IMPACT STUDY OF TELEMATICS AUTO INSURANCE

Cornel Coca Constantinescu[1], Ion Stancu[2*] and Iulian Panait[3]

[1)] Financial Supervisory Authority, Bucharest, Romania
[2)] Academy of Economic Studies and Institute of Financial Studies, Bucharest, Romania
[3)] Financial Supervisory Authority and Institute for Financial Studies, Bucharest, Romania

Abstract

The development of telematic systems, as well as the need to differentiate the motor insurance market, led to the emergence of new clauses in motor insurance contracts. Thus, vehicle insurance contracts with self-check (and telematic) insurance policies are in the recent focus of insurance companies for motor insurance. With the help of a telematics device installed on the vehicle and a mobile application the driving mode of the driver is permanently assessed; the rating is calculated according and the discount for the insurance price is set accordingly. These types of auto insurance contract terms can provide, on average, 25% savings for carefully drivers.

Our paper presents, the recent developments in telematics insurance in Europe and around the world and the Romanian drivers propension to accept the monitoring of their driving behavior. We then present the economic, financial and socio-ecological advantages versus disadvantages revealed by specialized literature for both policyholders and insurers. In this context, we will prefigure the future of telematics insurance in Europe.

In our empirical study we estimate the financial impact of telematics insurance in Romania on gross written prices and gross paid indemnities. Finally, we estimate the socio-economic impact of these telematics insurance on the decrease in the number of kilometers, fuel consumption, number of accidents and casualties, and implicitly, on the reduction of the cost of the compensation. For this impact study we used the scenario technique (pessimistic, moderate and optimistic) in relation to the baseline scenario, respectively, the estimate of the natural evolution of the insurance market in the absence of telematics.

Keywords: auto telematics insurance, driving behavior rating, financial impact of telematics insurance, socio-economic impact of telematics insurance, scenario technique.

JEL classification: C53; D03; D53; G22

* Contact author, **Ion Stancu** – ion.stancu@isfin.ro

Introduction

At present, the calculation of insurance premium is based on age categories but without an adaptation for drivers in the same category. In calculating the premium, important indicators such as mileage, driving behavior and driving patterns are not taken into account. Competition, amplified by the lack of differentiation of insurance services, together with other factors related to the specific evolution of the market, including in the context of technological advances, leads to a significant reduction of margins and even income for many insurance companies in Romania. So, a driver who drives 40,000 km / year pays the same premium as the driver that runs 10,000 km / year. Often pricing is not sufficiently correlated with individual risk, even in the context in which it is recognized and accepted that insurance is a form of mutualisation. It is therefore necessary to change the paradigm in traditional insurance policies by offering new insurance services depending on the driving mode and mileage of the vehicle. Insurance companies will quantify the risk according to the behavior of the driver, which will reduce by a year the average compensation rate by up to 30%.

Insurance companies in many countries have adopted telematics insurance systems where the insurance premium is calculated according to the parameters of traditional multi-level telematics within 24 hours (Aviva-Canada, Generali-Italy, MAPHRE-Spain, RSA Insurance-England, Uniqa-Austria, WGV-Germany). In other countries, insurance companies calculate the premium depending on a telematics parameter: distance traveled (AIOI-Japan, AXA-Italy) or accidents (AXA-Switzerland).

"Deloitte expects digital vehicle insurance, where personal driving behavior data from so-called telematics equipment is used to calculate individual customer premium, could account for 17% of the European market by 2020. Currently, Italy leads using telematics with 6.3 million policies or 15-16% of all auto insurance policies in 2016.

Given that 95% of the life of a car is parked or not driven, it is still an example of creating insurance that better responds to customer behavior, especially if that customer could soon climb into the car. " (Raconteur.net file, 2017).

Figure no. 1 shows the evolution of telematics insurance in England from zero in 2009 to over 750,000 in 2016 (BIBA, 2017).

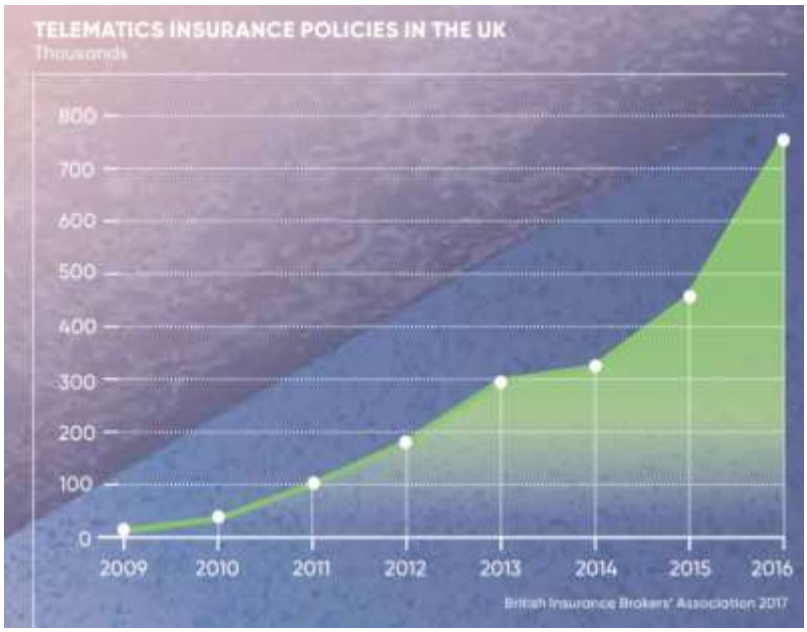

Figure no. 1. The Evolution of Telematics Insurance Policies in England, thousands insured
Source: BIBA, 2017

The drivers which most likely to benefit are those who, on the standard insurance market, have high prices due to age or other factors. Telematics policies are extremely popular among younger drivers. The GoCompare site suggests that 71% of all telematics policies were taken by drivers aged 25 years or over, compared to only 3% for those over 50 years old. As motor vehicle insurance costs are rising even for drivers outside the category of young drivers, we anticipate that the take-up of telematics will increase over the next decade for all age groups (Trakm8.com, 2018).

In Romania, differentiation of insurance policies is done according to the bonus / malus policy of CASCO insurance, respectively, discounts for drivers who have not registered accidents and higher premium for those who have had accidents. Proportionality is only for events reported to the insurance company and therefore without telematics monitoring.

The development of telematics systems, the significant decrease in insurer's earnings, and the need to differentiate the motor insurance market have led to the emergence of new clauses in motor insurance contracts. Thus, vehicle insurance contracts with a self-check (and telematic) policy are in the forefront of automotive insurance companies, especially CASCO. With the help of a telematics device installed on the vehicle and a mobile application, the driving style of the driver is permanently assessed and the accumulated

discount for the insurance premium is determined.[1] These types of auto insurance contract terms can provide, on average, savings of 25% for carefully drivers (BIBA, 2018).

1. Reflecting telematics insurance in the literature

We were glad to have a comprehensive telematics analysis in Tobias Ippisch work (2010), respectively, how telematics technology and processing information through this technology can create value in automotive insurance. In particular, studying the impact of motor vehicle accidents on travel and driving behavior demonstrates the benefits of telematics in the insurance sphere and points to the strategic importance of telematics.

This research is based on the theory of the agent, namely, the identification of the importance of information and informational asymmetries in the insurance markets, as well as on the theory of the planned behavior, namely, the specific analysis of the auto-accidents, their persistence and the influence of moderation and reduction factors of travels.

The assumptions about telematic data are tested on 1,598 Italian vehicles, the leading country in telematic insurance. The author's conclusions indicate that in the first month after the accident the drivers involved reduce the monthly travel by 11.4%, the monthly mileage by 13.9% and the average speed by 7.5%. The effects of accidents do not fade over time; in fact, they are still present at 5 months of follow-up. Finally, the author points out the implications of these conclusions for insures and insurers at both operational and strategic levels for the entire human community.

Siniša Husnjak (2014) and coauthors reveal in their work the fundamental principles of telematics that lead to new models in the auto insurance industry. The architecture of the telematics system used in the automotive insurance market, as well as the model of the insurance premium, are correlated with the risk profile of the insured.

The development perspectives of the telematic system are supported by a case study implemented in Eastern Europe. On a sample of only 22 participants, the authors found that the risk of accidents decreased by an average of 38%, which is confirmed by previous research on the subject.

Friedman and Canaan (2014) identified three distinct groups in their study of driving style monitoring through telematics coupled with price discounts based on their performance (Figure no.2).

[1] GROUPAMA is the first insurance company in Romania to test a telematics technology based driver control system

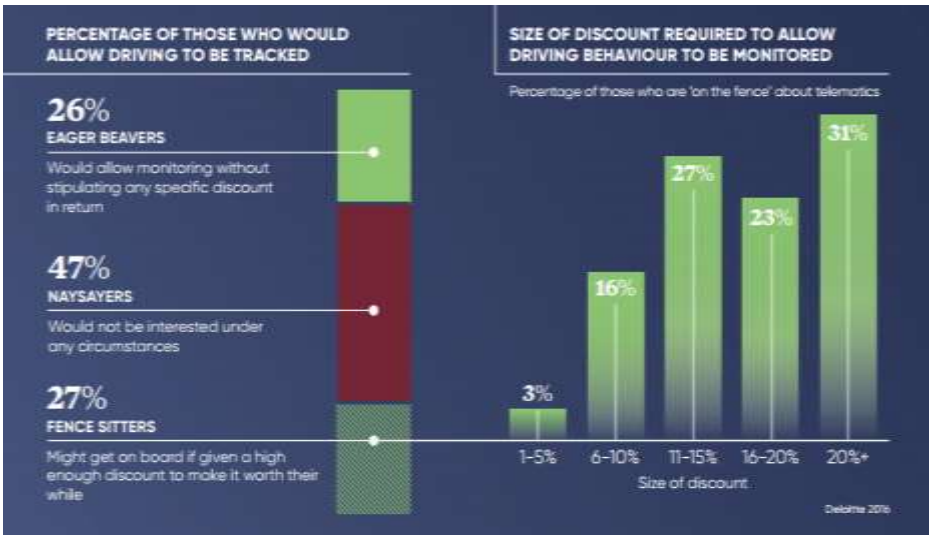

Figure no. 2. Structure of US car insurers according to the inclination towards telematics insurance and according to the size of the discount
Source: Deloitte's Center for Financial Services, 2016

- The eager beavers (willings), at a rate of 26%, would allow such monitoring, regardless of the size of the price discount.
- The naysayers (undecides), 27%, consider a discount that is large enough to accept telematics monitoring.
- Fence sitters (skeptics), in high proportion (47%), would not be interested at all to monitor their driving. Among them, however, the telematics monitoring idea was open, one fifth of them would expect a 10% reduction (Figure 2). Approximately half expecting premium cuts between 11 and 20%, while nearly a third think they would be entitled to discounts of over 20%.

The British Insurance Brokers Association (BIBA)[2] conducts annual research on the number of telematics insurance in the UK. Their growth in 2016 is close to 25% over the 2015 figure. These insurance policies can provide savings of up to 25% for carefully drivers. Studies show that 1 in 5 young drivers have an accident in the first 6 months of receiving a driving license. But if they admit a telematic self-control clause, this figure improves significantly to only 1 in 16, which makes young drivers three times more secure. In this context, BIBA proposes to eliminate the tax on telematics insurance prices for young drivers in order to encourage telematics insurance, reduce accidents and increase road safety.

[2] The BIBA study reveals that the number of telematics insurance in England in 2016 was over 750,000 insurance policies

2. Pro and con telematics insurance

2.1. Advantages of telematics insurance

Drivers can benefit from discounts of up to 40% at the cost of the car, depending on traffic behavior (Table no.1). It will be evaluated by a telematics device installed on the customer's vehicle, which records information on the areas and roads on which the vehicle is traveling, the average duration and number of trips, the hours of use, the incidents recorded and also the driving style data of the driver. On the basis of this information, the driver receives a rating according to which the insurance premium will be adjusted.

Table no. 1. Traffic behaviours and discounts from GROUPAMA

TYPE OF DRIVER	DISCOUNT
PRUDENT	40%
IMPROVED	20%
WARRIOR	0%

The customer can check his rating in real time and can adjust his behavior, thus having a direct influence on the policy premium. Depending on the history of driving behavior, the driver will know 15 days before the due date, which is the approximate amount of the price at the next CASCO rate[3].

Non-exclusive list of information that can be provided by telematics *(see also figure no. 3)*:

List of all trips	List of all journeys made by the vehicle with a detailed trip map
Duration of the trip	Duration of each individual journey
Travel distance	The distance between each individual trip
Start the journey	Start time for each individual trip
End of journey	End time for each individual trip
Average speed	The average speed of each individual trip
Maximum speed	The maximum speed of each individual trip
Driving style *	Combined score based on 2 levels of braking, accelerating and turning (only if the recorder is equipped with a 3-axis accelerometer)
Trip map	Detailed trip map for each individual trip
Total Duration	The total duration of all recorded trips
Total distance	Total distance for all recorded trips
Time of day	A table that stores daily the hours the vehicle is driven

[3] The discount for telematics insurance can reach up to 700 euros (Groupama, 2018)

Long trips	Percentage of uninterrupted and long-haul trips exceeding the predefined threshold by the insurance company
Unlisted time	Total time spent in unmanaged traffic (indicating traffic jams and clusters)

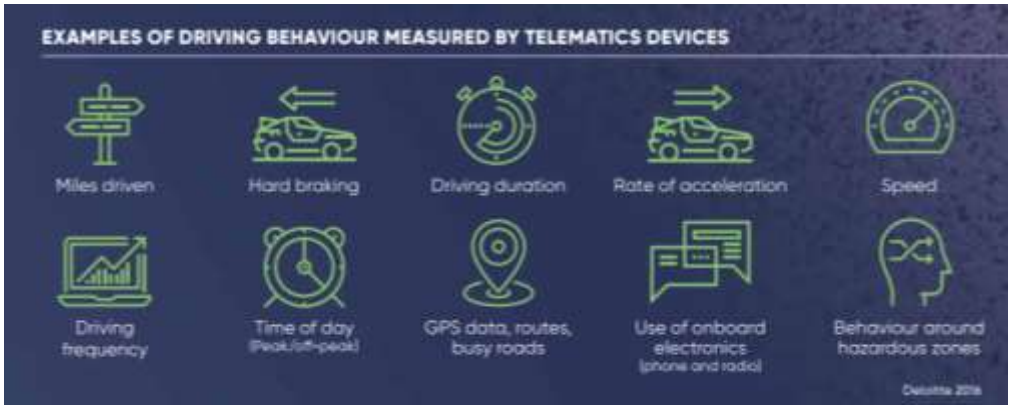

Figure no. 3. Information that can be provided by telematics technology
Source: Deloitte's Center for Financial Services, 2016

The self-control clause is an innovation for car insurance with a considerable economic and social impact. Researchers have also identified other benefits of the Self-control clause, namely, attracting new drivers who are aware of traffic safety; lowering accidents and reducing costs related to damage recovery (Litman, 1997); social and environmental benefits such as reducing CO2 emissions by inducing reduced vehicle use (Bordoff & Noel, 2008). Potential fuel savings can reach about 10% per year. The government should legislate for tax cuts for insurance companies on contracts concluded with the per kilometer driving clause.

A quasi-complete picture of the benefits of using telematics insurance was developed by Ptolemus Consulting Group (2013) and Reddy, S. (2012):

Social Benefits	Reducing the frequency and severity of accidents; reducing accident response time; tracking and recovering stolen vehicles; the correct determination of guilt for and equity in settling complaints; reducing vehicle driving, reducing pollution, decongesting traffic and reducing energy consumption;
Economic benefits	Reducing the chance of accidents; increasing the processing efficiency of applications; early detection and fraud prevention; setting prices based on risk profiles;
Benefits for the environment	Increasing the use of traffic less routes and limiting the use of motor vehicles; reducing fuel consumption; improving car maintenance; reducing CO2 emissions
Benefits for	Improving price precision; eliminating erroneous risk

insurance providers	classifications; preserving profitability; eliminating fraudulent applications; the possibility of low prices; reducing redress costs; brand differentiation
Benefits for users	Reducing premiums; taking a safe driving behavior after an accident; providing value-added services (vehicle diagnostics, stolen vehicle recovery, emergency services, driver monitoring, etc.)

The latest annual research by the British Insurance Brokers Association (BIBA, 2018) shows that the number of telematics insurance policies, including black box policies, has increased by 30%.[4] In the Baltic countries, the growth rate of telematics insurance is 90%. In the future, the number of telematics insurance beneficiaries will grow exponentially as illustrated by the growth rate from 1.85 million in 2012 to 89 million in 2017 in Central and Eastern Europe. For example, only the Croatian market provides 39,000 telematics-based policies, while in Slovenia there are only up to 25,000 such policies (Husnjak, 2015).

Statistics from the auto insurance industry (BIBA, 2018) show that:

- There is a 40% fall in accident risk when a new driver has a telematics policy;
- Average parameter reduction has a direct or indirect impact on 38% accident risk;[5]
- The percentage of drivers with improved driving score after introducing the self-check clause is 70%;
- Claims are reduced by 30%;
- The adoption of the pay-as-you-drive motor insurance clauses may cause the annual mileage decrease of a vehicle by approximately 10% (Edlin, A., 2003). It should be noted, however, that the fall in accident rates is not linear in relation to the reduction in mileage.

2.2. Disadvantages and reluctance to contract telematics insurance

However, in order to maintain insurers' profitability, it is estimated that a 5% decrease in the average premium has to be offset by a 25% expansion of the customers base. In motor third party liability insurance, the volume of the market depends on the number of registered vehicles, which in the most developed countries of Europe have low marginal growth rates of about 0.3% - 0.7% / year (Ippisch, 2010).

[4] Telematics in England:
2009 - 12.000 policies
2010 - 35.000 policies
2011 - 100.000 policies
2012 - 180.000 policies
2013 - 296.000 policies
2014 - 323.000 policies
2015 - 455.000 policies
2016 - 751.000 policies

[5] Studies show that 1 in 5 young drivers have an accident in the first 6 months of passing the driving test.

In Romania this situation is in fact a favorable one considering the modest coverage in insurance (the figure varies according to the entity making these estimates, but all sources converge to the appreciation that there is still significant market growth potential by improving degree of coverage). Observations made so far show that telematics does not greatly improve the behavior of Romanian drivers. They drive equally aggressively, with about the same number of accidents and the same number of kilometers (conclusions drawn from the telematics data of the Groupama fleet of cars). The most important benefit for insurers is that telematics leads to an increase in the share of low-risk (good) customers with significant discounts and a reduction in car insurance fraud.

Significant integration of telematics insurance in Romania will take place over a period of 3 to 5 years. The rate of adoption of telematics insurance is low in Romania. The more telematic customers in insurance are those who rarely travel with their personal cars (have a service car) or having expensive cars (collectors).

Those with high-risk identified by telematics will have higher premiums that they no longer pay and transfer their policy to other insurers because in Romania there is not full implementation of the annual insurance contract. In Romania there are insurers offering discounts of up to 40% even with the sacrifice of their profitability.

Insurers also mentioned a series of reservations regarding the new car insurance policy (Ippisch, 2010):

- telematics-based insurance requires considerable investment both in infrastructure and in wireless data transmission;
- managers of insurance companies doubt that they will recover telematics investments because telematics technology will become the standard equipment in the near future of vehicle manufacturing;
- their fear is also determined by the fact that telematics providers and car makers could weaken the insurance and customer relations and substantially reduce the volume of business for insurance policies which include the self-control clause;
- drivers are reluctant when they consider that the discounts are not large enough to justify accepting the self-control clause, the confidentiality issues, and the fear of having to pay higher premium in the event of inadequate driving;
- the idea of releasing so many personal driving data from insurers leads to concerns about privacy.

The pools conducted by Expressions of the Express magazine revealed several fears of telematics drivers (Express, 2017):

- “This type of policy is just one way "Big Brother is watching you", allowing the insurance provider to raise the prices.
- How the driving behavior will increase the cost of my insurance prices.
- I will not know whether they drive well or not.
- My insurer will inform the police of any deviations from the rules
- I will not be able to drive at night.

- A black box will interfere with my music.
- All my friends will know I have a black box - it's not cool!
- Insurers know this data and penalize drivers at renewal.
- If a bad driver borrows my car, I will be penalized.
- I will be fined if I go to estimated mileage due to unexpected travels.
- You will tell my parents where I drive.
- The black box will distract me when I drive."

Deloitte's Center for Financial Services in New York (Deloitte University Press, 2014) also highlighted for automotive insurers a number of strategic, potentially critical, short-term questions, such as:

- "What will be the adoption rate of telematics insurance consumers and how quickly will they materialize in the market?
- What percentage of their business could be telematics insurance?
- How much should you invest to build a telematics capacity?
- What impact could telematics have on risk segmentation and price level?
- What information should be generated from telematic data to compete effectively?
- How will they collect and analyze the critical mass of data they will need to run a viable telematics program on their own or through cooperative arrangements with other carriers and / or insurers?
- What additional value-added services could provide telematics to differentiate the product, while buying and renewal decisions are not priced?
- What about the risk of channeling the price customer base with telematics insurance while losing prizes in transition? On the other hand, how could it counteract the risk of being stagnant while early adopters choose their lowest-risk policyholders and convince them to change insurers by offering low telematics insurance?
- Is telematics insurance, first of all, a strategy to generate new business or to keep the best risks in the existing register? Or can both targets be reached in tandem?
- How much could you benefit from a competitive advantage? How much is it in the risk of falling and how much it could lose business, waiting to enter the field of telematics insurance? How quickly do you have to be in competition to capitalize on this opportunity before you suffer a significant erosion of the best risks?"

In addition to the critical aspects revealed by the Deloitte study, we note the unavoidable impact that the advancement of automotive technology will certainly have on the auto insurance industry and even more on the efficiency of using the telematics system (in the context of the assumption that autonomous vehicles will already have mechanisms and algorithms for prudent and preventive driving, and their behavior in traffic will probably no longer depend on the owner / occupant / occupant.

Also, a possible large-scale application of autonomous vehicle technologies would also make changes to the structure and parts of the insurance contract in the sense that it is likely that the beneficiary of the compulsory liability insurance will become the vehicle manufacturer and not the owner / possessor / occupant).

Depending on the speed with which they will be adopted and the form that these new technologies will take, their impact on the insurers' investment efficiency in adopting the telematics system could be significant.

A particular feature of the implementation of telematics insurance in Romania is the Bonus-Malus system currently in place for RCA insurance (civil liability for the use of land vehicles). Thus, while telematics is an attempt to match the insurance price with the individual risk given by the way the car is used in traffic, based on a retrospective approach, the Bonus-Malus system has virtually the same purpose and approach, but refers only to the incidents caused by the insured vehicle.

Both systems lead to reductions in the insurance price relative to a reference level (in the first case, the insured who does not accept the telematics device, in the second case, the new and no-class vehicle in the B0 class) comparable to amplitude (up to 40 % in the case of telematics according to the above-mentioned sources, or 50% maximum for vehicles that fall into the B8 class).

In essence, both the telematics system and the Bonus-Malus system refer to the behavior of the vehicle (i.e. those who drive the vehicle), but the telematic system is much more detailed taking into account not only accident / damage events already produced but a series of parameters already mentioned that make up a more specific risk profile. Therefore, simultaneous (in parallel) use of the two systems without adjustments taking into account the interrelationships between them would not probably lead to the best results for insurers.

The important distinction between the two systems is that the Bonus-Malus system is an aggregated one on the whole market, with a database that is interconnected with all insurers and can be publicly consulted, with all the legal, logistical and cost-cutting implications. Unlike this, the telematic system is used at the individual insurer level, optional (of course on the basis of a legal framework), without automatically assuming an aggregate image of the market but only at the level of the insurer's portfolio (or even just part of it). For this reason, state support (of course on the basis of an accommodating legal framework) is even more helpful if the insurer opts for the use and promotion of the telematics system, argued by the potential company-wide potential benefits (mentioned above).

Insurance telematics relies heavily on the accuracy of GPS data received from the telematics device. It should be borne in mind that telematic information may be influenced by environmental conditions, such as atmospheric effects, dark skies. This may lead to a risk of income reduction for the insurance company or even loss to the telematics insurance customer.

Therefore, telematic information needs to be contextualized through advanced GPS data algorithms and mapping. Choosing the right data processing solution in insurance telematics is therefore of major importance to the insurance company. In this way, environmental deviations that influence the accuracy of GPS data can be eliminated, significantly increasing the overall reliability of information.

3. Estimation of the financial impact of telematics insurance in Romania

We tried a scenario approach with several parameters built as a combination of the most relevant ones listed in the previous section:

- S1 - pessimistic with historical rates of variation of the parameters that we consider to impact on telematics insurance;
- S2 - moderate with encouraging rates of variation of parameters with impact on telematics;
- S3 - optimistic with European rates of parameter variation with impact on telematics.

Table no. 2. Assumptions of simulation of the financial impact of telematics insurance

Assumptions values (% unless otherwise specified)	Scenarios at the aggregate market level		
	S1 - pessimistic	S2 - moderate	S3 - optimistic
1. Reducing the frequency of damage to the RCA* and CASCO** telematics vs. the standard one	5.0%	15.0%	30.0%
2. The share of telematics portfolio in total RCA* and CASCO**	5.0%	10.0%	15.0%
3. Average price reduction due to telematics, in addition to the Bonus-Malus class	10.0%	15.0%	25.0%
4. Growth of the market by increasing the coverage (annual average, additional to the natural rate)	1.0%	3.0%	5.0%
5. Additional cost per policy (RON)	600	400	300

* Civil liability for the use of land vehicles
** Land vehicles, excluding railway rolling stock

Source: personal estimates based on Romanian Financial Supervisory Authority (ASF) and European statistics (BIBA, Deloitte, etc.)

The simulation was performed under a set of concrete assumptions (quantifiable) selected for impact calculations, respectively,

- Reducing the frequency of damage to the RCA and CASCO telematics vs. the standard may vary between 5% (S1) and may reach 30% (S3) as it is estimated that telematics will increase at European level.
- The sample to which this frequency reduction applies in the total CASCO and RCA insurance portfolio we estimated it with a weight of 5% (S1) and 15% (S3),

while a European share of 17 %. We also considered that the telematics portfolio has a similar distribution to the aggregate policy portfolio at market / insurer level.

- The average price reduction for telematics insurance was estimated at between 10% (S1) and 25% (S3). At the European level, it was estimated at 25.5%
- The natural growth rate of the number of RCA and CASCO contracts in Romania (taking into account the impact of telematics) is currently 1.5% on average per year, which has allowed us to use additional growth rates in the simulation 1% (S1) and 5% (S3). We started from the 5-year average increase in the number of insured vehicles (translated in similar growth and gross written prices, gross paid indemnities etc.), in addition to the natural growth of the market generated by other factors.
- The average extra cost of using the telematics system (Device + Infrastructure for Taking, Processing, Analyzing, and Using Information on Devices) has been downgraded from 600 RON / per policy (S1) to 300 RON / per policy.

Other hypotheses		
Natural growth of the market	1.5%	contracts
	4.0%	price

- The growth rate of the insurance price is in Romania of 3% on average per year (as a result of general inflation and especially of claims inflation = change in the expected cost of receivables from an insurance policy compared to a similar previous policy). In simulation, we used an average annual growth rate of 4%.
- The telematics impact estimation horizon is one year and we have as a basis for comparison the current values of RCA and CASCO insurance (number of contracts, gross written prices = PBS, gross paid indemnities = IBP etc.). In a future research, we will extend the 5-year estimate horizon.

We believe that the most relevant result is the one in the following chart, along with the estimated values for the three scenarios for the first year of telematics insurance development. The evolution of the number of contracts, PBS and IBP, on scenarios versus baseline (estimation of natural market evolution in the absence of telematics) is presented:

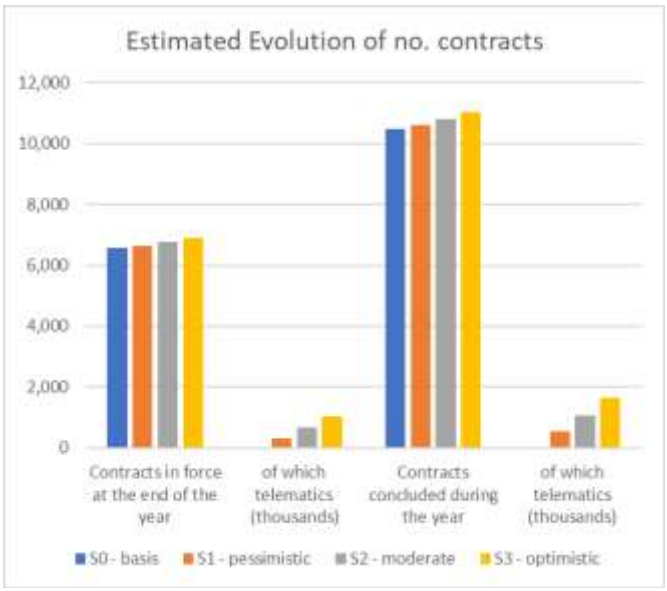

Chart no. 4. Scenarios on the number of telematics contracts

Source: Personal estimates based on ASF and European statistics (BIBA, Deloitte, etc.)

Table no. 3. The simulation results in the three scenarios

(pessimistic, moderate and optimistic)

Error! Not a valid link. *Source:* Personal estimates based on ASF and European statistics (BIBA, Deloitte, etc.)

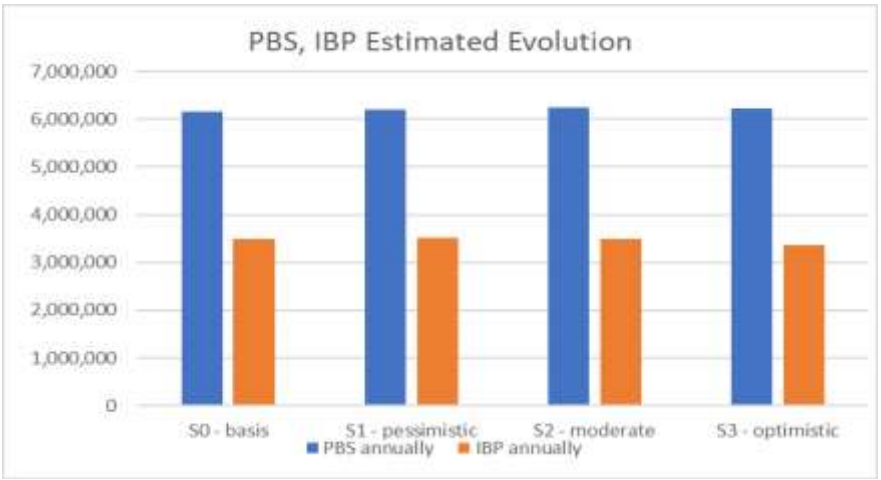

Chart no. 5. Scenarios on the evolution of PBS and IBP results by promoting telematics insurance

Source: Personal estimates based on ASF and European statistics (BIBA, Deloitte, etc.)

This highlights the favorable, negatively correlated dynamics of PBS and IBP.

compared with S0 - based		
S1 - pessimistic	**S2 - moderate**	**S3 - optimistic**
0.8%	**1.5%**	**1.1%**
0.6%	**-0.1%**	**-3.5%**

Source: Personal estimates based on ASF and European statistics (BIBA, Deloitte, etc.)

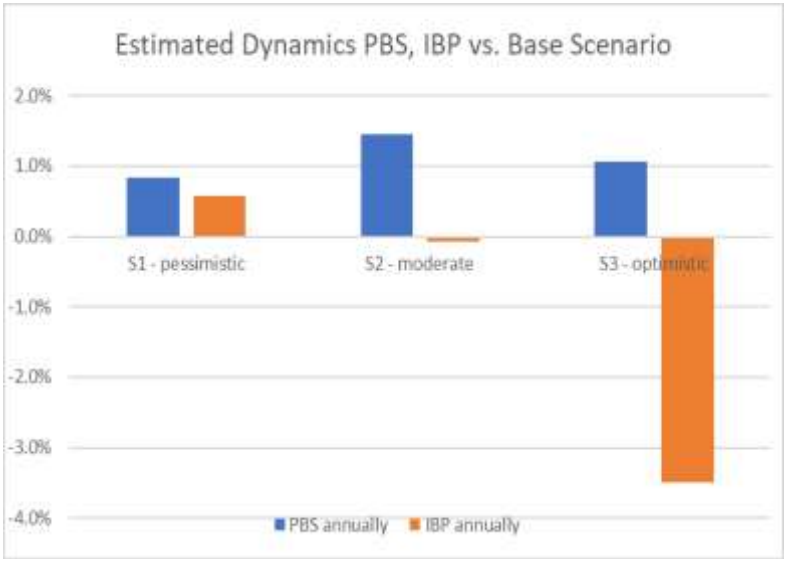

Chart no. 6 PBS and IBP variation rates resulting from the promotion of telematics insurance

Source: Personal estimates based on ASF and European statistics (BIBA, Deloitte, etc.)

Thus, according to the assumptions used, the results indicate a slightly positive impact of telematics on PBS, which may increase more rapidly than the baseline scenario (which may indicate an increase in insurance coverage), despite the insurance prices more reduced for drivers who support the implementation of the new monitoring technology.

The results also indicate that this estimated increase in PBS due to telematics also has a qualitative component, accompanied by a less accelerated dynamics of IBP (in the first scenario, more pessimistic), or even negative (in the case of 2-moderate scenario and 3-optimist), explained by the assumptions made regarding the reduction of the frequency of

damage to the telematics portfolio (calibrated taking into account cautiously the results documented in other markets).

4. Estimation of the socio-economic impact of telematics insurance – Moderate Scenario

Estimating the socio-economic benefits started from the simulated results in the 2-moderate scenario that I considered the most plausible (number of telematic contracts, as well as PBS and IBP, Table no.4):

Table no. 4. Simulate the number of telematics insurance contracts
Error! Not a valid link. *Source:* Personal estimates based on ASF and European statistics (BIBA, Deloitte, etc.)

Error! Not a valid link. * Land vehicles, excluding railway rolling stock
** Civil liability for the use of land vehicles

Source: Personal estimates based on ASF and European statistics (BIBA, Deloitte, etc.)

For this estimate, we have taken into account a new set of hypotheses based on European mileage statistics, resulting in fuel savings, reduction in the number of accidents and, implicitly, the number of injuries and compensation costs (Table 5.)

Table no. 5. Hypotheses of simulating the socio-economic impact of telematics insurance

1. Edlin (2003)	It is expected that the annual mileage of a vehicle will decrease by about 10% after switching to mileage insurance schemes.
2. Parry (2005)	Get similar results and calculate a mileage reduction of 9.1%.
3. BIBA (2018)	Decrease by approximately 10% of annual mileage
4. BIBA (2018)	It estimates a 40% reduction in accident risk
5. ERSO	Per accident, a cost of 136,000 euros for serious harm was estimated in 2010, 10,400 euros for minor injuries and 1,048,000 euros for death
6. BIBA (2018)	Claims are reduced by 30%
7. www.amodo.eu (2014)	Potential fuel savings can reach about 10% / year
8. Daedalus Millward Brown (2014)	Romanians travel by car on average 14,700 km per year (12,800 km / women, of which 65% went to the city, 15,300 km, men, 57% of which in the city)
	An average car consumes annually 1,245 liters (+/- 2%), for which it pays at the current price / liter of about 8,000 RON

9. Groupama	Those who have opted for the self-control clause, half are individuals, the rest being generally micro-enterprises with a small number of employees.
	The Self-Control clause may be attached to a CASCO policy when the customer chooses the payment in 4 installments and the total price is greater than or equal to 800 euro/year. Acquisition of this clause immediately gives a 20% discount at the first CASCO rate.
10. asigurariblog.ro	New car sales are supported, by about 80%, by legal persons. For their part, firms generally prefer leasing, and this method of financing cannot be done without insurance. Hence the potential for CASCO insurers in 2017.

At a total of 1,081 thousand telematics insurance contracts, our estimates lead to the improvement of the driving score for 757 thousand drivers, to reductions of 1,588.7 thousand kilometers traveled and potential fuel savings of RON 723,573 thousand, with obvious implications both economical and environmentally friendly. Also, under the same assumptions, it was estimated that the number of road accidents, but also the number of seriously injured persons and deceased persons (Table 6 and No 7):

Table no. 6. Simulation of socio-economic benefits of telematics insurance

Auto Insurance Classes	Improvement of the driving score, thousands of drivers
A3 - CASCO*	60
A10 - RCA**	696
Total	**757**
Hypotheses	**70%**

Reduction of no. km/year/car	Potential fuel savings (thousand RON/year)	Reduction of thousands of road accidents	Reducing number of thousands of fatalities	Reducing number of thousands of seriously injured persons	Reducing the number of thousands of deceased people
-127,010	57,846	-35	-8	-8	-2
-1,461,720	665,728	-398	-95	-90	-21
-1,588,730	**723,573**	**-432**	**-103**	**-98**	**-23**
10%	**10%**	**36187**	**8642**	**8172**	**1951**

Source: Personal estimates based on ASF and European statistics (BIBA, Deloitte, etc.)

Table no. 7. Simulation of social benefits of telematics insurance

Auto Insurance Classes	Reduction of the cost of compensation for minor injuries (mil €)	Reducing the cost of compensation for serious injuries (mil €)	Reduction of the cost of compensation for deaths (mil € /
A3 - CASCO*	-36	-1061	-1953
A10 - RCA**	-412	-12216	-22474
Total	**-448**	**-13,277**	**-24,426**
Hypotheses	**10.4**	**136**	**1,048**

Source: Personal estimates based on ASF and European statistics (BIBA, Deloitte, etc.)

Against the backdrop of these possible financial and socio-economic benefits, our personal opinion leads to encouraging policyholders and, above all, insurers to adopt and develop telematics assurance as a policy of differentiation from previous policies and as an input to economic, ecological, national and European.

Conclusions

On the whole, our results show a favorable impact of telematics, given the hypotheses used. Some impact indicators are not significant, but account should also be taken of the short horizon used for the forecast (first year after application). In fact, for all cases considered, the impact can be very different, being also influenced by factors that are difficult to include in the model: for example, market peculiarities, behavioral characteristics of drivers, road quality, communication policies and incentives for adopting new technology.

It is known that, in particular, the social benefits of investment projects (at least as important as those of a financial nature at the level of entities or the market), as we have also attempted to take into account in the last part of the simulations, are the most difficult to quantify. For all these reasons, our approach is only a first step in this research direction and estimates with a higher degree of accuracy could result from pilot projects of insurers, similar to those quoted in the above sections.

References

[1] Deloitte's Center for Financial Services din New York (Deloitte University Press, 2014) available online at https://www2.deloitte.com/content/dam/insights/us/articles/telematics-in-auto-insurance/DUP-695_Telematics-in-the-Insurance-Industry_vFINAL.pdf

[2] Friedman S., and Canaan M., (2014), Overcoming speed bumps on the road to telematics, available online at https://www.amodo.eu/wp-content/uploads/2014/01/interview.eng_.pdf)

[3] Ippisch T., (2010), Telematics Data in Motor Insurance: *Creating Value by Understanding the Impact of Accidents on Vehicle Use*, University of St. Gallen, Graduate School of Business Administration, Economics, Law and Social Sciences (HSG) available online at https://www1.unisg.ch/www/edis.nsf/SysLkpByIdentifier/3829/$FILE/dis3829.pdf

[4] Husnjak, S., Peraković, D., Forenbacher, I., Mumdziev, M., (2015), *Telematics System in Usage Based Motor Insurance*, ELSEVIER, Procedia Engineering 100 (2015) 816 – 825, available online at https://www.sciencedirect.com/science/article/pii/0308596181900392

[5] Ptolemus Consulting Group, *Usage-Based Insurance (Global Study)*, Free Abstract, 2013.

[6] Reddy, A. S., 2012, *The New Auto Insurance Ecosystem: Telematics, Mobility and the Connected Car*, Cognizant, Accessed October 2014,

[7] S., Tong, L., Lloyd, L., Durrell, K., McRae-McKee, P., Husband, E., Delmonte, I., Parry, S., Buttress (2015), *Provision of telematics research*, Transport Research Laboratory, 2015, available online at https://pdfs.semanticscholar.org/a75c/095196101189f488b3df8f40cbe4d4bf75a5.pdf

[8] Romanian Financial Supervisory Authority (ASF) and European statistics (BIBA, Deloitte etc.)

[9] https://pdfs.semanticscholar.org/a75c/095196101189f488b3df8f40cbe4d4bf75a5.pdf

[10] https://www.aviva.co.uk/car-insurance/drive/

[11] https://www.biba.org.uk/press-releases/biba-research-reveals-telematics-almost-reach-one-million-mark/

[12] https://www.express.co.uk/life-style/cars/864041/Black-box-car-insurance-telematics-will-it-track-my-driving-is-it-cheaper

[13] https://www.raconteur.net/future-of-insurance-2017

[14] https://www.trakm8.com/articles/how-will-telematics-change-car-insurance-in-the-next-10-years