UNIVERSITY OF TAMPERE

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The way forward – how the European union has and will respond to the new need for insurance law governing autonomous vehicles

Risk Management and Insurance

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ABSTRACT

This thesis studies the current legislative framework for the insurance of automated and autonomous vehicles in the European Union, the changes made to current Member State regulation for the testing and deployment of such vehicles and attempts to predict future changes to EU level regulation. The aim of this thesis is to understand the non-technical aspects of autonomous and automated driving and its implications for insurance regulation and legislation within the European Union.

The introductory chapter presents an overview of international conversation on the subject of automated and autonomous driving, describes current EU development on the subject and presents the relevant international law. The chapter also describes the development of EU law, main EU legislative bodies and principles and the research setting. The second chapter studies the development of insurance law in the European Union and the development of Motor Insurance Directives from the year 1972. The development of Motor Insurance Directives is understood via amendments to previous legislation. European Commission's public consultation on current directive (Motor Insurance Directive (MID) (2009/103/EC) is included in this chapter. The chapter three explains the theoretical framework of this thesis describing both the qualitative research method and the European Integration Theory. The fourth chapter studies four European Union Member States in detail on the countries' policies on autonomous and automated vehicles. As a reference, changes made in four non-EU Member States, are also explained.

This thesis depicts, as the main results, a framework of the levels of regulation for insurance in the European Union, lists currently made changes to chosen countries and predicts possible changes. As such, this thesis discusses the possibility of the Motor Insurance Directive being amended or replaced. This thesis also discusses possible implications for insurance markets and companies and the possible opportunities and threats for timing of EU level regulative changes.

TIIVISTELMÄ

Pro gradu tutkielma tutkii tämänhetkistä robottiautojen lainsäädännöllistä kehystä Euroopan unionissa, tarkentaa jäsenvaltioiden tekemiä sääntelyn ja lainsäädännön muutoksia ja pyrkii esittämään mahdollisia tulevaisuuden muutoksia unionin sääntelyyn. Tutkielman tavoitteena on ymmärtää robottiautojen ja -ajamisen ei-teknisiä aspekteja ja siten kyseisen tekniikan merkitystä vakuutussääntelylle Euroopan unionissa.

Johdantokappale esittää kokonaiskuvan robottiautojen ja -ajamisen kansainvälisestä keskustelusta, kuvaa Euroopan unionin valmistautumista kyseiseen tekniikkaan ja pyrkii antamaan kokonaiskuvan olennaisesta kansainvälisestä lainsäädännöstä. Johdantokappale selventää Euroopan unionin lainsäädännön kehitystä, tärkeimpiä unionin toimielimiä ja lainsäädännön periaatteita sekä tutkimuksen taustaa. Toinen kappale tutkii vakuutuslainsäädännön kehitystä unionissa painottaen erityisesti liikennevakuutusdirektiivien kehitystä vuodesta 1972 alkaen. Direktiivien kehitystä kuvataan aikajärjestyksessä analyysin pohjautuessa direktiivien aikaisemmasta sääntelystä poikkeaviin uudistuksiin. Kappaleessa kuvataan myös Euroopan komission julkista konsultaatiota nykyhetkellä voimassa olevasta direktiivistä (liikennevakuutusdirektiivi (MID) (2009/103/EC). Kolmas kappale selventää tutkimuksen teoreettista viitekehystä kuvaten käytettyjä kvalitatiivisen tutkimuksen ja Euroopan integraatioteorian periaatteita. Neljäs kappale tutkii Euroopan unionin jäsenvaltioiden tekemiä muutoksia ja valmistautumista robottiautojen testausta ja käyttöönottoa varten ja kuvaa referenssinä myös neljän unionin ulkopuolisen valtion vastaavia kehityshankkeita.

Tutkielman päätelmät kuvaavat kolmitasoista robottiautojen sääntelyä Euroopan unionissa, listaavat tarkasteluun nostettujen valtioiden tekemiä sääntely- ja toimintatapamuutoksia sekä esittävät mahdollisia kehityspolkuja. Ensiksikin nykyistä liikennevakuutusdirektiiviä saatetaan muuttaa komission konsultaation perusteella tai nykyinen direktiivi saatetaan korvata uudella. Toisaalta robottiautojen tuomat muutokset saattavat tuoda merkittäviä muutoksia vakuutusmarkkinalle ja vakuutusyhtiöille ja siten näiden muutosten ennakoiminen ja niihin vastaaminen tuovat niin mahdollisuuksia kuin riskejä Euroopan unionin sääntelyn ajoittamiselle.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

The European Union, an economic and political union of 28 European countries, is the most important legislative body of vehicle insurance regulation within the boundaries of the Union. Road Traffic Regulation is mainly a Member State level matter, although the Union has approved regulation for the ease of transport within the borders of the Single Market. EU regulation has consisted of minimum level harmonization and has centered around transport of goods and passenger rights. In international law, the Vienna Convention on Road Traffic (1968) and the UNECE World Forum for Harmonization of Vehicle Regulations hold the most weight in both traffic and vehicle technical regulation.

The development of automated and autonomous vehicles is gathering pressure for change in legislation and regulation of road traffic and insurance. Automated vehicles are capable for parts of the driving function to be transferred to the vehicle and its operating systems, while automated vehicles may assume handling of all driving tasks without intervention from human driver. Currently the legislation of the EU does not cover either automated or autonomous vehicles, although there has been interest in including these phenomena. Certain Member States of the EU have already included autonomous vehicles within their own vehicle insurance and road traffic legislation. For example, Germany passed amendments to country's Road Traffic Act (de. Straßenverkehrsgesetz) in May 2017 allowing the use of autonomous vehicles in road traffic. Finland has also made changes to country's legislation, amending the Motor Liability Insurance Act (fin. liikennevakuutuslaki). Other Member States have compiled recommendations or regulations for testing of the vehicles.

One example of the drive of the European Union to enact insurance legislation for autonomous driving is the Declaration of Amsterdam given by the Ministers of Traffic of the Member States after a conference on the subject in April 2016. The Declaration, given "on cooperation in the field of connected and automated driving" (Declaration of Amsterdam 14.4.2016) lays down the eventual interception of both information technology and automation of vehicles. The Declaration introduces a framework on the interception and the technological steps toward it, as seen in Figure 1.

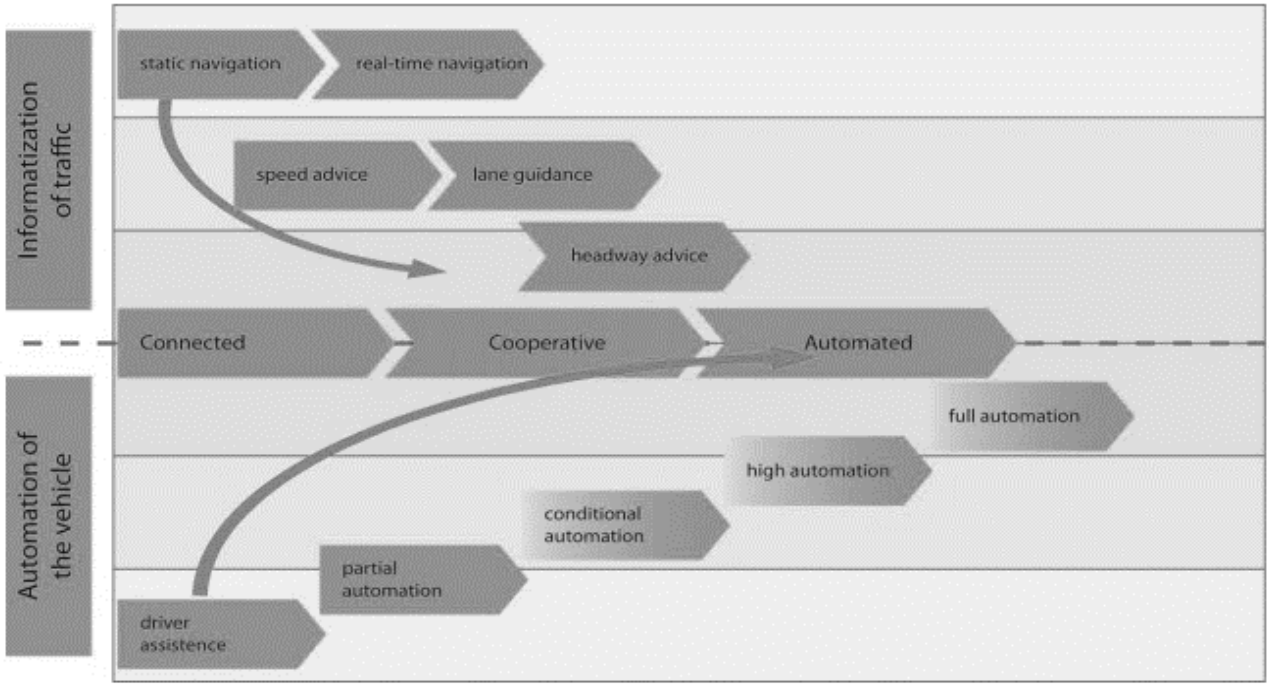


Figure 1: Connected, cooperative and automated driving developments (should come together to harvest societal benefits) (source: Declaration of Amsterdam 14.4.2016)

The Declaration lists liability as one the main challenges for the development towards automated driving and highlights the need for EU level regulation for the movement over European borders to not be hindered from either citizens' or businesses perspective. The exact wording of the Declaration on the subject, "interoperable and compatible when crossing borders" (Declaration of Amsterdam 14.4.2016, p.1) stresses the point. The current initiatives and platforms, such as the European Cooperative Intelligent Transport Systems (C-ITS) platform, the Round Table on Connected and Automated Driving and the Gear 2030 initiative, are mentioned as valuable, although insufficient steps. The Declaration calls for a more coordinated approach between the Union and its Member States in order to "remove barriers and to promote a step-by-step learning-by-experience approach" (Declaration of Amsterdam 14.4.2016, p.1). In practice, the coordinated approach would take form in a framework for the deployment of connected and autonomous vehicles for the year 2019.

The interest in autonomous driving has not confined itself in Europe. United States of America has been in the focus of international conversation not for the least for the companies developing such technology, mainly Google and Tesla, both originating from the USA. As such, consulting enterprises, such as KPMG, have made their own USA centric predictions for the future of autonomous vehicles. According to KPMG White paper, published on October 2015

and titled “Marketplace of change: Automobile insurance in the era of autonomous vehicles”, the conversion could bring perhaps the most significant change to the motor insurance logic and market since its inception. This change is mandated by regulatory permission and supervision.

The KPMG White paper draws a picture of a possible future for personal car insurance, where the challenges of changing motor insurance market will affect small and motor insurance focused carriers the most. The Paper lists eight key drivers for the change in the insurance market in preparation for autonomous vehicles. The first is integrity of technology describing the current existence of needed technology for autonomous vehicles. The second is capability accessibility as traditional car manufacturers and high-tech companies develop both new autonomous driving features and in case of tech companies, also fully autonomous driving capable vehicles. The third is infrastructure availability as autonomous vehicles may be used in existing roads and the fourth is regulatory permission describing the allowance of autonomous vehicle public road testing in several American states. The fifth driver is legal responsibility as the question of responsibility in an accident involving autonomous vehicle need to be addressed in parallel with advances in autonomous technology. The sixth is consumer adaption as consumer education on potential benefits must precede consumer adaption. The seventh and eight are, respectively, mobility services and data protection. Mobility services, focused on the emergence of mobility on demand, have become more commonly used. Data protection, on the other hand, is a key issue as autonomous vehicles both demand and generate substantial amount of data.

The views of the Paper may be summarized along three main topics. The first one is the alignment of several key ingredients for change, this including regulatory permissions for autonomous vehicles. The second are major shifts within the car insurance industry as accident frequency falls, the expansion of commercial and product liability insurance and by so the shrinking of personal car insurance sector. The writers of the Paper, Jerry Albright, Alex Bell, Joe Schneider, Chris Nyce, believe the aforementioned changes could result in severe market issues, changing business models and new competitors. The third topic of the summary underlines the need for swift action. While the White Paper mainly considers insurers as its audience, it does highlight the need for swift regulatory updates by the European Union.

European Commission has expressed much interest in intelligent transport systems, or road telematics, in road, rail, maritime and inland navigation and air transport. In road traffic,

intelligent transport systems refer to communication and sensor infrastructure, in other words communication technology equipped vehicles communicating from vehicle to vehicle (V2V Communication) and with the infrastructure. Commission deems cooperation between Member States to be vital for continuous cross border services and coordinated EU-level action even more so, as for example common rules on liability build large scale economics driving market change. Intelligent transport systems are vital in the deployment of autonomous vehicles as those vehicles must be able to use them to operate at maximum efficiency and safety and EU-level action is deemed necessary also on this aspect of autonomous vehicles. (European Commission on Intelligent Transport Systems on roads)

The pressure on the Union to issue legislation for autonomous vehicles is also driven by the United States of America. In September 2016, the U.S. Department for Transportation (DOT) and National Highway Traffic Safety Administration (NHTSA) issued a joint paper titled ”Federal Automated Vehicles Policy - Accelerating the Next Revolution in Roadway Safety” ascertaining guidelines for both vehicle performance and regulatory approach. The use of autonomous vehicles is currently legally permitted in the States of Nevada, California and Florida while other 14 states are currently making legislative changes to allow the use of autonomous vehicles. Outside of the USA, also Australia, China and Singapore have taken steps to allow for testing of autonomous vehicles.

As autonomous driving functions lessen and, in the future, perhaps eliminate driver’s liability of traffic accidents, the question of assigned liability becomes critical. The current model of using vehicle liability insurance, paid by the owner or holder of vehicle and covering traffic accidents caused by human error, would not be sufficient. Autonomous driving assigns liability to the causer of traffic accidents e.g. the vehicle, or more importantly the manufacturer of the vehicle or its parts and systems. The car insurance market, currently adding to EUR 123.5bn (2014) in the EU, would therefore undergo a significant change and require clear regulation and legislative demands. The need for EU level legislation should not be understated, as convergent regulation within Member States allows frictionless use of autonomous vehicles and ease of determining the liability and by so need of insurance.

The future of car insurance has been widely discussed and reported in the last years. Financial Times published an article “Cost of car insurance to plunge with rise of driverless vehicles” on 28th of June 2016 discussing the decline of motor insurance covered accidents lowering the price of said insurance products and by so radically also lowering company premiums and

profits. The article claims that, while fully autonomous cars are still in a testing stage, currently increasing popularity of safety features such as marking assistance and blind-spot detection will lower the probability of accidents and therefore lower claims frequency. The article quotes Automous Research, a London based research company, reporting 42 % of worldwide insurance premiums originating from motor insurance. Of accidents, the article claims 90 % are caused by human error. The understanding therefore is, that the average claims probability will fall from 9 % to 2,4 % by 2060. The article further cites Autonomous Research that insurance premiums will fall in the same timeline by over 38 % from $541 to $334 worldwide and, as the worldwide developing speed alters, the UK premiums would fall from 63% causing profits of motor insurance industry by 81 %. The article also cites re-insurance company Swiss Re, writing that the currently market sold safety features will already lower accidents on motorways by 16 % and on other roads by 12 % by 2020. Advanced future information gathering systems in vehicles, that will constantly contact other road users and infrastructure such as road lights, will lower the accidents on motorways 45 % and 28 % on other roads.

The same benefit of autonomous vehicles harnessing also the benefits of connectivity and by so reducing traffic fatalities, is also noticeable in European Union publications. European Commission's Europe on the Move factsheet "Harnessing the Benefits of Automation, Connectivity and Smart Mobility Services" highlights the current fact of 90 % of traffic accidents are caused by human error and the reducing of the percentage by cooperative Intelligent Transport Systems, used by more and more autonomous vehicles.

According to data from Eurostat statistics "Share of the population reporting that they had a road traffic accident resulting in injury, by sex, 2014 (%)" 1,5 % of women and 1,9 % of men in EU-28 countries reported having had a road traffic accident causing an injury in 2014. The percentages differ significantly between Member States. Accidents were most common for men in Malta, Italy and Hungary with a percentage over 2,5. For women the statistics differ to a lesser extent, the most common road traffic accidents were in Slovenia with a percentage of 2,1. In Hungary, Netherlands, United Kingdom, Belgium, Germany and Luxembourg the percentages were second highest for women with 1,9 percent.

According to the Financial Times article the largest change, caused by autonomous vehicles in the insurance industry, will be the fall of personal motor insurance policies and the rise of commercial ones. In other words, motor insurance risk will become systems risks as more and

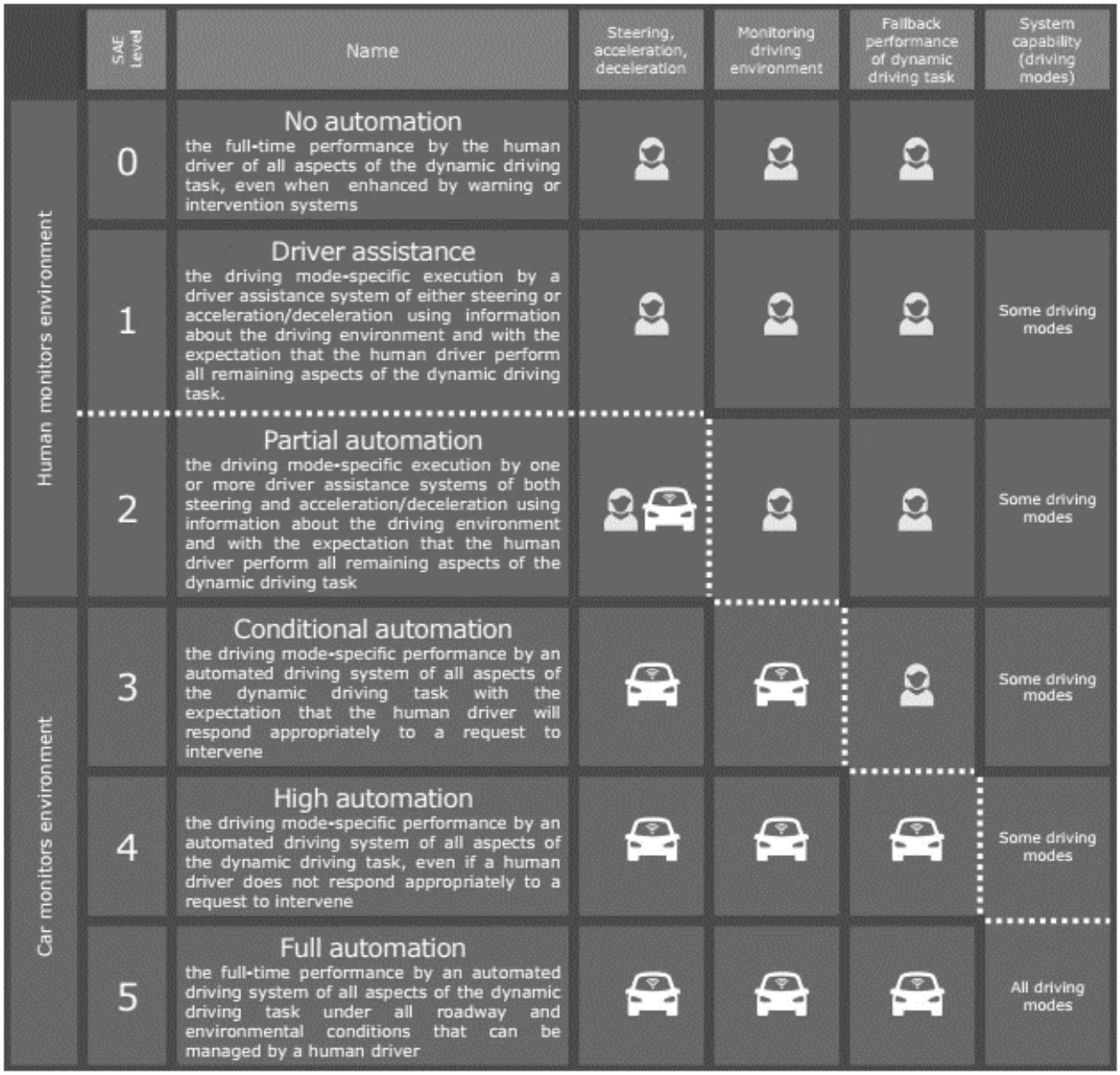
more accidents will not be the faults of human error, but a technical failure at the risk of the manufacturer.

Autonomous vehicles are a highly international issue, not in the least as technical requirements for vehicles as well as international traffic rules are agreed at United Nations level. The Union takes this a few steps further as insurance law is part of European Union legislation and the Union has already addresses autonomous vehicles. Both the European Parliament and the European Commission have published their early briefings on these issues.

1.1 Autonomous vehicles – an Explanation

Autonomous and automated vehicles are generally classified using a six-level system developed by International Society of Automotive Engineers' (SAE). The Levels of Driving Automation classifies vehicles at level zero (0) to have no automation and in levels one (1) and two (2) the monitoring of environment is in the driver's responsibility. Both level one "driver assistance" and level two "partial automation" vehicles contain some driving modes and in the level two vehicles steering, acceleration and deceleration may be performed by the vehicle. In this aspect the level two vehicle differs from level one, as level one vehicles may operate independently on either steering or acceleration and deceleration. Many currently manufactured vehicles may be classified as level one or level two. Example of level one automation is adaptive cruise control capable of adjusting speed based on following distance. Level two vehicles may contain, for example, active lane-keeping assist feature.

Vehicles in levels 3-5 may be classified as environmental monitoring as the responsibility shifts from the driver to the vehicle. In level three (3) "conditional automation" vehicles all driving tasks may be handled by the vehicle, however driver is expected to respond to request to intervene or take operational control. Level four (4) "high automation" vehicles are capable of all driving tasks, even if driver does not respond appropriately to request to intervene. Level five (5) vehicles are classified as "full automation" and are capable for all driving tasks in all environments.



Source: Adapted from SAE Standard J3016 (SAE, 2014).

Figure 2: Levels of Driving Automation by International Society of Automotive Engineers' (SAE) (source: OECD Automated and Autonomous Driving – Regulation under Uncertainty)

The currently available levels of automation do not require change to the regulative approach of motor liability as the driver is responsible for monitoring the environment. However, when vehicles capable of level three automation are used, the responsibility shifts to the vehicle. Traffic accidents would increasingly be on the responsibility of the vehicle and its manufacturer(s) and new legislation is needed for both traffic regulation, vehicle technical requirements and liability matters.

1.2 Vienna Convention of Road Traffic

While Member State level and European Union level legislation and regulation is generally understood as the most important aspects of Motor Legislation, the role of the United Nations is less so. In any case the role of the organization and especially of its international treaties on the subject of road traffic is significant in connection with autonomous vehicles. The Vienna Convention of Road Traffic, especially, is meaningful for the development of autonomous vehicles.

Vienna Convention on Road Traffic, often called the Convention on Road Traffic, is an international treaty on common traffic regulations and is binding on the signatory states. The Convention was prepared and opened for signatures by the United Nations Economic and Social Council's Conference on Road Traffic. The Conference was held at Vienna from 7 October to 8 November in 1968. The Convention entered into force on 21 May 1977. (United Nations Treaty Collection on Convention on Road Traffic)

The Convention has 36 signatories and 76 parties, bringing the total number of abiding countries to 112. The European Union has also ratified the Convention. Therefore, the Convention is binging on all EU Member States, even should they not have ratified the treaty. The case of Great Britain is currently unclear due to ongoing Brexit negotiations, as Great Britain has not ratified the treaty and has only been subject to it as a Member State. Several of the world's largest countries, United States of America, China, India and Australia among other states, have not ratified the treaty. (United Nations Treaty Collection on Convention on Road Traffic). The Convention is administered by the Working Party on Road Traffic Safety (WP.1) of the United Nations, alongside the 1968 Convention on Road Signs and Signals (European Parliament Briefing on ″Automated vehicles in the EU" (2016)).

The issue of the Treaty in connection to autonomous vehicles is the question of the driver responsible for the operation of their vehicle. The original Convention reads in the Article 8, paragraph 1:" Every moving vehicle or combination of vehicles shall have a driver." and the paragraph 5 of the same Article: "Every driver shall at all times be able to control his vehicle or to guide his animals." The Article 39 is also relevant, having in paragraph 1:" Every motor vehicle, every trailer and every combination of vehicles in international traffic shall satisfy the provisions of Annex 5 to this Convention. It shall also be in good working order." In these Article the Convention clearly states that every motor vehicle must have a driver, the driver

must be in command of the vehicle and the vehicle must support these requirements. These requirements do not support or allow for autonomous driving features in cases of them operating the vehicle without commands from the driver. (Treaty Series Volume 1042: United Nations Convention on road traffic)

As the Convention in its original form severely limited development and testing of autonomous driving features and vehicles as amendment was proposed in 2015 by Belgium, Germany, Italy, France and Austria (Reuters "Cars could drive themselves sooner than expected after European push" 19.5.2014). The amendment was passed on 8 April 2016 and while it does not affect driver responsibility, vehicles may be equipped with driving assistance systems that are not able to be affected by the driver. The systems must fulfill given technological requirements. Systems may also be overridden, such as is the case with lane crossing/departure warnings and adaptive cruise control systems. (Ministry of Transport and Communications (Finland) "International Convention on Road Traffic promotes automation" 17.3.2016)

1.3 UNECE World Forum for Harmonization of Vehicle Regulations

As the Vienna Convention on Road Traffic is a binding international agreement for the European Union, the UNECE World Forum for Harmonization of Vehicle Regulations (WP.29) is forum for discussions of technical matters. The WP.29 operates within the institutional framework of the UNECE Inland Transport Committee under three separate United Nations Agreements. The aim of the WP.29 is, between Contracting Parties (the Member States), to establish regulatory instruments for motor vehicles and any equipment associated with motor vehicles (UNECE on WP.29 – Introduction). The Contracting Parties of the WP.29 include 53 countries and the European Union. All European Union countries are signatories alongside the Union (UN 1958 Agreement).

The three agreements, under which the WP.29 operates, are the UN Regulations, annexed to the 1958 Agreement, United Nations Global Technical Regulations (UN GTRs) associated with the 1998 Agreement and UN Rules annexed to the 1997 Agreement. The 1958 Agreement is officially called the 'Agreement concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these United Nations Regulations'. The 1998 Agreement is the 'Agreement on UN Global Technical Regulations (UN GTRs)' and the 1997 Agreement is called the 'Agreement Concerning the Adoption of Uniform Conditions for Periodical

Technical Inspections of Wheeled Vehicles and the Reciprocal Recognition of Such Inspections'. (UNECE on WP.29 – Introduction)

The UN Regulations contains provisions on aspects of safety and environment, including both performance-oriented test requirements and administrative aspects. The administrative aspects include procedures for type approval, conformity of standards in production and mutual recognition of type approval. The UN GTRs contain testing procedures and globally harmonized performance-related requirements in order to provide a stable and predictable regulatory framework for consumers, manufacturers and the complete industry and any associations of either. The UN Rules contain guidelines for periodical technical inspections for vehicles in use and conditional acceptance of Contracting Parties of international inspection certificates when granted in compliance with the UN Rules. (UNECE on WP.29 Introduction)

The WP.29 operates as part of the UNECE Inland Transport Committee (ITC). ITC hosts 11 different working groups. The ITC is part of the United Nations Economic Commission for Europe as one the United Nations five regional commissions. The regional commissions are administered by the Economic and Social Council (ECOSOC), one of the six principal organs of the United Nations (United Nations Economic Commission for Europe "World Forum for Harmonization of Vehicle Regulations (WP.29) – How it Works – How to Join it – Third Edition"). The Figure 3 illustrates the organizational structure of the United Nations in regard to the WP.29. The figure does not represent all UN activities or complete organizational structure.

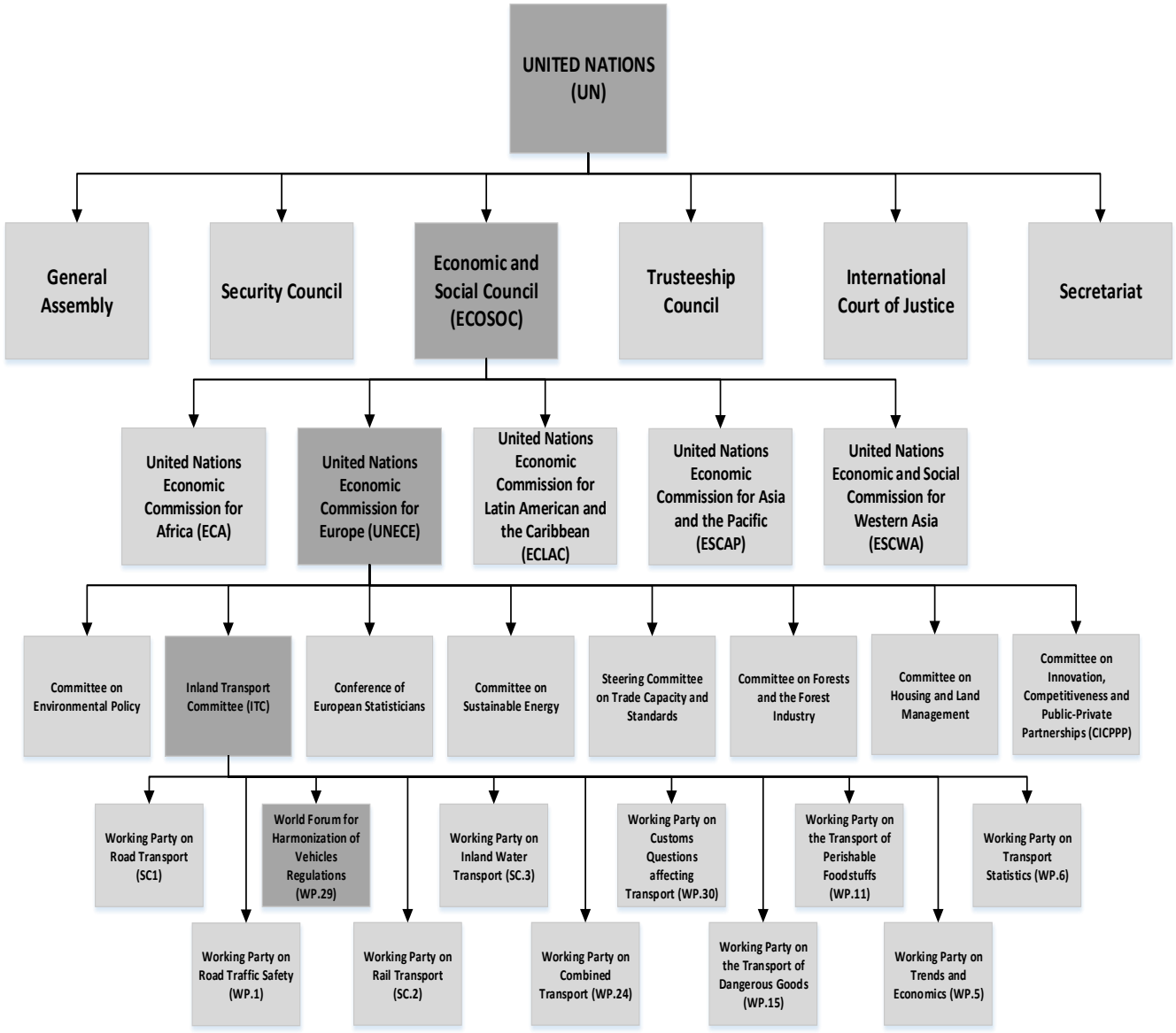


Figure 3: The Structure of United Nations and the World Forum for Harmonization of Vehicles Regulations (WP.29) (source: United Nations Economic Commission for Europe "World Forum for Harmonization of Vehicle Regulations (WP.29) – How it Works – How to Join it – Third Edition", UNECE on Governance and organizational structure, UNECE on Inland Transport Committee (Introduction))

1.4 European Union Law

The roles of European Union law and the Union itself for autonomous vehicles legislation and regulation are diverse and therefore it is important to understand the development of EU law as a basis for any future extrapolation. The organizational bodies of the Union each have a key

direct or indirect role in the development of the legislation or its application and the principles of EU law portray the ideals of any passed legislation.

European Union is an omni-competent organization dominating political and legislative agenda within its Member states and also of states having relation with the EU (Szyszczak & Cygnan 2005). The name is generally used as an umbrella term to cover all activity within the Union (Szyszczak & Cygnan 2005).

European Union law has developed during the last seventy years. The economic agenda of the European Coal and Steel Community (ECSC) has expanded itself and incorporated also political and military matters. The Union itself has also expanded from the six founding members of Germany, France, Italy, Netherlands, Belgium and Luxembourg in 1957. The criteria for joining the Union encompasses economic, political and legal aspects and several negotiating steps (European Union website of Enlargement). The then European Communities were expanded in 1973 when three new members, Denmark, Ireland and the United Kingdom, joined. Greece joined in 1981 and Portugal and Spain in 1986. In 1995 Austria, Finland, Sweden joined the European Union as the Maastricht Treaty had incorporated the Communities under the term Union. In 2004 the Union expanded radically as several of the former Communist countries joined the Union. The ten new Member States were Estonia, Latvia, Lithuania, Poland, Slovakia, Slovenia, Hungary, Czech Republic, Cyprus and Malta. Bulgaria and Romania joined in 2007 and Croatia in 2013 bringing the number of Member States to 28 (European Union website on EU Countries). In June 2016 the United Kingdom held a referendum on whether the country would stay or exit the Union and the majority voted for the countries exit by 51.9 %. The United Kingdom is scheduled to depart on 29 March 2019 and withdrawal negotiations are in progress (BBC).

The institutional framework of the European Union originates from the European Coal and Steel Community. The framework of tripartite system consisting of the Council of Ministers, the Commission and the European Parliament remains the main policymaker and lawmaker, however the roles of the bodies have been refined and new bodies have been added to better balance decision-making (Foster 2016).

The main principles governing EU law are principles of conferral, subsidiarity and proportionality. The principles of supremacy of EU law and legal certainty are also relevant. The main legislation procedure of Union legislation is the ordinary legislative procedure in

which both the European Parliament and the Council of the European Union have equal legislation power.

1.4.1 History

The legislative agenda of the Union has developed gradually. The history of legislation in the EU can be traced to 1945, when French political economist Jean Monnet argued for a federal Europe in order to avoid another great European war. The first Treaty to be signed was the Treaty of London founding the Council of Europe in 1948. The Council of Europe's main tasks were determined to be to foster European unity and focus on human rights. One of the most significant achievement of the Council has been the European Convention on the Protection of Human Rights and Fundamental Freedoms (ECHR). European Court on Human Rights interprets the EHCH and has provided a uniform standard on human rights to all signatories (Szyszczak & Cygnan 2005). As the political climate of Europe lacked trust after the resent Second World War the Council of Europe as a human rights organization did not have the same stigma as, for example, military cooperation.

The Union itself was founded in 1957 around the fundamental idea of economic cooperation. French Foreign Minister Robert Schuman introduced eponymous Schuman Plan on May 9, 1950 with the principle idea of gathering German coal and French steel under control of supranational institution and by so both preventing the use of them in military pursuits. Schuman also recognized the need for larger economical scale of both coal and steel production to become independent of the economic assistance of United States (Marshall Aide) (Szyszczak & Cygnan 2005). The European Coal and Steel Community (ECSC) was founded in 1952 (treaty signed in 1951) in accordance of the Schuman Plan, allowing economic collaboration and free trade of coal and steel. The countries joining the Treaty were, apart from Germany and France, the Benelux countries of Netherlands, Luxemburg, and Belgium and also Italy (Szyszczak & Cygnan 2005). Germany's (Federal Republic of Germany or West Germany) Chancellor Konrad Adenauer had readily accepted the idea of supranationalism in coal and steel production. Italy on the other hand wished for both economic benefits and believed the European Coal and Steel Community to offer resistance to Communism in the country. The Benelux countries had, before the Robert Schuman introduced the idea, moved on with mutual customs union and believed the Community to offer economic benefits (Foster 2016).

The main significance of the Treaty was the transferring of competence in decision making to supra-national institutions and by so the surrender of sovereign legal powers (Szyszczak & Cygnan 2005). The ECST combined both intergovernmentalism and supranationalism in the integration (Foster 2016). The Treaty established a High Authority under the control of a President, a Council of Ministers, an Assembly of national parliamentary representatives of ECSC countries and a Court of Justice. At this stage, the Council of Europe remained a forum for discussion, however the Treaty had established a formal decision-making structure and the Court of Justice had the power to enforce the Treaty and secondary legislation. Elements of also political integration were by so introduced to ECSC Member States (Szyszczak & Cygnan 2005).

In the following years the European Coal and Steel Community was deemed a successful venture and it had provided the six Member States an operating structure (Szyszczak & Cygnan 2005). In 1955 Messina Conference, the former Prime Minister of Belgium and President of the Common Assembly of the European Coal and Steel Community, Paul-Henri Spaak as the chairman of a committee in charge of the preparation of a report on the creation of this common European market (the Spaak Committee) proposed, in the created Spaak Report, new common objectives for integration. The Benelux countries were in favor of integration through a common market and in sectors of transport and atomic energy. The Intergovernmental Conference on the Common Market and Euratom was held in 1956 and led to the six founding counties signing of the Treaty of Rome in 1957 founding the European Economic Community (EEC) and the European Atomic Energy Community (Euratom) (European Commission Report: Paul–Henri Spaak: a European visionary and talented persuader). Both Communities came into force in 1958 and followed the institutional structure of the ECSC establishing, as new institutions also a Commission and a Council of Ministers. The Assembly and the Court of Justice served all three Communities (Szyszczak & Cygnan 2005).

The benefits of economic cooperation in the form of free trade were also seen in non-EEC countries. A separate agreement of European Free Trade Association (EFTA) was established in 1960 as an alternative and was largely lead by the United Kingdom as it had not wished to join the Franco-German dominated EEC. The founding members of EFTA were United Kingdom, Austria, Denmark, Norway, Portugal, Sweden and Switzerland. Finland joined in 1961, Iceland in 1970 and Liechtenstein in 1991. (Website of EFTA: EFTA through the years). Several of the EFTA countries have later joined the EEC (later European Union) and the current Member States are Iceland, Liechtenstein, Norway and Switzerland. However, from a

legislative perspective the EFTA has significance as EFTA countries operate in the Internal Market (creating European Economic Area EEA) and the therefore relevant EU acts are continuously incorporated into governing EEA Agreement (EEA document: How EU acts become EEA acts and the need for adaptations).

In the 1960s the it became apparent that the three Treaties of European Coal and Steel Community, European Economic Community and European Atomic Energy Community presented administrative challenges. Therefore, the Merger Treaty in 1965 (coming into force 1967) merged the High Authority of the ECSC and Commissions of the EEC and Euratom into one body, the European Commission. The Treaty also provided that there would be one Council of Ministers as the main decision-making body and the Assembly was changed into European Assembly electing its MEPs for the first time in 1979 (Szyszczak & Cygnan 2005).

The 1960s and 1970s have been described by the term "Eurosclerosis" as integration was slow due to rise in national self-interest. During the hiatus, the European Court of Justice could, however, ensure the foundations for an economic constitution. Economic integration was, in any case, deemed a necessary precursor for later political integration. In 1984 the Intergovernmental Conference (IGC) accepted the 1985 White Paper on the Completion of the Internal Market. The White Paper explored the benefits of using the principle of mutual recognition (Court of Justice Cassis de Dijon judgement 1979) and by so introduced minimum standard harmonization instead of highly technical maximum standard legislation. The Single European Act (SEA) of 1987 then gave a fixed deadline of December 31, 1992 to for the completion of the Internal Market and restricted the national veto, replacing it with qualified majority voting (GMV) (Szyszczak & Cygnan 2005).

In 1989 the European Council held two intergovernmental conferences (IGC) to examine future steps for European integration. The first of the ICGs considered the next objectives of European Monetary Union (EMU) and concluded that the adoption of single European currency would enhance the possibilities offered by the completion of the Internal Market. The second IGC addressed political integration, especially in matters concerning foreign affairs, defense and immigration (Szyszczak & Cygnan 2005).

The Treaty of Maastricht in 1993 (signed in 1992), also called the Treaty on European Union, integrated the outcomes of the two intergovernmental conferences of 1989 introducing intergovernmental cooperation in foreign policy and justice along with home affairs. A three-pillar model was created to describe the newly formed European Union (EU) (Szyszczak &

Cygnan 2005). The pillar model consisted of economic, social policy and environmental cooperation by European Community (EC), common foreign and security policy (CFSP) and cooperation in the fields of justice and home affairs (JHI). The first pillar used a community integration method, with in other words decision power was on EU level, while in matters concerning the second and third pillar the decision power was n national level. The second and third level pillar used intergovernmental cooperation method. (European Parliament: Fact Sheets on the European Union – 2017 - The Maastricht and Amsterdam Treaties).

The democratization of former Soviet Eastern Europe raised the question of Eastern enlargement and the possibility of it hindering the efforts of closer political integration between existing Member States. An intergovernmental conference was held in 1996 and, as both enlargement and closer political integration were deemed necessary, the IGCs task was to consider the next steps in attaining both objectives.

The Treaty of Amsterdam (amending the Treaty on European Union, the Treaties establishing the European Communities and certain related acts) entered into force 1997 (signed in 1997) affirmed many of the Maastricht Treaty developments, established commitment to enlargement and gave the date for formal opening the talks in March 1998. The Treaty gave special prominence to balanced and sustainable development and high levels of employment in the form of a mechanism to coordinate Member States' employment policies. Previously in the Treaty of Maastricht incorporated third pillar Agreement on Social Policy was moved to the first pillar and therefore matters such as asylum, immigration and crossing of external borders, fighting fraud, customs cooperation and judicial cooperation in civil matters were brought to community integration method (European Parliament: Fact Sheets on the European Union – 2017 - The Maastricht and Amsterdam Treaties). A previously outside the Union formed Schengen Agreement was also incorporated into the EC pillar. Schengen Agreement allowed free movement of Schengen country nationals in the Schengen area along with non-Schengen nationals once they had entered the Schengen area.

The Treaty of Nice was preceded by The Nice Intergovernmental Conference in February 2000 and a summit in December 2000. The preparatory meeting during the Nice IGC were considered to be relatively straightforward, however the summit proved to be a different matter. The challenges in negotiations centered around the extensions for qualified majority voting (GMV) for 27 more Treaty Articles (although the Commission had proposed the extension to more Articles), voting weight in Council and the size of the Commission (Foster 2016). The Nice

Treaty came into force in 2003 after being rejected by an Irish referendum in 2001, before being accepted by a second referendum in 2002. The question of mistrust by citizens of the Union resulted in a Declaration included in the Treaty to "reconnect" with citizens and place individuals to the center of integration (Szyszczak & Cygnan 2005). The main structural changes brought by the Treaty centered around enlargement. The maximum number of seats and their allocation in the European Parliament, the number of votes allocated to Member States in the Council and the qualified majority voting threshold were altered to suit the enlargement (European Commission: Summary of the treaty of Nice). The Treaty of Nice was negotiated at an important moment for EMU as well, as Euro became the single European currency in financial transactions in 1999 and Euro notes and coins entered circulation in 2002 (Szyszczak & Cygnan 2005).

European Union constitution was considered during 2001-2007. Laeken Summit in December 2001 first set up the agenda of a 'Convention on the Future of Europe' and laid the goals for a more democratic, transparent and efficient EU in a Declaration. Moreover, the governance of the Union, institutional preparations for expansion, division of competences and democratic participation in the decision-making process for the Union would be given more attention. In addition, simplifying the Treaties, numerous Protocols and Declarations, determining the status of the Charter of Fundamental Rights, better defining and understanding the principle subsidiarity and addressing the importance of national parliaments to the legitimacy of the Union. The Convention was then charged with creating a Constitutional Treaty for the European Union. (Foster 2016)

The Constitutional Treaty for Europe was created by the aforementioned principles, featuring also a new President for the European Council, a Foreign Minister and a smaller Commission. The Qualified Majority Voting numbers (QMV) in the Council were, however, again an argued matter along with the number of Commissioners. These challenges were overcome after the ten new Member States and low turnout at the European Parliament Elections on June 2004 underlined the need for compromises. The Constitutional Treaty was signed in October 2004 by all Member States, however at the ratifying state (either by parliamentary approval, referendum or both) the electorates of France and Netherlands rejected the Treaty in 2005.

The Constitutional Treaty was reconsidered in a summit in Brussels in June 2007, however the summit agreed the abandon the Treaty and replace it. A new amending Treaty was named the Reform Treaty and was to be signed in Lisbon in 2007. Many of the original features of the CT

Treaty were incorporated into the new Treaty, however the most important aspects were the changes to the Treaty of Maastricht renaming it the Treaty of the European Union and changes to the Treaty of Rome renaming it the Treaty on the Functioning of the European Union. (Foster 2016)

The Lisbon Treaty, as the Reform Treaty was later known, faced ratification challenges in Ireland in June 2008 as Irish voters voted against the Treaty. The Treaty was renegotiated and Ireland was promised respect on the country's taxation policies, military neutrality and ethical issues. A new compromise of the number of Commissioners was reached and it was greed that every Union country would have one. This was controversial to the Treaty itself. Challenges were also resolved in regard to Germany's, Czech Republic's and Poland's constitutional matters and the delay in ratificating the Treaty in Poland and Czech Republic by countries Presidents was overcome. The Lisbon Treaty was ratified by all countries in November 2009 and entered into force on 1 December 2009. (Foster 2016)

The main changes of the Lisbon Treaty can be divided into five categories. Firstly, the Union became a legal personality, the word 'Community' was replaced by the word 'Union' and the Treaty of the European Community (EC Treaty) was renamed as the Treaty on the Functioning of the of the Union. Secondly, the proposed Union Minister for Foreign Affairs was renamed as the High Representative of the Union for Foreign Affairs and Security Policy. Thirdly, the European Council was established as a full institution and a European President was introduced. Fourthly, the names and types of secondary law were kept, however the definitions of Regulations, Directives and Decisions were slightly altered. Fifthly, the Charter on Fundamental Rights became legally binding, although with an opt-out for its internal application. The Declaration 53, including the Charter, became attached to the Treaties.

Treaty	Year Treaty	Year Treaty Into	Coutries in Treaty	Established by the Treaty	Major Changes	Notable
The Treaty of Paris (Treaty establishing the European Coal and Steel Community)	1951	1952	Germany, France, Italy, Netherlands, Belgium, Luxembourg	High Authority under power of President, Council of Ministers from Member States, an Assembly of national parliamentary representatives and a Court of Justice	Coal and steel production from Member States under supranational authority	
Treaties establishing the European Defence Community and European Political Community	n/a	n/a	Germany, Italy, Netherlands, Belgium, Luxembourg	n/a	Military, Political control and Foreign Policy incorporation	not passed due to France not ratifying
The Treaties of Rome (the Treaty establishing the European Economic Community and the Treaty establishing the European Atomic Energy Community)	1957	1958	Germany, France, Italy, Netherlands, Belgium, Luxembourg	Commission and a Council of Ministers, Common Market, Customs Union, Joint Policies on common agriculture policy, common trade policy, transport policy, social policy, coordination on nuclear energy	Common Market with free movement of people, goods, services and capital, Customs Union with common external tariff on imports from outside the EEC, coordination on reserach on nuclear energy	The Treaty establishing the European Economic Community has been amended several times, after Lisbon Treaty named the Treaty on the Functioning of the European Union
The Merger Treaty	1965	1967	Germany, France, Italy, Netherlands, Belgium, Luxembourg,	High Authority of ECSC and Commission of EEC merged into European Commission, Council of Ministers of ECSC and EEC merged into one body, the Assebly renamed the European Parliamentary Assebly (European Parliament) with direct election of MEPs	The European Parliament electing its MEPs with direct elections (first in 1979)	
The Single European Act	1986	1987	Germany, France, Italy, Netherlands, Belgium, Luxembourg, Denmark, Ireland, UK, Greece, Portugal, Spain	European Council, deadline for the completion of the Single Market by 31 December 1992, Court of First Intance (later General Court)	Qualfied Majority Voting (not unanimity) in Council on subjects relating to Single Market (excluding taxation, ovement of persons, rights and interests of employed persons), more legislative power to European Parliament and the European Commission, Court of Justice	
The Treaty of Maastricht on European Union	1992	1993	Germany (East-Germany and West Germany reunified in 1990), France, Italy, Netherlands, Belgium, Luxembourg, Denmark, Ireland, UK, Greece, Portugal, Spain	European Union consisting of three pillars (European Community (EC), common foreign and security policy (CFSP) and cooperation in the fields of justice and home affairs (JHI)), European Monetary Union (EMU) and in stages single European Currency and Central European Bank (CEB), EU citizenship, principle of subsidiarity	more legislative power to the Parliament, new policy areas of trans-European networks, industrial policy, consumer protection, education and vocational training, youth, culture, Social Protocol	UK opt out from Social Protocol
The Treaty of Amsterdam (amending the Treaty on European Union, the Treaties establishing the European Communities and certain related acts)	1997	1997	Germany, France, Italy, Netherlands, Belgium, Luxembourg, Denmark, Ireland, UK, Greece, Portugal, Spain, Austria, Finland, Sweden	Schengen Agreement, mechanism to coordinate Member States' employment policies	Agreement on Social Policy to EEC pillar and community integration method, commitment to eastern enlargement (formal opening of talks in March 1998),	
The Treaty of Nice	2001	2003	Germany, France, Italy, Netherlands, Belgium, Luxembourg, Denmark, Ireland, UK, Greece, Portugal, Spain, Austria, Finland, Sweden		changes to Qualified Majority Voting, changes to operation and organization of European Courts	

Treaty	Year Treaty Signed	Year Treaty Into Force	Coutries in Treaty	Established by the Treaty	Major Changes	Notable
The Constitutional Treaty for Europe	2004	n/a	Germany, France, Italy, Netherlands, Belgium, Luxembourg, Denmark, Ireland, UK, Greece, Portugal, Spain, Austria, Finland, Sweden, Cuprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia	President of the European Council and Foreign Minister	smaller Commission, formal inclusion of Charter of Human Rights, simplified legislative tools, more involvement for national parliaments	Treaty rejected by electorates of France and Netherlands in ratification stage and Treaty later replaced by Treaty of Lisbon
Treaty of Lisbon (the Reform Treaty)	2007	2009	Germany, France, Italy, Netherlands, Belgium, Luxembourg, Denmark, Ireland, UK, Greece, Portugal, Spain, Austria, Finland, Sweden, Cuprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia, Bulgaria, Romania	High Representative of the Union for Foreign Affairs and Security Policy (Union Minister for Foreign Affairs), Charter of Human Rights as legally binding,	three pillar model of the EU replaced by consodilated legal personality of the EU, Ec Treaty renamed The Treaty on the Functioning of the European Union, changes in the types and names of secondary law	opt out from Charter of Fundamental Rights by UK, Czech Republic and Poland

Table 1: The History of the Treaties of the European Union (source: Foster 2016, 7-32 & Szyszczak & Cygnan 2005, 4-17 & Summary of the Treaty of Rome & Summary of Treaty establishing the European Atomic Energy Community & Summary of Treaty of Maastricht)

1.4.2. The Roles of the Commission, the Council of Ministers of the European Union, the European Council, the European Parliament and the European Court of Justice

The structure of the European Union has been often discussed for its complexity and non-democratic processes. Changes to the structure and legislative processes were made in the Lisbon Treaty in 2009, particularly in strengthening the position of the European Parliament.

The main decision-making structure of the Union involves the European Commission, the Council of Ministers of the European Union and the European Parliament. To crossly simplify, the Commission initiates new legislative measures that are then co-decided by the Council and Parliament and implemented by the Commission. The Commission then ensures the compliance of implemented legislation and has to power to take member States or other Union institution to the European Court of Justice. The European Council offers general policy guidelines and the European Court of Justice independent courts on EU legislation.

The Commission has the role of executive administrator and proposer of legislation for the European Union. Article 17 of the Treaty on the European Union tasks the Commission to

promote general interest of the Union and take initiatives to reach this goal. The Commission is collectively responsible for all decision taken, although proposals are prepared by a Commissioner and their Directorate (Foster 2016). The Commission is composed of political leadership provided by 28 Commissioners and staff that is organized into specific policy areas called Directorates-General (DG). (European Union on European Commission, Overview)

The main functions of the Commission can be divided into six sections (Foster 2016, 45-46). The first one can be described as the demand to ensure that provisions of Treaties and taken measures of the institutions are the Treaties are applied in the Communities. The Commission has the task of bringing breaches to Treaties by Member States to the European Court of Justice under Article 258 of the Treaty of the Functioning of the European Union. Breaches by other institutions are processed under Article 263 and individuals, such as companies, under various provisions of the Treaty and relevant secondary law.

Secondly the Commissions is tasked to formulate and propose policy initiatives and legislative proposals in the form of opinions and recommendations. The basis of policy initiatives and legislative proposals may be provided by the Treaty on the Functioning of the European Union or the demand for one may be otherwise considered necessary by the Commission. The Commission has the sole right to propose legislation as provided in the Article of 172 of the Treaty of the European Union, however the Commission may be requested to submit proposals by the Council of Ministers as provided by the Article 241 of the Treaty on the Functioning the European Union, by the European Parliament as provided by the Article 225 of the Treaty or by the European Citizens' Initiative as provided by the Articles of 11 and 24.

The third section of the main functions of the Commission considers the limited power of the Commission for independent decision-making in participation of shaping of measures by European Parliament or the Council of Ministers. The Article 211 of the Treaty establishing the European Community was the proving act, however the Article was replaced by the Lisbon Treaty and was not directly replaced. Nevertheless, as the Commission is tasked to take appropriate measures promoting the general interests of the Union, the power has not been removed (Foster 2016, 46).

The fourth section considers implementation of non-legislative and otherwise termed administrative or Regulatory acts conferred by the European Parliament of the Council of Ministers as provided by the Articles 290 and 291 of the Treaty on the Functioning of the European Union. Implementing powers are regulated by regulation 182/2011 and supervised

by committees determined by the Council of the European Union as provided by the Article 291 of the Treaty on the Functioning of the European Union (Foster 2016, 46).

The fifth section of the main functions of the Commission considers the responsibility of the Commission for the external representation of the Union. The Commission is also responsible for the negotiation of international agreements as provided by Articles 207 and 2018 of the Treaty on the Functioning of the European Union. The exception to this is the Common Foreign and Security Policy (CFSP) as the High Representative has the responsibility (Foster 2016, 46). The sixth responsibility of the Commission is the leading role in drawing of the European Union's annual budget as provided in the Articles 314-316 of the Treaty on the Functioning of the European Union and its implementation as provided in the Articles 317-319 (Foster 2016, 46).

The Council of Ministers of the European Union, often called the Council, is the main legislative organ of the European Union. Before the Lisbon Treaty the Council had more legislative power, however the Treaty changes legislative processes affording the European Parliament more power. The Council's composition, functions and tasks are outlined in the Article 16 of the Treaty on European Union and in the Articles 237-243 of the Treaty on the Functioning of the European Union (Foster 2016, 47).

The Council consists of Member State ministers and has ten different configurations. They are divided by subject and are Agriculture and fisheries, Competitiveness, Economic and financial affairs, Environment, Employment, social policy, health and consumer affairs, Education, youth, culture and sport, Foreign affairs, General affairs, Justice and home affairs and Transport, telecommunications and energy (European Council on Council Configurations). The General Affairs Council coordinates other Council configurations and is attended by Foreign Ministers. The Foreign Affairs Council is coordinated and chaired by the High Representative and does not enjoy legislative powers. In other configurations the subject of the Council meeting determines the attending Member State minister. The ministers must be authorized to act on behalf of their State and commit their State to discussions and votes (Foster 2016, 47).

The main tasks of the Council center around the general requirement for legislative policymaking and coordination of the Union's functions. Together with the European Parliament the Council exercises legislative and budgetary functions. Under Articles 290 and 291 of the Treaty on the Functioning on the European Union the Council has the power to make decisions and, together with the European Parliament, delegate certain decision-making and

implementing powers to the European Commission. The Council has general power to enact legislation, particularly in regard to the functioning of the Internal Market. An example of this is the power to adopt provisions on harmonization of legislation concerning turnover taxes, excise duties and other indirect taxes as provided by the Article 113 of the Treaty on the Functioning of the European Union (Foster 2016, 47, 53).

The Council is chaired by a presidency, which is a six-month long period held by each Member State in turn. The President of the Council coordinates the Council's work. In order for continuity of the Council, the current President coordinates with the previous and succeeding President forming an 18-month rolling Council governance. The words 'Troika' and 'Trio' have occasionally been used of the three Presidents (Foster 2016, 48).

The legal base of enacted legislation depends on the Treaty provision in question. The Council's secondary legislation decision and enacting powers are shared with the European Parliament and the co-decision procedure is the most common decision-making procedure. The Council has several voting procedures as a part of decision-making procedures. Unanimity demands all Member States to agree, simple majority voting demands an arithmetic majority and the Qualified Majority Voting (QMV) demands 260 votes of possible 352 must be reached. The votes were assigned to Member States in the Lisbon Treaty taking into account Member States' population, Gross Domestic Product (GDP) and also size in order to protect smaller Member States Foster. Most Council decision are reached by consensus or a simple majority 2016, 50-53).

The European Council became a full Union institution in the Lisbon Treaty as provided by Articles 13 and 15 of the Treaty on European Union. The European Council consists of 28 heads of state and government, the European President, The President of the European Commission and the High Representative for foreign affairs. The last three do not enjoy voting rights as provided by Article 235(1) of the Treaty on the Functioning on the European Union. The task of the European Council is to provide impetus for development and general political guidelines (Article 4 of the Treaty on European Union).

The European Council President, also called the European President, is an office created in the Lisbon Treaty. The President is elected by the European Council with Qualified Majority Voting system for a period of two-and-half years with possibility for one renewal. The President chairs the European Council, cooperates with the European Commission and General Affairs Council in organizing the work of the European Council, reports European Council meeting to

the European Parliament (Article 15(6) of the Treaty on European Union) and oversees the external representation of the Union (Foster 2016, 55).

The High Representative of the Union for Foreign Affairs and Security Policy coordinates Union's external relations. The High Representative is chosen among proposed Commissioners, elected by the European Council by Qualified Majority Voting system and becomes a Commission Vice-President as provided by Article 18 of the Treaty on European Union. The tasks of the High Representative include conducting of Common Foreign and Security Policy, chairing Council's foreign affairs meetings, attending relevant European Council meetings and leading the Commission in external relations (Foster 2016, 55-56)

The European Parliament is a directly elected parliamentary institution. The Parliament is governed by Article 14 of the Treaty on European Union and Articles 223-234 of the Treaty on the Functioning on the European Union. The number of Members of the European Parliament (MEPs) was fixed to 750 and the President by the Lisbon Treaty. MEPs are organized to cross-border political groups, of which there are currently seven. The number of MEPs of each Member State should be proportionate to the population of the State, however a political deal concerning Qualified Majority Votes and number MEPs has slightly disrupted the system (Foster 2016, 57).

The functions of the European Parliament comprise of being the forum for discussion and debate, holding legislative power jointly with the Council in close to 90 % in lawmaking and also budgetary functions. This co-decision procedure, sometimes called the 'ordinary legislative procedure' is also used in areas of freedom, security and justice. Moreover, the Parliament has the power of consent in accession of new Member States, entry of the Union into association agreements, the European Court of Human Rights and international agreements. Articles 49 of the Treaty on European Union and the Article 218 of the Treaty on the Functioning of the European Union govern these powers. The Parliament can veto delegated acts (Foster 2016, 57-60).

The Court of Justice of the European Union (CJEU) is comprised of the Court of Justice, the General Court and specialized courts. The Court of Justice has one judge from each Union Member State and 11 general advocates. The Court of Justice considers requests for preliminary rulings from national courts, appeals and certain actions for annulment. The General Court currently has 49 judges; however, the number will rise to 58 in 2019. The General Court rules on annulments by individuals, companies and Member State governments, mainly in areas of

trade, competition law, trademarks, State aid and agriculture. The general tasks of the Court of Justice of the European Union are interpreting and enforcing European Union law, annulling Treaty or fundamental rights violating EU law, ensuring EU institutions in taking action where required by Treaties and sanctioning EU institutions (European Union on Court of Justice of the European Union).

1.4.3 Main Principles and Procedures of EU Law

The main principles of European Union law are the principles of conferral, subsidiarity and proportionality. The principle of conferral refers to Union acting only within limits of the competencies of the Treaties (Article 5 of the Treaty on European Union). Subsidiarity principle addresses Union acting in non-exclusive competence areas in only, should member State level action not be deemed sufficient (Article 5 of the Treaty on European Union). Proportionality principle describes EU legislation having to be limited to necessary action for the achievement of Treaty objectives (Article 5 of the Treaty on European Union). The supremacy of the Union law in areas provided by Treaties can also been seen as one of the principles. The supremacy of EU law describes the requirement of Member States to, in cases of Regulations, Directives and Decisions, apply EU law to national legislation in the form described by the Act. Legal certainty is additionally an important principle of EU law, as several year-long predictability allows natural and legal persons the possibility of long-term planning.

The European Council, The European Commission and the European Parliament are the main institutions in legislative matters. Commission prepares and proposes legislative instruments as provided by Article 17(2) of the Treaty on the European Union. Certain suggestions and recommendations may originate from, for example other EU institutions or EU citizens. The Council and the Parliament then receive the Commission's proposal, debate it and decide the final shape of the legislation and enact it.

The enacting procedures divide into four as provided by the Article 289 of the Treaty on the Functioning of the European Union. The first is the ordinary legislative procedure, also called the co-decision procedure. The ordinary legislative procedure consists of joint adoption of regulation, directive or decision by the Council and the Parliament. In specific cases, when provided by Treaties, the adoption of regulation, directive of decision may be done by the Parliament with participation of the Council or vice versa. The third possibility is the adoption of legal acts by legislative procedure then constituting as legislative acts. The fourth possibility

are the specific cases provided by Treaties, in which legislative acts may be adopted on initiative of Member States or European Parliament or on recommendation of request of European Central Bank, Court of Justice or European Investment Bank (Foster 2016, 96).

The Article 294 of the Treaty on the Functioning on the European Union details the ordinary legislative procedure. The procedure provides equal law-making power for both the European Parliament and the Council and therefore can be argued for representing checks and balances to the legislative process. In the procedure the Council may vote with Qualified Majority Voting system or unanimously differing by subject. The general voting systems is the Qualified Majority Voting system.

The ordinary legislative procedure has four main stages. First the Commission forwards the legislative proposal, having taken into account national parliaments and other relevant legislative bodies, to the Parliament for its opinion and to the Council for consideration. The Parliament may approve or amend the proposal by simple majority or, although not to the letter approved by the Article 294, substantially amend or reject the proposal and return it to the Commission. The Council at the first reading may approve Parliaments amendments or the original text has there not been amendments and adopt the text. The Council must act within three months with a qualified majority.

The second stage is the second reading of the European Parliament. The Parliament must act within a three-month period with a possibility for one-month extension. Approval or no action within the timeframe deem the act to have been adopted. A rejection by an absolute majority ends the procedure. The Parliament may also propose amendments forwarding those to the Commissions for comment and the Council for a second reading.

The third stage is the second Council reading. The Council must act within a three-month period with a possibility for one-month extension approving the Parliament's amendments with a qualified majority or unanimously should the Commission have issued a negative opinion. The case will then be adopted as amended. Should the Council not accept the amended text the matter is referred to a conciliation committee for a compromise within six to possible eight weeks. The committee comprises of Council, Commission and Parliaments members.

The fourth stage is the committee conciliation. Should a joint text be agreed and the Council approve with either qualified majority, or in case of certain Treaty obligations, full unanimity and the Parliament by simple majority the text is adopted. The there be no approval for joint text or the conciliation committee has not agreed on a text, the text will not be adopted.

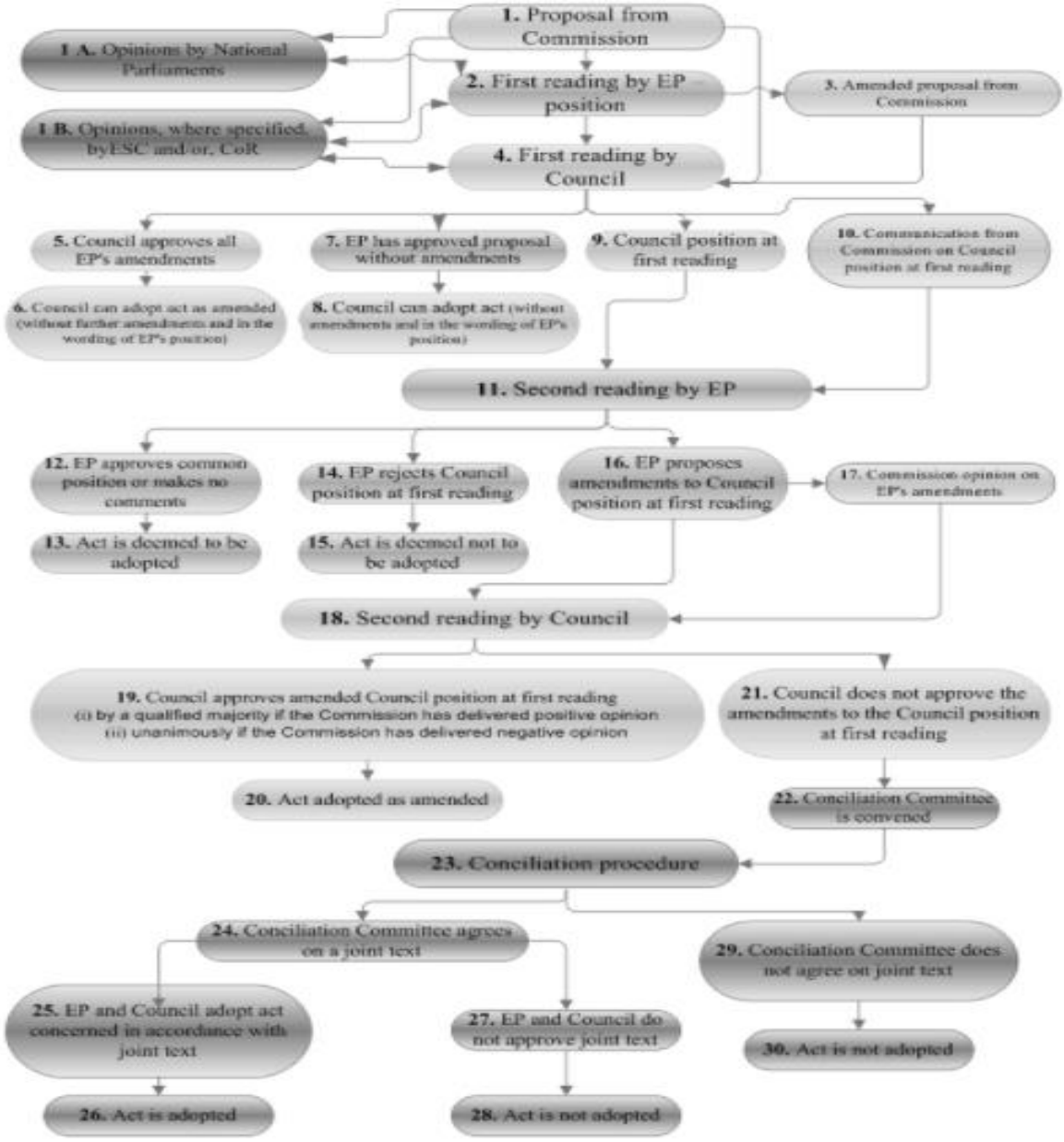


Figure 4: The co-decision procedure (source: European Commission on the co-decision or ordinary legislative procedure)

1.5 Identifying Research Gap

Autonomous vehicles and the changing nature of insurance has been subject to previous research. 'A survey of public opinion about autonomous and self-driving vehicles in the U.S., the U.K., and Australia', a paper by Brandon Schoettle and Michael Sivak researched public opinions of autonomous vehicles. While the paper draws a comprehensive picture of public

opinion on autonomous vehicles and does not concentrate on insurance matters, the paper submits that autonomous vehicles are thought, especially by younger persons, those with higher education and employed persons, to lower vehicle insurance rates. Ilkka Nummelin studied in his Master thesis (fin. pro gradu) the timetable and effects of autonomous vehicles to non-life insurance operations in Finland (fin. ”Miten ja milloin automaattiautot vaikuttavat Suomen vahinkovakuutusliiketoimintaan”). The thesis was published in 2017.

Insurance and the change of autonomous vehicles to the products of it, has been mainly studied on the context of USA, the thesis by Nummelin being one of the rare examples otherwise. A case in point of the USA focus is the article by Daniel J. Fagnant and Kara Kockelman published in the journal ‘Transportation Research Volume 77’ titled: “Preparing a nation for autonomous vehicles: opportunities, barriers and policy recommendations”. The main themes of the article are the advantages of autonomous vehicles to road safety, congestion and need for parking spaces, fewer vehicles with higher brought societal benefits and the current barriers to automated driving caused by costs, liabilities, licensing, security and data privacy concerns.

Another USA focused article is the “New Technology - Old Law: Autonomous Vehicles and California's Insurance Framework” written by Robert W. Peterson that explores different insurance frameworks for California. The article was published in 2012. Article “Sue My Car Not Me: Products Liability and Accidents Involving Autonomous Vehicles” written by Jeffrey G. Gurney, published in 2013, explores the liabilities of driver and the manufacturer in four different scenarios involving a driver and an autonomous vehicle. In the scenarios “distracted driver”, “diminished capabilities driver” and “distracted driver” the article argues that the liabilities in these cases should rest with the manufacturer as the driver was not in command or ready for the command of the operations of the vehicle. In the case of “attentive driver”, on the other hand, the article argues for the liability to rest with the driver as they could have taken over the operation of the vehicle.

This thesis attempts to cover some of the current lack of research on the subject of EU level insurance regulation when the vehicle in question is capable of autonomous driving. The ideology is to first understand European Union law and its principles and then by also covering current Member State level legislative changes to form a hypothesis for EU level regulation and legislation.

1.6 Setting Research Purpose and Questions

Personal vehicle insurance is a key part of the European insurance market and by so any major change may have far-reaching effects on both insurers, insured and countries overseeing insurers and gathering tax revenue. Also, as automated and autonomous vehicles may cause new risks, both the need for and current status of changing regulation create interesting possibilities for study.

The purpose of this Master thesis is to present an overview of current European Union level autonomous vehicle insurance regulation, examples of Union Member State and, as a reference, non-EU country regulation and proposed and possible changes to EU regulation. As testing and road use of autonomous vehicles is a key part of the insurance regulation development, the current level of either Road Traffic Act changes or testing requirements are also explored.

The thesis centers around three main research questions:

1. What is the current legislative framework for the insurance of automated and autonomous vehicles in the European Union?
2. How autonomous vehicles have changed both road traffic regulation and personal vehicle insurance regulation in European Union Member States? (Few non-EU countries are given as reference examples)
3. What changes have been proposed or are likely to be proposed to current EU insurance regulation on autonomous vehicles?

The first research question examines the level of regulation currently used on personal vehicle insurance in the European Union. This is done by understanding the historical perspective and development of both EU law as an entity and on insurance related regulation. As the aim of this thesis is to focus on the European Union as an entity, the current differences between Member State Motor Insurance legislation are not explored at length, but the interest is in understanding the European level legislation and in part, also the effects of international law to it. The second research question elucidates on the current changes to automotive insurance legislation on Member State level and the third examines the current and probable future legislation at European Union level. The key assumption in the third research question is, that Union level legislation would be written on with the understanding of prior Member State legislation.

This thesis utilizes several main information sources. ‘Understanding EU Law’ (2005), written by Erika Szyszczak and Adam Cygan and ‘EU Law - Directions’ (2016), written by Nigel

Foster are used to draw a comprehensive picture of the development of legalization in the European Union. 'Insurance in Private International Law – A European Perspective' (2003) written by Francesco Seatzu and 'The European Single Insurance Market: Overview and impact of the liberalization and deregulation processes' (2003) written by Maciej Sterzynski used referenced in understanding the general picture of insurance regulation and its development in the European Union. Motor Insurance Directives are used directly to understand the development and current status of Motor Insurance legislation while the European Commission's 'REFIT evaluation on Motor Insurance Directive' is referenced in order to clarify the current status and possible changes to the current regulation.

'International Comparative Research – Theory, Methods and Practice' (2009) written by Linda Hantrais is used as the main information source for understanding the method of research of this thesis. On the other hand, 'European Integration Theory' (2009), written by Antje Wiener and Thomas Diez, describes the research framework. Many of the other sources cover European Union's official documents, such as Commission's and Parliament's publications. For the empirical research of this thesis, much of the data is drawn from state level Ministry publications, news articles and legal article archives, such as Lexology, due to the relative lack of academic research on the subject. All used references have been subjected to both validity and reliability checks.

1.7 Research Methods, Structure, Main Exclusions and Used Concepts

The main research methods concern both the international and the regulation concentrated aspects of this thesis. The structure of the thesis moves from general overview of both the technical aspects of autonomous vehicles and European Union law, to European Union general insurance and Motor Insurance legislation and to research methods and theory. The empirical cases, conclusions and references are presented thereafter.

The main exclusions are made in order to concentrate on the European Union law, liming discussion of both international law and future Member State legislation. Used concepts are, due to the matter researched being both technical and regulative, divided into four subgroups to promote clearness and ease of reading.

1.7.1 Research Methods and Thesis Structure

This thesis uses, as research method, the ideology of comparative international research in order to search, identify and compile relevant cases. As this thesis concentrates on both European Union and Member State regulation, the data gathered is mainly qualitative and therefore qualitative methods of finding relevance are also used. The use of qualitive methods also allows for multistage structure of research. The gathered data is interpreted by the European Integration Theory in order to present valid and comparative results in European, as especially the European Union framework.

The structure of this thesis presents first a general understanding of autonomous vehicles and the different levels of automation. The chapter 1 also gives an overview of European Union law describing both the history, administrative and political bodies and principles of EU law. Research purpose, questions, methods, main exclusions and concepts are included in chapter 1. The second chapter gives an overview of European Union insurance legislation, the development of it, the development of Motor Insurance Law and explores the European Commission's report on evaluation of the current Motor Insurance legislation.

The third chapter explains the research methodology and theoretical framework utilized in this thesis. The main research methodology is drawn from International Comparative Research while the conclusions of this thesis are understood via the theoretical framework of European Integration Theory.

The empirical understanding of this thesis is explored in the fourth chapter. The chapter contains an overview of both select European Union Member States' and non-EU countries changes to regulations and legislation on the testing, use and insurance of autonomous vehicles. The chapter also draws a picture of the general effects probable to the EU legislation on autonomous vehicles.

The fifth chapter presents a summary and main results of all data and conclusions discussed, the limitations of this thesis and extrapolates on future research. The chapter six contains all references utilized in this thesis divided to three categories of legal references, literature references and online references.

1.7.2 Main Exclusions

Main exclusions of this thesis center around the concept of European Union law. Vienna Convention on Road Traffic and the role of UNECE World Forum for Harmonization of Vehicle Regulations are explained, however due to the focus of this thesis on the autonomous vehicle insurance regulation in the EU, the Convention or other international law is not explored in depth. Similarly, few excerpts of non-EU country legislation on autonomous vehicles are presented to better understand the global perspective on the demand for EU level legislation, however the excerpts are given as examples and not explored further.

While technical aspects of autonomous vehicles and connected driving are briefly explained, this thesis does not concentrate on the technology of autonomous of connected driving as the focus of this thesis is in current and proposed European Union level insurance regulation.

The main focus of the thesis in in consumer owned personal vehicle insurance on the focus of autonomous vehicles, and therefore alternative insurance options of, for example state-owned vehicles, are not discussed.

1.7.3 Used Concepts

Used concepts are presented as divided into four subcategories. The subcategories are technological concepts, insurance concepts, European Union concepts and general law concepts. The aim of the categorizing is to provide used concepts in an understandable format. Singular concepts are then provided in alphabetical order within each subcategory.

The technological concepts subcategory includes definition for automated and autonomous vehicles, connected vehicles and C-ITS (Cooperative – Intelligent Transport Systems) systems. The insurance concepts include the two main insurance types for Motor Insurance, the Third-Party Liability Insurance and the Voluntary Comprehensive Car Insurance. European Union concepts subcategory includes definitions for ECI, Commission's REFIT program, EEA and EFTA, EU Decision, Directive, Opinion, Regulation and Recommendation and the Internal Market. The concepts also include the three main ideologies behind the functioning of the Union, federalism, intergovernmentalism and supranationalism and the two main Treaties of the EU: TEU and TFEU. The general law subcategory covers definitions for civil and criminal law and legal centralism.

1.7.3.1 Technological Concepts

Automated vehicle is a motor vehicle (car, bus or truck) having driver assisting technology available and parts of the driving function can be transferred to the vehicle computer and operating systems. (European Parliament Briefing on Automated Vehicle in the EU, January 2016)

Autonomous vehicle is a motor vehicle (car, bus or truck) that is capable of fully autonomous driving and handling of all driving tasks without assistance or intervention from human driver. (European Parliament Briefing on Automated Vehicle in the EU, January 2016). May also be called self-driving vehicle or a robotic vehicle.

Connected vehicle is a motor vehicle (car, bus or truck) equipped with communicating capabilities and therefore able to communicate with other vehicles and/or infrastructure via Internet (European Parliament Briefing on Automated Vehicle in the EU, January 2016). The term CAD, abbreviation of Connected and Autonomous Vehicles, may also be used.

Cooperative – Intelligent Transport Systems (C-ITS) are systems consisting of communication and sensor infrastructure and appropriate communication technology equipped vehicles (car, bus or truck) communicating from vehicle to vehicle (V2V Communication) and with the infrastructure. (European Parliament Briefing on Automated Vehicle in the EU, January 2016).

1.7.3.2 Insurance Concepts

Motor Third Party Liability Insurance (MTPLI), also called Car or Motor Liability Insurance, is a compulsory insurance for vehicles within the European Union. Coverage taken in one EU country is valid throughout the Union. The insurance generally covers personal injuries (driver may be excluded) and property damage of non-guilty party. The coverage differs between different Member States.

Voluntary Comprehensive Car Insurance (VCCI), also called First Party Liability or Damage, is a voluntary and additional insurance for motor vehicles. The insurance covers, in case of traffic accident, personal injuries of the driver (if not covered by Motor Third Party Liability) and damage to the vehicle of guilty party. The insurance may also cover damages in cases of theft, collisions with wildlife and other harm to the vehicle. The coverage may differ between

different Member States, between different insurers within a Member State and the coverage level taken.

1.7.3.3 European Union Concepts

European Citizens' Initiative (ECI) is an European Union mechanism to offer citizens a possibility to request legislative proposal by the European Commission. An Initiative requires at least one million citizens of seven Member States to be considered by the Commission. The European Citizens' Initiative was made possible by the Lisbon Treaty and the possibility of them has been available since 1 April 2012. Regulation 887/2013 provided detailed requirements for European Citizens' Initiatives (Foster 2016, 45-46).

The European Commission's Regulatory Fitness and Performance program, generally called REFIT program, refers to a part of the European Commission's better regulation agenda striving to deliver intended policy benefits to Union citizen's while removing needless regulation and by so lowering costs (European Commission on Refit – making EU law simpler and less costly).

The European Economic Area (EEA) refers to a common Internal Market of the European Union Member States and three European Free Trade Association (EFTA) Member States, Liechtenstein, Norway and Iceland. The Internal Market was created by the Agreement on the European Economic Area (EEA Agreement) in 1994. The Four Freedoms, the free movement of goods, services, capital and persons, are at the heart of the European Economic Area. The Agreement on the European Economic Area also covers cooperation on consumer protection, tourism and culture, the environment, social policy and education, research and development and guarantees equal rights and obligations for citizens and economic operators within the Internal Market. Any new European Union Member State must apply to become party to the Agreement on the European Economic Area. (EFTA on EEA Agreement)

The European Free Trade Association (EFTA) is an intergovernmental free trade organization of Liechtenstein, Norway, Switzerland and Iceland. The mission of the European Free Trade Association is to promote free trade and economic integration to the benefits if EFTA's Member States and trading partners (EFTA on The European Free Trade Association). The EFTA was founded in 1960 by Austria, Denmark, Norway, Portugal, Sweden, Switzerland and the United Kingdom. European Free Trade Association gathered more Member States in the following decades, however most of the founding Members and later affiliated Member States have later joined the European Union (EFTA on EFTA through the years).

European Union Decision is a binding act to all parties it is addressed. The parties may be individual Member States, companies or other parties. A Decision is directly applicable. (European Union website: Regulations, Directives and other acts)

European Union Directive is a legislative act, that sets out a mandatory objective for the legislation of every Member State. Individual Member States may then incorporate the objective to their legislation in the best suitable way (European Union website: Regulations, Directives and other acts). Directive as a legislative act is addressed in the Article 288 of the Treaty on the Functioning of the European Union (Foster 2016, 215)

European Union Opinion is a non-binding act. The purpose is to allow institutions to make statements without imposing legal consequences. (European Union website: Regulations, Directives and other acts)

European Union Recommendation is a non-binding act. The purpose of Recommendation is to communicate the views of institutions and suggest lines of action without imposing legal consequences. (European Union website: Regulations, Directives and other acts)

European Union Regulation is a binding legislative act in the Union. The Regulation must be applied in its entirety and unmodified in every Member State (European Union website: Regulations, Directives and other acts).

Federalism is a flexible term, most commonly used the describe a form of political integration, where constituent states transfer sovereign powers, such as political and economic matters, to federation, which then controls member states from the center. Generally, member states regulate local issues, such as education independently. (Foster 2016)

The Internal Market of the European Union refers to a single market within the EU, allowing free movement of the Four Freedoms, in other worlds the movement of goods, services, capital and persons. The single market was created in 1993 with the Maastricht Treaty and further expanded with the Single Market Act in two parts in 2012 and 2013. The aims of the Internal Market are to boost economic growth and improve confidence in European business. (EUR-Lex on Internal Market).

Intergovernmentalism describes the general way international organizations operate. Decisions require unanimity, are rarely enforceable and only oblige signatory states, not citizens of those states. (Foster 2016)

Supranationalism describes decision making at a higher level than that of member states and decisions replace of override national ones. (Foster 2016)

The Treaty on European Union (TEU) is one the two main Treaties of the European Union establishing the Union, its aim, values, purpose, governance and the limits of its competencies. The Treaty also establishes the internal market, monetary union and foreign, external and security policy. The Treaty was signed in 2007. (Consolidated Version of the Treaty on European Union)

The Treaty on the Functioning of the European Union (TFEU) is the other of the main EU Treaties. The Treaty organizes the functioning of the Union establishing among other issues, both the Union's and Member States' competences and Union's general provisions. The Treaty was signed in 2007. (Consolidated Version of the Treaty on the Functioning of the European Union)

1.7.3.4 General Law Concepts

Civil law refers to non-criminal law and generally refers to disputes of rights between two or more natural or legal entities (Cornell Law School, Legal Information Institute on Criminal Law).

Criminal law refers to a system of laws that concerns the punishment of either natural or legal entities. The crime may be an act or lack of one and the punishment is designated on the basis of the crime and may therefore differ for different actions. Different states have their own criminal codes, e.g. the conducts designated as crimes and punishments designed for them differ (Cornell Law School, Legal Information Institute on Criminal Law).

Legal centralism refers to the principle of law being the center of all regulatory theory and debate and being the seen solution to any social complexities. Legal centralism is often not explicitly presented; however, it is implicit in the logic of regulatory and legislative projects. (Tala & Pakarinen 2010).

2 INSURANCE LAW IN EUROPEAN UNION

2.1 History of European Union Insurance Law

The Single Insurance Market in Europe is an ongoing project originating from the years 1973 and 1978 when so called "First Generation" Insurance Directives were passed (Seatzu 2003). The "First Generation" Directives consist of the Non-Life Directive from 1973 and the Life Directive from 1979, both of which established a limited freedom of establishment controlled by hosting Member States. The "Second Generation" directives, Non-Life Directive from 1988 and Life Directive 1990, introduced a limited form of freedom of movement in insurance services, as especially private customer sold insurance were still much regulated on the national level. Second Generation directives were therefore unsatisfactory in establishing a European Union level free movement of services. (Sterzynski 2003)

The deregulation and liberation breakthrough in the establishment of free movement of services was achieved with the "Third Generation" insurance directives. The Directives, Non-Life and Life both from year 1992, established what is called the Single Insurance Market or SIM. The Directives introduced three essential principles: The Single European License, Home Country Control and solvency supervision. The Single European License allows all European Union - based insurers registered in their home states to operate within the Union. The Home Country Control designates only the authorities in the insurer's country of origin as having power of supervision. The solvency supervision replaced earlier prior approval requirements of insurance premiums and policy controls replacing them with financial controls including technical provisions and assets localization strategies, among others. (Sterzynski 2003)

The forming of Single Insurance Market and simultaneous deregulation had positive effects on European insurance market, as explored by Sterzynski in 2003 on data from 1995 to 2000. One of he main effects was stronger local market penetration by foreign insurers most often by establishing operation by branches, agencies or representatives or taking over local companies by share acquisition. Another effect was demutualization of mutual insurance companies due to challenges in gathering funds for increased competition. Other changes were decrease in insurance product prices and larger spectrum of products available. The Figure 5 explores other

effects of the reforms, such as quality of insurance services, knowledge and investments transfer as restructuring of the EU insurance market.

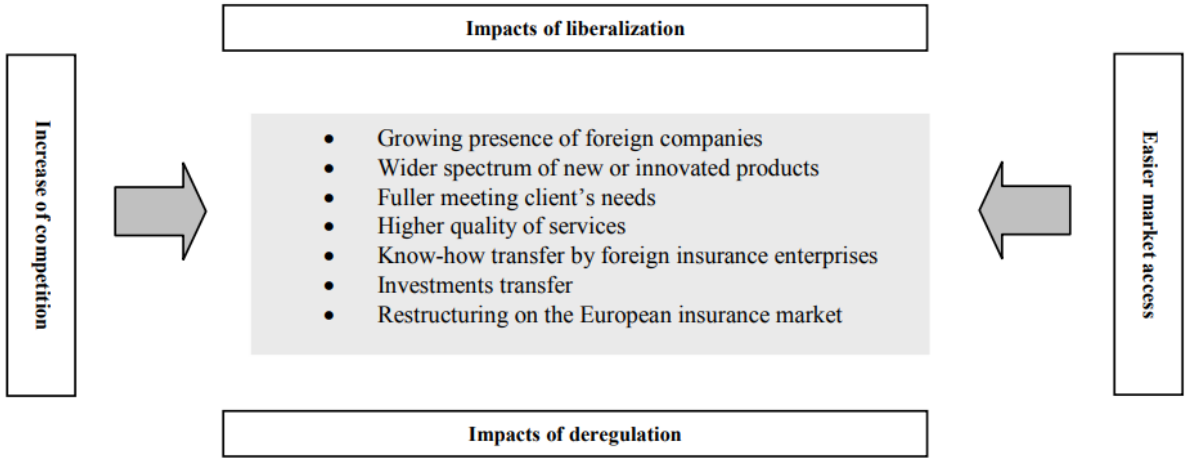


Figure 5: The Single Market and Deregulation Effects (source: Sterzynski, Belgian Actuarial Bulletin, Vol. 3, No. 1, 2003)

While the initial changes brought by the Third Generation Insurance Directives, forming of the SIM and subsequent deregulation were positive from a competitive market perspective, one aspect remains the same. The European market is, from customers perspective, still highly Member State based, as a study by the German European Consumer Centre found in 2014. The study, studying British, German and French insurers, presents 86,8 % likelihood of customer not being able to buy online cross-border insurance and remarks this limits benefits of scale to both insurer and insured and also entrance of highly sophisticated insurance products to lesser insured markets. ("The European Single Insurance Market - Cross-border insurance contracts: conclusion or exclusion?" by European Consumer Centre Germany)

The latest major legislative reform to the Single Insurance Market has been the introduction of harmonizing Solvency II capital requirements. The so-called Omnibus II Directive, or more formally Directive 2014/51/EU of the European Parliament and of the Council (16.4.2014) amended previous Solvency II Directive enabling structural reform and on 10 October 2014 The European Commission adopted Delegated Regulation (Delegated Regulation (EU) 2015/35) introducing implementation rules for Solvency II. The Regulation was amended on 20 September by Delegated Regulation 2016/467 introducing calculations for regulatory capital requirements. The requirements cover several categories of assets held by insurers and reinsurers. The solvency requirements came into force 1 January 2016. (EIOPA on Solvency II)

2.2 History of European Union Motor Insurance Law

First steps in European Union motor insurance legislation were taken in 1972 when the First Motor Insurance Directive, also called First Council Directive (72/166/EEC), was adopted. The aim was to facilitate free movement of motor vehicles through then European Economic Area. The idea was based on the United Nations Green Card System (European Commission Consultation Document on Motor Insurance 2009/103/EC refit). The main change to previous status was the expansion of Motor Insurance cover taken in one Member State to cover damages in another Member State in the extent of the visited Member State. The Directive was followed by Second Council Directive (84/5/EEC) in 1983 providing, among other things, monetary minimum cover requirements and made national guarantee funds mandatory. The guarantee funds cover damage expenses caused by uninsured or unknown vehicles within Member States.

The Third Council Directive (90/232/ EEC) came into force on 31 December 1992 and provided the basis of a single premium in the then European Community Area (EUR-Lex on Motor vehicles liability insurance). In other words, the directive provided one insurance premium, paid in any Member State, covered damage in any other Member State. The cover taken must insure the same cover as required by any other Member State or the cover of the Member State of origin, should the latter offer higher compensations.

The Fourth Motor Insurance Directive (2000/26/EC), signed in 16 May 2000, amended the First Motor Directive and the Second Council Directive on Life Insurance (88/357/ETY). The main changes brought by the Directive were the extension of free movement of services to Motor Insurance products (Third-Party Liability Insurance), mandatory compensation agents of all Motor Insurance providers stationed in every Member State and an information center for victims of motor accidents to request information on all vehicles and their insurers involved in the accident.

The Fifth Motor Insurance Directive (2005/14/EC) was signed 11 May 2005 amending all previous Motor Insurance Directives and the Second Council Directive (88/357/EEC) on non-life insurance. The main changes to previous legislation were the higher compensation requirements, for both personal injuries and property damage, for victims of motor accidents. The other amendments to previous legislation were relatively minor, mainly specifying understanding or details.

The Directive 2009/103/EC of the European Parliament and of the Council on Motor Insurance assembled the five previous Motor Insurance Directives into one Directive and repealed them. The new Directive standardized the contents of the obligation to insure and improved the rights of motor accident victims. The Directive is based on the concept of minimum requirement harmonization; in other words, Member States must adopt the Directive's requirements and may, however, also provide stricter regulation. For example, the Directive does not require Motor Insurance products to cover personal injuries of the guilty party, however Finland, Sweden and ETA country Norway have included the requirements into national legislation. (Governments Proposal to Parliament on Motor Insurance Act and Related Acts (HE 123/2015) (Finland), Chapter 1.1.3)

Currently the Directive in force is the Motor Insurance Directive (MID) (2009/103/EC). However, the Directive may be amended or replaced in the near future. This would happen as a result of the public consultation the Commission held during summer and fall of 2017 on the functionality of the Directive.

2.3 The Evaluation of Motor Insurance Directive

The Commission held a public consultation on a refit of the Motor Insurance Directive during 28 July 2017 - 20 October 2017 gathering 3 478 responses to current proposals. The results of the evaluation have not yet been published. The evaluation, using Union's REFIT (The Commission's Regulatory Fitness and Performance program) as guide, covered the entire Directive (European Commission Consultation Document on Motor Insurance 2009/103/EC refit). REFIT itself is a part of Commission's better regulation agenda and, as a program, strives to deliver intended policy benefits to Union citizen's, remove needless regulation and by so lower costs.

The REFIT evaluation on Motor Insurance Directive, while covering the whole directive, focused on eight specific areas. These were the portability of claims history statements, in cases of insurer's insolvency possible guarantees towards victims, minimum cover amounts, insurance checks, terminology, scope of the Motor Insurance Directive, autonomous cars and transfer of vehicles. The portability of claims history statements refers to the possibility of EU citizens asking and receiving a statement from their motor insurer on their claims history during the previous five years. The statement can then be used in obtaining a lower bonus/malus-rating and by so a lower premium when moving from one Member State to another and switching

insurers. The Commission has concerns over the cases in which the second insurer has not taken the statement into account when pricing motor insurance.

The possible guarantees toward victims in cases of insurer's insolvency refers to the challenge of a motor insurance accident victim not receiving compensation is case of the responsible person's in another Member State located insurer becoming insolvent. The evaluation sites a case of cross-border motor insurance operator becoming insolvent and another State's guarantee fund having to compensate damages. In 2015, as a response to Commission's Green Paper on Retail Financial Services, it was suggested by several stakeholders, that a guarantee fund a Member State is responsible for claims (domestic and EU wide) in case an insurer based in the State becomes insolvent. The Commission is especially interested, in whether stakeholders believe EU legislation is needed to afford full protection to victims of traffic accidents in case of insurer's insolvency.

The Motor Insurance Directive provides minimum amounts that third-party liability insurance must cover in cases of personal and property damage. The minimums in case of personal injuries are currently EUR 1 220 000 per victim or EUR 6 070 000 per claim and in cases of property damage EUR 1 220 000 per claim. The amounts are adjusted every five years to compensate for inflation. The minimums do not take into account the type of vehicle causing the accident and therefore some Member States have introduced a higher minimum cover amount for heavy vehicles, such as trucks. The Member State heavy vehicle minimum may be up to EUR 25 000 000. The Commission gathered information on the subject focusing on the understood need for EU wide minimums, the monetary amount of them as well as the possible need for differentiation between the minimums of variously sized vehicles and the monetary amount of them.

The Motor Insurance Directive currently prohibits border insurance that are not non-systematic, discriminatory and aimed exclusively at insurance verification. However as uninsured vehicles are paid by all other policyholders the checks can be argued for. The functioning of the Motor Insurance Directive can also be seen in high insurance coverage. Nowadays available electronic checking could therefore be an option for insurance checks. The Commission is therefore interested in stakeholder opinion on viability of electronic and non-traffic restricting insurance checks to be included in new Motor Insurance legislation. Also, as the Green Card system protects citizens in case of an accidents caused by a visiting person the Motor Insurance Directive offers protection for visitors being a victim of traffic accident by a citizen. This is

currently done by Member States requiring non-native insurers to appoint claims representatives and Member States being required to establish information centers for tracking of drivers and compensation bodies for assistance of visiting traffic accident victims. The evaluation is therefore on whether the current system has been sufficient or whether there is a need for change.

The terminology of the Motor Insurance Directive, that is currently under evaluation, has to do with the terms "victim" and "injured party". The Directive contains a definition of "any person entitled to compensation in respect of any loss or injury caused by vehicles" for "injured person (MID 2009/103/EC Chapter 1 General Provisions Article 1 Section 2), however the term "victim" has no definition in the Directive. The Commission has concerns over whether this disparity undermines the effective functioning of the Directive by provisions differing on the use of either term "victim" or term "injured party".

The current Directive provides that the use of any motor vehicle propelled by mechanical power and intended for travel on land must be insured for third party liability. The loose definition was created to protect traffic accident victims. The challenge is however, the expanded number of vehicles the scope nowadays provides. Member State have been able to exempt vehicle types from insurance obligation as long as a guarantee fund compensates the personal and property damages caused by exempt vehicles. The Vnuk-ruling (case C-162/13) of the European Court of Justice, concerning damages caused by a tractor in private property) however defined the 'use of vehicles" covers any use of a motor vehicles as long as the use is consistent with the normal use of the vehicle. Therefore, the insurance obligation could be extended to agricultural, industrial, construction, motor sports or fairground use of motor vehicles. The public consultation was on the subjects of whether the Directive should cover accidents in both public and private property, whether Member States should be able to exempt certain persons or vehicle types from insurance obligation, which types of vehicles should be exempt and whether third party motor insurance should cover agricultural, industrial, construction, motor sports or fairground use of motor vehicles and accidents on non-public areas. The consultation on the scope of third party liability insurance has raised concerns in, among others, racing sports as it is feared the tightened regulation could downsize the industry due to the more official handling of accidents (Autosport 11.10.2017).

Transfer of vehicles refers to the practice of purchase of cars in one Member State while living and by transporting purchased car to another Member State. Currently the buyer has 30 days to

register and insure the vehicle in their home State. The Commission raised the question, whether the current framework was sufficient or whether any changes should be made.

In regard to autonomous vehicles this one part of the consultation is particularly significant. The Directive's use of term "vehicle" does not distinguish between a vehicle with a human driver and a vehicle operated and controlled by vehicle's autonomous functions. Therefore, the Directive can be argued not need a refit in order the prepare for the use of autonomous vehicles. The question is, however, whether the responsibility of the operation of the vehicle will be partly or entirely transferred to manufactures of vehicles or entities responsible for developing and maintaining road infrastructure. The consultation, consequently, asks whether autonomous vehicles should be insured as current vehicles with drivers are and whether the Directive should in any way be clarified in regard to the development of autonomous vehicles.

3 RESEARCH METHODOLOGY AND THEORETICAL FRAMEWORK

3.1 Overview

The theory and empirical of this thesis are based on the methodology of international comparative research. This method allows for a wide-ranging set data to be explored and included is the thesis while also researching a specific phenomenon. The European Union can be seen both as an international, regional and as a weak-linking federation state and therefore an approach to its research must permit for both width and depth of inquiry.

The main theoretical framework of which this thesis is understood by is the European integration theory. It gives the opportunity to understand European integration from various angles, taking into account the structures and institutions of the European Union and its Members States while building understanding of both those areas that are common and those that differ within the Union.

3.2 International Comparative Research

International comparative research is based on the methodology of comparative research, the study of societies, cultures, countries, institutions, social structures and systems and their changes over time and space. Comparative studies use same research tools to systematically compare phenomena in more than one temporal or spatial setting. International comparative studies, on the other hand, use the methods of comparative research employing those in an international setting or, in other words, when comparing two or more countries, cultures or societies. Comparisons over time may also be included in these studies, although the conventional usage of the discipline limits both temporal dimension and intra-country comparisons. The world international is generally used instead of cross-country, due to the understood limitations of the term as cross-country can be seen as only allowing of juxtaposition of data. The prefix 'inter' is understood to cover the notion of context, another widely required concept in international comparative research. (Hantrais 2009, 2-3)

International comparative research can be seen as an independent filed of inquiry as it demands both the inclusion of perspectives from more than one state and a comparative frame of reference with time or space as controlling variables. Comparative approach should be the defining value throughout the process of research from design state to interpretation of findings. According to Kohn (1989, 77-102) and Vigour (2005, 17) these terms may give comparative research also a designation of strategy (Hantrais 2009, 6).

The main scientific reasons for undertaking comparative research, also in an international setting, include providing an empirical basis for a theory, generating hypotheses using case studies, identifying and both explaining and identifying multilevel variations, search for constant factors or general laws capable for explaining a set phenomenon, testing of transferability and robustness of theory or hypotheses, verifying or falsifying relationship between variables, establishing scientific explanations between variables and thus enabling predictions, developing of sets of travelling concepts and creating validations by comparisons of analysis units. In this thesis the reasoning for it covers the providing of an empirical basis for a theory, testing of its transferability and enabling of predictions based on empirical factors. However, and more importantly, international comparative research with a policy dimension has the aim of informing policy, identifying common policy objectives, evaluating of solutions proposed for dealing with common problems, drawing lessons of best practices and assessing

transferability of polities between societies. Of these, the most important ones in regard to this thesis are the last three, evaluations of solutions, lessons of best practices and the transferability of policies. (Hantrais 2009, 10-11)

The process of international comparative research begins with the selections of the subject of inquiry. Especially within the European Union the swift in near past has been to more complex and encompassing research subjects, while specific queries into, for example, income and labor market participation, have lost some of their interest. The second step in research process is the formulation of research questions. The main ideology in this phase is the stressing of the main parameter of using theoretical presuppositions in determining of the research questions and the management of the research. However, available resources and research culture may affect the process. In general research questions are formulated to ask what, why and how. The questions of why can be seen as most valuable as they seek to uncover empirical relationships between variables and understand the possibilities of wider applicability. (Hantrais 2009, 48-49)

The third step in international comparative research consists of choosing comparators and units of analysis. Comparators may be countries, cultures or societies that feature in the analysis while units of analysis refer to objects of which researched collects data for analysis. Comparators and units of analysis may also synonymous (Hantrais 2009, 48). In legal studies the units of analysis are generally different legal systems and in the context of this thesis, the legal systems of chosen EU and non-EU countries as well as the EU law itself.

The fourth step is the selection of the appropriate level of analysis and the right distance. The level of analysis concerns the study concentrating on either micro or macro level study. Microlevel focuses on individual activities or behaviors, while macrolevel concentrates on individuals, systems, structures and processes. The rights distance has to the with the principle of 'variable distance' (Germ. verschiedene Distanz), a concept developed by Georg Simmel in 1917. The principle directs that the distance from the object observed affects the way it is observed. A long-distance study may, for example, be European Union reports based on Eurostat data from either large amount of countries or fewer countries from various points in time. A close-up comparison, on the other hand, contains fewer societies, cultures or countries of interest and more variables within. A close-up view enables identification of also variations within a particular country, culture of society of interest. (Hantrais 2009, 54-57)

The fifth step in international comparative research concerns the method of research. First of all, from an epistemological perspective, research paradigms can be divided in two. Advocates

of positivist, universalist, experimental and empirical traditions base their theories on the ontological conviction of reality being objective and singular and therefore all human facts are knowable and can be tested. Exponents of positivist, universalist, experimental and empirical tradition, on the other hand, argue that all knowledge is relative and culturally bound. A case study, especially if only a single unit is analyzed, can be seen as too narrow for either forming of generalizations or disproving of existing ones. This does not, however, mean that narrow case studies cannot produce new hypothesis, refine existing ones, confirm theories or be used control groups for other studies. As research paradigms can also be argued to cover either normative or empirical, in other words questions of how societies or systems should be and questions of how phenomenon or phenomena occur, case studies can offer material to either. (Hantrais 2009, 57-58)

The sixth step is the collection of data and analysis of it. Quantitative analysis generally demands data collected from either survey instruments or administrative registers and then statistical analysis. Qualitative data, on the other hand, can be gathered from many sources such as observations and historical data, as long as gathered data is essential in identifying and understanding the object of inquiry. Analysis of the gathered research material must be handled in a way to answer both to the research questions and taking note to both the quality and reliability of data as that affects also the validity and reliability of the research. (Hantrais 2009, 65-66)

3.3 European Integration Theory

European integration theory can be described as a field of systematic reflection on the intensifying process of political cooperation and the development of common political institutions in Europe. The theory also includes analysis to the outcome of the cooperation and development, as well as theories of change in identities and interests of social actors. European integration theory enables understanding of European processes, institutions and outcomes of integration as well as enunciate expectations of future development. It also gives the opportunity to study integration of the European Union, building understanding and conceptualizing of the process. (Wiener & Diez 2009, 2-5)

European integration theory can be categorized into three phases, as seen in Table 2. The timelines are not definitive as studies of each phase have continued to emerge in years both earlier than later than the given decade or decades. However, the research aims were the most

dominant during the said timelines. From the 1960s onwards, explanations of integration were the most important studies answering to questions on the explanations for outcomes and the reason for integration. The main theoretical reference points were liberalism, realism and neoliberalism. From the 1980s the main interest was in analyzing governance and researching the political system of the Union and describing its processes and regulative policies. The main theories bringing understanding to the research were governance, comparative politics and policy analysis. From the 1990s onwards, the interest shifted to understanding the construction of the European Union. The main interest was in researching social and political consequences and conceptualization of integration and governance. The main theoretical references were social constructivism, international political economy, normative political theory and gender approaches, among others. (Wiener & Diez 2009, 6-11)

Phase	When?	Main themes	Main theoretical reference points
Explaining integration	1960s onwards	How can integration outcomes be explained?	Liberalism, realism, neoliberalism
		Why does European integration take place?	
Analysing governance	1980s onwards	What kind of political system is the EU?	Governance, comparative politics, policy analysis
		How can the political process withing the EU be described?	
		How does the EU's regulatory policy work?	
Constructing the EU	1990s onwards	How and with which social and political consequences does integration develop?	social constructivism, post-structuralism, international political economy, normative political theory, gender approaches
		How are integration and governance conceptualized? How should they be?	

Table 2: Three phases of European Integration Theory (source: created according to 'Table1.1 Three phases in integration theory' by Wiener & Diez 2009, 7)

The current stage of European integration, constructing the EU, can be seen is historical events of the Union, firstly in the signings of both the Maastricht Treaty in 1991 forming the European Union and in the Treaty of Amsterdam in 1996 forming the Schengen Area, among other matters (Wiener & Diez 2009, 10). During the 1990s the Union gained three new Member States, Austria, Finland and Sweden, and by the late 1990s EU prepared for its largest enlargement to accept 10 new Member States that had been under the Soviet rule. The Union both widened and deepened simultaneously and thus integration theory faced challenges in analyzing and problematizing these interrelated processes. The concept of the finality or goal of the European integration become a much-theorized research question. Same interest was

shown in questions of European governance and in normative implications of specific Union policies. The understanding of integration, the defining and development of particular policy areas and the political effects of these definitions and historical processes were also much discussed during the third phase (Wiener & Diez 2009, 10).

A key part of the phase three of the European integration is the divide between different areas of integration. While European prosperity in the form of economic integration has generally been welcomed also by European citizens, more federalist ideas of common foreign policy have faced challenges. This was evident in the ratification challenges of the Treaty of Maastricht, the failed Constitutional Treaty and in the ratification process of the Treaty of Nice during which Ireland first rejected the Treaty in a referendum before passing it in another after some key changes to the Treaty. It has been argued that the Union should concentrate on its main competence of prosperity via increasing of market efficiency and correcting of failures in public goods such as the environment. In integrations theory, and in more specifically its normative theory, the challenge of the different valuation of integration within the EU can be divided to two approaches. Firstly, the question of justice of outcomes and structures, and not simply efficiency and productiveness, has to be understood and answered. Secondly, the process of decisions that are made and the level of European citizens identifying with them, is equally important as both of the approaches must co-exist. (Wiener & Diez 2009, 198-199).

On the subject of insurance legislation on the European Union level, both of the approaches, justice and process, must be addressed. While insurance, especially Motor Insurance, can arguable be understood in economic sense, insurance as a product affects also social policy. Social policy is generally understood as being a more Member State level matter. After all, insurance law with low levels of protection for damages, may force Member States to offer protections for its citizens also elsewhere in the Union. As for the process, insurance is in its nature a challenging concept of future risks, protections and liabilities, and therefore fair process and trust in it are essential for any insurance regulation's success.

4 CURRENT STATE OF AUTONOMOUS VEHICLE INSURANCE LAW

4.1 Overview

The current EU legislation main principle of being grand in grand matters and small in small ones would most likely also be seen in autonomous vehicle legislation. The Union's goal of ease of movement within the Union would stress supranational legislation while also taking into account current Member State legislation. As the REFIT program of the Commission states, the aim of all legislation is to deliver needed results while also reducing bureaucracy and lowering costs (European Commission on REFIT).

Currently several European Union Member States have developed both their road traffic legislation and vehicle insurance legislation to incorporate needed changes for the testing and introduction of autonomous vehicles. Steps have been taken in Belgium, Czech Republic, Denmark, Finland, France, Germany, Italy, Netherlands, Poland, Spain and in the United Kingdom. Outside of the Union Australia, China, Singapore, United Arab Emirates and United States of America have either made changes to their legislation to permit autonomous vehicles on public roads, have otherwise planned for the testing and development or have published information on future steps.

The European Parliament published a briefing in 2016 titled "Automated vehicles in the EU". The briefing draws a clear picture of the need for both thorough and harmonized approach for automated or autonomous vehicle regulation, not for the least for European competitiveness in the international market. Product Liability is currently strongly harmonized by 'Directive on liability for defective products (Council Directive 85/374/EEC)'. According to the Directive a product is defective, when it does not provide the safety a customer is entitled to expect and the manufacturer is liable for any defective products. The challenge in conjunction with the Directive and autonomous or automated vehicles is that damages caused by vehicles are covered by the Directive and these liabilities are addressed at Member State level.

Competitiveness is the angle from which the need for both harmonized European approach to autonomous and automated vehicles and the strong international cooperation gain importance. Imports and exports of motor vehicles with automated or autonomous driving capabilities must have a clear framework for product liability matters for ease of trade. In 2016 European Union's exports of exports of motor vehicles amounted to EUR 192.0 billion, while imports were 40 % of exports, EUR 77.0 billion. EU trade surplus was therefore EUR 128.2 billion. Exports grew

from 2013 on average at 2 percent yearly rate, while imports grew on average 14 percent. The largest EU export countries were Germany and United Kingdom, the two countries also having the largest motor vehicle trade surpluses. Belgium had the largest motor vehicle trade deficit of EUR 5.0 billion. The largest trading partners were United States and China. US was the main destination for motor vehicle exports, amounting to 25 percent of all EU motor vehicle exports in 2016. China amounted to 16 percent during the same year. The largest import countries were Turkey with 20 percent, Japan with 19 percent and United States with 14 percent. Figures 6 and 7 draw a detailed picture of the import and export countries of the Union, highlighting the importance of clear product liability regulation.

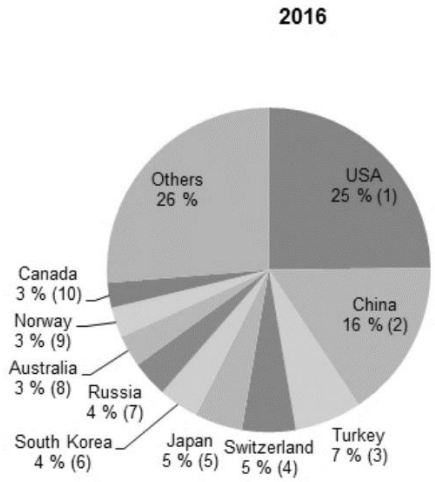


Figure 6: EU trade of motor vehicles, main trading partners' shares for exports in 2016 (source: Eurostat Statistics Explained on "International trade in motor vehicles")

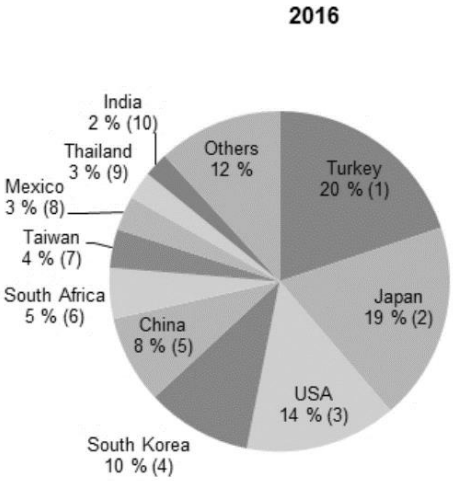


Figure 7: EU trade of motor vehicles, main trading partners' shares for imports in 2016 (source: Eurostat Statistics Explained on "International trade in motor vehicles")

4.2 Autonomous Vehicle Legislation in EU Countries

According to a Lexology article from 25 July 2017, 11 European union countries had begun to enable testing of autonomous driving or make changes to their legislation in preparation for the testing and development of autonomous vehicles. The countries, Belgium, Czech Republic, Denmark, Finland, Germany, France, Italy, Netherlands, Poland, Sweden and the UK, differ much in their approaches for the preparation for autonomous vehicles. The general theme is however clear. The challenges in every nation are generally two-fold. Both the use of public roads for testing and eventual development of autonomous vehicles and the insurance of the vehicles are undergoing public discussion and legislative changes (Lexology, At a Glance: Autonomous Vehicles). Understanding of the current situation on road use is relevant in creating the big picture of the context of change to insurance legislation. Therefore, both are mentioned in individual country cases.

The countries chosen for more examination are Belgium, Finland, Germany and United Kingdom. The reason for these choices is to study forerunners of legislative changes required for autonomous driving within the European Union. These four countries also represent the diversity of the Union being of different sizes and approaches to the Union. United Kingdom has been one of the forerunners and has, among other matters, been seen as an inspiration for Belgium's changes. The uncertainty of UK's exit of the European Union in March 2019 is, however, challenging for drawing long-reaching conclusions of UK's policy and its effect on EU policy.

4.2.1 Belgium

The challenges for autonomous vehicles in Belgium are twofold. To begin with, Article 8.1 of the Belgian Highway Code demands all vehicles have a driver when in transit. The Ministry of Mobility has, however, given permission for road testing of autonomous vehicles and has produced a Code of Good Practice including recommendations for autonomous vehicle manufactures and developers. The Code of Good Practice was published in 2016, based on a similar one published in July 2015 by UK Department for Transport with the title "The Pathway to Driverless Cars: A Code of Practice for testing".

The Code of Good Practice demands, first of all, a high level of safety for any testing of autonomous vehicles of public roads and highways. The vehicles themselves must be

compatible with all relevant road traffic legislation of Belgium, the drivers and operators of tested vehicles must have appropriate licenses and training, risk management must be taken into account and authorities must be given opportunity to supervise any and all testing no matter of the testing being performed on either public and private property or roads. An important requirement is the presence of a test driver or a test operator, however a driver must be present if the vehicles exceeds the speed of over 30 kilometers per hour (Autonomous vehicles - Code of Practice for testing in Belgium 2016).

On the subject of insurance, the Code of Good Practice demands all statutory insurance requirements to be applied. This requires the vehicle to be insured by Motor Third Party Liability Insurance, at the minimum. Voluntary Comprehensive Car Insurance is recommended, however not mandatory and should any testing be included for the test driver's work requirements, the employee must be insured by their employer. Compliance with insurance requirements must be proven to the authorities by submitting of copies of relevant documents.

Other requirements given oblige the testing organization to cooperate with the authorities and to report each testing. Communication is highlighted as essential and testing organizations must inform authorities of testing details, possible consequences of testing and the mitigation measures and any and all instruction for onlookers. Police must be informed of testing location and time and registration data of tested vehicles. The tested vehicles must have been through prior testing in non-public conditions and testing organizations must pay additional attention to mitigate any harm for the most vulnerable of road users, such as disabled people, children, pedestrians and cyclists. Data recording, data protection and cyber security are also points of interest, as all testing must be recorded, privacy data must be handled within legal requirements and unauthorized access to the automated controllers of the vehicle must be mitigated via compliance with standard IEC 61508 or equivalent software trustworthiness standard.

One the other key elements of the Code of Good Practice concerns to the transitions between manual and automated driving modes. The transitions must be clearly understandable, it must be easily established whether the vehicle is in manual or autonomous driving mode, the system must clearly warn for situations when manual control must be reinstated and the actual transition from autonomous to manual driving must be easily obtained. The last requirements of the Code concern failure warnings and software requirements. These, as all other requirements of the Code of Good Practice, are given with a safety-first approach. They require, for example, prior testing checks for vehicle, audible and visual signals as systems warnings,

manual control possibility for steering and braking in all situations and recording and testing of all software used in tested vehicles (Autonomous vehicles - Code of Practice for testing in Belgium 2016).

The second challenge for autonomous vehicles in Belgium concerns the matter of liability. Articles 1382 and 1383 of the Belgian Civil Code contain a specific mention of human person in case of driver liability. The same issue is apparent also in article 1384 of the Belgian Civil Code (goods under custody) citing indirect liability, or in other words damage caused by the vehicle and not directly the driver. The manufacturers' liability could, however, be more suitable for autonomous vehicles. Article IX.2 of the Belgian Economic Code provides that the vehicle manufacturer is liable for any unsafe products is has made available for the public. The regulation enables prosecution of both company and its directors in case of unsafe products. The aforementioned criminal liability is accompanied by a civil liability regulation from the Article 1 of the Belgian Product Liability Act of 25 February 1991. The Article 1 provides that the vehicles manufacturer may be liable on a no-fault basis for damage caused by a manufacturing defect (Lexology, At a Glance: Autonomous Vehicles).

4.2.2 Finland

Similar to challenges in Belgium, the two main obstacles for the deployment of autonomous vehicles have again been the requirement of being able to test vehicles in road conditions and the need for insurance. While the current road traffic legislation permits testing on public roads in theory, in practice testing parties are asked to contact Trafi (Finnish Transport Safety Agency) for assistance with technical approval and registration (Trafi on Automated vehicle trials). Several companies are currently running various tests. One example of them is VTT Technical Research Centre of Finland Ltd, a research company based in Finland, has been testing two autonomous vehicles in road conditions. The vehicle designed for city conditions has been named Marilyn (Citroen C4) and another is a Volkswagen Touareg designed for non-urban areas (VTT press release 18.5.2017).

In Northern Finland a 10-kilometer section of a public road has been updated to support autonomous and connective driving testing in arctic conditions. The update has given access to distribution switches providing tester-specific private VLAN, teleoperators' routers, heated equipment shelters, electricity, internet connection, cable protective pipes for additional cables,

cable manholes, electric distribution centers and fixed stands for any needed equipment (Finnish Transport Agency on E8 - Aurora Test Ecosystem).

The section stretches from Pahtonen to Muonio and is part of Aurora Borealis corridor on E8 (Finnish Transport Agency on E8 - Aurora Test Ecosystem). The Aurora refers to the developed Finnish public test ecosystem, Borealis to test ecosystem on Norway created by Norwegian Public Road Administration and the E8 is one of the European Union's autonomous driving testing corridors (Finnish Transport Agency on E8 – Aurora).

Apart from the current systems of approval by Trafi and public sector supported testing road sector, the legislation covering autonomous driving features is changing as well. The Finnish Government submitted a proposal to Parliament on 23 November 2017 proposing changes to Road Traffic Act and related Acts to better accommodate automation in vehicles. The proposal, officially called the Government's proposal to Parliament for the Road Traffic Act and Related Acts, mentions automation in chapter 1.1. and examines the topic in detail in chapter 1.4. discussing both the possibilities of automation, e.g. rising road safety and less pollution, and challenges, e.g. congested traffic due to longer safety distances and technical malfunctions. (Finlex: " HE 180/2017 Hallituksen esitys eduskunnalle tieliikennelaiksi ja eräiksi siihen liittyviksi laeiksi")

The proposal is summarized in the press release of the Finnish Ministry of Transport and Communication given on 24th of November 2017 titled "The new Road Traffic Act aims for a safer future". The main purposes of the changes are the improvement of road safety and smooth running of traffic in Finnish roads, creation of preconditions for traffic digitalization and safe traffic automation and deregulation. The proposed Act collects all relevant statutes under one Act, reduces their number and modernizes authorities' procedures. On automated driving, the new Act considers the person controlling the vehicle its driver no matter should the person not sit inside the vehicle and demands the vehicle to not start moving unexpectedly under remote operation. The Act also proposes the changing of yellow traffic lines to white, to better be detected by machine vision and all traffic control devices to be transmitted to an information system maintained by the Finnish Transport Agency for wider use of said data. (Ministry of Transport and Communication, Press Release: "The new Road Traffic Act aims for a safer future")

Legislative changes have not been limited to those of Road Traffic Act. The Motor Insurance Act (17.6.2016/460) (Fin. liikennevakuutuslaki) was amended in 2016 and the changes came

into force on 1 January 2017. While autonomous driving and autonomous driving features are not clearly stated in the new Act, the vagueness of the § 51 offers the possibility of insurance providers to demand compensation from manufacturers. This fact is stated in in the "Governments Proposal to Parliament for the Motor Insurance Act and Related Acts" (HE 123/2015). The Government's Proposal also proposed changes to the Product Liability Act (694/1990) to solidify the amendment to the Motor Insurance Act. The Act had previously exempted insurers from claiming compensation from manufactures in case of a Motor Insurance accident of which insurer had paid compensations to the victims. The 13 § of the Product Liability Act was amended to only exempt insurance cases of medication injuries and therefore Motor Insurance insurers are able to seek compensation from manufacturers of vehicles in case the cause of the accident is due to technical issues.

4.2.3 Germany

Automotive industry is the largest manufacturing industry branch in Germany covering both large international car manufacturers as smaller regional operators. The industry directly employed over 800 000 and had a yearly turnover of over EUR 405 MRD in 2016 (Bundesministerium für Wirtschaft und Energie: "Automobilindustrie - Branchenskizze"). For the automotive industry's importance to the German economy, it is therefore no wonder that the German Government announced in September 2015 its strategy for connected and automated driving. The strategy focuses on five key areas, law, infrastructure, innovation, IT security and data protection with the aim of Germany becoming the leading supplier of automated and connected vehicles.

The implementation of the strategy manifested in December 2016 as the availability of EUR 100 Million for subsidies for projects developing autonomous driving capabilities and technologies. The grant was made by the German Federal Ministry for Traffic and Digital Infrastructure (Bundesministerium für Verkehr und digitale Infrastruktur) as part of "Automatization and Inter-connection in the area of road traffic" program. EUR 69.2 million of the grant had been granted by July 2017. (Lexology: "Autonomous Cars - Opportunities and Challenges in Germany")

Germany's Federal Ministry for Economics and Energy (Bundesministerium für Wirtschaft und Energie) has made available similar grants as the Federal Ministry for Traffic and Digital Infrastructure, although for small and medium enterprises. Other subsidies are in the form of

testing fields both in Germany and one across Germany, France and Luxembourg (as was agreed in 2017). A new all road conditions testing field will be opened in Baden-Württemberg in spring 2018. (Lexology: "Autonomous Cars - Opportunities and Challenges in Germany")

Automotive News Europe article "German industry welcomes self-driving vehicles law" 15.5.2017 reported on 15th of May 2017 on the positive response of automotive industry to then coming into effect changes on the German Road Traffic Act (*Germ. Straßenverkehrsgesetz*), also called the (StVG). The newly amended Act, in its § 1a StVG, demands all vehicles with "highly or fully autonomous driving functions" must gain prior approval. The definition was created by the Federal Highway Research Institute (Bundesamt für Straßenwesen or BASt) in 2012 (Lexology: At a Glance: Autonomous Vehicles). The Act also demands the presence of a qualified driver prepared to take over at any time, when autonomous driving functions are in use. All vehicles, no matter the level capable of autonomous driving, must also be equipped with a steering wheel and braking pedals. The main liability remains on the driver; however, the manufacturer may be held liable should the vehicle's systems prove that traffic accident was caused by the vehicle in autonomous driving mode (Die Bundesregierung "Automatisiertes Fahren auf dem Weg"). A recording device, a black box, must therefore be installed in every autonomous driving function using vehicle. Changes to the Act were introduced in order to legalize the testing of autonomous vehicles on German roads and to eliminate inconsistencies in traffic legislation (Automotive News Europe 15.5.2017).

The 8th Amendment to the StVG came into force on 21 June 2017, having been passed by the Parliament of Germany (Die Bundestag) earlier that year. The aim of the Amendment was to facilitate operation of fully or highly automated vehicles on German roads by establishing clear rules on vehicle's steering and braking features and operation liabilities, as mentioned above. The then Federal Minister for Transport and Digital Infrastructure on Merkel's third Government, Mr. Alexander Dobrindt, proposed the legislation by following words "In plain language the draft legislation means that in future, a computer will be in charge at the wheel. During this time, the driver can avert his attention and surf the internet, check his emails and can stream films." (Lexology "Limited breakthrough for autonomous vehicles?"). In other words, the Minister saw this Amendment as enabling the future possibility of fully autonomous vehicles. (Lexology: At a Glance: Autonomous Vehicles)

Insurance legislation in Germany has yet to see any changes due to the development of autonomous vehicles. The only change on liabilities was the increase of maximum liability

sums in the Road Traffic Act. The current maximum liability on personal injuries was increased from five million euros to ten million euros and on property damage the rise was from one million euros to two million euros. In any case, partial move from driver liability to product liability, as seen in Belgium and Finland, is a probable change. Other possible development, as suggested by an article written by Dr. Herbert Palmberger and René Schnichels of the commercial law company Heuking Kühn Lüer Wojtek, could be the increase in both cyber insurance demand and claims. ("Self-driving cars 2018 will bring changes to the German automotive and insurance industries" 18.12.2017)

4.2.4 United Kingdom

UK Department for Transport published in February 2015 a report named "The Pathway to Driverless Cars - Summary report and action plan" detailing the then current situation and future steps to enable autonomous driving in United Kingdom. The report determines that operation of autonomous vehicles is legal on public roads and does not require advance permits or insurance. The Department of Transport also established the Centre for Connected and Autonomous Vehicles (CCAV) to coordinate policies and provide funding for research (Centre for Connected and Autonomous Vehicles (CCAV) on "About us").

United Kingdom is currently in the process of passing a new bill for autonomous and electric vehicles titled the "Automated and Electric Vehicles Bill". In spring 2017, there was the intention to include most of currently negotiated requirements in amendments to the Vehicle Technology and Aviation Bill ("VTA Bill"). The amendments were cancelled when the Parliament was dissolved due to the Prime Minister Theresa May calling a General Election (Lexology: "At a Glance: Autonomous Vehicles"). The Automated and Electric Vehicles Bill is currently at the Committee stage at the House of Lords of the Parliament (UK Parliament on Bill and Legislation).

As the currently negotiated bill is based on the cancelled amendments to the VTA Bill, it is enlightening to understand the extent of the cancelled changes. The amendments would have extended insurers' responsibility and required automated vehicle owners to insure their vehicles, similar to non-automated vehicles. Therefore, no matter the level of automation in vehicle, the same route would have been available for compensations. The injured party may have claimed compensation from vehicle's insurer and the insurer may in turn had filed for compensation from responsible party to the extent of law, including product liability law.

The amendments to the VTA Bill would have laid several provisions. First of all, the British Government would have been responsible for maintaining of list of all vehicles categorized as 'automated vehicles' and the new provisions would have only concerned vehicles included in this list. Secondly, insurers would have been liable for damages caused by 'automated vehicles' in self-driving mode, should the vehicle have been insured at the time of the accident. Had the vehicle been uninsured, the owner would have been responsible for any damages. Thirdly, insurers may have recovered claims costs from manufacturers in cases of 'automated vehicle' accidents. Insurer's liability may had been reduced should the injured party been wholly or partially responsible for the accident. Insurer's liability may had been excluded should the self-driving features been used in situation not suitable for them. Insurer's liability may also had been limited or excluded should any unauthorized or prohibited modifications been made to the vehicle's operating system or should any software updates required by the insurer not had been installed. (King & Wood Mallesons (KWM): "Self-driving Cars: China and Beyond- Who will be Liable?")

4.3 Examples non-EU Country Legislation

Several non-EU countries have taken steps to develop and test autonomous vehicles, although as all development is generally on the testing stage, mainly allowances to Road Traffic Acts or similar regulation have been made. Risk Management and Insurance have played a much smaller role. While the USA is generally the most known country in connection to autonomous driving, Australia, China and Singapore have also made their own regulative allowances.

The question of regulation of autonomous vehicles is not, however, yet solved in the USA either. While currently three states, Nevada, California and Florida, have authorized the use of autonomous vehicles on public roads, the question of regulation maker and regulator is still unresolved. According to Reuters article on June 16, 2017, titled "U.S. states could not set self-driving car rules under Republican plan", U.S. House Republican proposal design and testing of autonomous vehicles could be regulated on federal level, while insurance and registration rules would be authorized on state level. The question of pre-review and approve method of regulators approving of technology before deployment (Obama administration proposal in 2015) would also be taken out of the law. (Reuters: "U.S. states could not set self-driving car rules under Republican plan")

Asian based international law firm King & Wood Mallesons (KWM) reports in article "Self-driving Cars: China and Beyond- Who will be Liable?" (8 August 2017) that the state tort laws may also be an important factor in questions of autonomous vehicle collisions and other accidents. The tort laws differ from state to state as liability may currently be based on traditional negligence, no-fault liability or on strict liability. The article also suggests the use of product liability.

The current steps taken by different states on liability vary from state to state. Michigan enacted Senate Bill No. 633 on 27 December 2013 proving that manufacturers bear liability for alleged damages only in cases the defect resulting in the damages was present in the vehicle at the time of manufacture. Manufacturers are also only liable under product liability for modifications for equipment installed to convert vehicle for autonomous driving, in case damage was present at the time equipment was installed and damages were caused by it. Tennessee has drafted similar provisions.

Massachusetts has provided that manufacturers are assumed liability in accident cases the automated technology is at fault. New York has provisioned a wider liability, providing manufacturer, operator and owner are all strictly liable for any vehicle caused personal or property damage. The article notes that both Michigan and Tennessee have significant vehicle production in state, while Massachusetts has none.

In Australia autonomous vehicle testing has been allowed under guidelines written by the National Transport Commission (NTC), an independent advisory board, and Austroads, the top organization of Australian transport and traffic agencies. The guidelines have been accepted by all State Transport Ministers and have support from all levels of the Australian government. The guidelines give strict requirements for safety and test application information, including on the insurance taken for the tests. (Lexology: "At a Glance: Autonomous Vehicles")

The National Transport Commission (NTC) published a policy paper in 2016 on regulatory reforms needed for automated road vehicles. On liability the main finding was the progressive complexity on questions of liability. The drivers of increasing complexity were found to be the possibility of multiple parties responsible for any accident, the interaction of human and machine and human's responsibility of either taking command or monitoring vehicle performance and new possible accident causes, such as failing sensors, cybersecurity breaches and software errors. The paper concludes, that Australia' current liability framework is sufficient, although cautions for the possibility of manufacturers being discouraged by liability

risks. The paper also remarks that as the technology is only emerging, legislative changes would be premature. The paper states that once technology for autonomous driving is fully developed the main questions would defining of both the meaning of driver and control. (King & Wood Mallesons (KWM): “Self-driving Cars: China and Beyond- Who will be Liable?”)

In China the current issue of regulation for autonomous vehicles is the lack of addressing of the key issues in existing regulation. Chinese legislative and regulative system does not cover criminal or civil liabilities, related traffic offences, vehicle registration or sharing of telematics information. It is partly due to these deficiencies that the Chinese government has given rather careful estimates of 50 % of vehicles to have Driver Assistance (DA), Partial Automation (PA) and Conditional Automation (CA) by 2020 and for the percentage to rise to 80 % by 2025. The entering of vehicles with High or Full Automation is estimated to happen by 2025. These estimates are part of the "Mid- to Long Term Development Plan of the Automotive Industry" issued by the Ministry of Industry and Information Technology on 6 April 2017. Autonomous vehicles are included in the China's 13th Five Year Plan for 2016-2020. (Lexology: “At a Glance: Autonomous Vehicles”)

One of the actions taken in China has been the establishment of a new subcommittee under the existing Automotive Standardization Committee, called the Connected Smart Automotive Subcommittee. The Subcommittee will be responsible for the development of national standards on technologies concerning sensors, autonomous assistance, autonomous driving and information services, when relating directly to telematics information. (Lexology: “At a Glance: Autonomous Vehicles”)

China has yet to make changes for its insurance or liability regulations in preparation for autonomous driving. China’s current liability regime is based on both traffic and tort law. In case of a traffic accident the driver who caused the accident may be held liable under both the People’s Republic of China (PRC) Road Traffic Safety Law and PRC Tort Law. In case of motor vehicle colliding another motor vehicle at-fault liability will apply, whereas in cases of motor vehicle colliding with non-motor vehicle or a pedestrian, presumed-fault or strict liability will apply. The Traffic Safety Law provides that the insurer of the guilty party must pay a capped amount to the accident victim and should the sum paid not be sufficient to cover the damages the driver shall pay for any further damages. (King & Wood Mallesons (KWM): “Self-driving Cars: China and Beyond- Who will be Liable?”)

In Singapore the Parliament amended country's Road Traffic Act (RTA) in February 2017 exempting autonomous vehicles, their operators and persons in charge of testing from existing RTA standards and allowing for testing both in private and public roads. One the most important exemptions was the clause of human driver being responsible for the safe operation of the vehicle. Regulation for autonomous vehicles specifically is under development (Lexology: "At a Glance: Autonomous Vehicles"). The RTA Bill also includes a new offence of person interfering with autonomous driving testing or the equipment or devices of the vehicle. The person would be liable for damage caused and be subjected to a fine up to 5 000 Singaporean Dollars if convicted (Lexology: "Singapore government proposes new laws governing autonomous vehicles").

Singapore has not made changes to its liability or insurance provisions concerning the driver or owner of autonomous vehicles. The current liability requirement provided by the RTA Bill concern the liabilities of testing. The operators of autonomous vehicles must either be covered by liability insurance or place a deposit as security with the supervisory authority Land Transport Authority (LTA). (Lexology: "Singapore government proposes new laws governing autonomous vehicles").

4.4 Overview of Current EU Member State and Non-EU State Legislation

The eight countries chosen for closer examination on their progress in enabling and regulating autonomous vehicles and their liabilities, differ significantly from one country to the next. Despite all of the countries having taken some steps, the extent of these changes is far from identical. Belgium, Australia and China have not made legislative changes and have either established guidelines for autonomous vehicles and their testing or have established the party to give these guidelines in the future. United Kingdom has permitted testing, but has yet to pass legislation. The Automated and Electric Vehicles Bill is undergoing parliamentary scrutiny at the House of Lords.

Germany and Singapore have amended countries' Road Traffic Acts to enable both testing and use of autonomous vehicles. However, on liability and insurance matters the only change in Germany has been the raising of the maximum liability sums. Singapore has made no changes to insurance legislation and regulation, other than requiring either insurance or a security deposit for testing caused liabilities.

Finland has made amendments to Motor Insurance Law and Product Liability Law in order to enable insurers to seek compensation from manufacturers. The Finnish Road Traffic Act has yet to be amended, although Government has published their Proposal on the matter. United States has made the most progress in amending liability and insurance laws to better suit the operating model of autonomous vehicles. The challenge of USA is, however, that current changes have been done at state level and on the federal level clear consensus on the matter has yet to emerge.

The Table 3 summarizes the main changes and legislative and regulative amendments made by the eight countries. The countries are divided to EU member States and Non-EU countries as presented previously. Non-regulative changes are not included in the Table.

	Traffic regulation	**Liability/Insurance regulation**
EU Countries		
Belgium	- no legislative changes	- no legislative changes
	- Code of Good Practice by Ministry of Mobility	- Code of Good Practice by Ministry of Mobility
Finland	-testing permitted under current legislation, however prior contact with Transport Safety Agency required	-possibility of manufacturer liability added to Motor Insurance Law
	- Goverment submitted a proposal on changes to Road Traffic Act	- amendment to Product Liability Act
Germany	- changes made to Road Traffic Act	- maximum liability sums raised
United Kingdom	- no legislative changes	- "Automated and Electric Vehicles Bill" at House of Lords in Parliament
	-operation of autonomous vehicles permitted on public roads without need for permission	
Non-EU Countries		
Australia	- testing allowed under guidelines from National Transport Commission (NTC) and Austroads	-paper by National Transport Commission (NTC)
		- no legislative changes
China	- no legislative changes	- no legislative changes
	-establishment of Connected Smart Automotive Subcommittee to develop national standards	
Singapore	-amendments to Road Traffic Act (RTA) exempting autonomous vehicle testing from testing regulation	- no legislative changes
		-testing must be covered by insurance or by security deposit
USA	- legislative changes at state level	- legislative changes at state level

Table 3: Main Changes to Traffic and Insurance or Liability Regulation in Belgium, Finland, Germany, UK, Australia, China, Singapore and USA

4.5 Probable Effects of Developing Autonomous Car Legislation in the European Union

Similarly, to the differences between these countries on regulation, the overall approach to autonomous vehicles differs. United States, Singapore and the UK have taken a more forward going approach, although in the US the level of change is a state level question. Belgium's approach is modeled after the UK's as published by the country's Ministry of Mobility. The German and Finnish approach can be summarized as "hands on the wheel, eyes on the road". The approaches of both countries have been careful in emphasizing the responsibility of the driver.

Due to the uncertainties of current Brexit negotiations, UK's approach to autonomous vehicles may not give much insight into future EU level regulation. Germany, on the other hand, may hold much weight in any discussion on the matter, due to both the country's position as the leading economy of the Union and the weight of the automotive sector in Germany, creating both country level and EU level pressure to create clear regulation for the whole Union. Also, the current freedom of mobility of vehicles within the Union would demand Union level agreement on technology, road traffic regulation and insurance, similar to current Green Card system.

It is likely that the question of liability may be one of key themes of autonomous vehicles use as liability can be divided into three components. The driver of the vehicle may be liable for inattention even in level five autonomous vehicles, in case the driver does not notice the request of the vehicle to take over. The owner of the vehicle may be liable for any mismanagement in vehicle maintenance or system and program updates. On the other hand, the manufacturer and their subcontractors may be held liable in case of manufacturing defect or system error. The basis of the liability would therefore be a programming fault or vehicle defect causing a traffic accident. The third party to be held liable could be the operating state or their appointed road maintenance services, in case of poor road maintenance. The European Union is comprised of several countries, where the climate with high probabilities for snow and ice accumulating on road surfaces covering all road marking could be a significant liability risk on the public sector.

The probable change to vehicle insurance for the insurance of autonomous vehicles centers mainly around the use of product liability. Therefore, the manufacturer(s) or subcontractor(s) would be held liable for part or the entirety of autonomous vehicle caused damages to persons

and property. However, the Commission's REFIT consultation on Motor Insurance Directive in fall of 2017 raised the question of involving also the entity responsible for the development and maintenance of road infrastructure. Should product liability become the basis for insuring the use of vehicles, it would change the current nature of motor vehicle insurance and create a new market for B2B insurance as the manufacturers and subcontractors would most likely need to use insurance to cover eventual damages of manufactured vehicles. This would mean a dramatic downsizing of entities buying motor insurance.

Consequently, the current EUR 124 billion total motor premium income, as seen in the Figure 8 would for the most part change from being mostly private customer bought product to an insurance between manufacturer and insurer. However, a part of the Voluntary Comprehensive Car Insurance would, most likely, remain in the hands of also private customers. The need for insurance covering weather, theft or vandalism related damages would not be covered by manufacturer or road infrastructure maintaining entity as the risks of weather, theft and vandalism are similar to those other private properties, such as homes, face. The third-party liability premium, as seen in Figure 9 would change hands entirely in the amount covering autonomous vehicles. In any case, as the introduction of autonomous vehicles will last decades and non-autonomous vehicles will be used simultaneously the insured. The premiums for both third party liability insurance and Voluntary Comprehensive Car Insurance would therefore be divided into the premiums paid by manufacturers and subcontractors, by possible entities responsible for road maintenance and by non-autonomous car owners.

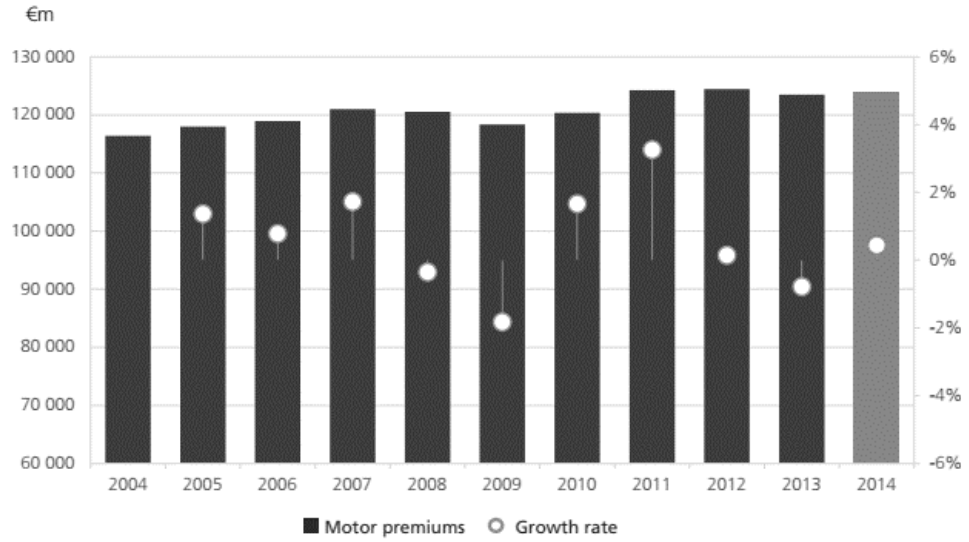


Figure 8: Direct motor premiums written in the domestic market — 2004–2014 (source: Insurance Europe European Motor Insurance Markets Addendum June 2016)

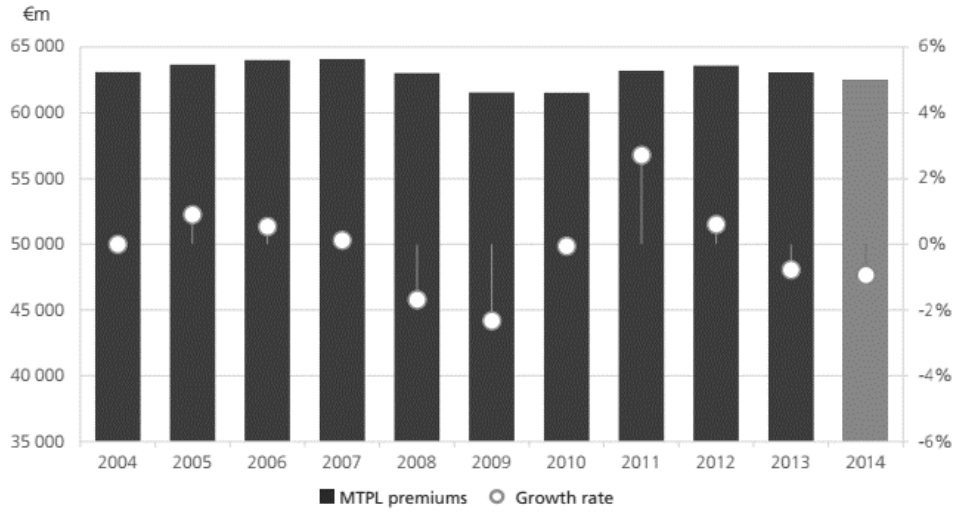


Figure 9: MTPL premiums — 2004-2014 (source: Insurance Europe European Motor Insurance Markets Addendum June 2016)

The challenges of European Union Member States in the development of autonomous and connected driving features and vehicles may also contain the danger of politically motivated takeovers of high-technology European companies buying European, often with Government subsidies, manufactured technology overseas. Germany, France and Italy, all important car manufacturing countries, have called for European level defense instruments for screening of suspected takeovers. The European Commission made a proposal on 13 September 2017 to the establishment of framework allowing Member States to screen direct foreign investment to the European Union for not only critical infrastructure and security but also critical technology able to becoming obstacle for companies developing autonomous vehicle technology. The proposal is currently under discussion at the EU level. (Lexology: "Autonomous Cars - Opportunities and Challenges in Germany")

5 CONCLUSIONS

Oskari Juurikkala argued in his article "Social Norms, Culture and Better Regulation" on negatives of legal centralism in most regulatory theory and debate (Tala & Pakarinen 2010). Legal centralism, or the principle of law being the one that matters, diminishes the role of social norms in societies and behavior. Despite the problematic nature of legal centralism, the future

of autonomous vehicle testing, widespread use and insurance is governed by legislative proposals.

This thesis has approached autonomous vehicle insurance from European Union perspective. The Union currently accounts approximately 20 percent of the world's total trade (European Union's official website on "Measuring the EU's economy") and as the Union houses many international vehicle manufactures competing on developing more autonomous driving capabilities, the need for harmonious regulation is apparent.

The presented main results of this thesis center around the three main research questions, while implications subchapter covers both the given predictions for EU and Member State level legislation and how these changes could then affect the insurance industry. The presented limitations are understood via the validity, reliability and sufficiency of used references and the conclusions drawn from those. The future research subchapter covers three possible cases of further research.

5.1 Summary and Main Results

This thesis has attempted to answer three main research questions:

1. What is the current legislative framework for the insurance of automated and autonomous vehicles in the European Union?
2. How autonomous vehicles have changed both road traffic regulation and personal vehicle insurance regulation in European Union Member States? (Few non-EU countries are given as reference examples)
3. What changes have been proposed or are likely to be proposed to current EU insurance regulation on autonomous vehicles?

In doing so, this thesis has presented an overall picture of the international conversation on automated and autonomous vehicles and of the current EU development on the subject. International law and its effects on EU and member State legislation, while not the core object of this thesis, have been detailed for the understanding of broader regulative framework. EU law is sum of its parts and understanding its history, one can draw conclusions for future level of integration. EU law can currently be seen as pursuing deep levels of European integration

without outright federalization. The Lisbon Treaty and the never ratified Constitutional Treaty are prime examples.

The roles of the main EU bodies and their responsibilities in the ordinary legislative procedure describe the process of legislation and give an indication on the timeframe of future legislative changes. The main principles of EU law, conferral, subsidiarity, proportionality, supremacy and legal certainty, characterize the possible change. Principle of conferral refers to EU acting only within limits of the competencies given by the Treaties, subsidiarity to Union's acting in non-exclusive competence areas, proportionally to Union acting only for the achievement of Treaty objectives, supremacy to the requirement of Member States to apply Union law and legal certainty to the need for predictability of Union legislation.

Insurance legislation of the European Union has been forming from the years 1973 and 1978, when the First Generation Insurance Directives came into force. Non-Life Insurance Directive (1973) and Life Insurance Directive (1978) were followed by Second Generation Insurance Directives in 1988 (non-life) and 1990 (life). The Third Generation Insurance Directives came into force in 1990. The latest major regulative change for insurance legislation has been the introduction of the Solvency II capital requirements.

History of motor insurance legislation in the Union dates back to 1972, when the First Motor Insurance Directive, also called First Council Directive (72/166/EEC), was adopted. The Directive was enacted in order to facilitate free movement throughout Member States. Second Council Directive (84/5/EEC) from the year 1983 provided increased protection for victims of accident. The Third Council Directive (90/232/ EEC), coming into force in 1992, provided the basis of a single premium throughout the then European Community Area. The Fourth Motor Insurance Directive (2000/26/EC), from the year 2000, amended the First Motor Directive and the Second Council Directive on Life Insurance (88/357/ETY), again increasing protection for victims. The Fifth Motor Insurance Directive (2005/14/EC), signed in 2005, amended all previous Motor Insurance Directives and the Second Council Directive (88/357/EEC) on non-life insurance. The Fifth Motor Insurance Directive provided, among other smaller changes, higher compensation requirements. All five Directives were assembled together to one Directive and repealed by the Directive 2009/103/EC of the European Parliament and of the Council on Motor Insurance. The Directive is based on minimum requirement harmonization.

The Directive currently in force is the Motor Insurance Directive (MID) (2009/103/EC). The European Commission held a public consultation on the Directive in 2017. The results of the

consultation have yet to be published. The consultation concentrated on eight key areas that were the portability of claims history statements, possible guarantees for victims in cases of insurer's insolvency, minimum cover amounts, insurance checks, terminology, scope of the Motor Insurance Directive, autonomous cars and transfer of vehicles. Autonomous vehicles are included in the consultation for the Commission to gather opinions of whether there is need for change in the current Directive. The wording of the Directive may cover both human and technology operated vehicles, however, the Directive does not cover manufacturers' or infrastructure entities' liabilities.

The theoretical framework of this thesis has followed the principles of European Integration theory using the methods of qualitative research. European Integration Theory is a practice of systematically studying the process of political cooperation and common political institutional development in Europe. The current state of integration, 'constructing the EU', faces its challenge in the legitimacy of different areas of integration. While economic integration has been welcomed by Member States and citizens, any steps towards federalization have been problematic. In case of insurance regulation, the economic aspect is clear, however social consequences are more challenging. In any case, in insurance legislation both the justice of outcomes, structures and productiveness, and the efficiency of them and the identifying of Union citizens of the legislation must be understood and considered.

This thesis has studied four European Union Member States in detail on the countries' policies on autonomous and automated vehicles. Belgium has made no legislative changes, having, however, published a Code of Good Practice. Finland has added the possibility of product liability claims for motor insurers and the Government has published a Proposal for changes to the Road Traffic Act. Germany has allowed the testing of autonomous vehicles on German roads by amending country's Road Traffic Act and has raised the maximum liability sums. United Kingdom has allowed the testing of automated and autonomous vehicles, although with no legislative action. 'Automated and Electric Vehicles Bill' is currently in process at the House of Lords of the British Parliament. In reference four non-EU countries have also been studied in this thesis. Australia and China have made no legislative changes, National Transport Commission having published both guidelines for testing and a paper discussing liability matters. China has established 'Connected Smart Automotive Subcommittee' to develop suitable regulation. Singapore has allowed testing and use of automated and autonomous vehicles by amending country's Road Traffic Act. Singapore has yet to create regulation on liability matters. Legislative changes in USA have been passed at state level.

The main results of this thesis aim to answer the three research questions. Firstly, the current legislative framework has been explained as consisting of three levels. The international level, comprising of main international law of the Vienna Convention and the Geneva Convention. All European Union Member States and the EU itself (on grounds of resolution 97/836/EC) are signatories of the Geneva Convention of the Economic Commission for Europe ECE of the United Nations 1958. Most of EU Member States and the Union have also signed the Vienna Convention on Road Traffic 1968. The decision power on allowing for automated or autonomous vehicles is not simply a matter an individual state or indeed the EU. Geneva Convention does not contain any provisions on permitted vehicles, the Convention binds its signatories to implementing regulation of the World Forum of Harmonization of Vehicle Regulations.

The second level of the legislative framework consists of European Union regulation. EU has provided for mainly minimum level harmonization requirements in its regulation of both road traffic and motor insurance. The third level describes the Member State level regulation, differing from one country the next. The Figure 10 draws an overview picture of the three levels of legislation and the current trend of regulation changing from the Member State level.

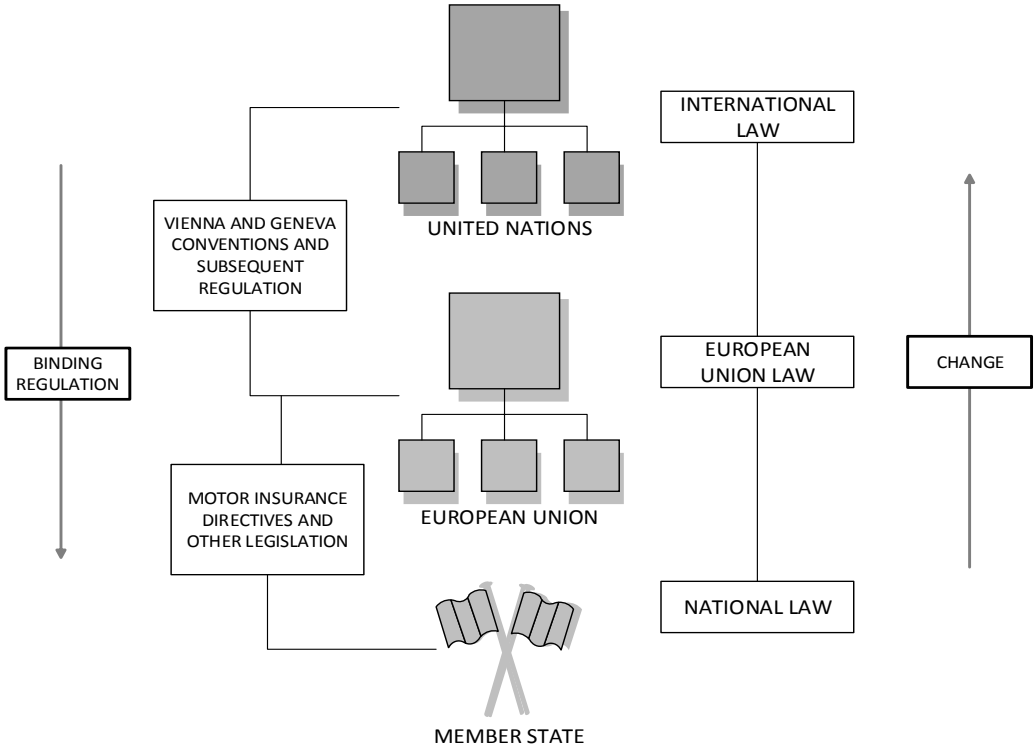


Figure 10: Legislative Framework of automated and autonomous vehicles regulation

The second research question examines the subject of Member State level changes in preparation for autonomous and automated vehicles. Belgium, Finland, Germany and United Kingdom all have either made legislative or other changes. As a reference point, USA, China, Singapore and Australia have made at times similar, other times much differing regulative changes. The country specific approaches are summarized in chapter 4.4.

The third research question is more difficult is answer. While minor changes have been proposed to the Motor Insurance Directive on the subject of automated and autonomous driving, it is likely that these changes will not be sufficient. The matter is discussed in more detail in the following subchapter. In any case, any future change should take into account the current Member State level approaches and aim to gather the best practices of them.

5.2 Implications on EU and Member State Legislation and on Insurance Providers

Takis Tridimas commented on his chapter "Federalization, Crisis Management and Law Reform" in the volume 'The Evolution of Eu Law' (2011) that the European Union has the "luxury of looking at the wider picture" as the Union is less affected by national political and electoral pressures. His meaning is that the Union is often capable of passing mandatory regulation also on unpopular subjects, as the electoral and political pressure takes a different form than in the Member State level. After the financial crisis, the EU has taken a keen interest in financial regulation including insurance, and the trend has been towards federalization. In other words, the Union has increasingly introduced maximum, not minimum harmonization. In the light of this it is likely that any change to the Motor Insurance Directive would also aim higher in terms of harmonization. If nothing else, the European Union would most likely focus on enabling the technology of autonomous and automated driving to develop. Consumer rights and protection could also be on the list along with safety, meaning tighter regulation on safety features for both the vehicles and the roads themselves.

The insurance markets are likely to change as well, resulting in a new need for altered regulation. The motor insurance market, currently amounting to approximately EUR 124 billion (Insurance Europe European Motor Insurance Markets Addendum June 2016) could shift to offer mainly VCMI products for consumers and larger insurance policies for manufacturers, though these policies might need to cover all product liability. The model used in Britain of the

consumer filing claims to their motor insurer and the insurer then filing separate claim to the manufacturer (or their insurer) could be one possible model for this. The vehicle manufacturer would therefore need umbrella policies for countries their vehicles are sold as VCCI in its narrower future form might still result in service charges by the insurer. A new market would therefore emerge between the native insurance company and the insurer of the product liability of a certain manufacturer in a certain area. In some ways this could model itself after current reinsurance markets where the primary insurer pays their share of risk and the reinsurer the rest of the claim. Another possible option could resemble current vehicle warranties where the consumer contacts the car dealer, who then contacts importer and the importer contacts the manufacturer. The end result would account to the same, the manufacturer holds the liability, the primary insurer would simply not be contacted in the process. Figure11 depicts both possible options.

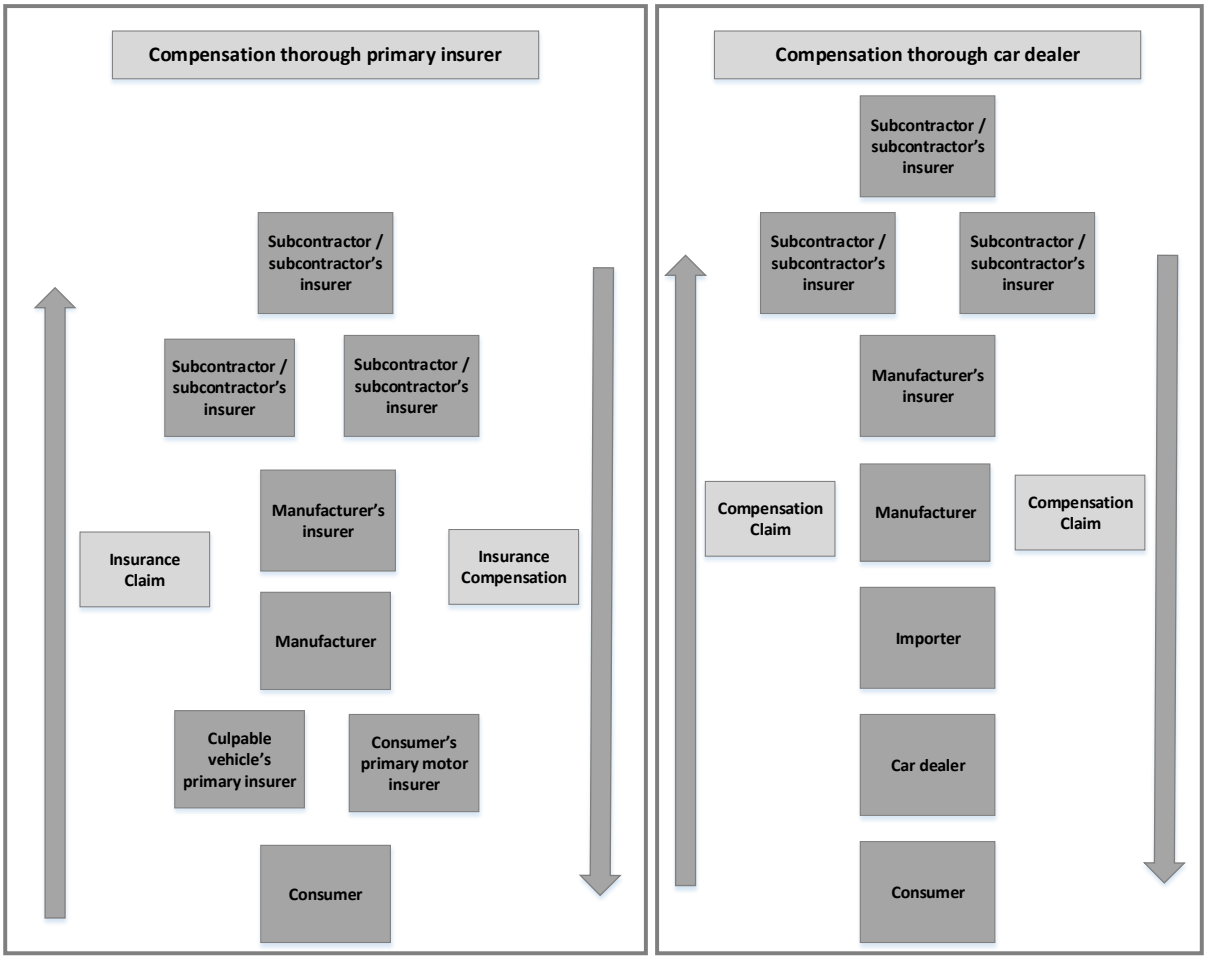


Figure 11: Possible compensation models for automated or autonomous vehicle accidents

The challenge of automated and autonomous vehicles is the high-risk profile of any operating technology. A fault in programming or operation may cause irreplaceable damage not only in terms of human lives but also in consumer trust and opinion of the technology and the manufacturer. An example of this could be an accident involving Tesla Model X in California in March 2018, as reporter by the Guardian on 30 March 2018. The vehicle collided with a highway barrier killing its driver. The vehicle was operating under autopilot mode, however, according to Tesla the vehicle had requested the driver to take over prior to the crash. The request had not prompted action from the driver. This crash was the third one in series of automated driving accidents, following another Tesla vehicle in January and a Volvo Uber vehicle in March. The article reported the accident with the words "the latest accident to involve self-driving technology" (The Guardian: "Tesla car that crashed and killed driver was running on Autopilot, firm says"). For the manufacturers this publicity is not ideal. For liability and insurance, the reliability of technology in calculating the probabilities of accidents and when deciding whether to grant insurance in the first place is crucial. Unreliable technology could place an undue burden on insurers and raise the price of manufacturer product liability insurance, raising the operating costs of manufacturers and by so raising the costs of vehicles for consumers. In the future another possibility could be subcontracting the operating technology or parts of it from other companies, such as high-technology companies. The liabilities could then be challenging to divide and would, most likely, became major parts of subcontracting contracts.

The final conclusion to be drawn from this thesis is the challenge to form a reliable prediction for the future of motor insurance regulation in the European Union. The current trend of small alterations for the Motor Insurance Directive will not be sufficient, should automated and autonomous driving become the common norm. As neither the technology nor the insurance market have developed sufficiently any policy change would base itself partly on predictions. EU therefore faces a situation of both opportunities and threats. The Union could take a pre-emptive approach and create regulation on assumption of the future insurance market and by so perhaps enable the market the form as hoped. This could a possibility for stability for the motor insurance market and a way for the Union to be a forerunner in the global market. Another option for the EU is to wait and gather understanding of the best practices which would form in Member States and abroad. The EU could then pass legislation of the best-found principles. The opportunities of this are no possibly wrong type legislation and the possibility of forming legislation according to best practices. The threat is the degeneration of the Single

Market for vehicles. Should the European Market become overly challenging to operate by differing Member State regulation the movement of goods, is this case vehicle, could suffer and the Union would afterwards face an uphill battle in creating uniform legislation. On the point of view of vehicle manufacturers, this would not be optimal. The threat is that testing and early deployment of automated and autonomous vehicles would occur outside of the Union's borders in a country more easily navigated from the liability point of view.

5.3 Limitations

Understanding limitations of any research has a high importance, due to the nature of qualitative research often either generating a hypothesis or affirming an existing one. As reasoning and deductions are based on data and other research may use another's results, the demand for accuracy is high. The validity, reliability and specific limitations of any research must therefore be considered carefully.

While all information included in this thesis has been subjected to critical assessment of the data's validity and reliability, the limits of both must be taken into account. On one hand, validity, often described as the extent of a concept responding to reality, measures whether used data corresponds with the actual phenomenon. On the other hand, reliability can be described as the trustworthiness of the information, be it either data or conclusion.

One of limitation of this this is the possibility of important and key data being missed. Much of the research process has been of searching for relevant data, however, due to the many aspects and various data sources, the data found and used may not always have been up to date. Another aspect is the time sensitivity of presenting current legislation and state of legislative process. As legislation, especially concerning developing technology, may have a limited lifespan and as this thesis has explored various countries, some of the data found may not have been current or had changed shortly afterwards.

Public availability may have also presented limitations. Some data may not have been available for public use or the data available may not have been current. Data may also have been written in a different language, and therefore not found. Another aspect on the language limitation for this thesis is the reliability of translations. Many of the sources used have been either translated for this thesis or previously translated and the reliability of these can only be as accurate as the capability of the translator.

The typical procedure of The European Commission is to publish several versions of many of their papers. The reason for this is to receive feedback on the presented proposals while the proposals are still preliminary, and not utilize resources should the proposal not be well received by other institutions. This procedure, however, presents challenges for the validity of Commissions papers used as references as the version utilized may not always be final or the most current.

The exclusions of this thesis of most international law, non-Member State law, privately owned vehicles and technical aspects of autonomous driving may affect the reliability of drawn conclusions as all of them could have given better insight into the matter researched. The exclusions of other, in parts relevant legislation, such as legislation concerning cybercrime or personal data protection, may have had the same effect.

5.4 Future Research

Many possibilities can be suggested for future research on the topic of this thesis. One of them concerns Motor Insurance legislation in both the EU and its Member States, another insurance providers future actions and the third the timeline of consumer's move to autonomous driving and its implication on bough insurance.

The first one, concerning the potential future changes to Motor Insurance legislation, could be approached from either European Union or Member State level. While this thesis has hypnotized that the change for Union level Motor Insurance legislation will occur in the near future and imitate to some extent the changes passed at State level, the actual change and then given rationale would be an interesting research subject. The same can be said of both the current status of regulation in those Member States not covered in this thesis and of all future changes.

The second possible research topic could be change to insurance providers' business models. In today's market, much of the Motor Insurance products available are designed for private consumers and rely heavily on the principle of human driver, either of the insured vehicle or the party involved, being responsible for the operation of the vehicle and by so the resulted accident. This model faces heavy obstacles, should the manufacturer be increasingly held

responsible. Any research to this phenomenon could both research the exact response of insurance providers in general and the calculation of premiums in particular.

The third one could concern the timeline consumers began more widely both trust and employ autonomous vehicles and whether they would wish to insure said vehicles with insurance products related to current voluntary comprehensive insurance. Even should product liability or similar liability insurance of the manufacturer offer compensation for actual traffic accidents, the insurance would not likely not cover outside threats, such as vandalism, fire, theft or glass damage.

Of course, this listing has been for reference only, as the field of Motor Insurance legislation and the impact of autonomous vehicles and driving features may bring changes currently not foreseen. The status of both may, in perhaps only a decade, have brought changes to many current processes and ways of life, and by have also generated many new subjects of study.

6 REFERENCES

6.1 Legal References

6.1.1 Motor Insurance Directives (presented in chronological order)

Council Directive 72/166/EEC of 24 April 1972 on the approximation of the laws of Member States relating to insurance against civil liability in respect of the use of motor vehicles, and to the enforcement of the obligation to insure against such liability. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31972L0166:en:HTML. (source sited 29.12.2017)

Second Council Directive 84/5/EEC of 30 December 1983 on the approximation of the laws of the Member States relating to insurance against civil liability in respect of the use of motor vehicles. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31984L0005:EN:HTML (source sited 30.12.2017)

Third Council Directive of 14 May 1990 on the approximation of the laws of the Member States relating to insurance against civil liability in respect of the use of motor vehicles. http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31990L0232&from=EN (source sited 30.12.2017)

Directive 2000/26/EC of the European Parliament and of the Council of 16 May 2000 on the approximation of the laws of the Member States relating to insurance against civil liability in

respect of the use of motor vehicles and amending Council Directives 73/239/EEC and 88/357/EEC (fourth Motor Insurance Directive). http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32000L0026 (source sited 3.1.2018)

Directive 2005/14/EC of the European Parliament and of the Council of 11 May 2005 amending Council Directives 72/166/EEC, 84/5/EEC, 88/357/EEC and 90/232/EEC and Directive 2000/26/EC of the European Parliament and of the Council relating to insurance against civil liability in respect of the use of motor vehicles (fifth Motor Insurance Directive). http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32005L0014 (source sited 28.12.2017)

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 (also called the Motor Insurance Directive (MID) 2009/103/EC) http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:263:0011:0031:EN:PDF (source sited 20.11.2017)

6.1.2 Other Legislation

Consolidated Version of the Treaty on European Union. http://eur-lex.europa.eu/resource.html?uri=cellar:2bf140bf-a3f8-4ab2-b506-fd71826e6da6.0023.02/DOC_1&format=PDF (source sited 19.12.2017)

Consolidated Version of the Treaty on the Functioning of the European Union. http://eur-lex.europa.eu/resource.html?uri=cellar:2bf140bf-a3f8-4ab2-b506-fd71826e6da6.0023.02/DOC_2&format=PDF (source sited 19.12.2017)

EUR-Lex. EUROPA. EU law and publications. EUR-Lex. EUR-Lex - l22028 – EN. Motor vehicles liability insurance. http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3Al22028 (source sited 29.11.2017)

EUR-Lex. Europa. EU law and publications. EUR-Lex - xy0023 – EN. Summary of the Treaty of Rome. EUR-Lex. http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=URISERV%3Axy0023 (sited 28.11.2017)

EUR-Lex. Europa. EU law and publications. EUR-Lex. EUR-Lex - xy0024 – EN. Summary of the Treaty establishing the European Atomic Energy Community (Euratom). http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM:xy0024 (source sited 28.11.2017)

EUR-Lex. EUROPA. EU law and publications. EUR-Lex. EUR-Lex - xy0026 – EN. Summary of Treaty of Maastricht on European Union. http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3Axy0026 (source cited 28.11.2017)

EUROPA. EU law and publications. EUR-Lex. EUR-Lex - xy0027 – EN. Summary of The Single European Act. http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3Axy0027 (source sited 28.11.2017)

EUR-Lex. EUROPA. EU law and publications. EUR-Lex. Summaries of EU Legislation. Internal market. http://eur-

lex.europa.eu/summary/chapter/internal_market.html?root_default=SUM_1_CODED%3D24 (source sited 20.11.2017)

Government's proposal to Parliament for the Motor Insurance Act and certain related Acts (fin. Hallituksen esitys eduskunnalle liikennevakuutuslaiksi ja eräiksi siihen liittyviksi laeiksi) (HE 123/2015) https://www.finlex.fi/fi/esitykset/he/2015/20150123#idp450452480 (source sited 11.1.2018)

Motor Insurance Act (Fin. Liikennevakuutuslaki) (17.6.2016/460). https://www.finlex.fi/fi/laki/ajantasa/2016/20160460#L3 (source sited 27.12.2017)

Product Liability Act (Fin. Tuotevastuulaki) (17.8.1990/694). https://www.finlex.fi/fi/laki/ajantasa/1990/19900694?search%5Btype%5D=pika&search%5Bpika%5D=tuotevastuulaki#P13 (source sited 27.12.2017)

United Nations. Treaty Series. Treaties and international agreements registered or filed and recorded with the Secretariat of the United Nations. Volume 1042. Convention of Road Traffic, pages 17-398. https://treaties.un.org/doc/Publication/UNTS/Volume%201042/v1042.pdf (source sited 11.1.2018)

6.2 Literature References

Craig, Paul & De Búrca, Gráinne. 2011. "The Evolution of EU Law". Second Edition. Oxgord University Press

Fagnant, Daniel J. & Kockelman, Kara. 2015. "Preparing a nation for autonomous vehicles: opportunities, barriers and policy recommendations". Transportation Research, Volume 77, July 2015, Pages 167-181

Foster, Nigel. 2016. "EU Law – Directions". Fifth Edition. Oxford University Press

Gurney, Jeffrey. 2015. "Sue My Car Not Me: Products Liability and Accidents Involving Autonomous Vehicles". U. Ill. J.L. Tech. & Pol'y 247

Hantrais, Linda. 2009. "International Comparative Research – Theory, Methods and Practice". First Edition. Palgrave Macmillan

Nummelin, Ilkka. 2017. Pro gradu. "Miten ja milloin automaattiautot vaikuttavat Suomen vahinkovakuutusliiketoimintaan". http://tampub.uta.fi/bitstream/handle/10024/100671/GRADU-1487840537.pdf?sequence=1 (source sited 16.9.2017)

Peterson, Robert W. 2012. "New Technology - Old Law: Autonomous Vehicles and California's Insurance Framework". 52 Santa Clara L. Rev. 1341 (2012)

Seatzu, Francesco. 2003. "Insurance in Private International Law – A European Perspective". Hart Publishing

Sterzynski, Maciej. 2003. "The European Single Insurance Market: Overview and impact of the liberalization and deregulation processes". Belgian Actuarial Bulletin, Vol. 3, No. 1, 2003

Szyszczak, Erika & Cygan, Adam. 2005. "Understanding EU Law". First Edition. Sweet and Maxwell Limited

Tala, Jyrki & Pakarinen, Auri. 2010. “Better Regulation – A Critical Assessment – Proceedings from the International Conference on Legislative Studies in Helsinki 2010”. National Research Institute of Legal Policy - Research Communications 105

Wiener, Antje & Diez, Thomas. 2009. “European Integration Theory”. Second Edition. Oxford University Press

6.3 Online References

Automotive News Europe. 15.5.2017 “German industry welcomes self-driving vehicles law” http://europe.autonews.com/article/20170515/ANE/170519866/german-industry-welcomes-self-driving-vehicles-law (source sited 18.9.2017)

Autonomous vehicles - Code of Practice for testing in Belgium. 2016. https://mobilit.belgium.be/sites/default/files/resources/files/code_of_practice_en_2016_09.pdf (source sited 19.12.2017)

Autosport. “MIA: Insurance directive could 'close down all motorsport' in EU” https://www.autosport.com/national/news/132349/insurance-law-could-close-motorsport-in-eu (source sited 27.11.2017)

BBC. News. Politics, 13.11.2017. „Brexit: All you need to know about the UK leaving the EU”. http://www.bbc.com/news/uk-politics-32810887 (source sited 15.11.2017)

Bundesministerium für Wirtschaft und Energie: “Automobilindustrie - Branchenskizze”. https://www.bmwi.de/Redaktion/DE/Textsammlungen/Branchenfokus/Industrie/branchenfokus-automobilindustrie.html (source sited 2.1.2018)

Centre for Connected and Autonomous Vehicles (CCAV) (UK). “About us”. https://www.gov.uk/government/organisations/centre-for-connected-and-autonomous-vehicles/about (source sited 15.12.2017)

Cornell Law School. Legal Information Institute. Civil Law. https://www.law.cornell.edu/wex/civil_law (source sited 13.12.2017)

Cornell Law School. Legal Information Institute. Criminal Law. https://www.law.cornell.edu/wex/criminal_law (source sited 13.12.2017)

Declaration of Amsterdam. 14.4.2016. “Declaration of Amsterdam on cooperation in the field of connected and automated driving”. https://www.regjeringen.no/contentassets/ba7ab6e2a0e14e39baa77f5b76f59d14/2016-04-08-declaration-of-amsterdam---final1400661.pdf. (source sited 13.1.2018)

Department for Transport (UK). “The Pathway to Driverless Cars - Summary report and action plan”. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/401562/pathway-driverless-cars-summary.pdf (source sited 12.12.2017)

Die Bundesregierung. 12.5.2017. Artikel. Strassenverkehrgesetz. „Automatisiertes Fahren auf dem Weg“. https://www.bundesregierung.de/Content/DE/Artikel/2017/01/2017-01-25-automatisiertes-fahren.html (source sited 25.9.2017)

Finnish Transport Agency. E8-Aurora. https://www.liikennevirasto.fi/web/en/e8-aurora#.WnyMk65l_IU (source sited 11.1.2018)

Finnish Transport Agency. E8-Aurora. Test Ecosystem. https://www.liikennevirasto.fi/web/en/e8-aurora/test-ecosystem#.WnyFSq5l_IU (source sited 11.1.2018)

EFTA. EEA Agreement. http://www.efta.int/eea/eea-agreement (Source sited 14.11.2017)

EFTA. The European Free Trade Association. http://www.efta.int/about-efta/european-free-trade-association (source sited 11.11.2017)

EFTA. EFTA through the years. Main events in the history of EFTA from 1960 until today. http://www.efta.int/About-EFTA/EFTA-through-years-747 (source sited 18.10.2017)

European Commission. Codecision. Procedure. The Co-decision or ordinary legislative procedure. http://ec.europa.eu/codecision/procedure/index_en.htm (source sited 29.11.2017)

European Commission. Consultations. "Public consultation on REFIT review of Directive 2009/103/EC on motor insurance". https://ec.europa.eu/info/consultations/finance-2017-motor-insurance_en (source sited 20.11.2017)

European Commission. Directorate-General for Financial Stability, Financial Services and Capital Markets Union. Regulation and Prudential Supervision of Financial Institutions. Insurance and pensions. "Consultations Document. REFIT1 Review of Directive 2009/103/EC on motor insurance". https://ec.europa.eu/info/sites/info/files/2017-motor-insurance-consultation-document_en.pdf (source sited 15.11.2017)

European Commission. Europe on the Move. "Harnessing the Benefits of Automation, Connectivity and Smart Mobility Services". https://ec.europa.eu/transport/sites/transport/files/mobility-package-factsheet-ii.pdf. (source sited 13.10.2017)

European Commission. The Founding Fathers of the EU. "Paul–Henri Spaak: a European visionary and talented persuader". https://europa.eu/european-union/sites/europaeu/files/docs/body/paul-henri_spaak_en.pdf (source sited 19.10.2017)

European Commission. 2003. Press Release Database. Summary of the treaty of Nice. http://europa.eu/rapid/press-release_MEMO-03-23_en.htm (source sited 24.10.2017)

European Commission. Law. Law-making process. Evaluating and improving existing laws. "Refit – making EU law simpler and less costly". https://ec.europa.eu/info/law/law-making-process/evaluating-and-improving-existing-laws/refit-making-eu-law-simpler-and-less-costly_en (source sited 15.11.2017)

European Commission. Mobility and Transport. Intelligent Transport Systems. Roads. https://ec.europa.eu/transport/themes/its/road_it (source sited 2.11.2017)

European Consumer Centre Germany. "The European Single Insurance Market - Cross-border insurance contracts: conclusion or exclusion?". 2014. https://www.cec-zev.eu/fileadmin/user_upload/cec-zev/PDF/documentation/etudes/assurances_resume_anglais.pdf (source sited 29.12.2017)

European Council. The Council of the EU. Council configurations. http://www.consilium.europa.eu/en/council-eu/configurations/# (source sited 21.11.2017)

European Insurance and Occupational Pensions Authority (EIOPA). "Solvency II". https://eiopa.europa.eu/regulation-supervision/insurance/solvency-ii (source sited 29.12.2017)

European Parliament. 2016. Briefing January 2016 “Automated vehicles in the EU”. http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/573902/EPRS_BRI(2016)573902_EN.pdf (source sited 18.9.2017)

European Parliament. 2017. Fact Sheets on the European Union – 2017. “The Maastricht and Amsterdam Treaties”. http://www.europarl.europa.eu/ftu/pdf/en/FTU_1.1.3.pdf (source sited 24.10.2017)

European Economic Area. Standing Committee of the EFTA States. Subcommittee V on Legal and Institutional Questions. “How EU acts become EEA acts and the need for adaptations”. http://www.efta.int/media/documents/eea/1113623-How-EU-acts-become-EEA-acts.pdf (source sited 18.10.2017)

European Union. About the EU. “Court of Justice of the European Union (CJEU)”. https://europa.eu/european-union/about-eu/institutions-bodies/court-justice_en (source sited 15.11.2017)

European Union. About the EU. “Countries”. https://europa.eu/european-union/about-eu/countries_en#tab-0-1 (source sited 24.10.2017)

European Union. About the EU. “The Economy”. https://europa.eu/european-union/about-eu/figures/economy_en (source sited 2.2.2018)

European Union. About the EU. “EU institutions and other bodies”. “European Commission”. https://europa.eu/european-union/about-eu/institutions-bodies/european-commission_en (source sited 1.11.2017)

European Union. EU Law. Regulations, Directives and other acts https://europa.eu/european-union/eu-law/legal-acts_en (source sited 13.11.2017)

Eurostat. Statistics Explained. “Extra EU trade of motor vehicles, main trading partners' shares for exports, 2013 and 2016”. http://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Extra_EU_trade_of_motor_vehicles,_main_trading_partners%27_shares_for_exports,_2013_and_2016.png (source sited 3.3.2018)

Eurostat. Statistics Explained. “Extra EU trade of motor vehicles, main trading partners' shares for imports, 2013 and 2016”. http://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Extra_EU_trade_of_motor_vehicles,_main_trading_partners%27_shares_for_imports,_2013_and_2016.png (source sited 3.3.2018)

Eurostat. Statistics Explained. “International trade in motor vehicles”. http://ec.europa.eu/eurostat/statistics-explained/index.php/International_trade_in_motor_vehicles (source sited 3.3.2018)

Eurostat. Statistics Explained. “Share of the population reporting that they had a road traffic accident resulting in injury, by sex, 2014”. http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Share_of_the_population_reporting_that_they_had_a_road_traffic_accident_resulting_in_injury,_by_sex,_2014_(%25)_HLTH17.png (source sited 1.11.2017)

Financial Times Article in “the Future of Insurance” section. 28.6.2016. “Cost of car insurance to plunge with rise of driverless vehicles” https://www.ft.com/content/8718f37a-21d9-11e6-9d4d-c11776a5124d (source sited 14.9.2017)

The Guardian. 31.3.2018 “Tesla car that crashed and killed driver was running on Autopilot, firm says”. https://www.theguardian.com/technology/2018/mar/31/tesla-car-crash-autopilot-mountain-view (source sited 4.4.2018)

Heuking Kühn Lüer Wojtek. 18.12.2017. “Self-driving cars 2018 will bring changes to the German automotive and insurance industries”. https://www.heuking.de/en/news-events/articles/self-driving-cars-2018-will-bring-changes-to-the-german-automotive-and-insurance-industries.html (12.1.2018)

Insurance Europe. “European Motor Insurance Markets Addendum June 2016”. https://www.insuranceeurope.eu/sites/default/files/attachments/European%20motor%20insurance%20markets%20addendum.pdf (source sited 27.11.2017)

King & Wood Mallesons (KWM). 8.8.2017. “Self-driving Cars: China and Beyond- Who will be Liable?”. https://www.chinalawinsight.com/2017/08/articles/corporate/self-driving-cars%EF%BC%9Achina-and-beyond-who-will-be-liable%EF%BC%9F/ (source isted 9.3.2018)

KPMG White paper October 2015 “Marketplace of change: Automobile insurance in the era of autonomous vehicles” https://assets.kpmg.com/content/dam/kpmg/pdf/2016/06/id-market-place-of-change-automobile-insurance-in-the-era-of-autonomous-vehicles.pdf (source sited 7.9.2017)

Lexylogy. 25.7.2017. ”At a Glance: Autonomous Vehicles”. https://www.lexology.com/library/detail.aspx?g=84fa3449-b22a-4d61-afec-8f32bb7967fc (source sited 25.10.2017)

Lexology: 16.1.2018 “Autonomous Cars - Opportunities and Challenges in Germany”. https://www.lexology.com/library/detail.aspx?g=051836a2-45cd-42c0-a66a-ea62137a2188 (source sited 18.1.2018)

Lexology. 3.11.2017 “Limited breakthrough for autonomous vehicles?” https://www.lexology.com/library/detail.aspx?g=655ed7ea-31c4-41c0-a891-49d12fe03f4c (source sited 27.12.2017)

Lexology. 21.2.2017. “Singapore government proposes new laws governing autonomous vehicles”. https://www.lexology.com/library/detail.aspx?g=049847e3-6a57-42cb-b5cc-b7fec0e2b019 (source sited 7.2.2018)

Ministry of Transport and Communications (Finland). 17.3.2016. “International Convention on Road Traffic promotes automation”. https://www.lvm.fi/en/-/international-convention-on-road-traffic-promotes-automation (source sited 11.1.2018)

Ministry of Transport and Communications (Finland). 24.11.2017. ”The new Road Traffic Act aims for a safer future”. https://www.lvm.fi/en/-/the-new-road-traffic-act-aims-for-a-safer-future-958341 (source sited 18.12.2017)

Motor Insurer’s Centre. Act governing motor liability insurance 2017. http://www.lvk.fi/en/obligation-to-insure/motor-liability-insurance-2017/ (source sited 13.9.2017)

Parliament (UK). Parliamentary business. Bills and legislation. Bills before Parliament 2017-19. Public Bills. “Automated and Electric Vehicles Bill 2017-19”. https://services.parliament.uk/bills/2017-19/automatedandelectricvehicles.html (source sited 3.4.2018)

Reuters 19.5.2014. “Cars could drive themselves sooner than expected after European push”. https://www.reuters.com/article/us-daimler-autonomous-driving/cars-could-drive-themselves-

sooner-than-expected-after-european-push-idUSKBN0DZ0UV20140519 (source sited 15.1.2018)

Reuters. 12.5.2017. Innovation and Intellectual Property. "Germany adopts self-driving vehicles law". https://www.reuters.com/article/us-germany-autos-self-driving/germany-adopts-self-driving-vehicles-law-idUSKBN1881HY (source sited 25.9.2017)

Reuters. 16.6.2017. Innovation and Intellectual Property. U.S. states could not set self-driving car rules under Republican plan. https://www.reuters.com/article/us-usa-selfdriving/u-s-states-could-not-set-self-driving-car-rules-under-republican-plan-idUSKBN1962YV (source sited 3.10.2017)

Trafi. Automated vehicle trials. https://www.trafi.fi/en/road/automated_vehicle_trials (source sited 11.1.2017)

UNECE. About UNECE. Organizational Structure. "Governance and Organizational Structure". https://www.unece.org/oes/nutshell/governing_bodies.html (source sited 5.3.2018)

UNECE. Transport. Areas of Work. Inland Transport Committee. About us. "Introduction". https://www.unece.org/trans/main/itc/about.e.html (source sited 5.3.2018)

UNECE. Transport. Areas of Work. Vehicle Regulations. About us. "WP.29 – Introduction". https://www.unece.org/trans/main/wp29/introduction.html (source sited 5.3.2018)

United Nations. Economic and Social Council. Economic Commission for Europe. World Forum for Harmonization of Vehicle Regulations. 174th session. "Agreement concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these United Nations Regulations" (also called the 1958 Agreement). http://www.unece.org/fileadmin/DAM/trans/main/wp29/wp29regs/2018/ECE-TRANS-WP.29-343-Rev.26.pdf (source sited 5.3.2018)

United Nations. Economic Commission for Europe. "World Forum for Harmonization of Vehicle Regulations (WP.29) – How it Works – How to Join it – Third Edition". http://www.unece.org/fileadmin/DAM/trans/main/wp29/wp29wgs/wp29gen/wp29pub/WP29_Blue_Book_2012_ENG.pdf (source sited 5.3.2018)

United Nations. Treaty Collection. Chapter XI. Transport and Communications. B. Road Traffic. 19. Convention of Road Traffic. Vienna, 8 November 1968. https://treaties.un.org/Pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XI-B-19&chapter=11&Temp=mtdsg3&clang=_en (source sited 11.1.2018)

VTT Technical Research Centre of Finland Ltd. Press Release. 18.5.2017. "VTT:n robottiautot siirtyvät yleiselle tielle ja alkavat seurustella keskenään". http://www.vtt.fi/medialle/uutiset/vtt-n-robottiautot-siirtyv%C3%A4t-yleiselle-tielle-ja-alkavat-seurustella-kesken%C3%A4%C3%A4n (source sited 12.1.2018)