The Rise of Self-Driving Cars: Is the Private International Law Framework for non-contractual obligations posing a bump in the road?

by Jan De Bruyne and Dr. Cedric Vanleenhove

Abstract

The contribution by Jan De Bruyne[1] and Dr. Cedric Vanleenhove[2] focusses on some implications related to the commercialisation of self-driving or autonomous cars. Such vehicles are no longer a mere futuristic idea. They could soon be available on the market. Society in general and the applicable rules in particular will undergo a transformation following the introduction of autonomous vehicles. Despite the many benefits, self-driving cars also pose several challenges. These do not only relate to technical aspects but also to the influence of the autonomisation of traffic on infrastructure and employment in different sectors. More importantly, several legal challenges will need to be addressed as well before society will be able to fully enjoy the benefits of self-driving cars. The question as to who should be held liable for damage caused by self-driving car has already been addressed in academia. Less attention has been devoted to the relationship between autonomous vehicles and the existing private international law rules in the European Union. Although the application of the current jurisdictional and conflict of laws rules does not present problems, the membership of some EU Member States of the 1971 Hague Traffic Accidents Convention and/or the 1973 Hague Products Liability Convention impedes the harmonisation of conflict of laws rules in non-contractual matters as envisaged by the Rome II Regulation. In cases concerning liability arising from traffic accidents and in product liability cases, different Member States courts sometimes apply a different national law. This reduces foreseeability and legal certainty.

I.   Introduction

Self-driving or autonomous vehicles are no longer a mere futuristic idea. According to recent predictions, fully autonomous vehicles could already be available within five to twenty years.[3] Today, technology has already partly taken over some of the user's tasks in controlling the vehicle.[4] Examples thereof are adaptive cruise control, lane keeping assistance and automatic parking systems. This technology will ultimately be developed to the point at which vehicles are able to take persons from one place to another without any human interference.[5]

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[3] Anderson, J.M., Kalra, N., Stanley, K.D., Sorensen, P., Samaras, C., Oluwatola, O.A. (2016), *Autonomous Vehicle Technology – A Guide for Policymakers*, California, RAND, p. 4.

[4] We use the notion of 'driver' only when it has legal consequences. This is the case with regard to certain provisions included in legislation addressing the 'driver' of the vehicle. Elsewhere, we use the term 'user', without envisaging a legal delineation.

[5] See for an overview of the technology used in autonomous vehicles: Anderson, J.M., Kalra, N., Stanley, K.D., Sorensen, P., Samaras, C., Oluwatola, O.A. (2016), *Autonomous Vehicle Technology – A Guide for Policymakers*, California, RAND, pp. 55-

Society in general and the existing legal rules in particular will undergo a huge transformation with the rise of autonomous vehicles. It is, therefore, not surprising that several aspects related to self-driving cars and artificial intelligence are increasingly being studied in academia[6] and addressed by policymakers.[7] This contribution focusses on one of these aspects, namely issues of private international law that relate to the commercialisation and use of autonomous vehicles. After a brief discussion on the working of self-driving cars (part II) and their impact on society (part III), we will focus on the question to which extent existing private international law rules in the European Union (EU) are compatible with self-driving cars. Such an exercise is relevant considering that the use of autonomous vehicles might result in cross border issues (part IV). We conclude with summarising the main findings of this study (part V).

II.   The Working of an Autonomous Vehicle or a Self-Driving Car

There are five stages in the course of operating a non-autonomous vehicle. During the first stage, the user of a vehicle needs to define his location. This allows him to choose a route. The user gathers data from his surroundings through sensory perception in a second stage. The third stage relates to the interpretation of this data. More specifically, the user will transform the collected data into useful information. The user subsequently takes a decision in the fourth stage. He could, for instance, decide to adapt his speed or his direction. The fifth stage consists of the actual execution of the decision.[8]

During each of these five stages, the user can be assisted or even replaced by technology. A self-driving car localises itself by using Light Detection and Ranging (Lidar), a Global Positioning System (GPS) and digital maps. Lidar identifies objects in the surroundings by using laser beams. The combination of this information together with data provided by the GPS and/or programmed digital maps allows a self-driving car to precisely determine its position (cf. first stage).[9] To perceive its surrounding, an autonomous vehicle uses different kinds of sensors such as cameras, Radio Detection and Ranging (Radar), Lidar, infrared cameras and ultrasonic sensors.[10] One or more Lidar sensors are placed on top of the vehicle and provide a 360-degree view around the vehicle. This way, Lidar makes it possible to detect the position and movement of objects in the surroundings of the car.[11] Radar uses radio waves to detect objects. It has a greater reach than Lidar and is better at evaluating the speed of moving objects. However, Radar is less precise in localising objects.[12] Cameras in turn are useful as they can recognise colours. This makes it possible to transmit important information regarding traffic lights and signs.[13] Based on these sensors and programmed digital

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74; Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 129-150.

[6] The many studies used and referred to in this contribution will make this clear. In the context of liability for damage caused by self-driving cars in Belgium, for instance, reference can be made to: Tanghe, J, De Bruyne, J. (2017), Software aan het stuur – Aansprakelijkheid voor schade veroorzaakt door autonome motorrijtuigen, Vansweevelt, T., Weyts, B. (Eds.), *Nieuwe risico's in het verzekeringsrecht - ALLIC III*, Antwerpen, Intersentia, forthcoming; Tanghe, J., De Bruyne, J. (2017), Aansprakelijkheid voor schade veroorzaakt door autonome motorrijtuigen, *Rechtskundig Weekblad*, Vol. 80, pp. 963-986; Tanghe, J., De Bruyne, J. (2017), Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective, *Journal of European Tort Law*, forthcoming.

[7] Reference can be made to the working of the EU High Level Group GEAR 2030. The Group debates the main challenges for the automobile industry in the next fifteen years and will make recommendations to ensure that the relevant policy, legal and public support framework is in place for the roll-out of highly automated and connected vehicles by 2030 (see for more information: http://ec.europa.eu/growth/sectors/automotive/policy-strategy_nl).

[8] Surden and Williams use similar stages: *sense*, *plan* and *act* (Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at p. 141).

[9] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 137-145; Anderson, J.M., Kalra, N., Stanley, K.D., Sorensen, P., Samaras, C., Oluwatola, O.A. (2016), *Autonomous Vehicle Technology – A Guide for Policymakers*, California, RAND, pp. 61-65.

[10] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 143-144.

[11] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 144-145.

[12] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 145-146.

[13] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at p. 146.

maps, a self-driving car is able to obtain an accurate impression of its surrounding (cf. second stage).[14] Software systems subsequently have to interpret the collected data and transpose it into useful information (cf. third stage). Based on this information, software systems will make a decision (cf. fourth stage) and subsequently execute it (cf. fifth stage).[15]

Vehicles will not suddenly become fully autonomous or self-driving. Instead, technology will gradually take over a user's control over the vehicle in three steps. In a first stadium, different forms of sensor technology provide the user of the vehicle with information about his location and surroundings (e.g. GPS or all kinds of warning systems such as parking sensors). These forms of technology affect a user's localisation (cf. first stage), perception (cf. second stage) and interpretation (cf. third stage) but cannot make or execute any decisions themselves (cf. fourth and fifth stage).[16] The second stadium of technological evolution relates to the vehicle's automatisation. Automatisation simplifies driving tasks by automatically implementing the user's instructions. This technology does not make any decision either.[17] In a third technological stadium, forms of software technology allow the vehicle to make decisions itself (cf. fourth stage). Thus, instructions by the user become less important or even redundant. This is referred to as the autonomisation of traffic. The essence of a self-driving car, therefore, is the fact that it can make certain choices by itself.[18]

This autonomisation of vehicles will occur in different steps.[19] Some forms of partial vehicle autonomy are already available today. These are covered by the umbrella term Advanced Driver Assistance Systems (ADAS).[20] The combination of all these technologies allows vehicles to become increasingly autonomous. As a consequence, the commercialisation of vehicles able to transport a person entirely autonomously without any human interference seems inevitable. In that case, one can speak of a fully autonomous or 'driverless' vehicle.[21] Today, only prototypes of such vehicles exist. They are currently tested on the road by companies such as Google and Tesla.[22]

III.   Benefits and Challenges of Self-Driving Cars

The rise of autonomous vehicle technology has different benefits. Foremost, traffic will become much safer with software operating the vehicle. The number of accidents will reduce as computers are generally much better drivers than their human equivalents. The focus of software systems, for instance, does not diminish due to fatigue, alcohol or checking social media. The ability of software to react is much faster and more accurate than that of humans.[23] Transport will also

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[14] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 137-141.
[15] See more extensively: Tanghe, J., De Bruyne, J. (2017), Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective, *Journal of European Tort Law*, forthcoming.
[16] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 131-137.
[17] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, p. 132, footnote 46.
[18] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 131-135. See more extensively: Tanghe, J., De Bruyne, J. (2017), Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective, *Journal of European Tort Law*, forthcoming.
[19] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 131-135.
[20] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 134-135; Van Wees, K.A.P.C. (2004), Vehicle Safety Regulations and ADAS: Tensions Between Law and Technology, X, *IEEE International Conference on Systems, Man and Cybernetics*, The Hague, pp. 4011-4016; Van Wees, K.A.P.C (2015), Aansprakelijkheidsaspecten van (deels) zelfrijdende auto's, *Aansprakelijkheid, Verzekering & Schade*, Vol. 28 (online PDF version Kluwer Navigator), pp. 1-20, at pp. 2-3.
[21] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 132-133.
[22] See for a more extensive overview: Tanghe, J., De Bruyne, J. (2017), Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective, *Journal of European Tort Law*, forthcoming.
[23] Anderson, J.M., Kalra, N., Stanley, K.D., Sorensen, P., Samaras, C., Oluwatola, O.A. (2016), *Autonomous Vehicle Technology – A Guide for Policymakers*, California, RAND, pp.12-16 & 59-60; Zohn, J.R. (2015), When robots attack: How should the law handle self-driving cars that cause damages, *University of Illinois Journal of Law, Technology & Policy*, Vol.

become more time efficient. Human passengers have the possibility to be involved in other professional or leisure activities as they do not necessarily have to pay attention to the road. All these factors have a positive influence on productivity and the work/life balance.[24] Autonomous vehicle technology also increases mobility for those who are currently unable or unwilling to drive such as elderly, minors or disabled people.[25]

There are, however, several challenges and concerns regarding self-driving cars as well. These relate to technological aspects, the influence of autonomous vehicles on various facets of society such as employment, transportation or public infrastructure, and legal issues.[26]

First, technological concerns remain. Recent accidents involving Tesla and Google vehicles illustrate that autonomous technology is not entirely flawless.[27] The autopilot sensors of a Tesla car, for instance, were not able to distinguish a white tractor-trailer crossing the highway from the bright sky above, leading to a fatal crash.[28] Autonomous vehicles will probably have to share the road with 'regular' non-autonomous cars and other road users during a considerably long transition period. This interaction between humans and software will inevitably lead to accidents. In February 2016, a Google autonomous vehicle hit a bus because it did not know that long vehicles are less inclined to stop and give way.[29] Moreover, the technology used in self-driving cars is still costly nowadays making their commercialisation less interesting.[30]

Second, autonomous vehicles will have an influence on various facets of our society such as employment, transportation and public infrastructure.[31] Software might replace those persons

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2015, (2), pp. 461-485, at p. 471; Duffy, S., Hopkins, J.P. (2013), Sit, Stay, Drive: The Future of Autonomous Car Liability, S*MU Science & Technology Law Review, Vol. 16,* pp. 453-480, at pp. 453 & 478-479; Funkhouser, K. (2013), Paving the Road Ahead: Autonomous Vehicles, Products Liability, and the Need for a New Approach*, Utah Law Review*, Vol. 2013, (1), pp. 437-462, at p. 467 & 459; Gurney, J.K. (2013), Sue my car not me: products liability and accidents involving autonomous vehicles, *University of Illinois Journal of Law, Technology & Policy*, Vol. 2013, (2), pp. 247-277, at pp. 250-251; Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 135-136; Van Wees, K.A.P.C 2015), <u>Aansprakelijkheidsaspecten van (deels) zelfrijdende auto's</u>, *Aansprakelijkheid, Verzekering & Schade*, Vol. 28 (online PDF version Kluwer Navigator), pp. 1-20, at p. 2.

[24] Anderson, J.M., Kalra, N., Stanley, K.D., Sorensen, P., Samaras, C., Oluwatola, O.A. (2016), *Autonomous Vehicle Technology – A Guide for Policymakers*, California, RAND, pp. xv & 17-18; Zohn, J.R. (2015), When robots attack: How should the law handle self-driving cars that cause damages, *University of Illinois Journal of Law, Technology & Policy*, Vol. 2015, (2), pp. 461-485, at p. 471; Duffy, S, Hopkins, J.P. (2013), Sit, Stay, Drive: The Future of Autonomous Car Liability, S*MU Science & Technology Law Review, Vol. 16,* pp. 453-480, at p. 475; Gurney, J.K. (2013), Sue my car not me: products liability and accidents involving autonomous vehicles, *University of Illinois Journal of Law, Technology & Policy*, Vol. 2013, (2), pp. 247-277, at p. 251; Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at p. 136.

[25] See in this regard: Bradshaw-Martin, H., Easton, C. (2014), Autonomous or 'driverless' cars and disability: a legal and ethical analysis, *European Journal of Current Legal Issues,* Vol. 20, (3) retrieved 28/03/2017 from <u>webjcli.org/article/view/344;</u> Anderson, J.M., Kalra, N., Stanley, K.D., Sorensen, P., Samaras, C., Oluwatola, O.A. (2016), *Autonomous Vehicle Technology – A Guide for Policymakers*, California, RAND, pp. xv & 16-17; Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at p. 136; Funkhouser, K. (2013), Paving the Road Ahead: Autonomous Vehicles, Products Liability, and the Need for a New Approach*, Utah Law Review*, Vol. 2013, (1), pp. 437-462, at p. 439.

[26] See for a more extensive overview: Tanghe, J., De Bruyne, J. (2017), Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective, *Journal of European Tort Law*, forthcoming.

[27] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at p. 136.

[28] Tesla's Blog, *A Tragic Loss*, 30 June 2016, retrieved 28/03/2017 from www.teslamotors.com/blog/tragic-loss .

[29] See in this regard: Bowles, N., *Google self-driving car collides with bus in California, accident report says,* The Guardian, 1 March 2016, retrieved 28/03/2017 from www.theguardian.com/technology/2016/feb/29/google-self-driving-car-accident-california; Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at pp. 150-151.

[30] Zohn, J.R. (2015), When robots attack: How should the law handle self-driving cars that cause damages, *University of Illinois Journal of Law, Technology & Policy*, Vol. 2015, (2), pp. 461-485, at pp. 469-470; Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at p. 136.

[31] See for an overview: Anderson, J.M., Kalra, N., Stanley, K.D., Sorensen, P., Samaras, C., Oluwatola, O.A. (2016), *Autonomous Vehicle Technology – A Guide for Policymakers*, California, RAND, pp. 38-40: Yeomans, G. (2014), *Autonomous*

nowadays employed in the transportation sector and the related industries.[32] Companies could develop an on-demand taxi service using self-driving vehicles that would replace human taxi drivers.[33] Experts also predict a decline in the 'crash economy' once autonomous vehicles are commonly used. When traffic becomes safer, there will be less need for certain services such as garages, lawyers, insurance companies or physical therapists.[34] Autonomous vehicles will also affect the road capacity, induce a change in the development of roadways and result in an increased need for technological infrastructure. Self-driving cars used for urban driving will probably be smaller and, therefore, use less road capacity. These vehicles will also be in operation most of the time, especially when mobility demand is high. As a consequence, cities will need fewer parking spaces and can use that space for other purposes (e.g. creating additional lanes). The advantages of self-driving cars could also affect the use of trains, planes and public transport. It has already been mentioned that users of an autonomous car can spend their time in the vehicle to work, enjoy free time or even catch some sleep. This might decrease the demand for other means of transportation offering the same advantages such as trains, busses or airplanes. Additionally, the way in which roadways are maintained and their infrastructural components may change over time. When vehicles become fully autonomous, there may no longer be a need for guardrails, traffic lights or rumble strips. Instead, the government will have to invest in infrastructure and safety tools adapted to self-driving cars.[35]

Third, the legal framework might need a fundamental make-over.[36] The Belgian Highway Code, for example, is not yet adapted to the introduction of autonomous car technology as it still requires that each vehicle has a 'driver'.[37] The driver must at all times be able to perform the necessary driving actions and must have his vehicle under control.[38] This requirement does not seem tenable in light of autonomous car technology. Besides privacy issues related to self-driving cars,[39] the question also arises who should be held liable for damage caused by such vehicles.[40] Reliance on fault-based liability will become uncertain in the context of autonomous vehicles. It will, for instance, not be straightforward to determine who the 'driver' is in an autonomous vehicle and whether he can

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Vehicles – Handing over control: opportunities and risks for insurance, Lloyd's, March 2014, pp. 1-27, p. 6 retrieved 28/03/2017 from www.lloyds.com/news-and-insight/risk-insight/library/technology/autonomous-vehicles.

[32] Anderson, J.M., Kalra, N., Stanley, K.D., Sorensen, P., Samaras, C., Oluwatola, O.A. (2016), *Autonomous Vehicle Technology – A Guide for Policymakers*, California, RAND, pp. xvii & 39.

[33] Clements, L.M., Kockelman, K.M., *Economic Effects of Automated Vehicles*, Presented at the 96th 18 Annual Meeting of the Transportation Research Board, January 2017, p. 7, retrieved 28/07/2017 from www.caee.utexas.edu/prof/kockelman/public_html/TRB17EconomicEffectsofAVs.pdf .

[34] Anderson, J.M., Kalra, N., Stanley, K.D., Sorensen, P., Samaras, C., Oluwatola, O.A. (2016), *Autonomous Vehicle Technology – A Guide for Policymakers*, California, RAND, pp. xvii & 39-40.

[35] Hars, A., *Misconception 8: Self-driving cars will increase congestion in cities*, Driverless car market watch, 29 July 2017, retrieved 07/08/2017 from www.driverless-future.com/?cat=26 ; Clements, L.M., Kockelman, K.M., *Economic Effects of Automated Vehicles*, Presented at the 96th 18 Annual Meeting of the Transportation Research Board, January 2017, pp. 3-7, retrieved 28/07/2017 from
www.caee.utexas.edu/prof/kockelman/public_html/TRB17EconomicEffectsofAVs.pdf .

[36] Surden, H., Williams, M.A. (2016), Technological Opacity, Predictability, and Self-Driving Cars, *Cardozo Law Review*, Vol. 38, pp. 121-181, at p. 136.

[37] Article 8.1. Koninklijk besluit van 1 december 1975 houdende algemeen reglement op de politie van het wegverkeer en van het gebruik van de openbare weg, published on 9 December 1975 (Highway Code).

[38] Article 8.3. Koninklijk besluit van 1 december 1975 houdende algemeen reglement op de politie van het wegverkeer en van het gebruik van de openbare weg, published on 9 December 1975. See in this regard also the decision by the Belgian Court of Cassation, 17 January 1989 as reported in *Arresten Hof van Cassatie* 1988, p. 599 and in *Verkeersrecht – Jurisprudentie* 1989, p. 181.

[39] See in this regard: Bloom, C., Tan, J., Ramjohn, J., Bauer, L., Self-Driving Cars and Data Collection: Privacy Perceptions of Networked Autonomous Vehicles, USENIX Association, *Thirteenth Symposium on Usable Privacy and Security*, 12-14 July, 2017, pp. 357-375; Glancy, D.J. (2012), Privacy in Autonomous Vehicles, *Santa Clara Law Review*, Vol. 52, (4), pp. 1171-1239.

[40] Reference can be made to the many studies that have already been done with regard to the liability for damage caused by self-driving cars. See for example: Schellekens, M. (2015), Self-driving cars and the chilling effect of liability law, *Computer Law & Security Review*, Vol. 31, pp. 506-517; Bose, U. (2015), The Black Box Solution to Autonomous Liability, *Washington University Law Review*, Vol. 92, (5), pp. 1325-1351; Tanghe, J., De Bruyne, J. (2017), Aansprakelijkheid voor schade veroorzaakt door autonome motorrijtuigen, *Rechtskundig Weekblad*, Vol. 80, pp. 963-986; Tanghe, J., De Bruyne, J. (2017), Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective, *Journal of European Tort Law*, forthcoming.

be held liable for a violation of the law that is actually committed by the vehicle itself (e.g. crossing a red light). Liability in traffic-related matters will, therefore, evolve from a fault-based mechanism towards forms of strict liability. As a result, victims will have to target other parties to claim recovery such as the producer of the vehicle or the software. Research, however, shows that the application of the existing strict liability regimes might not be straightforward in the context of autonomous vehicles either. For instance, it is unsure if software is considered a product that falls within the Product Liability Directive[41] and whether the defect that caused the damage already existed at the time when the vehicle was put into circulation.[42] Considering that the rise of self-driving cars might also result in cross-border conflicts, private international law issues will become important.

IV.   Private International Law Rules and Self-Driving Cars

The arrival of self-driving cars is very likely to become a global phenomenon. Their use will be widespread and will not be confined to the territories of individual countries. They will instead operate across national borders. Families will use their autonomous vehicle to be driven to a holiday resort in another country, businesses will rely on self-driving trucks to ship goods to foreign customers and employees who have to visit international clients will do so in their autonomous company car. Therefore, the rules of private international law come into play. Private international law is an area of law that regulates the relationship between different national legal systems. It deals with situations of a private law nature that contain a cross-border element (also called: international element). It is important to note that such cross-border element or international element can be present even if the autonomous vehicle does not cross a boundary between different nations. If two self-driving cars owned by Croatians collide in the city of Zagreb and one of the owners wants to sue the Swedish producer of the defective software that caused the accident, the software producer's foreign location is enough to trigger the application of private international law rules.

Traditionally, private international law consists of three main pillars. The first is international jurisdiction, the branch of private international law that determines which courts will be able to rule on the cross-border dispute. The second is the applicable law, which designates the national law that will govern the dispute and that the forum court will have to apply to decide the case before it. The third one deals with the enforcement of judgments and authentic instruments but is not relevant for this contribution.

In the following pages, the current private international law framework for jurisdiction (part A) and applicable law (part B) within the European Union are briefly discussed. We thereby only focus on rules that are relevant in the context of accidents with self-driving cars. We will analyse whether these applicable rules of private international law rules might be problematic in matters concerning such vehicles. The importance of this question was recognised by the European Union when it commissioned, through the European Parliament's Policy Department for Citizens' Rights and Constitutional Affairs at the request of the Committee on Legal Affairs (JURI committee), a study analysing the potential legal impact of the introduction of connected and autonomous vehicles on rules of private international law determining jurisdiction and applicable law in the EU Member States in the event of a cross-border traffic accident (hereafter: the Study on Cross-border Traffic Accidents in the EU – the Potential Impact of Driverless Cars).[43]

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[41] Article 2 defines a product as "all movables, with the exception of primary agricultural products and game, even though incorporated into another movable or into an immovable" (Council Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products, *OJ* L 210).

[42] According to article 7, the producer will not be held liable if he proves that, having regard to the circumstances, it is *probable that the defect that caused the damage did not exist at the time when the product was put into circulation by him or that this defect came into being afterwards.*

[43] Kadner Graziano, T. (2016) *Cross-border Traffic Accidents in the EU - the Potential Impact of Driverless Cars*, European Parliament – Directorate-General for Internal Policies of the Union, Brussels, 2016, pp. 1-66.

A. Jurisdiction

The Brussels I*bis* Regulation regulates the competence of EU courts in civil and commercial cases.[44] The Regulation indicates the Member State of which the courts have jurisdiction to hear the case. It does not lay down before which courts within that Member State the claim has to be brought (exceptions are article 7.2 and article 11.1.(b), see *infra*). That is determined by the national procedural rules of subject-matter jurisdiction and territorial jurisdiction of the forum.

According to the basic principle laid down by article 4.1 of the Regulation, jurisdiction is to be exercised by the courts of the EU Member State in which the defendant is domiciled, regardless of nationality. The domicile or nationality of the claimant has no impact whatsoever. The Regulation in principle only applies if the defendant has his/her/its domicile within the European Union (although there are many exceptions that erode the basic principle). To determine the domicile of natural persons, the Brussels I*bis* Regulation refers to national law (article 62). Conversely, the domicile of legal persons is defined autonomously in the Regulation (recital 15). The domicile of companies is located in the place where the corporation has its statutory seat, central administration or principal place of business (article 63.1). The operation of the basic principle of the Regulation is straightforward. Claims against the keeper of the autonomous vehicle, the manufacturer of the vehicle or the developer of the software, to name just a few, will have to be brought before the courts of the Member State where the keeper, manufacturer or developer respectively is domiciled.

In certain instances, the claimant will be able to bring the claim in another Member State than the one where the defendant is domiciled. Article 7 provides a list of additional venues that are available next to the domicile of the defendant. Of particular interest is article 7.2, which contains a special jurisdictional rule for tort claims. The defendant of a tort claim can on the basis of article 7.2 be summoned before the courts of the place in a Member State where the harmful event occurred or may occur. It should be noted that the Regulation deviates from its normal pattern and designates which courts within the Member State have jurisdiction (namely the ones of the place where the harmful event occurred or may occur). This special ground is only available if the defendant is domiciled in the EU. In the *Bier* case, the European Court of Justice (ECJ) established the rule of the double forum, which states that article 7.2 grants jurisdiction to the courts of the place where the damage occurred (*locus damni – Erfolgsort*) as well as to those of the place of the event giving rise to that damage (*locus actus – Handlungsort*).[45] The *locus damni* can only be construed as a place where direct, initial damage is suffered.[46]

The existence of article 7.2 thus offers the victim of an accident with supplementary options. The tort claim against a defendant domiciled in the EU can always be filed in the Member State where the accident took place as this corresponds to the *locus damni* prong of the *Bier* judgment. The usefulness of the *locus actus* prong can be demonstrated with an example.

> *Imagine that a Croatian national, domiciled in Zagreb, is driving his car around Germany's capital Berlin and gets rear-ended by an autonomous vehicle owned by a French national, domiciled in Paris. The accident is caused by a malfunctioning camera in the vehicle of the French national. The car was manufactured by a Swedish company in a factory in Gent in Belgium. The Croatian victim can sue the French national in France (article 4.1) or before the courts of Berlin as locus damni (article 7.2). However, a more viable option for the victim could be to bring a claim based on product liability against the Swedish manufacturer as "deep-*

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[44] 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, *OJ* L 351. This Brussels I*bis* Regulation revised and replaced the Brussels I Regulation as of 10 January 2015.
[45] ECJ 30 November 1976, *Handelskwekerij G.J. Bier BV v. Mines de potasse d'Alsace SA*, Case 21/76, ECR 1976, p. 1735.
[46] See: ECJ 11 January 1990, *Dumez France SA and Tracoba SARL v. Hessische Landesbank and others*, Case 220/88**,** ECLI:EU:C:1990:8; ECJ 19 September 1995, *Marinari v. Lloyd's Bank plc*, Case 364/93, *ECR* 1995 I-2719; ECJ 10 June 2004, *Rudolf Kronhofer v. Marianna Maier and others*, Case 168/02, ECLI:EU:C:2004:364.

pocket" defendant. Going through the same exercise as we did for the claim against the French owner of the vehicle leads to the following result: Sweden (article 4.1) and Germany (locus damni under article 7.2). In Kainz, the European Court of Justice clarified that where a manufacturer faces a claim of liability for a defective product, the locus actus is the place where the product in question was manufactured.[47] Since the place of manufacture is the factory in Gent in Belgium, the victim can also elect to begin a lawsuit before the courts of Gent. As the place of manufacture (Belgium) is different from the defendant's domicile (Sweden), the locus actus opens an additional forum for the claimant.

Weaker parties receive procedural protection under the Brussels I*bis* Regulation. Under the Regulation, insurance, consumer and employment contracts involve a weaker party that should be protected by rules of jurisdiction more favourable to his interests than the general rules (recital 18). Jurisdiction in insurance, consumer and employment matters is determined, apart from some minor exceptions, solely by the respective sections dealing with those types of contracts (articles 10, 17.1 and 20.1) For the purposes of this contribution, it is interesting to look at insurance contracts and the regime they are subjected to, which differs from the normal approach of the Regulation.

The insurer may bring proceedings only in the courts of the Member State in which the defendant is domiciled, irrespective of whether he is the policyholder, the insured or a beneficiary (article 14.1). This is consistent with the basic premise of the Regulation. When the claim is brought against the insurer, the insurer domiciled in a Member State may be sued in the courts of the Member State of his domicile (article 11.1.(a)). When the claim concerns liability insurance, the insurer may in addition be sued in the courts for the place where the harmful event occurred (article 12). This ground of jurisdiction corresponds to article 7.2 and takes its place in insurance matters. However, actions by the policyholder, the insured or a beneficiary may also be brought in the courts for the place (in a Member State) where the claimant is domiciled (article 11.1.(b)). Note how the provision determines international and, simultaneously, local jurisdiction.[48] In private international law, the possibility to sue in one's own domicile is called a *forum actoris*. Articles 10, 11 and 12 also apply to actions brought by the injured party directly against the insurer, where such direct actions are permitted (article 13.2).

In the European Union, the victim of a traffic accident has the option to bring a direct claim against the liability insurer of the car involved in causing the damage. This is guaranteed by article 18 of Directive 2009/103/EC, which compels Member States to ensure that any party injured as a result of an accident caused by a vehicle covered by insurance as referred to in article 3 of the Directive (*i.e.* compulsory civil liability insurance in respect of the use of vehicles) enjoys a direct right of action against the insurance undertaking covering the person responsible against civil liability.[49] In practice, victims usually bring a claim directly against the insurer.[50] Due to the availability of the *forum actoris* in article 11.1.(b) of the Brussels I*bis* Regulation, the victim of an accident with a self-driving car will thus be able to initiate a direct action against the liability insurer of the vehicle involved in causing the damage before the courts of his own domicile.[51] Litigating in one's own domicile has obvious benefits: proximity and familiarity with local procedure to name but a few of those advantages.

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[47] ECJ 16 January 2014, *Andreas Kainz v. Pantherwerke AG*, Case 45/13, ECLI:EU:C:2014:7.
[48] Heiss, H. (2007), Article 9, Magnus, U, Mankowski, P. (Eds.), *Brussels I Regulation* (pp. 270-301) Munich, Sellier – European Law Publishers, p. 278.
[49] Directive 2009/103/EC of the European Parliament and of the Council of 16 September 2009 relating to insurance against civil liability in respect of the use of motor vehicles, and the enforcement of the obligation to insure against such liability, *OJ* L 263.
[50] Kadner Graziano, T. (2016) *Cross-border Traffic Accidents in the EU - the Potential Impact of Driverless Cars*, European Parliament – Directorate-General for Internal Policies of the Union, Brussels, 2016, p. 18.
[51] This has been confirmed by the European Court of Justice: ECJ 13 December 2007, *FBTO Schadeverzekeringen NV v. Jack Odenbreit*, Case 463/06, ECR I 2007, p. 11321.

B. Applicable Law

Once the jurisdiction of the court of a Member State has been established, the question becomes which law this court will apply to decide the dispute. In the European Union, the Rome II Regulation has laid down uniform rules for determining the law applicable to non-contractual obligations.[52] The Regulation upholds the principle of universal application. Any law specified by the Regulation shall be applied whether or not it is the law of a Member State (article 3).

In the absence of a choice of law between both parties pursuant to article 14, the pivotal provision is article 4 which lays down the general rule of the *lex loci damni*.[53] The law applicable to non-contractual obligations is the law of the country in which the damage occurs irrespective of the country in which the event giving rise to the damage occurred and irrespective of the country or countries in which the indirect consequences of that event occur (article 4.1 and recital 17).[54] Only when both the tortfeasor and the victim have their habitual residence (as defined by article 23) in the same country at the time when the damage occurs, the law of that country shall apply in lieu of the *lex loci damni* (article 4.2). For the determination of the place of the damage, one can fall back on the case law concerning article 7.2 of the Brussels I*bis* Regulation as the Rome II Regulation requires its provisions to be interpreted consistently with the Brussels I Regulation (recital 7 of the Rome II Regulation) and, therefore, also with the latter's successor, the Brussels I*bis* Regulation. These general provisions are applicable to traffic accidents.

Under the Regulation, product liability is governed by a separate article (article 5) with criteria that deviate from the general rule in article 4. A choice of law between the parties in accordance with article 14 is possible. Article 5 is construed as a cascade of connecting factors. First, the law of the country of the common habitual residence of the tortfeasor and the victim is to be applied (article 5.1). Second, in the absence of a common habitual residence, one has to apply the law of country of the injured party's habitual residence when the damage occurred, provided the product was marketed in that country (article 5.1.(a)). For the provision to apply it is not required that the product that caused the damage was bought in the country of habitual residence of the victim. It suffices if the line of products was marketed in that country. This follows from the second sentence of article 5.1 as this refers to "the marketing of the product, or a product of the same type".[55] This caveat applies throughout article 5. If the requirements of article 5.1.(a) are not fulfilled, the third step is to apply the law of the country in which the product was acquired, if the product was marketed in that country (article 5.1.(b)). Failing that, the fourth step leads to the application of the law of the country in which the damage occurred, provided the product was marketed there. Finally, the applicable law shall be the law of the country in which the person claimed to be liable is habitually resident if he or she could not reasonably foresee the marketing of the product, or a product of the same type, in the country the law of which is applicable under article 5.1.(a), article 5.1.(b) or article 5.1.(c). This foreseeability clause will be insignificant in practice because most products are being distributed throughout Europe and even manufacturers and distributors are well aware of that fact.[56]

As the Rome II Regulation has harmonised the EU Member States' conflict of laws rules in non-contractual matters, it does not matter where in the EU the suit is brought. The rules designating the applicable law are the same for every court in the EU, leading to the application of the same national law. Certainty as to the applicable law improves the predictability of the outcome of litigation and subsequently contributes to the proper functioning of the internal market (recital 6).

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[52] Regulation 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), *OJ* L 199.

[53] Dickinson, A. (2008), *The Rome II Regulation – The Law Applicable to Non-Contractual Obligations*, Oxford-New York, Oxford University Press, p. 307.

[54] See in that regard: ECJ 10 December 2015, *Lazar v. Allianz SpA*, Case 350/14, ECLI:EU:C:2015:802.

[55] Kadner Graziano, T. (2016) *Cross-border Traffic Accidents in the EU - the Potential Impact of Driverless Cars*, European Parliament – Directorate-General for Internal Policies of the Union, Brussels, 2016, p. 33.

[56] Kadner Graziano, T. (2016) *Cross-border Traffic Accidents in the EU - the Potential Impact of Driverless Cars*, European Parliament – Directorate-General for Internal Policies of the Union, Brussels, 2016, p. 35.

The harmonisation effort of the Rome II Regulation is, however, distorted by the existence of international conventions. For EU countries that are signatory states to the 1971 Hague Traffic Accidents Convention and/or 1973 Hague Products Liability Convention, these instruments provide the conflict of laws rules for non-contractual liability arising from traffic accidents and the conflict of laws rules for non-contractual liability for defective products respectively. According to article 28 of the Rome II Regulation, the Regulation does not prejudice the application of international conventions unless the conventions were concluded exclusively between two or more EU Member States. As both the Hague Traffic Accidents Convention and the Hague Products Liability Convention also have members from outside the EU, they take precedence over the Rome II Regulation. Article 28 thus permits the coexistence of two different sets of private international law rules within the EU.[57]

The 1971 Hague Traffic Accidents Convention determines the law applicable to non-contractual liability arising from traffic accidents (article 1, paragraph 1). Currently twenty-one countries are member of the Convention.[58] Among them are thirteen EU Member States such as Croatia, France, Belgium and Spain. When the judges of the countries bound by the Convention are confronted with a traffic accident with an international element they have to resort to the conflict of law rules of the Convention to find the applicable law. Under the Hague Traffic Accidents Convention there is no reciprocity requirement, *i.e.* the Convention is applicable even if the law to be applied is not that of a signatory state (article 11). In other words, like the Rome II Regulation the Convention sets forth the principle of universal application. Certain aspects such as recourse actions and the liability of manufacturers, sellers and repairers of vehicles are excluded from the Convention's field of application (article 2, (1) and article 2, (4-6)).

As a basic principle, the law applicable is the law of the State where the accident occurred (*lex loci delicti*) (article 3). The Convention, however, provides for certain circumstances in which another law will govern the question of liability. When only one vehicle is involved in the accident and it is registered in a State other than that where the accident took place, the law of the State of registration (*lex vehiculi*) applies to determine liability towards the driver, owner or any other person having control of or an interest in the vehicle irrespective of their habitual residence (article 4, a), first indent). The law of the registration State also applies to determine liability towards a victim who is a passenger and whose habitual residence is in a State other than that where the accident occurred (article 4, a), second indent). Lastly, liability towards victims who are outside the vehicle at the place of the accident and whose habitual residence is in the State of registration also fall under the law of the State of registration of the vehicle (article 4, a), third indent). In accidents where two or more vehicles are involved, the same exceptions to the *lex loci delicti* apply but only if all vehicles are registered in the same State (article 4, b)). Where one or more persons outside the vehicle or vehicles at the place of the accident are involved in the accident and may be liable, the derogations from the *lex loci delicti* principle are applicable only if all these persons have their habitual residence in the State of registration, even if these persons are also victims of the accident (article 4, c)).

The 1973 Hague Products Liability Convention determines the applicable law in product liability cases. Eleven states currently apply the Convention. Among them are seven EU Member States.[59] Croatia, France and Spain serve as prominent examples. The Convention also operates on the basis of universal application (article 11). The law of the country of the habitual residence of the person directly suffering damage applies, if that country is also the principal place of business of the person claimed to be liable or the place where the product was acquired by the person directly suffering damage (article 5). Failing that, the law to be applied is the law of the country where the

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[57] Kadner Graziano, T. (2016) *Cross-border Traffic Accidents in the EU - the Potential Impact of Driverless Cars*, European Parliament – Directorate-General for Internal Policies of the Union, Brussels, 2016, p. 22.
[58] For an up-to-date list see: Hague Conference on Private International Law, *Convention of 4 May 1971 on the Law Applicable to Traffic Accidents,* www.hcch.net/index_en.php?act=conventions.status&cid=81.
[59] For an up-to-date list see: Hague Conference on Private International Law, *Convention of 2 October 1973 on the Law Applicable to Products Liability*, www.hcch.net/index_en.php?act=conventions.status&cid=84 .

injury occurred, provided this is also the place of the habitual residence of the person directly suffering damage, or the principal place of business of the person claimed to be liable, or the place where the product was acquired by the person directly suffering damage (article 4). Finally, the applicable law shall be the law of the country of the principal place of business of the person claimed to be liable, unless the claimant chooses to base his claim upon the law of the country of the place of injury (article 6).

As mentioned before, some Member States apply the Rome II Regulation to traffic accidents whereas others apply the 1971 Hague Traffic Accidents Convention. A comparison of the rules of both instruments reveals that the connecting factors utilised are not the same. The applicable law will thus be different depending on the EU Member State in which the claim is brought. Such a split in conflict regimes is an unwelcome plight.[60]

Consider the following example:

> *A, domiciled in France and B, domiciled in Spain, are on a trip in Germany in A's autonomous car. The car is registered in France. In Munich, the car malfunctions and crashes into a wall. B suffers physical damage.*
>
> *B wants to take legal action against A as keeper of the vehicle. B can start proceedings before the French courts because A is domiciled there (article 4.1 Brussels Ibis Regulation). B can also bring his claim in Germany before the courts of Munich as the accident took place there (locus damni under article 7.2 Brussels Ibis Regulation).*
>
> *If the case is heard by a French court, it will apply the Hague Traffic Accidents Convention. The lex loci delicti does not apply because victim B is a passenger and his habitual residence is in a State other than that where the accident occurred (article 4, a), second indent). The law of the country of registration of the car thus applies: French law.*
>
> *If the case is heard by a German court, it will apply the Rome II Regulation to determine the applicable law. As A and B do not have their habitual residence in the same country, the lex loci damni applies pursuant to article 4.1: German law.*

Whether the convergence between jurisdiction and applicable law, which is called *Gleichlauf*[61] in private international law circles, is desirable need not be answered here. The concern is that the same traffic accident is subjected to a different national law, depending on where in the EU the litigation takes place. As national substantive laws regarding liability for traffic accidents vary considerably,[62] the choice of forum could be crucial. This problem affects all traffic accidents and is thus not unique to self-driving cars. The European Parliament identified the issue in its resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics. It noted that simplifying the current dual system for defining applicable law (based on the Rome II Regulation and the 1971 Hague Convention on the law applicable to traffic accidents) would improve legal certainty and limit possibilities for forum shopping.[63]

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[60] Nagy, C.I. (2010), The Rome II Regulation and Traffic Accidents: Uniform Conflict Rules with Some Room for Forum Shopping – How So?, *Journal of Private International Law*, Vol. 6(1), p. 108.

[61] *Gleichlauf* can be defined as the circumstance in which the court with jurisdiction – the forum – applies its own law, the *lex fori*. See in this regard: Van Calster, G. (2016), *European Private International Law*, Oxford and Portland, Oregon, Hart Publishing, p. 4.

[62] Kadner Graziano, T. (2016) *Cross-border Traffic Accidents in the EU - the Potential Impact of Driverless Cars*, European Parliament – Directorate-General for Internal Policies of the Union, Brussels, 2016, p. 20.

[63] European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)), no. 60.

Forum shopping is the technique whereby a litigant selects his forum to sue, on the basis of suitability.[64] Indeed, as the Brussels I*bis* Regulation offers litigants multiple venues to choose from, claimants can consider which forum is most favourable to bring their claim in. In the context of traffic accidents, the victim could be tempted to choose the country according to the national law that country's courts (either via the conflict of laws rules of the Rome II Regulation or of the Hague Traffic Accidents Convention) will apply.[65] If the selection of the forum is inspired by the substantive law that the judge will have to apply to the dispute, the term "law shopping" (which the authors treat as a form of forum shopping) can be used.[66] There is hostility towards forum shopping and the term has disparaging – if not pejorative – connotations.[67] On a European level, even though an anti-forum shopping attitude can be detected, the Brussels I*bis* Regulation's use of a general head of jurisdiction (article 4.1) which competes with special heads of jurisdictions (article 7.2 being one of them) actually offers forum shopping possibilities.[68]

Although it is debatable whether forum shopping (or law shopping) should be combatted, it is true that the dichotomy of instruments undermines legal certainty. It has been suggested that the dual system of regimes compromises the objective of unifying the rules on the law applicable to traffic accidents in Europe, as well the foreseeability of solutions across Europe and legal certainty.[69] The Rome II Regulation as the flagship of the unification effort of private international law in the EU thus surprisingly sinks the flagship of final and comprehensive unification.[70]

A possible solution could be to insert a specific provision for traffic accidents into the Rome II Regulation. If the provision mirrors the connecting factors used by the Traffic Accidents Convention, both instruments are assimilated and it would no longer make a difference whether the forum state is a member of the Convention or not. The applicable law would be the same, increasing predictability and legal certainty. The provision could offer the parties the possibility of choosing the applicable law (an option which is not available under the Traffic Accidents Convention).

Another way out of the dilemma would be to better coordinate both instruments. Article 28 should be amended in such a way that the Regulation has precedence over the Convention.[71] Cases involving persons all having their habitual residence in the EU could be governed by the Rome II Regulation, whereas the Hague Traffic Accidents Convention would continue to govern cases where at least one of the parties is resident outside the EU.[72] This solution would, however, require a renegotiation of the scope of application of the Hague Traffic Accidents Convention.[73]

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[64] Van Calster, G. (2016), *European Private International Law*, Oxford and Portland, Oregon, Hart Publishing, p. 8.

[65] Thiede, T., Kellner, M, (2007) "Forum shopping" zwischen dem Haager Übereinkommen über das auf Verkehrsunfälle anzuwendende Recht und der Rom II-Verordnung, *Versicherungsrecht*, pp. 1624-1628.

[66] See in this regard: Ferrari, F. (2017), Forum (and law) shopping, Basedow, J., Rühl G., Ferrari, F., de Miguel Asensio, P. (Eds.), *Encyclopedia of Private International Law*, Cheltenham, Edward Elgar Publishing, p. 8, forthcoming.

[67] Ferrari, F. (2017), Forum (and law) shopping, Basedow, J., Rühl G., Ferrari, F., de Miguel Asensio, P. (Eds.), *Encyclopedia of Private International Law*, Cheltenham, Edward Elgar Publishing, p. 1, forthcoming referring to Juenger, F.K. (1989), Forum Shopping, Domestic and International, *Tulane Law Review*, Vol. 63, pp. 553-574, at p. 553.

[68] Ferrari, F. (2017), Forum (and law) shopping, Basedow, J., Rühl G., Ferrari, F., de Miguel Asensio, P. (Eds.), *Encyclopedia of Private International Law*, Cheltenham, Edward Elgar Publishing, pp. 2-3, forthcoming.

[69] Joubert, N. (2008), Les règles de conflit spéciales en matière de délits dans le Règlement du 11 juillet 2007 (Rome II), Corneloup, Joubert (Eds.) *Le règlement communautaire 'Rome II' sur la loi applicable aux obligations extracontractuelles* (pp. 55-84), Paris, Litec, p. 55; von Hein, J. (2007), Die Kodifikation des europäischen IPR der außervertraglichen Schuldverhältnisse vor dem Abschluss?, *Versicherungsrecht*, p. 451; Leible, L., Engel, A. (2004), Der Vorschlag der EG-Kommission für eine Rom II-Verordnung, *Europäische Zeitschrift für Wirtschaftsrecht,* p. 17; Kadner Graziano, T. (2016) *Cross-border Traffic Accidents in the EU - the Potential Impact of Driverless Cars*, European Parliament – Directorate-General for Internal Policies of the Union, Brussels, 2016, p. 27.

[70] Nagy, C.I. (2010), The Rome II Regulation and Traffic Accidents: Uniform Conflict Rules with Some Room for Forum Shopping – How So?, *Journal of Private International Law*, Vol. 6(1), pp. 106-107.

[71] Nagy, C.I. (2010), The Rome II Regulation and Traffic Accidents: Uniform Conflict Rules with Some Room for Forum Shopping – How So?, *Journal of Private International Law*, Vol. 6(1), p. 108.

[72] Malatesta, A. (2006), The Law Applicable To Traffic Accidents' Malatesta, A. (Ed.), *The Unification of Choice of Law Rules on Torts and Other Non-Contractual Obligations in Europe* (pp.85-106), Milano, CEDAM, p. 105; Kadner Graziano, T. (2008) The Rome II Regulation and the Hague Conventions on Traffic Accidents and Product Liability – Interaction, conflicts and future perspectives, *Nederlands Internationaal Privaatrecht*, pp. 425-429.

[73] Kadner Graziano, T. (2016) *Cross-border Traffic Accidents in the EU - the Potential Impact of Driverless Cars*, European Parliament – Directorate-General for Internal Policies of the Union, Brussels, 2016, pp. 27-28.

In product liability cases the same duality of EU countries applying the Rome II Regulation and those applying the 1973 Hague Products Liability Convention arises. The more modest number of EU countries that are member to the Convention and the limited harmonisation by the Products Liability Directive[74] somewhat soften the impact of the coexistence.[75] However, the predicted increased reliance on claims against the producer in the context of self-driving cars in turns exacerbates the situation.[76]

V.   Concluding Remarks

The contribution shed light on the impact of self-driving cars on our daily lives. Although the commercialisation of such vehicles surely has many benefits, several obstacles will need to be overcome before society will be able to enjoy them. One challenge lies in the legal field. Whereas the question as to who should be held liable for damage caused by an autonomous vehicle has already been addressed in academia, less attention has been dedicated to the relationship between autonomous vehicles and the existing private international law rules in the EU. Our analysis shows that the existing rules of jurisdiction and applicable law do not pose particular problems when applied to self-driving cars. There are no issues that are exclusively related to self-driving cars. The rise of autonomous vehicles does enlarge the existing problems. The coexistence of the Rome II Regulation and the 1971 Hague Traffic Accidents Convention prevents the unified application of law governing traffic accidents in the EU. Depending on the EU Member State in which the claim is brought, the applicable law is determined by the Regulation or by the Convention, which can lead to different results. The same can be said *mutadis mutandis* of the relationship between the Rome II Regulation and the 1973 Hague Products Liability Convention. As product liability will play a more prominent role in the context of autonomous vehicles, the latter dichotomy will be encountered increasingly more often. This issue needs to be addressed, in order for predictability to be achieved and legal certainty to be safeguarded.

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[74] Council Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products, *OJ* L 210.

[75] Kadner Graziano, T. (2016) *Cross-border Traffic Accidents in the EU - the Potential Impact of Driverless Cars*, European Parliament – Directorate-General for Internal Policies of the Union, Brussels, 2016, p. 30 & 32.

[76] Kadner Graziano, T. (2016) *Cross-border Traffic Accidents in the EU - the Potential Impact of Driverless Cars*, European Parliament – Directorate-General for Internal Policies of the Union, Brussels, 2016, p. 51. See in this regard: Tanghe, J, De Bruyne, J. (2017), Software aan het stuur – Aansprakelijkheid voor schade veroorzaakt door autonome motorrijtuigen, Vansweevelt, T., Weyts, B. (Eds.), *Nieuwe risico's in het verzekeringsrecht - ALLIC III*, Antwerpen, Intersentia, forthcoming; Tanghe, J., De Bruyne, J. (2017), Aansprakelijkheid voor schade veroorzaakt door autonome motorrijtuigen, *Rechtskundig Weekblad*, Vol. 80, pp. 963-986; Tanghe, J., De Bruyne, J. (2017), Liability for Damage Caused by Autonomous Vehicles: a Belgian Perspective, *Journal of European Tort Law*, forthcoming; Smith, B.W. (2017), Automated Driving and Product Liability, *Michigan State Law Review*, Vol. 1, pp. 1-74.