

# Compensation for Torts of Necessity: The Law and Economics View

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### Abstract

This paper seeks to propose a new interpretation of the rules that envisage compensation, be it damages or an indemnity, when a person takes an action in a case of necessity. The person acting out of necessity will also take into account the sum of money that he will be required to pay if the necessary action is taken and this will consequently affect his choices. Moreover, the amount of the damages or indemnity will also have an effect on the choices that the victim will make. More specifically, it will be shown that in certain situations compensation should ideally be equal to the loss actually suffered by the victim while in others optimal compensation could even be a figure equal to zero and in any case not such as to cover the entire loss suffered by the victim. This incentive-based interpretation suggests that certain compensation rules that until now have been considered efficient by scholars of law and economics are actually inefficient.

### I. Introduction

Special rules governing the civil law consequences<sup>1</sup> of actions taken in a case of necessity are contained in various Western legal systems,<sup>2</sup> including the Italian system.<sup>3</sup> Firstly the legal systems classify the potential victim's reaction as lawful or unlawful, in the wake of which they then establish the consequences of taking the necessary action, providing for full damages, a fair indemnity or even nothing at all.

US scholars have pointed out<sup>4</sup> that provisions under which the taking of an action gives rise to an obligation to pay a sum of money can serve two different

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<sup>1</sup> In this paper it is assumed that the rules governing actions taken in a case of necessity only concern the civil law consequences. It should however be noted that in the Italian system the concept is also regulated by provisions of criminal law. Therefore, if the necessary action is classified as a tort, the victim may have recourse to self-defense but, from a criminal-law point of view, only within the limits set forth by Art 52 of the Italian Criminal Code. Art 54 of the Italian Criminal Code contains provisions on the state of necessity as justification.

<sup>2</sup> As we will see, rules governing the private consequences of an action taken in a case of necessity are found not only in Italian law but also in German, English and US law, with French law providing a notable exception.

<sup>3</sup> Reference is made to Art 2045 of the Italian Civil Code, as below.

<sup>4</sup> See K.W. Simmons, 'The Restatement (Third) of Torts and Traditional Strict Liability: Robust Rationales, Slender Doctrines' 44 *Wake Forest Law Review*, 1355, 1359 (2009).

functions. The first is the fairness-based function that seeks to achieve a balance of interests considered equitable and morally fair. The second is the incentive-based function that seeks to influence the conduct of the persons who, aware of the negative consequences of their conduct, will decide to act in one way rather than another, taking the cost required under the provision into account in their cost-benefit analysis. The negative consequences arising from certain conduct are therefore tantamount to a price that must be paid to implement that conduct. As that price varies, the decisions made by persons will also change.

Following the law and economics approach, optimal prices can exist and these are ones that cannot be amended by others allowing additional aggregate benefits that are higher than the additional aggregate costs. Therefore, there are no fairness-based grounds at the basis of ideal provisions but only reasons of efficiency. It should also be noted that an efficient provision can often also appear equitable. So, for example, if by imposing an obligation on A that entails a cost of two euro for it but a gain of one hundred euro for B, the efficient provision that imposes the obligation on A could also appear equitable.<sup>5</sup>

Without seeking in any way to deny that the provision of compensation in the event of a necessary action has a primarily fairness-based function, this article seeks to propose an incentive-based interpretation and to imagine that the damages or indemnity must be calculated taking into account how the actor and the victim behave when the sum of money to be paid is set at a certain level, so that it represents the price for taking the necessary action. The incentives created on the basis of differing amounts of compensation will then be assessed, according to precepts of law and economics, on the basis of their capacity to produce efficient results.<sup>6</sup> In the same way the potential victim's conduct will also be studied, taking into account how he will react on the basis of the amount payable if the necessary action is taken.

## II. Problems to Be Addressed

The rules governing actions taken in a case of necessity essentially raise two problems for interpreters of law.

The first problem concerns whether or not the action taken out of necessity can be classified as lawful or not. This classification serves to determine the nature of the potential victim's reaction to protect himself. If the action of the person

<sup>5</sup> Reference is firstly made to R. Posner's work, which is well represented in the volume *The Economics of Justice* (Cambridge: Harvard University Press, 1981). See also F.H. Buckley, 'Three Theories of Substantive Fairness' 19 *Hofstra Law Review*, 33 (1990). On the relationship between efficiency and fairness see U. Mattei, *Comparative Law and Economics* (Ann Arbor: University of Michigan Press, 1997), 1-27.

<sup>6</sup> With all the caveats that accompany the economic analysis of law, referencing, if I may, E. Baffi, 'Su alcuni limiti dell'analisi economica del diritto (a proposito di un recente volume di Guido Calabresi)' *Rivista critica del diritto privato*, 457 (2016).

acting out of necessity (the actor) must be classified as lawful, then the victim's reaction will be unlawful and will therefore give rise in the ordinary way to an obligation to pay damages for the harm that the victim causes. If instead the action taken out of necessity constitutes unlawful conduct, then the victim's reaction will be lawful and indeed may be classified as self-defense, with the main consequence that the victim will not be under any obligation to pay damages for the harm that he has caused through his reaction.

The second question concerns the consequences in terms of the indemnity or damages payable by the person who acted out of necessity. In Western legal systems<sup>7</sup> the solutions are many and varied, as according to some systems nothing is payable to the victim of the necessary action, while other legal systems call for full compensation of the loss caused.<sup>8</sup>

### III. Elements of Comparative Law

With regard to the first point, that is to say, the nature of the victim's reaction, commencing with US common law, it has to be said that the rules essentially arise from the leading case of *Ploof v Putnam*.<sup>9</sup> In this case Ploof moored his ship at a dock owned by Putnam, without the latter's consent. Ploof was forced to moor, as due to a storm and rough sea, the ship would very probably have been lost if he had ventured into open sea. Due to its movements Ploof's ship was damaging Putnam's dock and to avoid further damage Putnam had his employees set the ship free. The vessel ended up in the storm-torn sea, ran aground and suffered damage. The ship's cargo was lost and the people on board fell into the sea and also suffered injury. The Court established that Putnam's reaction to protect his own interests was unlawful and ordered him to compensate Ploof for the harm caused. The necessary action taken by Ploof was therefore lawful.

After that The Restatement of Torts and The Restatement (Second) of Torts<sup>10</sup> classified reactive measures taken by victims of a necessary action as unlawful, defining the necessary act as lawful.

To understand whether or not a necessary act is lawful under the German legal system, reference must be made to § 904 BGB (German Civil Code), which in stating that the owner cannot prohibit the harmful act taken to avoid more serious damage, appears to classify an action taken in a case of necessity as

<sup>7</sup> An analysis of the rules governing actions taken in a case of necessity from a comparative law perspective is contained in J. Gordley and A.T. von Menren, *An Introduction to the Comparative Study of Private Law* (Cambridge: Cambridge University Press, 2009), 213-233.

<sup>8</sup> With regard to the possibility of using the economic analysis of law as a tool for a comparative study of legal institutions, reference to U. Mattei, n 6 above, is imperative.

<sup>9</sup> *Ploof v Putnam* 71 A. 188 (Vt. 1908).

<sup>10</sup> §§ 197 and 263 of both Restatements.

lawful.<sup>11</sup> The commentary to the second draft of the BGB<sup>12</sup> states that the conduct of someone who destroys another person's fence to enable the fire brigade to enter his own property or a neighbor's house so that they can fight a fire, is lawful. But for certain respects the code rules appear inadequate. In fact while § 904 of the BGB states that a person acting out of necessity may damage another person's property and in this case will be obliged to pay an amount to the victim, it does not lay down any rule for cases where a personal right is infringed.

The French legal system lacks a provision defining the nature, or civil law consequences, of actions committed out of necessity. The French Code Civil does not contain an article corresponding to Art 2045 of the Italian Civil Code or to § 904 of the BGB. This has led academic commentators to draw up theories based on criminal law, but attention has mainly focused on the compensation to be paid to the victim rather than on whether or not the necessary action is lawful.<sup>13</sup>

The same applies to the English legal system, where no leading cases deal with the consequences of victims' reactions and therefore indirectly with the legal classification of necessary actions. It has to be said that the leading cases concerning compensation due to victims have once again led scholars to address the issue of the existence and size of the claim for compensation.<sup>14</sup> However, in the first case dealt with by an English Court, ie *Mouse's Case*,<sup>15</sup> the Court expressly ruled that it was lawful to take a necessary action that causes damage to third parties.<sup>16</sup>

In Italy<sup>17</sup> academic commentators are sharply divided on the legal nature of

<sup>11</sup> On the matter M. Bianca, *Diritto Civile. La responsabilità civile* (Milano: Giuffrè, 2012), V, 655, fn 23. An in-depth analysis of German law and legal literature is provided in A. Diurni, *Gli stati di giustificazione nella responsabilità civile* (Torino: Giappichelli, 2003), specifically 169.

<sup>12</sup> *Protokolle Der Kommission für die zweite Lesung des Bürgerlichen die zweite Gesetzbuches* (Berlin, 1898), VI, § 419, 214.

<sup>13</sup> In France there is a plan to reform the law of torts available at <https://tinyurl.com/y2fp4twu> (last visited 28 May 2019).

<sup>14</sup> W.V.H. Rogers, *Winfileld and Jolowitz on Tort* (London: Sweet & Maxwell, 15<sup>th</sup> revised ed, 1998), 880.

<sup>15</sup> 77 Eng. Rep. 1341 (K. B. 1609).

<sup>16</sup> For a comparison between English and American law see N. Tamblyn, 'Private Necessity in English and American Tort Law' *Global Journal of Comparative Law*, 38 (2012).

<sup>17</sup> The most important monographic studies on cases of necessity in civil law are those of M. Briguglio, *Lo stato di necessità nel diritto civile* (Padova: CEDAM, 1963); B. Troisi, *Lo stato di necessità nel diritto civile* (Napoli: Edizioni Scientifiche Italiane, 1988); G. Chironi, *Lo stato di necessità nel diritto privato* (Torino: Fratelli Bocca, 1906). Other works on the matter include: S. Piras, 'Saggio sul comportamento necessitato nel diritto privato' *Studi sassaresi* (1948); T. Brasiello, *I limiti della responsabilità per danni* (Milano: Giuffrè, 1959); A. De Cupis, *Il danno* (Milano: Giuffrè, 3<sup>rd</sup> ed, 1979), I; B. Inzitari, 'Necessità (diritto privato)' *Enciclopedia del diritto* (Milano: Giuffrè, 1977), XXVII, 852; R. Scognamiglio, 'Responsabilità civile' *Novissimo Digesto Italiano*, XV, 655 (1968); D. Rubino, 'Osservazioni in tema di necessità e concorso di persone nel fatto colposo' *Rivista giuridica della circolazione e dei trasporti*, 202 (1953); A. Brunetti, 'Contributo allo studio del risarcimento del danno prodotto nello stato di necessità' *Filangieri*, XVIII, 481, 670, 734 (1903); L. Coviello, 'Lo stato di necessità nel diritto civile' *Filangieri*, XXIII (1898); A. Diurni, n 11 above; M Comporti, 'Fatti illeciti: le responsabilità presunte (Artt

necessary actions, as one side believes they should be included under lawful acts<sup>18</sup> or that there is such a thing as a ‘right of necessity’,<sup>19</sup> while the other side and case-law<sup>20</sup> considers them to be unlawful.<sup>21</sup> Additional particular theories have also been developed by individual authors.<sup>22</sup> Unlike other legal systems, such as

2044-2048), in P. Schlesinger and F.D. Busnelli eds, *Codice Civile. Commentario* (Milano: Giuffrè, 2012); G. Monateri, ‘Illecito e responsabilità civile’, in M. Bessone ed, *Trattato di diritto privato* (Torino: Giappichelli, 2005), I, 104; M. Franzoni, ‘Fatti illeciti (Artt 2043-2059)’, in F. Galgano ed, *Commentario del codice civile Scaloja-Branca* (Bologna: Soc. ed. del Foro italiano, 1993), 294. The subject was recently addressed by L. Nonne, ‘Profili critici dello stato di necessità nel diritto privato’ *Rivista di diritto civile*, 582 (2017).

<sup>18</sup> See S. Piras, n 17 above, 182, who states that ‘as the conduct is lawful (...) the lawfulness of self-defense (...) by someone who (...) is the victim of the necessary damage, is excluded’; A. Candian, *Nozioni istituzionali di diritto privato* (Milano: Giuffrè, 1949), 139; N. Di Taso, ‘Stato di necessità e fatto del terzo’, note on Corte d’Appello di Napoli 24 December 1951, *Foro Padano*, 1094, especially 1098 (1952), according to whom, conduct committed out of necessity constitutes a ground for excluding unlawfulness, because ‘as it does not infringe any legal rule and indeed as the possibility of such an action is expressly recognized and regarded positively, this conduct is not to be considered unlawful, but rather lawful, that is, legally authorized or permitted’; G. Tucci, *Il danno* (Napoli: Jovene, 1970), 9, and also Id, ‘La risarcibilità del danno da atto lecito nel diritto civile’ *Rivista di diritto civile*, 229 (1967), especially 265, according to whom, while the case referred to in Art 2045 constitutes a ‘lower level of wrongdoing’, it envisages a lawful action and the power to take said action is expressly recognized by the legal system according to ‘a just principle of social solidarity’, given that the damaged interests weigh less than the protected interests. See also A. De Cupis, n 17 above, 29 and 153, according to whom action taken out of necessity ‘remains not unlawful’; Id, ‘Stato di necessità e responsabilità indiretta’ *Rivista di diritto civile*, 445 (1957). Finally, see P. Trimarchi, *La responsabilità civile: atti illeciti, rischio, danno* (Milano: Giuffrè, 2017), 104, who classifies the case of necessity as one of the grounds of justification, stating that the infringing party who acts out of necessity cannot be considered at fault.

<sup>19</sup> L. Coviello, n 17 above, 2: ‘in our country a state of necessity should be considered (...) as a right of necessity’.

<sup>20</sup> Corte di Cassazione 13 December 1966 no 2913, *Giustizia civile*, I, 1951 (1967): the conduct of anyone who, forced by the need to save himself or others from serious personal injury, not deliberately caused by him and not otherwise avoidable, causes damage to a third party, is always attributable to the perpetrator, because it is the result of a free determination of intention to commit a breach of legal rules or rules of conduct to avoid personal injury to himself or others. This explains why in civil law, even in the case of necessary action, there is still a form of liability, even if it is mitigated. To the same effect, Corte di Cassazione 27 November 1972 no 3464, *Giustizia civile*, I, 170 (1974).

<sup>21</sup> The unlawfulness of necessary actions is claimed by E. Bonasi-Benucci, ‘Colpa e stato di necessità’ *Rivista giuridica della circolazione e dei trasporti*, 1129, especially 1131 (1954); A. Giuliani, *Dovere di soccorso e stato di necessità nel diritto penale* (Milano: Giuffrè, 1970), 33; A. Venchiarutti, ‘Lo stato di necessità’, in P. Cendon ed, *La responsabilità civile* (Torino: UTET, 1998), 487; M. Franzoni, n 17 above, under the entry on Art 2045, 294. Further details on the various theories drawn up with regard to the Italian legal system can be found in the study contained in C. Caricato, *Danno e indennità* (Torino: Giappichelli, 2012), 29-63 and the bibliography cited therein.

<sup>22</sup> According to M. Bianca, n 11 above, 667: ‘A distinction has to be drawn between a case of necessity entailing the sacrifice of another person’s personal right and a case of necessity entailing the sacrifice of another person’s economic right. The first case is classified as a personal exemption from liability (...) The second case is classified as a ground for excluding unlawfulness.

the US and German ones, the Italian system provides that necessity only exists when the infringing party acts to save himself or others from the danger of serious personal injury, which means that an action taken to save a property right will not be classified as an action taken out of necessity under Art 2045 of the Italian Civil Code.<sup>23</sup>

The second question concerning a necessary action regards the existence and size of the indemnity or damages that the person acting out of necessity must pay to the victim.

In the US legal system<sup>24</sup> the leading case arose two years after the one that defined victims' reactions as unlawful and is the *Vincent v Lake Erie Transportation* case.<sup>25</sup> Once again the case concerned the owner of a vessel that had moored at a dock without the dock owner's consent. More specifically, Lake Erie Transportation owned a ship that was unloading goods at Vincent's dock when a storm hit that stretch of sea. Instead of facing the open sea with the almost certain risk of losing the ship, Lake Erie Transportation moored its vessel firmly to Vincent's dock, causing damage to the dock. Because of the ship's movements, Lake Erie Transportation replaced the ropes that were breaking with stronger ropes. In this case the Court stated that although Lake Erie Transportation had not acted negligently, it still had to fully compensate Vincent for the damage.<sup>26</sup>

The Court also specified that if, in the *Ploof* case, where human lives were

For example, the action of anyone who breaks into another person's property to save himself from a fire is not unlawful'.

<sup>23</sup> If the action taken to save a property right is therefore unlawful, the victim's reaction cannot also be classified as unlawful and will constitute the justification for self-defense. However the victim's reaction will only be lawful as a form of self-defense within the limits set forth in Art 52 of the Italian Criminal Code, under which the defense must be proportionate to the injury. For example, if a person moors his ship to a dock without the owner's consent, and does so to avoid the actual and real danger that the ship will be destroyed in a storm, the action of the dock owner who unties the ship to avoid damage to the dock cannot be classified as self-defense, given the disproportion between the defense and the injury. To this effect, Corte di Cassazione 5 August 1964 no 2227, *Foro italiano*, I, 1931 (1964): 'while it is true that Art 2044 Italian Civil Code does not expressly reproduce the condition concerning proportionality between defense and injury, there can however be no real doubt that the civil law has adopted the same notion of the criminal-law exemption in all its constituent elements and, therefore also that resolute condition'. To the same effect, Corte di Cassazione 25 May 2000 no 6875, *Massimario del Foro italiano* (2000): 'when the defense reaction is excessive, it ceases to be lawful, giving rise to a tort constituting a source of obligation to provide civil compensation'. See, among the many, M. Bianca, n 11 above, 680.

<sup>24</sup> On the various rules proposed in the US to govern cases of necessity, see S.D. Sugarman, 'The "Necessity" Defense and The Failure of Tort Theory, The Case against Strict Liability for Damages Caused while Exercising Self-Help in an Emergency' 5(2) *Issues in Legal Scholarship*, 1-153 (2005).

<sup>25</sup> *Vincent v Lake Erie Transportation* 124 N.W. 221 (Minn. 1910).

<sup>26</sup> With regard to the *Vincent* case, R. Posner, 'Can Lawyers Solve the Problems of the Tort System?' 73 *Californian Law Review*, 743, 754 (1985) states that 'The owner of the pier rendered the shipowner a valuable service, for which ordinarily he would as a businessman expect to be paid. It seems as a minimum he should be compensated for out-of-pocket costs in rendering the service'.

also at stake as well as serious risks to individuals' safety, Ploof had stayed moored to Putnam's dock, he would have had to pay compensation for the damage caused. So according to the Court, in the case of a necessary action, compensation had to fully cover the loss. The Restatement of Torts and The Restatement (Second) of Torts stated in Sections 197 and 263 that in the case of damage arising from a necessary action, full compensation must be paid.

In § 904 of the BGB the German legal system also provides for full compensation when a property right has been infringed. As already stated, the German Civil Code lacks a provision to govern cases where the right sacrificed by the victim is a personal right. It is however recognized that when there is a conflict between personal rights, fair compensation must be awarded.<sup>27</sup>

For their part French scholars believe that compensation must correspond to full reparation of the damage,<sup>28</sup> while in England the prevalent view is that damage must be partially compensated.<sup>29</sup>

However, in the English legal system two of the leading cases on the civil law consequences of actions taken in cases of necessity did not envisage any compensation at all for the victims. More specifically, the first case in chronological order, ie *Mouse's Case*,<sup>30</sup> dating back to 1609, concerned a barge crossing the Thames, carrying people and their baggage. The barge was in danger and in order to avoid sinking some passengers threw other peoples' baggage into the river.

The plaintiff, who was the owner of some of the baggage thrown into the water, claimed compensation on the basis of the trespass rule. The Court did not recognize any entitlement to damages or an indemnity, ruling that

'for (the) safety of the lives of passengers (...) it is lawful for any passenger to cast the things out of the barge',<sup>31</sup>

The second case in chronological order, *Esso Petroleum Co. v Southport Corp.*,<sup>32</sup> concerned the matter of a vessel owned by Esso Petroleum Co. when in danger of being wrecked and consequently losing its cargo and also human lives, the ship discharged four hundred tons of oil into the sea, which polluted the coastline and required a cleanup operation. The Southport Corporation claimed compensation for the expenses incurred to clean the beach. The House of Lords

<sup>27</sup> See C.W. Canaris, 'Notstand und Selbstaufopferung im Straßenverkehr' *Juristen Zeitung*, 655 (1963), who considers the case of a motorist who, in order to avoid a danger on the road, knocks down a pedestrian, in this case recognizing the pedestrian's right to fair compensation.

<sup>28</sup> B. Starck et al, *Obligations. 1, Responsabilité délictuelle* (Paris: Litec, 4<sup>th</sup> ed, 1991), §§ 300-301. With regard to fair reparation on the basis of an unjust enrichment, see also F. Terre et al, *Droit private Les obligations* (Paris: Dalloz, 7<sup>th</sup> ed, 1999), § 704.

<sup>29</sup> W.V.H. Rogers, n 15 above, 880.

<sup>30</sup> 77 Eng. Rep. 1341 (K.B. 1609).

<sup>31</sup> *ibid* 1342.

<sup>32</sup> *Esso Petroleum Co. v Southport Corp.* 1956 App. Cas, 218.

upheld the decision of the trial judge who had not awarded any compensation.<sup>33</sup>

In the Italian legal system, Art 2045 of the Italian Civil Code establishes that a ‘fair indemnity’ is due to the victim of a necessary action. The provision has been interpreted as meaning that the victim is not entitled to full reparation of the damage, but at the same time the court cannot award nothing. The prevalent view is that determination of the amount of compensation in question is entirely unrelated to the actual damage and therefore entails an entirely independent assessment.<sup>34</sup> However, some also claim that the damage suffered by the victim must provide a point of reference for determining the amount of the indemnity payable.<sup>35</sup>

#### IV. The Function of Compensation

Again with regard to the Italian legal system, the unanimous opinion is that the provision of compensation in the shape of a fair indemnity has a fairness-based function as it seeks to make good the loss which, according to a principle of distributive justice, the victim of the necessary action suffered.<sup>36</sup>

In order to carry out an incentive-based analysis, it is necessary to divide the situations where the actor takes an action that infringes another person’s right into four categories.

#### V. The Various Cases of Necessity

It is indeed possible to identify four categories of situations where an action is taken out of necessity, which in turn can be divided into two groups.

The first category of situations occurs when the presence of the victim in person<sup>37</sup> or the victim’s *chattel* in a certain place and at a certain time is a

<sup>33</sup> According to the trial judge ‘(t)he safety of human lives belongs to a different scale of values from the safety of property. The two are beyond comparison and the necessity for saving life has at all times been considered a proper ground for inflicting such damage as may be necessary on another’s property (*Southport Corp. v Esso Petroleum Co*, 2 All E.R. 1204, 1209-1210 (Q.B. 1953))’.

<sup>34</sup> Among the many, A. De Cupis, n 17 above, 583.

<sup>35</sup> To this effect, R. Scognamiglio, ‘Indennità’ *Novissimo Digesto Italiano* (Torino: UTET, 1962), VIII, 594, according to whom the extent of the damage ‘will considerably affect the court’s equitable assessment, at least by persuading it to set an upper limit on compensation’.

<sup>36</sup> See, eg, M. Franzoni, ‘L’illecito’, in M. Franzoni ed, *Trattato della responsabilità civile* (Milano: Giuffrè, 2<sup>nd</sup> ed, 2010), I, 1167, according to whom the equitable assessment must seek to assign a sum which, in terms of a sense of justice, proves satisfactory. To the same effect, M. Briguglio, n 17 above, 164; B. Troisi, ‘L’autonomia della fattispecie di cui all’art. 2045 cod. civ.’ *Rassegna di diritto civile*, 975, 1001 (1984); Id, ‘Stato di necessità’ *Enciclopedia giuridica Treccani* (Milano: Treccani, 30<sup>th</sup> ed, 1993), I Diritto Civile, 1, 3.

<sup>37</sup> When the comparison is between the actor’s life and the victim’s life, an economic analysis cannot provide any indication. The same may also conceivably apply to serious damage to the victim’s physical integrity.

necessary condition for implementing the necessary action, meaning that without the victim or his *chattel* the necessary action could not have been taken and consequently the asset in danger could not have been saved (category a)).

A second category can be added, characterized by the fact that a certain investment made in the victim's *real estate* is a necessary condition for implementing the necessary action (category b)).

Both these categories of situations are also distinguished by the fact that the presence of the victim or his property does not contribute to creating the danger.

An example of a situation that falls under the first category (category a)) is provided by the presence of a boat in an area frequented by bathers and when one of them gets into difficulty, he climbs onto the boat to save himself from drowning, causing damage. If the boat had not been there, the necessary action could not have been taken.

The *Vincent* case can be considered an example of the second category (category b)), where the action taken to protect the ship was only possible thanks to the presence of the dock built by Vincent. Without that dock the necessary action could not have been taken.

The requirement that the victim or his property (that is damaged) must not have contributed to causing the situation of necessity seeks is based on a distinction which it is felt is essential be drawn. It is intended to distinguish it from the case where the property not only provides the tools for taking the necessary action but also contributed to the creation of the situation of necessity. An example is *Mouse's Case*, where the baggage thrown into the Thames was the means by which the necessary action was taken but its presence had contributed to causing the danger. These cases require special efficiency-based rules that differ from the optimal rules for the first two categories considered.

A third category is represented by situations where the investments made in the victim's *real estate* that is damaged by the person acting out of necessity are not a necessary condition for implementing the necessary action (category c)).

Another category can be added where the presence of the victim or his *chattel* in a certain place and at a certain time is not a necessary condition for implementing the necessary action (category d)).

An example of a category c) situation is provided by the case where a motorist plunges his car onto farmed land, destroying the crops. In this case the presence of crops is not a necessary condition for implementing the necessary action (the necessary action could still have been implemented if the land had not been farmed).

An example of the fourth category (category d)) is provided by the case where a motorist is forced to knock down a pedestrian to avoid serious damage to himself caused by a car driving the wrong way. In this situation the presence of the pedestrian was not a necessary condition for implementing the necessary action.

Hence we have seen four categories of situations that can be divided into

two groups and that are seldom differentiated by legal commentators. However, incentive-based reasoning suggests that different rules are required for these categories.

## **VI. Categories a) and b) of Situations of Danger and of Necessary Action**

With regard to categories a) and b) of situations of danger, *optimal compensation is equal to the damage actually suffered by the victim*. From the actor's perspective, optimal compensation is indeed equal to the damage caused to the victim. If the damage suffered by the victim is indicated by  $L$  and the benefit to the actor by  $G$ , and if compensation  $I$  is equal to  $L$ , then the actor will only take the action if  $G > L$ ,<sup>38</sup> determining a change where the gain is higher than the loss. The necessary action would therefore be efficient.

Instead from the victim's perspective, it is conceivable that optimal compensation need not be commensurate with the actual damage. For example, it could be said that if a number of efficient precautions could be taken by the potential victim, the compensation receivable should only be equal to the damage if the victim took those precautions, otherwise it should be lower. Assume that a boat finds itself surrounded by numerous bathers, giving rise to a certain likelihood that some of them may find themselves in a situation of necessity. Imagine that an efficient precaution could be to place boarding ladders on the boat to help the bather climb on board, hence limiting the damage. Therefore, the compensation could be established as equal to the damage that would have been suffered if the boat owner had positioned the boarding ladder, thus encouraging the owner to put the efficient precaution in place. If he failed to do this, the compensation receivable by him would be lower than the damage suffered. However, in such cases compensation calculated on the basis of just the damage that would have been suffered if the boat owner had taken the precautions, determines a cost for the boat owner, represented by the efficient precautions. If he failed to take them he would incur a loss represented by the difference between the compensation receivable and the damage actually suffered. The fact that he has to bear a cost could induce the boat owner to give up that particular activity. In the case under review, he could be induced to move further away from the area frequented by the bathers. This action would entail a sacrifice for him as he would have preferred to stay where the bathers were, but above all a sacrifice for the bathers who would no longer have access to the property that would enable them to take the necessary action to save their life.

Another example, falling under category b) of situations of danger, is

<sup>38</sup> This follows the reasoning of K. Hylton, 'The Economics of Necessity' 41 *The Journal of Legal Studies*, 269 (2012) and assumes that the actor makes a rational balanced choice rather than an instinctive action.

represented by the *Vincent v Lake Erie Transportation Co* case.<sup>39</sup> In that case the real danger that the ship would sink was avoided thanks to the presence of Vincent's dock. Compensation lower than the actual damage suffered by Vincent would have dissuaded others in the same condition from building docks at all.

Therefore there would have been fewer docks to which boats in difficulty could have moored.<sup>40</sup>

If the compensation receivable were *always* lower than the damage suffered, this effect of substituting (ie of forgoing) the activity required to implement the necessary action would be even more pronounced.

So in category a) and b) cases, the need to ensure that the potential victim does not forgo his activity thereby causing consequent harm for potential actors suggests that, also from the point of view of incentives for the potential victim, the optimal compensation should totally cover the damage suffered.

At this point it may be worth establishing whether, according to economic logic, in these situations a reactive measure should be considered as self-defense or as an unlawful act entailing an obligation for the victim to pay damages to the actor for the harm occasioned to the latter.

As, in the cases under review, optimal compensation is equal to the damage suffered, ie  $I = L$ , the actor will take the action only when  $G > L$ .

Now if we assume that the costs of legal proceedings are equal to zero while the cost of objecting to the necessary action is positive, which can be indicated with  $a$ , then it could be said that the victim will never object to the necessary action. In fact, if he objected, that would save the asset worth  $L$  but would mean incurring the cost  $a$ , while if he did not object he would obtain compensation equal to  $L$ .

He will therefore object when

<sup>39</sup> On the matter W. Landes and R. Posner, 'Salvors, Finders, Good Samaritans, and other Rescuers: An Economic Study of Law and Altruism' 7 *The Journal Legal Studies*, 83, 128 (1978) state that if the owner of the dock were not fully compensated 'there will be insufficient dock building'.

<sup>40</sup> A particular case that has been studied by US moral philosophers is the one where a hiker is caught in a snowstorm and in order to save his life enters someone else's cabin, eats their food to satisfy his hunger and burns their wood to keep himself warm. This specific case falls under those where the investment made in the victim's property must be considered the means by which the necessary action leads to the desired result (category b). In this situation the presence of the cabin guarantees that the hiker can save his life. Some US moral philosophers believe that the hiker has a moral obligation to pay for the goods consumed, while other believe the opposite. Examining the issue from the point of view of incentives, if the legal provision states that no compensation or only a partial compensation must be paid to the owner of the cabin, this may well result in the owner abandoning the cabin or, coming from an *ex ante* prospective, not building it at all, causing specific damage for hikers who will no longer have a place to take shelter to save their lives. See in particular J. Feinberg, 'Voluntary Euthanasia and The Inalienable Right to Life' 7 *Philosophy & Public Affairs*, 93, 102 (1978). On the matter also G. Christie, 'The Defense of Necessity Considered From the Legal and Moral Points of View' 48 *Duke Law Journal*, 975, 1005 (1999).

$$L-a > L$$

Given that, as has been said, the costs for objecting to the necessary action are positive, he will never object.

It should therefore be stated that the question of the legal nature of the victim's reaction is immaterial from a practical point of view, as measures of this type would never be implemented.

However the situation changes if there are costs of legal proceedings to consider. One can imagine that the victim of a necessary action must incur costs to identify the person who acted out of necessity, bring legal action and see his claim satisfied. When such costs, which can be high, exist and assuming that the victim will not be under an obligation to pay compensation for the harm caused by his reaction, he will object to the necessary action whenever

$$a < c$$

ie when the cost of the reactive measure is lower than the costs of legal proceedings.

If the victim objects, he obtains a benefit equal to  $L-a$ . If he does not object, he obtains a benefit equal to  $L-c$ , as the compensation receivable for the damage he has suffered is equal to  $L$ , so if  $a < c$  he will object.

However, when the victim decides to react against the necessary action because  $a < c$  and he does not have to pay compensation for the harm caused by his reaction, he will not take into account the loss of wealth that the person acting out of necessity will suffer. The actor takes his action when  $G > L$ ,<sup>41</sup> so that if the victim objects to the necessary action he incurs harm equal to  $G$ . The advantage arising from the reactive measure lies in the fact that the potential victim saves the asset worth  $L$ . From a social point of view, reactive measures should only be taken when

$$a < c - (G-L).^{42}$$

<sup>41</sup> However, it can be argued that when the actor takes the action he is not in a position to compare the value of the asset to be saved and the value of the asset that will be sacrificed. In other words, when faced with real and tangible danger of damage to a personal asset/right, he does not make a rational balanced choice based on a cost-benefit analysis, but acts instinctively. In such cases, the equitable function of indemnity or damages comes into play. It must however be pointed out that, in order not to discourage the victims of necessary actions from behaving in a certain way, in these category a) and b) cases, compensation equal to the full damage sustained by the victim guarantees desirable results. It is also worth mentioning that Italian case-law underlines the fact that the actor is free to choose how to act. For example, Corte di Cassazione 13 December 1966 no 2913, *Giustizia civile*, I, 951 (1967), states that necessary action is always attributable to the person causing the damage, because it is the result of a free determination of intention to commit a breach of legal rules or rules of conduct.

<sup>42</sup> For the sake of simplicity, the actor's costs of proceedings are not considered. Instead these costs are taken into account by K. Hylton, n 38 above, *passim*.

In other words the cost of the victim's reaction must be lower than the costs of legal proceedings, from which  $G$  must be deducted, ie the harm sustained by the actor, and the value of the asset saved by the actor, ie  $L$ , must be deducted from the damage suffered by the victim.

Therefore, as  $G-L > 0$ <sup>43</sup>

$$c > c - (G-L)$$

There will then be an excessive level of reactive measures as the potential victim will object even when the cost of his reaction is lower than the cost of legal proceedings but higher than the difference between the costs of legal proceedings and the loss in wealth. If now we assume that when the potential victim reacts he must pay compensation for the harm thereby caused, he will take the reactive measure when

$$a < c - (G-L)$$

In fact, if he takes the reactive measure he will have to compensate the harm  $G$ , but will save the asset  $L$  from loss.

Given the coincidence between one and two, providing that the harm inflicted must be compensated and therefore that the reactive measure is unlawful produces optimal incentives for the potential victim.

Assume, for example, that the asset to be saved is worth one thousand euro, the costs of legal proceedings are equal to three hundred euros, the costs of the reactive measure are equal to one hundred euro and the benefit for the actor is equal to ten thousand euros.<sup>44</sup> If the reactive measures were lawful, the potential victim would compare his costs of reaction with the costs of proceedings. In this example he would take the reactive measure and the solution would be inefficient, because for a saving of three hundred euros made by not incurring the costs of legal proceedings and of one thousand euro for saving the asset that would have been sacrificed, there would be a loss of ten thousand euros by the actor, in addition to one hundred euro represented by the costs of reaction. So for a social benefit of one thousand three hundred euros there would be social harm equal

<sup>43</sup> In actual fact it is not always the case that  $G-L > 0$ . In fact, if  $a < c$  the actor will take the action in a case of necessity if  $G > L-a$ . In cases where  $L-a < G < L$ , the actor will take his action even if it is inefficient to do so, and the victim will not implement reactive measures and will not bring court proceedings.

If  $a > c$ , the actor will take the action whenever  $G > L-c$ . For  $L-c < G < L$ , the necessary action will be taken even though it is inefficient to do so and the victim will not implement reactive measures and will not bring court proceedings. In this paper, in order to keep in line with Hylton's reasoning, it will be considered that  $G > L$ .

<sup>44</sup> This example does not take into account the fact that for many legal systems self-defense must be proportionate to the injury. However some Italian legal commentators state that, when there is a real risk of damage to a personal right and when the asset to be sacrificed is a property right, this proportionality is not required (see S. Piras, n 17 above, 143).

to ten thousand and one hundred euros. The potential victim's decision would have been optimal if he had been required to pay compensation for the harm he has inflicted.<sup>45</sup>

It must therefore be said that, according to an economic logic, the victim's reaction is to be considered unlawful, with the consequence that the harm suffered by the actor should be compensated. However this does not mean that reactive measures are always inefficient and therefore undesirable. Consider this second example: the benefit for the actor is equal to one thousand two hundred euros; the costs of legal proceedings are equal to seven hundred euros; the cost of the reactive measure is equal to one hundred euro and lastly the cost of the sacrifice of the victim's right is equal to one thousand euro. In this case the reactive measure would be implemented and its implementation would be efficient. It is important to bear in mind that the costs of legal proceedings are still social costs. More specifically, if the reactive measure was taken the change in social welfare would be  $€1000 - €1200 - €100 = - €300$ . If the victim did not react and later brought legal action the change in social welfare would be equal to  $€1200 - €1000 - €700 = - €500$ .<sup>46</sup>

At this point it is necessary to understand why there needs to be a distinction between a trespass, ie an action by which another person's property right is infringed and which is classified as an unlawful act, and an action taken in a case of necessity, which is instead a lawful act. Even in the case of trespass the damage caused must be compensated in full and even in the case of trespass the problem of excessive victim reactions can arise.

The distinction between a trespass, which is an unlawful act, and a necessary action, which is a lawful act, lies in the different presence of transaction costs. In the case of necessity the transaction costs are so high compared to the time in which negotiations should be concluded that the legal system uses a liability rule,<sup>47</sup> that is, it authorizes the infringement of another person's right against

<sup>45</sup> In fact, for a benefit of one thousand three hundred euros, he would have incurred a cost of ten thousand one hundred euros and would not therefore have reacted.

<sup>46</sup> It could however be argued that if reactive measures are considered unlawful, after they are taken proceedings will have to be initiated to investigate and order payment of damages and the parties will have to bear the costs of proceedings. As part of these costs will be borne by the actor, the potential victim will not take that part into account and therefore reactive measures will still be excessive.

<sup>47</sup> With regard to the nature of liability rules, reference must be made to G. Calabresi and A. Melamed, 'Property Rules, Liability Rules, and Inalienability: One View of the Cathedral' 85 *Harvard Law Review*, 1089 (1972). Two aspects are worthy of mention: when the victim has to sacrifice his physical integrity or a personal right, the use of a liability rule may not be justified as it may not be possible for the court to measure the subjective appraisal of these assets, which could differ considerably from one person to another. Besides, the existence of high transaction costs does not always justify use of a liability rule. For example, a person cannot break the window of a house when the owner is absent to take a bar of chocolate, even if his desire is strong and he would be willing to pay the damage caused. In order for a case of necessity to exist, legal systems demand that there is a risk of serious damage for the actor, or

payment of compensation. Instead in cases of trespass, the transaction costs compared to the time in which the negotiations should be concluded are low, which means that the right may be transferred through a voluntary agreement, ie a contract. The transferor's right is then protected by a property rule.<sup>48</sup> Where there is a contract, the transferor may obtain a share of the contractual surplus, which in the case of necessity instead goes entirely to the actor but, above all, a contract provides the certainty that a right passes into the hands of the person who values it most while no such certainty is provided when the legal system relies on a liability rule. If, say, the courts systematically underestimate the damage suffered by the victim of the necessary action, inefficient transfers of rights may well occur and this is why it is preferable to use a voluntary agreement to transfer rights when transaction costs are low. Therefore in a trespass the victim may lawfully take action to protect his own interest, because in this way the right will be transferred – where there is an advantage for both parties – through a contract.<sup>49</sup>

## VII. Categories c) and d) of Situations of Danger and of Necessary Action

### 1. Category c)

Category c) of situations where action is taken out of necessity is represented by cases where investments have been made in a property that are not a necessary condition for implementing the necessary action. In other words if the investments had not been made, it would still have been possible to successfully implement the necessary action. In these situations efficient compensation rules should ensure that the actor takes action when the benefit obtained is higher than the damage inflicted.<sup>50</sup> However, at the same time, if the victim of the necessary action were entitled to compensation equal to the damage actually suffered, he would make investments that were not efficient and too many investments compared to those that would ideally be made if account were taken of the certain likelihood

serious harm. On the point, see K. Hylton, 'Property Rules and Liability Rules, Once Again' *Review of Law & Economics*, 137- 191, 178, 182 (2006).

<sup>48</sup> With regard to the insubordination of property rules also in situations where transaction costs are low see I. Ayres and E. Talley, 'Solomonic Bargaining: Dividing a Legal Entitlement to Facilitate Coasean Trade' 104 *Yale Law Journal*, 1027 (1995), and L. Kaplow and S. Shavell, 'Property Rules versus Liability Rules: An Economic Analysis' 109 *Harvard Law Review*, 713 (1996).

<sup>49</sup> This point is underlined by K. Hylton, n 38 above, 272 et seq.

<sup>50</sup> In US law, when someone acts on instinct rather than on the basis of a rational balanced choice, no compensation for damage is due. So, eg, if a person intrudes on land to escape a vicious dog, no compensation is due. See K. Hylton, n 38 above, 273. Instead, under the Italian legal system, the person would be entitled to a 'fair indemnity' pursuant to Art 2045 of the Italian Civil Code.

that they would be destroyed as a result of the necessary action. Hence a moral hazard<sup>51</sup> would arise, as the victim, knowing that he will be fully compensated, will not consider the fact that those investments could be destroyed. In these cases the efficient solution would be to provide for fixed compensation equal to the damage that would be suffered by a victim who has made efficient investments. If the potential victim acts rationally and does not miscalculate, where such compensation is payable, he will only make efficient investments and compensation will be equal to the damage suffered.

Consideration will be given to cases where the potential victim cannot take reactive measures because it is too costly to do so.<sup>52</sup>

In practical terms, consider the following case. Tom is the owner of a piece of land beside a road where there is a dangerous bend and therefore a certain likelihood that motorists may find themselves in a case of necessity and have to run off the road, ruining the crops growing on the land. Suppose that in the period when the field is farmed there is a one third probability that the crops will be destroyed by a motorist forced to intrude on the land to avoid harm to himself or his property.

Tom can choose whether to grow beets or roses. Bear in mind that in one third of cases the crop will be destroyed as a result of a necessary action.

Beets have a cost of thirty euros and provide a revenue of sixty euros. Roses have a cost of two hundred euros and provide a revenue of two hundred forty euros.

The expected value of the two investments is the following:  
with regard to beet growing:

$$EV_b = 2/3 \text{ €}60 + 1/3 \text{ €}0 - \text{€}30 = \text{€}10;$$

with regard to rose growing:

$$EV_r = 2/3 \text{ €}240 + 1/3 \text{ €}0 - \text{€}200 = - \text{€}40$$

The investment with the highest expected value is represented by the beet growing. The investment in roses actually has a negative expected value.

Now suppose that the owner of the land is entitled to compensation equal

<sup>51</sup> Although the term 'moral hazard' is traditionally used to indicate the conduct of an insured who implements an inefficient 'hidden action' in the knowledge that the costs will be passed on to the insurance company, the term is also used to indicate the inefficient non-hidden conduct of someone who knows that the damage sustained will be compensated by a third party. With regard to the first meaning, see K. Arrow, 'Uncertainty and the Welfare Economics of Medical Care' 53(5) *American Economic Review*, 941 (1953); with regard to the second meaning, see L. Blume et al, 'The Taking of Land: When Should Compensation Be Paid?' 99 *The Quarterly Journal of Economics*, 71 (1984).

<sup>52</sup> Assume, eg, that to prevent motorists from driving onto land, it is necessary to build a very expensive wall. In this case it could prove advantageous to be the victim of a necessary action rather to invest resources to prevent that action from being taken.

to the damage actually suffered.

In this case his expected revenue would be:  
for beets

$$ER_b = 2/3 \text{ €}60 + 1/3 \text{ €}60 - \text{€}30 = \text{€}30;$$

for roses

$$ER_r = \text{€}2/3 \text{ 240} + 1/3 \text{ €}240 - \text{€}200 = \text{€}40$$

He would therefore consider it more advantageous to grow roses even if it would be more socially desirable to invest in beets.

However, if entitled to full compensation, not only will the person make less efficient investments but he will also make excessive investments, ie too many investments. Assume that the entitlement has altered the potential victim's incentives so that he chooses the more efficient investment, ie in beets, and imagine that the first unit of investments in beets has a value of nine hundred euros and costs two hundred euros. The second unit of investments in beets still costs two hundred euros, but the value of the investment is equal to seven hundred and fifty euros. The third unit of investments in beets costs two hundred euros and has a total value of two hundred forty euros.

The first unit of investments in beets has a positive expected value and is therefore desirable.

$$EV_1 = 2/3 \text{ 900} + 1/3 \text{ 0} - \text{€}200 = \text{€}400$$

For the second unit of investments in beets the expected value is equal to:

$$EV_2 = 2/3 \text{ €}750 + 1/3 \text{ 0} - \text{€}200 = \text{€}300$$

And it is therefore socially desirable.

The third unit of investments in beets has an expected value equal to

$$EV_3 = 2/3 \text{ €}240 + 1/3 \text{ 0} - \text{€}200 = - \text{€}20.$$

The third unit of investments in beets should not therefore be made.

However, if the owner is entitled to receive compensation equal to the actual damage suffered, he will make the investment in question because his expected revenue will be

$$ER = 2/3 \text{ €}240 + 1/3 \text{ €}240 - \text{€}200 = \text{€}40$$

Hence, when compensation is equal to the damage actually suffered, the victim of the necessary action will not make the most efficient investments and will make too many investments.

The situation where there is a likelihood that an actor destroys the investments

made by the victim is similar to the case where government expropriates private property for a different purpose to what was intended by the private individual and destroys the investments made by the expropriated person.<sup>53</sup> It was scholars researching the optimal rules governing takings<sup>54</sup> who pointed out that compensation equal to the investments made leads to inefficient choices as, when choosing which and how many investments to make in a property, the person who could potentially be expropriated will not take into account the probability that those investments may be totally destroyed as the expropriating government will have to use the property for a different purpose.<sup>55</sup>

Instead zero compensation firstly proves efficient. In this case for the victim of the expropriation the expected revenues from his investments will be equal to their expected value and therefore he will only make those with a positive expected value. In the case with which we are concerned of actions taken out of necessity and with regard to category c) cases, the optimal compensation could therefore be said to be equal to zero, as in this way the victim of the necessary action will take into account all the investments that will be lost if the actor takes the action. It should be borne in mind that in the English case of *Esso Petroleum*, which falls under this category c) of necessary actions, the court did not award any compensation.

Scholars of the notion of expropriation have also shown that the result of making efficient investments is achieved by providing for fixed compensation,<sup>56</sup> which is not contingent on the amount of the investments made by the person who could potentially be expropriated (or the potential victim of the necessary action). With regard to choosing the most efficient investments, it is sufficient to point out that with fixed compensation equal to T, the expected revenues of two possible investments increase by the amount of T, which means that the zero-compensation investment which proves preferable and is also efficient, will still be preferable when compensation is fixed. With regard to excessive levels of investments, fixed compensation once again guarantees the optimal choice.<sup>57</sup>

<sup>53</sup> In Italian legal theory, S. Piras, n 17 above, 194, hypothesizes that cases of necessity can constitute a taking due to private necessity. The commentary to the second BGB project, *Protokolle Der Kommission für die zweite Lesung des Bürgerlichen die zweite Gesetzbuche* n 12 above, 214, also develops a parallel between necessary action and taking.

<sup>54</sup> Reference is made to L. Blume, D. Rubinfeld and P. Shapiro, n 51 above.

<sup>55</sup> If the government acquires the property to achieve an aim that coincides with the private individual's aim, then optimal compensation will be equal to the value of the investments, in order not to dissuade the private individual from producing those properties. On the point see S. Rose-Ackerman, 'Regulatory Takings: Policy Analysis and Democratic Principles', in N. Mercurio ed, *Taking Property and Just Compensation, Law and Economics Perspectives on the Takings Issue* (Boston: Kluwer, 1992), 30. On the economic analysis of takings see T. Miceli, *The Economic Theory of Eminent Domain. Private Property, Public Use* (Cambridge, Mass.: Cambridge University Press, 2011).

<sup>56</sup> L. Blume et al, n 51 above, 78.

<sup>57</sup> Going back to the example of the investment in beets, the third unit of investments proved inefficient. If fixed compensation, for example of €1,000, is provided, the person will

Fixed compensation, ie not contingent on the investments made by the person who could potentially be expropriated or the potential victim of the necessary action, ensures that the most efficient investments are chosen and that the investment level is optimal. Instead, compensation linked to the actual damage suffered by the expropriated person or the potential victim of the necessary action will in any case lead to inefficient choices, as part of the social cost of the investment will be passed on to the government or to the actor and the potential victim will not take this into account.<sup>58</sup>

So, for example, if a person sets up a very expensive system for growing tropical plants on a beach near a commercial port, given that there is a certain likelihood that one of the many ships using the port may find itself in a situation of necessity and have to pour the oil from its tankers into sea – which will destroy the tropical plant growing system – it has to be said that the investment is inefficient and therefore that compensation should not be linked to said investment. Reference should only be made to the damage that would have been sustained if efficient investments had been made. An even more extreme example is provided by the case where a person places his collection of crystal-ware near a bend on a dangerous road where motorists may have to run off the road, intruding on another person's property and crashing into the crystal-ware. In this case compensation should not be equal to the damage actually suffered by the victim, because such compensation would not encourage the victim to choose a different place to keep his crystal-ware.

It has been pointed out that, from the actor's point of view, efficient compensation is equal to the damage caused to the victim. The potential actor will decide whether to take the action to save his property on the basis of the compensation established by law. So, if compensation is equal to zero the actor will take too many necessary actions,<sup>59</sup> as even when the benefit is only marginal, he will still take the necessary action. Fixed compensation could therefore be calibrated in such a way as to control the actor's choice. To sum up, it has been pointed out that with regard to the potential actor compensation should be equal to the damage suffered by the victim. Instead with regard to the victim, the optimal compensation should be fixed and not contingent on the investments made so as to ensure that costs arising from the destruction of investments are

not make that third investment in beets. In fact, if he only makes the first two investments his expected revenue will be equal to €1,000 + €1,450 = €2,450. If he makes the third investment his expected revenue will be equal to €1,000 + €1,410 = €2,410.

<sup>58</sup> L. Blume and D. Rubinfeld, 'Compensation for Takings: An Economic Analysis' 72(4) *Californian Law Review*, 569, 644 (1984): 'Whatever the exact determination of compensation, it is important that the measure be one that cannot directly affect the behavior of the individual investors, since any compensation measure which can be affected by private behavior will create the possibility of inefficiency due to moral hazard'.

<sup>59</sup> The Italian legal system controls the actor's choices by providing, in Art 2045 of the Italian Civil Code, that a case of necessity is present only when action is taken to avoid 'serious personal injury'.

not passed on to the actor and overlooked by the victim.

The solution to the *conundrum* is to set fixed compensation that is equal to the damage that would be suffered by a victim if he only made efficient investments.<sup>60</sup> Given that, when compensation is fixed, a rational person will only make efficient investments, that is to say, with a positive expected value, the compensation will be equal to the damage actually suffered. But this concurrence between compensation and damage must not give the impression that the compensation is contingent on the damage actually suffered by the victim. If the victim were to act irrationally or misjudge the situation and make further or inefficient investments, the compensation would be lower than the damage actually suffered. To go back to the farming example, compensation must be established as the value of the crop when beets are grown and only the first two units of investment are made. A rational person will grow beets and only make two units of investment. In this way the damage suffered by a rational person will be precisely equal to the compensation set by the law. However, if the potential victim irrationally or mistakenly grows roses or makes the third unit of investment in beets, compensation would be lower than the damage actually suffered.

It is however important to note how difficult it can be for the court to determine which investments are efficient and how efficient they are. Generally speaking it can be said that if the likelihood of a situation of necessity occurring is very low, efficient investments in terms of type and number will tend to be those that would be made if the likelihood were equal to zero, whereby the compensation should seek to cover the damage actually suffered by the victim. If the likelihood of the harmful event is high, then the type and level of investments may well be inefficient and the court will be required to carefully assess whether the potential victim chose, and only made, investments of the efficient kind.

The result that appears to have been obtained so far lies in the fact that in category c) cases compensation should not be linked to the investments made by the victim but should be fixed. This is why legal systems such as the German and US system, which provide for full compensation of the damage caused, prove inefficient.<sup>61</sup>

<sup>60</sup> This solution is identified by T. Miceli, 'Compensation for the Taking of Land under Eminent Domain' 147 *Journal of Institutional and Theoretical Economics*, 354 (1991).

<sup>61</sup> Until now we have assumed that the potential victim was unable to take reactive measures. Now we need to see what happens when these measures can be taken. Assume that the potential victim has made efficient investments worth five hundred euros and that compensation is set at five hundred euros. Now imagine that the potential victim makes a further investment of four hundred euros which increases the value of the investments by four hundred fifty euros. The compensation level stays the same at five hundred euros. In this case, if the reactive measure is considered unlawful, the person will take the reactive measure even though it would be efficient to leave the actor the possibility of infringing the right. Imagine that the actor obtains a benefit of one thousand and one hundred euros from the necessary action. If the potential victim does not take any reactive measures he will suffer a loss of  $€500 - €950 = -€450$ , ie equal to the difference between the compensation that was not obtained and the value of the sacrificed asset. Assume then that a reactive measure costs fifty euros. If the potential victim takes a reactive measure he will

## 2. Category d)

Lastly consideration must be given to category d) situations where the presence of the victim or his chattels is not a necessary condition for implementing the necessary action, but rather a mere possibility.

These are situations where the potential victim is not constantly exposed to the risk of the necessary action, but may occasionally find himself in a situation where this risk is present. Imagine the case of a pedestrian who may find himself at a junction where there is a certain likelihood of being knocked down by a motorist acting out of necessity. The pedestrian may be in that place for a certain period of time, but at other times he will be in different places where there is no risk of being knocked down by a motorist. *In these cases the aim is to ensure that the actor only takes the action when the benefit is higher than the cost.*<sup>62</sup> But at the same time it is necessary to discourage the potential victim from making excessive investments or implementing excessive levels of activity. Given the lack of information provided by the courts, a second best solution could be represented by compensation linked to the damage suffered by the victim.

In terms of efficiency, both the level of investments that the potential victim makes and that may be destroyed, and the length of time or number of times that he is exposed to the risk of suffering damage as the result of a necessary action should be controlled by means of optimal compensation. In the case in

suffer damage equal to €950 - €50 - €1100 = - €200. He will save the asset worth nine hundred and fifty euros but will have to spend fifty euros to take the reactive measure and will have to compensate the damage equal to one thousand and one hundred euros. It will therefore be advantageous for the potential victim to take the reactive measure even if the forced transfer of the right would have been efficient. In any case it will therefore always be preferable to consider reactive measures as unlawful and as giving rise to an obligation to compensate the actor for the harm inflicted on him. If said measures were considered lawful, the potential victim would always object, as in the example considered he would obtain a benefit of four hundred and fifty euros, equal to the difference between the value of the investment saved and the compensation that was not obtained for not having permitted the necessary action to be taken. In this case the potential victim would also object to all the efficient necessary actions that would lead to a benefit for the actor that was greater than the victim's investment loss. Instead by envisaging the need to pay compensation equal to the harm caused to the actor, ie G, the potential victim will object to all the inefficient necessary actions, while less reactive measures will be taken against efficient necessary actions.

This paper does not however deal with the social desirability of the additional investment that has been envisaged.

<sup>62</sup> As already said, we are imagining that a person can make a rational choice, rather than acting on instinct. In US law, no indemnity or damages are payable in cases of instinctive action. This was the ruling in the *Cordas v Peerless Transportation Co.* case (27 N.Y.2d 198 [N.Y. City Ct. 1941]), where a cab driver jumped from his car to escape an armed man who had got into the cab. The car continued to roll and knocked down a woman and her two children. The Court ruled that in this case no compensation was due as the cab driver's behavior was reasonable in view of the nature of the threat and the emergency conditions. This rule is approved by K. Hylton, n 38 above, 273. Under the Italian legal system the victims would have been entitled to compensation in the shape of a fair indemnity. The provision of an indemnity or damages could be justified with a view to allocating the risk to the best risk bearer, as referred *infra*. It could be assumed that the taxi company is the party that best bears the risk of the consequences of necessary actions.

question it is however extremely difficult to identify rules to limit the investments made by the potential victim in order to contain losses in the event of a necessary action. As I have said, the potential victim is exposed to a risk of damage from a necessary action at certain times while at others he is not and the investments he makes serve to increase his welfare even when he is not running any risk.<sup>63</sup>

The requirement to be met by the legal system consists in governing the activity of the potential victim with regard to the number of times and length of time he finds himself in a situation where there is a risk of suffering damage as the result of a necessary action. Imagine the case of a pedestrian who intends to spend time at a junction where there is a probability  $p$  that he will be knocked down by a motorist in a situation of necessity. With regard to the person potentially causing the damage, optimal compensation should totally cover the damage. In this way he would only take the necessary actions that are valued higher than the damage they produce. With regard to the potential victim there is the problem that, when compensation is equal to the damage actually suffered, he externalizes the social costs of the accident, in that he does not take them into account as they are fully compensated by the actor. Imagine that a pedestrian has a benefit equal to ten euros in stopping at a junction. The probability  $p$  that he will be knocked down is equal to zero point two. If the investment is made, the damage is equal to one hundred euros. The decision to stop at the junction therefore has an expected value equal

$$EV = 0.8 \times \text{€} 10 + 0.2 \times -\text{€} 100 = -\text{€}12.$$

This decision is therefore socially undesirable.

If, however, in the event of an accident the damage were fully compensated, then the expected revenue would be equal to eight euros ( $ER = \text{€}8 + \text{€}0 = \text{€} 8$ ), which means that the pedestrian would stop at the junction.

Efficient compensation would be equal to zero. In that way, by internalizing all the costs the potential victim would be spurred to choose the efficient activity level. Therefore, the pedestrian would only stop at the junction if the expected benefit obtained was higher than the expected social cost that could arise. Zero compensation however runs counter to the need to encourage the potential actor to consider the damage he causes through the necessary action. It has indeed been pointed out that, with regard to the actor's decisions, optimal compensation would be equal to the damage actually produced.<sup>64</sup>

<sup>63</sup> However there are still cases where the potential victim's conduct may be subject to sanctions and namely when, *in view of the investments made*, he behaves in a way that puts those investments at risk by virtue of a necessary action. So someone who brings particularly precious and easily damaged items to an area where necessary actions are frequently taken could be discouraged from doing so by providing for compensation that may even be equal to zero. In other words, these are cases where the conduct in itself must be controlled, regardless of the level of activity.

<sup>64</sup> Suppose that a person gains a benefit of ten euros from the first hour he stops near the

It can be expected that, when it is possible to assess the benefit gained by the potential victim from the activity and identify his exact activity level, then it should be possible to calculate the compensation on the basis of the efficient activity level. The compensation payable should be equal to the damage when the activity level is efficient and equal to zero when the activity level is excessive. In fact when the activity level is excessive, any compensation would lead to inefficient choices, as when deciding whether to undertake a further level of activity, the person would also consider the compensation he would be paid.<sup>65</sup> With zero compensation when the activity level is excessive, rational people, knowing that no damages or indemnity would be received if they chose an excessive activity level, would choose the efficient level of said activity.<sup>66</sup>

In those cases where it is impossible to assess the benefits gained by the potential victim from his activity or to assess his activity level,<sup>67</sup> when the legal system is faced with a situation where (a) with regard to the actor, the optimal compensation to be set should be equal to the actual damage and (b) with regard to the victim, it should be equal to zero, a 'second best' solution could be represented by compensation that is a percentage of the damage caused. In this way, the actor's choices would be at least partially controlled and the potential victim's choices would also be at least partially controlled. The provision of compensation that is a portion of the damage actually caused also spurs the actor to take the action that entails a lower cost for him and that corresponds to a lower social cost.<sup>68</sup>

junction, a benefit of six euros from the second hour and a benefit of three euros in the third hour. The efficient level could be to stop for two hours and therefore the person would obtain compensation equal to the damage suffered if he stopped for only two hours. If the person stopped for three hours and the necessary action was taken in that third hour, he would not be entitled to any compensation. In fact in that case any compensation would lead to inefficient choices, as when deciding whether to undertake a further level of activity, the person would also consider the compensation he would be paid.

<sup>65</sup> So, for example, if a person stops for hours at a junction where it is dangerous to stop on account of necessary actions taken by motorists, without gaining a significant benefit from stopping there, then the compensation should be equal to zero.

<sup>66</sup> Again in this case we can raise the issue of whether or not victim's reactions are to be classified as unlawful. The same reasoning made with regard to category a) situations when a necessary action is implemented applies: the reactive measure must be considered unlawful, so that the potential victim will only implement it if  $a < c - (G-L)$ , which is the condition for achieving optimal incentives.

<sup>67</sup> For example we cannot know how many hours the victim stopped at a certain junction.

<sup>68</sup> Suppose that a motorist in difficulty has to choose whether to head towards farmed land or towards an area where there are people. Compensation linked to damage will push him towards the farmed land. However the same result could be achieved in Italian law by interpreting the expression 'not otherwise avoidable' contained in Art 2045 of the Italian Civil Code as meaning that, to ensure that the case of necessity is justified, the necessary action taken must be the one that causes the least social damage.

### **VIII. Optimal Allocation of Risk and Compensation**

So far we have assumed that compensation has to be calculated without assigning it the function of allocating the risk to the best risk bearer. In other words we have assumed that the persons were risk neutral. However, it may prove necessary to allocate the risk to the person who is more capable of bearing it. There may in fact be cases where one person certainly appears to be the best risk bearer. So, if a person encounters various situations of necessity, it may be preferable to allocate the risk of harmful events to him, as he could eliminate the negative consequences borne with one single insurance cover. One such example is the case of a transport company, whose employees may find themselves having to deal with situations of necessity when driving its vehicles. By allocating the risk to the transport company, with consequent compensation equal to the damage suffered by the victim, it can insure itself against said risk, while if the potential victims of the necessary action had to insure themselves, the costs would be higher.

In the case of two equally risk averse persons who find themselves with the same probability of having to take a necessary action to the detriment of the other, a mutual form of insurance could entail sharing the damage caused by the necessary action between them. Consider the case of two motorists who may both find themselves causing ten thousand euros of damage to the other. In this case the provision of compensation equal to five thousand euros would represent a form of mutual insurance.<sup>69</sup>

### **IX. Conclusions**

The situations where a person is forced to act out of necessity are so many and varied that it is impossible to find a single optimal measure of the compensation to be paid.

More specifically, in cases where the victim himself or his property represents the means by which the necessary action is taken, compensation equal to the damage actually suffered by the victim prevents him from deciding not to do certain things so as not to suffer the damage arising from the necessary action, with the undesirable consequence that the actors potentially causing the damage will not be able to take the necessary action and therefore save their property.

Instead in situations where the victim himself or his property is not the means by which the necessary action is taken, in order to ensure that potential victims do not fail to take into account the risk that their property may be destroyed when the necessary action is taken, compensation that does not cover

<sup>69</sup> Assuming that the damage can be shared between two motorists when neither of them caused the accident through negligence, in order to obtain a form of mutual insurance, E. Carbonara et al, 'Sharing Residual Liability: The Cheapest Cost Avoider Revisited' 45 *The Journal of Legal Studies*, 173, 200 (2016).

all the damage and which, where possible, is fixed, is desirable.

This article has shown that rules, especially the US and German rules, which envisage full compensation for the damage suffered by the victim of the necessary action are inefficient<sup>70</sup> for actions belonging to categories c) and d), ie situations where the injured party or his property are not the means through which the necessary action is successfully taken.

Likewise rules, such as the English ones, that do not award any compensation to the victim of the necessary action are equally inefficient. This is because they do not take into account category a) and b) cases where the victim's property or the victim himself represents the means by which the necessary action is taken and therefore only partial compensation would lead potential victims not to implement the activities that actually allow the necessary action to be taken.

The rule laid down in Italian law, according to which the victim is awarded a 'fair indemnity', allows compensation to be calculated according to the different situations in which he finds himself.<sup>71</sup>

The rules of the Italian legal system, set forth in Art 2045 of the Italian Civil Code, therefore appear more economically efficient than the different rules established in Western legal systems. They allow compensation to be calibrated by distinguishing between cases defined as categories a) and b) and those falling under categories c) and d).

Leaving aside the efficiency factor, the fairness-based reasons that commend a certain amount of compensation rather than another are still valid, as has been shown from the start.

<sup>70</sup> The efficiency of the US rules is instead claimed by K. Hylton, n 38 above, *passim*.

<sup>71</sup> This article has not dealt with the case of necessary rescue, and namely when someone acts causing damage to save others from a certain danger. See, on the matter, the analysis of A. Porat and E. Posner, 'Offsetting Benefits' 100 *Virginia Law Review*, 1165 (2014). However the arguments put forward hereunder to claim that a distinction must be made between the various situations and that the victim should not always be awarded full compensation still appear valid.