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# Tort Law and Economic Development: Strict Liability in Legal Practice

Eugênio Battesini\*

**Abstract:** “The last two hundred years of the evolution of Western societies has been a story of developing countries, a story in which tort law has played a rather important role” (Mattei, 1998, p. 241). As an instrument par excellence for correction of negative externalities, tort law has a high impact on the economic system. Tort law also provides fertile ground for law and economics comparative studies. More advanced tort law systems register the existence of a dualistic system of liability, performing the coexistence, in "relative harmony", of the basic rule of negligence with the strict liability, applicable in cases specifically provided for. In legal practice, however, it is a complex issue, revealing the existence of a "gray area" that makes it difficult to establish a clear and consistent dividing line. Among the few attempts to establish a "clear cut test", highlight those performed by Landes and Posner (1981, p. 907-908; 1987, p. 180) that use economic analysis, specially the fundamentals crystallized in the Hand formula: "high expected accident cost" and "impracticality of avoiding accidents through exercising greater care". This paper adheres to the research paradigm proposed by Mattei, considering that tort law has a high impact on the economic system and that comparative law and economics studies are relevant in order to improve tort law systems, especially in developing countries and countries in transition to the market economy. The paper also adheres to the theoretical guidelines proposed by Landes and Posner, aiming the application of strict liability in legal practice, especially in order to apply one of the main institutional innovations carried out in the Brazilian system of liability, the general clause of strict liability for highly dangerous activities of the sole paragraph of the Article 927 of the Brazilian Civil Code of 2002, legal provision that significantly expanded the role of the courts, which were explicitly authorized to qualify some activities as dangerous, making them subject to strict liability. The paper is structured in two parts. The first part explores the traditional legal theory in comparative perspective and the contribution of economic analysis of law. The second part presents empirical evidence of the application of strict liability for risky activities in comparative law and in Brazil. In conclusion, first, it is highlighted the fact that, although the doctrinal convergence around the risk theory and around the factors of application of strict liability proposed by the economic analysis, in legal practice the systems examined do not present a uniform list of risky activities. It is suggested the existence of multiple efficient equilibrium solutions, result of process of "adaptive efficiency" in implementing strict liability by the risk of the activity. Second, considering Legislative and Judiciary actions in the process of defining what risk activities are subject to strict liability, three categories of legal systems are identified, namely: open system (e.g. United States), closed system (e.g. Germany) and hybrid system (e.g. Brazil). It is suggested, pragmatically, that the hybrid systems harmonize the actions of Legislative and Judiciary, allowing make use of "the best of both worlds". Third, considering the experience of harmonization and unification of European tort law and the institutional innovations carried out in the Brazilian system of liability, it is stated that the establishment of a secure institutional base

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to make the choice between negligence and strict liability is of fundamental importance to developing countries and countries in transition to the market economy.

**Key-words:** Law and economics. Tort Law. Comparative Law. Strict liability. Brazil.

## I. INTRODUCTION

Considering the interface between tort law and economic development, Mattei highlights one important and usually neglected point: “the last two hundred years of the evolution of Western societies has been a story of developing countries, a story in which tort law has played a rather important role” (Mattei, 1998). As an instrument par excellence for correction of negative externalities, tort law has a high impact on the economic system. In the first stages of economic development, the internalization of social costs is performed basically by negligence and the choice is between non liability and negligence. In more advanced stages of economic development, acquires relevance the strict liability and the choice became one of either negligence or strict liability. Going further, Mattei notes that tort law provides fertile ground for comparative law and economics. Among other aspects, by the fact that the legal doctrine of torts, anywhere, is focused on the same set of problems, such as: the fundamentals of liability, causation, and the choice between negligence and strict liability (Mattei, 1998).

More advanced tort law systems register the existence of a dualistic system of tort law, performing the coexistence in "relative harmony" of the basic rule of negligence, raised to the position of general principle of liability, with the rule of strict liability, applicable in cases specially provided for in all legal systems (Dam, 2006; Werro, Palmer e Hahn, 2004). From the doctrinal point of view, however, it is a complex issue, revealing the existence of a "gray area" that makes it difficult to establish a clear and consistent dividing line between negligence and strict liability (Koch e Koziol, 2002; Werro, Palmer e Hahn, 2004). Faure (2002) consigs to be difficult to establish a "clear cut test", noting that among the few attempts to do so, highlight those performed by Landes and Posner (1981; 1987), that use the economic analysis of law, specially the fundamentals crystallized in the Hand formula: "high expected accident cost" and "impracticality of avoiding accidents through exercising greater care".

This article adheres to the research paradigm proposed by Mattei, considering that tort law has a high impact on the economic system and that comparative law and economics studies are relevant in order to improve tort law systems, especially in developing countries and countries in transition to the market economy. The paper also adheres to the theoretical guidelines proposed by Landes and Posner, aiming the application of strict liability in legal practice, especially in order to apply one of the main institutional innovations carried out in

the Brazilian system of liability, the general clause of strict liability for highly dangerous activities of the sole paragraph of the Article 927 of the Brazilian Civil Code of 2002, legal provision that significantly expanded the role of the courts, which were explicitly authorized to qualify some activities as dangerous, making them subject to strict liability.

The paper is structured in two parts. The first part explores the traditional legal theory in comparative perspective. The doctrinal foundations of strict liability are presented, pointing out the similarities between the legal systems of tort, and pointing out that the establishment of objective criteria to identify categories of risky activities subject to strict liability is a methodological problem common to many countries, whether they are of common law or civil law tradition. In addition, the first part explores the contribution of economic analysis of law, with emphasis on the objective criteria to identify categories of risky activities subject to strict liability presented by Landes and Posner: "high expected accident cost" and "impracticality of avoiding accidents through exercising greater care".

The second part presents empirical evidence of the application of strict liability for risky activities in comparative law, pointing out the existence of three categories of legal systems, according to the degree of participation of the Judiciary, namely: open systems, in which it is competence of the Judiciary the task of defining the list of dangerous activities to apply strict liability, whose typical example is the United States; closed systems, in which the definition of the list of dangerous activities is an attribution of the Legislative, and to the Judiciary is not allowed to qualify activities as being dangerous to apply strict liability, whose typical example is Germany; and mixed systems, in which, besides applying strict liability to the list of dangerous activities prepared by the Legislative, the Judiciary has express legislative authorization to expand the list of dangerous activities, as is the case of Brazil. In addition, the second part presents empirical evidence that confirm the possibility of using fundamentals of economic analysis as a criterion for applying the strict liability in Brazil, with the indication of judicial precedents that perform the application of the general clause of strict liability for highly dangerous activities of the sole paragraph of the Article 927 of the Brazilian Civil Code of 2002.

The conclusion performs a synthesis of the main ideas developed and presents the key conclusions of the study. First, it is highlighted the fact that, although the doctrinal convergence around the risk theory and around the factors of application of strict liability proposed by the economic analysis, in legal practice the systems examined do not present a uniform list of risky activities. It is suggested the existence of multiple efficient equilibrium solutions, result of process of "adaptive efficiency" in implementing strict liability by the risk of the activity. Second, considering Legislative and Judiciary actions in the process of

defining what risk activities are subject to strict liability, three categories of legal systems are identified, namely: open system, closed system and hybrid system. It is suggested, pragmatically, that the hybrid systems harmonize the actions of Legislative and Judiciary, allowing make use of "the best of both worlds". Third, considering the experience of harmonization and unification of European tort law (Article 5:101 of the Principles of European Tort Law), and the institutional innovations carried out in the Brazilian system of liability (Article 927 of the Brazilian Civil Code of 2002), it is stated that the establishment of a secure institutional base to make the choice between negligence and strict liability is of fundamental importance to developing countries and countries in transition to the market economy.

## II. DOCTRINAL FUNDAMENTS

### II.1. Traditional legal theory

The main purpose of the law of damages (accident law), Zweigert and Kötz (2002) consigns, consists in specify, among the wide range of everyday events that leads to the damage, which ones should be transferred from the victim to the author, according to the justice and fairness ideals that are dominant in society. In a similar way, Schäfer and Ott (1991; 2004) register that, as a method of resolving conflicts of interest in activities that involve risk of accidents, the law of damages has the task of determining the subjective legal position and the rights of actuation of the potential victims and authors. In general lines, thus, the law of damages, *responsabilité civile* in civil law systems or tort law in common law systems, can be defined as a subdivision of legal science that dedicates itself to the study of criteria for select situations whether the damage caused to thirds should be repaired (when repair) and of the criteria for the realization of repair (how to repair).

So insightful, Zweigert and Kötz (2002) put in evidence the fact that, if we left aside historical aspects to focus the analysis on practical aspects of the law of damages, it appears that "groups and types of cases that seem problematic are practically the same in all legal systems". And the fact that "all legal systems have a collection of doctrines" that allow courts to balance the interests involved in each case and decide whether or not compensation should be paid. So, "it is not surprising to discover that the same assessment process repeats itself in different systematic contexts". As is indicating the manifestation of the celebrated German comparatists, despite the structural differences of the various legal systems, there is strong convergence in the law of damages, with the *responsabilité civile* and the tort law operating analogously in a common material base.

In such a context, in order to attribute liability, legal doctrine traditionally identifies three basic elements or requirements, namely: the existence of a

damage, injure or harm, monetary or personal, to a third part; the existence of a causation, a link that connects the action to damage, the cause effect relation between the act practiced and the verified damage; and the existence of a nexus of imputation, a qualified legal action founded on the idea of negligence or created risk (look upon the topic, for example: European Group on Tort Law, *Principes du Droit Européen de la Responsabilité Civile*, 2011; and American Law Institute, *Restatement of the Law Third, Torts: Liability for Physical Harm*, 2005). The three classic elements of legal doctrine, as Cooter and Ulen (2008) register, constitute a “coherent picture of social life”. Since “we impose risks upon each other in our daily lives”, society has “developed norms that prescribe standards of behavior to limit these risks”. Therefore, when people “cause harm by violating these standards of behavior, the cost of harm must fall upon someone”, so that “the courts trace cause of the harm back to the violation of the standard and assign liability either to the party at fault or simply to the party who caused the harm”.

Concerning the nexus of imputation, the foundation or the reason for the attribution of responsibility to a particular person for damage caused to another person, it is understood that the contemporary legal phenomenal is the existence of a dualist system of liability, with the coexistence of negligence and strict liability. As Dam (2006) signalizes, all legal systems provide strict liability norms in addition to the basic negligence norm, whereas if negligence does not makes satisfactory results, the strict liability is often provided as a solution. In a converging way, Werro, Palmer and Hahn (2004) consigns that the principle of negligence is not and never was the sole basis of liability, however, there is widespread recognition between law makers, judges and law academics that negligence is the rule and strict liability is an exception.

About the dualist system of liability, emblematic are the manifestations of two major Brazilian jurists, namely Caio Mário da Silva Pereira, author of the Draft Code of Obligations, in reforming the Brazilian Civil Code of 1916, and Miguel Reale, the General Coordinator of the Commission responsible for preparing the Brazilian Civil Code of 2002. Pereira (1998; 2008) highlights that the two regimes coexist, negligence represents the basic notion and the general principle of liability, and strict liability is applied in cases specified, or when the injury comes from the situation created by an operator profession or activity which exposed the victim to the risk of harm, concluding that, “it is in this very sense that modern systems follows..., to go against the traditional idea of negligence is the same as to create a asymmetric dogmatic with all other systems..., though, to stay only with it is to stop progress itself”. Reale (1978) highlights that “both forms of liability are intertwined and makes themselves thereby dynamics”, thus should be recognized “negligence as the main rule, therefore the individual should be liable predominantly by its action or omission

due its negligence or illicit will”, which “does not exclude that the structure of business could lead to the strict liability...., this is a fundamental point”.

In fact, despite to be crystallized in the contemporary legal systems the idea that negligence and strict liability are both in “relative harmony”, performing the coexistence of the basic rule of negligence, raised to the position of general principle of responsibility, with the rule of strict liability applicable in cases specially provided for, in the doctrinal point of view that theme reveals itself complex. The existence of a “grey area” between the concepts of negligence and strict liability is an important question raised by Koch and Koziol (2002), by presenting the conclusions of the comparative study aimed to the unification of strict liability, sponsored by the European Centre of Tort and Insurance Law.

Also recognizing the existence of a “grey zone”, Werro, Palmer and Hahn (2004) appoints to the difficulties inherent to the delineation of the actuation field of negligence and strict liability, highlighting that the discussion about strict liability has been going on for many years, but there is still a great uncertainty about its meaning and limits. Going further, the authors consigns that this uncertainty makes itself stronger when compared the different national systems of tort. There are substantial differences regarding the influence that European legal systems attribute to strict liability. Even though strict liability is considered exception in most of them, the rate of occurrence of that is not the same. Concluding than that it is safe to say that there are numerous strict liability zones, both in civil law and common law systems.

It is possible to conclude than that important methodological questions flourish under the dual system of liability. Acquires relevance especially the theme concerning the theoretical foundations of strict liability, or, pragmatically, it is necessary to establish objective criteria for the application of strict liability.

Considering the traditional legal doctrine, the application of strict liability is usually based on reasons such as: the imperative of social politics, specially public peace and social welfare; the standard term of equity; the abuse of rights, characterized by the exercise of rights by its owner with lack of respect for economic and social goals which are the reason for that right to be instituted or to use these rights harming the moral and good costumes, or even to exceed the limits of good faith; the guarantee theory, built on the duty of care imposed to special people such as parents for their children, employers for their employees; and, above them all, the risk theory (see on this subject Paula, 2007).

The birth of the idea of risk activity as the foundation for the application of strict liability dates back to the second half of the XIX century, from the work of European jurists, especially of French authors such as Saleilles, Jossierand, Mazeaud and Mazeaud, Ripert, Demogue, and Savatier. Representative contribution to the development of the risk theory was carried out by one of the pioneers of interactive study between law and economics, the Austrian jurist

Victor Mataja<sup>1</sup>, which in the book *The Compensations Law by the Economic Perspective* (1888) defends the appliance of strict liability throughout the use of arguments of economic nature (Gonçalves, 2006; Dias, 2006).

Over time, the traditional legal doctrine developed the risk theory considering various modalities, such as: integral risk, extreme modality that accepts the duty to indemnify even in cases of non-characterization of the causation, being sufficient the existence of damage; the created risk, with attribution of liability to the agent that develops a potentially dangerous activity, putting in secondary plane the interest or finality with which the activity is developed; the professional risk, with attribution of liability to the agent that develops habitually and continuous activity that implies in risk; and the profit risk, by assigning liability to the agent that profits with the damage activity, which enjoys advantages, not necessarily economic, obtained with the exercise of risky activity (Pereira, 1998). However, there remains the difficulty in applying the risk theory and in establishing a consistent clear-cut borderline between negligence and strict liability.

Consistent attempt to delimitate the border between negligence and strict liability, throughout the risk theory, was made by Werro, Palmer and Hahn (2004). After register that “in all European legal systems, the technical feasibility and the economic reasonableness of precautionary measures are regarded as essential for determining the standard of care”, and that the European courts, frequently makes use of “cost-benefits analysis”, widely applied in England and Scotland and intuitively by the other jurisdictions, the authors proposes, in a first approximation, that negligence should be explained as “liability for reasonably foreseeable and avoidable harm” and, by extension, that strict liability should be explained as the liability for “unforeseeable and/or inevitable” harm or that can be “prevented at excessive cost”. Following the same analytical line in suggestive manifestation, Dam (2006) consigns that “the bigger the potential risk, the more there will be food for thought of a rule of strict liability”, though the strict liability frequently is applicable to situations in which accidents can happen with a “considerable level of probability and if they happen they are likely to cause severe damage, namely death and serious personal injury”.

As it is possible to infer from the manifestation of jurists such as Franz Werro, Vernon Palmer, Anne-Catherine Hahn and Cees Van Dam, the setting of objective criteria for the application of strict liability, and for the delineation of the actuation field of strict liability and negligence, can be made by the use of fundamentals of economic analysis of law, theme that will be further explored in the next section.

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<sup>1</sup>Mataja, Victor. *Das Recht des Schadenersatzes vom Standpunkte der Nationalökonomie* (1888). Consistent exposition of Victor Mataja ideas was made by England (1990).



## II.2. Economic analysis of law

The dichotomy strict liability and negligence in a long term has been object of integrative studies of law and economics. In addition to the aforementioned contribution of Victor Mataja, which in the work *The Compensations Law by the Economic Perspective* (1888) proposes the adoption of strict liability as a way of providing incentives to prevention and social spread of accident damages, other four pioneers of law and economics movement had made normative analysis on the performance of strict liability, namely: Pietro Trimarchi, in the work *Rischio e Responsabilità Oggettiva* (1961); Guido Calabresi, in work *The Cost of Accidents: a Legal and Economic Analysis* (1970); Gordon Tullock, in the work *The Logic of Law* (1971); and Richard Posner, in the work *Strict Liability: a Comment* (1973) (Battesini, 2011).

Also in the contemporary literature of law and economics, the normative analysis about the option between negligence and strict liability has played a prominent place, by considering the behavior of the injurer and of the victim (unilateral and bilateral accident models) and by analyzing factors such as the level of care, the level of activity, the level of information, the risk distribution and administrative costs. Among the main contributions, can be refereed the works of: Mitchell Polinsky, *Strict Liability vs. Negligence in a Market Setting* (1980); Mário Rizzo, *Law amid Flux: the Economics of Negligence and Strict Liability in Tort* (1980); Steven Shavell, *Strict Liability versus Negligence (1980) and Economic Analysis of Accident Law* (1987); and William Landes and Richard Posner, *The Positive Theory of Tort Law* (1981) and *Economic Structure of Tort Law* (1987) (Schäfer & Müller-Langer, 2009; Battesini, 2011).

The recent literature on tort law and economics are also dedicated to the topic, for example the textbooks of: Steven Shavell, *Foundations of Economic Analysis of Law* (2004); Hans-Bernd Schäfer and Claus Ott, *The Economic Analysis of Civil Law* (2004); Cento Veljanovski, *The Economics of Law* (2006); Richard Posner, *Economic Analysis of Law* (2007); Ejan Mackaay and Stéphane Rousseau, *Analyse Économique du Droit* (2008); Thomas Miceli, *The Economic Approach to Law* (2009); Hugo Acciarri, *Elementos de Análisis Económico del Derecho de Daños* (2009), Daniel Cole and Peter Grossman, *Principles of Law and Economics* (2011); Eugênio Battesini, *Direito e Economia, Novos Horizontes no Estudo da Responsabilidade Civil no Brasil* (2011); and Robert Cooter and Thomas Ulen, *Law and Economics* (2012). In general lines, strict liability is appointed as an efficient mechanism of control of the level of care and of the level of risk activity developed by the injurer (unilateral accident model), since it incentives the adoption of both an optimal activity level and an efficient care, besides promoting the internalization of social costs. As pointed out by Faure (2002), “it is important to stress that apparently from an economic point of view it is, with a few nuances, more particularly the element of ‘danger’ which justifies

the introduction of strict liability... Strict liability will then have the advantage that it will give optimal incentives to the injurer to take all possible measures to reduce the accident risk. This argument is especially true if there are so called unilateral accidents, where the influence of the victim on the risk is only minor”.

However, notwithstanding the normative economic analysis highlights the efficiency of strict liability in the control of the level of care and of the level of risk activity developed by the injurer, in reality, as consigns Faure (2002), “a clear cut test is therefore difficult to give”, noting that among the few inroads<sup>2</sup> in terms of positive economic analysis in order to “describe several factors which may lead to a preference for a strict liability rule”, stands out the contribution performed by Landes and Posner.

Placing in evidence the difficulties in establishing the borders between negligence and strict liability, Posner (2007) highlights that “it would be a mistake, despite of their differences, to dichotomize negligence and strict liability”, thus, “negligence has a strict liability component” as well as “strict liability has a negligence component”. Focusing on the control of the level of the dangerous activity developed by the injurer, Posner (2007) goes further and argues that “the courts’ inability to determine optimal activity levels except in simple cases is potentially a serious shortcoming of a negligence system”. Therefore, as strict liability reduces the costs of accidents by inducing activity-level changes, Posner argues that, “only when a class of activities can be identified in which activity-level changes by potential injurers are the most efficient method of accident prevention is there a compelling argument for imposing strict liability”.

Justified the use of strict liability in controlling the level of dangerous activities, Landes and Posner (1981; 1983; 1987) turn their concern to the establishment of guidelines for the application of strict liability, making the connection with the elements of the Hand formula, analytical instrument whose importance transcends the thematic of negligence and acts like an “algorithm” for deciding torts questions generally.

The origin of the Hand formula lies in the action of Judge Learned Hand in the case *United States v. Carroll Towing Company*<sup>3</sup>. One of the questions to be decided in the contest brought to trial was whether there had been contributing negligence on the part of the Connors Company, owner of one of the vessels involved, in leaving their barge moored to the pier in New York Bay without anyone on board, in view of the subsequent breaking of the moorings and the

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<sup>2</sup> Another inroad on the theme is performed by Guido Calabresi and Jon Hirschoff that use the notion of cheapest cost avoider, performing the counterpoint to the Hand formula (Calabresi and Hirschoff, *Toward a Test for Strict Liability in Torts*, 1972).

<sup>3</sup>*United States v. Carroll Towing Company*. Circuit Court of Appeals, Second Circuit, 1947. 159 F. 2d. 169. See also: Epstein (2004), Diamond, Levine and Madden (2007) Stephen (1988) and Gonçalves (2001).

collision with another vessel. In his appraisal of the case, Judge Learned Hand declared that "there is no general rule to determine when the absence of a barge or other attendant will make the owner of the barge liable for injuries to other vessels if she breaks away from her moorings", considering that "the owner's duty, as in other similar situations, to provide against resulting injuries is a function of three variables: (1) the probability that she will break away; (2) the gravity of the resulting injury, if she does; (3) the burden of adequate precautions". Using the notation P for the probability of injury, L for the injury and B for the burden of care, Judge Hand stated that "liability depends upon whether B is less than L multiplied by P", ( $B < P.L$ ).

Developing along the analytical lines set forth by Judge Hand, Landes and Posner (1981; 1987) emphasize that the original formulation of the Hand formula offers a fundamental insight into the subject of negligence; however, it does not accurately reflect the way in which questions of attributing liability are actually resolved, given that "the court ask, what additional care inputs should the defendant have used to avoid this accident, given the existing level of care?". In investigating a particular accident, the focus is upon the specific precautionary measures which should have been adopted in order to avoid it, continue Landes and Posner, inviting a "marginal analysis", the application of a "economic standard of negligence", which allows for the comparison of the incremental variations in the costs of prevention and in the resulting benefits in terms of reduction of the expected damage.

Marginal analysis shows that the efficient level of precaution is achieved when the increment in cost of taking precaution is equal to the variation of the expected loss multiplied by the probability of the damaging event, that is, when each monetary unit spent on prevention reduces by one monetary unit the loss expected as a result of the accident (a 1:1 ratio). Considering figure 1, it follows that the intersection of the curves representing marginal costs and marginal expected benefits (marginal reduction of expected losses), a point corresponding to  $X^*$  (a 1:1 ratio – the negligence threshold) represents the efficient level of precaution, while the area to the left of point  $X^*$ , for example, point  $X_1$  (the marginal cost/marginal benefit ratio being equal to 0.25 – a 1:4 ratio) indicates the adoption of a less than efficient level of precaution, showing the existence of negligent behavior, and the area to the right of point  $X^*$ , for example, point  $X_2$  (marginal cost/marginal benefit ratio being equal to 4 – a 4:1 ratio) indicates the adoption of a more than efficient level of precaution, showing the existence of diligent behavior.

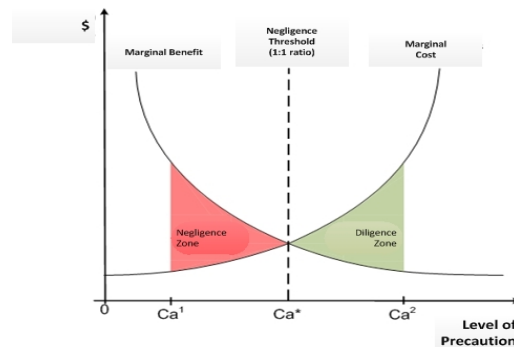


Figure 1 - Graphical representation of the Hand formula as criterion for fault assessment. Adapted from Veljanovski (2006). Level of precaution in physical units; cost of accidents in monetary units.

The advantage of the marginal version of the Hand formula, Posner (2007) emphasizes consists in allowing for the measurement of small increments in security, which is shown to be fundamental in as much as “it will usually be difficult for courts to get information on other than small changes in the safety precautions taken by the injurer”. The Hand formula, according to Owen (2005), has the merit of “expresses algebraically the common sense idea that people may fairly be required to contemplate the possible consequences of important actions before so acting”. The main contribution made by the Hand formula, states Abraham (2002), is “unpacks the general notion of reasonable behavior in three components: the probability that a particular act or omission will cause harm; the magnitude of the harm if it occurs; and the value of the interest that must be foregone or sacrificed in order to reduce the risk of harm”. In reality, with magistrates considering whether it would have been possible for the injurer to adopt additional preventative measures which could have substantially reduced the risk of accidents (marginal cost/benefit analysis), the application of the Hand formula has been put into effect, whether explicitly or implicitly, both in countries with a tradition of common law and those with a tradition of civil law (see on this subject Battesini, 2011).

Performed this brief digression about the Hand formula as a criterion for fault assessment, it becomes easier to establish the connection with strict liability. In suggestive manifestation, Dam (2006) consigns that “the waters of negligence liability run into the waters of strict liability, and it is impossible to indicate the exact borderline between the two”. In line with this reasoning, Landes and Posner (1981; 1987) identify three factors for verifying if a class of activities should be subject to application of strict liability, from which two of them are connected to the Hand formula.

The first factor regarded by Landes and Posner is about “the high expected accident cost” (considering the Hand formula, situations in which the probability

multiplied by the damage, “P.L”, has an elevated value), element that “shows that there are substantial social benefits from reducing the accident rate”, the level of activity. The second factor is about “the impracticability of avoiding accidents through exercising greater care” (considering the Hand formula, situations in which the probability, “P”, has an elevated value, even though when the burden of care, “B”, has an elevated value), element that puts in evidence that the reduction of accident rates “cannot be done economically simply by conducting the activity with greater care”. The third factor is about the “feasibility of reducing accidents by curtailing or relocating the activity”, element that shows that the reduction of accident rates may economically be done by changes or even elimination of the activity, because it is “marginal and can be changed or eliminated without great social loss”.

Posner (2007) points out as examples of hazardous activities that justify the application of the strict liability injuries caused by the use of explosives in construction and mining and wild animals in zoos and circus. In addition, he argues that the category of hazardous activities is not fixed, therefore can be extended for many categories of activities. In this sense, highlights that the strict liability can be applied regarding “new activities” (for instance, drugs scientific researches) thus there is little experience with security characteristics and there are no good substitutions for them. What does not stands in oppose, though, that known the characteristics of safety inherent to the “new activity” strict liability comes to be substituted for negligence.

Other examples of characterization of activities as being dangerous, throughout the application of elements of the Hand formula, in order to apply strict liability, can be found in comparative law and in Brazilian system of liability, as it can be inferred by empiric evidences presented in the next step of this study.

### **III. EMPIRIC EVIDENCES**

#### **III.1. Comparative Law**

The factors proposed by positive economic analysis to verify whether a class of activity should be subject to strict liability, especially the factors connected to the Hand formula, namely the high expected accident costs and the impracticability of avoiding accidents through exercising greater care, illustrate many of the options for strict liability, whether in common law or civil law systems.

The United States common law proportionate a typical example of open legal system, in which it is Judiciary’s competence the concretization of the strict liability for risk activity. Landes e Posner (1981; 1987) registers that many of the areas of strict liability “are grouped under the rubric of ultra-hazardous or abnormally hazardous activities”, and that “the roots of this principle in the

economics of optimal accident avoidance are apparent in the Restatement's list of the factors to be considered in determining whether an activity is abnormally dangerous".

According to the Second Restatement of Law - Torts<sup>4</sup>, the factors to be considered in determining whether an activity is abnormally dangerous are: (a) existence of a high degree of risk of some harm to the person, land or chattels of others; (b) likelihood that the harm that result from it will be great; (c) inability to eliminate the risk by the exercise of reasonable care; (d) extent to which the activity is not a matter of common usage; (e) inappropriateness of the activity to the place where it is carried on; and (f) extent to which its value to the community is outweighed by its dangerous attributes.

Landes e Posner (1981; 1987) continue by highlighting that the elements chosen by the Second Restatement coincides with the economic principle that make strict liability the preferred liability rule for some activities: the elements (a) and (b) reflect the first economic factor, the high expected accident cost; the element (c) reflects the second economic factor, the impracticability of avoiding accidents through exercising greater care; and the elements (d), (e) and (f) reflects the third economic factor, the impossibility to reduce accidents by restriction or relocation of the activity.

Considering the jurisprudential evolution about strict liability in abnormally dangerous activities, Dobbs (2000) points to the contemporary consolidation around activities involving: use, transportation or storage of explosives and other potentially inflammable products such as gasoline and propane; generation and transmission of energy, especially involving high-voltage; use, transportation and storage of chemical products and other toxic materials such as agricultural defensives; air transportation; and other activities that involve removal of soil and mineral prospecting.

Other field in which strict liability has been applied in United States concerns injuries caused by defected or dangerous products. It is though a controversial issue. As highlights Posner (2007), liability for dangerous products is frequently explained through the notion of negligence, by applying the Hand formula. However, it often justifies the use of strict liability, making necessary the reference to the level of activity discussion, as well as the supposal of asymmetric information between the fabricant and the consumer. Analyzing the jurisprudential evolution about strict liability by defected or dangerous products,

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<sup>4</sup> American Law Institute. *Restatement of the Law Second, Torts*, v. 3, §520, p. 36. In a more restrictive way, the Restatement of Law Third – Torts: Liability for Physical Harm, refers to the creation of an elevated and predictable risk of damage, even though the reasonable precaution is exercised by all participants, even if their activity is not common: American Law Institute. *Restatement of the Law Third, Torts: Liability for Physical Harm*, §20, p. 278. More at Epstein, 2004, p. 593-599.

Owen (2005) consigns the relevance of the leading cases of *Mac Pherson v. Buick Motor Co.*<sup>5</sup> and *Greenman v. Yuba Power Products, Inc.*<sup>6</sup> highlighting their incorporation to the Second Restatement of Law - Torts<sup>7</sup>. Owen add, though, that the Third Restatement of Law – Product Liability<sup>8</sup> evidences the tendency to restrict the application of the rule of strict liability for dangerous products, linking them to the negligence rule with the use of the Hand formula as a criteria to infer the defective nature of the product: “as more and more courts turned to some form of risk-benefit test in the 1980s and 1990s, and with the Third Restatement’s adoption of the risk-utility test for use in design and warnings cases, cost-benefit analysis is now undoubtedly the dominant liability test in products liability law”.

In British common law, Rogers (2002) highlights to be difficult “to classify a particular head of liability as fault-based or strict”, thus, frequently, the elements of both are present; suggesting that in substantial ways, the negligence and strict liability systems are in fact “a continuum rather than two categories”.

The most known example of strict liability is the leading case *Rylands v. Fletcher*<sup>9</sup>, in which the House of Lords stated to be the owner responsible for any unnatural use of his lands, in the case, the water supply in storage has been broken, causing damages to the neighbor. About the case *Rylands v. Fletcher*, Werro, Palmer e Hahn (2004) consign that it was used in United States as a “starting point” for a broad rule of strict liability for ultra-hazardous activities, as in United Kingdom in opposite, it has been one of the few examples of strict liability in common law, thus the strict liability has intense regulation in specific statutes.

Rogers (2002) registers that “of course we have no Code, but numerous statutes impose liability stricter than that for pure fault”: *Reservoirs Act 1975*, *Railway Fires Acts 1906 e 1923*, *Gas Act 1965*, *Environmental Protection Act 1990*, *Merchant Shipping Act 1995*, *Civil Aviation Act 1982*, *Nuclear Installations Act 1965*, *Animals Act 1971* and *Consumer Protection Act 1987*. It can be inferred than that the British common law reveals himself more closed that the United States common law, being attributed to the Judiciary a role comparatively less representative on the task of qualification of risk activities as subject of strict liability.

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<sup>5</sup> Decision made in 1916 that makes liable the automobile manufactory for the accident occurred by a factory defect, in one of the vehicles wheels, independently of the vehicle acquisition has not been made directly from the factory (111 N.E. 1050 - N.Y. 1916), quoted by Epstein (2004).

<sup>6</sup> Decision made in 1963 that made liable the manufacturer of saws by accident occurred for a design defect that made a sharp to be drop out and make serious injuries to the operator (337 P.2d 897 - Cal. 1963), quoted by Epstein (2004).

<sup>7</sup> American Law Institute. *Restatement of the Law Second, Torts*, v. 2, §402A, p. 347-348.

<sup>8</sup> American Law Institute. *Restatement of the Law Third, Products Liability*, §3, p. 111.

<sup>9</sup> L.R. 3 H.L. 330, 1868, quoted by Epstein (2004).

In civil law, by the other hand, the typical example of closed system is provided by Germany, thus courts are not allowed to introduce strict liability based upon risk activity. Fredtke e Magnus (2002) consigns that German Law is “basically dominated by the principle of fault liability whereas strict liability is regarded as the exception”, which “has been developed exclusively by the legislator and nearly always in the form of special statutes outside the German Civil Code of 1900”. Going further Werro, Palmer e Hahn (2004) highlights that, “the bulk of strict liability is found in specific statutes rather than in the civil codes. The scope of these statutes is generally limited to one specific activity that the legislator has qualified as ultra-hazardous”. Specify the authors that “the technique of relegating strict liability to special statutes reflects the idea that they represent an exceptional deviation from the principle of fault. It is for that very reason that German and Greek judges are not authorized to create strict liability rules drawing analogies with existing liability rules”.

According to Fredtke e Magnus (2002), the legislative technique used consists in connect strict liability to potentially dangerous activities or specific objects or properties that constitutes a potential source of danger, highlighting situations such as: plants with function of production, manufactory, storage or transportation of environment potentially hazardous products; transmission networks for electricity, water supply and gas; nuclear plants; wild animals damages; genetically modified organisms; mining; hunt; defective products; rail, air and road based transportation.

Analyzing the dichotomy strict liability and negligence in France, Galand-Carval (2002) emphasizes that: “the expanding of strict liability is a prominent feature of the general evolution of the French law of torts”; specifying that some forms of strict liability were part of the Civil Code of 1804 such as animal’s liability (art. 1385 CC) and ruin (art. 1386 CC), but nothing “compared with the profusion of no-fault systems which characterizes the present law”; for, then, conclude affirming that “today, strict liability is extremely common and, in the field of compensation for personal injuries field, it has almost surpassed liability for negligence”.

Notwithstanding the rules contained in the Civil Code and specific statutes, such as Aviation Code (1924), Nuclear Energy Damages Act (1965), Water pollution Act (1977) and Badinter Act (1985), that had introduced strict liability in road traffic accidents, as Werro, Palmer e Hahn (2004) highlight, jurisprudence has played a key role in the development of a strict liability in France: “of all legal systems covered in our survey, the French system is therefore probably the one where the courts contributed most to the development of strict liability”. Unlike other European legal systems, “in French law, the legitimacy of the judge made strict liability rules not seem to have ever been seriously contested. Quite to the contrary, scholarly claims for an extension of strict liability



were welcome rather openly by the judiciary”. Therefore, is possible to qualify French system as a hybrid system, which harmonizes Legislative and Judiciary actions in strict liability.

Still in French civil law tradition, the Italian and the Portuguese systems of liability are of particular interest. Such countries explicitly adopted a hybrid system, making significant progress in promoting the harmonious action of the Legislative and the Judiciary in the process of defining what risk activities are subject to strict liability.

As consigns Werro, Palmer e Hahn (2004), in Italy and Portugal strict liability is subject of law provision in specific statutes, as in environment and nuclear damages. As well as being subject of predictions in Italian and Portuguese Civil Codes, for instance, of animal’s liability (art. 2052 ICC and art. 502 PCC), the building’s owner liability for his property facts (art. 2053 ICC; art. 492 PCC) and road traffic damages (art. 2054 ICC; art. 503 PCC).

Judicial action in Italy and Portugal consists, mainly, in the application of strict liability rules provided by law. As Werro, Palmer e Hahn (2004) register, “like their German and Greek counterparts, Italian and Portuguese judges are not allowed to extend the scope of these liability rules by way of analogy. However, under the so-called ‘*general clauses of liability for dangerous activities*’ that exist in both systems, they can qualify certain activities as dangerous, thereby making them subject to a form of stricter-than-usual liability” (art. 493, §2, Portuguese Civil Code)<sup>10</sup>.

Emphasizing, exactly, the general clauses of strict liability for dangerous activities, introduced in Italian and Portuguese systems of liability, Werro, Palmer e Hahn (2004) presents elucidative synthesis of strict liability for dangerous activities in Europe. They quote that “liability for ultra-hazardous activities has remained a controversial concept, in part because the notions of ‘ultra-hazardous’ or ‘abnormally dangerous’ are often considered vague. It is also controversial whether this form of liability should be limited to ‘things’ or ‘facilities’, or whether it should extend to ‘activities’ or even to ‘sources of risk’ in general”. Behind these controversies, there are “*different conceptions on the role that judges and legislators should play* within the tort system: should the legislator attempt to draw up a more or less comprehensive list of dangerous activities subject to strict liability, or should their identification be left to the courts?”

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<sup>10</sup>Italian Civil Code. Art. 2050. One who causes damages to another in the exercise of a dangerous activity by its nature or the operational means is obligated to pay damages, if does not proof to have adopted all expected measures to avoid the accident. Portuguese Civil Code. Art. 493, §2. One who causes damages in the exercise of dangerous activity, by its own nature or the means utilized, it is obligated to pay for the damages, except if demonstrates that employed all providences affordable for the circumstances to avoid them. Quoted by Bussani and Palmer (2003, p. xxxiv e xxxv).

Proceeds Werro, Palmer e Hahn (2004) consigning that “German law provides the clearest example of a legal system with a narrow conception of liability for ultra-hazardous activities. The decision as to the type of activities subject to strict liability is reserved to the legislator, who determines them through specific statutes. Judges, by contrast, are not allowed to introduce strict liability for comparable risks”. In addition, the authors quotes that “this risk-specific approach has influenced many other civil law systems”, as nowadays “most of civil law systems have adopted strict liability rules for the operation of railways, motor vehicles, pipe line, aircraft, nuclear installations, genetic engineering and certain types of polluting facilities/activities. For some of these activities, comparable statutes also exist in English and Scots law as well as Finnish and Danish law. Although it does not have statutory basis, the English liability rule of *Rylands v. Fletscher* can be viewed as another example of risk-specific liability”.

Conclude Werro, Palmer e Hahn (2004) registering that “not all of the European legal systems take as narrow an approach to strict liability for dangerous activities as German and English law”, and, after delineate the experiences with limited scope of Austrian, Denmark and Finland Law, quotes Italian and Portuguese law that gave a “considerable step further in including ‘general clauses of liability for dangerous activities in their codes’”. These risks can result from “the magnitude of harm that is to be expected in case of an accident or from the fact that the occurrence of accidents is very probable. The danger, however, must result from the activity itself and not from a lack of due care in its exercise”. It is throughout these criteria that Italian courts delimit the scope of Art. 2050 Civil Code, qualifying as dangerous the activities such as: “excavations, the use of explosives, ski lifts, the production of pharmaceuticals (including the preparation of blood) and the use of fire weapons for hunting” (see on this subject Comporti, 2009).

At this point of the analysis, imperative to note that, considering the countries that explicitly authorize the Judiciary to qualify activities as highly dangerous for purposes of applying the rule of strict liability, as is the case of Unites States in common law and Italy and Portugal in civil law, it is clear that the strict liability application criteria used by courts are strongly connected to the positive economic analysis. In other words, the elements connected with the Hand formula, “the high expected accident cost”, and “the impracticability of avoiding accidents through exercising greater care” are factors to be considered by courts in applying the rule of strict liability to risk activities. This finding is of great importance in the current Brazilian institutional context, as shown in the next stage.

### **III.2. Brazil**

Generally speaking, the Brazilian institutional context of application of strict liability in risk activities is fairly similar to Portuguese and Italian context. The strict liability is regulated by specific statutes and by the Civil Code, including: rail transportation (Executive Act n. 2.681, December 7, 1912), nuclear activities (Law n. 6.453, October 17, 1977), damages to the environment (Law n. 6.938, August 31, 1981), mining (Executive Law Act n. 227, February 28, 1967), air transportation (Law n. 7.565, December 19, 1986), product liability (Law n. 8.078, September 11, 1990; article 931 Civil Code), damage by animals (article 936 Civil Code), ruin liability and thrown objects from buildings (articles 937 and 938 Civil Code). The judicial action consists mainly in applying rules of strict liability provided in legislation. The courts can not extend the scope of these rules by analogy.

Although, along with one of the main innovations of the Brazilian Civil Code of 2002<sup>11</sup>, the general clause of strict liability for highly dangerous activities of the sole paragraph of article 927, the courts action was significantly expanded. The courts were explicitly authorized to qualify some activities as dangerous, therefore, making them subject for strict liability application. In this sense, Brazil changes from a closed civil law system, as is the case of Germany, for a hybrid civil law system, similar to Italy and Portugal, making significant progress in promoting the harmonious action of the Legislative and the Judiciary in the process of defining what risk activities are subject to strict liability.

Enlightening is the manifestation of Schreiber (2009): “the most reasonable conclusion must to be that the general clause of strict liability directs itself to hazardous activities, which is to say; to activities that presents a high level of risk”. Whether because they “focus on intrinsically dangerous goods (as radioactive material, explosives, gunfire, etc.)”, or because they “employs methods of high injury potential (as control of water resources, manipulation of nuclear energy, etc.)”. It is certain that “the definition, although elastic, of a list of activities covered in the application scope of the sole paragraph of the article 927, is a task appointed to jurisprudential action and to doctrinaire investigations”.

In such context, acquires relevance the establishment of objective guidelines to qualify activity as dangerous, task in which are of a great value the elements connected to Hand formula: “the high expected accident cost” (considering the Hand formula, situations in which the probability multiplied by the damage, “P.L”, has an elevated value), and “the impracticability of avoiding accidents through exercising greater care” (considering the Hand formula,

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<sup>11</sup> Brazil. Law n. 10.406, January 10, 2002. Institutes the Civil Code. *Article 927*. One who by illicit causes damages to another is obligated to repair it. *Sole Paragraph*. There is obligation to repair the damage, despite negligence, in cases specified in law, or when the activity usually developed by the author implies, by its own nature, risk for the rights of another.

situations in which “P” has an elevated value, even though when “B” has an elevated value).

The high expected accident cost and the impracticability of avoiding accidents through exercising greater care are factors that enable the characterization of activities as hazardous, to apply the general clause of the sole paragraph of article 927 of the Civil Code, such as: generation and transmission of electric energy; use, transportation and storage of explosives, toxic and radioactive materials; soil removal, and; hunt and risky sports. In the same direction, despite the relatively short lifetime of the New Civil Code, some judicial precedents can be identified.

The *Superior Tribunal de Justiça*, in decision stated in May 19, 2009, in the *Recurso Especial* n. 896568/CE<sup>12</sup>, qualified as highly dangerous activity (activity with “high expected accident cost”), according to the sole paragraph of article 927 of the Civil Code, the electricity broadcast, condemning the *Companhia Energética do Ceará* to pay material damages and moral damages to Antônio Silvério de Paiva, due the electrocution occurred by repairing the electric network in a client’s residence. As goes the Minister Luis Felipe Salomão statement:

In the present case, the plaintiff exercises the role of electric repairer and was hired to repair with urgency the residential network of Geraldo Lopes de Castro. In trying to cut, with all reasonable cautions, the cable responsible to carry energy into the house, the plaintiff received strong electric charge, due a net overcharge that was originated by a high tension cable break in the region, which resulted in his incapacity to work. It is observed that the defendant, a public utility company, operates in the sector of electric power transmission, activity that, despite its essentiality, presents highly dangerous, offering risks to the population. In such context, we must apply the “Risk Theory”, which recognize the obligation of one that causes damages to another thus the risks inherent to the activity or profession to repair the harm. Therefore, if developed a risky activity and moreover, profit is taken from it, shall the firm, also respond for the damages eventually caused to third parties, independently of profs of negligence in its conduct. That is the orientation given by our legal system in sole paragraph of the article 927of the Civil Code.

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<sup>12</sup>Brazil. *Superior Tribunal de Justiça*. Civil. Civil liability. Public services concessionary. Electricity transmission. Highly dangerous activity. Risk Theory. Strict liability. Rapporteur for judgment: Minister Luis Felipe Salomão. May 19, 2009. In: D.J., Jun. 30, 2009, p. 233. Available: <[https://ww2.stj.jus.br/revistaeletronica/ita.asp?Registro=200602196193&dt\\_publicacao=30/06/2009](https://ww2.stj.jus.br/revistaeletronica/ita.asp?Registro=200602196193&dt_publicacao=30/06/2009)>. Access: August 30, 2009.

The *Tribunal de Justiça* of the State of São Paulo, in decision stated in June 4, 2009, in the *Apelação* n. 559.487-4/8<sup>13</sup>, qualified as highly dangerous activity (activity with “high expected accident cost”), according to the sole paragraph of article 927 of the Civil Code, the energy transmission, condemning the company *ELETROPAULO Metropolitana Eletricidade de São Paulo S.A.* to pay moral damages to Manoel Ferreira de Melo, due the death of his wife and daughter by electrocution, while they were trying to cross a fallen tree by the rain force which was in contact with transmission cables. As goes the Judge rapporteur Ênio Santarelli Zuliani statement:

We observe that DAMIANA with her daughter KAROLINE in her arms walked around the neighborhood of Palestina in Jucituba when, in trying to cross a fallen tree by the rain force, was electrocuted along with her daughter, thus the tree was connected to fallen energy cables in the trunk and rams of the tree. (...) In the case, the accident occurred in August 29, 2005, which determines the incidence of art. 927, sole paragraph of CC/2002 which disposes that “there is obligation to repair the damage, despite negligence, in cases specified in law, or when the activity usually developed by the author implies, by its own nature, risk for the rights of another”. Therefore, one that exploits by concession, by profit, the service of energy transmission, answers for the damages caused to third parties, independently of proof of negligence, thus the rule that one who profits responds for the liens. In the same direction, goes the precise lection of CARLOS ALBERTO BITTAR (*Responsabilidade civil nas atividades perigosas*, in *Responsabilidade civil – doutrina e jurisprudência*, coordination of Yussef Said Cahali, Saraiva, 1984, p.93): “It must be considered as dangerous the activity that has a great probability, a remarkable potential to cause damage, in comparison to the average activities revealed by statistic sources, technical elements or even common sense”.

The *Tribunal de Justiça* of the State of Minas Gerais, in decision stated in May 28, 2009, in the *Agravo de Instrumento* n. 1.0439.08.081641-6/001<sup>14</sup>, qualified as highly dangerous activity (activity with “high expected accident cost”), according to the paragraph of article 927 of the Civil Code, the damming of water carried out by *Mineração Rio Pomba Cataguases Ltda.* As goes the Judge rapporteur Duarte de Paula statement:

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<sup>13</sup> Brazil. *Tribunal de Justiça* of the State of São Paulo. Pedestrian and daughters death by electronic discharge by cross a fallen tree. *Apelação* n. 559.487-4/8. Manoel Ferreira de Melo e *ELETROPAULO Metropolitana Eletricidade de São Paulo S.A.* Judger appporteur Ênio Santarelli Zuliani. December 13, 2007. Available: <<http://esaj.tj.sp.gov.br/esaj/portal.do?servico>>. Access: August 31, 2009.

<sup>14</sup> Brazil. *Tribunal de Justiça* of the State of Minas Gerais. *Ação Indenizatória*. Damages caused for dam break. Strict Liability. Activity risk. Inexistence of consumption relation. Proof burden inverted. Impossibility. Rapporteur Judge Duarte de Paula. May 28, 2009. In: D.J., June 15, 2009. Available: <[http://www.tjmg.jus.br/juridico/jt\\_/inteiro\\_teor](http://www.tjmg.jus.br/juridico/jt_/inteiro_teor)>. Access: august 31, 2009.

By the process analysis, the plaintiff affirms that the defendant was negligent in allowed the leak of about two billions of liters of toxic waste sludge that affected many kilometers of extension and spread around many cities. Besides which, the plaintiff claims to have lost several furniture, besides having been damaged his property. Affirms to be applicable the rule of strict liability and requires compensation for material and moral damages. (...) The sole paragraph of art. 927 of the Civil Code predict that there will be obligation to pay damages, independently of negligence, in cases predicted by Law or when the developed activity by the author by its own nature risks for another. (...) Therefore, by using the expression “independently of negligence”, we infer that the Civil Code adopted strict liability for damages that happened in the exercise of risky activities. (...) In the lawsuit case, the demand were directed against a mining company which its activity is developed frequently, which reveals to my understanding that the danger is intrinsic to the productive process, reason why it has to be responsible by damages that may occur by its exercise.

The *Tribunal de Justiça* of the State of Rio Grande do Sul, in decision stated in July 2, 2009, in *Apelação Cível* n. 70026905885<sup>15</sup>, qualified as highly dangerous activity (activity characterized by “the impracticability of avoiding accidents through exercising greater care”) according to the sole paragraph of article 927 of the Civil Code, horse racing, condemning the *Haras Santa Anita do Minuano* to pay material damages and moral damages to Michele Britzius Vargas, due damages suffered by her by falling from the horse. As goes the Judge rapporteur Liége Puricelli Pires statement:

It is a compensatory damages lawsuit provoked by victim of accident occurred in turf activity, which was riding horse of property of the defendants in dispute of straight edge, which suffered mental injuries that affected her professional activities. (...)I understand that the activity developed by the defendants, which is Horse Raising of pure blood English horses for sportive activities of Turf, has surely profit intention by the raisers, even though that it does not configures as economic-productive activity. Therefore, I believe that it is a financial exploitation of risky activity, thus applicable is the sole paragraph of art. 927 of CC/02, rule that adopts the “Activity risk theory” in our legal system”. (...)Thus is surely that the sportive activity exploited by the defendants makes great risks to people hired to conduct the animals, not rarely inflicting harms with lethal rate, given the velocity that horses can get and the dangerous risk of falling own horse on the jockey. This activity shows up in such danger that the National Race Code (Law n. 7.291/84) predicting in its art. 82 the obligation for Turf

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<sup>15</sup> Brazil. *Tribunal de Justiça* of the State of Rio Grande do Sul. Civil liability. Accident occurred by jockey in turf activity .Risk theory. Strict liability. Rapporteur Judge Liége Puricelli Pires. July 2, 2009. In: D.J. July 10, 2009. Available: <[http://www.tjrs.jus.br/site\\_php/consulta](http://www.tjrs.jus.br/site_php/consulta)>. Access: august 31, 2009.

Entities, understood as Jockey Clubs, to sign life insurances for accidents suffered by its professionals in order to exclude its responsibility. (...)Therefore characterized the strict liability for animal owner, who exploits the financially sport activity and the service provided by the athlete.

On the other hand, raises controversy about the qualification as dangerous activity, by applying the standard term of the sole paragraph of article 927 of the Civil Code, the road transportation. The road transportation is surely a risky activity. Risk that in most of situations is symmetrically distributed between the parties, drivers of motorcycles, cars, buses and trucks. Situation that, in the light of economic analysis, according to Hylton (2007), justifies the negligence criteria, and, that Werro, Palmer e Hahn (2004) states, it is in line with legal practice: “no matter how strictly liability for dangerous activities may be defined, the fault principle generally comes in when both parties to a tort suit respond under the same strict liability rule”.

From another perspective, the asymmetry in the risk distribution is present when one party conducts a motorized vehicle and the other does not, for instance a pedestrian or cyclist. Situation that, in the light of the economic analysis, justifies strict liability in order to control the level of the risky activity developed by motorized vehicles riders. In fact, as states Koch e Koziol (2002), many countries uses the strict liability in such situations, namely: Austria, Belgium, France, Germany, Greece, Israel, Netherlands, Spain, Switzerland, Poland and Italy. Other countries such as United States and United Kingdom adopt the principle of negligence.

Important registers, however, are made by, Koch e Koziol (2002) namely, countries that elects strict liability in traffic accidents made it throughout specific statements, creation followed by imposing mandatory insurances and compensation funds. Which is the same as to say that, by the social relevance of these themes and public policies implications, the option between strict liability and negligence is up to Legislative power, not being topic of judicial appreciations directly, occurring throughout interpretation of the standard term of strict liability of dangerous activities. That position, by its righteous direction, should guide the conduct of the subject also in Brazil.

Made these considerations, it is possible to say that the use of economic fundamentals, crystallized in Hand formula, are compatible with the Brazilian institutional context. Therefore, by applying the standard term of strict liability of the sole paragraph of article 927 of the Civil Code, the Brazilian courts can identify as dangerous the activities in which the expected accident cost are high and in which it is not possible to deter accidents even when adopted high level of care.

#### IV. CONCLUSION

Most fundamentally, recognizing that tort law has a high impact on the economic system and that comparative law and economics studies are relevant in order to improve tort law systems, especially in developing countries, this article has demonstrated how the fundamentals of economic analysis of law can contribute to the resolution of methodological problem common to many legal systems, namely, the establishment of criteria to identify categories of risky activities subject to application of strict liability.

Exploring the traditional legal theory in comparative perspective, the analysis revealed that, despite to be crystallized in contemporary legal systems the idea that negligence and strict liability coexist in “relative harmony”, being negligence the defining principle of liability and having strict liability its own field of actuation, in legal practice the question reveals itself complex, through the recognition of the existence of a “grey zone” between negligence and strict liability. Important methodological questions flourish in the dualist system of liability, specially the definition of the fundamentals of the imputation nexus in strict liability. In the legal field, among the many theories developed to justify the strict liability application, the risk theory is highlighted in its many varieties.

In addition, the study revealed that the difficulty in the establishment of the borders between negligence and strict liability is also developed in law and economics literature. Among the scarce incursions that aim to describe the factors that can justify the preference for strict liability, Landes and Posner are references. Focusing the level of dangerous activities developed by the injurers, Landes and Posner identify three factors for verifying if a class of activities should be subject to application of strict liability, from which two of them are connected to Hand formula. The first factor is about “the high expected accident cost” (considering the Hand formula, situations in which the probability multiplied by the damage, “P.L”, has an elevated value), element that “shows that there are substantial social benefits from reducing the accident rate”, the level of activity. The second factor is about “the impracticability of avoiding accidents through exercising greater care” (considering the Hand formula, situations in which the probability, “P”, has an elevated value, even though when the burden of care, “B”, has an elevated value), element that puts in evidence that the reduction of accident rates “cannot be done economically simply by conducting the activity with greater care”.

In comparative analysis, this study showed that the factors proposed by positive economic analysis to verify whether a class of activity should be subject to strict liability, especially factors connected to the Hand formula, illustrate many options for strict liability, whether in common law or civil law systems. In the United States, the classic open system example, in which it is competence of the Judiciary the task of defining the list of dangerous activities to apply strict liability, many of the areas of strict liability are grouped under the rubric of ultra-



hazardous or abnormally hazardous activities, with the jurisprudence being consolidated in fields such as: use, transportation and storage of explosives and other potentially inflammable products such as gasoline and propane; generation and transmission of energy, specially involving high-voltage; use, transportation and storage of chemical products and other toxic materials such as agricultural defensives; air transportation; and other activities that involve removal of soil and mineral prospecting. In the United Kingdom and Germany, examples of closed systems, in which the definition of the list of dangerous activities is an attribution of the Legislative, and to the Judiciary is not allowed to qualify activities as being dangerous, strict liability is applied in fields such as: rail and air transportation; nuclear activities; and environment potentially dangerous activities. France, Italy and Portugal are examples of hybrid systems, in which, besides applying strict liability to the list of dangerous activities prepared by the Legislative, the Judiciary has the power to expand the list of dangerous activities. In France, the jurisprudence has performed a fundamental role in the application strict liability for dangerous activities. In Italy and Portugal, the distinctive line is given by the general clauses of strict liability for dangerous activities, which granted express legislative authorization to Judiciary to qualify activities as being dangerous in order to apply strict liability. Activities that have been qualified as dangerous includes: soil removal; use of explosives; use of weapons for hunting; and other activities in which the expected damage are high or probable to happen.

In Brazil, other example of hybrid system, the context of strict liability for dangerous activities is similar to both Italian and Portuguese contexts. Strict liability is object of legal prediction in specific statutes and in the Civil Code, such as: rail transportation; nuclear activities; environmental damages; mining; air transportation; product liability; animal liability; ruin liability and objects thrown through buildings. In these cases, the courts actuation consists in applying the rules of strict liability provided in legislation. Although, along with one of the main innovations of the Brazilian Civil Code of 2002, the general clause of strict liability for highly dangerous activities of the sole paragraph of the article 927, it was given extension to the Brazilian courts actuation, due explicit legal authorization to qualify activities as dangerous and applying strict liability to them. In such a context, acquires relevance the establishment of objective guidelines to qualify activities as dangerous, in which are of a great value the elements connected to the Hand formula. The high expected accident cost and the impracticability of avoiding accidents through exercising greater care are factors that enable the characterization of activities as hazardous, in order to apply the general clause of the sole paragraph of the article 927 of the Brazilian Civil Code of 2002. Thereby, despite the short life of the New Civil Code, some legal precedents can be identified in the *Superior Tribunal de Justiça*, *Tribunal de Justiça* of Minas Gerais, *Tribunal de Justiça* of São Paulo and *Tribunal de Justiça*

of Rio Grande do Sul. Strict liability has been applied in fields such as: generation and transmission of electricity; soil removal; and dangerous sports.

Several key conclusions emerge from this study. First, considering the empirical evidence of the comparative analysis, it is verified that under the dualistic system of liability there is a strong convergence around the risk theory with the consolidation of the strict liability as an efficient mechanism of control of the level of care and of the level of risk activity developed by the injurer, since it incentivizes the adoption of both an optimal activity level and an efficient care, besides promoting the internalization of social costs. In addition, there is a strong convergence around the factors of application of strict liability proposed by the economic analysis, with the "high expected accident cost" and "impracticality of avoiding accidents through exercising greater care" illustrating many of the options for the adoption of the rule of strict liability, whether in countries of common law or civil law tradition.

Notwithstanding the doctrinaire convergence, the comparative analysis showed that in legal practice the systems examined do not present a uniform list of risky activities. Even if some activities such as the generation and transmission of electric power, mining and air transport are classified as of risk in virtually all legal systems, other activities such as hunting, sports of risk, damage caused by genetically modified organisms or by defective products and road transport are treated heterogeneously. This phenomenon, along the lines proposed by the theoretical formulation of Garoupa and Gomez Ligüerre (2011), can be explained considering the existence of single efficient equilibrium solution or multiple efficient equilibrium solutions. The model that considers the existence of single efficient equilibrium solution implies in considering that one legal system provides efficient combination of risky activities in order to apply strict liability and that the other systems do not provide. The model that considers the existence of multiple efficient equilibrium solutions, moreover, implies in considering that in the long run legal systems converge to efficient equilibrium solutions, but they are not identical because the local conditions of application of strict liability by the risk activity vary significantly from legal system to legal system. In aprioristic analysis, the existence of multiple efficient equilibrium solutions seems to be the explanation provided with greater theoretical consistency. It is possible to infer the existence of a kind of "adaptive efficiency" in implementing strict liability by the risk of the activity.

Second, in methodological terms, the article identifies three categories of legal systems according Legislative and Judiciary actions in the process of defining what risk activities are subject to strict liability, namely: open system, in which it is Judiciary's competence the concretization of the strict liability for risk activity; closed system in which courts are not allowed to introduce strict liability based upon risk activity; and hybrid systems, in which, besides applying strict

liability to the list of dangerous activities prepared by the Legislative, the Judiciary has the power to expand the list of dangerous activities.

Following this line of reasoning, another important question is whether the decision concerning the activities which are to be subjected to a strict liability rule should be made by the legislator or by a judge. In other words, who is best suited to apply the economic test for strict liability. It is subject addressed by Faure (2002), which records that “the advantage of judge made law in general is that it can much more easily adapt itself to the specific situation of the particular accident risks. Hence the judge could examine whether the Landes/Posner criteria for strict liability were met in a particular case and decide on a case by case basis whether this was a strict liability situation. Such a ‘tailor made’ application of the test for strict liability can never be applied by the legislator”. On the other hand, Faure notes that “legislation has the advantage that it may more easily pass on the information with respect to the applicable rule to the parties in the particular accident setting. The case by case decision on strict liability may lead to higher information costs for the party involved (in legal terms one could say that it provides less legal certainty)”. Of course there is no definitive answer, but pragmatically it is possible to say that the hybrid systems harmonize Legislative and Judiciary actions in the process of defining what risk activities are subject to strict liability, allowing make use of “the best of both worlds”.

Third, considering the interface between tort law and economic development, the topics discussed in this article reveal themselves of great importance to developing countries and countries in transition to a market economy. When the choice of the legal system changes from nonliability/negligence to negligence/strict liability, acquires relevance the establishment of objective criteria for the application of the strict liability in legal practice. In this sense, the directives for verifying if a class of activities should be subject to application of strict liability presented by economic analysis of law, “the high expected accident cost” and “the impracticability of avoiding accidents through exercising greater care”, are of great relevance.

Paradigmatic is the experience of the European Group on Tort Law that, in developing the Principles of European Tort Law (2011), performs harmonic interaction between the traditional legal risk theory and the theoretical guidelines of economic analysis of law, establishing in Article 5:101 (1) that “a person who carries on an abnormally dangerous activity is strictly liable for damage characteristic to the risk presented by the activity and resulting from it” and that (2) “an activity is abnormally dangerous if (a) it creates a foreseeable and highly significant risk of damage even when all due care is exercised in its management and (b) it is not a matter of common usage. (3) a risk of damage may be significant having regard to seriousness or the likelihood of the damage”. It follows, therefore, from the experience of harmonization and unification of

European tort law that the establishment of a secure institutional base to make the choice between negligence and strict liability is of fundamental importance to developing countries and countries in transition to the market economy.

Finally, considering the Brazilian system of liability, the confirmation of the hypothesis that it is possible to integrate foundations of law and economics in order to apply the general clause of strict liability for highly dangerous activities of the sole paragraph of the Article 927 of the Brazilian Civil Code of 2002, showed that the integration of economic analysis in the study of strict liability in Brazil is a relevant fact. Among other advantages, the integration of fundamentals of economic analysis contributes to the systematization and rationalization of the decision-making process in the complex and multi-faceted cases of torts, increasing the predictability of judicial decisions.

## CONFLICT OF INTEREST

The author confirms that this article content has no conflicts of interest.

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