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# Could being in the European Union save lives? An econometric analysis of the Common Road Safety Policy for the EU-27

José I. Castillo-Manzano, Mercedes Castro-Nuño and Xavier Fageda

**ABSTRACT** Traffic safety has become a major component of European transport policies. But the road to a real Common European Road Safety Policy has been a long one. The notion of *Europeanization* might help to describe the European Union (EU)'s impact on national policies, although the process differs from other transport sectors. The objective of this article is to explain the effect of the EU road safety policy on domestic road mortality rates in the EU-27. Using data on European countries for the 2000–2009 period we analyse how EU traffic safety policies, institutions and networks facilitate and encourage the learning process in the individual countries. This timeframe coincides with the 2001 White Paper and the third European Road Safety Action Programme (ERSAP), both of which are crucial for constructing the Common Road Safety Policy.

**KEY WORDS** EU action programmes; Europeanization; panel data; Road Safety Policy; transport.

## 1. INTRODUCTION

Road traffic safety has become a major component of European transport policies and constitutes a *single social area* in European political and economic integration (Threlfall 2003). But the road to a real Common Road Safety Policy (CRSP) has been a long one. According to this author, the main priority of the Treaty of Rome (1957) was the creation of a single market with the free movement of goods, services and factors. With this in mind, a key role was given to the transport sector (Geerlings and Stead 2003). Nevertheless, the heterogeneous regulatory approaches of the member states meant that the Common Transport Policy (CTP) did not get off the ground until the mid-1980s. This policy was linked to the goal of removing all the barriers to the European single market (see Lehmkuhl [2002] for an analysis of the CTP and the different responses at national level).

We could extend the mechanism of ‘spillover’ used by Richardson (2012) to explain how the European Union’s inclusion of all the different areas in the

CTP (or in social affairs) has also led to the inclusion of other related issues, such as road safety. This is the result of both external forces (globalization of accident prevention by international institutions like the World Health Organization [WHO], the Organization for Economic Co-operation and Development [OECD] and the United Nations Economic Commission for Europe [UNECE]; see Peden *et al.* [2004]) and internal stimuli by the EU as Avenoso (2005) suggests.

Until the 1990s road safety initially remained under the CTP and was taken into consideration only insofar as the lack of Community action could threaten fair competition or the free circulation of goods and people (Commission of the European Communities [CEC] 1997). As such, during this period the most relevant achievements consisted of general legislation linked to other common policies in the sector: i.e., the harmonization of technical standards and periodic inspection of vehicles; the regulation of rest and working conditions for professional drivers; and the creation of a single driving licence to remove internal barriers (CEC 1993).

A first turning point came with the Treaty of Maastricht (1992), where for the first time traffic safety was recognized both explicitly and independently, and this was later reconfirmed by both the Amsterdam (1997) and the Lisbon (2007) Treaties. Since then, the European Union (EU) has developed a complex set of institutions, a network of organizations and coactive and non-coactive instruments for encouraging national policy-makers to adopt a new European road safety culture (Racioppi *et al.* 2004). The EU was seeking to address a local problem faced by all states (the massive economic cost and productivity losses related to traffic accidents) from a European perspective.

The notion of 'Europeanization' might help to describe the EU's impact on national policies (Knill and Lehmkuhl 2002). This concept has been widely studied by scholars and interpreted in a number of different ways depending on the policy area under consideration. The most relevant contributions include Featherstone and Radaelli (2003) on theoretical aspects of the effect of the Europeanization process on public policy in general; Richardson (2012) on the integration of crucial sectors, such as energy policy, the environment and agriculture; Geddes and Jordan (2012) on 'sensitive' social policies, such as migration policing; and Mazey (1998) on gender equality laws.

The objective of this article is to explain the effect of the CRSP on domestic road mortality rates in the EU-27. We aim to analyse how EU traffic safety policies, institutions and networks facilitate and advance the learning process in the individual countries. Our study is a contribution to emerging research on the question of Europeanization, but for a special case where the EU uses a coherent mix of policy instruments (legislation, soft law, economic stimuli, benchmarking and the dissemination of information and shared best practices), where there is a solid network of EU institutions and organizations for the discussion of road safety approaches, and where the pressures on member states assume different forms.

Of the alternative outcomes or dimensions for analysing the Europeanization of the CRSP, we choose the ‘the degree of change’ in a national system dimension, following Börzel and Risse (2003) and Bugdhan (2005), and focus on *the degree of change experienced in traffic accident-related fatalities*. We estimate a multivariate equation considering a set of correcting variables that are typically analysed in road safety studies. A brand new hypothesis will be tested: being in the EU, with all that this entails with respect to participating in large numbers of institutions, funds, regulations, actions and programmes, has a positive effect on road traffic accident numbers in member countries, and the longer a country has been a member of the EU, the greater this effect should be.

Our timeframe (2000–2009) coincides with the 2001 White Paper and third European Road Safety Action Programme (ERSAP), both of which are crucial for constructing the CRSP, as has already been explained in the preceding paragraphs. The EU is trying to create such a sense of urgency around safety issues with its ambitious target of halving fatalities at national level by 2010 that, as Bax (2011: 15) states, it ‘becomes a strong leader with a positive influence on national policy agendas’.

The article contains five sections: following this introduction, section 2 analyses the mechanisms through which the EU influences members’ national traffic safety policies; section 3 describes the sample, the variables and the model used. The results are discussed in section 4. The paper ends with the conclusions.

## 2. THE EU’S INFLUENCE ON MEMBER STATES’ DOMESTIC ROAD SAFETY POLICIES

The difficulties associated with the notion of Europeanization in the field of transport have also been analysed in several studies (Chabalier [2006] for railways; Lawton [1999] for air services; and Pallis [2006] for maritime transportation). In all these cases, Europeanization has been strongly rejected because the liberalization policies put forward by the EU encountered strong opposition from reluctant national governments and professional lobbies. In fact, when analysing road haulage, Kerwer and Teutsch (2001) use the term *elusive* Europeanization.

However, Europeanization with regard to road safety policy might have followed its own specific path, unlike that of other transport policies. The measures, actions and strategies implemented to reduce traffic accidents can be of benefit to all citizens (Peden *et al.* 2004) and drive up public awareness. In contrast, liberalization policies always have losers, like those taking advantage of monopolistic positions. The Eurobarometer survey (European Commission [EC] 2010a), conducted among more than 25,000 people in all 27 member states, shows that European citizens appreciate the efforts made in road safety in recent years, and they even call for governments to apply additional measures to tackle the problem.

Secondly, constructing the CRSP does not imply a loss of sovereignty, even though member states might be reluctant to develop road safety measures at the Community Level (EC 2003). However, the liberalization of transport services may involve an influx of private and/or international investors in the corresponding markets. In this regard, Bax (2011) states that EU issues on road safety are somewhat constrained by the subsidiarity principle, but at the same time gives EU institutions a key role as a stimulus to governments, researchers and policy-makers in member states. Although it is a policy that involves multiple actors (policy- and law-makers, citizens, car manufacturers, insurance companies, non-governmental organizations [NGOs], etc.), the CRSP is designed to save lives and maintains its public character under the banner of ‘shared responsibility’ (EC 2010b). As Hamelin (2010: 515) claims: ‘the EU seems more a facilitator than a coercive actor that imposes a solution’.

Thirdly, the impact of the European CRSP on national policies might be interpreted as a hybrid process according to Radaelli’s (2001) concepts and Bugdahn’s (2005) hypothesis on Europeanization: the imitation of national initiatives or mirrors through a mimetic process. Examples of this hybrid process include the following concepts:

- ‘horizontal Europeanization’ (e.g., some French innovations, such as automated speed enforcement or mandatory alcolocks);
- successful ‘best practices’ developed by certain member states (mainly North European, e.g., the ‘vision-zero’ approach introduced by the Swedish Parliament in 1997 and extended to the whole EU-27 since 2011; the ‘sustainable safety’ vision launched in the Netherlands in the early 1990s) that even dominate the design of European policy (by a kind of ‘domestication process’);
- a set of ‘national policy hinterlands’ (following Mazey’s [1998] definition) with domestic institutions, actions and legislation which are kept within the European targets (e.g., maximum speed limits and blood–alcohol content [BAC] laws);
- ‘top–down vertical Europeanization’, a particular style based on (coercive and non-coercive) pressures to adapt which emerge from European institutions for the convergence of national policies (e.g., Council Directive 91/671/EEC on the approximation of the laws of the member states relating to compulsory use of safety belts and other restraints systems of vulnerable users; the harmonization of driving licences by Council Directive 91/439/EEC; Directive 2008/96/EC on road infrastructure safety management; Council Decision 93/704/EC on the creation of a Community database on road accidents [CARE], which is binding for the member states; Directive 2002/22/EC of the European Parliament and the Council on the e-call emergencies system; the establishment of a ‘European Road Safety Charter’ for mobilizing stakeholders [EC 2003]).

In short, we understand that European integration on road safety policy is a complementary top–down and bottom–up process between EU institutions and member states using the Börzel and Risse (2000) approach. The

extraordinary and comprehensive nature of this complex process by necessity requires a long time period for its transposition and implementation.

The EU's CRSP policy mix can be found at the mobility and transport website ([http://ec.europa.eu/transport/road\\_safety/index\\_en.htm](http://ec.europa.eu/transport/road_safety/index_en.htm)). According to this source, three types of legislation emanate from the EU: regulations; directives; and so-called 'soft law', which contains stipulations that are non-binding for member states, such as action programmes, policy targets and white papers on topics not directly covered by the EU on account of the subsidiarity principle.

Most of the legal *acquis* developed through regulations, directives, decisions and resolutions refers to technical aspects of vehicles (roadworthiness inspection, blind spot mirrors, weight and dimensions, daytime running lights) and infrastructure (safety requirements for tunnels in the trans-European road network), the working conditions of professional drivers and cross-border enforcement (mutual recognition of financial penalties). The EU has also given recommendations on more specific areas of behaviour (speeding, alcohol and drugs while driving).

With respect to soft law, three white papers (1992, 2001, and 2011) and four European Road Safety Action Programmes (ERSAPs) have been implemented: the first ERSAP (1993–1996); the second ERSAP (1997–2001); the third ERSAP (2003–2010); and the fourth ERSAP (2011–2020) (CEC 1993, 1997; EC 2001, 2003, 2010b).

Avenoso and Townsend (2010) and Bosetti *et al.* (2010) suggest a turning point with the 2001 White Paper (entitled 'Time to Decide') and especially with the third ERSAP. Based on benchmarking and the cumulative exchange of earlier successful experiences from international leaders such as Australia and New Zealand, and European leaders such as Sweden, the United Kingdom (UK) and the Netherlands, the development of the third ERSAP not only resulted in increases in EU legislation and research projects on road safety, but at the same time member states were pressured to undertake their individual initiatives under a shared responsibility framework for the whole of society. One of the main contributions of the third ERSAP was the proposal, for the first time, to set a time limit for quantitative and measurable targets for the entire EU-27 (Loo *et al.* 2005): to halve the number of road fatalities from 54,300 in 2001 to no more than 27,150 by the year 2010 (EC 2001).

Following Bax (2011), the decision-making process for CRSP legislation is mainly based on two institutions: the EU's Road Safety Unit, which proposes directives and soft law; and the High Level Group on Road Safety (made up of national road safety directors), which discusses and approves these proposals with the council of 27 ministers of transport. The role the European Parliament usually plays is to give encouragement to interest groups, such as manufacturers, NGOs and research institutes. Sometimes the EU holds public consultations through questionnaires, surveys, conferences or the Internet. Events like the European Road Safety Day (held annually since 2007) and the European Youth Forum for Road Safety organized by the EU in 2011 are signs of the

importance that the EU attaches to the involvement of citizens in the management of this public health problem.

The EU gives priority to monitoring the full and correct implementation of the EU road safety *acquis* and its enforcement by member states (EC 2010b). Avenoso (2005) explains that the EU adopted a recommendation in 2004 on how member states should adopt a National Road Safety Policy or plan (NRSP), with an ambitious accident reduction target and a National Enforcement Plan based on the French experience, and fully detailed information about its implementation is reported back to the EU every two years.

This process provides a set of information policy tools to create and distribute accident data and benchmarking outputs with the aim of inspiring less well performing states to improve. The most important actions in this field are the CARE database (set up in 1993), the European Road Safety Observatory (ERSO) created in 2004, and the publication of best practice in handbooks, namely the *Summary and Publication of Best Practices in Road Safety in the EU Member States* (SUPREME) and *Road Safety* (ROSA).

The EU network on road safety extends beyond the member states to related organizations or interest groups that are part of a feedback mechanism of influences and co-operation, such as the ETSC (European Transport Safety Council), the European Road Transport Research Advisory Council (ERTRAC), the Conference of European Road Directors (CEDR), the Traffic Information System Police (TISPOL) Organization set up by traffic police, the United Nations Economic Commission for Europe (UNECE), the WHO, the OECD and the Alliance Internationale de Tourisme (AIT).

There is also a bilateral feedback relationship between EU institutions and some international organizations, such as the WHO and the OECD, with mutual recommendations on road safety issues, e.g., the adoption of a recent EU road injury strategy in keeping with their proposals since 2011.

Regarding economic instruments (see EU 2010c), the EU grants investments through the Cohesion Fund and the European Regional Development Fund, not only for infrastructure and police activities such as the enforcement programme, but also for research funding, which is also considered a priority. Helmreich (2010) estimates that the EU has spent €500 million on road safety research since 1994 to subsidize research projects either as independent action or as part of other generic transport projects. More than 100 research projects (most of them included in the third ERSAP), such as the European New Car Assessment Programme (EuroNCAP), Driving under the Influence of Drugs, Alcohol and Medicines (DRUID), SafetyNET, the European Roads Assessment Programme (EuroRAP) and EuroBob (an awareness campaign aimed at preventing drink-driving), can be found sorted by domain at the European Commission's mobility and transport website ([http://ec.europa.eu/transport/road\\_safety/projects/projects\\_domain\\_en.htm](http://ec.europa.eu/transport/road_safety/projects/projects_domain_en.htm)).

The EU also funds several actions in the areas of the environment, road infrastructure and mutual recognition of sanctions that show the EU's intention of helping to develop and implement strategies from awareness campaigns to road



safety audits (CEC 2004) and to achieve closer road safety integration with neighbouring and candidate countries. Meanwhile, the Technical Assistance and Information Exchange (TAIEX) programme, managed by the Directorate-General for Enlargement of the EU, supports partner countries with regard to the approximation, application and enforcement of EU legislation. Similarly, the South East Europe Transport Observatory (SEETO) is a regional transport organization supported by the EU for promoting co-operation on the development of the CTP and the CRSP for South-East Europe (Tilling 2006).

### 3. EMPIRICAL STRATEGY

#### 3.1. Delimitation of the sample

The EU enlargement process has had a major impact on the CRSP during our timeframe since, as Bosetti *et al.* (2010) state, at the time of their accession new members were performing poorly in terms of road safety. When the 2001 White Paper was published, the EU comprised only 15 members but was progressively enlarged (in 2004 and 2007) until it comprised 27 countries at the end of our target period in 2009.

Thus, we consider a heterogeneous sample (EU-27) with significant differences in historical, demographic, economic, political, sociological and geographic mobility and cultural conditions which affect both the various countries' initial road safety situations and the speed with which they transpose and implement the CRSP (Avenoso and Beckmann 2005).

A differential domestic impact of EU on road safety policies might be explained by the concepts of *goodness of fit* and the existence of *mediating factors* or intervening variables, as explained in Börzel and Risse (2003). In this regard, earlier studies based on the SUNflower approach, such as the European Transport Safety Council (ETSC 2006) and Wegman *et al.* (2008), use two items: SUNflower countries and SEC belt countries. The first group is formed by northern EU members – the UK, the Netherlands and Sweden – which have been true paradigms of solid road safety policies since the 1990s, with significant improvements and the highest performances. The second group is formed by southern, eastern and central members with higher fatality rates – namely Greece, Italy, Spain; countries such as the Baltic states, the Czech Republic, Romania and Bulgaria (which joined the EU at the end of the target period and have made great efforts to quickly implement the European acquis [Mikulik 2004]); and other countries such as Germany, where major political changes have taken place (see Clark *et al.* [2000] for the impact of reunification on road accidents). Taking into account the process of integration explained above and following Börzel's (2000) terminology, they might be identified as *leaders* and *laggards*, respectively.

Wegman *et al.* (2008: 84) explain these differences and reveal a clear geographical pattern of safety development from country to country, with the



influence of northern EU countries even being noted in other countries that are part of European Free Trade Association (EFTA) and border on the EU. All these countries, EU-27 + EFTA (except Liechtenstein, for which there are no available data) are grouped by safety experts:

1. Denmark, Finland, Iceland, Ireland, the Netherlands, Norway, Sweden, the United Kingdom;
2. Austria, Belgium, France, Germany, Italy, Luxembourg, Switzerland;
3. Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia;
4. Cyprus, Greece, Malta, Portugal, Spain.

We understand that the EU has had an influence on domestic road safety policies in these border countries through an imitation effect, as they mirror the SUNflower countries' good practices (in the same way that Ozel [2013] considers the Europeanization of specific policy areas in other border countries). For instance, the Swedish vision-zero approach that we explain above spread to Norway in its 'Road Traffic Safety Plan of 2002–2011' and Switzerland has developed other successful EU country strategies, such as the target of halving fatalities by 2010.

### 3.2. The model

Our purpose is to estimate how the different elements of EU road safety governance, considered as a whole, have transformed a specific aspect of domestic EU-27 policies, in keeping with the concept of Europeanization developed by Buller and Gamble (2002): the degree of change in the number of road fatalities during the period in which the EU created a sense of urgency with the first quantitative target of halving the figure, 2000–2009. We chose this timeframe because, during this period, the EU gave the CRSP a boost by collecting all previous experience together (Bosetti *et al.* 2010).

Our main hypothesis is that the mix of EU policies, instruments and targets, the existence of EU institutions and the network established with states and other organizations could have a positive influence on national traffic safety performance. Countries that have most recently joined the EU (SEC belt) would find it more difficult to adapt their road safety policies to the levels set by the EU. Hence, we expect a negative relationship between traffic fatality rates and the number of years that a country has been a member of the EU. By joining the EU, countries would be able to heighten the priority that they give to national road safety policies by their direct involvement in the CRSP, adhering more strictly to the EU *acquis*, improving the ability of their policies to implement non-binding EU policies and, overall, receiving the EU 'stimuli'.

The variable for the number of years that a country has been a member of the EU is used to identify the impact of the above-described Europeanization process. Once a country is in the EU, governments may have more incentives to be effective in reducing traffic fatalities in order to meet the goals imposed by the EU.

Recent research, such as Orsi *et al.* (2012), shows that road safety performance differs significantly from one member state to another. Nevertheless, when they join, members seem to be encouraged to adopt the overall EU target (non-binding and not a requirement for accession) in their national road safety policies in order to avoid having their credibility undercut and suffering from the poor public image that comes from becoming a ‘free-rider’.

There may be an imitation effect that gives a boost to recent EU members’ road safety policies. The performance of longstanding members (EU-15) was more in line with the target established by the 2001 white paper and the third ERSAP when it came into force in 2003, but the situation of new member states was more challenging (ETSC 2006). It is logical to think that existing advances, the ‘know-how’ of the old members and the structures established by the EU all rub off on countries in transition, as was analysed by Mattli and Plümpert (2002) in relation to the spread of democracy after the enlargement with Central and Eastern European countries.

With respect to our dependent variable (traffic fatality rate), it should be noted that the two previous papers that empirically examined road fatality rates in Europe (Albalade 2008; Albalade and Bel 2011) only used data for the EU-15 up to 2003, while our analysis uses data for the UE-27 up to 2009.

We develop a two-way fixed effects model that takes the following form for country  $i$  during period  $t$ :

$$Y_{it} = \alpha + \beta_k X_{it} + \lambda_k Z_{it} + \mu_i + \nu_t + \varepsilon_{it} \quad (1)$$

where  $Y_{it}$  is the log of the total fatality rate per capita,  $X_{it}$  contains the vector of economic, institutional and demographic attributes of the country and  $Z_{it}$  are variables related to road safety policies.  $\mu_i$  are country fixed effects that control for omitted time-invariant country-specific variables,  $\nu_t$  are year dummies that control for national trends and  $\varepsilon_{it}$  is a mean-zero random error.

We apply two different strategies to take into account country-specific effects. First, we perform the estimation using the ordinary least squares method including dummies for countries and years. We include policy variables with low time variability as covariates. Second, we also estimate a fixed effects model that exploits the within variation of the data. An advantage of the fixed effects model is that it allows any omitted variable to be controlled for which is correlated with the variables of interest and does not change over time. A shortcoming of the fixed effects model is that it may not consider time-constant variables (or those with a very low within variation) as explanatory variables. Thus, estimation with the fixed effects model does not include the policy variables.

Table 1 gives the explanatory variables, the sources of information and the descriptive statistics (mean and standard deviation). As mentioned above, the main variable that interests us is *Europeanization*, which is measured as

Table 1 Variables

<i>Variables</i>	<i>Description</i>	<i>Source</i>	<i>Mean</i>	<i>Standard deviation</i>
Fatalities per capita	Fatality rates per million inhabitants	CARE (EU road accidents database)	110.61	45.32
Gross domestic product per capita	Per capita gross domestic product in international comparable prices (US\$ at 2005 prices and Purchasing Power Parity [PPP])	UNECE Statistical Division database, compiled from official national and international (Community Innovation Survey [CIS], Eurostat, International Monetary Fund, OECD) sources	25211	11738
Motorization	Number of registered vehicles per 1,000 inhabitants	UNECE transport division, Eurostat, World Bank and national databases	424.27	113.57
Vehicles-km driven	Number of passenger-cars-km expressed in 1,000 million km and weighted by national population	European Commission (Directorate General for Mobility and Transport)	8.28	2.89
Density of motorways	Number km of motorways divided by square km of the country	Eurostat and UNECE	1.68	1.74
Upper secondary education	Percentage population 14–65 years old with upper secondary education	World Bank	46.72	14.41
Young	Percentage population 20–34 years old	UNECE	21.39	2.05
Old	Percentage population over 60 years old	UNECE	19.65	2.32
Europeanization	Number of years that a country has been a member of the European Union	European Commission	18.17	18.61

(Continued)

Table 1 Continued

<i>Variables</i>	<i>Description</i>	<i>Source</i>	<i>Mean</i>	<i>Standard deviation</i>
BAC_05	Dummy variable that takes a value of 1 for countries and periods where the maximum blood alcohol concentration rate allowed is lower than 0.5	European Commission road safety website	0.25	0.43
PPS	Dummy variable that takes a value of 1 for countries and periods with a points-based driving licence	Institute for Road Safety Research Netherlands (SWOV) and national legislation	0.74	0.43
Speed limits	Maximum speed limits (km/hour)	European Commission road safety website	121.18	13.66

the number of years that a country has belonged to the EU. As previously stated, we expect a negative relationship between this variable and road traffic fatalities.

We also consider typical variables used for road traffic fatalities in the empirical literature, related to the country's economic and social conditions and other additional variables related to road safety policies.

#### 4. RESULTS AND DISCUSSION

We find no substantial differences in the results whichever estimation technique is used as shown in Table 2.

The gross domestic product (GDP) per capita variable is not statistically significant. A possible explanation is that its variability is not high enough in our sample. However, we find lower road fatality rates in countries with higher levels of motorization. The motorization variable correlates with the economic development of the country. Road traffic fatalities seem to be lower in countries where transport is more developed, where infrastructure and vehicles may be safer and greater priority is given to road safety policies (Kopits and Cropper 2005). Albalade (2008) and Albalade and Bel (2011) also find a negative relationship between traffic fatalities and the level of motorization in analyses of a sample of European countries.

The vehicles-kilometre driven variable is positive and statistically significant. As expected, more traffic on the roads implies higher fatality rates, confirming

Table 2 Results of estimates: fatality rates per capita

<i>Independent variables</i>	<i>Fixed effects (within estimator)</i>	<i>Ordinary least squares</i>
Gross domestic product per capita	0.000012 (0.000011)	0.000012 (0.000011)
Motorization	-0.0013 (0.0005)**	-0.0012 (0.0005)**
Vehicles-km driven	0.05 (0.02)**	0.05 (0.02)**
Density of motorways	-0.14 (0.04)***	-0.14 (0.05)**
Upper secondary education	0.007 (0.05)	0.007 (0.005)
Young	0.003 (0.015)	0.003 (0.01)
Old	0.07 (0.02)**	0.08 (0.03)**
Europeanization	-0.07 (0.02)***	-0.07 (0.02)***
BAC_05	-	-2.38 (1.10)**
PPS	-	-0.90 (0.23)***
Speed limits	-	0.05 (0.02)**
Constant term	4.01 (1.13)***	-1.11 (1.52)
Country fixed effects	No	Yes
Time fixed effects	Yes	Yes
R <sup>2</sup>	0.77	0.95
Number of observations	258	258

Notes: Standard errors are given in brackets (robust to heteroscedasticity and clustered by country). Statistical significance at 1 per cent (\*\*\*), 5 per cent (\*\*) and 10 per cent (\*).

the findings of Albalate and Bel (2011) and McCarthy (2005). In contrast, the motorway density variable is negative and statistically significant. This confirms that the quality of transport infrastructure has a significant effect on road safety, as analysed in Albalate and Bel (2011) and Noland (2003).

We do not find that the population's educational background has a clear effect on road fatality rates, as found in Lourens *et al.* (1999). With respect to the vulnerable population-related variables, we find a positive relationship between fatality rates and the percentage of population over 60 years of age. We do not find evidence of higher road traffic fatality rates with a higher percentage of younger population. These findings are consistent with the idea that risk exposure is higher for a younger population, although the impact of the accidents means that morbidity and mortality are higher for an older population (Yee *et al.* 2006).

All road safety policies examined in this article seem to be effective in reducing traffic fatalities. The variables linked to the maximum blood alcohol concentration rate and the points-based driving license are negative and statistically significant, as was to be expected according to prior findings in Albalate (2008) and Castillo-Manzano & Castro-Nuño (2012) respectively, while the maximum speed limit variable is positive and statistically significant, corroborating the findings of Afukaar (2003).

Finally, the Europeanization variable is negative and statistically significant. Controlling for several explanatory factors, we find econometric evidence that a country's road traffic fatalities decrease as the number of years that the country has been a member of the EU rises. This leads us to confirm the initial hypothesis that the EU draws member countries closer together on road safety policy through joint involvement in all its institutions, programmes, funds and legislation. The transnationalization of policy norms and practices (see Peck and Theodore [2010] on this concept) is carried out with greater speed, making it easier for newcomers (the SEC belt countries) to have the opportunity to see and be advised directly on other members' successful policies and experiences. In many cases the longest-standing European members have had the greatest success in road safety worldwide (the SUNflower countries).

As in the case of the Economic Theory of Military Alliances (e.g., Kramer [2002] describes the enlargement of North Atlantic Treaty Organization [NATO] to include the Baltic states), benefits exceed accession costs for new members, and 'the club' continues to expand. The great national efforts made by new members, such as Spain, Latvia and the Czech Republic (Gitelman *et al.* 2010) have benefited from the successful road safety policies developed over many decades by the old European countries, such as Sweden, the Netherlands, Germany and the United Kingdom (Loo *et al.* 2005), that were destined to become international leaders in road safety.

Table 3 reports the results of an additional estimation with an extended sample of countries that includes non-EU members. This additional estimation is presented as a robustness check of the baseline regression, where the robustness check is designed to capture the effect of non-membership of the EU in any of the years of the period under consideration.

*Table 3* Results of estimates: per capita fatality rates (extended sample)

<i>Independent variables</i>	<i>Fixed effects (within estimator)</i>	<i>Ordinary least squares</i>
GDP per capita	8.07e-06 (0.0000141)	9.15e-06 (0.000014)
Motorization	-0.0003 (0.0004)	-0.0003 (0.0004)
Density of motorways	-0.12 (0.06)*	-0.13 (0.06)**
Europeanization	-0.033 (0.016)**	-0.038 (0.019)**
BAC_05	-	-0.79 (0.35)**
PPS	-	-0.20 (0.09)**
Speed limits	-	0.06 (0.03)**
Constant term	4.99 (0.50)***	-2.06 (3.16)
Country fixed effects	No	Yes
Time fixed effects	Yes	Yes
R <sup>2</sup>	0.62	0.92
Number observations	323	323

*Notes1:* Standard errors are given in brackets (robust to heteroscedasticity and clustered by country). Statistical significance at 1 per cent (\*\*\*), 5 per cent (\*\*) and 10 per cent (\*).

In this extended sample, the non-EU countries act as a counterfactual for the countries that are members of the EU in at least some years of the period under consideration. This extended sample should consider countries that belong to the EFTA, such as Iceland, Liechtenstein, Norway and Switzerland, which could act as a counterfactual for older EFTA countries that are currently members of the EU (Finland, Sweden, Austria). This extended sample should also include official EU candidates like Croatia, Iceland, The Republic of Macedonia, Montenegro and Turkey that could act as a counterfactual for geographically close countries that are currently members of the EU, like, for example, Slovenia, Greece or Cyprus.

However, it has been difficult for us to find full series of data for these additional countries using international sources (CARE, UNECE, Eurostat, World Bank). Hence, we are not able to include countries like Andorra, Liechtenstein, Monaco Montenegro and San Marino because data are not available for the dependent variable and for most of the explanatory variables. Owing to the lack of data, the estimation with an extended sample that includes non-EU members (Norway, Switzerland, Iceland, Croatia, The Republic of Macedonia and Turkey) is not able to consider some control variables: vehicles-km driven; upper secondary education; and the proportion of young and old people. Hence, this additional regression can only be considered as a robustness check of the baseline estimation. As shown in Table 3, the Europeanization variable is still negative and statistically significant after including non-EU countries in the sample, so our main hypothesis is validated after considering non-EU membership.

## 5. CONCLUSIONS

The notion of Europeanization might help to describe the impact of the EU on national policies, although the process is different from other transport sectors and more complex. This policy aims to save lives in a way that benefits all citizens and does not involve the liberalization of transport services but is a 'shared responsibility'.

EU influence might be interpreted as a hybrid process based on the mimetic dynamics of national initiatives, successful 'best practices' developed by northern member states which even 'domesticate' the EU policy (such as the Swedish 'vision-zero fatalities' approach or 'sustainable safety' from the Netherlands), a set of national 'hinterlands' which are preserved within the European targets, plus (coercive and non-coercive) pressures from European institutions to adapt.

There are substantial differences in the level of safety performance from one EU member to another. However, our main hypothesis is that some countries with high road fatality rates that are geographically, politically, socially and economically distant from other leader countries on road safety (SUNflower: Sweden; the Netherlands; and the UK) have started to adapt more quickly since their accession to the EU thanks to EU support. This support includes a mixture of instruments available to the EU, such as the legal *acquis*, soft



law (ERSAPs), economic tools, information-sharing and wide-ranging contact with governments and research institutions.

This hypothesis is specifically valid for SEC belt countries (Italy, Spain, Portugal, Greece, Baltic and eastern states). Other non-EU members, such as Norway and Switzerland, which are close to the SUNflower countries in every way, also benefit from EU road safety policy; in fact, both of these countries are considered internationally to be in the same road safety development group (Wegman *et al.* 2008). Proof of the extended influence of the EU on both countries is that they have also adopted the same target as EU member states of halving the number of traffic fatalities by 2010.

We included the *Europeanization* variable (the number of years that a country has been a member of the EU) and our main finding is that it is negative and statistically significant, which means that a positive influence on domestic road safety emerges after accession to the EU. When a new member state completes accession, road traffic issues gain in importance in national policy, and the country gains access to other members' successful experiences and take advantage of EU legislation, EU funding and the motivation provided by contributing to EU shared targets.

The cumulative nature of this variable also enables us to conclude that this process of positive imitation between member countries is not limited to the 2001 white paper and the third ERSAP, but that its significance could be understood as indirect empirical evidence of the effectiveness of all EU road safety policy executed to date.

Compared to the difficulties that this entails for strictly economic variables, such as unemployment and inflation, this should not be so complex for traffic safety policy *a priori*, thanks to all the experiences and recommendations (compulsory seat-belt use, reductions in limits on blood alcohol content and improved communication and advertising strategies, among many others), all of which generally have affordable implementation costs. Furthermore, these efforts by states to reduce this gap in road safety seem to receive solid social support, as according to the results of the Eurobarometer survey (EC 2010a) European citizens agree with the efforts made in this field in recent years and even call for governments to do more to combat the problem.

Finally, the European CRSP still has a long way to go (harmonizing alcohol consumption and speed limits). Following Wegman *et al.* (2008), the policy of improving road safety in each state might ultimately result in the same level of safety in every country, but this level is achieved in different ways in different countries which are tackling different initial problems. The European Economic and Social Committee (2011) points to the desirability of introducing differentiated measures or reduction targets for member states, since risks vary between countries. Member states where there have been substantial reductions in road traffic victims should focus mainly on the human factor (e.g., training and enforcement as top priorities). While member states

where there have been no substantial reductions in fatalities should also focus on the so-called 'hard' elements of road safety policy (improving infrastructure and vehicle safety requirements in addition to education, training and enforcement). According to the ETSC (2006), some of the measures implemented in SEC belt countries require a lengthy period of time to have their full impact on road safety.

As Heritier (2001) argues, in general terms the implementation of a European policy by member states does not mean the convergence of domestic structures towards a single European model. We think a more in-depth future analysis of convergence is required to understand how these differences contribute to achieving cohesion.

The EU intends not only to develop a general governance framework and challenging objectives to guide national and local strategies so that the above-described actions can be implemented at the most appropriate level, by the most appropriate means and as efficiently as possible, but also to maintain its strong leadership: i.e., when the fourth ERSAP replaces 'policy guidelines' with 'policy orientations', this will mark a shift in EU philosophy, indicating that the emphasis for the period 2011–2020 will not be so much on putting forward proposals for new legislation as on developing and applying the following three principles: shared responsibility; the integration of road safety into other policy areas; and achieving the same level of road safety in all EU countries (EC 2010b).

We therefore understand that this article's findings are especially useful in the context of difficulties found in European integration going forward. Our findings show an area where belonging to the European Union clearly provides positive benefits and demonstrates that it is much more than an economic and monetary union. In the words of Avenoso & Townsend (2010: 7): 'EU road safety legislation has an added value for all Member States'.

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## REFERENCES

- Afukaar, F.K. (2003) 'Speed control in developing countries: issues, challenges and opportunities in reducing road traffic injuries', *Injury Control and Safety* 10: 77–81.
- Albalade, D. (2008) 'Lowering blood alcohol content levels to save lives: the European experience', *Journal of Policy Analysis and Management* 27: 20–39.
- Albalade, D. and Bel, G. (2011) 'Motorways, tolls, and road safety: evidence from Europe', *SERIEs: Journal of the Spanish Economic Association*, DOI: 10.1007/s13209-011-0071-6.
- Avenoso, A. (2005) 'The making of European road safety policy – ETSC's programmes and positions', *Πανελλήνιο συνέδριο οδικής ασφάλειας* 30: 10–11.
- Avenoso, A. and Beckmann, J. (2005) *The Safety of Vulnerable Road Users in the Southern, Eastern and Central European Countries (the 'SEC belt')*, Brussels: European Transport Safety Council (ETSC).
- Avenoso, A. and Townsend, E. (2010) *Future Road Safety in the EU at Stake? ETSC Response to the EC Communication 'Towards a European Road Safety Area: Policy Orientations on Road Safety 2011–2020'*, Brussels: European Transport Safety Council.
- Bax, Ch. (2011) 'Policy Instruments for Managing EU Road Safety Targets: Carrots, Sticks or Sermons? An Analysis and Suggestions for the USA', *SWOV Institute for Road Safety Research, publication R-2011-15*, The Netherlands.
- Börzel, T.A. and Risse, T. (2000) 'When Europe hits home: Europeanization and domestic change', *European Integration Online Papers* 4/15.
- Börzel, T.A. and Risse, Th. (2003) 'Conceptualising the domestic impact of Europe', in K. Featherstone and C. Radaelli (eds), *The Politics of Europeanisation*, Oxford: Oxford University Press, pp. 57–80.
- Bosetti, S., Corrias, C., Scatamacchia, R., Sitran, A. and Delhay, E. (2010) *Ex-post Evaluation of the RSAP. Final Report. Volume I.N Specific Contract, DG TREN A2/143-2007*, Leuven: Transport and Mobility.
- Bugdhan, S. (2005) 'Of Europeanization and domestication: the implementation of the Environmental Information Directive in Ireland, Great Britain and Germany', *Journal of European Public Policy* 12: 177–99.
- Buller, J. and Gamble, A. (2002) 'Conceptualising Europeanisation', *Public Policy and Administration* 17: 4–24.
- Castillo-Manzano, J.I. and Castro-Nuño, M. (2012) 'Driving licenses based on points systems: efficient road safety strategy or latest fashion in global transport policy? A world wide meta-analysis', *Transport Policy* 21: 191–201.
- Chabaliere, D. (2006). 'The Europeanization of the railway sector', Paper presented at the 3rd Pan-European Conference on EU Politics. Bilgi University? Istanbul, September, 21–23.
- Clark, D.E., Wildner, M. and Bergmann, K.E. (2000) 'Injury mortality in East Germany', *American Journal of Public Health* 90: 1761–4.
- Commission of the European Communities (CEC) (1993) 'Communication from the Commission to the Council for an action program on road safety', COM(93), 246 final, Brussels.

- Commission of the European Communities (CEC) (1997) 'Promoting road safety in the EU. The Program for 1997–2001', Communication COM (97) 131 final, Brussels.
- Commission of the European Communities (CEC) (2004) 'European neighbourhood policy strategy paper', COM(2004) 373 final, Brussels.
- European Commission (EC) (2001) 'European transport policy for 2010: time to decide', White Paper', COM (2001) 370, Brussels.
- European Commission (EC) (2003) 'Halving the number of road crash victims in the EU by 2010: a shared responsibility', Communication from the Commission COM (2003) 311 Final, Brussels.
- European Commission (EC) (2010a) 'Flash Eurobarometer, no. 301. Road safety. analytical report', The Gallup Organization upon the request of Directorate-General Mobility and Transport, Hungary.
- European Commission (EC) (2010b) 'Towards a European road safety area: policy orientations on road safety 2011–2020', Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions COM(2010) 389 final, Brussels.
- European Commission (EC) (2010c) *EU at the Steering Wheel of Road Safety, EU Funded Research to Make Europe's Roads Safer*, Luxembourg: Publications Office of the European Union.
- European Commission (EC) CARE Database (2012) *National Data of EU Road Fatalities. Annual Evolution since 2001*, Brussels: Directorate General for Mobility and Transport.
- European Economic and Social Committee (2011) 'Opinion on the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: towards a European road safety area: policy orientations on road safety 2011–2020', COM(2010) 389 final.
- European Transport Safety Council (ETSC) (2006) *A Methodological Approach to National Road Safety Policies*, Brussels: European Transport Safety Council.
- Featherstone, K. and Radaelli, C.M. (eds) (2003) *The Politics of Europeanization*, Oxford: Oxford University Press.
- Geddes, A. and Jordan, A. (2012) 'Migration as adaptation? Exploring the scope for coordinating environmental and migration policies in the European Union', *Environment and Planning C: Government and Policy* 30: 1029–44.
- Geerlings, H. and Stead, D. (2003) 'The integration of land use planning, transport and environment in European policy and research', *Transport Policy* 10: 187–96.
- Gitelman, V., Doveh, E. and Hakkert, S. (2010) 'Designing a composite indicator for road safety', *Safety Science* 48: 1212–24.
- Hamelin, F. (2010) 'Renewal of public policy via instrumental innovation: implementing automated speed enforcement in France', *Governance: An International Journal of Policy, Administration, and Institutions* 23: 509–30.
- Helmreich, W. (2010) *Safety and Security in Mobility. Thematic Research Summary*, Brussels: EC, Transport Research Knowledge Centre.
- Héritier, A. (2001) 'Differential Europe: administrative responses to community policy', in M.G. Cowles, J. Caporaso and T. Risse (eds), *Transforming Europe: Europeanization and Domestic Change*, Ithaca, NY: Cornell University Press, pp. 44–59.
- Kerwer, D. and Teutsch, M. (2001) 'Elusive Europeanization: liberalizing road haulage in the European Union', *Journal of European Public Policy* 8: 124–43.
- Knill, C. and Lehmkuhl, D. (2002) 'The national impact of European Union regulatory policy: three Europeanization mechanisms', *European Journal of Political Research* 41: 255–80.

- Kopits, E. and Cropper, M. (2005) 'Traffic fatalities and economic growth', *Accident Analysis and Prevention* 37: 169–78.
- Kramer, M. (2002) 'NATO, the Baltic states and Russia: a framework for sustainable enlargement', *International Affairs* 78: 731–56.
- Lawton, T.C. (1999) 'Governing the skies: conditions for the Europeanisation of airline policy', *Journal of Public Policy* 19: 91–112.
- Lehmkuhl, D. (2002) 'Harmonisation and convergence? National responses to the Common European Transport Policy', *German Policy Studies* 2: 1–26.
- Loo, B.P.Y., Hung, W.T., Lo, H.K. and Wong, S.C. (2005) 'Road safety strategies: a comparative framework and case studies', *Transport Reviews* 25: 613–19.
- Lourens, P., Visser, J. and Jessurun, M. (1999) 'Annual mileage, driving violations, and accident involvement in relation to drivers' sex, age and level of education', *Accident Analysis and Prevention* 31: 593–7.
- Mattli, W. and Plümpert, T. (2002) 'The demand-side politics of EU enlargement: democracy and the application for EU membership', *Journal of European Public Policy* 9: 550–74.
- Mazey, S. (1998) 'The European Union and women's rights: from the Europeanization of national agendas to the nationalization of a European agenda?', *Journal of European Public Policy* 5: 131–52.
- McCarthy, P. (2005) 'Alcohol, public policy and highway crashes', *Journal of Transport Economics and Policy* 39: 109–25.
- Mikulik, J. (2004). 'Road safety in an enlarged Europe: challenges and opportunities for the 25 EU member states', Paper presented at the 6th European Transport Safety Lecture? ETSL, Brussels, 26 April.
- Noland, R. (2003) 'Traffic fatalities and injuries: the effect of changes in infrastructure trends', *Accident Analysis and Prevention* 35: 599–611.
- OECD (IRTAD) *Road Safety Annual Reports*. 2009–2011.
- Orsi, Ch. *et al.* (2012) 'Trends in motor vehicle crash mortality in Europe, 1980–2007', *Safety Science* 50: 1009–18.
- Ozel, I. (2013) 'Differential Europe within a nation: Europeanization of regulation across policy areas', *Journal of European Public Policy* 20(5): 741–59.
- Pallis, A.A. (2006) 'Institutional dynamism in EU policy-making: the evolution of the EU maritime safety policy', *European Integration* 28: 137–57.
- Peck, J. and Theodore, N. (2010) 'Mobilizing policy: models, methods and mutations', *Geoforum* 41: 169–74.
- Peden, M. *et al.* (2004) *World Report on Road Traffic Injury Prevention*, Geneva: World Health Organization.
- Racioppi, F., Eriksson, L., Tingvall, C. and Villaveces, A. (2004) *Preventing Road Traffic Injury: A Public Health Perspective for Europe*, Copenhagen: World Health Organization Regional Office for Europe.
- Radaelli, C. (2001) 'The domestic impact of European public policy: notes on concepts, methods and the challenge of empirical research', *Politique européenne* 5: 107–42.
- Richardson, J. (ed.) (2012) *Constructing a Policy-making State? Policy Dynamics in the European Union*, Oxford: Oxford University Press.
- Threlfall, M. (2003) 'European social integration: harmonization, convergence and single social areas', *Journal of European Social Policy* 13: 121–39.
- Tilling, C. (2006) 'The EU common transport policy for South-East Europe – what makes it a factor of cohesion and sustainability?', *South-East Europe Review for Labour and Social Affairs* 1: 7–14.
- Wegman, F. *et al.* (2008) *SUNflowerNext: Towards a Composite Performance Index*, Leidschendam: SWOV.
- Yee, W.Y., Cameron, P.A. and Bailey, M.J. (2006) 'Road traffic injuries in the elderly', *Emergency Medicine Journal* 23: 42–6.