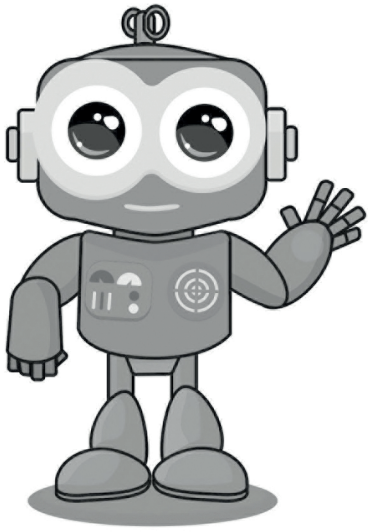
Benedetta Cappiello

# AI-systems and non-contractual liability

## A european private international law analysis



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# Introduction

# PRIVATE INTERNATIONAL LAW, CIVIL LIABILITY REGIMES AND AI: OPEN ISSUES

The advent of AI-systems has fundamentally altered the whole of society and it is about to change our daily lives as well as relationships between private parties.

This book will focus on the non-contractual obligations which arise within the European Union (hereinafter "EU") out of the development and use of AI-systems. More precisely, as for the civil liability regime the advent of AI is about to lead to a paradigm shift in the allocation of liability throughout the production chain. Namely, the question has become how to ascertain who is liable for what; the opacity of AI-systems – especially those engaging with machine learning techniques – can make it extremely difficult to identify who is in control and therefore responsible.

The current challenge for the legislator is to determine a clear legal framework able to firstly, guarantee continued technological development and secondly, to be integrated with already binding sources of law. Whether the said framework will correspond to an already existing one, adapted to AI-systems, or whether it will be an *ad hoc* framework will be ascertained in this analysis. What is certain is that the challenge to determine a legal framework assumes a cross-border connotation: only common and shared choices at the supranational level will guarantee the definition of a coherent and effective discipline.

Given that at the international level such a result cannot yet be ensured, it should (at least) be pursued at the European-regional level. Achieving this is highly desirable, given that technological evolution is a phenomenon that is affecting all Member States, therefore assuming the characteristics of a "common" issue. Overly diversified and non-modular political actions risk favouring a race-to-the-bottom approach in terms of the protection of private parties and also fundamental rights.

The referred field of research – AI-systems – is new as are the consequences it brings with it. However, the legislator – especially the European one – has already had time to tackle the issue. The following analysis is then twofold: *de lege lata* and *de lege ferenda.*

Precisely, this book intends to focus on the product's civil liability. A new balance between innovation-production and user and bystander protection shall be found, keeping in mind the principle on which the theory of civil liability is grounded: *neminem ledere.*

The legal challenge ahead is to fill the *vacuum* of accountability that has arisen due to the advent of AI-systems. Achieving this will in turn ensure the protection of users and bystanders (Chapter 1). The spread of AI-systems is therefore a chance to amend and harmonize the existing framework of EU regulations by setting substantive and private international law provisions [1].

As for the substantive provisions, there is an urgency to amend EC Directive No. 85/374 on defective products. Firstly, the Directive shall be adapted to regulate AI-systems which should be qualified as products; secondly, it shall be integrated with the new European Parliament Resolution of 20 October 2020 with recommendations to the Commissions on a civil liability regime for artificial intelligence (hereinafter "EP Resolution"). Besides, reference will be made to the EC Proposal for a regulation laying down harmonized rules on artificial intelligence aimed at regulating the development stage and use of AI-systems, (hereinafter the "Artificial Intelligence Act", the "Act", the "EAIA") (Chapter 2 [2]).

As for the private international law perspective, to start, a comparative (EU and US) and historical analysis on conflicts of laws on product liability will be provided with (Chapter 3 [3]).

Then, the analysis will follow the traditional private international law reasoning [4].

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[1] For an early analysis on the relationship between private international law and technological development see, *ex plurimis*, SOLTYNSKI S., Choice of law and choice of forum in transnational transfer of technology transactions, *RCADI*, 1986, 239 ff.

[2] See *infra* Ch. 2.

[3] See *infra* Ch. 3.

[4] See, *ex plurimis*, SALERNO F., *Lezioni di diritto internazionale privato*, CEDAM, Padova, 2020; MAYER P., HEUZÉ V., REMY B., *Droit international privé*, L.G.D.J., Paris, 2019; MOSCONI F., CAMPIGLIO C., *Diritto internazionale privato e processuale*, UTET, Torino, 2017; LOUSSOUARN Y., BOUREL P., DE VAREILLES-SOMMIERES P., *Droit international privé*, Dalloz, Paris, 2013; KONO T, Efficiency in private international law, *RCADI*, 2013, 161 ff.;

Firstly, the characterization of AI-systems will be tackled; those so far provided for within the European legislative proposals, or resolutions, leave doubt regarding the correspondence of AI-systems and products[5].

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OPERTI BADÀN D., Conflit de lois et droit uniforme dans le droit international privé contemporain: dilemme ou convergence? Conférence inaugurale, Session de droit international privé 2012, *RCADI*, 2013, 9 ff.; MAYER P., Le phénomène de la coordination des ordres juridiques étatiques en droit privé. Cours général de droit international privé, *RCADI*, 2007; VRELLIS S., Conflit ou coordination de valeurs en droit international privé. A la recherche de la justice, *RCADI*, 2007, 175 ff.; GAUDEMET-TALLON H., Le pluralisme en droit international privé: richesses et faiblesses (le funambule et l'arc-en-ciel), Cours général de droit international privé, *RCADI*, 2005; AUDIT B., Le droit international privé en quête d'universalité, Cours général de droit international privé, *RCADI*, 2001; PICONE P., Les méthodes de coordination entre ordres juridiques en droit international privé, Cours général de droit international privé, *RCADI*, 1999; VITTA E., Cours général de droit international privé, *RCADI*, 1979; LIPSTEIN K., *Principles of the conflict of laws national and international*, Martinus Nijhoff Publishers, Leiden, 1981; ID., The general principles of private international law, *Revue critique de droit international privé*, 1964, 91 ff.; BATIFFOL H., Le pluralisme de méthodes en droit international privé, *RCADI*, 1973, 75 ff.; QUADRI R., *Lezioni di diritto internazionale privato*, Liguori, Napoli, 1967; GIULIANO M., Presentazione al primo numero della Rivista, *Rivista di diritto internazionale privato e processuale*, 1965, 3 ff.; YASEEN M.K., Principes généraux de droit international privé, *RCADI*, 383 ff.; HAMBRO E., The relations between international law and conflict law, *RCADI*, 1962, 1-68; CAPOTORTI F., *Premesse e funzioni del diritto internazionale privato*, Jovene, Napoli, 1961; RIPHAGEN W., The relationship between public and private law and the rules of conflicts of laws, *RCADI*, 1961, 215 ff.; WENGLER W., The general principles of private international law, *RCADI*, 1961, 273 ff.; BETTI E., *Problematica del diritto internazionale privato*, Giuffrè, Milano, 1956; ZICCARDI P., *Introduzione critica al diritto internazionale*, Giuffrè, Milano, 1956; ID., *Considerazioni su di una definizione formale del diritto internazionale privato suggerita da Tomaso Perassi. Scritti di diritto internazionale in onore di Tomaso Perassi*, Giuffrè, Milano, 1957, 447 ff.; GOLDSCHMIDT W., Système et philosophie du droit international privé, *Revue critique de droit international privé*, 1955, 639 ff.; BATIFFOL H., Principes de droit international privé, *RCADI*, 1959, 431 ff.; ID., *Traité élémentaire de droit international privé*, L.G.D.J., Paris, 1949, 560 ff.; AGO R., *Lezioni di diritto internazionale privato*, Giuffrè, Milano, 1948; ID., Règles générales des conflits de lois, *RCADI*, 1936, 243 ff.; BALLADORE PALLIERI G., *Diritto internazionale privato*, Giuffrè, Milano, 1946; ARMINJON P., L'objet et la méthode du droit international privé, *RCADI*, 1927, 429 ff.; PILLET A., Théorie continentale des conflits de lois, *RCADI*, 1924, 447 ff.

[5] Among all the definitions so far proposed, see EC Proposal for a Regulation of the European Parliament and of the Council laying down harmonized rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts, COM(2021)206 final, 21 April 2021; European Parliament Resolution of 20 October 2020 with recommendations to the Commission on a civil liability regime for artificial intelligence, 2020/2014(INL), P9_TA(2020)0276, 20 October 2020; for a preliminary critique on the latter see SOUSA AUTUNES H., Civil liability applicable to artificial intelligence: a

As such, a solution to the issue of characterization will be found by relying on the ECJ autonomous characterization process (Chapter 4 [6]).

As for the head of jurisdiction, the question will be to make the connecting factors adapt to determine the competent court also when the activity of both, the manufacturer, and the AI-system, are purely virtual. In this regard, a question arises as to whether a special provision is needed; or whether the theological interpretation of the general and the special head of jurisdiction provided for in the EU Regulation Brussels I-Recast (hereinafter "Brussels I-Recast"), are sufficient to solve the issue [7] (Chapter 5 [8]).

Also challenging seems to be the legal incertitude raised by choice of

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preliminary critique of the European Parliament Resolution 2020, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3743242 (last accessed March, 2022); European Commission for the Efficiency of Justice (CEPEJ), European ethical Charter on the use of artificial intelligence in judicial systems and their environment, 2018. For an in-depth analysis, see *infra* Ch. 3, § 4.

[6] See *infra* Ch. 4.

[7] See 1968 Brussels Convention on jurisdiction and the enforcement of judgments in civil and commercial matters, Eur. Un. OJ L299, 21.12.1972 recast in Council Regulation (EC) No 44/2001 of 22 December 2000 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters, Eur. Un. OJ L12, 16.1.2001, currently recast in Regulation (EU) No 1215/2012 of the European Parliament and of the Council of 12 December 2012 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters, Eur. Un. OJ. L351, 20.122012. As for a general understanding on the "Brussels systems", see *ex plurimis*, MANKOWSKI P. (ed.), *Research Handbook on the Brussels I-Recast Regulation*, Edward Elgar, Cheltenam, 2020; SALERNO F., *Giurisdizione ed efficacia delle decisioni straniere nel Regolamento (UE) n. 1215/2012*, CEDAM, Padova, 2015; BOGDAN M., Private international law as component of the Law of the forum, *RCADI*, 2010, 9 ff.; STRUYKEN A.V.M., *Bruxelles I et le monde extérieurs*, in VENTURINI G., BARIATTI S. (eds.), *Nuovi strumenti del diritto internazionale privato. New Instruments of private international law, Nouveaux instruments de droit international privé, Liber Fausto Pocar*, Giuffrè, Milano, 2009, 893 ff.; CARBONE S.M., FRIGO M., FUMAGALLI L., *Diritto processuale civile e commerciale comunitario*, Giuffrè, Milano, 2004; GAUDEMET-TALLON H., *Compétence et exécution des jugement en Europe: règlement no. 44/2001. Conventions de Bruxelles et de Lugano*, L.G.D.J., Paris, 2000; LUZZATTO R., Giurisdizione e competenza nel sistema della convenzione di Bruxelles 1968, *Diritto del commercio internazionale*, 1991, 63 ff.; POCAR F., *La Convenzione di Bruxelles sulla giurisdizione e l'esecuzione delle sentenze*, Giuffrè, Milano, 1986, 3 ff.; KAYE P., *Civil jurisdiction and enforcement of foreign judgement*, Oxford University Press, Oxford, 1987; GAJA G., Diritto internazionale privato e riconoscimento delle sentenze secondo due recenti Convenzioni, *Rivista di diritto internazionale privato e processuale*, 1969, 25 ff.; FRAGISTAS N., La compétence international en droit privé, *RCADI*, 1961, 159 ff.

[8] See *infra* Ch. 5.

law rules: the general and special connecting factors provided for in the EU Regulation Rome II (hereinafter "Rome II") seem not adapted to solve non-contractual issues linked to AI-systems being both products and not [9]. Namely, it is disputable whether the *lex loci damni* connecting factor, as so far interpreted and applied by the ECJ is a convenient connecting factor; or, whether it better demands a broader interpretation of it, relying on the "ubiquity theory" [10]. Besides, party autonomy, too, should play a role because it is a convenient connecting factor, also when there is a non-contractual obligation at stake. Likewise, doubts are raised as to whether art. 2.1 framed within the above-mentioned EP Resolution is a criteria of

[9] See EU Regulation (EC) No 864/2007 of the European Parliament and of the Council of 11 July 2007 on the law applicable to non-contractual obligations (Rome II), Eur. Un. OJ L199/40, 31.7.2007. As for a general understanding on Rome II see, *ex plurimis*, STONE P., FARAH Y., *Research Handbook on EU private International Law*, Edward Elgar, Cheltenham 2015; MARONGIU BONAIUTI F., *Le obbligazioni non-contrattuali nel diritto internazionale privato*, Giuffrè, Milano, 2013; FRANZINA P., Il Regolamento n. 864/2007/CE sulla legge applicabile alle obbligazioni extracontrattuali, *Le nuove leggi civili commentate*, CEDAM, Padova, 2008; KADNER-GRAZIANO T.M., La responsabilité délictuelle en droit international privé européen, Bruylant, Bruxelles, 2004, 445 ff.; DE LIMA PINHEIRO L.L., Choice of law in non-contractual obligations between communitarization and globalization. A First Assessment of EC Regulation Rome II, *Rivista di diritto internazionale privato e processuale*, 2008, 5 ff.; CORNELOUP S., JOUBERT N., Le Règlement Communautaire "Rome II" sur la loi applicable aux obligations non contractuelles, *Lexis Nexis*, Paris, 2008; HAY P., Contemporary Approaches to Non-Contractual Obligations in Private International Law (Conflict of Laws) and the European Community's "Rome II" Regulation, *The European Legal Forum (EuLF)*, 2007. Some part of the academics has negatively judged the legislative/political choices enacted within Rome II Regulation: see, i.a., SYMEONIDES S., Rome II and tort conflicts: a missed opportunity, *American Journal of Comparative Law*, 2008, 173 ff.; DE BOER T.M., Party autonomy and its limitations in the Rome II Regulation, *Yearbook of Private International Law*, 2008, 19 ff.; GOTANDA J.Y., Damages in private international law, *RCADI*, 2007, 73 ff.; HERZOG P.E., Constitutional limits on choice of law, *RCADI*, 1992, 239 ff.; BEITZKE G., Les obligations délictuelles en droit international privé, *RCADI*, 63 ff.

[10] As for the ECJ jurisprudence on the "ubiquity theory" see ECJ, Judgment, 30 November 1976, *Mines de potasse d'Alsace*, C-21/76, 1976:166. As for the academics see, *ex plurimis*, VON HEIN J., Back to the future – (re-) introducing the principle of ubiquity for business-related Human rights claims, *Conflict of laws.net*, 2020; CARBONE S.M., TUO C., *Il nuovo spazio europeo in materia civile e commerciale*, Giappichelli, Torino, 2016, 85 ff.; SALERNO F., (2015), *cit.*, 157 ff.; GAUDEMET-TALLON H., (2000), *cit.*, 222 ff.; FRANZINA P., *La giurisdizione in materia contrattuale. L'art. 5 n. 1 del Regolamento n. 44/2001 CE nella prospettiva dell'armonia delle decisioni*, CEDAM, Padova, 2006; MARI L., *Il diritto processuale civile della Convenzione di Bruxelles. Il sistema della competenza*, CEDAM, Padova, 1999, 388 ff

territorial application or if it enacts a new choice of law rule. Its interpretation, and applications are not at all as clear as they should be (Chapter 6 [11]).

The concluding remarks will integrate the results reached in the analysis and ethical considerations. Both substantive and private international law provisions should be ethically oriented and ensure the protection of fundamental rights [12]. More precisely, private international law shall be an effective instrument for reaching the results pursued by the corresponding substantive provisions. Accordingly, a new direction of private international law seems desirable: as per AI-systems field, it might be time the European legislator accepts connecting factors oriented more towards human rights protection (Concluding remarks[13]).

[11] See *infra* Ch. 6.

[12] See INSTITUT DE DROIT INTERNATIONAL, 4ème Commission on Human Right and Private international law, Draft Resolution, Rapp.: F. POCAR, 2021; ID., Rapp.: J. Basedow, 2018; SALERNO F., La politica europea di cooperazione giudiziaria in materia civile e il suo impatto negli ordinamenti nazionali, *Freedom*, *Security&Justice*, *European Legal Studies*, 2021, 1 ff.; ADINOLFI A., L'Unione europea dinanzi allo sviluppo dell'intelligenza artificiale: la costruzione di uno schema di regolamentazione europeo tra mercato unico digitale e tutela dei diritti fondamentali, in DORIGO S. (ed.), *Il ragionamento giuridico nell'era dell'intelligenza artificiale*, Pacini giuridica, Pisa, 2020 13 ff.; MAYER P., La fondamentalisation du droit international privé portant sur le personnes et les relations familiales, *Revue des droits et libertés fondamentaux*, 2020; MORELLI A., POLLICINO O., Metaphors, judicial frames, and fundamental rights in Cyberspace, *American Journal of Comparative Law*, 2020, 616 ff.

[13] See *infra*, Concluding remarks.

# Chapter 1

# INTRODUCTORY REMARKS ON ARTIFICIAL INTELLIGENCE AND A METHODOLOGICAL PREMISE FOR A PRIVATE INTERNATIONAL LAW ANALYSIS

SUMMARY: Section I - GENERAL REMARKS ON ARTIFICIAL INTELLIGENCE. – 1. Technological evolution: the advent of AI-systems. – 2. The role of domestic and supranational legislators in regulating the development and use of AI-systems. – Section II. A PRIVATE INTERNATIONAL LAW ANALYSIS OF AI: METHODOLOGICAL PREMISE. – 3. The harmonization of European substantive provisions on non-contractual liability relating to AI-systems. – 4. Conflict of laws provisions on non-contractual liability relating to AI-systems: the state-of-the-art at the domestic, international and EU level. – 5. The heads of jurisdiction in the Brussels I-Recast Regulation and their application to non-contractual obligations relating to AI-systems. – 6. The methodological approach adopted by the Rome II Regulation and its relevance for AI-systems.

## Section I – GENERAL REMARKS ON ARTIFICIAL INTELLIGENCE

### 1. *Technological evolution: the advent of AI-systems*

Technological evolution is an ever-present phenomenon and each historical era has "lived" through its own. This has sometimes brought positive effects (we refer to, for example, the wheel, or to the printing press) and sometimes negative ones (see, for example, nerve gas, discovered by the Nobel laureate F. Haber, the spread of whose usage contributed to the protraction of the First World War, as well as the Sheele green color of the same gas, which soon proved to be lethal [1]).

[1] LABATUT B., *Quando abbiamo smesso di capire il mondo*, Adelphi, Torino, 2021.

The present era is witnessing the development of a number of different new technologies, each currying with its own consequences at both normative and sociological level [2].

This book will focus on AI-systems and the legal consequences driven by their development and use at private international law level (a focus will be made to the uniform European private international law on civil liability). As suggested in the Ethics Guidelines for trustworthy AI: "AI is a technology that is both transformative and disruptive" [3].

As per itself, AI is an umbrella and partially a-technical term, referring to an extremely numerous groups of mechanical processes led by algorithms.

Accordingly, two premises are needed. Firstly, a snapshot of the development waves of AI will help understanding what is still needed to make AI-systems more "human-friendly". Secondly, a preliminary understanding of the nature and differences among all available AI-systems is a fundamental step to determine its legal characterization (AI as a product or AI as a service) and the legal categorization of the consequences deriving from the development and use of AI.

At the origin of AI is the faith that all expressions of knowledge can be represented by a set of rules [4]. In 1956, at Dartmouth College, a group of

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[2] The so called "new technologies" which have appeared since the mid of the 1900s can be distinguished in two groups. In the first one, there are some early products of artificial intelligence including, among all: the robot Teseo of the 1950s, the Olivetti program 101 (1965), Commodore 64 (1982), the first camera (1988), the first smartphone model of IBM (1994), Cadabra, later renamed Amazon (1994), the software Windows '95 (1995), and Google (1998). The second group refers to the so-called "web-technology", namely the world wide web/internet (since 1969), and the peer-to-peer or distributed ledger technologies, popular since 1999. See CAPPIELLO B., Blockchain based organizations and the governance of on-chain and off chain rules: towards autonomous (legal) orders?, in CAPPIELLO B., CARULLO G. (eds.), *Blockchain, Law and Governance*, Springer, Cham, 2019, 13 ff.; MANYIKA J., CHUI M., BUGHIN J. *et al.*, Disruptive technologies: advances that will transform life, business, and the global economy, *McKinsey Institute Publication*, May 2013; IRTI N., SEVERINO E., *Dialogo su diritto e tecnica*, Laterza, Bari, 2001; SANTOSUOSSO A., *Diritto, scienza, nuove tecnologie*, CEDAM, Padova, 2016; BARICCO A., *The Game*, Einaudi, Torino, 2018; DE FILIPPI P., WRIGHT A., *Blockchain and Law*, Oxford University Press, Oxford, 2018; BARLOW J.-P., A Cyberspace Independence Declaration, 1996, http://www. olografix.org/loris/open/manifesto.htm (last accessed March, 2022).

[3] See the EC, High-Level Expert Group on AI, Ethics Guidelines for trustworthy AI, 8th April 2019, https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai (last accessed March, 2022).

[4] See Newell and Simon, cited in STRICKLAND E., The turbulent past and uncertain future of AI. Is there a way out of AI'boom-and-bust cycle? *IEEE Spectrum for the Technology Insider*, 2021.

mathematicians and computer scientists gathered to discuss an unexplored field of research. Among them there was also the young professor J. McCarthy, who first coined the term "artificial intelligence" describing it as: "the science and engineering of making intelligent machines, especially intelligent computer programs" [5]. The term "artificial intelligence" can be misleading in the sense that AI is not able to understand like the human brain but it can change its *status quo* and perform acts or respond to impulses automatically. Therefore, the term refers more to the concept of automation rather than to specific objects, in the sense that a/with/of AI are the algorithms which, once inserted in software or in a movable asset, are able to perform an action. The output, resulting from the automatism of the action or of the reaction, depends on the inputs with which the algorithm that makes up the software has been equipped by the developer. The "intelligence" of the algorithms is therefore not natural but it is derived from the rules that have been given to the algorithm. In itself an algorithm is therefore as intelligent as ... a nail. Rather, an algorithm is the combination of binary algorithms of the if-then type that produces an AI-system; that is, a representation of automatic and "intelligent" behavior in a given sector. Almost all AI-systems therefore follow the same chain model of algorithms [6].

How an algorithm of AI reaches the output depends on whether the system of AI is developed following the symbolic [7] or the connectionist approach [8].

Since 1956 and until the 1970s, AI researches following either one of

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[5] See MCCARTHY J., What is artificial intelligence, *Stanford University Publication*, 2007, http://jmc.stanford.edu/articles/whatisai/whatisai.pdf (last accessed March, 2022).

[6] See POLSON N., SCOTT J., *Numeri Intelligenti*, UTET, Torino, 2019, 13 ff.

[7] Symbolic AI expressly "teaches" computers about the world: according to this approach, "knowledge" in a given field can be represented as a set of rules (or code) and computer programs (software) can manipulate that knowledge using logic. Newill and Simon, two leading symbolists, were of the view that if a symbolic AI were structured with facts and premises in a number of fields, the result would be quite a broad intelligence. For a very first understanding on "symbolic AI", see YALÇIN O., Symbolic vs. Subsymbolic AI. Paradigms for AI Explicability, *Towards Data Science*, 2021; DICKSON B., What is symbolic artificial intelligence, *TechTalks*, 2019.

[8] The AI-connectionist approach was inspired by biology and connectionist researchers have, since the earliest periods, tried to develop artificial neural networks. AI-systems conceived in this way rely on being able to make sense of information themselves. A very first example of such a system was the perceptron built in 1958 by Rosenblatt, a Cornell psychologist, and funded by the U.S. Navy. See LEFKOWITS M., Professor perceptron paved the way for AI – 60 years too soon, *Cornell Chronicle*, 2019.

the two approaches have experienced an impressive advancement, also because governmental agencies in the US and in the United Kingdom have poured a lot of money into speculative research. The aim was to encourage technological improvement whilst also controlling it: the development of AI could, in turn, have empowered the most technologically advanced State within the International Community.

However, government financing stopped in the 1970s, mostly because US government funding dried up on the assumption that nothing significant would happen within the field of AI and financial resources were redirected to the Space race. In the 1980s researches were fueled again. This time the so-called "expert systems" developed through the symbolic approach, were developed to encode all available knowledge in a particular field, for example medicine or law [9]. However, already in the late 1980s, the "expert system" market crashed: it required ever more specialized hardware which was not likely to be built or commercialized for the public. In fact, cheap desktop computers which substituted the expert system turned out to be highly useful for the connectionist: they provided for computational powers effective enough to enable the development of deep learning. In a very short space of time, deep learning was highly developed and the neural net started to be used for a number of uses (for example optical character recognition exploiting the neural back propagation algorithm [10]). This rapid development was also due to the large amount of data which started to be available (as an incredibly high amount of data is needed to train deep learning systems).

Over the last two decades of the last century everything changed in terms of the sharing of information and data started to blossom everywhere. In addition, new chips have been created – for example, the graphic processing units (hereinafter "GPUs"), able to carry out the heavy processes required to transfer images in video games [11]. GPUs started to be

[9] As a way of example, reference shall be made to the Cyc project, aimed at coding "common sense" in machines; as of 2017, Cyc counts on 1.5 million terms and 24.5 million rules. See LENAT D., GUHA R.V. *et al.*, CYC: toward programs with common sense, *Communications of the ACM*, 1990, 30 ff.

[10] For a very first understanding, see AL-MASRI A., How does back-propagation in artificial neural networks work? *Towards Data Science*, 2019.

[11] Nvidia, a private company has developed a platform, classed CUDA, able to allow researchers to use GPUs for general purpose, other than video games. And in 2012, Krizhevsky exploited CUDA to write code for a neural network never seen before, see KRIZHEVSKY A., SUTSKEVER I., HINTON G., ImageNet Classification with deep Convolu-

used by computer scientists who were looking for more computer power. Thanks to this, deep learning took off and new software started to be able to sort 1000 objects out of millions of images, or to play difficult games as if they were humans [12]. In the first decade of this century, studies have shown that the amount of computational power required to train the largest AI deep learning algorithm doubled every two years until 2012 and, after this, doubled every 3 to 4 months. Researchers started to find new solutions to increase computational power. To solve the problem, symbolic and connectionist approaches were mixed and the "robotic hands" from Open AI is the first example of this mixed approach; these hands are in fact capable of resolving the Rubik's cube using neural nets along with a symbolic AI-system [13].

Given this historical background, today the most popular AI algorithms are qualified as "narrow AI" which differs from "Augmented Intelligence" (or "Artificial General Intelligence") [14]. In detail, it is possible to distinguish two characteristics that identify an algorithm currently used in an AI-system. First, an AI algorithm will never be able to give answers that are 100% certain, they are instead 90% probable. Secondly, it is necessary, or better still it would be necessary, to understand how an algorithm "knows" the instructions it is to be aligned with. In the case of a traditional algorithm (symbolic approach), the instructions are given in advance by the developer; while the algorithm, following the connectionist approach, learns the instructions through so-called alignment data. In practice, the developer does not instruct the algorithm which email is spam and which is not but instead provides the algorithm with a very large number of emails, including spam (the importance of the data that is collected and processed to make any type of database or dataset is evident). In other

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tional neural networks, https://www.cs.toronto.edu/~kriz/imagenet_classification_with_deep_convolutional.pdf (last accessed March, 2022).

[12] See SILVER D., SCHRITTWIESER J., SIMONYAN K. *et al.*, Mastering the game of Go without human knowledge, *Nature*, 2017, 354 ff.

[13] See ACKERMAN E., Open AI teaches robot hand to solve Rubik's cube, *IEEE Spectrum for the technology insider*, 2019.

[14] The so-called augmented intelligence is supposed to rely on highly sophisticated AI-software replicating the working of the human brain neural network. Such systems should be capable to solve the Turing test while doing a number of other tasks, without human control. The system is not available yet – at least within the private market, because human beings do not know how their own brains work. A list of categories within which AI can be divided is hereto available http://jmc.stanford.edu/artificial-intelligence/what-is-ai/branches-of-ai.html (last accessed March, 2022).

words, the role of the developer is not to tell the algorithm what to do but to teach it how to learn "the task" (in this example, classify the emails as spam or not) using the data at its disposal, and the rules of probability [15]. The algorithm then analyzes the examples provided and decides how to distinguish one from the other. This skill could potentially interrupt the link between the human action (algorithm developer) and the damage resulting out of the AI algorithm functioning.

Basically, AI software is built to perform a single task and improve over time; however, any improvement in the learning activity is risky. There is in fact a technical limit beyond which not even the developer is able to understand how the program – which is processing information-data through a deep learning activity – has come up with a particular solution. This lack of control is known as "the human out of the loop" phenomenon or "black-box problem" [16] and it is this problem with the current state of deep learning which must be tackled: should it be put into the market AI-systems which might be out human control? Or should an AI-system be avoided when its behavior/output remain unexplained?

From a technological perspective, the combination of neuro-symbolic systems seems to enable users to understand – or at least get closer to solving – the issue of the "human out of the loop". The US army is studying a variety of hybrid (symbolic and connectionist) approaches to overcome its limits; the aim being to allow users to understand how an AI-system has reached a given conclusion [17]. As of today, advancement in the

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[15] See POLSON N., SCOTT J., *cit.*, 25 ff.

[16] See CHOI Q., 7 Revealing ways as fail. Neural networks can be disastrously brittle, forgetful, and surprisingly bad at math, *IEEE Spectrum for technology insider*, 2021; CREVIER D., *AI: The tumultuous search for Artificial Intelligence*, BasicBooks, New York, 1993. As for the "out of loop problem" applied to automated vehicle, see MERAT N., SEPPELT B., LOUW T. *et al.*, The "out-of-the-loop" concept in automated driving: proposed definition, measures and implications, *Cognition, Technology and Work*, 2019, https://link.springer.com/article/10.1007/s10111-018-0525-8 (last accessed March, 2022).

[17] In a recent statement, the US Secretary of Defense, L. Austin, declared that the U.S. will spend nearly $1.5 billion on artificial intelligence research and development (July 2021). One year earlier, the Pentagon's Defense Advanced Research Projects Agency ("DARPA") has made public a new program of funding "artificial intelligence exploring" (AIE), https://www.darpa.mil/work-with-us/ai-next-campaign (last accessed March, 2022). China, on the other hand, has made clear the intention to be globally dominant in AI by 2030. On the link between AI research and development and army, see ACKERMAN E., How the U.S. army is turning robots into team players, *IEEE Spectrum for the technology insider*, 2021; ROBERTS H., COWLS J., MORLEY J. *et al.*, The Chinese approach to artificial intelligence: an

AI military sector follows a specific – and barely known – normative framework [18].

However, AI-systems that are able to tackle the "human out of the loop" problem should be developed and tested also within AI-systems meant for use within the private sector. As it will be seen, from a legal perspective, being in control of an AI-system means becoming accountable for any damage the system may cause both to users and bystanders, otherwise there would be a liability gap, potentially solvable only through a *fictio iuris* [19].

Besides, deep learning is currently facing a second type of problem: AI-systems cannot generalize their abilities. Learning a new task implies the deletion of what was already learned. From a technological perspective, once again the combination of the symbolic and connectionist approaches seems to make the training process of the AI-system easier as it is able to apply its skill to different tasks, not just to a single one. This in turn makes the task of acting in the real world (which is unpredictable), easier [20].

The consequences in legal terms are impressive: having an AI aware of what is going on around means putting AI-systems into the market whose use should – generally speaking – be less dangerous.

Given the above, as of today, from a technological perspective the task is either to adapt deep learning, rendering it more flexible and fully "under human control"; or to develop new approaches which have not yet been conceived. Meanwhile, from the legal perspective, legislators at all level are required to decide which political and normative approach to follow in order to ensure private parties can use AI safely.

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analysis of policy, ethics and regulation, *AI and Society*, 2021, 59 ff.; RUFFOLO U., AMIDEI A., *Intelligenza artificiale, human enforcement e diritti della persona* in RUFFOLO (ed.), *Intelligenza artificiale. Il diritto, i diritti, l'etica*, Giuffrè, Milano, 2020, 192 ff.; ALLEN G., Understanding China's AI strategy, *Center for a new American Security*, 2019; COSTANZA M., Impresa e responsabilità, in RUFFOLO U., *Intelligenza artificiale e responsabilità*, Giuffrè, Milano, 2017, 107 ff.

[18] Within the EU, art. 2.3 of the European Artificial Intelligence Act leaves AI for military use out of the future Regulation *ratione materiae* application. See EC, Artificial Intelligence Act, *cit.*

[19] Interestingly, art. 14 European Artificial Intelligence Acts states that: "high-risk AI-systems shall be designed and developed in such a way, including with human-machine interface tools, that they can be effectively overseen by natural persons during the period in which the AI-system is in use", see EC, Artificial Intelligence Act, *cit.*

[20] CHIVERS T., How deep-mind is reinventing the robot, having conquered go and protein folding, the company turns to a really hard problem, *IEEE Spectrum for Technology Insider*, 2021.

## 2. *The role of domestic and supranational legislators in regulating the development and use of AI-systems*

The law has always followed the advent of a significant technological development. What is interesting to note is that the development of new technologies has been increasing at a faster pace. In the last century, new technologies have appeared with increased frequency whereas, in the past, new technologies were a "big event" marked by "eras" (see the era of print, the era of steam etc.). The period between the development of a new idea-technology and the spread of the product-result has shrunk tremendously. Accordingly, the time available to legislators to enact regulations has decreased.

Currently, AI algorithms are widespread in an increasing number of objects in everyday use: machines, domestic (vacuum cleaners) or specialist (medical equipment). The benefits they bring are not only in terms of the speed of execution of the task they are meant to pursue; but also, in the precision and accuracy of the results achieved which are indisputable and most likely difficult to renounce. AI algorithms may also produce negative externalities that must be contained, first of all at a normative level. The unregulated and uncoordinated development of AI-systems and its negligent use can indeed cause damage not only to users but also, more generally, to society.

Therefore, a prompt legislative response is needed at a national and supranational level to subsume the development and use of AI-systems within legal frameworks that coordinate often opposing interests: legal certainty and technological development. Guaranteeing the former means ensuring the well-being of society; maintaining the latter should guarantee the political influence of a given nation within the International Community.

It is not surprising that, since its early stages, States have never tried to stop AI evolution: either through restricting funding or through the legislative framework. States have always favored AI development. AI-systems soon proved to be useful tools to demonstrate power within the international Community; and today, inter State relations are also played out in the field of technological improvement: the more sophisticated the technology that a state can rely on, the better it can foresee and so exercise influence on counterparties both in times of war[21] and in daily life.

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[21] See, *ex plurimis*, PASQUALE F., *Le nuove leggi della robotica*, Luiss University Press, Roma, 2021, 169 ff.; SPAGNOLO A., La regolamentazione delle armi autonome: letteratura o diritto? *Conflitto, sicurezza umana e nuove tecnologie*, 2019; RONZITTI N., *Diritto internazionale dei conflitti armati*, Giappichelli, Torino, 2017; SEHRAWAT V., Legal status of

The effort required by the national and supranational legislator is therefore twofold: to understand a language – the language of algorithms – which is very different from natural languages; and to define a stable, but not immobile, regulatory framework. The legal consequences deriving out of AI-system's development and use are, in fact, widespread and touch upon both the public and private sector [22]. As regards the latter, the entry of AI – qualified alternatively as either products or services [23] – in daily private relations has consequences in almost all civil and commercial matters such as, to name a few: contractual law, non-contractual liability and IP rights. In addition, criminal law is required to accommodate potential crimes committed with or because of AI-systems. Ethical aspects are also

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drone under LOAC and International law, *Penn State Journal of Law & International Affairs*, 2017, 166 ff.; MELONI C., Droni militari: proliferazione o controllo? Rapporto di ricerca, *Istituto di ricerche istituzionali* (IRIAD), Roma, 2017; SHAW I., *Predator Empire; drone warfare and full spectrum dominance*, Minnesota University Press, Minneapolis, 2016; CROOTOF R., The Killers robot are here, *Cardozo Law Review*, 2015, 1837 ff.; ZHAO S., A new model of big power relations? China-US strategic rivalry and balance of power in the Asia-Pacific, *Journal of Contemporary China*, 2015, 377 ff.; FLORIDI L., TADDEO M. (eds.), *The Ethics of information warfare*, Springer, Cham, 2014; BROOKS F., Drones and the international rules of law, *Georgetown University Law Center*, 2013, 83 ff.; SCHMITT M.N., Drone attacks under the jus ad bellum and jus in bello: clearing the 'fog of law', *Yearbook of international humanitarian law*, 2010, 311 ff.; ANGELUCCI G., VIERUCCI L. (eds.), *Il diritto internazionale umanitario e la guerra aerea*, Firenze University Press, Firenze, 2010.

[22] As for the challenge raised by present technological development towards States sovereignty see, *ex plurimis*, CANIZZARO E., *La Sovranità oltre lo Stato*, Il Mulino, Bologna, 2020; HOBBS C., Europe's digital sovereignty: From rule-maker to super-power in the age of US-China rivalry, *European Council on Foreign Relations*, 2020; MEREZHKO O., The mystery of the State and sovereignty in international law, *Saint Louis University School of law*, 2020, 23 ff.; MULDOON J., FAGOT AVIEL JR. *et al.*, *The new dynamics of multilateralism*, Routledge, New York, 2018; KOSKENNIEMI M., International Law: constitutionalism, managerialism and the ethos of legal education, *European Journal of Legal Studies*, 2007, 8 ff.; CRAWFORD J., *The creation of States in international law*, Oxford University Press, Oxford, 2006; HOLLIS D.B., Stewardship versus Sovereignty? International Law and the Apportionment of Cyberspace, presented at Cyper Dialogue, 19 March 2012, *Canada Centre for Global Security Studies*, 2012; KRASNER S.D., Problematic sovereignty: contested rules and political possibilities, Columbia University Press, NY, 2001; MACCORMICK N., *Questioning sovereignty: law, state and the nation in the European Commonwealth*, Oxford University Press, Oxford, 1999; WRISTON W., Technology and Sovereignty, *Foreign Affairs*, 1988, 63 ff. As for some early reflections on sovereignty, see SPERDUTI G., Le principe de souveraineté et le problème de rapports entre le droit international et le droit interne, *RCADI*, 319 ff.; KOROWICZ M.S., Some presents aspects of sovereignty in international law, *RCADI*, 1961, 1 ff.; VAN KLEFFENS E.N., Sovereignty in international law, *RCADI*, 1953.

[23] See *infra*, Ch. 4, § 5 and § 6.

raised by legislators to deal with the ethical and moral implications that arise from the development and use of AI. Maintaining the principles and values that the international Community has, up until now, achieved and consecrated within national constitutions, or conventions of international law is thus mandatory.

Given that AI is a worldwide phenomenon, the legislators' challenge necessarily assumes a cross-border aspect[24]. Only common, or at least shared, choices within the International Community will ensure the definition of a uniform approach. Overly diversified and non-modular political actions risk that the same product or service of AI will be treated highly differently from country to country. This will inevitably lead to – and increase – the "state shopping" phenomenon: that is that an AI developer will favor those countries which have adopted a *laissez-faire* policy, at the cost of decreasing the protection of AI users or bystanders. This practice is detrimental whenever not only the economic interest is at stake (increasing corporation earnings), but also where liabilities are to be allocated and rights are to be protected from unjust damage.

At the international level there is not (yet?) an International Organization (hereinafter "I.O.") nor entity which significantly focuses only on AI. Those already in existence have made some statements on AI, focused on how AI will impact on general issues of law[25] or on the I.O.s sphere of competence[26]. As a consequence, policy coordination is to be achieved among na-

[24] Currently, AI technology' application has reached remote geographical areas, such as the Sahara, where AI has helped in finding trees; or in the "Amazon Forest" where local people have been instructed on how to use AI technology to monitor the forest. See FLEMING A., One, two, tree: how AI helped find millions of trees in the Sahara, *The Guardian*, 2021.

[25] UN News, Global stories, Pegasus, Human rights – compliant laws needed to regulate spyware, 19 July 2021, https://news.un.org/en/story/2021/07/1096142 (last accessed March, 2022); Committee on Legal Affairs and Human Rights, Parliamentary Assembly, Council of Europe, hearing on the implications of the Pegasus spyware, Statement by United Nations High Commissioner for Human Rights M. Bachelet, 14 September 2021, https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=27455&LangID=E (last accessed March, 2022); see also UN News, Global perspective Human stories, Urgent action needed over artificial intelligence risks to human rights, 15 September 2021, https://news.un.org/en/story/2021/09/1099972 (last accessed March, 2022).

[26] In 2019, 38 UN agencies have organized a strategy called "AI for Good" for supporting AI development in specific fields (ITU-coordinate UNI-wide strategic approach) https://aiforgood.itu.int/about/un-ai-actions/ (last accessed March, 2022); see also WTO, Joint Statement on electronic commerce, EU Proposal for WTO disciplines and comments relating to electronic commerce, 26 April 2019; WTO, The future of world trade: how digital technologies are transforming global commerce, World Trade Report 2018.

tion States and/or regional organizations (for example the European Union "EU").

At first scrutiny, it seems that the US, China and the EU have currently been following different approaches.

With regards to European policy, over the last couple of years EU legislator has crafted concrete proposals for the EU-wide regulation of data, digital services and AI. Within the last few years, the EU has published a large number of proposals for regulations, some of which urge for close scrutiny to understand the political direction taken by the EU itself and so evaluate the appropriateness of the EU position [27]. Reference is made, for instance, at the European Artificial Intelligence Act and the EP Resolution on civil liability for AI which will be anlyzed further in the analysis [28].

European legislators are struggling to enact a solid and coherent normative framework while maintaining a watchful eye on what is happening outside EU borders, especially in the US. With regards to a (desirable) EU-US joint action, it has received a positive answer the formal request raised in December 2020 by the EU to have the EU Trade and Technology Council ("TTC") engage with the Biden Administration [29]. As a result, the

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[27] See European Parliament Resolution of 20 October 2020 with recommendations to the Commission on a framework of ethical aspects of artificial intelligence, robotics and related technologies, 2020/2012(INL); Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regards to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), Eur. Un. OJ L119, 4.5.2016; Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regards to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No. 45/2001 and Decision No. 1247/2002/EC, Eur. Un. OJ L295, 21.11.2018; Directive (EU) 2016/680 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regards to the processing of personal data by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data, and repealing Council Framework Decision 2008/977/JHA (Law Enforcement Directive), Eur. Un. OJ L119, 4.5.2016.

[28] See *infra* Ch. 2, § 6 and § 7.

[29] President J. Biden stated that "We must shape the rules that will govern the advance of technology and the norms of behavior in cyberspace, artificial intelligence, biotechnology so that they are used to lift people up, not used to pin them down. We must stand up for the democratic values that make it possible for us to accomplish any of this, pushing back against those who would monopolize and normalize repression", Remarks by U.S. President Biden at the 2021 Virtual Munich Security Conference, 19 February 2021,

EU-US TTC was created [30]. A first meeting of the EU-US TTC was held on the 29th of September 2021, in Pittsburgh. It ended with a public statement, the "Pittsburgh Statement" which states that: "the European Union and the United States affirm their willingness and intention to develop and implement AI-systems that are innovative and trustworthy and that respect universal human rights and shared democratic values" [31]. To reach this end, a focused working group on technology standards has been created to: "develop approaches for coordination and cooperation in critical and emerging technology standards including AI" [32].

Aside from this, the US has generally followed a slow and fragmented approach. As of today, various government offices have made public statements outlining positions for a national framework. However, the only binding provisions enacted on AI are at the state level. At the federal level, one piece of guidance issued by the Federal Trade Commission ("FTC") emphasizes the need to have a transparent, explainable and fair use of AI [33]. In a second piece of guidance, published in April 2021, the FTC warns companies against the biased and discriminatory practices of AI algorithms [34]. Lastly, in its March 2021 final report the national security commission for AI urged again for the pressing need to adopt a cohesive and comprehensive federal AI strategy [35].

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https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/02/19/remarks-by-president-biden-at-the-2021-virtual-munich-security-conference/ (last accessed, January 2022). As for the EU trade and technology Council, see https://ec.europa.eu/commission/presscorner/detail/en/IP_21_2990 (last accessed March, 2022).

[30] See DIGITALEUROPE, The ten priorities for the EU-US Trade and Technology Council – a partnership that come deliver, 2021, https://www.digitaleurope.org/resources/ten-priorities-for-the-eu-us-trade-and-technology-council-a-partnership-that-can-deliver/ (last accessed March, 2022).

[31] See EU-US Trade and Technology Council Inaugural Joint Statement September 29, 2021, Pittsburgh, Pennsylvania, at 2-5.

[32] *Ibid.*

[33] See Federal Trade Commission, Using Artificial Intelligence and Algorithms, 8 April 2020, https://www.ftc.gov/news-events/blogs/business-blog/2020/04/using-artificial-intelligence-algorithms (last accessed March, 2022).

[34] See Federal Trade Commission, Aiming for truth, fairness, and equity in your company's use of AI, 19 April 2021, https://www.ftc.gov/news-events/blogs/business-blog/2021/04/aiming-truth-fairness-equity-your-companys-use-ai (last accessed March, 2022).

[35] See US National Security Commission on Artificial Intelligence, Chair: E. Schmidt, Final Report, https://assets.foleon.com/eu-west-2/uploads-7e3kk3/48187/nscai_full_report_digital.04d6b124173c.pdf (last accessed March, 2022).

With regards to China, this country has published since 2013 a number of national-level policy documents reflecting the aim to develop a national AI political agenda. In this aim China is, at present, running "solo". The China State Council has in fact already developed and activated a strategy for technology leadership, focusing on highly advanced technologies (a plan worth nearly $150 billion) [36]. In May 2019, a multi-stakeholder coalition released the "Beijing AI Principles" which call for: "the construction of a human community with shared future, and the realization of beneficial AI for humankind and nature" [37].

How these principles will integrate with the others normative framework on AI is doubtful; mostly because what is currently going on is not a shared global agenda on AI. Conversely, the great powers have been struggling within the international arena to impose their own influence, akin to what happened during the race to the moon [38]. In those days, again the US and China were competing against each other on the technological field to achieve leadership in the space race. Some of the effects of this race were – and are – positive, especially considering the resulting impressive rapid increase in technological development [39]. However, the consequences can also be detrimental if the achievements do not attain a coherent and comprehensive normative framework.

This book focuses on the perspective adopted by the European legislator on non-contractual liability, interpreted with some insights into the US system.

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[36] See CONN A., AI Policy – China, Future of life Institute, 2020, https://futureoflife.org/ai-policy-china/ (last accessed November 2021); CHINA STATE COUNCIL, New generation artificial intelligence development plan, doc. n. 35, 2017.

[37] See 2018 Beijing AI Principles, https://www.baai.ac.cn/news/beijing-ai-principles-en.html (last accessed March, 2022).

[38] See ROBERTS H., COWLS J., MORLEY J. *et al.*, *cit.*; KYNGE J., LIU N., From AI to facial recognition: how china is setting the rules in new tech, *Financial Time*, 7 October, 2020; CADY F., ETZIONI O., China may overtake US in AI research, *Allen Institute for Artificial intelligence*, 13 March 2019.

[39] For an in-depth analysis integrating the technological improvement with economic data see MAZZUCATO M., *Missione economia. Una guida per cambiare il capitalismo*, Laterza, Bari, 2021.

## Section II – A PRIVATE INTERNATIONAL LAW ANALYSIS OF AI: METHODOLOGICAL PREMISE

### 3. *The harmonization of European substantive provisions on non-contractual liability relating to AI-systems*

To better understand the current issues, namely the legal consequences derived by AI-systems development and use, some historical background on non-contractual liability is needed.

Tort law systems developed their essential framework at the turn of the 19th and 20th centuries. In these historical periods, societies were increasingly changing, also in terms of economic activities which, in addition to benefits, brought with them negative consequences. Governments felt the need to frame new rules aimed at balancing the relationships between private parties where a previous connection was absent. Precisely, non-contractual liability systems were based on the principle of *neminem ledere* and, as such, they address the need to rebalance relations whenever, due to an action or an omission, with or without fault, one party damages another.

Over time, national legal systems adopted their own non-contractual civil liability regimes which assumed very different forms, depending on the historical era (from fault-based to strict liability) and the legal system of reference (civil law systems versus common law systems) [40].

In general terms, it can be derived that tort law is a branch of private law dealing with the consequences deriving from a tortious, delictual, or quasi-delictual [41] action or omission. As such, tort liability is essentially grounded on either wrongful conduct, or on a risk put into society by an individual's role (parents, teachers, drivers) or the work a person carries out (for example, a dangerous activity). From each given situation derives either fault based or strict liability. In both scenarios, there is an act or omission of the tortfeasor which results in damage. Acts, omissions and damage must be present as a casual direct link and, when this is the case,

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[40] See BUSSANI M., SEBOK A. (eds.), *Comparative tort law: global perspectives*, Edward Elgar, Cheltenham, 2015; WIDMER P. (ed.), *Unification of Tort Law: fault*, Kluwer Law International, Aalpen aan den Rjin, 2005; VAN GERVEN W., LEVER J., LAROUCHE P., VON BAR C., VINEY G. (eds.), *Cases, materials and text on national, supranational and international tort Law. Scope of protection*, Hart Publishing, Oxford, 1998.

[41] For a first understanding on the difference between torts and delicts see, *ex plurimis*, LEE R.W., Torts and delicts, *Yale Law Journal*, 1918, 721 ff.

the national court will award compensation to the injured party. Compensation can assume multiple forms[42], and it is the way through which the balance between the parties is redressed.

Similarly, to the eras of steam power and electricity, more recent technological revolutions – such as the development of AI-systems – have radically changed society. A question then arises as regards the appropriateness of the tort law system already in force. During the second half of the last century, legislators at a national level have mostly followed a wait-and-see approach. At the international level too, the level of harmonization which had been achieved within the field of contractual law has not yet been reached in non-contractual obligations[43]. However, the phenomena

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[42] For some literature on compensation within civil law systems see *ex plurimis*, CASTRONOVO C., *Responsabilità civile*, Giuffrè, Milano, 2018, 782 ff.; WILDERSPIN M., PLENDER R., *The European private international law of obligations*, Sweet & Maxwell, London, 2015; CARNEVALI U., *Dei fatti illeciti* (art. 2044-2059), Vol. 2, UTET, Milano, 2011; KOZIOL H., Punitive damages – A European Perspective, *Louisiana Law Review*, 2008; SACCO R., CISIANO P., *La parte generale del diritto civile*, Vol. 1, UTET, Torino, 2005; As regard the literature on damages within common law countries, see *ex plurimis*, VANLEENHOVE C., *Punitive damages in private international law*, Intersentia, Cambridge, 2016; HARDER S., *Measuring damages in the law of obligations*, Oxford University Press, Oxford, 2010; BURROWS A., *Remedies for torts and breach of contract*, Oxford University Press, Oxford, 2004.

[43] Since a long time, contractual law has been the object international Conventions enacting either harmonized substantive provisions or uniform choice of law provisions. Among all, reference can be made to United Nations Convention on Contracts for the International Sale of Goods of 1980 (the Vienna Convention); the 1977 Council of European convention for product liability in regard to personal injury and death; the 1973 Washington Convention providing a uniform law on the form of an international will; the 1964 Hague Convention on uniform sales laws; the 1956 Geneva convention on the contract for the international carriage of goods by road (C.M.R.); the 1929 Warsaw Convention for the unification of certain rules relating to international carriage by air. As for the academics see, *ex plurimis*, FERRARI F., A new Paradigm for international uniform substantive law conventions, *Uniform Law Review*, 2019, 467 ff. As within the EU, it is, since long time, under scrutiny the negotiation of an European Civil Code. See for an analysis of the pro and cons of a European Civil Code see, *ex plurimis*, SIRENA P., La scelte dei Principle of european contract law (PECL) come legge applicabile al contratto (The principles of European contract law (PECL) as the law chose by the parties to govern their contract, *Rivista di diritto civile*, 2019, 608 ff.; COLLINS H., Why Europe needs a Civil Code, *European Review of Private Law*, 2013, 907 ff.; SCHMID D., (Do) we need a European civil code?, *Annual Survey of International & Comparative Law*, 2012, 263 ff.; HARTKAMP A., HESSELINK M., HONDIUS E. *et al.* (eds.), *Towards a European civil code*, Wolters Kluwer, Alphen Aan den Rijn, 2010; HESSELINK M.W., The Ideal of codification and the dynamics of Europeanization, *European Law Journal*, 2006, 295 ff.; SMITS J., European Private Law: A plea for a spontaneous legal order, *Maastricht Faculty of Law Working Paper 3/2006*, 2006; ZIMMERMANN R., Civil Code and Civil Law: The "Europeanisation" of

of digitalization have already become strongly rooted in society, urging a prompt legislative response.

At the European level, the term "European" linked to tort law is an umbrella term[44]; to some, it refers to a common set of principles of tort law shared among EU Member States; while to others, it simply refers to the different "tort" laws of European countries. What is not in contention is that European tort law includes a variety of areas (from product liability to unjust enrichment, and so on), providing a European level playing field to remedy economic torts[45]. Today, there are various sources of European tort law: some entail substantive provisions and others are provisions of private international law[46]. As regards the former, as stated each European Member State has developed its own framework, reflecting its tradition as a country of civil or common law, along with its political approach or local preferences[47].

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Private Law Within the European Community and the Re-Emergence of a European Legal Science, *Columbia Journal of European Law*, 1994-95, 73 ff.; LEGRAND P., Against a European civil code, *The Modern Law Review*, 1997, 44 ff. *Contra*, already in 1874, P.S. Mancini, during the second meeting of the Hague Conference of Private International law, stressed the essential role played by international conventions providing for uniform choice of law instead of substantive provisions; see the Report "the advantage to be derived from making a number of general rules of private international law mandatory for all nations through on or more international conventions", *Journal du droit international privé*, 1874, 229 ff.; firstly republished by *Il Filangieri*, 1876, 625, then re-printed in *Antologia di diritto internazionale privato*, Milano, 1964, 43.

[44] According to some academics, the term "European" also identifies specific systems of law (such as EU law or European Human Rights law), see GILIKER P., What do we mean by EU tort law? in GILIKER P. (ed.), *Research Handbook on EU tort law*, Edward Elgar, Cheltenam, 2017, 440 ff. As pointed out, the term may also refer to the non-contractual liability of the European Union (art. 268 TFEU and art. 340.2 TFEU); see on this GUTMAN K., The non-contractual liability of the European Union: principle, practice and promise in GILIKER P. (ed.), *The Europeanisation of English Tort Law*, Hart Publishing, Oxford, 2014, 26 ff.; OLIPHANT K., European tort law: a primer for the common lawyer, *Current Legal Problems*, 2009, 440 ff.; Lord MACKENZIE S., The non-contractual liability of the European Economic Community, *Common Law Review*, 1972, 493 ff.

[45] See VAN RAEPENBUSCH S., La convergence entre les régimes de responsabilité extra-contractuelle de l'Union européenne et des États membres, *ERA Forum*, 2012, 680 ff.; KOCH B.A., The "European Group on Tort Law" and its "Principles of European Tort Law", *American Journal of Comparative Law*, 2005, 189 ff.

[46] As for private international law provisions, see *infra* § 6 and § 7.

[47] See MUELLER D.C., Federalism and the European Union: a constitutional perspective, *Public Choice*, 1997, at 25; ROSE-ACKERMAN S., *Rethinking the Progressive Agenda, the Reform of the American Regulatory State*, Free Press, New York, 1992; TIEBOUT C.M., A pure theory of local expenditures, *Journal of Political Economy*, 1956, 415 ff.

The EU itself does not have general competence in the field of tort law. In fact, it can regulate a given sector of private law only when specific competence has been provided to it by Member States[48]. The EU should potentially harmonize substantive provisions of tort law if, according to either art. 114 TFEU or art. 115 TFEU[49], the EU provisions can fully or partially harmonize existing national provisions where this is needed to remove obstacles to trade in the internal market[50]. As this is not often the case, the legislative framework of tort law has remained more local Member States oriented. So far, the EU has made only limited efforts to harmonize "substantive provisions" in tort law following a much-criticized top-down approach[51]. This has consisted of the enactment of primary or secondary legislation, mostly status-oriented, and providing for either a maximum or minimum level of harmonization[52]. Reference is made, for instance, to the Product Liability Directive (Directive 1985/374/EEC), which is the first example of maximum harmonization of EU private law[53]; as for an example of minimum harmonization,

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[48] See TESAURO G., *Manuale di diritto dell'Unione europea* (P. DE PASQUALE, F. FERRARO, eds.), Editoriale Scientifica, Napoli, 2020; MANKO R., EU competence in private law: the treaty framework for a European private law and challenges for coherence, *European Parliamentary Research Service*, 2015; WYATT D., *Community competence to regulate the internal market*, University of Oxford Faculty of Law Legal Studies, Research Paper Series, Working Paper No. 9/2007, 2007; SHUIBHNE N.N. (ed.), *Regulating the Internal Market*, Edward Elgar, Cheltenham, 2006; BERTOLI P., *Corte di giustizia, integrazione comunitaria, e diritto internazionale privato e processuale*, Giuffrè, Milano, 2005, 81 ff.

[49] See POCAR F., BARUFFI M.C., *Commentario breve ai Trattati dell'Unione europea*, CEDAM, Padova, 2014, at 905 (art. 114 TFEU), and at 911 (art. 115 TFEU).

[50] See ECJ, Judgment, 5 October 2000, C-376/98, *Germany v. Parliament and Council* ("Tobacco Advertising case"), 2000:544, § 27. For a critical analysis see DELHOMME V., Internal Market as an excuse: the case of EU Anti-tobacco legislation, Case note 02/2017, *Department of European Legal Studies*, 2017; WEATHERILLS S., The limits of legislative harmonization ten years after tobacco advertising: how the court's case law has become a "Drafting Guide", *German Law Journal*, 2011, 827 ff.; HILLION C., Tobacco Advertising: if you must, you may, *The Cambridge Law Journal*, 2001, 486 ff.

[51] See FAURE M., The harmonization of EU tort law: a law and economics analysis, in GILIKER P. (ed.), (2017), *cit.*, 428 ff.; VAN DAM C., *European Tort Law*, Oxford University Press, Oxford, 2006, 322 ff.; MAGNUS U., *Towards European civil liability*, in FAURE M., SMITS J., SCHNEIDER H. (eds.), Towards a European Ius Commune in Legal Education and Research, Intersentia, Cambridge, 2002, 205 ff.; ID., European perspectives of tort liability, *European Review of Private law*, 1995, 427 ff.

[52] See *infra* Ch. 2, § 2.

[53] See Council Directive 85/374 of 25 July 1985 on the approximation of the laws, regu-

reference can be made to Council Directive on Package Travel, Package Holidays and Package Tours (Directive 90/314/CEE[54]), the Directive on the Protection of Individuals with regards to the Processing of Personal Data and on the Free Movement of Data (Directive 95/46/EC[55]); the General Data Protection Regulation 2016/679); and treaty provisions (see arts. 268 and 340.2 TFEU). European Court of Justice ("ECJ") case law has also helped to frame some principle of European tort law[56].

Given the absence of a general harmonized framework of tort law principles and provisions enacted at the EU-center level[57], it is debatable whether or not one such centralization is truly needed, or whether solutions

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lations and administrative provisions of the Member States, concerning liability for defective products, Eur. Un. OJ L 210, 7.8.1985.

[54] See Council Directive on package travel, package holidays and package tours, Directive 90/314/CEE Eur. Un. OJ L 158, 23.6.1990.

[55] See Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 Directive on the protection of individuals with regard to the processing of personal data and on the free movement of data, Eur. Un. OJ L281, 23.11.1995.

[56] See ECJ, Judgment, 19 November 1991, joined cases C-6/90 and C-9/90, *Francovich and Bonifaci v. Italian Republic*, 1991:428; see DE BÚRCA C., *EU Law: text, cases and materials*, Oxford University Press, Oxford, 2015; LOCK T., Is private enforcement of EU law through state liability a myth? An assessment 20 years after Francovich, *Common Law Review*, 2012, 1675 ff.; TRIDIMAS T., The Court of Justice and judicial activism, *Common Market Law Review*, 1996, 199 ff.

[57] For a preliminary understanding of the EU nature see, *ex plurimis*, SCHUTZE R., *European Union Law*, Cambridge, University Press, Cambridge, 2018, 4 ff.; BERRY E., HOMEWOOD M., BOGUSZ B., *EU Law*, Oxford University Press, Oxford, 2017; GRADONI L., TANZI A., Diritto Comunitario una lex specialis molto specialis, in ROSSI L.S., DE FEDERICO G. (eds.), *L'incidenza del diritto dell'Unione Europea sullo Studio delle discipline giuridiche*, Editoriale Scientifica, Napoli, 2009; PELLET A., Les fondements juridiques internationaux du droit communautaire, *Collected courses of the Academy of European Law (AEL)*, 1997, 193 ff.; WEILER P., HALTERN U.R., The Autonomy of the Community legal order: through the looking glass, *Harvard International Law Journal*, 1996, 420 ff.; WEILER P., The Transformation of Europe, *The Yale Law Journal*, 1991, 2403 ff.; LEBEN C., *A propos de la nature juridique des Communautés européennes*, Bruylant, Bruxelles, 1991; PESCATORE P., *L'ordre Juridique des communautés européennes, étude des sources du droit communautaire*, Bruylant, Bruxelles, 1975; ID., International Law and Community Law, A Comparative Analysis, *Common Market Law Review*, 1970, 167 ff.; BUIGUES I., La nature juridique du droit communautaire, *Cahiers de droit européennes*, 1968, 501 ff.; MONACO R., Caratteri istituzionali della Comunità europea, *Rivista di diritto internazionale*, 1958, 9 ff. As for some pivotal judgement rendered by the ECJ, see ECJ, Judgment, 5 February 1963, C-26/62, *NV Algemene Transport – en Expeditie Onderneming van Gend & Loos*, 1963:1; ECJ, Judgment, 15 July 1964, C-6/64, *Flaminio Costa vs. E.N.E.L.*, 1964:66; ECJ, Judgment, 13 November 1964, C-90-91/63, *European Commission vs. Luxembourg and Belgium*, 1964:80.

provided for at Member States-local level (so called decentralized approach) represents the optimal solution, at least from a tort law perspective.

To answer, an analysis from an economic perspective is highly useful. According to the "economics of federalism" approach, scrutiny of some arguments leads to an understanding of whether a given issue of law merits a centralized or decentralized approach [58].

Centralization should in fact be favored only if it can be empirically proved that inefficiencies are created by having various tort law systems (theoretically, local communities work better where the problem is merely local); or that without centralization damages cannot be externalized (thus increasing production cost, while reducing development); or that absent a centralized framework, a Member State is attracting industry by lowering the tort law standard (the so-called race-to-the-bottom approach).

An in-depth and complete analysis of the said criteria would go beyond the focus of the present book; it suffices here to state that from a pure economic perspective, it can be derived that the main three theoretical arguments favoring the centralization of tort law at an EU level are limited [59].

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[58] For an in-depth analysis see, *ex plurimis*, WHITE F., Directive 85/374/EEC concerning liability for defective products: in the name harmonization, the internal market and consumer protection, in GILIKER P. (ed.), (2017), *cit.*, 128 ff.; MACHNIKOWSKI P. (ed.), European Product Liability. An Analysis of the State of the Art in the Era of New Technologies, Intersentia, Antwerp, 2016, 619 ff.; VAN BOOM W.H., Harmonizing tort law: a comparative law and economics analysis, in FAURE M. (ed.), *Tort Law and Economics*, Edward Elgar, Cheltenham, 2009, 402 ff.; VAN DAM C., European tort law and the many cultures of Europe, in WILHELMSSON T. (ed.), *Private Law and the Cultures of Europe*, Kluwer Law International, Alphen aan den Rijn, 2007, 53 ff.; VAN DEN BERGH R., VISSCHER L., The principles of European tort law: the right path to harmonisation? *European Review of Private Law*, 2006, 511 ff.; FAURE M., Economic analysis of fault, in WIDMER P. (ed.), *Unification of Tort Law: fault*, Kluwer Law International, Aalpen aan den Rjin, 2005, 311 ff.; VAN DEN BERGH R., Towards an institutional legal framework for regulatory competition in Europe, *Kyklos*, 2000, 435 ff.; ID., Subsidiarity as an economic demarcation principle and the emergence of European private law, *Maastricht Journal of European and Comparative Law*, 1998, 129 ff., at 143-5; SMITS J. (ed.), *The Contribution of Mixed Legal Systems to European Law*, Intersentia, Cambridge, 2001; OGUS A., Competition between national legal systems: a contribution to economic analysis to comparative law, *International & Comparative Law Quarterly*, 1999, 405 ff.

[59] See FAURE M., Economic Analysis of product liability, in MACHNIKOWSKI P., *European Product Liability. An analysis of the state of the art in the era of new technologies*, Insersentia, Cambridge, 2017, 636 ff.; WHITE F., (2017), *cit.*, 135 ff.; SHAVELL S., *An economic analysis of accident law*, Harvard University Press, Harvard, 1987, at 78-80; POLINSKY M., *An introduction to law and economics*, 5th edition, Wolters Kluwer, Alphen aan den Rijn, 2018, 95-97; COASE R.H., The problem of social cost, *Journal of law and economics*, 1960, 1 ff.

An alternative perspective may be of help: the bottom-up approach followed by academic groups looking for a European *ius commune* in tort law deserves attention [60]. Namely, it is worthwhile to mention that a number of studies have been conducted to identify common elements of tort laws among Member States with the aim to identify common principles [61]. Reference is made to the work of the Study Group on a European Civil Code [62] (Chair Prof. Von Bar) which has influenced the provisions of the Draft Common Frame of Reference [63] and the Research Group on EC Private Law (Acquis Group).

Also worth mentioning are the activities of the European Group of Tort Law ("EGTL"), which in 2005 presented the Principles of European Tort Law ("PETL") [64]. The PETL are not linked to any EU legislative attempt (it was started without an aim to define a Code [65]) nor they are financed by

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[60] See VAN GERVEN W., LAROUCHE P., LEVER J., *Tort Law: Casebooks for the Common Law of Europe (ius Commune Casebooks for the Common Law of Europe)*, Hart Publishing, Oxford, 2001.

[61] See CASTRONOVO C., (2018), *cit.*, 782 ff.; VON BAR C., *The common European law of torts*, Vol. one, Oxford University Press, Oxford, 2008; OLIPHANT K., STEININGER B. (eds.), *European tort law: basic text*, Jan Sramek Verlag, Vienna, 2011; VAN DAM C., (2013), *cit.*

[62] As for the Group introduction, see: https://max-eup2012.mpipriv.de/index.php/Study_Group_on_a_European_Civil_Code (last accessed March, 2022).

[63] See the Group on a European Civil code, and the Research group on EC private law (acquis Group), *Model rules of European private law. Draft Common Frame of Reference* (DCFR) Study, 2009, https://www.dsg.univr.it/documenti/OccorrenzaIns/matdid/ matdid 197976.pdf (last accessed March, 2022).

[64] See the EUROPEAN GROUP ON TORT LAW, *Principles of European tort law: text and commentary*, Springer, Cham, 2005; MARTÍN-CASALS M., The principles of European Tort Law (PETL) at the beginning of a second decade, in GILIKER P. (ed.), (2017), *cit.*, 363 ff.; KOCH B.A., *cit.*, 189 ff.; ALPA G., Principles of European tort law: a critical view from the outside, *European Business Law Review*, 2005, 957 ff.; SCHULTZ M., Disharmonization: a Swedish critique of the Principles of European Tort Law, *European Business Law Review*, 2007, 1305 ff.; KADNER-GRAZIANO T.M., Les "Principes du droit européen de la responsabilité délictuelle" (Principles of European Tort Law) – forces et faiblesses, in WINIGER B. (ed.), *La responsabilité civile européenne de demain. Projets de révision nationaux et principes européens/Eeuropäisches Haftungsrecht morgen. Nationale Revisionsentwürfe und europäische Haftungsprinzipien*, Schulthess and Bruylant, Geneva, 2008, 219 ff.

[65] See ZIMMERMANN R., *Principles of European Contract Law and Principles of European Tort Law: comparison and points of contact*, in KOZIOL H., STEININGER B. (eds.), *European Tort law*, de Grutyer, Berlin, 2019, 2 ff.; WAGNER G., The project of harmonizing European tort law, *Common Market Law Review*, 2005, 17 ff.

the EU. Instead, it aims to identify a common framework of tort law for Europe encapsulated in principles which are generally accepted among Member States. These principles whilst treated as soft law still have, or should have had, a strong impact on national legislation [66]. In other words, PETLs are the result of a process of soft-harmonization, involving the narrowing down of Member States legal systems.

The above approach could prove that a European level action is still needed, at least to narrow down the substantive tort law provisions of Member States [67]. However, this should necessarily follow the goal to reach harmonized conditions of competition within the internal market, without a binding code that reflects a "unique culture" (acceptance of law in principle could lead to divergence in practice) [68]. This would be a too far result, given the wide differences still existing between Member States civil and common law traditions [69].

## 4. *Conflict of laws provisions on non-contractual liability relating to AI-systems: the state-of-the-art at the domestic, international and EU level*

The paragraph above showed that, at the international and European level, a harmonized framework of substantive provisions on non-contractual liability is still absent. In addition, this field has inevitably never been

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[66] As for some reflex of the European principles on Member States national legislation, see: the Austrian Draft for the reform of the law of damages, GRISS G., KATHREIN H., KOZIOL E. (eds.), *Entwurf eines neuen österreichischen Schadenersatzrechts*, Springer, Vienna, 2006; the Romanian Civil Code, entered into force on 2011; the Slovakia Draft of the new Civil Code, 2015; new Spain statutory regime on how to assess personal injury resulting from road traffic accidents, was passed by the Spanish Parliament in 2015, and it reflects PETL's influence (see Spanish Supreme Court STS, 6.4.2016, RJ 2016, 75653). See MARTÍN-CASALS M., *cit.*, at 383.

[67] According to Spier and Haazen "nor is convergence or unification … of private law ever strictly speaking necessary if we favor convergence of European private law, we deem it simply desirable, perhaps highly desirable, but nothing more", SPIER J., HAAZEN O., The European Group on Tort Law ("Tilburg group") and European Principles of Tort Law, *Zeitschrift für European Privatrechts*, 1999, 477 ff.

[68] As for some readings on European culture see, *ex plurimis*, BELL J., English law and French law: not so different, *Current Legal Problems*, 1995, 63 ff.; WIEACKER F., Foundations of European legal culture, *American Journal of Comparative Law*, 1990, 1 ff.

[69] LEGRAND P., *cit.*, 44; ID., The impossibility of legal transplants, *Maastricht Journal of European and comparative law*, 1997, 111 ff.

the object of common practices with regards to international merchants and arbitrators (*lex mercatoria*) [70].

Given this, a coherent approach to non-contractual obligations with a transboundary nature will need to be found in other ways. Here, private international law would seem to play a pivotal role. In fact, conflict of laws issues arise when a case has relevant connections with two, or more, Member States whose substantive law is different.

Currently, the application of domestic private international law provision on non-contractual liability [71] has been superseded by the corresponding provisions enacted at both the international level and – since the EU has been endowed with competence for harmonizing private international law – the European level.

At the international level, the task of harmonizing private international law issues has been pursued within the Hague Conference of Private International Law which, since its constitution in 1983, has played the leading role in this field [72]. With regards to the choice of law on non-

[70] On the so called "new *lex mercatoria*" see, *ex plurimis*, BOSCHIERO N., La lex mercatoria nell'era della globalizzazione: considerazioni di diritto internazionale pubblico e privato*, Sociologia del diritto*, 2005, 75 ff.; MARRELLA F., *La nuova lex mercatoria – Principi UNIDROIT ed usi dei contratti del commercio internazionale, Trattato di diritto commerciale e di diritto pubblico dell'economia*, CEDAM, Padova, 2003; CARBONNEAU T., HUDSON A., *Lex mercatoria and arbitration: a discussion of the new law merchant*, Transnational Publishers, Inc., New York, 1990; GOLDAMN B., La lex mercatoria dans le contrats et l'arbitrage internationaux: réalités et perspectives, *Travaux du Comité français de droit international privé*, 1977-1979, 221 ff.; LAGARDE P., Approche critique de la lex mercatoria, in FOUCHARD P., KHAN PH., LYON-CAEN A. (eds.), *Le droit des relations économiques internationales: études offertes à Berthold Goldman*, Litec, Paris, 1982, 125 ff.

[71] As for an analysis of the italian choice of law on non-contractual obligations (art. 63 Italian Law no. 218/1995), see TONOLO S., Art. 63, in CONETTI G., TONOLO S., VISMARA F. (eds.), *Manuale di diritto internazionale privato*, Giappichelli, Torino, 2017, 338 ff.; MARONGIU BONAIUTI F., *cit.*, 119; DAVÌ A., *La responsabilità extracontrattuale*, UTET, Torino, 1997, 47 ff.; SARAVALLE A., Art. 63 in Legge 31 maggio 1995, n. 218, in BARIATTI S. (ed.), *Legge 31 maggio 1995 n. 218: riforma del sistema italiano di diritto internazionale privato: Commentario*, CEDAM, Padova, 1996,1451 ff.; BOSCHIERO N., (1995), *cit.*, 57 ff.

[72] The Conference has issued a number of "old-conventions" on various issues of private law. Its work then increased exponentially from 1955, when the Hague Conference was established as an I.O. As a result, the Hague Conference on private international law has 38 conventions and protocols providing for general grounds for jurisdiction, applicable law and the recognition and enforcement of foreign judgements on civil law. Currently the Hague Conference counts 88 States as parties, plus the European Community which became a member in 2007 (replaced and succeeded in 2009 by the European Union). Currently, the EU is a contracting party of Convention of 30 June 2005 on Choice of Court Agreements;

contractual obligations, the Hague Conference has not enacted a general convention on tort law; however, a few focuses on this specific issue. Reference is made to the Convention of the 4th of May 1971 on the law applicable to Traffic Accidents[73] and the Convention of the 2nd of October 1973 on the law applicable to product liability[74].

In parallel to the Hague systems providing for a number of choice-of-law conventions, there are the European sources of private international law.

When the European Community was constituted, European civil matters were dealt with at an intergovernmental level requiring cooperation among Member States[75]. The first legal text agreed was the 1968 Brussels Convention on Jurisdiction and the Enforcement of Judgements in Civil and Commercial Matters[76]. Later, in 1972, an ambitious project was launched pro-

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Convention of 23 November 2007on the International Recovery of Child support and other forms of family Maintenance, and Protocol of 23 November 2007 on the Law applicable to Maintenance Obligations. Recently, on 16 July 2021, the EU Commission issued a Proposal on the accession by the EU to the Hague Convention on the Recognition and enforcement of foreign Judgement in civil or commercial matters. As stated, the declaration is needed "in order to ensure that the achievement of the policy objectives of the Brussels I-Recast Regulation is not affected by the accession to the Convention" (see EU Commission Proposal for a Council Decision on the accession by the European Union to the Convention on the Recognition and enforcement of foreign Judgement in civil or commercial matters 19 July 2021 COM (2021) 388 final, 16 July 2021). As for some literature on the Hague Conference, see JOHN T., GULATI R., KÖHLER B., *The Elgar Companion to the Hague Conference on Private international law*, Edward Elgar, Cheltenham, 2020; VON OVERBECK A.E., La contribution de la Conférence de La Haye au développement du droit international privé, *RCADI*, 1992, 9-98; LIPSTEIN K., The Hague Conventions on Private, International, Public Law and Public Policy, *International and Comparative Law Quarterly*, 1959, 508 ff.

[73] As for the text, see https://assets.hcch.net/docs/abcf969d-bac2-4ad5-bf52-f1aabc0939ad.pdf (last accessed March, 2022).

[74] DURHAM B., Hague Convention on the law applicable to products Liability, *Georgia Journal of International and Comparative Law*, 1974, 178 ff.; SAUNDERS M.L., An innovative approach to international products liability: the work of the Hague Conference on Private International Law, *Law and Policy in International Business*, 1972, 187 ff. As fort the text, see https://www.hcch.net/en/instruments/conventions/full-text/?cid=84 (last accessed March, 2022).

[75] Art. 220 EC Treaty (currently replaced substantially by art. 19 TEU) states that: "the result of the international Conventions which bind the European territories of signatory countries, along with French overseas departments and French overseas territories, was to make available the legal option to cooperate on civil matters and to reach a "simplification of formalities governing the reciprocal recognition and enforcement of judgments […]", on this, see TESAURO G., *Manuale di diritto dell'Unione Europea*, CEDAM, Padova, 2012.

[76] See *supra* Introduction, note 7.

viding for an EC Draft of Convention on choice of law rules applicable to both contractual and non-contractual obligations (the *avant projet*)[77]. However, despite its (expected) broad application, the *avant projet* resulted in a framework of conflict of laws provisions only with regards to contractual obligations: the 1980 Rome Convention[78].

For some decades, the 1968 Brussels Convention[79] and the 1980 Rome Convention have reflected the European attempt to pursue a systematic approach within private international law; an approach aimed at providing for harmonized solutions with regards to both jurisdiction and the determination of the applicable law in a given field.

The European approach was changed radically with the entry into force of the Treaty of Amsterdam 1997. Among the new competences conferred upon the EU there is also a shared competence on judicial cooperation in civil matters (see art. 4 *lett.* j) TFEU). Namely, art. 81 TFEU (then art. 65 TEC) provides a list of measures on which the EU should focus to ensure judicial cooperation in civil matters. Measures within the field of private international law fit perfectly within this list. Specifically, art. 81 TFEU has become the legal basis on which European provisions on private international law are enacted, dependent on two conditions being met: that the

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[77] See EUROPEAN COMMISSION, Avant-projet de Convention sur la loi applicable aux obligations contractuelles et non-contractuelles, doc. n. XIC/398/72-F, Rev. 1, republished in *Rivista di diritto internazionale privato e processuale*, 1973, 189 ff.; see LANDO B., VON HOFFMANN O., SIEHR K. (eds.), *European Private International law of obligations: acts and documents of an international Colloquium on the European preliminary draft convention on the law applicable to contractual and non-contractual obligations, held* in Copenhagen on 29 and 30 April 1975, Mohr, Tubingen, 1976 ivi see also: FALLON M., *Les dispositions de l'Avant-projet C.E.E. relatives à la loi applicable aux obligations aquiliennes*, 87 ff.

[78] The Convention was meant to define a framework on choice of law provision to determine the law applicable to contractual obligations, which would work alongside the framework of the 1968 Brussels Convention. The 1980 Rome Convention *incipit* states that: "high contracting parties are anxious to continue in the field of private international law the work of unification of law which has already been done within the Community, in particular in the field of jurisdiction and enforcement of judgments", see EU Convention n. 80/934/EEC: Convention on the law applicable to contractual obligations opened for signature in Rome on 19 June 1980, Eur. Un. OJ L 266, 9.10.1980.

[79] See JENARD P., Relazione sulla Convenzione concernente la competenza giurisdizionale e l'esecuzione delle decisioni in materia civile e commerciale, Eur. Un. C 59, 5.5.1979; on this, see also POCAR F., *La convenzione di Bruxelles sulla giurisdizione e l'esecuzione delle sentenze*, Giuffrè, Milano, 1989; GOTHOT P., HOLLEAUX D., *La Convention de Bruxelles du 27 Septembre 1968*, L.D.J.G., Paris, 1984; WESER M., *Convention communautaire sur la compétence judiciaire et l'exécution des jugements*, Dalloz, Paris, 1975.

measure has "cross-border implications" (a condition which is inevitably present with private international law[80]), and that it is necessary (not obligatory[81]) to ensure "the proper functioning of the internal market" (this to be interpreted broadly to mean measures facilitating the movement of persons and goods)[82]. In addition, the measure must abide by the principles of subsidiarity and proportionality[83].

With regards to the extension of EU competence in private international law, attempts have been made to align this with both the internal[84] and external dimensions[85].

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[80] See FOIS P., La comunitarizzazione del diritto internazionale privato e processuale. Perplessità circa il carattere "definitivo" del trasferimento di competenze degli Stati membri della Comunità, in VENTURINI G., BARIATTI S. (eds.), *cit.*, 875 ff.; FALLON M., Les conflits de lois et de juridictions dans un espace économique intégré. L'expérience de la Communauté européenne, *RCADI*, 1995, 9 ff.

[81] Differently from art. 114 TFUE, the art. 81 TFUE does not require the existence of a mandatory link between the legal act enacted and the goal to reach the proper functioning of the internal market. See BERTOLI P., (2005), *cit.*, 80 ff.

[82] *Ibid*; see also ROSSI L.S., *Le Convenzioni tra gli Stati membri degli Stati membri dell'Unione europea*, Giuffrè, Milano, 2000, 242 ff.

[83] See art. 5.3 TEU and art. 8 Protocol n. 2. On the application of subsidiarity and proportionality principle, see SHAW K., *The Court of Justice of the European Union. Subsidiarity and Proportionality*, Brill Nijhoff, Leiden, 2018; BAST J., WETZ K., System of Competences, in KUIJPER P., AMTENBRINK F., CURTIN D. *et al.* (eds.), *The law of the European Union*, Wolters Kluwer, Alphen aan den Rijn, 2018; DE PASQUALE P., *Il principio di sussidiarietà nella Comunità europea*, Editoriale Scientifica, Napoli, 2000; ELLIS E. (ed.), *The principle of proportionality in the laws of Europe*, Oxford University Press, Oxford, 1999; STROZZI G., Il ruolo del principio di sussidiarietà nel futuro dell'integrazione europea: un'incognita e molte aspettative, *Rivista italiana di diritto pubblico comparato*, 1993, 59 ff.

[84] As for the internal dimension, by the time competence was conferred upon the EU the majority of academics agreed that, at the internal level "le pouvoirs législatifs de la Communauté en matière de droit international privé sont sans limite". Accordingly, the practice followed since then confirmed a broad interpretation and application of the EU competence, at least within its internal dimension. See FOIS P., *cit.*, in VENTURINI G., BARIATTI S. (eds.), at 880, *cit.*; *ivi* see also LUZZATO R., *Riflessioni sulla cd. comunitarizzazione del diritto internazionale privato*, 613 ff.; DE CESARI P., *Diritto internazionale privato e processuale comunitario*, Giappichelli, Torino, 2005.

[85] As for the external dimension, the question has interested both academics and the ECJ at length. The latter has, in a number of cases, stated its position regarding how broad the EU external competence on civil matter should have been. Precisely, the scope of EU external competence as regards judicial cooperation in civil matters, along with the conditions upon which the competence has been treated - or not - as exclusive, was raised when the EU was about to replace the Lugano Convention 1988 (see doc. No. 6683/99 and doc.

As a result, the EU legislator has defined a highly sophisticated system of uniform rules of private international law regulating a number of issues of private law [86]. And to pursue a systemic link between uniform grounds of jurisdiction and applicable law, the EU has focused on a wide spectrum of issues. Some, such as the rules on jurisdiction in civil and commercial matters, have already been object of "communitarization" [87] (international European Conventions previously in force being recast as European Regulations).

Amongst others, the "communitarization" process has raised issues of private law never dealt with before or upon which consensus between Member States had not yet been found, and which have, for the first time, become the object of a European Regulation.

As for the present book analysis, reference will be made exclusively to

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7871/00). The ECJ has issued a key decision in its opinion C-1/03 on the competence of the Community to conclude the new Lugano Convention on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters, rendered on the 7 February 2006, 2006:81, for a comment on the Opinion see: LAVRANOS N., Opinion 1/03 Lugano Convention, *Common Market law Review*, 2006, 1087 ff. To follow the debate raised in the aftermath of the ECJ opinion on Lugano Convention, see FRANZINA P., *The external dimension of EU private international law after opinion 1/13*, Intersentia, Cambridge, 2016. See also POCAR F. (ed.), *The External Competence of the European Union and Private International Law*, CEDAM, Padova, 2007; ROSSI L.S., *cit.*, 1012 ff.

[86] See TESAURO G., (2012), *cit.*, 13 ff.; POCAR F., BARUFFI M.C., *cit.*, at 455 and 587; BERTOLI P., (2005), *cit.*, 39 ff.; BARIATTI S., The Future «Communitarization» of the Choice of Law Rules on Non-Contractual Obligations (The «Rome I» Regulation), in MALATESTA A. (ed.), *The Unification of Choice of Law Rules on Torts and Other Non- Contractual Obligations in Europe*, CEDAM, Padova, 2006, 5 ff.

[87] See EU Regulation No. 2201/2003 concerning jurisdiction and the recognition and enforcement of judgments in matrimonial matters and the matters of parental responsibility, repealing Regulation (EC) No. 1347/2000, Eur. Un. OJ L 338, 23.12.2003; see also Regulation No. 1348/2000 on the service in the Member States of judicial and extrajudicial documents in civil or commercial matters, Eur. Un. OJ L 160, 30.6.2000 and Regulation 1346/2000 on insolvency proceedings Eur. Un. OJ L 160 30.6.2000, then repealed into Regulation (EU) 2015/848 of the European Parliament and of the Council of 20 May 2015 on insolvency proceedings, Eur. Un. OJ L 141, 5.6.2015; see Council Regulation (EC) No. 1206/2001 of 28 May 2001 on cooperation between the courts of the Member States in the taking of evidence in civil or commercial matters, Eur. Un. OJ L 174, 27.6.2001; Regulation (EC) No. 805/2004 of the European Parliament and of the Council of 21 April 2004 creating a European Enforcement Order for uncontested claims, Eur. Un. OJ L 143, 30.4.2004; to a general overview of regulations recasted or repealed in the aftermath of Treaty of Amsterdam, see BERTOLI P., (2005), *cit.*, 49-53. See also, VON HEIN J., KIENINGER E.M., RÜHL G. (eds.), *How European is European private international law. Sources, court practice, academic discourse*, Intersentia, Cambridge, 2019; FIORINI A., The evolution of European Private international law, *The International & Comparative Law Quarterly*, 2008, 969 ff.

the case for choice of law on non-contractual obligations, firstly dealt within the Regulation n. 864/2004, known as Rome II [88].

Within the above framework, the task of the EU Legislator is to ensure that the European uniform system of private international law remain applicable even to the "present need". Precisely, with regard to the EU provisions on jurisdiction and on choice of law on non-contractual obligations, the question is to understand whether they are adapt, or need to be adapted, to apply also in case of non-contractual liability linked to AI-systems.

## 5. *The heads of jurisdiction in the Brussels I-Recast Regulation and their application to non-contractual obligations relating to AI-systems*

Since the Treaty of Amsterdam, the "communitarization" of the private international law process has been increasingly speeding up. As for the process of "communitarization" of private international law rules on jurisdiction in civil and commercial matters, the 1968 Brussels Convention which uniformized at the EU level the head of jurisdiction, greatly inspired the Brussels I Regulation No. 444/2001, then recast as Brussels I-Recast Regulation No. 1215/2012 (together "the Brussels system" [89]).

As of today, the ECJ has had a number of chances to clarify the application of the convention before, and the regulations after. Few situations still remain open; among them, an open question concerns localizing the place(s) of damage(s) when the object at stake is "virtual" or "digital".

That said, the advent of AI-systems requires a closer scrutiny of the grounds of jurisdiction established within the EU. Reference is made to the general head of jurisdiction (art. 4) and the special rule on non-contractual liability (art. 7.2), enacted in Brussels I-Recast.

The question is whether the general and the special conflict of laws rules as interpreted by the ECJ and applied are too flexible thus favoring the damaged party, at the cost of discouraging innovation [90].

Precisely, as for the general head of jurisdiction, uncertainties arise in

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[88] See Rome II Regulation was enacted one year before the Rome I Regulation, however it is named Rome II because it came after the Rome Convention 1980, which pertained to accomplish the European aim proposed in the above mentioned *avant project*: to define a European harmonized framework of choices of law on the law applicable to both contractual and non-contractual obligations. For a general overview see *supra* note 8.

[89] As regards the label "Brussels System" see, SALERNO F., (2020), *cit*., at 3-4.

[90] For an in-depth analysis, see *infra* Ch. 5.

the case of cross-border AI-product liability, given the number of professionals involved in an AI-system production chain. Manufacturers, software developers, designers, importers, suppliers each play a specific role along the value chain in bringing a product from the manufacturing process to the market. Each of these individuals can be potentially hold liable either for damaging the product along the value and distribution chain; or of providing a defective component. Accordingly, the damaged party could potentially sue all individuals (allegedly) liable in front of their domicile court, as long as it is in an EU Member State.

That said, to avoid such proliferation of proceedings, which in turn means uncertainty of results in case of either consolidation or suspension because of *lis pendens*[91], the damaged party may deem more convenient raising the claim before the court determined *via* the special head of jurisdiction, when available.

In this regard, a question arises as regard art. 7.2 application in cases of civil liability linked to AI-systems, where the defendant is domiciled in a Member State.

Two main doubts arise.

Firstly, it is disputable whether and at which condition the "place of the event" will be interpreted according to the "ubiquity theory" as developed by the ECJ in *Mines de Potasse d'Alsace*[92]. As it will be shown, such approach risk either not to be applicable (when the activity is purely virtual); or to lead to solutions in contrast with the principle "*actor sequitur forum rei*"[93].

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[91] In case of parallel multi defendants' intra-Community, and intra- and extra-Community proceedings the rules on "consolidation" and *lis pendens* might apply. As for Brussels I-Recast reference is made to art. 8 and arts. 29-34, while as for the italian legal system reference is made to as art. 3.2 Law No. 218/1995 (Italian reform of the private international law system, 31 May 1995, Italian OJ 128, 3.6.1995). Correlatively, there might be also case of parallel proceedings started for both contractual liability (AI-system' seller *versus* the consumer) and civil liability (damaging party *versus* injured party). An in-depth and complete analysis of "consolidation", *lis pendens* and contractual and non-contractual claims would go beyond the focus of the present book. My perspective is in fact to ascertain whether, at a theoretical level, the rules on jurisdiction currently available in Brussels I-Recast might apply to civil liability claims linked to AI-systems only.

[92] See ECJ, *Mines de potasse*, *cit.*, § 13 ff.

[93] Brussels I-Recast recital 15 states that: "the rules of jurisdiction should be highly predictable and founded on the principle that jurisdiction is generally based on the defendant's domicile. Jurisdiction should always be available on this ground save in a few well-defined situations in which the subject-matter of the dispute or the autonomy of the parties warrants a different connecting factor". See SALERNO F., (2015), *cit.*, 16 ff.; MARONGIU BONAIUTI F., *cit.*, 24 ff. As for the case law, see ECJ, Judgment, 17 Jun 1992, C-

Second a question arises regarding how to tackle with the case of multiple damages, which are multi-localized in "virtual" and/or real places. Precisely, uncertainty concern whether the interpretative solution, meaning the "mosaic principle", provided for by the ECJ in *Shevill* decision [94] should be applied; or that provided for in the *eDate* decision [95]; or how the two should be combined (given that damages can occur simultaneously in virtual and real places).

As it will be shown, when a non-contractual obligation linked to a product is at stake, the multiplication of available *forum* – which is legitimized by the "mosaic principle"– significantly decreases foreseeability for producers or any other professionals involved in the product value chain [96]. However, Brussels I-Recast, alike Brussels I and 1968 Brussels Convention, mandates as a general principle that forum should be highly predictable.

That said, given that Brussels I-Recast, alike Brussels I and 1968 Brussels Convention, have so far not established a specific head of jurisdiction for product liability, the narrow interpretation of the "place of the event approach", as provided for in ECJ *Zuid Chemie* decision, should be the solution to prefer for the case when at stake there is an AI-system, irrespective of whether it is characterized as a "product" or not [97].

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26/91, *Handte*, 1992:268, § 14; ECJ, Judgment, 10 Jun 2004, C-168/02, *Kronhofer vs. Maier et al.*, 2004:364, § 12 ff.

[94] See ECJ, Judgment, 7 March 1995, C-68/93, *F. Shevill v. Presse Alliance*, 1995:61; MOSCONI F., CAMPIGLIO C., (2017), *cit.*, 86 ff.; CARBONE S.M., TUO C., *cit.*, 60 ff.; SALERNO F., (2015), *cit.*, 157 ff.; FRANZINA P., (2008), *cit.*, 995 ff. See *infra* Ch. 5.

[95] See ECJ, Judgment, 25 October 2011, *e-Date Advertising GmbH v. X. Martinez v. MGN Ltd*, C-509/09, 2011:685; see also the opinion delivered by AG P. Cruz Vilalón on the 29 March 2011, 2011:192. As for the literature, see DE MIGUEL ASENSIO P., *Conflict of laws and the internet*, Edward Elgar, Cheltenam, 2020; LUTZI T., Internet cases in EU private international law – Developing a coherent approach, *International Comparative & Law Quarterly*, 2017, 687 ff.; LIPTON J., *Rethinking Cyberlaw (a new vision for internet law)*, Edward Elgar, Cheltenam, 2015; FERACI O., Diffamazione internazionale a mezzo di internet: quale foro competente? Alcune considerazioni sulla sentenza eDate, *Rivista di diritto internazionale*, 2012, 461 ff.; EDARDS L., WAELDE C. (eds.), *Law and the Internet*, Hart Publishing, Oxford, 2009. See *infra* Ch. 5.

[96] *Contra*, Brussels I-Recast recital 16 requires that: "[…] in addition to the defendant's domicile, […] the existence of a close connection should ensure legal certainty and avoid the possibility of the defendant being sued in a court of a Member State which he could not reasonably have foreseen. This is important, particularly in disputes concerning non-contractual obligations arising out of violations of privacy and rights relating to personality, including defamation".

[97] ECJ, Judgment, 16 July 2009, *Zuid Chemie*, C-189/09, 2009:475.

Said so, the legal challenge ahead thus requires a two-step analysis.

Firstly, it has to be understood whether the provisions enacted within the Brussels I-Recast Regulation are to be adapted to locate the jurisdiction in the case a non-contractual obligation linked to the AI product's development and use arise. Here, the reasoning followed by the ECJ when asked to clarify the extension of the conflict of laws rules on jurisdiction provided for non-contractual obligations in 1968 Brussels Convention first, and Brussels Regulation I and I-Recast, represents an essential tool [98].

Secondly, it has to be ascertained whether the now under negotiation EP Resolution on civil liability for artificial intelligence should provide for an *ad hoc* head of jurisdiction. If this would be the case, the new connecting factor would prevail over those enacted in Brussels I-Recast [99]. As for now, the said Resolution provides only for art. 2.1 whose nature is still debated [100]: actually, it could be characterized either as a new special choice of law or as a (factual) criteria of territorial application [101].

Given this framework, according to this book's perspective there is an urgency to understand whether it would be enough to narrow down the interpretation of the head of jurisdiction already available in Brussels I-

[98] See *infra* Ch. 5.

[99] Art. 67 Brussels I-Recast states that: "this Regulation shall not prejudice the application of provisions governing jurisdiction and the recognition and enforcement of judgments in specific matters which are contained in instruments of the Union or in national legislation harmonised pursuant to such instruments. This while ensuring the consistency *ex plurimis* the provisions: general and special". See TUO C., CARPANETO L., DOMINELLI S., (eds.), *Brussels I bis Regulation and special rules. Opportunities to enhance judicial cooperation*, Aracne, Cagliari, 2021; LANGER W., SAUTER J., The consistency requirement in EU Law, *Journal of European Law*, 2017-2018, 40 ff.; SALERNO F., (2015), *cit.*, at 96-97; HERLIN-KARNELL E., KONSTADINIDES T., The rise and expressions of consistency in EU law: legal and strategic implications for European integration, *Cambridge Yearbook of European Legal Studies*, 2013, 139 ff.

[100] Art. 2.1 EP Resolution states that: "the regulation applies on the territory of the Union where a physical or virtual activity, device or process driven by an AI-system has caused harm or damage to the life, health, physical integrity of a natural personal, to the property of a natural or legal person or has cause significant immaterial harm resulting in a verifiable economic loss".

[101] As for a preliminary understanding of the provision, see BRITISH INSTITUTE OF INTERNATIONAL AND COMPARATIVE LAW, Study on the Rome II Regulation (EC) 864/2007 on the law applicable to non-contractual obligations, JUST/2019/JCOO_FW_CIVI_0167, October, 2021. On criteria of applicability, see BENEDETTELLI M., Connecting factors, principles of coordination between conflict systems, criteria of applicability: three different notions for a "European Community private international law", *Diritto dell'Unione europea*, 2005, 421 ff., at 425.

Recast. Or whether, and where, a special connecting factor in case of non-contractual obligation linked to AI-systems arise is truly required [102].

## 6. *The methodological approach adopted by the Rome II Regulation and its relevance for AI-systems*

By the time Rome II Regulation was negotiated, each Member State had its own choice of law provision determining the law applicable to non-contractual obligations [103]; however, solutions provided at domestic level were various along with the results they lead to. The practice of forum shopping was then a concrete risk, which could have negatively impacted on the correct functioning of the internal market [104].

This said, each solution issued at the national level reflected Member States' legal traditions [105]. Aware of the numerous legal traditions it would have had to struggle with, the EU legislator had to make some preliminary choices with regards to the choice of law method to follow within Rome II. The solution taken should have represented a compromise among Member States' law traditions.

The comprehension of the methodological approach of private international law followed within Rome II helps an understanding of whether or not the solutions provided for are options that are still available for the present need. This latter is, from this book's perspective, highly important as the current rate of technological improvement is overwhelming. The problem is whether, in the case where a non-contractual obligation is linked to the development or use of a new technological tool (such as an AI-system), legislation already in force – such as Rome II – represents an available option, or whether new ones, as the one (allegedly) enacted in art. 2.1 EP Resolution, are needed [106].

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[102] See *infra* Ch. 4.

[103] According to some part of the academics, non-contractual liability: "est de loin la partie des obligations non contractuelles la plus significative en pratique. Elle a aussi été la plus complexe et la plus controversé", see KADNER-GRAZIANO T.M., (2004), *cit*., 98.

[104] See FAWECETT J.J., Products liability in Private international law: a European perspective, *RCADI*, 1993, at 96 ff.

[105] See, *a.a.*, the French court of Cassation excluded to link the non-contractual obligation to a law different from that of *locus damni* (critère de rattachement). See AUDIT B., *Droit international privé*, L.G.D.J., Paris, 2018, 798 ff. *Contra*, see the flexible solution provided for in art. 62 Italian law of private international law, L. 218/1995, BOSCHIERO N., (1996), 42 ff.

[106] See *infra* in this §, and Ch. 2, § 7.

To reach an answer, two issues need to be tackled with: firstly, it has to be scrutinized whether the solution enacted within Rome II are flexible enough to guarantee balanced solution between parties, no matter of the object at stake; secondly, a question arises with regard to the importance accorded upon the so-said "material considerations" (also known as the "interest analysis" approach) [107].

As to the former, it is of interest to examine whether and how within Rome II the EU legislator has tackled the never-ending struggle between foreseeable and flexible choices of law solutions [108]. In this regard, Rome II recital 6 makes it clear that to improve: "the predictability of the outcome of litigation and certainty of the applicable law […]" [109], uniform choice of law solutions among Member States are needed. Accordingly, the EU legislator has attempted to find solutions aimed at balancing certainty of law (foreseeability) along with the need to administer concrete justice according to the case at stake (flexibility) [110].

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[107] See PICONE P., (1999), *cit.*; SYMEONIDES S., The judicial acceptance of the second conflicts Restatement: a mixed blessing, *Maryland Law Review*, 1997; PATOCCHI P.M., *Règles de rattachement localisatrices et règles de rattachement à caractère substantiel*, Études Suisses de droit international, 1985, 201 ff.; CURRIE B., *Selected Essays on the Conflict of Laws*, Duke University Press, Durham, 1963. As for an in-depth analysis, see *infra* Ch. 3, § 3.

[108] For a general understanding of the issue, see *ex plurimis*: SYMEONIDES S., Private international law at the end of the 20th century : progress or regress? : XV$^{th}$ International Congress of Comparative Law, Kluwer Law International, The Hague, 2000.; DAVÌ A., *cit.*, at 99; HAY P., Flexibility versus Predictability and uniformity in choice of law. Reflections on current European and United States conflicts law, *RCADI*, 1990; HANOTIAU B., *Le droit international privé américain (du premier au second Restatement of the Law, Conflicts of laws)*, L.G.D.J., Paris-Bruxells, 1979; VITTA E., (1979), *cit.*, 163 ff. Precisely, on the "flexible approach" of private international law solutions see, *ex plurimis*, VITTA E., In tema di riforma del diritto internazionale privato, *Il foro italiano*, 1986, 20 ff.; ID., The impact in Europe of the American conflict revolution, *American Journal of comparative law*, 1982, 1 ff.; AUDIT B., Le caractère fonctionnel de la règle de conflit (Sur la «crise» des conflits de lois), *RCADI*, 1984, 219 ff.; KAHN-FREUND O., General problems of private international law, *RCADI*, 1974, 406.

[109] See Rome II recital 15 (*supra* note 106) and, also on legal certainty see recital 31 stating that: "to respect the principle of party autonomy and to enhance legal certainty, the parties should be allowed to make a choice as to the law applicable to a non-contractual obligation".

[110] Recital 14 Rome II states that: "this set of rules thus creates a flexible framework of conflict-of-law rules. Equally, it enables the court seized to treat individual cases in an appropriate manner". See KAHN-FREUND O., *General problems of private international law*, Brill, Leiden, 1980, at 76, (introducing the need of gradual softening of private international law concepts, along with the search to balance certainty and equilibrium).

The search for such balance is reflected in Rome II framework: it provides in art. 4.1 a main connecting factor (foreseeability [111]) whose application is softened (flexibility) by special connecting factors (arts. 5-12 [112]) and by so-said "escaping-rules" (art. 4.2 and art. 4.3).

As for the main connecting factor, the EU legislator has opted for the traditional localizing principle. Such prevalence represents a neutral choice of law solution for all parties where a non-contractual obligation is at stake [113]. In principle, it does not favor any party while, at the same time, it considers the interests of the State where a relevant damage has occurred [114]. However, the treatment granted upon parties might change according to what is prescribed by the substantive law determined as the applicable law. Consequently, an exclusive and rigid application of the *lex loci damni* criteria is not always the best available option.

Aware of this, as seen the EU legislator has introduced some (formal) flexibility, through two solutions.

Firstly, the EU legislator has enacted the special connecting factors. These latter are framed according to the case they are meant to solve (being it: product liability (art. 5), environmental damage (art. 7), and so), where the general rule enacted in art. 4.1 is thought not to ensure a correct

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[111] As made clear foreseeability is the methodological approach already followed in a number of other European private international law provisions. Interestingly to note, after the US "Conflicts' of law revolution", EU Member States have slowly moved from certainty to flexibility without undertaking drastic changes, see SYMEONIDES S., (2000), *cit.*, 34 ff. As for the search of foreseeability in conflict rules on jurisdiction, see PONTIER J., BURG E., EU Principles on Jurisdiction and Recognition and Enforcement in Civil and Commercial Matters, *RCADI*, 2004, 92 ff. As for case law, see ECJ, Judgment, 2 May 2006, *Eurofood*, C-341/04, 2006:281, § 33 (that definition shows that the center of main interests must be identified by reference to criteria that are both objective and ascertainable by third parties. That objectivity and that possibility of ascertainment by third parties is necessary in order to ensure legal certainty and foreseeability concerning the determination of the court with jurisdiction to open main insolvency proceedings […] focusing on EU Reg. 1346/2000/CE).

[112] MARONGIU BONAIUTI F., (2013), *cit.*, 120 ff.

[113] See *infra* Ch. 6, § 1.

[114] Interestingly to note, the Netherlands Staatscommissie has qualified the lex loci commissi delicti rule as a "natural" choice of law solution to be applied to the extra contractual liability ("de 'naturlijke' conflictregel voor onrechtmatige daden", therefore "met de mogelijkheid van uitzonderingen daarop"). See KADNER-GRAZIANO T.M., Le nouveau droit international privé Communautaire en matière de responsabilité extracontractuelle, *Revue critique de droit international privé*, 2008, 445 ff., at 457.

balance between the different interests at stake [115].

Secondly, the so-said flexibility of the solution provided for in Rome II seems to be reflected in the way through which the choice of law can be applied in practice. In fact, Rome II provides for an "escaping rule" which is meant to soften the rigid application of the general criteria. Namely, the "escaping rule" allows the seized court not to apply the law that should potentially be applicable, whenever a close scrutiny of the case reveals that there is a more convenient available solution [116]. Reference is made to art. 4.3, the "safeguard clause" [117], and to art. 4.2 which introduces a concurrent choice of law (*lex domicilii communis partium*) [118].

In sum, it seems that Rome II entails a balanced combination of foreseeable and flexible choice of law solution. In practice, the criteria enacted within the choice of law rule, both general (art. 4.1, 4.2 and 4.3) and special (arts. 5-12), offer the claimant a number of alternatives while preserving foreseeability [119].

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[115] See Rome II recital 19 states that "specific rules should be laid down for special torts/delicts where the general rule does not allow a reasonable bal- ance to be struck between the interests at stake".

[116] See SYMEONIDES, (2000), *cit.*, at 31; see also HAY P., (2007), *cit.*; *Contra*, some academics states that the escape rules provided for in art. 4.2. and 4.3 do not seem sufficient to truly reach an equilibrium between the certainty/foreseeability and flexibility. Precisely, according to Prof. Franzina, the equilibrium allegedly reached within Rome II is only formal: the general connecting factor enacted in art. 4.1 is rigid and it opens to the proper law only being the circumstances provided for in art. 4.3 Rome II; however, this latter application is strictly dependent on subjective and objective criteria, leaving aside "material considerations". See FRANZINA P., (2008), *cit.*, 978 ff.

[117] See Rome II recital 18. As for the academics, see *ex plurimis*, LEANDRO A., Articolo 4 – la legge applicabile in mancanza di scelta, in SALERNO F., FRANZINA P. (eds.), *Regolamento CE n. 593/2008 del Parlamento europeo e del Consiglio del 17 giugno 2008 sulla legge applicabile alle obbligazioni contrattuali («Roma I»)*, *Le nuove leggi civili commentate*, CEDAM, Padova, 2009, 637 ff.; GAUDEMET-TALLON H., (2005), *cit.*, 327 ff.; PICONE P., (1999), *cit.*, at 233-241, 249, 253 ff.; KOKKINI-IATRIDOU D., *Les clauses d'exception en matière de conflits de lois et de conflits de juridiction – ou le principe de proximité*, Dodrecth, Boston, 1994; LAGARDE P., (1986), *cit.*; DUBLER C., *Les clauses d'exception en droit international privé*, Librairie de l'Université, Georg Editeur, Geneve, 1983.

[118] See DORNIS T.W., When in Rome, do as the Romans do? A defense of the *lex loci domicilii communis* in Rome II Regulation, *European Legal Forum*, 2007, 152 ff.

[119] Such variety of solutions comes as no surprise and abides by the goal the EU legislator had in mind since the Regulation negotiation: it refers back to the aim made public by the Commission, with the publication of its relationship to Rome II. According to EC Proposal, § 2.1 the general purpose of Rome II Regulation is to improve the foreseeability

This said, and assuming that in Rome II foreseeable and flexible solutions are balanced, one last point remains, to complete this first analysis of the methodological approach followed by the EU legislator. Namely, one might question whether, and to what extent, Rome II solutions allow the seized court to introduce also "material considerations" in its reasoning while considering the applicable law [120].

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of solutions regarding applicable law. Namely: "[…] this proposal allows the parties to confine themselves to studying a single set of conflict rules, thus reducing the cost of litigation and boosting the foreseeability of solutions and certainty as to the law". According to the Commission the determination of a harmonized and foreseeable framework of choice of law provisions is suitable to state with "reasonable certainty" the law applicable. See EC, Proposal for a Regulation of the European Parliament and the Council on the law applicable to non-contractual obligations ("ROME II"), COM(2003) 427 final, 22.7.2003, 4 ff. See also European Council doc. n. 10812/05, 13 July 2005, at 2. The by that time Italian foreign minister, Mr. Frattini, highlighted that "even if Regulation Rome II was conferring upon Court a certain discretionarily, this should be deemed 'limited' and to not compromise the objective of law certitude".

[120] "Material considerations" reminds the approach proposed by Aristotle in the Nicomachean Ethics; point V. x 4-7 states that: "the law always speak in general terms, yet in many cases it is impossible to speak in terms that are both general and correct at the same time […] when the law pronounces a general rule and thereafter a case arises that is not covered by the general rule, then it is proper, where the legislators' pronouncement is defective because of its over simplicity, to rectify the defect by deciding in the same way as the legislator would have decided". As for the U.S. academics who firstly forged the "material considerations" approach see, *ex plurimis*, SYMEONIDES S., The American choice of law revolution in the courts: today and tomorrow, *RCADI*, 2002, 9 ff.; NORTH P.M., Reform, but not revolution. General course on private international law, *RCADI*, 1990, 9 ff.; CAVERS D.F., Contemporary Conflicts Law in American Perspective, *RCADI*, 1970 75 ff.; ID., A Critique of the Choice-of-Law Problem, *Harvard Law Review*, 1933-1934, 173 ff., reprinted in PICONE P.,WENGLER W., Internationales Privatrecht, Darmstadt, 1974, 125 ff.; LEFLAR R.A., Choice-Influencing Consideration in Conflict Laws, *New York University Law Review*, 1966, 267 ff.; EHRENZWEIG A.A., A Proper Law in a Proper Forum: A Restatement of the *Lex Fori* Approach, *Oklahoma Law Review*, 1965, 340 ff.; ID., *Private International Law: General Part*, Leyde, Dobbs Ferry, 1967; CURRIE B., *Selected Essays on the Conflict of Laws*, Duke University Press, Durham, 1963, *cit*.; REESE W.L.M., Conflict of Laws and the Restatement Second, *Law and Contemporary Problem*s, 1963, 679 ff. As for the italian academics, see *ex plurimis*, PICONE P., *Ordinamento competente e diritto internazionale privato*, CEDAM, Padova, 1986; ID., (1999), *cit*., 84-112, 241-253, study reprinted in PICONE P., *La riforma del diritto internazionale privato*, CEDAM, Padova, 1998; *ivi*, ID., Le norme di conflitto alternative in materia di filiazione (e il metodo materiale dei conflitti di leggi), 303-379; ID., La teoria generale del diritto internazionale privato nella legge italiana di riforma della materia, *Rivista di diritto internazionale*, 1996, 289 ff.; see also, DAVÌ A., *cit.*, 556 ff., later reprinted in GAJA G. (ed.), *La Riforma del diritto internazionale privato e processuale. Raccolta in ricordo di Edoardo Vitta*, Giuffrè, Milano, 1994, 45 ff.; BOSCHIERO N., (2004), *cit.*, 360 ff.; ID., (1999), 68 ff.

Recital 16 Rome II clearly states that the Regulation pursues the aim: "to ensure a reasonable balance between the interests of the person claimed to be liable and the person who has sustained the damage".

To reach the said "reasonable balance", the EU legislator has followed two paths. Firstly, "material considerations" can "modify" the traditional result pursued by the rigid localizing criteria enacted in art. 4.1 through the above referred "corrective tool" provided for in art. 4.3 [121]. This latter is thus an element of flexibility which also introduce "material considerations". Also, "material considerations" might interfere with the proper functioning of the connecting factors: the seized court in fact might introduce "material considerations" through mechanisms such as overriding mandatory provisions and/or public policy exceptions (see art. 16 et art. 26).

Secondly, the seized court might apply one of the special connecting factors framed for certain categories of torts/delicts. These latter are intended not only to introduce the above referred flexibility but, also, to ensure that the applicable law is the one more convenient to the damaged

[121] In general, on the role of mandatory rules and their (allegedly) push back toward the unilateral method of choice of law, see: FRANCESCAKIS P., Lois d'application immédiate et règles de conflit, *Rivista di diritto internazionale privato e processuale*, 1967, 691 ff.; ID., Quelques précisions sur le lois d'application immédiate et leurs rapports avec les regels de conflit de lois, *Revue critique du droit international privé*, 1966, 1 ff.; ID., *Le théorie du renvoie et le conflits de system en droit international privé*, Memoire, Université de Paris, 1958. As for the academics on art. 16 Rome II, see FRANZINA P., (2008), *cit.*, 1040 ff.; BERTOLI P., (2005), *cit.*, 451 ff.; BOSCHIERO N., I limiti al principio di autonomia posti dalle norme generali del Regolamento Roma I: considerazioni sulla "conflict involution" europea in materia contrattuale, in BOSCHIERO N. (ed.), La nuova disciplina comunitaria della legge applicabile ai contratti, Giappichelli, Torino, 2009, 82 ff.; BONOMI A., *Le norme imperative nel diritto internazionale privato*, Schulthess, Zürich, 1998; BIAGIONI A., L'ordine pubblico e le norme di applicazione necessaria nella proposta di regolamento Roma I, in FRANZINA P. (ed.), *La legge applicabile ai contratti nella Proposta di Regolamento "Roma I"*, CEDAM, Padova, 2006, 96 ff. As for the case law, see ECJ, Judgment, 9 November 2000, C-381/98, *Ingmar GB ltd and Eaton Leonard technologies INC*, 2000:605; ECJ, Judgment, 23 November 1999, C-369/96 and C-376/96, *Arbalde*, 1999:575, § 30. As for art. 26 Rome II, see BOSCHIERO N., *L'ordine pubblico processuale comunitario ed europeo*, in DE CESARI P., FRIGESSI DI RATTALMA M. (eds.), *La tutela transnazionale del credito*, Giappichelli, Torino, 2007, 163 ff.; PATAUT E., Lois de police et ordre juridique Communautaire, in FUCHS A., MUIR WATT H., PATAUT E. (eds.), *Les conflits de lois et le système juridique communautaire*, Dalloz, Paris, 2004, 117 ff.; FERACI O., *Ordine pubblico nel diritto dell'Unione europea*, Giuffrè, Milano, 1999; BUCHER A., L'ordre public et le but social des lois en droit international privé, *RCADI*, 1993, 9 ff.; EEK H., Peremptory norms and private international law, *RCADI*, 1973. As for case law, see ECJ, 28 March 2000, C-7/98, *Krombach*, 2000:164, § 18 ff.; ECJ, Judgment, 1 Jun 1999, C-126/97, *Eco Swiss China Time*, 1999:269. For an in-depth analysis, see *infra* Ch. 5, § 8, note 68 and 69.

party [122]. This is meant to guarantee a balanced solution whenever, according to the legislator, the general localizing connecting factor would have not (see art. 5 [123] and 7 Rome II) [124].

According to some academics, overall "material considerations" do have an insufficient impact on the result effectively reached by connecting factors [125].

We disagree with that.

The risk we see is a slightly different one. It seems that "material considerations" have an impact only at the abstract level; they have led the legislator to frame special connecting factors, truly aimed at protecting substantial specific interests (*i.e.* art. 5) [126]. However, these special connecting factors, as the main connecting factor enacted in art. 4.1, are all linked to a "localizing *criteria*". As such, "material considerations" rarely have an autonomous stand when the seized court is about to determine the applicable law (they might have more chance to play an autonomous role when applied as public policy exception). In practice, it is true that a seized court can take into consideration the practical result the choice of law is meant to produce (say the "material considerations" pursued by special connecting factors); however, it cannot modify the result (the law applicable) determined by the connecting factor applied by the court. This not even to protect substantial interest of the damaged party. Accordingly, the traditional "localizing methodological approach" remains safe.

For this reason, we agree with the conclusion according to which the choices of law solutions provided for in Rome II are not too "victim oriented" [127]. In favoring such "distance", the EU legislator has adopted a solution

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[122] See MUIR WATT H., Rome II et les "intérêts gouvernementaux": pour une lecture fonctionnaliste du nouveau règlement du conflit de lois en matière délictuelle, in CORNELOUP S., JOUBERT N., (eds.), *cit.*, 128 ff.

[123] See *infra* Ch. 6, § 6.

[124] On the struggle between the localizing principle and the proper law principle see, *ex plurimis*, GONZÁLES CAMPO J., Diversification, spécialisation, flexibilisation et matérialisation des règles de droit international privé, *RCADI*, 2000, 309 ff.; LOUSSOUARN Y., BOUREL P., DE VEREILLES-SOMMIÈRES P., *cit.*, 226 ff. As for the doctrine on the proper law, see MORRIS J.H., The proper law of a tort, *Harvard Law Review*, 1951, 885 ff.

[125] See WEINTRAUB R., Rome II and the tension between predictability and flexibility, *Rivista di diritto internazionale privato e processuale*, 2005, 561 ff.

[126] See, FRANZINA P., (2009), *cit.*, 979.

[127] *Ibid.*, at 980. As for the Regulation itself, the EU legislator justifies a policy approach not too victim oriented in recital 15 according to which: "the principle of the *lex*

different from that embraced within (some) Member States national law system [128].

The above examination of the Rome II methodological approach aims to be useful for the arguments which will be developed in the next Chapters.

In fact, the current state-of-the-art on choice of law on non-contractual obligations has reached a point where it seems to cover all present and future damages linked to a tort/delict based on product strict liability. However, the rate of current technological development is going at an impressive speed and doubts arise with regards to the impact it will have, and has been having, on the European normative framework.

Accordingly, the *fil-rouge* of the next Chapters will be to ascertain whether European uniform choice of law provisions represent the optimal solution when a non-contractual obligation with a cross-border nature has a relevant link with a tort/delict committed by/with or because of a new tool – such as an AI-system. As such, the issues to be dealt with won't be simply (or only) whether the European Rome II framework is adaptable but also, even if it will be adapted, whether it represents the preferred option. The doubt arises because the EU legislator has already framed art. 2.1 of the EP Resolution [129]. Its interpretation and application are not clear yet; however, if it will be agreed that art. 2.1 EP Resolution – as currently framed or as it will be amended in next legislative round – entails a new choice of law provision, then it will prevail over those enacted within Rome II [130]. This requires a deep scrutiny of the present and future solutions following a *de lege lata* and *de lege ferenda* approach.

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*loci delicti commissi* is the basic solution for non-contractual obligations in virtually all the Member States, but the practical application of the principle where the component factors of the case are spread over several countries varies. This situation engenders uncertainty as to the law applicable". See also, *ex plurimis*, CALVO CARAVAZA J., CARRASCOSA GONZÁLES A., *Las obligaciones extracontractuales*, Ed. Comares, Granada, 2008; POCAR F., Le lieu du fait illicite dans les conflits de lois et de juridictions, *Travaux du Comité française*, 1985-1986, 75 ff.

[128] For instance, art. 62 of the Italian law on private international law, n. 218/1995 reflects an approach favoring the damaged party. Namely, art. 62 confers upon the victim the choice to opt either for the *lex loci damni* or for law of the place of conduct. See BOSCHIERO N., (1996), *cit.*; SARAVALLE A., *Responsabilità del produttore e diritto internazionale privato*, CEDAM, Padova, 1991.

[129] See *infra* Ch. 2, § 7.

[130] Art. 27 Rome II states that: "this Regulation shall not prejudice the application of provisions of Community law which, in relation to particular matters, lay down conflict-of-law rules relating to non-contractual obligations". See FRANZINA P., (2008), 977 ff.