bearing expected harm. In expectation, the first regime elicits too little care and investment. In the second regime, it is a priori not clear in which way the average level of care and investment compares to the first best.

The advantageousness of one regime over the other clearly cannot be deduced from the contrasting of respective behavioral implications. Both regimes imply higher social costs than first-best behavior and it will very likely depend on the context which regime comes out first. As a next step, we contrast the respective levels of social costs. It proves to be advantageous to apply a reasonable person standard if $SC_{TDC} - SC_{UDC} > 0$ holds. We restate the terms used above, (15) and (24), to give an explicit expression.

$$\begin{aligned}
SC_T - SC_U = & \\
& \int_{\underline{\theta}}^{\theta^+} [D(x_T(\alpha_T(\theta))) + C(x_T(\alpha_T(\theta)), \alpha_T(\theta)) + g(\alpha_T(\theta), \theta) \\
& - [D(x_U) + C(x_U, \alpha_U(\theta)) + g(\alpha_U(\theta), \theta)]] dF(\theta) \\
& + \int_{\theta^+}^{\theta^{++}} [D(x_T(\alpha_T(\theta))) + C(x_T(\alpha_T(\theta)), \alpha_T(\theta)) + g(\alpha_T(\theta), \theta) \\
& - [D(x_U) + C(x_U, \alpha_U(\theta)) + g(\alpha_U(\theta), \theta)]] dF(\theta) \\
& + \int_{\theta^{++}}^{\bar{\theta}} [D(x_T(\alpha_T(\theta))) + C(x_T(\alpha_T(\theta)), \alpha_T(\theta)) + g(\alpha_T(\theta), \theta) \\
& - [D(x^*(\theta)) + C(x^*(\theta), \alpha^*(\theta)) + g(\alpha^*(\theta), \theta)]] dF(\theta)
\end{aligned} \tag{25}$$

The respective lines are arranged as to recognize the three different groups characterized in the subsection on uniform due care, A, B, and C. In the first two lines, potential injurers choose too little care and investment under both regimes (Group A, i.e. $\theta \leq \theta^+$). The distortion under the tailored due care level is relatively more (less) pronounced than under uniform due care the smaller (greater) the difference in type to the critical level θ^+ . This results because behavior under the reasonable person standard approximates first-best behavior for θ close to θ^+ . The second two lines depict potential injurers from Group B (i.e. $\theta^+ < \theta \leq \theta^{++}$). These individuals choose too small (large) levels of investment and precaution under tailored (uniform) due care. Given uniform due care, the problem will be negligible if θ is close to θ^+ , but all the more present for large θ . Finally, the last two lines reflect potential injurers from Group C (i.e. $\theta > \theta^{++}$) who act in a first-best manner under uniform due care. Consequently, the last two lines certainly give a positive sign.

Proposition 3 *The reasonable person standard implies smaller social costs than due care levels tailored to precaution costs if*

- (i) *the difference in types is sufficiently small, or*
- (ii) *the density is sufficiently concentrated around θ^+ .*

Proof. (i) Suppose that $\bar{\theta} - \underline{\theta} = \epsilon$ where $\epsilon \rightarrow 0$, then there is no group C because x_U is not much different from $x^*(\theta)$ for all θ and, consequently, α_U is not much different from $\alpha^*(\theta)$ for all θ . In contrast, the distortion in the investment level arises under the regime with tailored due care levels, which also entails a deviation in care taken. Consequently, $SC_{TDC} - SC_{UDC} > 0$

will hold true.

(ii) Suppose that density $F'(\theta)$ is very much concentrated around θ^+ . In that case, the bulk of potential injurers behave in a more or less first-best manner under the reasonable person standard because x_U and α_U are similar to $x^*(\alpha)$ and $\alpha^*(\theta)$, respectively, whereas there is no general argument for x_T and α_T being close to first-best levels. Consequently, potential downsides of applying the reasonable standard of care would be overcompensated, implying a lower level of social costs under the uniform due care level. ■

The proposition spells out that the reasonable person standard is better than tailored due care levels whenever differences among individuals are sufficiently small or if the majority of the population is not too different from the mean type. Particularly the latter case is likely to be descriptive for many settings in reality. For instance, when it comes to avoiding harm resulting from product use, it is plausible to assume that the majority of firms will use more or less standard technology implying similar cost levels whereas some outliers exist which use outstanding or mediocre technology, corresponding to very efficient or very costly care-taking.

Proposition 4 *The reasonable person standard implies larger social costs than due care levels tailored to care cost functions if the effect from due care adaptation on investment incentives, i.e. $\frac{\partial C(x_T, \alpha_T)}{\partial x} \frac{\partial x_T}{\partial \alpha}$, is relatively small.*

Proof. As delineated in Subsection 3.1, the investment decision of potential injurers is distorted under tailored due care levels because of the effect following from the adaptive due care level. Only as a consequence of the distorted investment will injurers choose insufficient precaution. Therefore, if the distortion in the decision on investment is sufficiently small, i.e. if $\frac{\partial C(x_T, \alpha_T)}{\partial x} \frac{\partial x_T}{\partial \alpha}$ is close to zero, then the reasonable person standard cannot outperform tailored due care levels in our framework. ■

Our argument in favor of the reasonable person standard relies on avoiding the inhibiting effect regarding investment that results from an adaptive due care level. Consequently, if the adaptation in due care only weakly impacts investment incentives at the margin, the reasonable person standard will often be disadvantageous regarding the minimization of social costs. The distortion in the investment calculus may be small if

$$\frac{dx_T}{d\alpha} = -\frac{C_{x\alpha}}{(C_{xx} + D_{xx})}$$

is not much different from zero. This will be true, for instance, if $\frac{\partial^2 C(x_T, \alpha_T)}{\partial x \partial \alpha}$ is close to zero, i.e. if the impact of additional investment on the marginal costs of care is exhausted at (x_T, α_T) .

Note that this is different from investment having a negligible impact on precaution costs in general. The above result may also be termed in favor of the uniform care standard. We conjecture that the application of the reasonable person standard is the more desirable the more pronounced the inhibiting factor resulting from increases in due care under tailored due care levels is.

4 Conclusion

The reasonable person standard is a very important concept empirically due to the fact that negligence is the predominantly applied liability rule in most jurisdictions and the fact that homogeneous injurer populations are a theoretical abstraction. Consequently, it is of central concern whether the approach chosen by the application of uniform behavioral standards for heterogeneous populations can be defended from an efficiency perspective.

The efficiency defense of the present literature is as follows: The reasonable person standard implies distortions in the care-taking of parties characterized by different precaution costs but the ensuing increase in social costs is dwarfed by the saving in administrative costs. If we were to apply due care levels tailored to the cost function, regulators would have to invest tremendous amounts in finding out the precaution costs of the party at hand by utilizing expert judgments and the like.

We forward a complementary efficiency defense for the reasonable person standard without referring to administration cost savings. Our argument instead relies solely on incentives. In a dynamic framework, we establish that distorted care decisions may be more than compensated when it comes to the level of social costs by the inducement of better behavior in another behavioral dimension. Potential injurers' decision on the care technology to use, a decision that is not regulated by some standard, may be more efficient under a uniform standard because injurers need not worry about increases in the due care level subsequent to the achievement of less costly care-taking. To put our result in a somewhat more general context, we find that it may be optimal to regulate a population of heterogeneous agents with a uniform standard if the observed heterogeneity is endogenous.

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