TORT-RELATED RISK COSTS AND THE FIRST-BEST ECONOMIC INEFFICIENCY OF THE HAND FORMULA FOR NEGLIGENCE: HOW TO FIX THE FORMULA WHEN IT CAN BE FIXED AND WHY IT SOMETIMES CANNOT BE FIXED

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Negligence and the related concepts of contributory comparative negligence play an important role in the common law of torts. In 1947, Judge Learned Hand developed a formula for negligence,¹ which U.S. courts have increasingly adopted. According to this formula, an injurer’s rejection of the avoidance-move that would be most profitable or least unprofitable for him to make if he would otherwise have to compensate his victims for any actual accident-or-pollution loss his rejection of this move imposed on them (henceforth, the injurer’s “privately-best” avoidance-move) is negligent if \( B_i < (\downarrow PL)_V \) for the move in question. In this formula, “\( B_i \)” stands for the burden (B) or private cost to the potential injurer (I) of the avoidance-move in question, “\( P \)” stands for the probability of the loss in question, “\( L \)” stands for the magnitude of the loss in question (or, more precisely, “[\( PL \)]_V” stands for the weighted-average-expected loss associated with the probability distribution of the various possible losses the victim [\( V \)] might suffer), and “(\( \downarrow PL \))_V” stands for the amount by which \( I \)’s “privately-best” avoidance-move would reduce the weighted-average-expected loss confronting the victim in question.²

As operationalized by Hand, the concepts of negligence, contributory negligence, and comparative negligence have also played critical roles both in Law & Economics scholars’ studies of tort law and my own analysis of tort-law-related liberal moral rights. Law & Economics scholars endorse the Hand formula for negligence because they believe that (1) in combination with analogously-defined concepts of contributory or comparative negligence, its use will maximize economic efficiency, (2) as a matter of policy, the law of torts should be assessed exclusively by its impact on economic efficiency, and (3) if (contrary to the view of many economists) there are responses to tort-law claims that are uniquely correct as a matter of law, those responses are the most-economically-efficient responses courts could make to the claims in question.³ I have argued that liberalism supports the use of the concepts of negligence and comparative negligence as operationalized by Hand formulas to resolve tort claims in cases in which (1) the weighted-average-expected equivalent-dollar losses that a rejected avoidance-move would have prevented would not have involved the victim’s losing their capacities to act as

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moral agents and (2) it would not have been economically efficient for the potential injurer to take account of the divergences between the private costs and benefits of the relevant avoidance-moves (on which the Hand formula focuses) and the allocative costs and benefits those moves would have generated.\(^4\)

Unfortunately, neither (1) the standard Law & Economics analysis of the economic efficiency of negligence/contributory-negligence or comparative-negligence tort-law regimes in which the concepts of negligence, contributory negligence, and comparative negligence are operationalized through Hand-type formulas nor (2) my own analysis of the ability of a comparative negligence regime in which negligence and contributory negligence are operationalized through Hand-type formulas to secure liberal tort-law-related moral rights takes account of the implications of the fact that the Hand formula for negligence ignores the possibility that a potential injurer’s privately-best avoidance-move may affect

\[(1) \text{ the risk costs that potential victims bear because they may not be fully compensated for any loss they sustain and any private transaction costs they have to incur to secure redress or compensation (R}_V).\]

\[(2) \text{ the risk costs that potential injurers bear because they may have to compensate their victims or incur private transaction costs to respond to tort claims made against them (R}_I) \text{ and, most importantly,}\]

\[(3) (R}_V + R}_I)\] \(^5\)

Nor have we noted that or thought through the consequences of the failure of the Hand formulas for contributory and comparative negligence to take account of the possible impact respectively of potential-victim and potential-victim and potential-injurer avoidance to change (R}_V + R}_I). Of course, Law & Economics scholars in general and I have recognized both the existence of tort-related risk costs—for example, when investigating the possible impact of particular legal regimes or tort insurance on them. However, Law & Economics scholars have not thought through the implications of the fact that avoidance can affect the sum of such risk costs that potential injurers, potential victims, and various third parties bear for the coherence of Hand formulas for negligence, contributory negligence, and comparative negligence or for the ability of a tort-law regime that employs it to induce potential accident-loss generators to make allocatively-efficient avoidance-choices\(^6\) (on the no-related-transaction-cost and otherwise-
Pareto-perfect assumptions that standard Law & Economics [first-best-allocative-efficiency] analyses make and that, for simplicity, this Article adopts). I am equally guilty: my analysis of the role that Hand-type formulas for these concepts cold play in a tort law that was designed to secure liberal moral rights also ignored the problems caused by the fact that avoidance moves may alter total tort-related risk costs.

This Article focuses on the implications of the fact that accident-loss avoidance-moves can affect \((R_V+R_I)\) for the ability of a tort-law regime that uses a Hand-operationalized negligence doctrine to secure economically-efficient avoidance on the first-best assumptions that Law & Economics economic-efficiency analyses almost always employ. Its arguments and conclusions will apply *mutatis mutandis* to my own claim that in some cases such a regime will instantiate liberal values. More specifically, the Article addresses three issues: (1) will the application of the standard Hand formula for negligence induce the potential injurer to make a first-best-allocatively-efficient avoidance-decision in all cases in which the potential injurer’s privately-best avoidance-move will affect the sum of his and his potential victim’s loss-related risk costs; (2) in cases in which the potential injurer’s privately-best avoidance-move will affect the sum of the risk costs that he and his victims bear, will it always be possible to induce the potential injurer to make the *ex ante* first-best-allocatively-efficient avoidance-decision by adding a “change in risk cost” term to the right-hand side of the standard Hand inequality; and (3) when it is possible to secure this outcome in such cases by adding such a term, will the revision in the Hand formula that will do the trick be straightforward or paradoxical. For simplicity, the Article’s first-best-allocative-efficiency analysis of these questions will focus exclusively on no-care situations (in which the most-allocatively-efficient response to the possibility of an accident-or-pollution loss’ being generated is for no-one to avoid) and potential-injurer individual-care situations (in which the most-allocatively-efficient response to the loss-possibility is for the potential injurer to avoid)—*i.e.*, this Article will assume that potential-victim avoidance can make no positive contribution to allocative efficiency. None of the Article’s conclusions depends on this feature of its analysis.

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Before writing this Article, I asked several Law & Economics scholars who had analyzed the allocative efficiency of various tort-law doctrines how the Hand formula would have to be
revised in light of tort-related risk costs for the resulting formula for liability to be first-best-allocatively-efficient. Without exception, these experts responded that this objective could always be achieved simply and straightforwardly by adding a “change in risk cost” term to the right-hand side of the standard Hand inequality.

The Article demonstrates that this proposed revision of the Hand formula for negligence is underspecified, that in some cases the required revision will be not only more complicated but far less straightforward than my collocutors suppose, and that in other cases one will not be able to induce potential injurers to make ex ante first-best-allocatively-efficient avoidance-decisions by adding to the right-hand side of the standard Hand inequality any of the “change in risk cost” terms that the economists with whom I spoke distinguished in the course of our conversations. Let me be more specific. The revision of the Hand formula that the relevant economists initially proposed was underspecified in two respects: (1) they did not indicate whether the “change in risk cost” (ΔR) term that they were proposing be added to the right-hand side of the standard Hand inequality was a ΔRI, ΔRV, or Δ(RI+RV) term, and (2) they did not specify the assumption about the percentages of any loss that would be caused by the potential injurer’s rejection of his privately-best avoidance-move that would be borne by I and V respectively on which the relevant “change in risk cost” figure would be based. This second omission is salient because, in some cases, (1) the absolute change the I’s privately-best avoidance-move will make in (RI+RV) will depend on the proportions of any resulting loss that will be borne by I and V respectively (henceforth, for simplicity, on whether I or V is liable) and relatedly (2) the critical character of the impact of (A) the change in (RI+RV) that the relevant avoidance-move would generate on (B) its allocative efficiency will itself be critically affected by whether I or V would be liable for any loss generated by I’s rejection of his privately-best avoidance-move. The claim that the revision of the Hand formula for negligence that will induce potential injurers to make ex ante first-best-allocatively-efficient avoidance-decisions will be straightforward is overbroad because in some cases in which it will be possible to induce potential injurers to make first-best-allocatively-efficient avoidance-decisions by adding a “change in risk cost” term to the right-hand side of the standard Hand inequality the required revision entails adding a victim-liable Δ(RI+RV) term to the right-hand side of the standard Hand inequality to generate the legal conclusion that the injurer will be liable for any loss that results from his rejection of his privately-best avoidance-move (that his rejection of this move will be negligent). And the claim that on our standard first-
best-allocative-efficiency-analysis assumptions it will always be possible to induce potential injurers to make *ex ante* first-best-allocatively-efficient decisions about risk-cost-affecting avoidance-moves by adding some $\Delta(R_I+R_V)$ term to the right-hand side of the standard Hand inequality is also wrong because—in some cases in which the critical character of the impact of (1) the change in $(R_I+R_V)$ generated by $I$’s privately-best avoidance-move on (2) its allocative efficiency is itself critically affected by whether $I$ or $V$ will be liable for any loss that $I$’s rejection of this move causes—no such revision in the Hand formula will be able to induce potential injurers whose privately-best avoidance-moves affect $(R_I+R_V)$ to make *ex ante* first-best-allocatively-efficient avoidance-decisions.

It is useful to distinguish eight subsets of the fairly-general set of cases in which $I$’s privately-best avoidance-move would affect $(R_I+R_V)$. Before delineating the distinguishing characteristics of each such subset of cases, I should point out that all will be defined and analyzed on the standard first-best-allocative-efficiency-analysis assumptions that the economy is otherwise-Pareto-perfect and that no private or allocative transaction costs will have to be generated either to satisfy the relevant Pareto-optimal conditions or (somewhat relatedly) to make, defend, or process any relevant tort claim. In the current context, these assumptions guarantee two sets of important relationships. First, they guarantee that all private figures equal their allocative counterparts: that the private cost of any potential-injurer avoidance-move—$B_I$—equals the allocative cost of that move and that the *ex ante* private benefits of any potential-injurer avoidance-move—its impact on certainty-equivalent accident-or-pollution losses (its impact on weighted-average-expected accident-or-pollution losses *plus* its impact on the sum of any related risk costs) equals the *ex ante* allocative benefits that move would generate. Second, and partially relatedly, the assumptions of first-best-allocative-efficiency analysis guarantee that victims of negligence will have to bear none of the losses caused by their injurer’s negligence (that negligent injurers will have to bear all the accident-and-pollution losses their negligence causes) and that victims of non-negligent conduct will have to bear all the accident-and-pollution losses caused by their injurer’s non-negligent conduct (that non-negligent injurers will have to bear none of the losses their non-negligent conduct causes). The analyses that follow will also all assume that the potential injurer will be held liable if and only if the loss in question was attributed to his negligence and that the negligence of the potential injurer’s avoidance-decision will be determined by the application of a Hand-type formula.
In the text that follows, the statement that an I’s privately-best avoidance-move “will critically reduce \((R_I+R_V)\)” indicates that the fact that it will reduce \((R_I+R_V)\) renders it *ex ante* first-best allocatively efficient when it would not otherwise be so. Relatedly, the statement that an I’s privately-best avoidance-move “will critically increase \((R_I+R_V)\)” indicates that the fact that it will increase \((R_I+R_V)\) renders it *ex ante* first-best allocatively inefficient when it would otherwise have been *ex ante* first-best allocatively efficient. Finally, the statement that an I’s privately-best avoidance-move “will not critically affect \((R_I+R_V)\)” though it will affect \((R_I+R_V)\)” indicates that the move’s impact on \((R_I+R_V)\) will not critically affect its allocative efficiency—*i.e.*, will not render a move that would otherwise have been *ex ante* first-best allocatively efficient *ex ante* first-best allocatively inefficient or *vice versa*.

I should now be able to delineate the eight subsets of the general set of cases in which a potential injurer’s privately-best avoidance-move will affect \((R_I+R_V)\):

1. cases in which I’s privately-best avoidance-move would reduce \((R_I+R_V)\) but would not do so critically, regardless of whether I or V would be liable for any losses I’s rejection of his privately-best avoidance-move imposes on V;

2. cases in which I’s privately-best avoidance-move would increase \((R_I+R_V)\) but would not do so critically, regardless of whether I or V would be liable for any losses I’s rejection of his privately-best avoidance-move imposes on V;

3. cases in which I’s privately-best avoidance-move would critically reduce \((R_I+R_V)\), regardless of whether I or V is liable;

4. cases in which I’s privately-best avoidance-move would critically reduce \((R_I+R_V)\) if and only if V is liable;

5. cases in which I’s privately-best avoidance-move would critically reduce \((R_I+R_V)\) if and only if I is liable;

6. cases in which I’s privately-best avoidance-move would critically increase \((R_I+R_V)\) regardless of whether I or V is liable;

7. cases in which I’s privately-best avoidance-move would critically increase \((R_I+R_V)\) if and only if V is liable; and

8. cases in which I’s privately-best avoidance-move would critically increase \((R_I+R_V)\) if and only if I is liable.
The text that follows will examine each of these subsets of the more general set of cases in which a potential injurer’s privately-best avoidance-move would affect \((R_f+R_v)\) to determine into which of the following four “outcome-categories” of cases their members belong. Before delineating these “outcome-categories,” I want to make two points: (1) the text that follows will continue to use the expression “subsets of cases” to refer to the eight classes of cases previously distinguished and the expression “outcome-categories of cases” to refer to the four classes of cases I am about to distinguish and (2) different members of some individual subsets of cases will belong in different outcome-categories of cases as I have defined these two italicized concepts. The four outcome-categories of cases I will distinguish are:

1. cases in which the standard Hand formula will induce the potential injurer to make the \textit{ex ante} first-best-allocatively-efficient avoidance-decision—the cases in subsets (1), (2), and (5) in the preceding list;

2. cases in which application of the standard Hand formula will not induce a potential injurer to make a first-best-allocatively-efficient avoidance-decision and one will not be able to induce potential injurers to make first-best-allocatively-efficient avoidance-decisions by adding either an injurer-liable or a victim-liable \(\Delta(R_f+R_v)\) term to the right-hand side of the standard Hand inequality—some cases in subset (4) and all cases in subset (8) in the preceding list;

3. cases in which the application of the standard Hand formula will not induce potential injurers to make a first-best-allocatively-efficient avoidance-decision but a straightforward alteration in the standard Hand formula would produce an operationalization of negligence whose application would induce potential injurers to make first-best-allocatively-efficient avoidance-decisions—all cases in subsets (3), (5), (6), and (7) in the preceding list; and

4. cases in which the standard Hand formula would have to be altered in a paradoxical way to produce an operationalization of negligence whose application would induce potential injurers to make first-best-allocatively-efficient avoidance-decisions—some cases in subset (4) in the preceding list.

I will now proceed to analyze the eight subsets of cases previously distinguished to determine (1) whether the standard Hand formula would induce the potential injurer they involve to make the \textit{ex ante} first-best-allocatively-efficient avoidance-decision, (2) whether—if the standard Hand formula would not achieve this objective—\textit{ex ante} first-best allocative efficiency could be secured by adding or subtracting a \(\Delta(R_f+R_v)\) term to the right-hand side of the standard Hand inequality, and (3) whether—when first-best allocative efficiency can be secured in this
way—the required revision of the standard Hand formula should be characterized as straightforward or paradoxical.

In three subsets of the general set of cases in which the potential injurer’s privately-best avoidance-move would affect \((R_I+R_V)\) the application of the standard Hand formula would induce the potential injurer to make his first-best-allocatively-efficient avoidance-decisions—subsets (1), (2), and (5). Subset (1) contains all cases in which \(I\)’s privately-best avoidance-move would reduce \((R_I+R_V)\) but would not do so critically, regardless of whether \(I\) or \(V\) would be liable for any loss \(I\)’s rejection of this move generated. The following example illustrates this subset of cases. Assume that, for \(I\)’s privately-best avoidance-move, \(B_I=$100\), \((\downarrow PL)_I=$105\), \((\downarrow (R_I+R_V))=$8\) if the potential injurer is liable for any loss his rejection of his privately-best avoidance-move generates, and \((\downarrow (R_I+R_V))=$10\) if the potential victim is liable for any such loss On our first-best-allocative-efficiency-analysis assumptions, these numerical assumptions warrant the following five conclusions or sets of conclusions:

1. \(B_I=$100\) is lower than \((\downarrow PL)_I=$105\), is lower than the value that \(((\downarrow PL)_I+\downarrow (R_I+R_V))\) would have if \(I\) were liable \(($105+$8=$113)\), and is lower than the value that \(((\downarrow PL)_I+\downarrow (R_I+R_V))\) would have if \(V\) were liable \(($105+$10=$115)\);

2. if the negligence of the relevant \(I\)’s rejection of his privately-best avoidance-move were assessed by the standard Hand formula for negligence, his rejection of this move would be deemed negligent (since \(B_I=$100<[(\downarrow PL)_I=$105]\);

3. if the negligence of the relevant \(I\)’s rejection of his privately-best avoidance-move were assessed by a Hand-type formula in which either a victim-liable or an injurer-liable \((\downarrow (R_I+R_V))\) term was added to the right-hand side of the standard Hand inequality, \(I\)’s rejection of his privately-best avoidance-move would also be deemed negligent (given that \(B_I=$100<\text{both }[(\downarrow PL)_V \text{ plus the injurer-liable } \downarrow (R_I+R_V)=$105+$8=$113] \text{ and } [(\downarrow PL)_V \text{ plus the victim-liable } \downarrow (R_I+R_V)=$105+$10=$115)];

4. the use of any of these three Hand-type formulae to assess the negligence of \(I\)’s rejection of his privately-best avoidance-move would induce him to make this move: this conclusion reflects the fact that the private cost to the potential injurer of making this move \((B_I=$100)\) is lower than the cost to him of rejecting it when he is legally obligated to compensate his victim for any loss his rejection of this move imposes on the \(V\) (the $105 of damages he should expect on the weighted average to have to pay his victims because he rejected the move in question plus the risk costs this liability would impose on him, which are $8 higher than the risk
costs he would have borne in connection with any accident-or-pollution loss his non-negligent conduct might have imposed on his potential victims had he been strictly liable); and

(5) the avoidance-move in question will be _ex ante_ first-best allocatively efficient since \( B_I = \$100 = \text{the allocative cost of the avoidance-move is lower than } ([\downarrow PL]_V \text{ plus the injurer-liable } [R_I+R_V] = \$113).\)

In short, in all cases in subset (1), both the standard Hand formula and variants of that formula in which either an injurer-liable or a victim-liable \([R_I+R_V]\) term is added to the right-hand side of the standard Hand inequality would induce the potential injurer to make a first-best-allocatively-efficient avoidance-decision (to make his first-best-allocatively-efficient, privately-best avoidance-move). I should note that although the addition of an injurer-liable \([R_I+R_V]\) term to the right-hand side of the standard Hand inequality would be both conceptually warranted and straightforward in these cases (since the injurer would be liable in the cases in question if the resulting variant of the Hand formula were used to assess his negligence), the addition of a victim-liable \([R_I+R_V]\) term would be somewhat peculiar since it would not affect the fact that the victim would not be liable (the fact that the potential injurer would be liable for his [negligent] rejection of his privately-best avoidance-move).

Subset (2) contains cases in which \( I \)'s privately-best avoidance-move would increase \((R_I+R_V)\) but would not do so critically. Before delineating an example that illustrates this subset of cases, I should point out that because the \( \Delta(R_I+R_V)\) that the privately-best avoidance-move generates in this subset of cases is an increase in \((R_I+R_V)\), the relevant change \((\uparrow |R_I+R_V|)\) must be subtracted from \((\downarrow PL)_V\) when calculating the private and allocative benefits that the avoidance-move in question will generate, and the revisions of the Hand formula that one might consider in these situations must involve the subtraction of an injurer-liable or victim-liable \((R_I+R_V)\) term from the right-hand side of the standard Hand inequality. The following example illustrates this subset of cases. Assume that, for \( I \)'s privately-best avoidance-move, \( B_I = \$105, (\downarrow PL)_V = \$100, \uparrow (R_I+R_V) = \$8\) if the potential injurer is liable for any loss his rejection of his privately-best avoidance-move generates, and \(\uparrow (R_I+R_V) = \$10\) if the potential victim is liable for any such loss. On our first-best-allocative-efficiency-analysis assumptions, these numerical assumptions warrant the following five conclusions or sets of conclusions:
(1) \( B_I = $105 \) exceeds \( (\downarrow PL)_I = $100 \), exceeds the value that \( (\downarrow PL) \rightarrow (R_I + R_V) \) would have if \( I \) were liable \( ($100 - $8 = $92) \), and exceeds the value that \( (\downarrow PL) \rightarrow (R_I + R_V) \) would have if \( V \) were liable \( ($100 - $10 = $90) \); 

(2) the application of the standard Hand formula for negligence would fail to induce \( I \) to make the avoidance-move in question—\( i.e. \), would fail to make it conventionally profitable for him to make the move—because it would yield the conclusion that his rejection of this move was negligent (since \( B_I = $105 > (\downarrow PL)_I = $100 \)); \( a \) fortiori

(3) the application of a variant of the standard Hand formula in which either a victim-liable or an injurer-liable \( \uparrow (R_I + R_V) \) term is subtracted from the right-hand side of the standard Hand inequality would fail to induce the \( I \) to make the avoidance-move in question since both of these revised formulae would yield the conclusion that \( I \)’s rejection of his privately-best avoidance-move was not negligent (given that \( B_I = $105 > \) both \( (\downarrow PL)_I \) \( \rightarrow \) the injurer-liable \( \uparrow (R_I + R_V) \) = $92 \) and \( (\downarrow PL)_I \) \( \rightarrow \) the victim-liable \( \uparrow (R_I + R_V) \) = $90); 

(4) regardless of whether the negligence of the relevant \( I \)’s rejection of his privately-best avoidance-move is assessed by the standard Hand formula or by either risk-cost-effect-adjusted variant of the standard Hand formula, he would not avoid since the cost to him of avoiding \( (B_I = $105) \) would exceed the cost to him of not avoiding (zero) since his rejection of the avoidance-move in question would be deemed not negligent and he would be liable only for the consequences of his negligence; and

(5) the avoidance-move in question will be \( ex \) \( ante \) first-best allocatively inefficient (since \( B_I = $105 \) = the allocative cost of the avoidance-move exceeds \( (\downarrow PL)_I \) \( \rightarrow \) the victim-liable \( \uparrow (R_I + R_V) \) = $90). 

In short, in all cases in subset (2), both the standard Hand formula and variants of that formula in which either an injurer-liable or a victim-liable \( \uparrow (R_I + R_V) \) term is subtracted from the right-hand side of the standard Hand inequality would induce the potential injurer to make a first-best-allocatively-efficient avoidance-decision (to reject his first-best-allocatively-inefficient, privately-best avoidance-move). Neither this conclusion nor its subset (1) counterpart should be surprising. Both reflect the fact that, in the two subsets of cases in question, neither (1) the legal conclusion about the negligence of the potential injurer’s decision to reject his privately-best avoidance-move, nor (2) the potential injurer’s decision whether or not to make that move, nor (3) the first-best allocative efficiency of the move in question will be affected by whether the negligence of the potential injurer’s rejection of his privately-best avoidance-move is assessed by the standard Hand formula or by a variant of that formula created by adding or subtracting a
victim-liable or an injurer-liable $\Delta(R_I+R_V)$ term to the right-hand side of the standard Hand inequality.\textsuperscript{10}

In one other subset of cases I have distinguished—subset (5), the standard Hand formula (as well as both risk-cost-adjusted variants of that formula) will induce the potential injurer to make a first-best-allocatively-efficient avoidance-decision. Subset (5) contains all cases in which $I$’s privately-best avoidance-move would reduce $(R_I+R_V)$ regardless of whether $I$ or $V$ is liable, $I$’s privately-best avoidance-move would reduce $(R_I+R_V)$ by more if $I$ is liable than if $V$ is liable, and (relatedly) the impact of $I$’s privately-best avoidance-move on $(R_I+R_V)$ will critically affect its 	extit{ex ante} first-best allocative efficiency (viz., will render 	extit{ex ante} first-best allocatively efficient a move that would otherwise have been 	extit{ex ante} first-best allocatively inefficient) if and only if $I$ is liable. The following example illustrates this subset of cases. Assume that, for $I$’s privately-best avoidance-move, $B_I=$105, $\downarrow\text{PL}_V=$100, $\downarrow(R_I+R_V)=$8 if the potential injurer is liable, and $\downarrow(R_I+R_V)=$3 if the potential victim is liable. On these assumptions, $B_I=$105 exceeds both $\downarrow\text{PL}_V=$100 and ($\downarrow\text{PL}_V$ plus the victim-liable $\downarrow[R_I+R_V]=$100+$3=$103), but $B_I=$105 is lower than ($\downarrow\text{PL}_V$ plus the injurer-liable $\downarrow[R_I+R_V]=$100+$8=$108). Given the fact that on our first-best-allocative-efficiency-analysis assumptions all private figures equal their allocative counterparts, the following four conclusions or sets of conclusions are warranted:

1. it will be 	extit{ex ante} first-best allocatively efficient for the potential injurer to make the avoidance-move in question if he would have to bear the accident-or-pollution loss that the move might prevent (since the 	extit{ex ante} allocative benefits of his making this move in the specified circumstances—$100+$8=$108—exceed the allocative cost of his doing so—$B_I=$105);

2. it will be 	extit{ex ante} first-best allocatively inefficient for the potential injurer to make the avoidance-move in question if the potential victim would have to bear any accident-or-pollution loss the move might prevent (if $I$ would not have to compensate his victim for such losses) since on that assumption the 	extit{ex ante} allocative benefits that the relevant avoidance-move would generate—$100+$3=$103$ (where $3$ equal the risk costs that $I$’s non-avoidance would impose on $V$ because $V$ would have to bear any loss caused by $I$’s rejection of his privately-best avoidance-move) will be lower than the allocative cost of $I$’s making the avoidance-move in question—$B_I=$105;

3. if the Hand formula is altered by adding the injurer-liable $\downarrow(R_I+R_V)$ to the right-hand side of the standard Hand inequality, (A) the potential injurer will be found negligent for rejecting the avoidance-move in question (since $B_I=$105$<\downarrow\text{PL}_V$
plus the injurer-liable  \( \downarrow[R_I + R_V] = $100 + $8 = $108 \), (B) I will therefore avoid since the private cost to I of the relevant avoidance-move (\( B_I = $105 \)) will be lower than the sum of the damages he will expect on the weighted average to have to pay V ($100) if he rejects the avoidance-move in question and the risk costs I will bear in relation to this obligation, which will equal the risk costs I would have borne had he been strictly liable in relation to his liability for the losses he might have imposed on V had he made his privately-best avoidance-move plus the additional $8 in risk costs he would bear if he were liable as a result of his rejecting this avoidance-move, and (C) the decision by I to make the avoidance-move in question will be \textit{ex ante} first-best allocatively efficient since the allocative cost of his making the move in question (\( B_I = $105 \)) will be lower than the \textit{ex ante} allocative benefits the move would generate once it is clear that he would be liable for rejecting it ($100 + $8 = $108); and, by way of contrast,

\[(4)\] if the Hand formula is either not altered or altered by adding the victim-liable  \( \downarrow[R_I + R_V] \) to the right-hand side of the standard Hand inequality, (A) the potential injurer’s rejection of the avoidance-move in question will not be found negligent (since \( B_I = $105 \) will exceed both \( \downarrow[PL]_I = $100 \) and \( \downarrow[PL]_V \) plus the victim-liable  \( \downarrow[R_I + R_V] = $100 + $3 = $103 \)), (B) the potential injurer will therefore not avoid, and (C) the potential injurer’s rejection of the avoidance-move in question will be \textit{ex ante} first-best allocatively efficient since the move’s allocative cost (\( B_I = $105 \)) will exceed the ($100 + $3 = $103) in \textit{ex ante} allocative benefits it would generate in the specified circumstances, given that those benefits will include the $3 reduction in risk costs the move will generate if the Hand formula were either not altered or altered in the above way since in either event I’s rejection of the move in question will not be found negligent and V will therefore bear the risk the rejection created.

These conclusions imply that in subset (5), (1) the standard Hand formula will be able to induce the potential injurer to make an \textit{ex ante} first-best-allocatively-efficient avoidance-decision and (2) the addition of either an injurer-liable or a victim-liable  \( \downarrow[R_I + R_V] \) term to the right-hand side of the standard Hand inequality will not cause the use of the resulting formula to be misallocative. The only puzzling feature of these conclusions is that the addition of an injurer-liable term to the right-hand side of the standard Hand inequality will not be misallocative despite the fact that it will induce the potential injurer to make an avoidance-move he would have rejected if his negligence and liability were to be determined by the standard Hand formula because this alteration in the formula would critically affect the \textit{ex ante} first-best allocative efficiency of the avoidance-move in question precisely by changing the legal assessment of its negligence and hence the risk-cost consequences of its rejection.

For both expositional reasons and to retain the interest of any readers who have come this far, I will now analyze the subsets of cases in which (1) the application of the standard Hand
formula will not induce the potential injurer to make a first-best-allocatively-efficient avoidance-decision and (2) it may not be possible or will not be possible to secure such decisions by adding or subtracting either a victim-liable or an injurer-liable \( \Delta(R_I+R_V) \) term to the right-hand side of the standard Hand inequality. All cases in subset (8) fall into this category. Subset (8) contains cases in which \( I \)'s privately-best avoidance-move would increase \( (R_I+R_V) \) regardless of whether \( I \) or \( V \) is liable, \( I \)'s privately-best avoidance-move would increase \( (R_I+R_V) \) by more if \( I \) is liable than if \( V \) is liable, and (relatedly) the impact of \( I \)'s privately-best avoidance-move on \( (R_I+R_V) \) will critically affect its \textit{ex ante} first-best allocative efficiency (\textit{viz.}, will render \textit{ex ante} first-best allocatively inefficient a move that would otherwise have been \textit{ex ante} first-best allocatively efficient) if and only if \( I \) is liable. The following example illustrates this subset of cases. Assume that, for \( I \)'s privately-best avoidance-move, \( B_I=95, \ (\downarrow PL)_V=100, \ (\downarrow \uparrow (R_I+R_V)=8 \) if the potential injurer is liable, and \( \uparrow (R_I-R_V)=3 \) if the potential victim is liable. On these assumptions, \( B_I=95 \text{ exceeds } \ (\downarrow PL)_V \text{ minus the injurer-liable } \uparrow (R_I+R_V)=100-8=92 \), but \( B_I=95 \text{ is lower than both } (\downarrow PL)_V=100 \text{ and } \ (\downarrow \downarrow (R_I-R_V)=100-3=97 \). Given the fact that on our first-best-allocative-efficiency-analysis assumptions all private figures equal their allocative counterparts, the following five conclusions or sets of conclusions are warranted:

\begin{enumerate}
  \item it will be \textit{ex ante} first-best allocatively efficient for the potential injurer to make his privately-best avoidance-move if he would not have to bear (if the victim were “liable” for) the accident-or-pollution loss that the move might prevent (since the \textit{ex ante} allocative benefits of his making this move in the specified circumstances—\$100-$3=$97—exceed the allocative cost of his doing so—\( B_I=95 \));
  \item it will be \textit{ex ante} first-best allocatively inefficient for the potential injurer to make his avoidance-move if he would have to bear any accident-or-pollution loss the move might prevent (if \( I \) would have to compensate his victim for such losses) since on that assumption the \textit{ex ante} allocative benefits that the relevant avoidance-move would generate—\$100-$8=$92 (where $8 equal the risk costs that \( I \)'s non-avoidance would impose on \( I \) because \( I \) would have to bear any loss caused by his rejection of his privately-best avoidance-move) will be lower than the allocative cost of \( I \)'s making the avoidance-move in question—\( B_I=95 \);
  \item if the Hand formula is altered by subtracting the injurer-liable \( \uparrow (R_I+R_V) \) from the right-hand side of the standard Hand inequality, (A) the potential injurer will be found not negligent for rejecting the avoidance-move in question (since
$B_{I}=$95>[$\downarrow PL]_{V} minus the injurer-liable $\uparrow[R_{I}+R_{V}]=$100-$8=$92), (B) $I$ will therefore not avoid since the private cost to $I$ of the relevant avoidance-move ($B_{I}=$95) will be higher than the cost to $I$ of rejecting his privately-best avoidance-move (zero), and (C) the decision by $I$ to reject the avoidance-move in question will be *ex ante* first-best allocatively inefficient since the allocative cost of his making the move in question ($B_{I}=$95) will be lower than the *ex ante* allocative benefits the move would generate once it is clear that $I$ will not be found negligent for rejecting his privately-best avoidance-move and concomitantly that $V$ would be “liable” for the consequences of $I$’s rejecting his privately-best avoidance-move ($100-$3=$97); and, by way of contrast, (4) if the Hand formula is either not altered or altered by subtracting the victim-liable $\uparrow(R_{I}+R_{V})$ from the right-hand side of the standard Hand inequality, (A) the potential injurer’s rejection of the avoidance-move in question will be found negligent (since $B_{I}=$95 will be lower than both $[\downarrow PL]_{V}=$100 and $[\downarrow PL]_{V} minus the victim-liable $\uparrow(R_{I}+R_{V})=$100-$3=$97)) and (B) the potential injurer’s privately-best avoidance-move will be *ex ante* first-best allocatively inefficient since the move’s allocative cost ($B_{I}=$95) will exceed the ($100-$8=$92) in *ex ante* allocative benefits it would generate in the specified circumstances, given that those benefits will be reduced by the $8 increase in risk costs the move will generate if the Hand formula were either not altered or altered by subtracting the victim-liable $\uparrow(R_{I}+R_{V})$ term from the right-hand side of the standard Hand inequality since under both these variants of the Hand formula $I$’s rejection of his privately-best avoidance-move will be found negligent and $I$ will therefore be liable for any losses his rejection of this move imposes on $V$; and (5) if the potential injurer’s rejection of his privately-best avoidance-move would be deemed negligent because its negligence would be determined by either the standard Hand formula or a variant of that formula in which a victim-liable $\uparrow(R_{I}+R_{V})$ term was subtracted from the right-hand side of the standard Hand inequality, the potential injurer would make his privately-best (*ex ante* first-best-allocatively-inefficient) avoidance-move (allocatively inefficient given the fact that he would be liable for any loss his rejection of it caused) because the private cost of this avoidance-move ($B_{I}=$95) would be *lower than* the private benefits the move would confer on the potential avoider—the sum of (A) the weighted-average-expected amount of damages it would prevent him from having to pay ($[\downarrow PL]_{V}=$100) and (B) the risk costs it would prevent him from bearing by eliminating his liability to $V$, risk costs that would be $8 higher than the risk costs he would bear because of his liability for any accident-or-pollution loss he imposed on $V$ if he were strictly liable for these losses and did not make his privately-best avoidance-move.

These conclusions imply that, in subset (8), (1) neither the standard Hand formula, nor (2) the Hand-type formula that would be created by subtracting a victim-liable $\uparrow(R_{I}+R_{V})$ term from the right-hand side of the standard Hand inequality, nor (3) the Hand-type formula that would be
created by subtracting an injurer-liable \( \uparrow (R_I+R_V) \) term from the right-hand side of the standard Hand inequality would be able to induce the potential injurer to make an \textit{ex ante} first-best-allocatively-efficient avoidance-decision.

Some of the cases in subset (4) also belong in this category. Subset (4) contains all cases in which \( I \)'s privately-best avoidance-move would reduce \( (R_I+R_V) \) regardless of whether \( I \) or \( V \) is liable for any loss caused by \( I \)'s rejection of his privately-best avoidance-move, \( I \)'s privately-best avoidance-move would reduce \( (R_I+R_V) \) by more if \( V \) is liable than if \( I \) is liable, and (relatedly) the impact of \( I \)'s privately-best avoidance-move on \( (R_I+R_V) \) will critically affect its \textit{ex ante} first-best allocative efficiency (\textit{viz.}, will render \textit{ex ante} first-best allocatively efficient a move that would otherwise have been \textit{ex ante} first-best allocatively inefficient) if and only if \( V \) is liable. The following example illustrates this subset of cases. Assume that, for \( I \)'s privately-best avoidance-move, \( B_I=$105, (\downarrow PL)_V=$100, \downarrow (R_I+R_V)=$8 \) if the potential victim is liable, and \( \downarrow (R_I+R_V)=\$3 \) if the potential injurer is liable.

On these assumptions, \( B_I=$105 \) \textit{exceeds} both \( (\downarrow PL)_V=$100 \) and \( ([\downarrow PL]_V plus the injurer-liable \( \downarrow [R_I+R_V]=\$100+\$3=\$103 \), but \( B_I=$105 \) \textit{is lower than} \( ([\downarrow PL]_V plus the victim-liable \( \downarrow [R_I+R_V]=\$100+\$8=\$108 \). Given the fact that on our first-best-allocative-efficiency-analysis assumptions all private figures equal their allocative counterparts, the following five conclusions or sets of conclusions are warranted:

(1) it will be allocatively efficient for the potential injurer to make the avoidance-move in question if the victim would have to bear the accident-or-pollution loss that the move might prevent (since the \textit{ex ante} allocative benefits of his making this move in the specified circumstances—\$100+\$8=\$108—\textit{exceed} the allocative cost of his doing so—\( B_I=$105);

(2) it will be allocatively inefficient for the potential injurer to make the avoidance-move in question if he would have to bear any loss the move might prevent (if he would have to compensate his victim for such losses) since on that assumption the \textit{ex ante} allocative benefits that the relevant avoidance-move would generate—\$100+\$3=\$103 (where \$3 equal the risk costs that \( I \)'s non-avoidance would impose on \( I \) because he would have to compensate \( V \) for such losses) \textit{will be lower than} the allocative cost of \( I \)'s making the avoidance-move in question—\( B_I=$105; \)

(3) if the Hand formula is altered by adding the victim-liable \( \downarrow (R_I+R_V) \) term to the right-hand side of the standard Hand inequality, (A) the potential injurer will be
found negligent for rejecting the avoidance-move in question (since $B_I = $105 < $100 + $8 = $108), and (B) a decision by $I$ to reject the avoidance-move in question will be *ex ante* first-best allocatively inefficient since the allocative cost of his making the move in question ($B_I = $105) exceeds the *ex ante* allocative benefits the move would generate once it is clear that he would be liable for the losses caused by his rejecting it ($100 + $3 = $103);

(4) if the potential injurer’s rejection of his privately-best avoidance-move would be deemed negligent because the Hand formula for negligence was altered by adding a victim-liable $\downarrow (R_I + R_V)$ term to the right-hand side of the standard Hand inequality, the potential injurer might or might not make his privately-best (*ex ante* first-best-allocatively-inefficient) avoidance-move because the private cost of this avoidance-move ($B_I = $105) might be *higher than* or *lower than* the *ex ante* private benefits the move would confer on the potential avoider—the sum of (A) the weighted-average-expected amount of damages it would prevent him from having to pay his potential victims ($100) and (B) the risk costs it would prevent him from bearing by eliminating his liability to $V$, which would be $3$ higher than the risk costs he would have borne in connection with any accident-or-pollution loss his non-negligent conduct might have imposed on $V$ had $I$ been strictly liable where the latter risk costs could be either *lower than* $2$ or *equal to or higher than* $2$; and, by way of contrast,

(5) if the Hand formula is either not altered or altered by adding the injurer-liable $\downarrow (R_I + R_V)$ to the right-hand side of the standard Hand inequality, (A) the potential injurer’s rejection of the avoidance-move in question will not be found negligent (since $B_I = $105 will exceed both $\downarrow PL = $100 and $(\downarrow PL) + (R_I + R_V) = $100 + $3 = $103)$, (B) the potential injurer will therefore not avoid, and (C) the potential injurer’s rejection of the avoidance-move in question will be *ex ante* first-best allocatively inefficient since the move’s allocative cost ($B_I = $105) will be *less than* the ($100 + $8 = $108) in allocative benefits it would generate in the specified circumstances, given that those benefits will include the $8$ reduction in risk costs the move will generate if the Hand formula were either not altered or altered in the above way since in either event $I$’s rejection of the move in question will not be found negligent and $V$ will therefore bear the risk the rejection created.

Two conclusions are therefore warranted. First, in some cases in subset (4)—*viz.*, when the risk costs the potential injurer would have had to bear had he been strictly liable in relation to the accident-or-pollution losses his non-negligent conduct might impose on $V$ were sufficiently high to make it profitable for him to make a privately-best avoidance-move whose rejection would be deemed negligent by a revised Hand formula in which a victim-liable ($R_I + R_V$) term was added to the right-hand side of the standard Hand inequality, the application of neither the standard Hand formula, nor the variant of that formula in which a victim-liable $\downarrow (R_I + R_V)$ term is
added to the right-hand side of the standard Hand inequality, nor the variant of the standard Hand formula in which an injurer-liable $\downarrow(R_I+R_V)$ term is added to the right-hand side of the standard Hand inequality will induce the potential injurer to make the \textit{ex ante} first-best-allocatively-efficient avoidance-decision. Second, in other cases in subset (4) in which the above condition is not fulfilled so that one will be able to induce $I$ to make an \textit{ex ante} first-best-allocatively-efficient avoidance-choice by adding a victim-liable $\downarrow(R_I+R_V)$ term to its $(\downarrow PL)_V$ term, this “solution” is anything but straightforward. The contrived and paradoxical character of this response to accident-and-pollution-related risk costs is manifest in two facts. First, the response entails adding a \textit{victim-liable} $\downarrow(R_I+R_V)$ term to the right-hand side of the Hand inequality to produce a legal conclusion (that $I$’s rejection of the avoidance-move in question is negligent) that will result in the victim’s not being liable—\textit{i.e.}, in the \textit{injurer’s being liable}.\textsuperscript{11} Second, the required solution is paradoxical in that it induces the potential injurer to make an \textit{ex ante} first-best-allocatively-efficient avoidance-decision not by inducing him to avoid when he would not otherwise have done so (not by inducing him to change his avoidance-decision from the one he would have made under a no-injurer-liability rule) but by altering the \textit{ex ante} first-best allocative efficiency of his continuing decision not to avoid—\textit{i.e.}, by rendering \textit{ex ante} first-best allocatively inefficient a privately-best avoidance-move that would otherwise have been \textit{ex ante} first-best allocatively efficient.\textsuperscript{12} Hence, some cases in this fourth subset belong in the same category as all cases in subset (8)—\textit{viz.}, cases in which neither the standard Hand formula nor either of the two risk-cost-effect-adjusted variants of that formula we are considering will induce the potential avoider to make an \textit{ex ante} first-best-allocatively-efficient avoidance-decision—and some cases in this fourth subset belong in the third outcome-category of cases I previously distinguished—\textit{viz.}, cases in which the standard Hand formula will not induce the potential injurer to make an \textit{ex ante} first-best-allocatively-efficient avoidance-decision but in which the $I$ can be induced to make such a decision in a paradoxical way by using an appropriate risk-cost-effect-adjusted variant of the standard Hand formula to assess the negligence of the $I$’s rejection of his privately-best avoidance-move.

The fourth outcome-category of cases contains cases in which the standard Hand formula would not succeed in inducing the potential injurer to make the \textit{ex ante} first-best-allocatively-efficient avoidance-decision but one will be able to secure first-best-allocatively-efficient potential-injurer avoidance-decisions in a straightforward way by adding or subtracting a
\(\Delta(R_I+R_V)\) term to the right-hand side of the standard Hand inequality. All cases in subsets (3), (6), and (7) belong in this category.

Subset (3) contains all cases in which \(I\)'s privately-best avoidance-move would reduce \((R_I+R_V)\) regardless of whether \(I\) or \(V\) is “liable” for any loss caused by \(I\)'s rejection of his privately-best avoidance-move—indeed, that regardless of whether \(I\) or \(V\) is liable for any loss caused by \(I\)'s rejection of his privately-best avoidance-move, the fact that \(I\)'s privately-best avoidance-move would reduce \((R_I+R_V)\) will critically affect its \textit{ex ante} first-best allocative efficiency (\textit{viz.}, will render this move \textit{ex ante} first-best allocatively efficient when it would otherwise not have been so). The following example illustrates this subset of cases. Assume that, for \(I\)'s privately-best avoidance-move, \(B_I+\$105\) \((\downarrow PL)_V=\$100, \downarrow (R_I+R_V)=\$8\) if the potential injurer is liable for any loss his rejection of his privately-best avoidance-move generates, and \(\downarrow (R_I+R_V)=\$10\) if the potential victim is liable for any such loss. On our first-best-allocative-efficiency-analysis assumptions, these numerical assumptions warrant the following five conclusions or sets of conclusions:

1. \(B_I=\$105\) \textit{exceeds} \((\downarrow PL)_V=\$100\) but is \textit{lower than} both the value that \((\downarrow PL)_V+\downarrow (R_I+R_V))\) would have if \(I\) were liable \((\$100+\$8=\$108)\) and the value that \((\downarrow PL)+\downarrow (R_I+R_V))\) would have if \(V\) were liable \((\$100+\$10=\$110)\);

2. the application of the standard Hand formula for negligence would fail to induce \(I\) to make the avoidance-move in question—\textit{i.e.}, would fail to make it conventionally profitable for him to make the move—because it would yield the conclusion that his rejection of this move was not negligent (since \(B_I=\$105>\downarrow (R_I+R_V)=\$100\)); but

3. the addition of either a victim-liable or an injurer-liable \(\downarrow (R_I+R_V)\) term to the right-hand side of the standard Hand inequality would create a formula for assessing negligence whose application would produce the conclusion that \(I\)'s rejection of his privately-best avoidance-move was negligent (given that \(B_I=\$105<\text{both }[(\downarrow PL)_V \text{ plus the injurer-liable } \downarrow (R_I+R_V)=\$108] \text{ and }[(\downarrow PL)_V \text{ plus the victim-liable } \downarrow (R_I+R_V)=\$110)];

4. the addition of either a victim-liable or an injurer-liable \(\downarrow (R_I+R_V)\) term to the right-hand side of the standard Hand inequality would create a formula for assessing negligence whose application would induce the potential injurer to make his privately-best avoidance-move by making it negligent for him to reject this move and therefore making him liable for any loss his rejection of the move in question caused: this conclusion reflects the fact that the private cost to the potential injurer of making this move \((B_I=\$105)\) \textit{is lower than} the cost to him of
rejecting it when he is legally obligated to compensate his victim for any loss his rejection of this move imposes on the \( V \) (the $100 of damages he should expect on the weighted average to have to pay his victims because he rejected the move in question plus the risk costs this liability would impose on him, which are $8 higher than the risk costs he would have borne in connection with any accident- or-pollution loss his non-negligent conduct might have imposed on his potential victims had he been strictly liable); and

\( (5) \) the avoidance-move in question will be \textit{ex ante} first-best allocatively efficient regardless of whether \( I \) or \( V \) would be liable for the consequences of \( I \)'s rejecting the move since \( B_I = $105 \) is the allocative cost of the avoidance-move \textit{is lower than} both \( ([↓PL]_I + \text{the injurer-liable} \downarrow[R_I+R_V] = $108) \) and \( ([↓PL]_V + \text{the victim-liable} \downarrow[R_I+R_V] = $110) \).

In this case, then, it will be possible to induce the potential injurer to make the \textit{ex ante} first-best-allocatively-efficient avoidance-decision in a straightforward way—\textit{viz.}, by adding an injurer-liable \( \downarrow(R_I+R_V) \) risk-cost term to the right-hand side of the standard Hand inequality to make the injurer liable for rejecting the move in question. This addition of the \textit{injurer-liable} \( \downarrow(R_I+R_V) \) term is “straightforward” because it operates by causing the potential injurer’s rejection of his privately-best avoidance-move to be found to be negligent—\textit{i.e.}, by making the potential \textit{injurer liable}. I should add, however, that, in this subset of cases, it will also be possible to induce the potential injurer to make the \textit{ex ante} first-best-allocative-efficient avoidance-decision in a somewhat paradoxical way—\textit{i.e.}, by adding a victim-liable \( \downarrow(R_I+R_V) \) term to the right-hand side of the standard Hand inequality. This alteration in the Hand formula would be paradoxical because it would entail the addition of a \textit{victim-liable} \( \downarrow(R_I+R_V) \) term to produce the conclusion that the \textit{injurer} would be \textit{liable} for a loss caused by his rejection of his privately-best avoidance-move.

Subset (6) contains all cases in which \( I \)'s privately-best avoidance-move will \textit{increase} \( (R_I+R_V) \) regardless of whether \( I \) or \( V \) is “liable” for any loss caused by \( I \)'s rejection of his privately-best avoidance-move—indeed, all cases in which, regardless of whether \( I \) or \( V \) is liable, the fact that \( I \)'s privately-best avoidance-move would increase \( (R_I+R_V) \) will critically affect its \textit{ex ante} first-best allocative efficiency (\textit{viz.}, will render this move \textit{ex ante} first-best allocatively inefficient when it would otherwise not have been so). The following example illustrates this subset of cases. Assume that, for \( I \)'s privately-best avoidance-move, \( B_I = $95 \), \( ([↓PL]_I = $100 \), \( (R_I+R_V) = $8 \) if the potential injurer is liable, and \( (R_I+R_V) = $10 \) if the potential victim is liable.
On our first-best-allocative-efficiency-analysis assumptions, these numerical assumptions warrant the following five conclusions or sets of conclusions:

(1) \( B_I = \$95 \) is lower than \( (\downarrow PL)_V = \$100 \) but exceeds both the value that \((\downarrow PL)_V - (R_I + R_V)\) would have if \( I \) were liable (\( \$100 - \$8 = \$92 \)) and the value that \((\downarrow PL)_V - (R_I + R_V)\) would have if \( V \) were liable (\( \$100 - \$10 = \$90 \));

(2) the application of the standard Hand formula for negligence would induce \( I \) to make the avoidance-move in question—\( i.e. \), would make it conventionally profitable for him to make the move—because it would yield the conclusion that his rejection of this move was negligent (since the private cost to \( I \) of making the move—\( B_I = \$95 \)—is lower than the private cost to him of rejecting the move, given that his rejection of it would be found negligent—the sum of the damages he would expect on the weighted average to pay \( V \) (\( (\downarrow PL)_V = \$100 \)) and the risk costs he would bear in relation to this liability (which would be \$10 lower than the risk costs he would bear if he were strictly liable and had made his privately-best avoidance-move [had behaved non-negligently] since this move would increase the relevant risk costs by \$10); but

(3) the subtraction of either a victim-liable or an injurer-liable \((R_I + R_V)\) term from the right-hand side of the standard Hand inequality would create a formula for assessing negligence whose application would produce the conclusion that \( I \)'s rejection of his privately-best avoidance-move was non-negligent (given that \( B_I = \$95 < \text{both} (\downarrow PL)_V \) minus the injurer-liable \( (R_I + R_V) = \$100 - \$8 = \$92 \) and \((\downarrow PL)_V \) minus the victim-liable \( (R_I + R_V) = \$100 - \$10 = \$90 \));

(4) the addition of either a victim-liable or an injurer-liable \((R_I + R_V)\) term to the right-hand side of the standard Hand inequality would create a formula for assessing negligence whose application would deter the potential injurer from making his privately-best avoidance-move since—by rendering his rejection of this move non-negligent—it would reduce the private cost of his rejecting this move (zero) below the private cost of his making it (\( B_I = \$95 \)); and

(5) the avoidance-move in question will be \textit{ex ante} first-best allocatively inefficient regardless of whether \( I \) or \( V \) would be liable for the consequences of \( I \)'s rejecting the move since \( B_I = \$95 \) is the allocative cost of the avoidance-move \textit{exceeds} both \((\downarrow PL)_V \) minus the injurer-liable \( (R_I + R_V) = \$92 \) and \((\downarrow PL)_V \) minus the victim-liable \( (R_I + R_V) = \$90 \).

In this case, then, it will be possible to induce the potential injurer to make the first-best-allocatively-efficient avoidance-decision (to reject his privately-best avoidance-move) in a straightforward way—by subtracting a \textit{victim-liable} \((R_I + R_V)\) risk-cost term from the right-hand side of the standard Hand inequality to make the injurer's rejection of the move in question non-
negligent (i.e., to make the victim liable). I should add, however, that, in this case, it would also be possible to induce the potential injurer to make the ex ante first-best-allocatively-efficient avoidance-decision in a somewhat paradoxical way—i.e., by subtracting an injurer-liable \( \uparrow (R_I + R_V) \) term from the right-hand side of the standard inequality. This alteration in the Hand formula would be paradoxical because it would entail the subtraction of an injurer-liable \( \uparrow (R_I + R_V) \) term to make the victim liable for a loss caused by the injurer’s rejection of his privately-best avoidance-move (i.e., to make the injurer’s rejection of his privately-best avoidance-move non-negligent).

Subset (7) also belongs in this outcome-category of cases. Subset (7) contains all cases in which I’s privately-best avoidance-move will increase \( (R_I + R_V) \) regardless of whether I or V is liable for any loss caused by I’s rejection of his privately-best avoidance-move, I’s privately-best avoidance-move will increase \( (R_I + R_V) \) by more if V is liable than if I is liable, and (relatedly) the impact of I’s privately-best avoidance-move on \( (R_I + R_V) \) will critically affect its ex ante first-best allocative efficiency (viz., will render ex ante first-best allocatively inefficient a move that would otherwise have been ex ante first-best allocatively efficient) if and only if V is liable. The following example illustrates this subset of cases. Assume that, for I’s privately-best avoidance-move, \( B_I = 95 \), \( \downarrow (PL) = 100 \), \( \uparrow (R_I + R_V) = 8 \) if the potential victim is liable, and \( \uparrow (R_I + R_V) = 3 \) if the potential injurer is liable.

On these assumptions, \( B_I = 95 \) exceeds \( \downarrow (PL) = 100 \), but \( B_I = 95 \) is lower than \( \downarrow (R_I + R_V) = 100 \). Given the fact that on our first-best-allocative-efficiency-analysis assumptions all private figures equal their allocative counterparts, the following five conclusions or sets of conclusions are warranted:

1. It will be allocatively efficient for the potential injurer to make the avoidance-move in question if he would have to bear the accident-or-pollution loss that the move might prevent (since the ex ante allocative benefits of his making this move in the specified circumstances—\( 100 - 3 = 97 \)—exceed the allocative cost of his doing so—\( B_I = 95 \));

2. It will be allocatively inefficient for the potential injurer to make the avoidance-move in question if he would not have to bear any loss the move might prevent (if the victim would have to bear these losses) since on that assumption the allocative cost of I’s making the avoidance-move in question—\( B_I = 95 \)—would exceed the
ex ante allocative benefits that the relevant avoidance-move would generate—$100-$8=$92 (where $8 equal the added risk costs that I’s non-avoidance would impose on V);

(3) if the Hand formula is either not altered or altered by subtracting the injurer-liable ↑(R_I+R_V) from the right-hand side of the standard Hand inequality, (A) the potential injurer would be found negligent for rejecting the avoidance-move in question (since B_I=$95<both ↓[PL]_V=$100 and ↓[PL]_V minus the injurer-liable ↑(R_I+R_V)=$100-$3=$97)), and (B) any decision by I to make the avoidance-move in question will be ex ante first-best allocatively efficient since the allocative cost of his making the move in question (B_I=$95) is lower than the ex ante allocative benefits the move would generate once it is clear that he would be liable for the losses caused by his rejecting it ($100-$3=$97);

(4) if the potential injurer’s rejection of his privately-best avoidance-move would be deemed negligent because its negligence is assessed by either the standard Hand formula or a variant of that formula in which an injurer-liable ↑(R_I+R_V) term is subtracted from the right-hand side of the standard Hand inequality, the potential injurer would make his private-best ex ante first-best-allocatively-inefficient avoidance-move because the private cost of this move to him (B_I=$95) would be lower than the private benefits it would confer on him—the $100 in weighted-average-expected damages it would prevent him from having to pay his potential victims plus any risk costs it would prevent him from bearing by eliminating his liability to V, which would equal the risk costs he would have borne had he been strictly liable in relation to the losses he might have imposed on V had he rejected his privately-best avoidance-move (which will be $3 lower than the risk costs the potential injurer I would have borne had he made his privately-best avoidance-move but been obligated to indemnify V regardless of whether he had made his privately-best avoidance-move since that move would have increased I’s risk costs by $3); and, by way of contrast,

(5) if the Hand formula is altered by subtracting the victim-liable ↑(R_I+R_V) from the right-hand side of the standard Hand inequality, (A) the potential injurer’s rejection of the avoidance-move in question would not be found negligent (since B_I=$95 exceeds ↓[PL]_V minus the victim-liable ↑(R_I+R_V)=$100-$8=$92), (B) the potential injurer will therefore not avoid, and (C) the potential injurer’s rejection of the avoidance-move in question will be ex ante first-best allocatively efficient since the move’s allocative cost (B_I=$95) will exceed the ($100-$8=$92) in allocative benefits it would generate in the specified circumstances, given that those benefits will be reduced by the $8 increase in risk costs the move would generate if the Hand formula were altered in this way since under this altered variant of the Hand formula I’s rejection of the move in question would not be found negligent and V would therefore bear the risk the rejection created.
These results imply that in this sub-case one will be able to induce $I$ to make an *ex ante* first-best-allocatively-efficient avoidance-choice by making a straightforward alteration in the Hand formula for negligence—*viz.* by subtracting a victim-liable $\uparrow(R_I+R_V)$ term from its $(\downarrow PL)_V$ term to make the potential injurer’s rejection of his privately-best avoidance-move non-negligent—*i.e.* to make the victim liable.

**Conclusion**

A summary is in order. I have asked several economists who specialize in analyzing the allocative efficiency of tort law how one would have to alter the Hand formula to induce potential injurers whose privately-best avoidance-moves would affect $(R_I+R_V)$ to make *ex ante* first-best-allocatively-efficient avoidance-decisions. All responded that one could always achieve this result straightforwardly by adding a “change in risk cost” term to the right-hand side of the standard Hand inequality. This Article has shown that this response is both too simplistic and too optimistic. In particular, This Article showed that this response

1. failed to recognize the difference between an injurer-liable and a victim-liable “change in risk cost” term;
2. failed to recognize that in all cases in one of the eight subsets of cases I distinguished and in some cases in another of the subsets of cases I distinguished, neither the application of the standard Hand formula for negligence nor the application of a variant of that formula that included an injurer-liable or a victim-liable “change in risk cost” term could induce the potential injurer to make an *ex ante* first-best-allocatively-efficient avoidance-decision; and
3. failed to recognize that, in the rest of the cases in the second subset of cases to which I have just referred, the risk-cost-effect adjustment that would have to be made to the standard Hand formula to induce the potential injurer to make an *ex ante* first-best-allocatively-efficient avoidance-decision would be paradoxical rather than straightforward.

These conclusions imply that in some situations the fact that a relevant avoidance-move will affect $(R_I+R_V)$ will render the Hand formula for negligence incoherent and that in some situations the fact in question will prevent a negligence regime that uses the Hand operationalization of the concept of negligence will not be able to secure economic efficiency in even an otherwise-Pareto-perfect economy. Obviously, the coherence conclusion does not
depend on whether tort law is to be evaluated by its impact on economic efficiency or by its instantiation of liberal values. Regrettably, the usefulness conclusion also applies equally when the issue is whether any negligence/contributory-negligence or comparative negligence tort-law regime will secure liberal moral rights.

1 Judge Learned Hand first delineated his formula for negligence in United States v. Carroll Towing Co., 159 F.2d 169, 173 (2d Cir. 1947).
2 Actually, the standard rendition of the Hand formula omits the “↓” symbol I have included—i.e., assumes that the avoidance-move under consideration would prevent an accident that otherwise might or would occur. My formulation generalizes the formula to the more typical situation in which the relevant avoidance-move will reduce weighted-average-expected accident or pollution losses without eliminating the possibility of their occurring. This generalization affects the definitions of the separate “P” and “L” in ways in which the preceding text does not capture. I should add that the standard version of the Hand formula for negligence also omits the subscripts \( I \) and \( V \) that my rendition includes.

Four additional points should be noted. First, this Article assumes that the tort situations it is analyzing are situations in which either no avoidance or individual care will be privately best. In other words, this Article ignores the possibility that multiple care (usually called “joint care”) might be privately best. Among other advantages, this assumption enables me to avoid complications caused by two facts: (1) the \( (\downarrow P L)_V \) that a given avoidance-move will effectuate will sometimes depend on the avoidance-decisions made by other tort participants and (2) current positive tort law does not always estimate the private benefits the \( I \)’s avoidance would generate on the assumption that all other tort participants have made the avoidance-moves that constitute their contribution to the “privately-best” avoidance-move package.

The second point relates to the operationalization of “privately best” in a world in which tort avoidance can affect not only the risk costs that the relevant injurer and victim individually bear but the sum of those risk costs. In a world in which neither the injurer nor the victim would ever bear any tort-related risk costs, the injurer’s privately-best avoidance-move would be the move for which \( (\downarrow P L)_V - B_I \) was highest. However, in a world in which an injurer’s avoidance-move can reduce the sum of the tort-related risk costs that he and his potential victim bear, the privately-best avoidance-move may no longer be the move that maximizes \( (\downarrow P L)_V - B_I \); in particular, a move that yields a \( (\downarrow P L)_V - B_I \) that is lower than the \( (\downarrow P L)_V - B_I \) that would be yielded by some alternative will be “privately best” if the former move reduces the sum of the injurer’s and victim’s risk costs \( (R_I + R_V) \) by sufficiently more than that sum would be reduced by the latter move to generate a larger \( (\downarrow P L)_V + (\downarrow (R_I + R_V) - B_I) \) total. This result might obtain if the former avoidance-move would reduce the variance of the probability distribution of possible losses by more than that variance would be reduced by the latter move, though the former move reduced the mean of that probability distribution by less than that mean would be reduced by the latter move. The text that follows ignores this possibility.

The third point concerns the relationship between the privately-best avoidance-move available to the potential injurer and the “most-economically-efficient” avoidance-move available to him or her (an expression that I will replace with most-allocatively-efficient to remind readers that the relevant concept is a technical economic concept and that it may not be the most desirable, all things considered, for the potential injurer to make the most-allocatively-efficient avoidance-decision available to him). It is important to recognize that—in our actual, Pareto-imperfect economy—the avoidance-decision that is “privately best” for the potential injurer may not be “most-allocatively-efficient” (allocatively best) (even if, as this Article assumes for simplicity, neither the relevant victim nor anyone else can make an avoidance-move that is more-allocatively-efficient than the most-allocatively-efficient avoidance-move available to the potential injurer). This conclusion reflects the fact that, in a Pareto-imperfect economy,

1. \( B_I \) may not equal the allocative cost of the avoidance-move in question,
2. \( (\downarrow P L)_V \) may not equal the certainty-equivalent allocative benefits the move in question should be expected to generate (risk-cost consequences aside), relatedly
For a detailed explanation of why—for example—imperfections in price competition will cause the relevant private benefit and cost figures to differ from their allocative counterparts in ways that will perfectly offset each other only fortuitously and may well cause the privately-best avoidance-move to differ from the most-allocatively-efficient avoidance-move, see Richard S. Markovits, *Monopoly and the Allocative Inefficiency of First-Best-Allocatively-Efficient Tort Law: The Whys and Some Therefores*, 46 CASE W. RES. L. REV. 485 (1993). For simplicity, this Article also ignores this complication—indeed, assumes that \((\text{\textdollar}PL)_I - (\text{\textdollar}B_I)\) equals the allocative efficiency of the avoidance-move in question where the \((\text{\textdollar}I)\) term stands for the effects of avoidance on total risk costs, given the identity of the party who would actually bear any resulting loss.

The fourth point, which the text and note 5 will explore in more detail, is the fact that the impact of an injurer-avoidance-move on \(R_I\), \(R_V\), and \((R_I + R_V)\) will depend on whether \(I\) or \(V\) will be liable for any tort losses and tort-claim transaction costs that are generated. This footnote explains why I reject each of the three claims to which the text refers. The first is undermined by the Pareto imperfections that abound in all real-world economies and by the allocative transaction costs that accident-loss contingencies and realities generate. Thus, since—for the reasons delineated in the third paragraph of footnote 2—in all actual, highly-Pareto-imperfect economies many avoidance-moves whose rejection the Hand formula would not deem negligent or contributorily negligent will be allocatively efficient and many avoidance-moves whose rejection the Hand formula would deem negligent or contributorily negligent will be allocatively inefficient, a negligence/contributory-negligence or comparative-negligence tort-law regime in which negligence and contributory negligence were operationalized through the Hand formula would often not yield economically-efficient outcomes even if the human response to accident-loss contingencies and realities generated no allocative transaction costs and no relevant avoidance-move would change the sum of the risk costs borne by potential accident-injurers and potential accident-victims. In fact, not only would the Pareto imperfections that are present in all actual economies render the Hand formula for negligence second-best allocatively inefficient, it would also almost certainly render the Hand operationalizations third-best allocatively inefficient as well—i.e., allocatively inefficient, even taking account of (1) the inevitable cost and inaccuracy of the data that bears on the divergences between the relevant private and allocative costs and private and allocative benefits and (2) the inevitable cost of the relevant theoretical analysis.

The connection related between accident-contingency-and-reality-related allocative transaction costs and the inaccuracy of the first claim is somewhat more complicated to describe. In part, the complexity relates to an ambiguity of the relevant economic-efficiency claim. Is that claim the claim that any negligence/contributory-negligence or comparative-negligence legal regime that incorporates the Hand formula for negligence is more economically efficient than (1) any other legal regime of these types or (2) any other conceivable legal regime, including *inter alia* a strict-liability regime, a strict-liability/contributory-negligence regime, or a no-liability regime with or without some form of State compensation for accident losses? And in part, the complexity relates to the fact that the relevant allocative transaction costs include not just the allocative transaction cost of settling and adjudicating tort-law claims but the allocative transaction cost of forming accident-loss-insurance contracts, of making and responding to accident-loss private-insurance claims, and of making and responding to accident-loss-related government-transfer claims. If the claim to which the text refers is the more encompassing claim that a negligence/contributory-negligence or comparative-negligence regime in which the concept of negligence is operationalized through the Hand formula is the most-economically-efficient system the State could implement, I suspect that the relevant allocative transaction costs would count against it: regardless of how “negligence” is operationalized, the allocative-transaction-costliness of trying any particular accident case will always be higher in tort-law regimes in which “negligence” plays a role than in tort-law regimes in which negligence plays no role; moreover, this litigation-allocative-transaction-cost-based economic-efficiency disadvantage of negligence-oriented legal regimes will, in my judgment, be reinforced by a tendency of negligence-based regimes to increase the amount of private accident-loss insurance taken out and the amount of accident-loss-related private-insurance and government-transfer claims and payments that are made. If the claim to which the text refers is the more modest...
claim that a negligence/contributory-negligence or comparative-negligence regime that incorporates the Hand formula for negligence would constitute the most-economically-efficient variant of these regimes that could be adopted, that claim is also undermined by the existence of related allocative transaction costs. Thus, the allocative-transaction-costliness of determining the allocative cost and benefits of particular accident participants’ making particular avoidance-moves (and the erroneousness of some of the conclusions that would be reached on such issues) may favor the economic efficiency of assuming in contravention of the Hand formula that all individuals that do not suffer from relevant, easy-to-prove disabilities are average in relation to their abilities to engage in cost-effective avoidance. Or the allocative-transaction-costliness of assessing the negligence of the rejection of certain types of avoidance-moves (e.g., of firms’ doing research to discover less-accident-prone production processes or products) and the erroneousness of some of the conclusions that would be reached on such issues may favor the economic efficiency of assuming that the rejection of such moves is never negligent—i.e., of not attempting to apply the Hand formula to the avoidance-move rejections in question.

The second claim to which the text refers is the claim that, as a matter of policy, tort law should be designed to maximize economic efficiency in the monetized sense in which the concept is defined in tort-policy discussions—i.e., on a definition according to which a choice is said to have maximized economic efficiency if in comparison with its alternatives it generated the greatest possible positive difference between the equivalent-monetary gains it conferred on its beneficiaries and the equivalent-monetary losses it imposed on its victims. Different economists make different arguments for this second claim. Some try to justify it by asserting that economic efficiency is not only an ultimate value but is the lexically-most-valuable ultimate value. In fact, however, economic efficiency in this monetized sense is not an ultimate value at all. In itself, the fact that a choice maximizes net equivalent-monetary gains has no moral significance. Other economists try to justify this claim by asserting that utilitarianism is the correct or only justifiable normative system and that choices that maximize economic efficiency will always maximize the total utility of all creatures whose utility counts. This proximate-value argument also cannot bear scrutiny. To start, utilitarianism in any of its variants may not be coherent because it may not be possible to develop a metric for converting all affective states into units of utility—utils. Moreover, even if this difficulty can be overcome, choices that maximize economic efficiency will not always maximize total utility—in particular, will not do so if the average util value of the equivalent-monetary units lost by a choices’ victims is sufficiently higher than its counterpart for the equivalent-monetary units gained by the choice’s beneficiaries for the average-utility-weighted equivalent monetary losses of the victims to exceed the average-utility-weighted equivalent-monetary gains of the beneficiaries despite the fact that the equivalent-monetary losses of the victims are lower than the equivalent-monetary gains of the beneficiaries. This proximate-value argument is also undermined by the fact that, although many economists appear to believe that all alleged moral norms other than utilitarianism are either or both incoherent or demonstrably indefensible, (1) many alternatives to utilitarianism are both coherent and morally defensible, (2) at least some such norms favor some decisions that would decrease total utility (and economic efficiency), and (3) actual common-law countries are committed to instantiating an alternative to utilitarianism (in the service of the conception of justice they are committed to instantiating)—liberalism—that does obligate them to create and implement a body of tort law that includes doctrines that will sometimes reduce total utility and economic efficiency (see below). Finally, some economists argue that one morally-ought to develop a body of tort law that maximizes economic efficiency because—regardless of the value that one wants to instantiate—the optimal way to do so is to develop an economically-efficient tort law and then use tax law to instantiate the value in question. As I have shown elsewhere, this argument fails inter alia because the societies in question are liberal, moral-rights-based societies (see below) and tax law will sometimes not be able to secure the liberal entitlements of wronged accident-victims, because the tax-law component of the allegedly superior policy-package will sometimes not be politically available, and because the tax-law component of the allegedly-superior policy-package may be prohibitively allocative-transaction-costly. For a complete discussion of this last (double-distortion-argument) justification for an economically-efficient tort law, see Richard S. Markovits, Why Kaplow and Shavell’s “Double-Distortion Argument” Articles Are Wrong, 13 GEO. MASON L. REV. 511 (2005).

For reasons that are related to some of the claims made in the preceding paragraph, I also reject the conclusion that, if there are responses to accident-law claims that are uniquely correct as a matter of common law, those responses are the most-economically-efficient responses courts could make to the claims in question. Unfortunately, my argument against this conclusion is complex. I can do no more than outline it here. In my judgment, the United States and all other common-law countries are liberal, moral-rights-based societies of moral
integrity—i.e., are societies that (1) draw a strong distinction between “the right” and “the good” (between moral-rights claims about what justice requires and moral-ought claims about what morally-ought to be done when no moral right is a stake), (2) are committed to securing justice (protecting moral rights) even when a widely-held, morally-defensible conception of the good must be diserved to do so, (3) are committed more specifically to instantiating a liberal conception of justice that places a lexically-highest value on all moral-rights bearers for whom the society is responsible being treated with appropriate, equal respect and appropriate, equal (when the relevant actor is the State) an appropriate (when the relevant actor is an individual) concern in part for their “welfare” in the utility-oriented sense in which economists define the enquoted concept but pre-eminently for their having a meaningful opportunity to lead a life of moral integrity by taking their moral obligations seriously and by taking seriously as well the dialectic task of developing a personal conception of the good and leading a life that is consonant with their respective chosen conceptions of the good, and (4) fulfill the preceding commitments sufficiently well to deserve to be characterized as societies of moral integrity. I also believe that the liberal norm that any liberal, moral-rights-based society of moral integrity is committed to instantiating in the service of its conception of justice is generically inside its law—indeed, forms the basis of a mode of legal argument (arguments of [liberal] moral principle) that is the dominant mode of legal argument in such societies in that it operates not only directly and decisively when it is applicable but also indirectly to determine the variant(s) of such other modes of legal argument as textual argument, historical argument, structural argument, arguments from precedent, and prudential argument that are valid and the variants of these other modes that are invalid (even when they have been used sufficiently often in relevant ways by legal-system actors for the Legal Positivists to conclude that, for that reason, they are legally valid). See Richard S. Markovits, Matters of Principle: Legitimate Legal Argument and Constitutional Interpretation Chapter 1 (NYU PRESS, 1998). I have delineated elsewhere fourteen reasons why the common law of torts that is required by liberalism—i.e., that would be created by a liberal, moral-rights-based society of perfect moral integrity—would not be economically efficient. See Richard S. Markovits, On the Economic Inefficiency of a Liberal-Corrective-Justice-Securing Law of Torts, 2006 ILL. L. REV. 525 (2006). However, my analysis also reveals that, were it not for the problems caused by the fact that avoidance-moves can affect the total amount of tort-related risk costs that are generated, a liberal common law of torts would use the Hand formulae for negligence and contributory negligence (which focus on the private as opposed to the allocative costs and benefits of accident-avoidance moves) to assess the tort liability of certain classes of potential accident-injurers and accident-victims whose choices increased ex ante weighted-average-expected accident-losses of a certain type. For example, were it not for the tort-contingency risk-cost issues on which this Article focuses, liberalism would imply that the Hand formula for negligence should be used to determine the tort liability of accident-injurers who could not cost-effectively analyze the divergence between the private and allocative costs of the avoidance moves available to them and the divergence between the private and allocative benefits of those avoidance-moves when their avoidance-move rejection increased the weighted-average-expected “mere-utility” equivalent-monetary losses confronting others—i.e., increased the weighted-average-expected exposure of others to losses that would not prevent them from leading a life of moral integrity by killing them, by injuring them neurologically in some way that precludes them from functioning as moral agents, or perhaps by causing them pain and/or physical disability that for psychological reasons strongly militate against their taking advantage of their continued neurological capacity to lead a life of moral integrity. In my judgment, liberalism implies that (1) when making choices that increase the “mere-utility”-loss exposure of others who are legal strangers, persons are obligated to treat these strangers’ losses as if they were their own—i.e., to make those choices that would be in their interest if they were their own potential victims, (2) the relevant metric for measuring the potential-victim stranger’s preventable loss and the potential injurer’s cost of avoidance is monetary as opposed (say) to units of utility (utils), and (3) actors are not at fault for failing to execute analyses that they cannot execute cost-effectively in monetary terms. The second point of these three reflects the fact that, in their private capacities, potential injurers are rarely causes in fact and virtually never morally-responsible causes of those states of the world that might cause the marginal utility of money to their potential victims to be different from the marginal utility of money to the average member of their society—viz., the fact that their potential victims are either richer or poorer than the average member of their society or the fact that their potential victims are utility monsters or unusually ascetic (place a higher-than-average or lower-than-average utility-value on money at the margin than does the average member of their society for reasons unrelated to their income/wealth positions relative to the income/wealth position of the average member of the society in question). See Richard S. Markovits, Liberalism and Tort Law: On the Content of
Fourth, to the extent that, in the real world, a relevant potential injurer or potential victim is insured against the accident-or-pollution-loss or duty-to-compensate in question, an avoidance-move rejection that would otherwise damages by making the insurance company rather than the "nominal" defendant the actual payor. reducing the extent to which jurors and judges make false-negative findings of negligence and underestime would be inconsistent with this Article’s otherwise-Pareto-perfect and no-transaction-cost assumptions — compensation-duties are both privately insured and publicly "insured" to some extent, consideration of this reality third point in the most recent list, which partially reflects the second, provides a liberal justification for the use of a first-best formula for determining liability (one that ignores the divergences between relevant private and allocative figures) that is not available to those who believe that the use of the Hand formula is justified by its (alleged) economic efficiency.

Seven points should be noted. First, in a world in which no accident-or-pollution loss or accident-or-pollution-loss compensation-duty is either privately insured or publicly “insured” through state disability-insurance, state unemployment-insurance, or state-run welfare programs, the amount of risk costs a party will bear in relation to the possibility that a potential injurer may generate some loss whose certainty-equivalent magnitude would be reduced by his privately-best avoidance-move will be

(1) directly related to the dispersion (say the variance) of the probability distribution of the possible losses in question,

(2) inversely related to the extent to which the other risks the relevant party faces reduce the contribution that the possibility of this loss makes to the variance of the probability distribution of his various possible overall wealth/income positions,

(3) directly related to the risk-averseness of the party bearing the risk in question.

Second and relatedly, in such a world, an avoidance-move that reduces weighted-average-expected accident-losses can therefore reduce \((R_1+R_2)\) by reducing the variance of the probability distribution of the possible losses that the avoidance-move in question may prevent or reduce. Of course, an avoidance-move that reduces weighted-average-expected accident-losses can also increase \((R_1+R_2)\) by increasing the variance of the possible-loss distribution.

Third, although, in the real world, accident-and-pollution losses and accident-and-pollution-loss compensation-duties are both privately insured and publicly “insured” to some extent, consideration of this reality would be inconsistent with this Article’s otherwise-Pareto-perfect and no-transaction-cost assumptions—i.e., with the first-best character of this Article’s allocative-efficiency analysis—since both public and private “insurance” of this sort would distort avoidance-incentives in an otherwise-Pareto-perfect, transaction-costless world. I hasten to add that—in our actual, highly-Pareto-imperfect world—private tort insurance may actually reduce the amount of misallocation avoidance-decisions generate not only by reducing the risk-cost consequences of given misallocative avoidance-decisions but also by reducing the number of misallocative avoidance-decisions made—inter alia (1) by leading to the quotation of insurance premiums whose publication reduces the extent to which potential injurers and victims misestimate the losses they will generate, (2) by giving someone (the insurance company) an incentive to induce the traditional injurer and/or victim to make avoidance-moves whose rejection would be negligent, (3) particularly when liability is strict or false-positive errors may be made on the negligence issue, by making it profitable for some actor (the insurance company) to do accident-and-pollution-loss-preventing research, and (4) by reducing the extent to which jurors and judges make false-negative findings of negligence and underestimate damages by making the insurance company rather than the “nominal” defendant the actual payor.

Fourth, to the extent that, in the real world, a relevant potential injurer or potential victim is insured against the accident-or-pollution-loss or duty-to-compensate in question, an avoidance-move rejection that would otherwise increase private risk-related costs simply by raising the risk costs the potential injurer or victim bore because he did not know how much of the ex post loss he would bear or how much of his legal-claiming costs he would bear would also increase such a party’s risk-related costs by increasing the insurance premiums he paid, the transaction costs he incurred to take out additional insurance coverage and/or pursue his insurance claims, and the risk costs he bore because he did not know exactly how much compensation the insurance company would pay and/or how much transaction costs he would have to incur to take out the relevant additional insurance and pursue his insurance claims.

Fifth, in a Pareto-imperfect world in which inter alia accident-and-pollution-related private insurance and public “insurance” is available, the amount of risk-related costs a potential injurer’s rejection of an avoidance-move imposes on himself and his potential victim depends inter alia on the amount of public “insurance” provided, the transaction-costliness of private and public insurance, the extent to which private and public risk-pooling can reduce total risk costs, and the extent to which potential injurers and potential victims make the insurance decisions that are in their own interest.
Sixth, in a Pareto-imperfect world in which relevant private insurance and public “insurance” is available, an avoidance-move’s impact on allocative risk-related costs will depend primarily on (1) the amount by which the move would reduce the private risk costs the traditional injurer and victim bore after they had taken out whatever relevant insurance they purchased, (2) the amount by which it would decrease (increase) the private risk costs that are borne by the shareholders, debtholders, and employees of the insurance companies whose insurance sales it would decrease, (3) the amount of allocative transaction costs whose generation it would prevent by deterring the sale/purchase of addition insurance and the making and processing of private-insurance and government-transfer claims, and (4) the amount of misallocation it would deter the government from generating by reducing the transfer-payments the government had to make and hence the misallocation the government would have to generate to finance its transfer-programs.

Seventh, and finally, the preceding references to the risk costs that various parties would bear did not address the following, difficult issue that may arise once one acknowledges that—in our actual, Pareto-imperfect world—parties may misestimate the risks they face and/or the equivalent-dollar cost these risks impose on them: if parties misperceive the risk costs they are bearing, do the associated allocative risk costs equal the risk costs they think they bear or the risk costs they would conclude they were bearing if they were sovereign maximizers? I have heard several supposed justifications for the economists’ failure to note the fact that the Hand formula for negligence ignores the possible impact of avoidance on the amount of risk costs that potential injurers and potential victims bear. The first is that Hand ignored such risk-cost consequences and that it is perfectly appropriate for economists to take legal doctrine as it is. Although both these propositions are true, they clearly do not justify the economists’ failure either to point out the relevance of the failure of the Hand formula to reflect the impact of avoidance on risk costs to its allocative efficiency or to explore the way in which Hand’s formula would have to be revised to be allocatively efficient in a world in which avoidance might affect accident-and-pollution-related risk costs.

The second—offered by several readers of this manuscript—is that the economists’ failure to question Hand’s use of a formula for negligence that ignores the impact of avoidance on risk costs is justified because this attribute of Hand’s formula is consistent with (indeed, is a corollary of) another of its features—viz., its ignoring the impact of potential-injurer avoidance on accident-and-pollution-related allocative transaction costs. This supposed justification fails for two reasons. First, the Hand formula’s implicit “no (impact on) allocative risk costs” “assumption” is not a corollary of its implicit “no (impact on) allocative transaction costs” “assumption”; even if no transaction costs would have to be generated to resolve the compensation issues raised by accidents, (1) potential victims who know that they will not be able to recover some or all of any loss they sustain will face accident-and-pollution-related risk costs because they will not know ex ante the precise magnitude of the loss they will sustain and costs they will bear, and (2) potential injurers who know that they will have to compensate any victims of the accidents they cause will face accident-and-pollution-related risk costs because they will not know ex ante the precise magnitude of any loss they cause for which they will be liable. Hence, even on the unrealistic assumption that no transaction costs will have to be generated to make, defend, and resolve accident-claims, potential-injurer avoidance may affect $R_v$, $R_p$, and $(R_v+R_p)$. Second, even if (contrary to fact—see below) the concept of negligence that our society is morally committed to employing to resolve some tort disputes would ignore the impact of avoidance on allocative risk and transaction costs, it would not be appropriate for economists who were analyzing the allocative efficiency of a doctrine that uses this concept to ignore these attributes of the employed concept: from the perspective of allocative efficiency, both the failure of the Hand formula to take account of the possible impact of avoidance on allocative risk costs and its failure to take account of the possible impact of avoidance on allocative transaction costs would be imperfections, and there is no reason to believe that these two imperfections would perfectly offset each other.

Third, two legally-trained Law & Economics scholars with whom I discussed this issue tried to justify the economists’ failure to consider the allocative-efficiency relevance of the failure of the standard Hand formula for negligence to reflect the impact of avoidance on allocative risk costs by citing the fact that positive tort law (1) does not entitle potential victims of accidents or pollution-events that did not occur to recover the risk costs that the possibility of such losses’ occurring imposed on them and (2) does not entitle actual victims of accidents or pollution-events that did occur who are entitled to recover some or all of the loss the actual accident or pollution-event imposed on them to recover the additional, related risk costs the defendant’s choice imposed on them. Admittedly, legal positivists might argue that this doctrinal reality justifies Hand’s creation of a formula for
negligence to be used to resolve common-law tort cases that ignores the impact of avoidance on risk costs. However, this doctrinal reality cannot justify economists’ who are analyzing the allocative efficiency of Hand’s formula ignoring the possible relevance of the formula’s failure to take account of the possible impact of potential-injuror avoidance on allocative risk costs.

In short, although I have heard at least three supposed justifications for the failure of economists to note the fact that the Hand formula ignores the possible impact of avoidance on risk costs to investigate the relevance of this omission for the allocative efficiency of a legal doctrine that employs this formula and to consider the way in which the standard Hand formula would have to be revised in the light of avoidance’s possible risk-cost consequences to secure allocatively-efficient avoidance-decisions, none of these arguments can bear scrutiny.

7 “First-best-allocative-efficiency” analyses proceed on the assumption that the only (relevant) Pareto imperfection in the economy is the possible imperfection on which the analysis is focusing. For a detailed account of why the type of first-best-allocative-efficiency analysis of a tort-law issue that this Article (like almost all Law & Economics analyses of tort law) executes is neither second-best nor third-best allocatively efficient, see Richard S. Markovits, The Allocative Efficiency of Shifting From a “Negligence” System to a “Strict Liability” Regime in Our Highly-Pareto-Imperfect Economy: A Partial and Preliminary Third-Best-Allocative-Efficiency Analysis, 73 CHI.-KENT L. REV. 11 (1998).

I have already noted (see the penultimate paragraph of note 2 supra) one consequence of the first-best character of this Article’s allocative-efficiency analysis—its assumption that the allocative efficiency of an injurer avoidance-move equals ([↓\text{PL}]_I + [\↓\text{R}_I + \text{R}_I] - \text{B}_I) where the \text{\&}(\text{R}_I + \text{R}_I) term indicates the reduction in risk costs that the relevant avoidance-move would generate in an otherwise-Pareto-perfect, transaction-costless world taking into account inter alia the identity of the party who would bear any loss the move’s rejection generated. Less globally, the first-best character of this Article’s allocative-efficiency analysis is manifest in its assumption that no potential injurer or potential victim has tort-loss insurance (see note 3 supra) and in its related assumption that (1) an injurer whose liability is governed by a negligence standard will bear all of the loss his negligence causes and no loss if he is not negligent and (2) a victim whose injurer’s liability is governed by a negligence standard will bear none of the loss his injurer’s negligence imposed on him and all of the loss his injurer’s non-negligent choices imposed on him (see the text in the paragraph preceding the paragraph in which note 8 appears infra).

8 The reference to allocative transaction costs might be thought to be redundant, but, as Calabresi has emphasized, the conventional set of Pareto-optimal conditions fails to list as an eighth condition “the preceding conditions can be fulfilled without generating any allocative transaction costs.” See Guido Calabresi, The Pointlessness of Pareto: Carrying Coase Further, 100 YALE L. J. 1211 (1991).

I am assuming that the victims are not employees of the injurers who have been injured in the course of their employment. This second set of textual conclusions reflects the analysis’ first-best-allocative-efficiency premises that (1) all actual victims of negligence are legally entitled to recover from their injurer all of the losses their injurer’s negligence imposed on them, (2) both negligence and contributory negligence will be defined and applied in first-best-allocatively-efficient ways, (3) no victim will be contributorily negligent, (4) cause-in-fact will be defined in a first-best-allocatively-efficient way and no mistakes will be made in applying this definition of cause-in-fact, (5) no case will be dismissed on proximate-cause (scope of liability) grounds, (6) damages will be accurately measured, (7) no actor will be covered by private or public accident-and-pollution-loss or accident-and-pollution-liability insurance, (8) all victims will bring and pursue the tort claims they are entitled to win (no such victim will be deterred from doing so by transaction costs [broadly understood], non-sovereignty, and/or non-maximization), (9) no entitled victim’s net recovery will be reduced by lawyer’s fees, expert-witness fees, or court costs, and (10) no victim or injurer will have to incur any other sort of (non-monetary) transaction costs to pursue or defend a tort claim.

I should add, however, that if the revision in question is to be judged not by its capacity to secure first-best-allocatively-efficient potential-injuror avoidance-decisions but by its consonance with the moral norm that I think we are committed to instantiating in tort cases involving potentially injurious conduct that does not compromise anyone’s ability to lead a life of moral integrity (see below), the choice between adding an injurer-liable and a victim-liable \text{\&}(\text{R}_I + \text{R}_I) will be salient: at least on my current otherwise-Pareto-perfect and no-transaction-cost assumptions, in those cases in which the potential injurer’s rejection of his privately-best avoidance-move is (first-best) allocatively efficient, a victim-liable \text{\&}(\text{R}_I + \text{R}_I) term should be added to the right-hand side of the standard Hand inequality (since the victim should and will bear the relevant risks in those instances), and (again on the above
assumptions) in those cases in which the potential injurer’s rejection of his privately-best avoidance-move is (first-
best) allocatively inefficient, an injurer-liable ↓(R_I+R_V) term should be added to the right-hand side of the standard
Hand inequality (since the injurer should and will bear the relevant risks in these instances). Nevertheless, although
such philosophical concerns make the “right revision” somewhat more complicated in this general case, the right
revision in any given case in this set is still perfectly straightforward.

11 Indeed, one might say that this contradiction implies that the relevant purported “alteration of the Hand formula
for negligence” really amounts to the imposition of strict liability (at least if one assumes that strict liability would
be combined with contributory negligence).

12 Obviously, an analogous argument could be developed to demonstrate that, in some situations in which the
relevant risk costs depend on whether the tort victim or tort injurer is liable, the alteration that would have to be
made in the Hand formula for contributory negligence to induce a potential victim to make an allocatively-efficient
avoidance-decision would have to be contrived and paradoxical rather than straightforward.