

INSURANCE TELEMATICS

**GLOBAL
STUDY**

**EXTENDED
FREE
ABSTRACT**



**From experimentation
to mass implementation**

ABOUT PTOLEMUS CONSULTING GROUP



PTOLEMUS is the **first strategy consulting firm entirely focused on telematics and location-based services**.

We help our clients apply strategic analysis to this fast-moving ecosystem, across all its industries (consumer electronics, insurance, automotive, mobile telecoms, etc.) and on an international basis.

PTOLEMUS, founded by Frederic Bruneteau, operates across Europe and has Partners in Brussels, Paris, Munich, Milan and Boston.

It has also built a network of telematics specialists across the world to be able to analyse and address global mobility issues.

PTOLEMUS has performed multiple consulting and research assignments on insurance telematics.

Our consulting services

Strategy definition

New market entry, business plan development, board coaching and support

Evaluation of investment

Strategic due diligence, market assessment, feasibility studies

Procurement strategy

Specification of requirements, launch of tenders, supplier negotiation & selection

Innovation management

Product & services development, roadmap definition, project management & launch, patent strategy

Business development

Partnership strategies, response to RFPs, lobbying

Implementation

Project & programme management, risk analysis & mitigation strategy

Our fields of expertise

Mobile content and social networking

Application stores, crowd-sourcing, etc.

Navigation & location-based services

Maps, traffic, fuel prices, speed cameras, weather, parking, etc.

Usage-based charging

PAYD / PHYD insurance, Road User Charging, PAYD car leasing & rental

Telematics & Intelligent Transport Systems

Connected car, tracking, fleet management, eCall, bCall, Stolen Vehicle Recovery, Car As A Service, connected train, etc.

Positioning / Location enablement

M2M & connectivity

THE AUTHORS OF THIS STUDY

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Mr. Bruneteau founded the PTOLEMUS Consulting Group on the conviction that pervasive location and connectivity would revolutionize the business of mobility. He has 17 years of experience in 12 countries with companies such as TomTom, SFR Vodafone, Arthur D. Little and BNP Paribas.

Mr. Bruneteau, who led the writing of this report, has performed several insurance telematics assignments, notably the due diligence of Octo Telematics. He also chaired the latest Insurance Telematics conference in London and Fleet & Asset Management Conference in Amsterdam.

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Sergio Tusa has gained over 20 years of experience in the telematics, location-based services and automotive domains.

Before PTOLEMUS, Sergio held management responsibilities with Magneti Marelli (Fiat Group), Cobra Automotive, Nokia, Tele Atlas and Philips. He also created and led Geonext, the first LBS and fleet management service provider in Italy.

He has led several insurance telematics and stolen vehicle recovery projects, for customers such as Ferrari, Fiat and Renault/Volvo Trucks.

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Olivier Bourhis has accumulated over 20 years of experience across the globe in strategy, business development, marketing and sales.

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He also chaired the latest Telematics Munich conference.

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OUR SINCERE THANKS

The richness of a study is largely based on the willingness of the “outside world” to co-operate and give its time and knowledge for the benefit of the wider society and economy.

We would like to thank

- All persons who kindly accepted to respond to our questions. A list of the companies we interviewed is available on page 20;
- Our families for their patience and understanding;
- All companies that responded to our survey of technology solutions.

INTRODUCTION

Since the first Pay As You Drive experiment by Progressive Insurance in 1998, almost everything has changed in telematics. It has transformed into a fast growing model that all insurers worldwide must revisit.

How important is the emergence of telematics for the global motor insurance sector however?

In 2010, the European motor insurance market - the largest in the world - was worth an estimated **€124 billion**. Insurers paid out almost €100 billion in claims to car owners. By comparison, we estimate that its **telematics-enabled services market at €5 billion, or 4% of the motor insurance market**.

This highlights the contrast between a major but maturing sector of the economy and a burgeoning pocket of growth. This also clearly indicates that any take-up of telematics by insurers will have a major impact for telematics service providers and device makers.

Does the reverse hold true?

In this study, we respond by analysing whether telematics will change the motor insurance market and how profoundly it will impact it.

We assess the present state of insurance telematics in Europe and the challenges ahead. We also identify and propose solutions to overcome them. Last not but not least, we analyse the continuing evolution of the industry value chain and attempt to detect the winners and losers.

This report will provide **insights to insurers' management teams**, notably CEOs, CMOs, CIOs, Business Unit Directors and Directors in charge of risk management and claims management.

It will also interest assistance providers, automotive manufacturers, their tier-1 and tier-2 suppliers, telematics service providers (TSPs) and technology providers (TTPs), regulators and governments.

Our investigation also brings **responses** to the following questions:

- Is telematics necessary for insurers and what are its driving factors?
- What challenges remain and what actions must be taken by each party to face them?
- How can customer acceptance for these services be increased?
- How do the various telematic solutions available compare against each other?
- Which are the best suppliers for each type of solution and commercial target?
- How will the industry value chain evolve based on the actions of the principal agents?
- What is the business case for the mass introduction of PAYD/PHYD insurance?
- What is the expected market size for these products & services in the next 5 years?

To conduct what is the most comprehensive study ever written on insurance telematics, we have relied on

- Interviews with over 80 executives from all sides of the industry, from Allianz to Zurich,
- More than 2 years of desk research and primary research, notably a survey of available technology solutions,
- Building a simplified motor insurer's business model, with specific inputs for France, Germany, Italy and the UK,
- Building a 10-year forecast model of the European market so as to combine strategic and technology analysis with hard figures, and obviously,
- A review of applicable patents worldwide,
- Our existing experience in the field of insurance telematics.

This report will provide a **“one-stop-shop” analysis** of this complex business issue, across Europe and North America. The potential of other regions will also be assessed.

In our view, it is an **important read** for all insurers because

- The motor insurance market is facing structural losses due to heavy price competition and rising claim costs,
- Telematics-based insurance offerings will provide to insurers who launch them a competitive advantage, notably a better pricing of risk,
- The ITS directive and fast decreasing technology costs are paving the way for a mass-market launch,
- PTOLEMUS' analysis will help insurers learn from pioneers, overcome challenges, better understand the case for value-added services and make informed decisions,
- An examination of the present business models and value chain is needed to prepare the market for the next phase of growth,
- It compares the leading telematic solutions available to insurers.

It has been a pleasure for us to conduct this study. We hope that you will enjoy reading it. If you identify inaccurate information in our study, please let us know. We will correct it immediately. Your feedback will always be well received. If your company plays a role in this business and has not been mentioned in our report, please let us know so that we can update it in the coming months. Please send your **comments** to insurance@ptolemus.com.

Thank you very much.

Sincerely,

Frederic Bruneteau
Managing Director

EXECUTIVE SUMMARY

What will you need to remember?

We have tried the impossible and summarised the study in the following 12 axioms.

1. **After Italy, telematics-enabled insurance will gradually become mainstream in the US, the UK and all developed countries.** Overall, telematics-enabled policies will generate more than €50 billion in premiums by the end of the decade.
2. In most countries, **first successful models will be launched by direct insurance start-ups or "natural born-innovators"** of the insurance world. As in the US, leading insurers will increasingly have no other option than following these.
3. **In most markets, telematics will attract and retain the lowest risk drivers of each segment, offering them discounts of up to 50% on their premiums.** Traditional offerings will increasingly be purchased by high-risk customers.
4. Stimulated by the gender ruling and upcoming regulation, **telematics will revolutionise the way insurers assess drivers' risks.** It will also force insurers to **reinvent their business**, notably by building a regular relationship with their customers, thereby reducing churn.
5. As seen in the US, **governments and regulators will gradually turn positive towards telematics**, notably to reduce the emissions of CO₂ and other car pollutants.
6. **Professionally installed solutions will remain the leading technology to provide PAYD / PHYD solutions in Europe while OBD dongles will continue to dominate in North America.**
7. **This will drive a market for numerous value added services**, notably bCall, eCall, stolen vehicle recovery, remote diagnostics, fuel management, etc.
8. EOBD solutions will emerge in Europe in 2013, notably in low premium markets. TSPs and insurers that ignore these will be at risk.
9. **The smartphone will become the next OBU of the insurance industry** - We expect it to emerge as a valid data probe within 2-3 years.
10. Numerous **automotive OEMs will seize the eCall opportunity to make motor insurance a major part of their connected services business.**
11. In the commercial segment, insurance telematics will be sold as **a component of larger fleet management solutions** by insurers but also TSPs, leasing companies, integrators, OEMs and other players.
12. **Privacy will need to be actively managed and transparent** by insurers. Otherwise, a public backlash against telematics could happen.

FOOD FOR THOUGHT

"We believe Snapshot is a **game changer** – representing the **future of auto insurance** as our mobile and interconnected world gives us the opportunity to offer immediate and substantial savings to our customers."



Glenn Renwick
President & CEO, Progressive
May 2011

"Adopting UBI [usage-based insurance] sooner rather than later will not **only attract better drivers** willing to participate, but will also allow carriers to build and maintain a database on numerous variables that influence loss costs."

Moody's Investor Service
December 2011 **MOODY'S**

"Privacy is for old people"

Reid Hoffman
CEO, LinkedIn
January 2010



Steve Poizner
California Insurance
Commissioner
December 2010

"The voluntary pay-as-you-drive initiative is an innovative program that will allow insurers to offer plans based on more accurate mileage, so that people who choose to drive less will pay less for auto insurance"

"The combination of technology and a sustained programme of working with drivers ... can help save lives on the roads, reduce costs and improve the working environment for drivers."



Robert Gremli
Chief Risk Engineering Officer, Zurich
November 2010

"**Traditional car insurance relies on low mileage drivers subsidising high mileage drivers.** If you don't drive a lot, you pay for the accidents of your high mileage neighbours. PAYD is a difficult innovation for existing insurance companies to follow because of this subsidy system."



Roger Grobler
Chairman, Real Insurance
September 2010

UK insurer
October 2011

"I think in **5 years every major insurer will have a telematics offering in their portfolio.**

I think PAYD / PHYD will still be a relatively niche product and insurers will target particular segments like young drivers."

"Everybody has a plan until they get punched in the face"

Mike Tyson,
Professional boxer



"**We have completely removed paper** from the customer experience. Even the underwriting is done through electronic signature"



Michel Lungart
CEO, Amaguiz
December 2009

"Privacy is not just a right...it's an emotion"



Simon Davies
Privacy International
January 2010

"At Wunelli, we have both PAYD & PHVD & claims data (both fault & non-fault) for over 15 000 devices now. **The data is absolute gold.**

We can now calculate the probability of a future fault accident from only 1000 miles worth of data."



Paul Stacy
IT & Innovation Director, Wunelli
2011

"Our data shows that the vast majority of our customers are responding to our **'carrot' rather than 'stick' approach** and are improving their driving skills because they are rewarded for doing so. Our scheme is only in its infancy, but it is clear that if telematics was taken up on a larger scale it could be a major step forward in improving the safety on Britain's roads."

David Neave, Director of General Insurance
The Co-operative Insurance
November 2011



"Customers will only buy a product they are attracted to. One of the things the insurance industry continues to get wrong is that it designs products for itself and not the customer. **Forget the actuarial stuff, what you need to do is design a product that customers want**, that fits on price comparison sites, and that you can compare with a conventional product."

French insurer
February 2012

"This is clearly interesting but we will not be those that open and create the market"

"We consider our motor insurance as the must have accessory that customers don't want and hope never to use (...) No one knows better how to repair a Volkswagen group vehicle than the Volkswagen group approved paint and body shop network, therefore they are at the heart of our proposition. So when a customer does make a claim on our insurance we can guarantee that their vehicle will be returned to factory standards, **making our insurance the best accessory a customer will ever own or use.**"

Robert Cottrell
Head of Insurance
Volkswagen Financial Services (UK)

"PAYD saves money and is a more accurate and fairer method to price auto insurance (...) **PAYD pricing reduces inequities** by eliminating the subsidies low-mileage drivers currently pay for high-mileage drivers in the traditional pricing system."

Mike Brockman
CEO, Insure the box
April 2011



Joseph Ferreira, MIT Professor
Eric Minikel, IBI Group
November 2010

Andy Napoli
President, Consumer Markets Division
The Hartford
December 2011



"The data is compelling. **This capability has really redefined the way we think about pricing auto.** Insurers that don't use telematics to price auto coverage will eventually attract poor drivers who were turned down for coverage by the insurers that do"

Sources: Insurance Daily, Real Insurance, Moody's, World Economic Forum, California Department of Insurance, News Assurances

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LIST OF COMPANIES INTERVIEWED AND MENTIONED IN THIS REPORT

As part of our research, we have **held discussions with 83 organisations in 18 countries** including

- 29 insurance companies,
- 17 Telematics Service Providers (TSPs),
- 8 Telematics Technology Providers (TTPs),
- 6 automotive Original Equipment Manufacturers (OEMs) and tier-1 suppliers.

We would like to **thank these organisations** for their precious contribution to this report. They are listed hereafter and will benefit from an extended free extract of the report and a discount on the [Full Study](#).

We have also indicated the **280 companies** that are **mentioned** in this report.

Company name	Country	Sector	Discussion	Mentioned
AA	UK	Automobile club		✓
AAA Club Partners	USA	Automobile club		✓
Accutek Ind.	USA	ODM		✓
Achmea	Netherlands	General insurance	✓	✓
ACI	Italy	Automobile club		✓
ACTA	France	Roadside assistance provider		✓
Assercar	France	Repair centres		✓
ADAC	Germany	Automobile club		✓
Admiral Insurance	UK	General insurance		✓
Agero	USA	Automobile club / TSP		✓
Aioi Nissay Dowa Insurance	Japan	General insurance		✓
Airmax Group	UK	TSP	✓	✓
Aisin AW	Japan	Tier-1 supplier		✓
Alcatel-Lucent	France	Telecom equipment vendor		✓
ALD Automotive	France	Leasing company	✓	✓
Allianz	France	General insurance	✓	✓
Allianz	Germany	General insurance	✓	✓

Company name	Country	Sector	Discussion	Mentioned
Allianz	Italy	General insurance	✓	✓
Allianz	UK	General insurance		✓
Allstate Insurance	USA	General insurance		✓
Alo@Assurances	France	Consumer insurance		✓
Alpine	Japan	In-car audio equipment		✓
Altech Netstar	South Africa	TSP		✓
Altima Assurances	France	General insurance	✓	✓
Amadeus Capital Partners	UK	Private equity fund	✓	✓
Amaguiz (Groupama)	France	Consumer insurance	✓	✓
ANIA	Italy	Insurance trade association		✓
ANWB	Netherlands	Automobile club		✓
Aplicom	Finland	TSP/TTP	✓	✓
Apple	USA	Consumer electronics vendor		✓
ARM Holdings	UK	Processor design vendor		✓
Arval	France	Leasing company	✓	
ASFA	France	Insurance trade association		✓
Assicurazioni Navale	Italy	General insurance		✓
Assurland.com	France	Online comparison site		✓
Atmel	USA	Semi-conductors vendor		✓
Atos	France	IT integrator		✓
AutoDirect Insurance	UK	Consumer insurance		✓
Aviva (formerly Norwich Union)	UK	General insurance	✓	✓
Axa	Belgium	General insurance	✓	✓
Axa Assistance	France	Roadside assistance provider	✓	
Axa Matrix Risk Consultants	France	Commercial insurance	✓	✓
Barnes & Noble	USA	Book distribution chain		✓
B&Q	UK	Restaurant chain		✓
BDI (Bundes-beauftragte für den Datenschutz und die Informationsfreiheit)	Germany	Data protection authority		✓
Best Buy	USA	Electronics retail chain		✓
Bird & Bird	France	Law firm	✓	
Blockbuster	USA	Video rental chain		✓
BluO Fund	Luxembourg	Private equity fund	✓	✓
BMW	Germany	Automotive OEM		✓
Bouygues Telecom	France	Mobile operator	✓	✓
British Airways	South Africa	Airlines		✓
BT Software & Research	USA	Telecommunications operator		✓

Company name	Country	Sector	Discussion	Mentioned
Budget Insurance	UK	Personal line insurance		✓
Bull	France	IT integrator		✓
Cap Gemini	France	IT integrator		✓
CEA	Belgium	Insurance trade association		✓
CEN (European Committee for Standardisation)	Belgium	Standardisation organisation		✓
CertEurope	France	Trusted third party services		✓
Cesar Satellite	Russia	TSP	✓	✓
Cinterion	Germany	Connectivity module provider		✓
CLAL Insurance	Israel	General insurance		✓
Clarion	Japan	In-car audio equipment		✓
CNIL (Commission Nationale de l'Information et des Libertés)	France	Data protection authority	✓	✓
Cobra Automotive	Italy	TSP	✓	✓
Cobra Electronic Solutions	Italy	TTP	✓	✓
Compagnie Générale d'Automatisme (CGA HBS)	France	Engineering firm		✓
Comparethemarket.com	UK	Online comparison site		✓
Confused.com	UK	Online comparison site		✓
Continental	France	Tier-1 supplier	✓	
Corona Direct	Belgium	General insurance	✓	✓
COVEA Group	France	General insurance	✓	✓
Coverbox	UK	Consumer insurance	✓	✓
Crédit Mutuel Arkea	France	Consumer insurance	✓	
Cybit Masternaut	UK	TSP	✓	✓
Daimler Fleetboard	Germany	TSP		✓
Daimler Insurance Services	Germany	OEM	✓	✓
Danlaw	USA	TTP	✓	✓
Data Tec Co Ltd	Japan	ODM		✓
Davis Instruments	USA	TTP		✓
DBV Winterthur	Germany	General insurance		✓
Delphi	USA	Tier-1 supplier		✓
Denso	Germany	Tier-1 supplier	✓	✓
Department of Transportation	USA	Government		✓
Diamonds	UK	Insurance broker		✓
Direct Line Germany	Germany	Consumer insurance		✓
Discovery Insure	South Africa	Consumer insurance		✓
Diva	UK	Insurance broker		✓
Dixon's	UK	Consumer electronics retail chain		✓

Company name	Country	Sector	Discussion	Mentioned
Drive Service	Italy	Repair & maintenance services	✓	✓
DriveCam	USA	TTP		✓
Elmic Systems	USA	Embedded software		✓
Equity Red Star	UK	General insurance		✓
ERTICO - ITS Europe	Belgium	Trade association	✓	
Europcar	South Africa	Vehicle rental		✓
European Commission	Belgium	Government	✓	✓
European Court of Justice	Belgium	Government		✓
Exigen	USA	Insurance software provider		✓
F&I	USA	Magazine		✓
Farmers Insurance	USA	General insurance		✓
Fiat	Italy	Automotive OEM		✓
Financial Times	UK	Newspaper		✓
Fleet Logistics	UK	TSP		✓
Fleetmatics / Sagequest	USA	TSP		✓
FMSCA (Federal Motor Carrier Safety Administration)	USA	Government		✓
Focus	Germany	Magazine		✓
Foley & Lardner	USA	Law firm		✓
Ford	USA	Automotive OEM		✓
Fujitsu Ten	Japan	Automotive supplier		✓
Garmin	USA	Electronics		✓
GE Equipment Services	USA	Fleet management company		✓
General Motors	USA	Automotive OEM		✓
Generali France	France	General insurance	✓	✓
Generali Group	Italy	General insurance	✓	✓
Generali Group	Italy	General insurance	✓	✓
Genertel (Generali Group)	Italy	Consumer insurance		✓
Geotab	USA	TSP		✓
GirIMotor	UK	Insurance broker		✓
GMAC Insurance	USA	Consumer insurance		✓
Good Technology	USA	Mobile handset vendor		✓
Google	USA	Search engine		✓
Greenroad Technologies	USA	TSP		✓
Groupama	UK	General insurance		✓
Grupo Nacional Provincial	Mexico	General insurance		✓
Harman	USA	Tier-1 supplier		✓
High Point Auto Insurance	USA	Personal line insurance		✓

Company name	Country	Sector	Discussion	Mentioned
Hitachi	Japan	Conglomerate		✓
Hollard Insurance	South Africa	General insurance		✓
Honda	Japan	Automotive OEM		✓
Hughes Telematics	USA	TSP	✓	✓
HUK-Coburg	Germany	General insurance		✓
Hyundai	South Korea	Automotive OEM		✓
Hyundai Mobis	South Korea	Tier-1 supplier		✓
IBI Group	USA	Studies		✓
IBM	USA	IT integrator		✓
ID Macif	France	Consumer insurance		✓
IDM Trucking	USA	Transportation		✓
iKube	UK	Consumer insurance		✓
IMA	France	Roadside assistance provider		✓
IMS	Canada	TSP	✓	✓
Industrial Alliance, Insurance and Financial Services Inc.	Canada	General insurance		✓
Information Commissioner's Office	UK	Data protection authority		✓
ING	Netherlands	Consumer insurance	✓	
Innosurance	Australia	Commercial insurance		✓
Insure the box	UK	Consumer insurance		✓
Interactive Driving Systems	USA	Risk management solutions		✓
International Road Union	Switzerland	Trade association		✓
Intesa San Paolo Assicuri	Italy	General insurance		✓
Iron Mountain	UK	Storage services		✓
ISACA (Information Systems Audit & Control Association)	Worldwide	Trade association		✓
Iveco	Italy	Automotive OEM		✓
IVOX	USA	Risk management solutions		✓
Ixonos	Finland	Software developer		✓
Jambit	Germany	IT integrator		✓
KDDI	Japan	Mobile operator		✓
Kia Motors	South Korea	Automotive OEM		✓
Kuantic	France	TTP		✓
Ladybird	UK	Insurance broker		✓
LG Electronics	South Korea	Consumer electronics vendor		✓
Liberty Mutual	USA	General insurance		✓
LinkedIn	USA	Social networking		✓
Lysanda	UK	TTP	✓	✓

Company name	Country	Sector	Discussion	Mentioned
MAAF Assurances	France	General insurance		✓
MACIF Assurances	France	General insurance	✓	✓
Magneti Marelli	France	Tier-1 supplier	✓	✓
MAIF Assurances	France	General insurance	✓	✓
Mapfre	Spain	General insurance	✓	✓
Markerstudy Group	UK	Consumer insurance		✓
Marks & Spencer	UK	Retail		✓
Masternaut	France	TSP	✓	✓
MATMUT Assurances	France	General insurance		✓
Mercedes Benz	Germany	Automotive OEM		✓
Meta System	Italy	TTP		✓
Metaskil	UK	Software developer		✓
Michelin	France	Tyre manufacturer	✓	
MileMeter	USA	Consumer insurance		✓
Mitsubishi Electric	Japan	Conglomerate		✓
Mobile Devices	France	TTP	✓	✓
Mobileye	Israel	TTP		✓
Montezemolo & Partners	Italy	Private equity fund		✓
Moody's	USA	Rating agency		✓
MORE TH>N	UK	Consumer insurance		✓
Motaquote	UK	Consumer insurance		✓
Motorola Mobility	USA	Mobile phone vendor		✓
Nationwide Insurance	USA	General insurance		✓
Navteq	France	Map provider	✓	✓
ND a Islandi Ehf	Island	n.a.		✓
News of the World	UK	Newspaper		✓
NIS Glonass	Russia	Public-private partnership		✓
Nokia	Finland	Mobile phone vendor		✓
Norton Rose	UK	Law firm	✓	
Norwegian Biotronics	Norway	n.a.		✓
Novacom Europe	Netherlands	TSP		✓
NXP	Netherlands	Chipset vendor	✓	✓
ÖAMTC	Austria	Automobile club		✓
Octo Telematics	Italy	TSP	✓	✓
Oracle	USA	Enterprise resource planning software		✓
Orange	UK	Mobile operator		✓

Company name	Country	Sector	Discussion	Mentioned
Orange Business Services	France	Integrator / TSP	✓	✓
ÖSA (Öffentlichen Versicherungen Sachsen-Anhalt)	Germany	General insurance		✓
Panasonic	Japan	In-car electronics		✓
PHS Datashred	UK	Business services		✓
Pioneer	Japan	In-car electronics		✓
Polis Direct	Netherlands	Consumer insurance		✓
Privacy International	UK	Non-governmental organisation		✓
Progressive Insurance	USA	Consumer insurance		✓
PSA Peugeot Citroën	France	Automotive OEM	✓	✓
Punch Telematix	Belgium	TSP		✓
QNX	Canada	Embedded software		✓
Qualcomm Enterprise Services	Netherlands	TSP	✓	✓
Quality Planning	USA	Insurance services		✓
RAC	UK	Automobile club		✓
RACE	Spain	Automobile club		✓
RBS Insurance	UK	General insurance		✓
Real Insurance	Australia	Consumer insurance		✓
Reala Mutua	Italy	General insurance		✓
RealVNC	UK	Embedded software		✓
RelayRides	USA	Car sharing provider		✓
Renault	France	Automotive OEM		✓
Renault Trucks	France	Automotive OEM		✓
Renesas	USA	Semiconductors		✓
Robert Bosch	Germany	Tier-1 supplier		✓
Rosno (Allianz Group)	Russia	General insurance		✓
Royal & Sun Alliance	UK	General insurance		✓
Safeco	USA	General insurance		✓
SageQuest	USA	TSP		✓
Samsung	South Korea	Consumer electronics vendor		✓
SAP AG	Germany	Enterprise resource software	✓	✓
Sara	Italy	General insurance		✓
Scania	Sweden	Automotive OEM		✓
Scope Technologies	Singapore	TSP/TTP	✓	✓
Second Opinion Financial Systems	USA	Software developer		✓
Seesam	Latvia	General insurance		✓
Sensomatix	Israel	Data management	✓	✓

Company name	Country	Sector	Discussion	Mentioned
SFEREN	France	General insurance		✓
Sheila's Wheels	UK	Insurance broker		✓
Sierra Wireless	Canada	Connectivity module provider		✓
SiRF (CSR Group)	UK	Chipset vendor		✓
Skymeter	Canada	TTP	✓	✓
SmartDrive	USA	TTP		✓
Société Générale	France	Bank		✓
Solly Azar (Verspieren Group)	France	Insurance broker	✓	✓
Sony	Japan	Consumer electronics vendor		✓
Sony Ericsson	Japan	Mobile phone vendor		✓
Standard & Poor's	France	Rating agency	✓	✓
State Farm Insurance	USA	General insurance		✓
Stellar International	Ireland	n.a.		✓
Stok Nederland	Netherlands	TSP	✓	
T-Mobile	Germany	Mobile operator		✓
TCS	Switzerland	Automobile club		✓
Telefonica	Spain	Mobile operator		✓
Telenav	USA	Navigation / MRM provider		✓
Teletrac	USA	TSP		✓
Telit	Italy	Connectivity module provider	✓	✓
Telogis	USA	TSP	✓	✓
Test-Achats	Belgium	Consumer rights organisation		✓
Texa	Italy	TTP	✓	✓
Thatcham	UK	Certification company		✓
The Carphone Warehouse	UK	Telecommunications retail		✓
The Co-operative Insurance	UK	General insurance	✓	✓
The Hartford	USA	General insurance		✓
The Sun	UK	Newspaper		✓
The Wall Street Journal	USA	Newspaper		✓
Tiger Wheel & Tyre	South Africa	Tyre fitment centre		✓
Tokio Marine Risk Consulting	Japan	Risk consulting firm		✓
Toll Collect	Germany	Road charging provider		✓
TomTom Business Solutions	Netherlands	TSP	✓	✓
Touring	Belgium	Automobile club	✓	✓
Toyota	Japan	Automotive OEM	✓	✓
Toys'R Us	South Africa	Games stores		✓
Tracker	South Africa	TSP	✓	✓
Tracker Network (UK)	UK	TSP		✓

Company name	Country	Sector	Discussion	Mentioned
Trafficmaster	UK	TSP		✓
Transics	Belgium	TSP		✓
Travelers Insurance	USA	General insurance		✓
Trimble MRM	USA	TSP	✓	✓
uBlox	Switzerland	Chipset vendor		✓
UGF Group	Italy	General insurance		✓
Unipol	Italy	General insurance		✓
Uniqia	Austria	General insurance	✓	✓
US Bank	USA	Bank		✓
Valeo	France	Tier-1 supplier		✓
Vanguard plc	UK	Mobile phone retailer		✓
Vector Capital	USA	Private equity firm		✓
Verisk Insurance Solutions	USA	Software developer		✓
Vivium (P&V Group)	Belgium	General insurance	✓	✓
Vodafone	UK	Mobile operator	✓	✓
Volkswagen	Germany	Automotive OEM		✓
Volkswagen Financial Services (UK)	UK	Financial services		✓
Volvo Cars	Sweden	Automotive OEM		✓
Volvo Trucks	Sweden	Automotive OEM		✓
Wireless Car	Sweden	TSP	✓	
Wunelli	UK	TSP	✓	✓
Xirgo Technologies	USA	TTP	✓	✓
Young Marmalade	UK	Consumer insurance	✓	✓
Zurich	Italy	Consumer insurance	✓	
Zurich	UK	Consumer insurance	✓	
Zurich Financial Services	France	Commercial insurance	✓	✓
Zurich Fleet Intelligence	UK	Commercial insurance	✓	✓

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Disclosure

The recommendations and opinions expressed in this study reflect PTOLEMUS' independent and objective views. However, PTOLEMUS cannot provide any guarantee as to the accuracy of the information provided or the reliability of its analyses and forecasts.

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I. OVERVIEW OF THE PRESENT ENVIRONMENT

A. Overview of insurance telematics

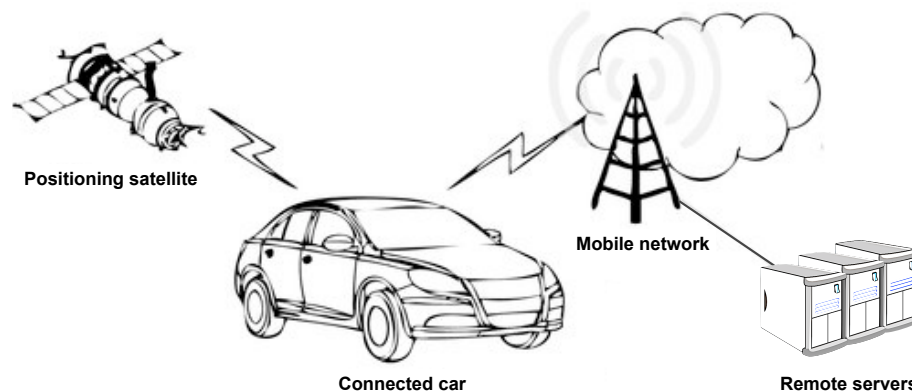
1. What is insurance telematics?

Did you ever wonder why your motor insurer asks for your age, gender, address and claims history while calculating your premium?

Wouldn't it be more appropriate to see how, when, where and how much you are driving instead?

That is exactly what the proponents of telematics-based insurance are advocating. Telematics is the integrated use of telecommunication and information technology for vehicles. It is mostly widely used for providing services such as real-time navigation, roadside assistance, vehicle tracking and more recently - motor insurance.

Figure 1: Telematics: the car connects to the Internet



Source: PTOLEMUS, Embedded Computing Design

Insurance telematics is thus the use of telematics by motor insurers with an objective to **adjust the premium on the actual risk**.

In this report, we shall study telematics-enabled usage-based insurance (UBI) programs such as *Pay-As-You-Drive* (PAYD) and *Pay-How-You-Drive* (PHYD) policies. We will also evaluate ancillary value added services that are often provided by insurers such as stolen vehicle recovery and remote vehicle diagnostics among others.

It is important to note that while the car's **geo-location** adds precious data for the premium to be calculated, **insurers do not need to record it and even less to store it for a telematics insurance plan**. For example, numerous PHYD policies are based on driving behaviours, primarily driven by acceleration and braking patterns.

2. UBI vs. insurance telematics

Although Usage-based Insurance (UBI) and Insurance Telematics are often used one for the other, they actually are different concepts.

In fact, UBI is a wider notion that includes all policies that make the premium depend on the level of usage of the driver. As we will see in this paragraph, not all these policies require a telematic unit in the car.

Usage-based motor insurance policies first sprung up in the United States of America in August 2004 with the launch of **Progressive Insurance's** *TripSense* product. Launched in Minnesota, it enabled participants to save up to 25% on their renewal policies depending on how much and when they drove.

Figure 2: Progressive's *TripSense* plan and the TripSensor data logger



Source: Progressive Insurance

It was a revolutionary concept in its own right and opened many new opportunities to insurers.

It became the first ever motor insurance offering which used a consumer's actual behaviour data to price his risk rather than the mutualisation system that has been the mainstay of motor insurers for centuries.

Progressive met with equal praise and skepticism. Numerous press articles highlighted the risks of a "Big Brother approach". While some appreciated its potential to price insurance premiums more fairly, reduce driving and promote safer driving habits, others were concerned by the cost of the technology, the potential invasion of consumer privacy and the difficulties in creating a sustainable business model.

Two main categories of usage-based insurance policies emerged with remarkably distinct characteristics and business models: self-reporting based policies and telematics-based policies.

a. Self-reporting based policies

These policies calculate the premium's amount primarily on the total distance driven **as reported by customers** through the odometer of the car. Customers are required to communicate the odometer reading at specific intervals (e.g. at the annual renewal of the policy) and sometimes the insurer performs random checks on customers to ensure that the reported reading is accurate.

For insurers, these policies are easy to implement and to integrate with existing operations. In numerous countries, a few insurers have implemented these.

For example, as early as in 2004, **Polis Direct** introduced in the Netherlands a 'kilometre policy' whereby the customer's premium could increase or decrease by up to 50% based on his actual mileage against his forecast mileage.

In the US, **MileMeter**, a Texas-based start-up, introduced in 2008 a pay-per-mile policy that claimed to save customers up to 75% on their motor insurance premium. They require customers to provide a **digital photograph** of their odometer at the time of renewal of policy, which happens every 6 months.

Customers have to prepay for 6,000 miles at a time or 6 months at a time. The rate per mile is calculated by the company based on the age, location, car model and past history of the driver.

A similar service was also launched in September 2008 by **Real Insurance** in Australia called *Pay as you drive*. It relies on customers to faithfully report their odometer readings at the time of purchase, renewal or filing a claim. They include a fixed base amount in their quote with a variable rate per mile.

Figure 3: Real Insurance were one of the first to launch verified mileage programmes

The screenshot shows the 'realpayasyoudrive' website. At the top, there's a navigation bar with links: Quote, How PAYD works, Why PAYD is great, Tools, About PAYD, Work for PAYD, and Media room. Below the navigation bar, there's a testimonial from Suzie Hopman, a woman with blonde hair, who says: "We don't use our car very often. All the distances we travel are quite short." and "PAYD was \$400 less than any other insurer for our two cars." To the right of the testimonial is a form titled "CAN YOU SAVE TOO? Find out:" with fields for Post code, Age, Gender (set to Female), and Car year. Below the form is a button "CAN I SAVE?". At the bottom, there's a section titled "Pay as you drive car insurance" featuring a blue car and text explaining the service: "Pay as You Drive is comprehensive car insurance where you only pay for the kilometres you plan to drive. With Pay As You Drive, you get the benefits of comprehensive car insurance cover, but only pay for the kilometres you plan to drive. You pay a minimum premium and buy kilometres from us. Get a car insurance quote now and see if you can save." There are also buttons for "GET ONLINE QUOTE", "Update your existing PAYD policy details online now", and "Submit a PAYD car insurance claim online".

Source: Real Insurance

Similar schemes were introduced by **Corona Direct** in Belgium, **MAAF** in France and **StateFarm** in the US.

Figure 4: In Belgium, Corona Direct commits to up to 50% savings with its pay-per-mile plan



Source: Corona Direct

Thus, non-telematic UBI programs use the similar statistical factors to assess the risk level of a customer. However, they levy the premium entirely or partly based on his / her actual mileage rather than as a fixed lump sum per annum.

However, these insurers suffer from a number of **drawbacks**, notably

- The **odometer accuracy** is affected by factors such as tyre size and wear & tear which can lead to greater error in risk pricing;
- Such systems generally rely on the customer's honesty to calculate the periodic mileage but there is a clear **conflict of interest** for the consumer which makes the system unreliable;
- There is a **greater risk of fraud**. For example, it is easy to imagine photographs of fake odometers. This makes the system not easily scalable;
- The **system does not gather any additional driver behaviour data** that can be used for more accurate risk pricing such as the time of the day when the vehicle was driven, the type of road on which it was driven, the distance per trip, his/her driving style, etc.
- There is **no opportunity for generating additional revenue** through the sale of ancillary services.

In a nutshell, because mileage is the most important variable in the assessment of risk, policies based on odometer readings bring a step forward in the analysis and the pricing of risk.

However, numerous other variables can also add risk-rating accuracy. This is what telematics-based insurance can deliver.

b. Telematics-based insurance

Telematics-based insurance policies were first started in the United States by Progressive Insurance in 2004.

They were called *Pay-as-you-drive* to indicate that the consumer's insurance premium would have a direct correlation with the total distance that he/she drove. A GPS device is generally installed in the car to track the distance driven and is automatically transmitted to the insurer.

They offered significant **improvements** over the non-telematic UBI products, notably

- A GPS device can measure the distance travelled with greater accuracy as compared to an ordinary odometer;
- It does not rely on the consumer's honesty while reporting the annual mileage;
- The on-board unit can be configured to track other parameters that can help the insurer to more accurately price the risk of the consumer;
- It can be used to deliver other driver services such as stolen vehicle recovery, emergency call, breakdown call and real-time traffic information.

Today, **telematics-based insurance policies are offered in 5 different continents to more than 2 million subscribers.**

Insurance companies have developed various innovative business models to market these policies and the technological platform has improved to reduce the implementation cost and effort, increase the data collected and support a plethora of value added services to meet the needs of different consumer groups.

The simplicity of Pay As You Drive (PAYD)

In 2006, **Hollard Insurance**, the international insurance group, launched in South Africa the first commercial Pay As You Drive policy based on a black box solution. It targeted low mileage drivers, notably women, as well as young drivers.

It promised

- A reduction of the premium in case of an annual mileage below 25 000 km,
- The first 400 km free,
- A stolen vehicle tracking device,
- An emergency assistance button inside your car,
- A coverage including the way to a business meeting,
- **Electronic logbooks of the distance covered available for tax purposes.** You should save on premiums if you travel less than 480 km a week, or 25 000 km a year.

The company has maintained and expanded its PAYD offer to **6 different "DrivePlan" options**, based on the number of kilometres insured per month: Drive500, Drive 750, Drive1000, Drive1250, Drive1500 and even an unlimited plan, DriveMax.

Premiums are collected monthly, on the first day of the month. The **same way as in a mobile phone subscription**, if the driver exceeds his plan included kilometres, he/she pays a variable cost per month. However, the user can roll over non-used kilometres from one month to another.

To market it, Hollard has even launched TV advertising campaigns that promise discounts of up to 30%. The main message is simple: pay only for what you need. Standard motor insurance contracts, similarly to fitness clubs, force customers to pay for something they do not need. By measuring what they actually need, discounts are possible.

Figure 5: Hollard Insurance - "Car insurance is like your new gym contract"



Source: Hollard Insurance

Interestingly, Hollard supports several tracking devices, notably Tracker's SkyTrax or Hollard's own device.

To leverage Tracker's large customer base, **Hollard has also opened its Pay as You Drive plan to Tracker subscribers.**

In both cases, the customer pays a monthly subscription fee equivalent to €5-12 to rent the device. The €12 option notably includes stolen vehicle tracking, as shown in the following table. If his/her car is equipped with a device already, it can be used as well.

However, the model differs in one important dimension, the duration of the contract. The Hollard contract is a monthly agreement whereas Tracker requests a 3-year commitment.

Figure 6: Hollard Insurance' & Tracker's proposed plans (in South African Rands)

	Service provider		
	Hollard Insurance	Tracker	
Included items	DriveMate	SkyTrax Data	SkyTrax Recover
Mileage reporting	✓	✓	✓
Driving behaviour reporting*	✓	✓	✓
Roadside assistance	✓	✓	✓
Medical assistance	✓	✓	✓
Detailed trip reports	✓	✓	✓
Stolen vehicle recovery			✓
Automatic health checks			✓
High risk zone notification			✓
International roaming			(✓)
SMS polling			(✓) (R1 / request)
Monthly cost for PAYD clients	R60 / month	R55 / month	R125 / month
Contract term	Monthly contract	36 months	36 months
Cancellation policy	No cancellation cost if device is returned	Payment of R796	

Note: (✓) indicates an optional feature; * Driver behaviour is not used in the policy pricing.

Source: Hollard Insurance

Obviously, kilometre-based policies are a big step forward compared to standard flat-rate policies in approximating risks.

While remaining simple to understand, PAYD policies reward low mileage drivers, who, in almost all cases, carry lower risks. This is a big advantage compared to **standard policies, which de facto represent a subsidy of low mileage drivers to "road warriors"**.

However, PAYD does not take into account the behaviour of drivers. For example, a trip on Saturday night will cost the same amount as a trip on Tuesday at 3 PM. In our view, this explains why the marketing focus of Hollard has been on women and pensioned workers, rather than on young drivers.

This is the reason why several insurers have launched telematics-enabled policies that take other factors than mileage into account. These are named **Pay How You Drive (PHYD)** policies.

The accuracy of Pay How You Drive (PHYD)

In June 2009, **Liberty Mutual** launched such a scheme towards commercial fleets, in partnership with GE Commercial Finance and US Bank, the provider of fuel cards.

Built on Sensomatix driver behaviour's software, it used tracking boxes from multiple TSPs (Telematics Service Providers): Geotab, Teletrac, Telenav and Telogis. To optimise the data generated, Liberty Mutual has selected devices that integrate accelerometers.

Therefore, in addition to mileage and the time of trips, it **records potentially dangerous events** such as speeding, cornering, harsh breaking, lane-changing, etc.

Liberty Mutual proposes fleets to increase the safety of their drivers and reduce their insurance premium and their fuel consumption thanks to 3 sets of indicators, integrated into a **single fleet dashboard**, shown below:

- A safety score, based on at-risk driving habits,
- A fuel score, conditioned on the use of the US Bank Voyager Fleet Card,
- An insurance discount score.

Figure 7: Liberty Mutual OnBoard Advisor's dashboard



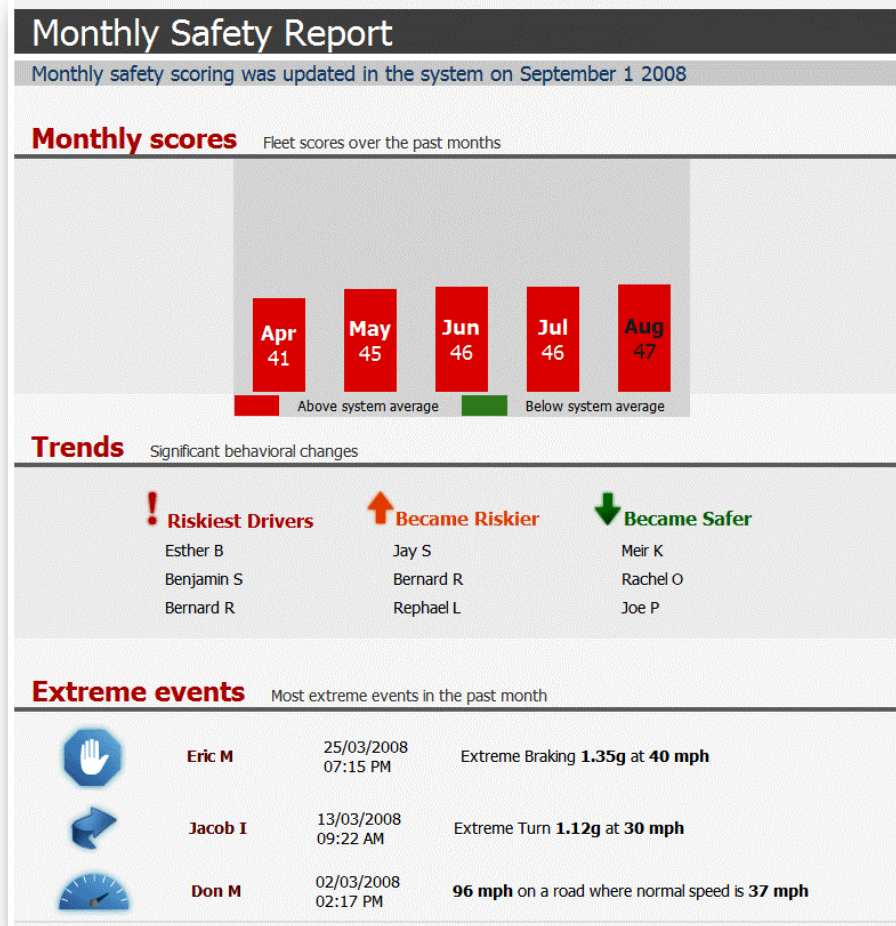
Source: Liberty Mutual

The fleet manager obtains statistics on the level of performance of its fleet and individual drivers. Such a report is shown hereafter.

If the fleet's company regularly monitors driving behaviours and provides monthly and direct feedback to drivers, Liberty Mutual promises **premium discounts of up to 40%** and typical reductions of 12-15% in fuel and insurance costs.

Thanks to Liberty Mutual's system, the fleet owner can promote good driving behaviours and prevent accidents from happening. In addition to a fairer insurance policy, it delivers also an **improvement in safety**.

Figure 8: Liberty Mutual OnBoard Advisor's dashboard



Source: Liberty Mutual

While it is possible to question the impact on privacy of PHYD, it is clear that **Actual Behaviour-Based Insurance (ABBI) is a major improvement in the fairness of the insurance risk mutualisation system.**

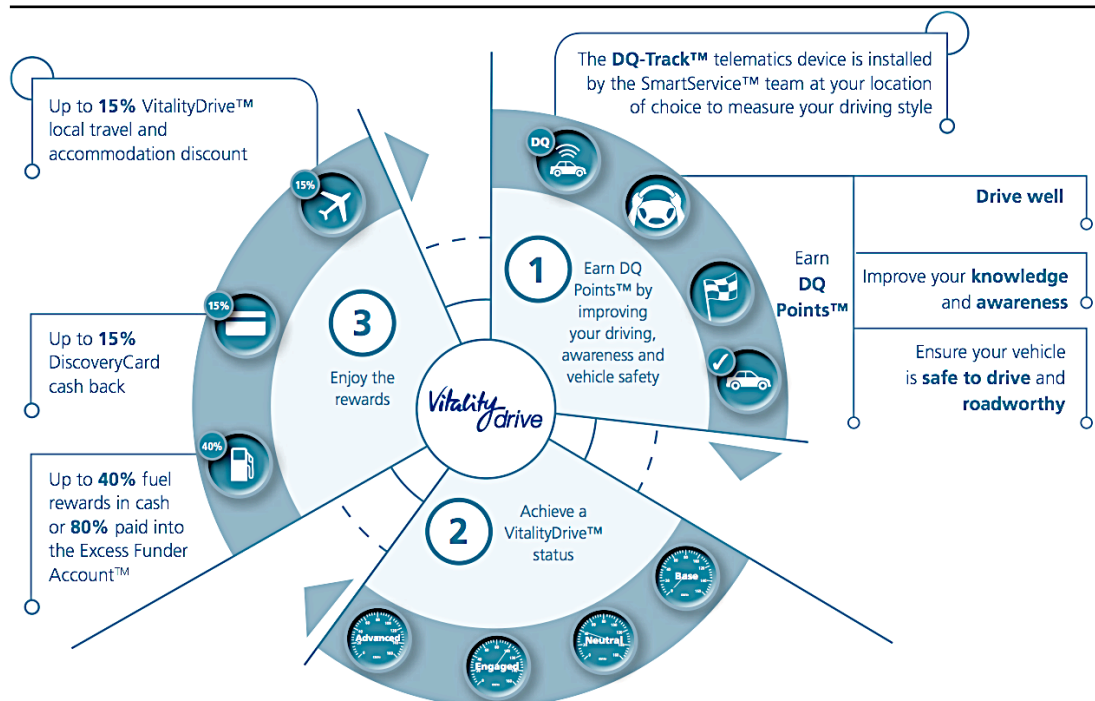
Discovery, a South African personal insurance provider, has even coined the term of **DQ** ("Driver Quotient") in its commercial offering to show that the driver was ultimately in control of the premium he / she pays. We will be interested to read studies on the correlation between IQ and DQ...

Discovery has launched a comprehensive Pay How You Drive (PHYD) programme called *VitalityDrive* that rewards good behaviour. It is detailed in the next figure.

As part of its plan, **Discovery offers a large range of side benefits** that go beyond a reduction in the premium:

- Up to 15% discounts at BP gas stations for holders of the Discovery card;
- Up to 15% discounts at Tiger Wheel & Tyre, a network of tyre fitment centres specialising in performance wheels and tyres;
- Up to 15% discount at DiscoveryCard partner stores, e.g. Toys'R Us;
- Up to 15% discount at local travel partners, notably British Airways and Europcar.

Figure 9: Discovery's Vitality Drive - The higher the DQ, the bigger the rewards



Source: Discovery Insure

To help the driver increase its DQ, Discovery proposes its customers to

- Use an interactive online tool, to see their past trip information and driver records;
- Follow *VitalityDrive* accredited pro-active driving course every two years to win DQ Points.

We sum up thereafter the **strengths, weaknesses, opportunities and threats** that the classic rating model, the reporting-based pricing model and the telematics-based pricing models have.

SWOT analysis of the 3 main rating models

Figure 10: SWOT of classic rating & pricing methodologies (Rating based on preliminary risk factors)

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> ✓ Well understood by underwriters, agents and brokers ✓ Well understood and accepted by customers ✓ Vast amount of statistics available to correlate risk factors and claim statistics ✓ Already built and well integrated into existing insurance IT (CRM, billing, claims management) systems ✓ Low cost as does not require a device / an installation ✓ Impact on privacy is limited to initial declaration by customer 	<ul style="list-style-type: none"> * Based on statistical data, not individual behavioural data * Not dynamic - Based on risk factors at the time of first set up (afterwards, this depends on the willingness of the customer) * Significant delay between actual claims data and pricing decisions, generally resulting in 12 months time lag in pricing (an increase of claims in year N leads to increased premiums in year N+1) * Incentive to improve driving is indirect (better driving does not prevent accidents) and delayed (time to obtain a bonus) * Facilitates fraud as it is largely based on customers' own declarations * In case of an incorrect declaration, the risk exists of having an accident without indemnification * Limited opportunities to develop direct link with the customer (except through smartphone) * No ability to recover vehicle in case of theft * Little control over risks in case of fleets
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> ★ More and more data sets are available, making the rating more accurate every day 	<ul style="list-style-type: none"> ◆ Rising costs of insurance for young & senior drivers makes it unaffordable to drive in certain countries (notably the UK), pushing these segments towards telematics ◆ Best customer segments generally pay more than they should, which could push them towards telematics-based solutions ◆ Acceptance of traditional risk factors is decreasing as they are increasingly seen as sheer discrimination (cf. "post-coding" debate between ABI and the Conservative Party in the UK) ◆ Gender ruling and other similar anti-discrimination rulings or European directives could prevent the use of the most useful risk factors (gender, age, postcode, etc.) ◆ Mandated eCall by 2015 could push automotive OEMs to sell insurance themselves and even become insurers (as part of a larger motor finance unit)

Source: PTOLEMUS

Figure 11: SWOT of self-reporting methodologies (Rating based on customer's self reporting of mileage)

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> ✓ Simple model, easy to explain for brokers and direct agents ✓ Well accepted by customers, which leads to good volumes ✓ Positive incentive to drive less, leading to lower risks ✓ Indirect positive effects on the environment (CO₂ emissions, noise, etc.) ✓ Indirect positive effects on fuel consumption ✓ Low cost as does not require a device / an installation 	<ul style="list-style-type: none"> * Based on trust, i.e. fraud is very easy * Does not integrate other behavioural factors than mileage (e.g. driving times) * Declaration cannot easily be requested more often than on a yearly basis, resulting in 12 months time lag in pricing (an increase of claims in year N leads to increased premiums in year N+1) * Incentive to improve driving is indirect (better driving does not prevent accidents) and delayed (time to obtain a bonus) * Facilitates fraud as it is largely based on customers' own declarations * Little opportunities to develop direct link with the customer (except through smartphone) * No ability to recover vehicle in case of theft * Little control over risks in case of fleets
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> ★ Increase in petrol prices pushes such usage-based models ★ More and more data sets are available, making the rating more accurate every day ★ Large diffusion of smartphones enables insurers to request customers to more easily send a digital photograph of their odometer 	<ul style="list-style-type: none"> ◆ Rising costs of insurance for young & senior drivers makes it unaffordable to drive in certain countries (notably the UK), pushing these segments towards telematics ◆ Certain attractive customer segments will still pay more than they should, which could push them towards telematics-based solutions ◆ Acceptance of traditional risk factors is decreasing as they are increasingly seen as sheer discrimination (cf. "post-coding" debate between ABI and the Conservative Party in the UK) ◆ Gender ruling and other similar anti-discrimination rulings or European directives could prevent the use of the most useful risk factors (gender, age, postcode, etc.) ◆ Mandated eCall by 2015 could push automotive OEMs to sell insurance themselves and even become insurers (as part of a larger motor finance unit)

Source: PTOLEMUS

Figure 12: SWOT of telematics-based methodologies (Rating based on customer's own records)

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> ✓ Individual pricing, based on actual driving behaviour (mileage, time, place, style, etc.) ✓ Well accepted by customers, which leads to good volumes ✓ Positive incentive to drive less, leading to lower risks ✓ Indirect positive effects on the environment (CO₂ emissions, noise, etc.) ✓ Indirect positive effects on fuel consumption ✓ Ability to recover the vehicle in case of theft (for models with a black box) ✓ Ability to provide eCall services and thus reduce the number of fatalities ✓ Ability to strongly reduce fraud ✓ Ability to provide actual driving data to actuarial models ✓ Strong incentive to improve driving skills and style ✓ Ability to adjust pricing on a dynamic basis (to the customer's driving behaviour and to market changing patterns) 	<ul style="list-style-type: none"> * Unclear effect of telematics for the motor insurance market as a whole (risk of decreasing its size) * Cost of purchasing and installing (and potentially decommissioning) the device - except for OBD models * Difficult business case, notably in low motor premium markets * Complex business case for low premium drivers * Perception of possible infringements on privacy (Big Brother effect) * Requires a strong CRM system
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> ★ Decreasing cost of telematics devices ★ Ability to discriminate based on real risks instead of gender-based, age-based pricing that will / may become unlawful ★ Live customer feedback possible (thanks to a display in the car) ★ Low cost, self installed EOBD dongle solutions ★ Use of more accurate CAN bus-related data ★ eCall becoming compulsory for new car models in the EU by 2015 ★ ERA Glonass becoming compulsory for new car models in Russia by 2013 ★ Brazilian stolen vehicle tracking mandate (CONTRAN 245) could be enacted in 2012 	<ul style="list-style-type: none"> ◆ Risk of backlash against "customer tracking" ◆ Laws preventing insurers to charge for the rental of the device (as latest Italian law)

Source: PTOLEMUS

3. A European perspective on insurance telematics

The European insurance telematics market emerged in 2006, with the launch of Norwich Union's PAYD programme in the UK. Although that programme failed and was eventually stopped in 2008, PAYD continued to flourish in Europe.

There were more than 1,200,000 telematics-based PAYD insurance customers in Europe at the end of 2011 with a majority of them concentrated in Italy, Spain, France and the UK.

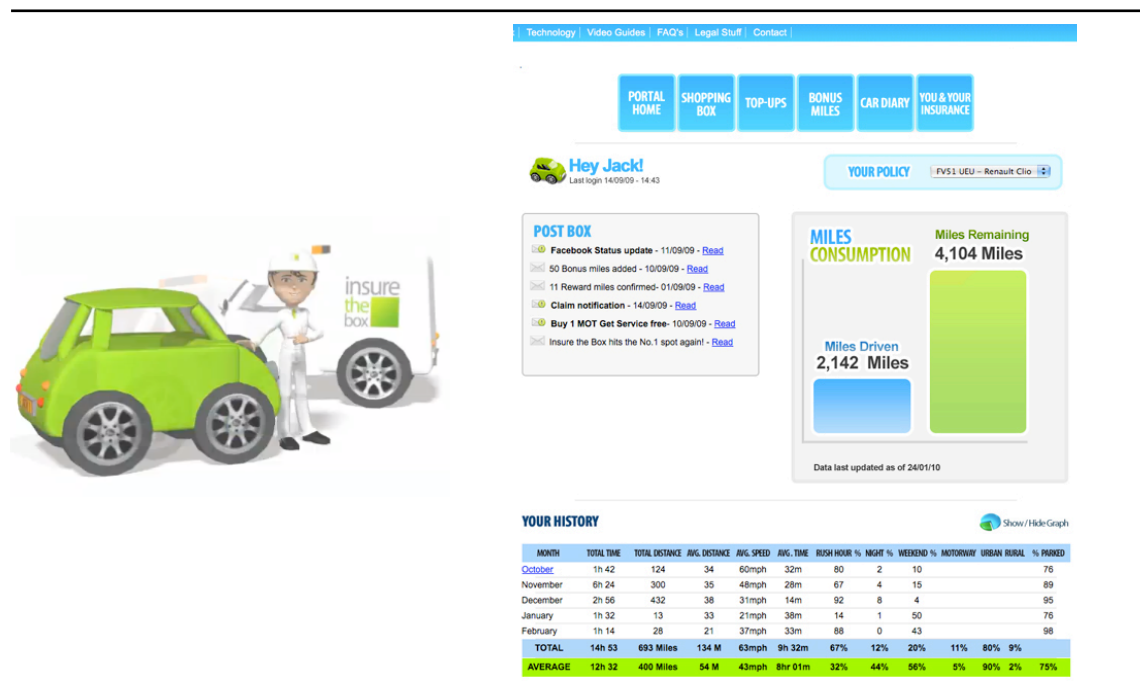
Indeed, Europe has become **the most important market for insurance telematics** and is becoming a field of experimentation for the entire industry.

A number of **innovative business models** have emerged and increasing levels of consumer acceptance are being witnessed.

For example, in January 2009, **Wunelli**, a telematic service provider, launched the **Coverbox** panel in the UK in partnership with a number of leading insurance companies including Allianz, Groupama, The Co-operative Insurance and Markerstudy 'to prove to the insurance industry that telematics can work effectively with motor insurance and assist in reducing risk.'

More recently, **Insure the box**, a provider of telematics-based insurance in the UK, has partnered with brands such as Marks & Spencer, The Carphone Warehouse, B&Q, Dixon's, etc. It offers its customers 'Reward Miles' (i.e. discounts on their motor insurance) when they shop online through its dedicated portal.

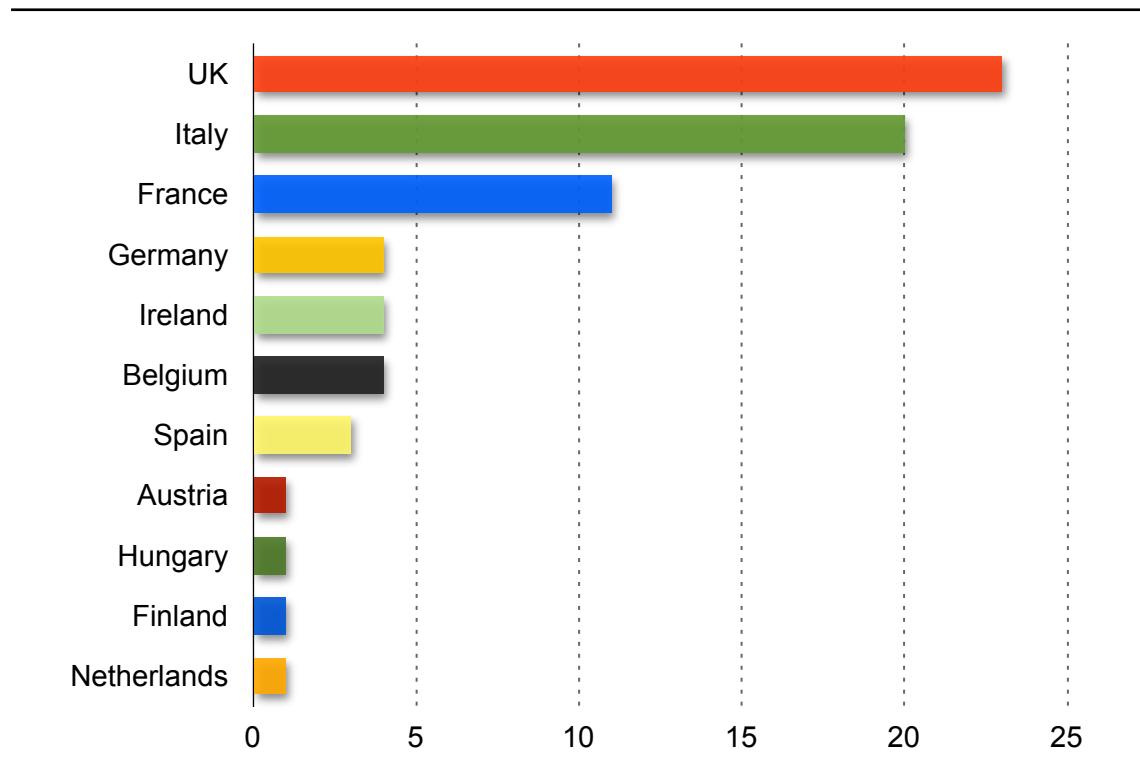
Figure 13 : The web portal for Insure the box' customers



Source: Insure the box

This high level of activity and innovation proves that insurance telematics is also taking hold in Europe. The difficult economic environment in Europe may further encourage consumers to look at new ways to cut their costs.

Figure 14 : Nearly 75 PAYD and PHYD insurance trials and launches in Europe



Source: PTOLEMUS

Numerous insurers are finally willing to seriously consider telematics as an option. The recent rulings on gender discrimination and the eCall directive (explained in Section II.B.) are likely to give further impetus to the growth of insurance telematics in Europe.

With all this optimism however, there is also the **need of a reality check** as several hurdles still remain before telematics-based insurance products and accompanying services can become a common sight.

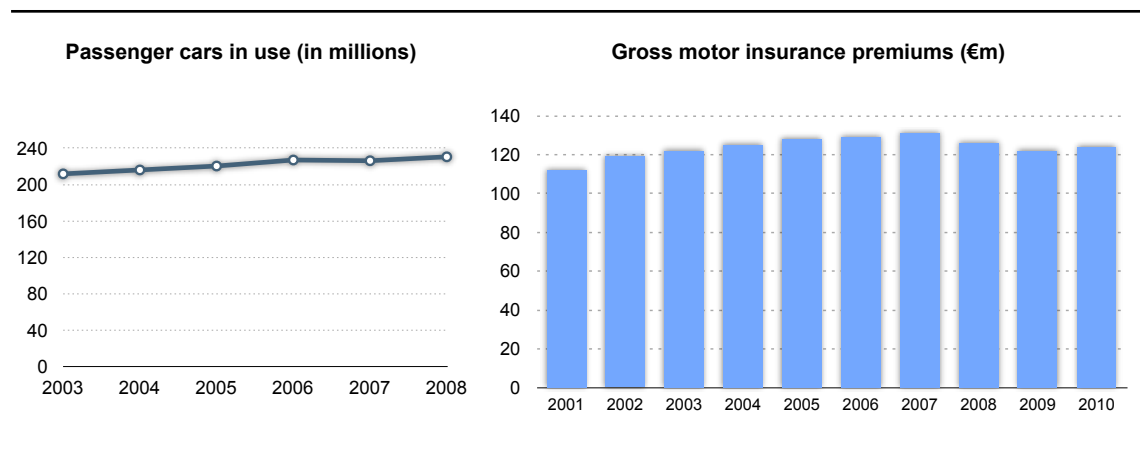
B. Key features of the motor insurance market

1. A maturing business

While the number of passenger cars in use is growing at an average growth rate of 1-2%, the European motor insurance market has stagnated.

As shown in the figure below, in 2010, premiums generated by the industry were the same as in 2003. Given that the number of passenger cars in use has increased in all countries, this obviously means that the average premium has decreased.

Figure 15: The European motor insurance market has entered a stagnation phase



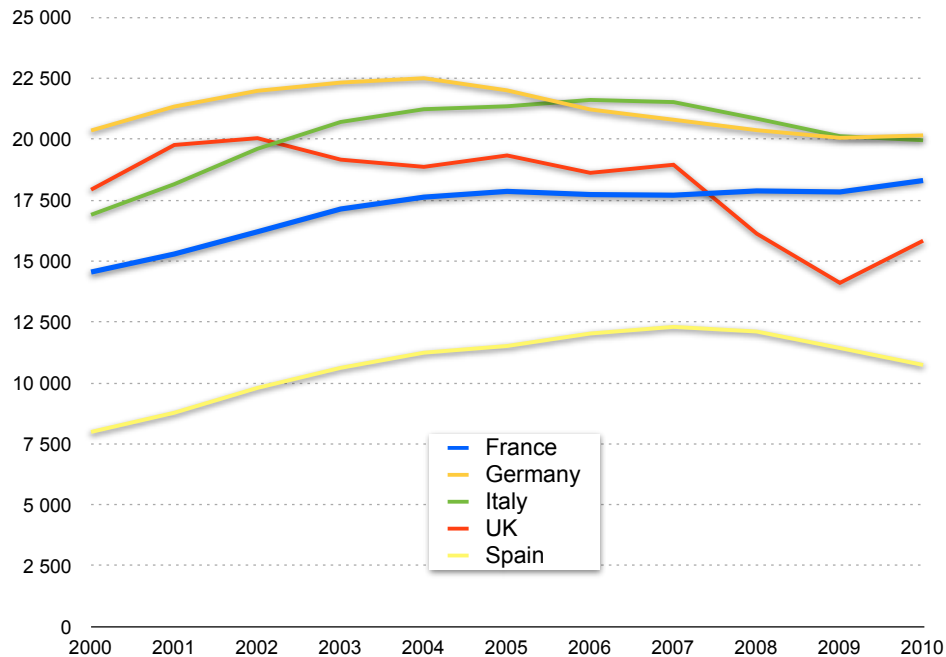
Source: ACEA (Statistics include Turkey), CEA

Most of the largest markets, notably Germany, Italy, the UK and Spain, have declined in the last 5 years. The most affected country has been the United Kingdom, probably due to a higher level of competition.

However, we must qualify this. The French market has constantly grown in the last 10 years. Similarly, supposedly highly competitive and mature countries such as Belgium and the Netherlands have experienced total premium increases by respectively 33% and 23% between 2001 and 2010.

In addition, all new EU countries such as Poland and Romania have experienced rapid growth in the last 10 years. For example, the Romanian market has been multiplied more than 6 times during the period.

Figure 16: Gross premiums in key European markets are on the decline (amount in million €)



Source: CEA

With gross premiums stabilising and average premiums falling, **insurers in mature markets need to look at new ways of maintaining profitability.**

In certain markets, insurance premiums are rising again, notably in the UK. In November 2011, Admiral reported increases of 12% in 2009, 26% in 2010 and 14% in the first three quarter-period of 2011.

However, this inflation of premiums is outpaced by the **rise in claim expenditures**. Numerous insurers continue to see their profitability deteriorate, notably due to the increase in bodily injury claims.

The Financial Services Authority (FSA), which notably regulates motor insurers in the UK, recently reported that the combined operating ratios for the market deteriorated further to 120.5% in 2010. This implies that insurers lost about 20p for every £1 they collected in premiums.

2. Increasing churn

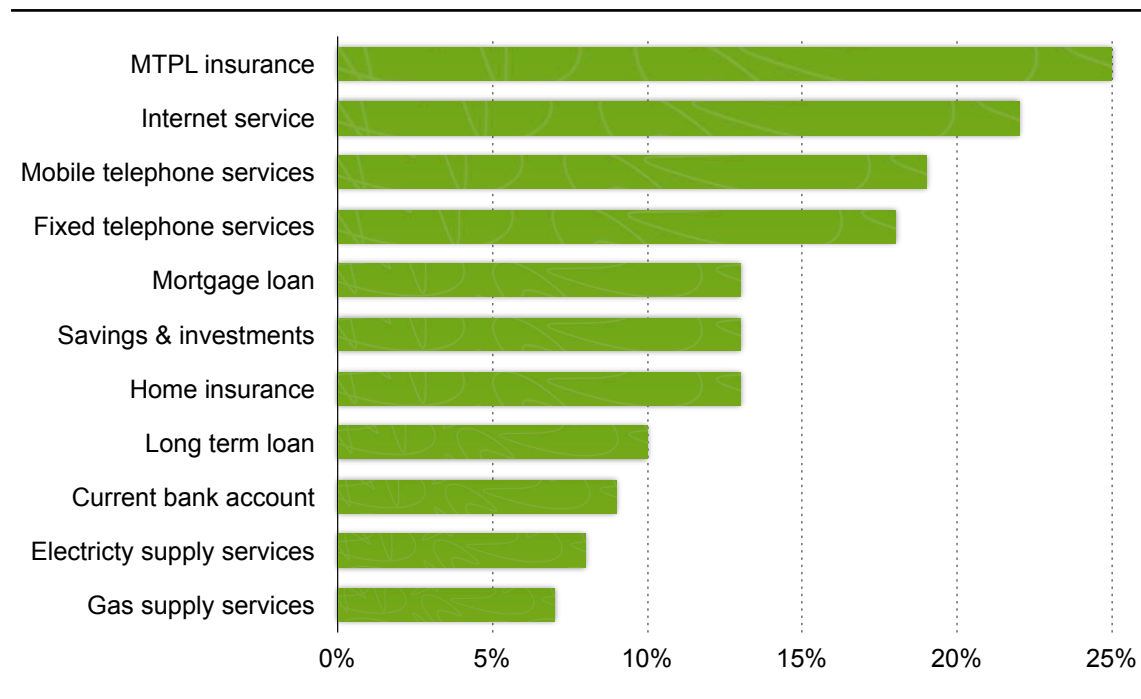
It is difficult to evaluate whether competition has increased in the European market. For example, CEA, the association of European insurers, does not publish average premium statistics across a long period.

In particular, it is not clear whether the decrease in the number of motor insurers in the EU (from 1 385 in 2002 to 1 099 in 2007) is due to more intense competition or simple capitalistic concentration moves. Even in growing markets such as France, the number of motor insurance companies has been cut by 25% between 2000 and 2009.

While motor insurers' combined ratio exceed 100 in a large number of countries, this does not in itself indicate increased competition. Many interviewed insurers have indicated that motor insurance is the entry point to a larger offering comprising property insurance and life insurance. As such, **most insurers "subsidise" their motor insurance activity** and consider it as a **customer acquisition cost**.

However, it is true that in most EU countries **it has become easier for customers to switch insurance providers**, as the chart below attests. There is a noticeable difference between home insurance and motor insurance (MTPL in that case), which is affected by a much higher churn level.

Figure 17: Share of Europeans who have tried to switch their provider in the last 2 years (%)



Source: European Commission - Euromonitor January 2009

This is due to the growing role of direct insurers, online comparison tools, aggregators, etc. Increasingly, changing your motor insurance provider is just one click away.

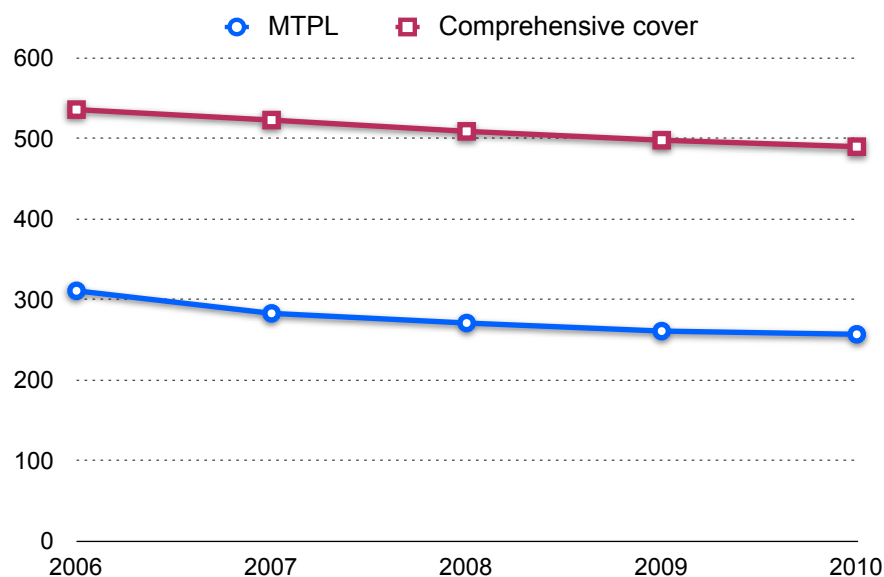
Let us now have a look at the two main segments of the motor insurance market, i.e. the Motor Third-Party Liability (MTPL) segment and the Own Damage insurance segment.

With the exception of the UK, **MTPL** is the minimum mandatory cover in all major European economies. It accounts for the **majority of the market premiums, except in a few countries, notably France**. MTPL insurance covers customers against claims for bodily injuries, death and loss or damage to property raised by third-parties. As MTPL insurance products are fairly homogenous, consumers found their purchase decisions almost solely on price. This has in turn resulted in extreme price competition in this segment and **underwriting profitability has remained negative every year since 2001 for the European region**.

The MTPL combined ratio (ratio of total expenditures against gross premium earned) increased from 104.2% to 108.1% between 2006 to 2008 signifying that underwriting motor insurance has increasingly become a loss-making business. Given the cyclical nature of the insurance industry, this seems to mark the beginning of another tough period for motor insurers with rising costs and falling profitability.

In the **Netherlands** for example, motor insurers are struggling to pass on the increasing costs to the customers due to the intense competition. While total claims expenditure has increased by 10% between 2005 and 2009, the net premiums written have actually decreased by 3% in the same period. Thus the average premium per policy for MTPL and comprehensive insurance has fallen every year from 2006 to 2010 - which has adversely affected underwriting profitability.

Figure 18: Average premiums in the Netherlands are decreasing due to intense competition (in €)



Source: VVN

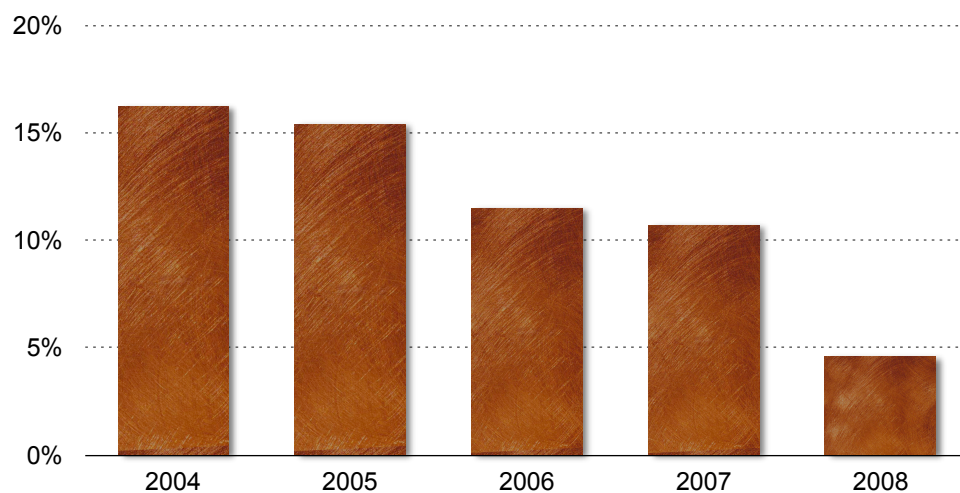
The **own damage** insurance is an additional cover that protects the insured against accidental fire or theft of his vehicle as well as damage to his vehicle in the event of an accident where he/she is at fault. Along with the MTPL insurance, it is known as a **comprehensive insurance** cover. Own damage insurance is generally taken out on newer vehicles that are more expensive to repair.

So far, the price competition in this segment has been less intensive than in the MTPL segment since product differentiation is higher. Comprehensive insurance being optional, the products are structured to meet the needs of the different consumer segments rather than to comply with regulatory requirements.

However, even in this segment, the **profitability has fallen sharply** in recent years. According to the latest data released by the CEA, the European insurance and reinsurance federation, the claims ratio for own-damage policies in Europe has increased from 61.3% in 2005 to 70.9% in 2008.

In the same period, underwriting margins have decreased from 15.4% to 4.6%. This trend is likely to continue in 2010 and 2011 bringing down underwriting profitability even further.

Figure 19: Own damage profitability has fallen sharply as competition has heated up



Source: CEA

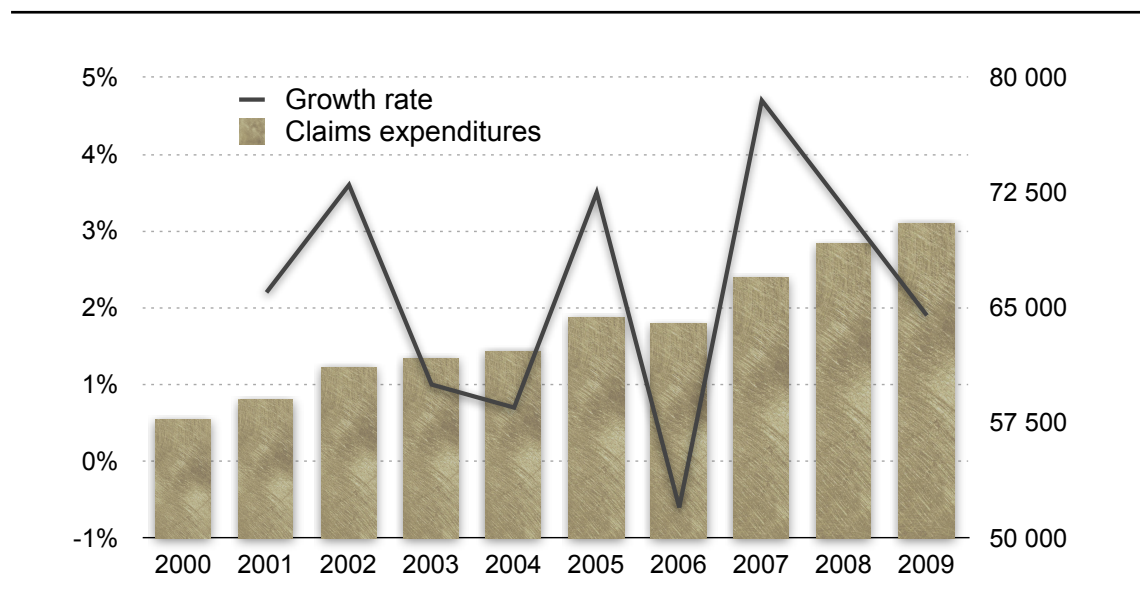
Thus, it is evident that motor insurers are facing **increasing pressure on their bottom lines**, in part due to aggressive pricing by competitors, and need to find ways to differentiate themselves more effectively.

3. Rising claim costs

A key feature of the present day motor insurance market is the increasing outlay on claims. While the number of accidents has decreased, the actual expenditure on claims has increased across all major European markets.

According to CEA, total claims have grown almost 50% in the period between 2003-09 across Europe. While the claims ratio decreased at the beginning of the decade, it has not stopped growing since 2005.

Figure 20: Rising motor claims expenditures in Europe (in M€)

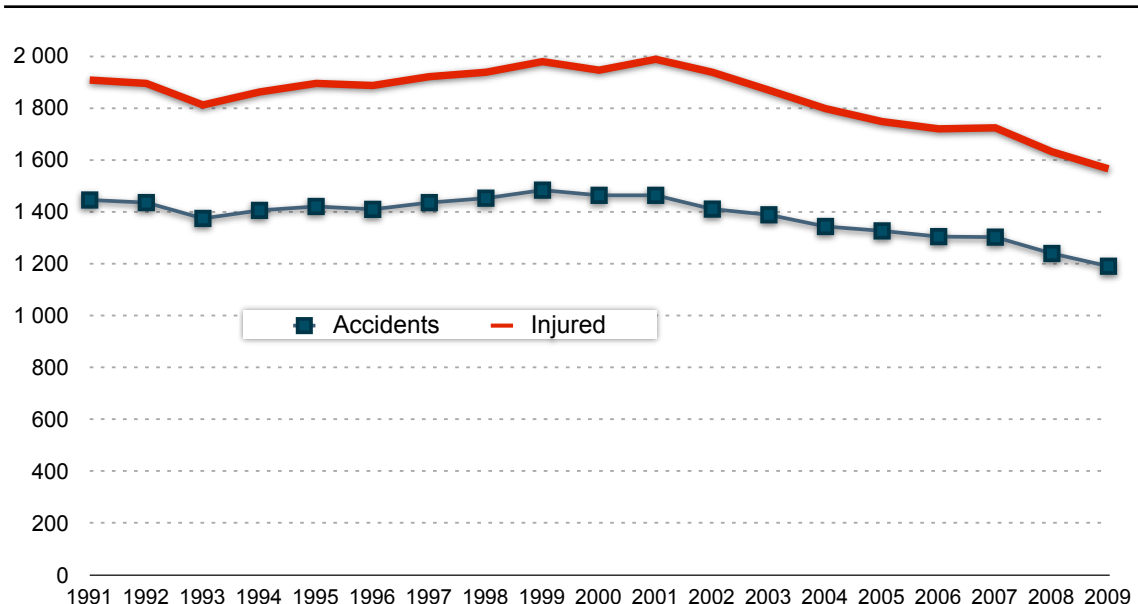


Source: CEA (EU 27)

This growth of claim costs goes against the long-term trend in the reduction of accidentology and the number of fatalities.

Between 2000 and 2009, the number of fatalities in Europe has decreased by 38%. The number of injuries has decreased by 20%, as shown in the chart hereafter.

Figure 21: Number of road accidents and injured in Europe (in thousands)



Source: European Commission (Directorate General Energy and Transport)

The increase in claim costs can be attributed to three main factors, described thereafter.

a. Repair costs

The claim costs for motor insurers have been rising steadily across Europe and this is in part due to the rising prices of spare parts and repairs.

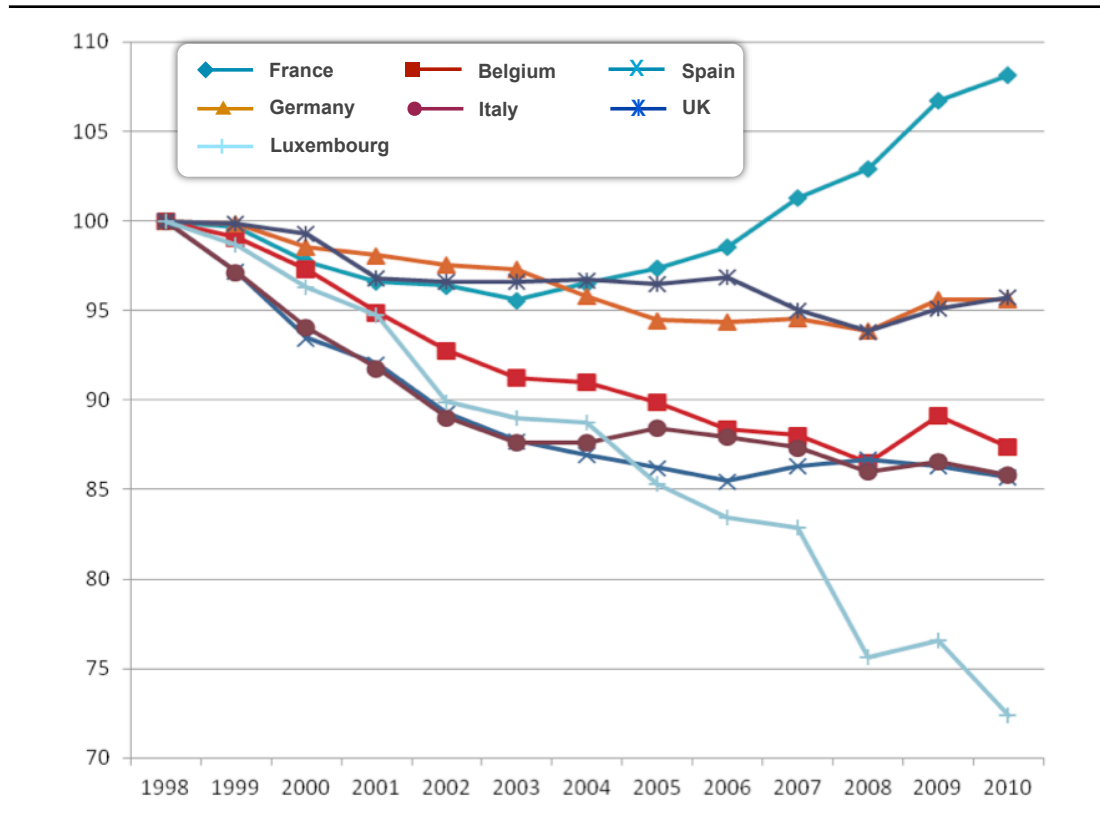
It is estimated that automotive OEMs generate up to 25% of their net income from spare parts. They leverage the fact that competition virtually does not exist in this market as the customer cannot choose its part supplier. **The prices of spare parts have increased by 22% on average in the last decade** in the European Union.

However, the EU market is not uniform in that respect.

In **France**, the price of spare parts (excluding tyres) has increased by 25% between January 2005 and October 2010 - as shown in the chart thereafter. In addition, 85% of bodywork repair revenues are generated by insurance claims and the repair centres controlled by car makers generate 53% of the sector's revenues.

This has led the French Competition Authority to launch an investigation and a public consultation on the subject in April 2012.

Figure 21: Price index of automotive spare parts & accessories (in thousands)



Source: Eurostat (Prices in real terms)

Unless public bodies mandate an open market for spare parts, this trend is likely to remain.

Manufacturer-run workshops tend to be more expensive than others and as such insurers discourage their customers from using them.

In certain countries, such as the UK, spare parts' prices have now grown but general repair and maintenance prices have increased very fast - 50% more than inflation between 1998 and 2010.

To counter this, most motor insurers are now tying up with certain "preferred partners" in order to cut down their claim costs. This is the case of Pacifica, Generali, Aviva, Th  lem Assurances, and Sogessur, which have partnered with Assercar in France. The five insurance companies have even taken a stake in the company's capital.

Figure 22: Five insurers have partnered with Assercar in France

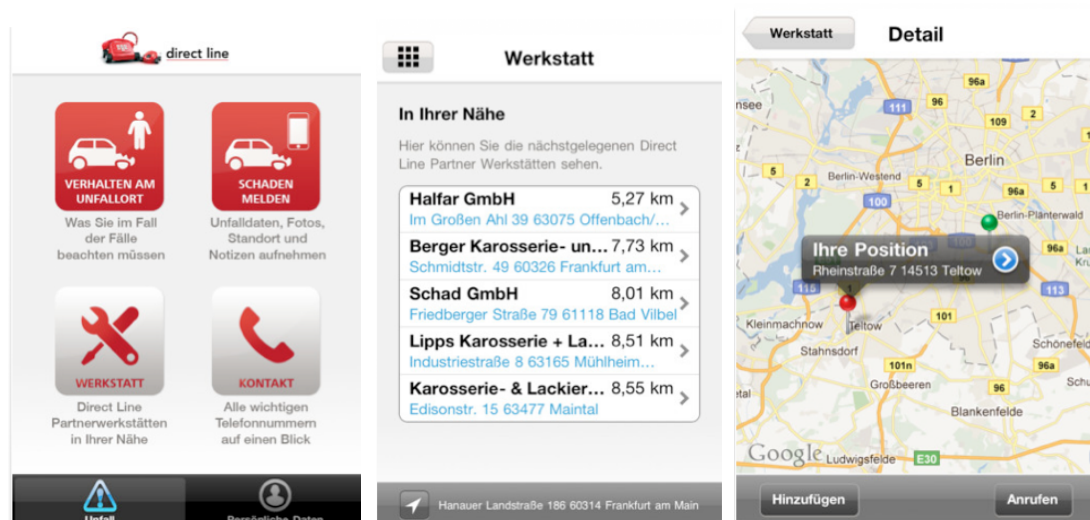


Source: Assercar

However, promoting the use of these partner networks remains a challenge, notably because insured customers tend to go the closest garage (or the garage they are used to) when they have an accident.

This explains why numerous insurance houses have launched mobile applications that notably guide their customers to the nearest certified repair centre.

Figure 23: Direct Line's mobile application helps German customers find partner workshops



Source: Direct Line Germany

b. Personal injury claims

Despite the decrease in the number of injuries during the last decade, personal injury claims have risen dramatically in certain countries in Europe in the last decade, most noticeably in the UK, France, Poland and Italy.

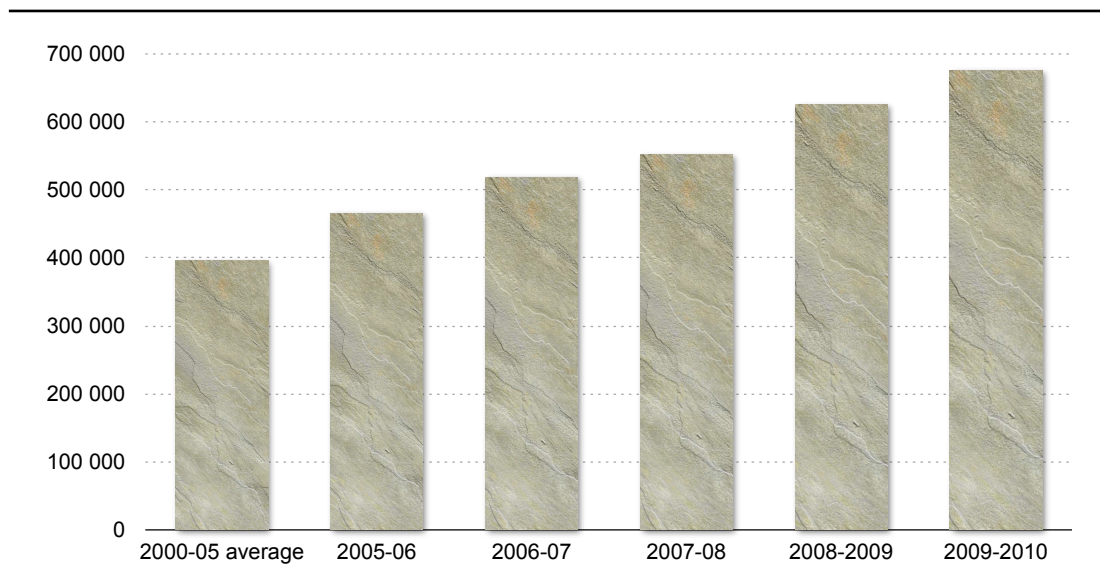
Personal injury claims in the EU grew by an average of 2.3% per annum between 2003-2006 and represented about 14% of all motor insurance claims. However, in certain countries such as Italy, they accounted for almost 22% of all claims.

In the UK, the increase in personal injury claims despite the simultaneous fall in the number of accidents is being attributed to the increasing preponderance of **claims management companies**. It has become much easier for a claimant to seek compensation for personal injury through these firms. A large number of these solicitors also work on a contingent fee, better known as "no-win, no-fee" basis, which provides an incentive for them to seek exaggerated and even fraudulent claims.

While certain insurance companies have severely opposed these firms and some of their business practises (such as referral fees), there can be no doubt that they have also helped the public in claiming their right to compensation for injury.

Data from the Compensation Recovery Unit in the UK shows that the number of personal injury claims from motor accidents has grown by almost 10% annually.

Figure 24: Motor injury claims have increased by 70% in just 5 years in the UK

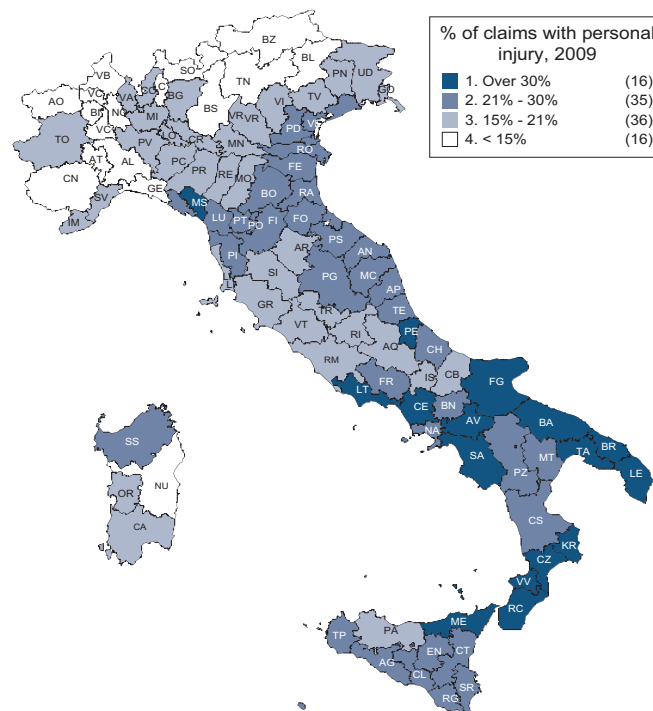


Source: Compensation Recovery Unit, UK

In **Italy**, the situation has become even more worrying.

According to ANIA, the Italian insurance association, personal injury claims have become a major issue, representing **two thirds** (€9 billion) of **total damages paid**. Bodily injury claims represented 21.7% of all claims in 2009, about 10% more than the EU average. In certain areas, it even exceeds 40%, clearly indicating fraud.

Figure 25: Share of motor claims with personal injury in 2009 (in % of total claims)



Source: ANIA

Since personal injuries typically involve significantly higher claim expenditures for the insurer, an increase in the proportion of these claims results in higher total claims expenditures.

According to CEA estimates, personal injury claims account for about 14% of all claims recorded by European insurers but represent **more than 50% of all claims expenditures**.

This is verified by examining figure from individual countries such as **Belgium** where personal injury claims accounted for only 9% of all personal motor claims in 2009 but they accounted for 48% of total claim expenditures...

On average, a personal injury claim costs **three times the average cost of all claims**.

c. Fraud

Motor insurers have been reporting increased instances of fraud in the last 3 years. The Insurance Fraud Bureau has estimated that fraudulent organised motor insurance claims cost insurers about **£350 million a year in the UK**.

Fraud includes fraudulent claims, staged accidents, phantom passenger claims and underwriting frauds i.e. non-disclosure of information or false disclosure in order to get a more favourable rate of insurance premium.

Whiplash injury claims in particular have drawn the ire of insurers who believe they are often used for fraudulent and exaggerated claims.

For example, actuaries know that adults have rising accident rates when they reach the 45-55 age bracket. This is because parents often take out motor insurance on a car in their own name despite the car being primarily driven by their 16-25 year old child.

Despite their best efforts, insurers are yet to find an effective solution to tackle fraud. We will cover this in more depth in Section VI.A.1.

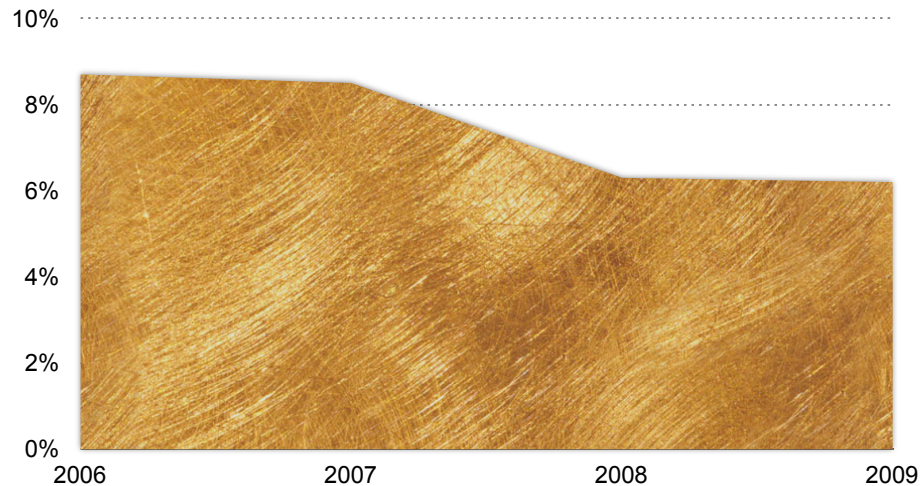
4. Limited investment income

With insurance underwriting being largely unprofitable due to the high price competition and market stagnation, motor insurers have come to rely on income from investments to stay profitable.

Due to the financial crisis however, insurers have seen returns on their investments drop significantly after 2007.

This is confirmed by the recent results of the French motor insurance industry, which have seen net financial income as a percentage of net premiums drop from 8.5% in 2007 to 6.2% in 2009. This is shown on the next chart.

Figure 26: Financial income no longer healthy for French insurers (Net financial income as % of net premium)



Source: FFSA

Since 2009, the situation has again deteriorated due to the bad performance of stock markets and uncertainties around sovereign debt risks. For example, Admiral reported an investment income of 1% in 2010.

The impact of this fall will be more pronounced on insurance companies predominantly focused on the motor car market such as the Admiral Group and AutoDirect who cannot cross subsidise the losses against other insurance businesses.

To make the situation more complex, since the 2008 financial crisis, all insurers have been affected by a decrease in the growth and sometimes a decline in collected life insurance premiums.

This puts even **more pressure on re-establishing profitability** in their motor insurance business.

5. The advent of online distribution

In numerous countries, direct online distribution has significantly altered the playing field for insurance companies.

For example, **43% of private car insurance sold in the UK in 2010 was through direct channels** such as telephone and the web. In France, the FFSA reports that 45% of motor insurance was sold by insurers directly to consumers.

Online price comparison websites such as comparethemarket.com, confused.com and assurland.com have served to increase transparency and direct competition between insurers. As product differentiation between insurers is minimal, price comparison has become easier.

Furthermore, when purchasing through these online comparison websites, customers may not pay the same amount of attention to the details of each policy and the service quality and the price differences between insurers get highlighted. It also makes the customers self-select the appropriate policy, which can sometimes lead to misinformed decisions, as they no longer receive the assistance of a specialist advisor such as the broker.

On the other hand, the Internet allows the insurers to directly distribute their products and facilitates more direct interaction with the end consumers.

6. Sustainability of the mutualisation model

The present model, based on the mutualisation of risks, no longer seems to serve well the motor insurance industry. It seems that **the industry is moving from a cyclical pattern to a more structural deterioration of business conditions**.

Claim costs continue to rise sharply while insurers are finding it difficult to raise prices proportionately due to strong price competition. This is confirmed by the French motor insurance industry, which witnessed a 6.6% increase in motor claims in 2009 while total premiums actually decreased by 0.2%. The motor insurance industry is becoming chronically unprofitable and as such it is imperative for insurers to devise new solutions to combat these market forces.

The present **mutualisation model** of motor insurance assigns customers into different risk classes on the basis of geographic and demographic characteristics. The level or risk of a particular customer segment is then determined by analysing historical claims data. Such a system incorporates a certain degree of **systemic error** as all members of a particular risk class are not homogenous in their actual risk exposure and it relies on cross-subsidisation to balance a relatively high-risk customer against a relatively low-risk customer.

The recent **Test Achats ruling**, also called "gender ruling", by the European Court of Justice is a big threat to the preservation of the mutualisation model as is. It is described in detail in Section II.B.3 of this report. In a nutshell, it forbids insurers to take gender into account as a risk factor.

This could significantly reduce the accuracy of current risk pricing models by preventing a difference between low-risk (women) and high-risk consumers (men) in a particular risk class. This in turn could incentivise these low-risk consumers to look at other pricing options or deter them from seeking insurance altogether.

Product differentiation, especially in MTPL, is **minimal** and although service has become a focus area for most insurers, customer touch-points are too few and far apart to have a big impact on purchase behaviour.

As a result, we expect strong price competition to continue in the foreseeable future. The high instances of fraud are also hurting the industry and thus far insurers have struggled to find a workable solution to combat this.

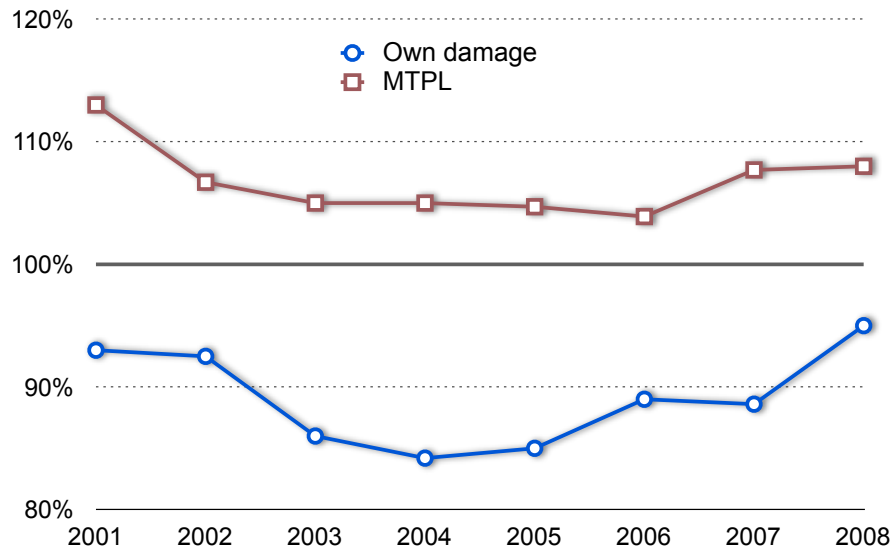
Therefore, we believe that **the present mutualisation model is no longer the optimum solution for the industry**:

- Low mileage drivers pay for road warriors;
- Prudent drivers subsidise, to a certain extent, drivers that display an aggressive behaviour;
- Honest drivers pay for fraudsters;
- Better protected drivers (which take Own Damage policies) subsidise customers with minimal coverage (MTPL policies) and
- Last but not least, customers without cars pay for those who own a car (due to the fact that other insurance activities subsidise the loss making automobile insurance business).

Therefore, the **current system goes against fairness** but also against safety, against the preservation of the environment and even against a better protection against risks.

In our view, **this is not the most efficient model any longer**. Moreover, it is not sustainable. Such high levels of losses will be difficult to support in the long run as the profitability of other sectors deteriorate, notably life insurance.

Figure 27: European motor insurance average combined ratio (in %)



Note: Combined ratio = (Claims expenditure + operating expenses) / gross earned premiums on home territory
Source: CEA

While the sector could initiate a large cost-cutting exercise (as has been the case in the Netherlands for instance), we believe that an improved evaluation of risks and a more active management of drivers' behaviours could offer significantly better prospects to insurers.

In other words, the motor insurance offers favourable conditions for a change towards more modern methods of risk pricing.

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II. TELEMATICS-ENABLED INSURANCE: THE NEXT STAGE?

A. Telematics is now an impending necessity

1. The benefits of telematics

The current motor insurance environment is difficult at best due to the limitations of the mutualisation model. In such a situation, it becomes necessary for insurers to look at alternative solutions.

Telematics offers insurers the opportunity to revolutionise the way in which motor insurance is carried out. Through telematics, motor insurance can potentially change from a burden that is discharged annually to a subscription service. Customers pay for insurance based on their usage in a similar way they do for other utilities such as electricity or mobile telephony.

We compare in the table below the benefits and drawbacks of traditional motor insurance schemes with telematics-based schemes.

Figure 28: Comparison between traditional motor insurance and telematics-based insurance

	Standard insurance	Telematics-enabled insurance
Advantages	<ul style="list-style-type: none"> • Simplicity of the model for customers and channels • Level of premium is known in advance 	<ul style="list-style-type: none"> • Ability to adapt premium to actual risk level • Self selection • Ability to detect numerous cases of fraud • Stolen vehicle recovery capability • Ability to provide feedback to driver • Incentive on reducing risk of accidents • Recurring relationship between insurer and customer • Ability to reduce fuel consumption • Crash post-accident analysis • Ability to improve actuarial models
Disadvantages	<ul style="list-style-type: none"> • Takes primarily into account statistical risk factors rather than individual factors • Creates adverse selection by attracting high mileage drivers, high risk drivers • Limited ability to control creates an incentive to fraud • Unability for the insurer to dynamically adjust the premium (only the year after) 	<ul style="list-style-type: none"> • Required installation of an on-board device (except in the OBD model) • Cost of the device • Uncertainty on the level of the premium • Impact on driver's privacy

Source: PTOLEMUS

Telematics brings numerous advantages to insurers and truly revolutionises several dimensions of the motor insurance business.

First, **telematics transforms the risk management process** by providing accurate mileage and driving pattern data. Furthermore, since this data can be transmitted at regular intervals, the insurer can more easily create forward-looking risk estimates rather than relying on historic driving behaviour to estimate future risk.

Secondly, telematics can contribute to create a recurring relationship between the insurance company and the customer. **The insurer truly enters the service business.**

It also assists in the processing of **claims** as the data from the telematics unit can be used to determine fraud and accountability for accidents.

We will detail these advantages in the coming sections.

2. Telematics will come from competition

The **biggest incentive** to shift to telematics however comes from **competition**.

With the cost of the technology falling, more and more insurers are considering telematics-enabled insurance products. Indeed, a number of new entrants have emerged in this market such as Coverbox, Insure the box and iKube who have used the cautious nature of incumbent providers to their advantage.

In a way, this **evolution is similar to what happened earlier to direct online insurance**. While online insurers first emerged in the 1990s, large insurance companies did not launch Internet-based operations before the following decade.

In France, insurers did not launch credible alternatives before 2008 (with the beginning of Amaguiz, ID Macif and Alo@Assurances). They probably perceived that they had the most to lose in a systemic change. They also had a channel conflict between their agent and broker channels and this new direct channel.

UBI products naturally appeal most to low-mileage and low-risk users. With their competitors and new entrants setting up telematics-based products, it will become increasingly difficult for an insurer to retain these customers. Other insurers will therefore be forced to follow suit or significantly increase their premiums to offset the increased risk profile of their customers.

Thus telematics can also be used as a defensive strategy and not just an aggressive one.

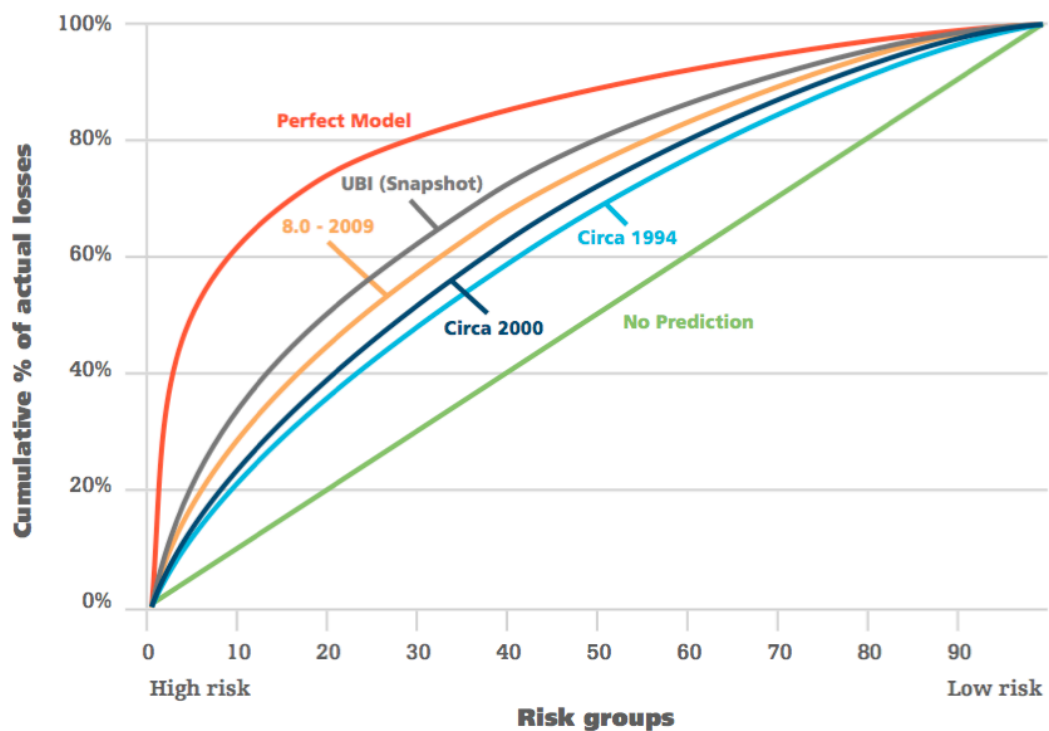
In the end, **the key change factor could be the impact of telematics on the assessment of risks in the customer portfolio.**

In the US, **Progressive** seems to strongly benefit from its telematics-based plan. Not only has it attracted around 600 000 customers with its UBI policies but it reports an average 3% annual growth of its personal motor insurance premiums in the last 5 years and an 8% rate in 2010.

While telematics is only one of several factors, Progressive indicates that it is still impressed by “the loss prediction power of usage-based rating”. It proclaims that it has reached its **best predictability rates ever** with its telematics-based *Snapshot* plan, as shown in the chart below.

These results are all the more remarkable as Progressive Snapshot’s can record drivers’ patterns only during the 6 month-observation period. A permanently installed device would provide even better results. For example, it would be able to identify new drivers of a car.

Figure 29: Telematics-based insurance predicts risks better than previous actuarial models



Source: Progressive Insurance

In the end, companies that react quickly to this new market opportunity could benefit the most. They will be able to learn from their experiences and be better positioned to discover the ideal offering for their own market and customer base.

A. Why telematics will grow faster than ever

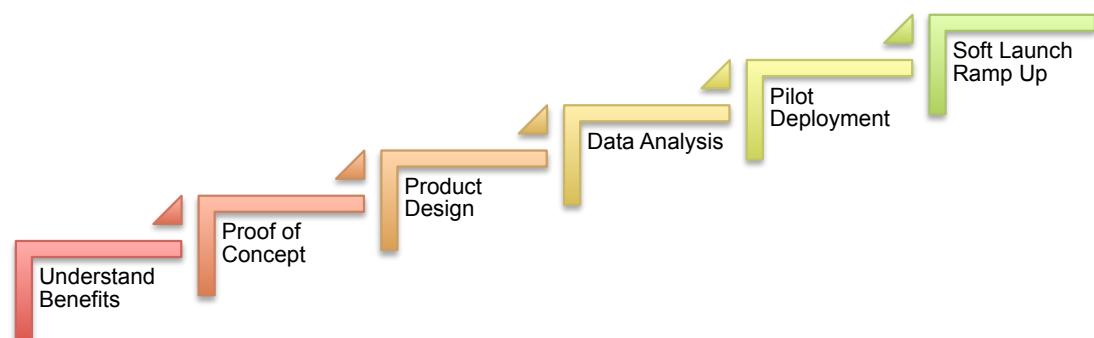
Despite the theoretical benefits of telematics-based insurance over existing insurance products, the uptake by insurers has been relatively prudent, except in Italy.

A number of initial explorers of this idea were put off by the high cost of the technology, the privacy concerns of end-consumers and the difficulties in implementing this new system.

Since then, however, the industry and the public are beginning to understand the benefit of a telematics-enabled solution and start-ups such as Coverbox have served as a proof of concept and also helped gather sufficient data for actuarial analysis of risk factors.

A number of insurers have undertaken pilots and soft launches of PAYD/PHYD solutions to test the waters with fairly successful results. They have gone through the different steps of the telematics innovation process, shown below.

Figure 30: The stages towards mastering a PAYD/PHYD insurance product



Source: PTOLEMUS

We expect that, within the next 5 years, almost every insurer will have launched telematics UBI products and those already in the market will look to ramp up their operations and add more products to their PAYD portfolio.

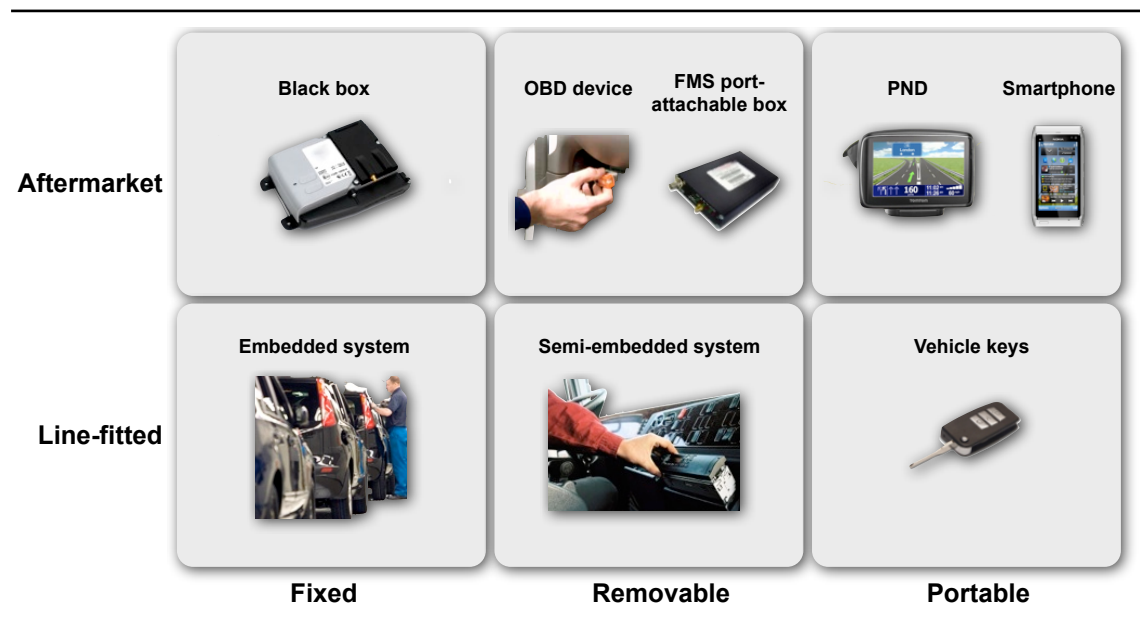
We detail hereafter the rationale behind this prediction.

1. Technological drivers

There are multiple solutions to connect a vehicle, each of which has advantages and drawbacks. Some of these come from the consumer market (for example, embedded navigation systems, OBD devices and smartphones) while others have been developed for commercial vehicles (standard black boxes or boxes attachable to the FMS port).

We insist upon the fact that the solutions shown in the chart below are theoretical and will need to prove that they can be applied to the specific requirements of the insurance industry.

Figure 31: Potential solutions to bring connectivity to the insured vehicle



Source: PTOLEMUS

So far, the insurance telematics industry has primarily relied on

- Dedicated **black boxes**, also called **On-Board Units (OBUs)** - in Europe for all segments and in the US for the commercial segment - and
- **On-Board Diagnostics (OBD) dongles** - in the US personal line segment.

Obviously, other, more affordable solutions exist, notably the use of embedded connected systems (if deployed at a large scale such as eCall) or the mobile phone.

In this section, we will examine how the cost of existing solutions will evolve and whether new solutions can emerge.

a. More affordable black boxes

The costs of implementing a telematics-based insurance policy with a specific black box can be broken down into **4 main components**:

- The cost of the On-Board Unit (OBU),
- Installation (and potentially des-installation) costs,
- Recurring costs such as data connectivity costs and
- The cost of building or switching back-end systems and processes to support the new product.

Since the first implementations in Europe, **OBU costs** have come down drastically. While the industry and indeed the devices themselves continue to evolve rapidly, a certain degree of standardisation has been established and the growing size of the telematics market has also enabled all manufacturers to start realising economies of scale.

Moore's law for PCs famously states that the number of transistors that can be placed on an integrated circuit doubles every 2 years. Combined with the increasing speed of transistors, this leads to a doubling of computing power every 18 months.

We foresee a similar level of progress to apply to telematics, pushing towards fast decreasing prices - at equivalent functionalities - of OBUs for PAYD.

As we already experience in other telematics markets such as fleet management or eCall, we will witness **greater commoditisation of the telematic box**. The bill of material (BOM) of components necessary to assemble an insurance OBU is decreasing fast:

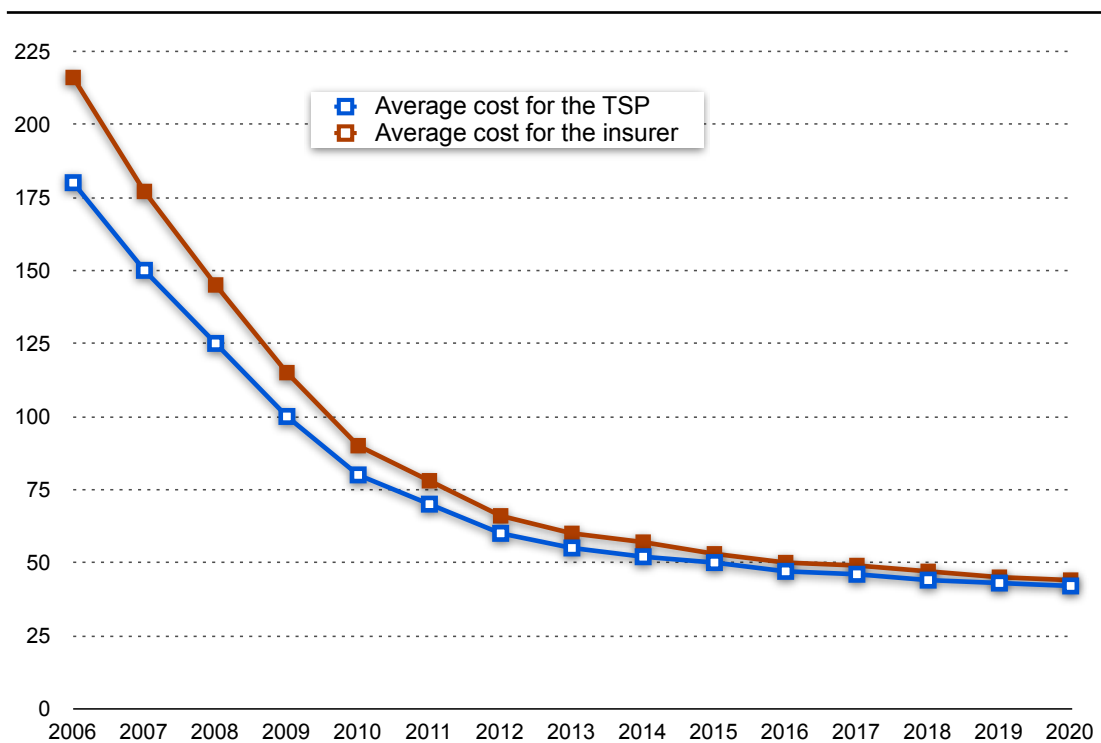
- GPS chipsets now cost as little as \$1,
- Accelerometer prices have also fallen below \$1,
- At equivalent functionality level, processor costs decrease by 15-20% a year. In addition, the majority of TSPs use ARM processors that run the Linux Operating System, which is royalty-free;
- Connectors do not cost much more than manufacturing costs (in China).

Most of these components are now integrated into a single module that is generally sold between \$10-25 depending on the functionalities.

This price trend is due to the take off of the M2M (machine-to-machine) market but also to the phenomenal growth of the smartphone market, which creates economies of scale for all producers. This **fast reduction in the price of the OBU paves the way for making insurance telematics mass-market.**

We expect it to continue but at a slower pace as it is partly counter-balanced by the integration of new functionalities - for example compatibility with 3G cellular networks or inclusion of chipsets supporting the Glonass (in 2012) and Galileo (in 2015) constellations.

Figure 32: The average cost of a PHYD-capable black box* (in €)



Source: PTOLEMUS estimates (*relates to a professionally installed device)

b. Low cost OBD solutions

When considering the overall cost of equipping a vehicle with an OBU, clearly the installation process is one of the largest components. It is also a delicate step of the customer commissioning process because the insurer risks losing the customer if the installation is not performed properly or if it is delayed.

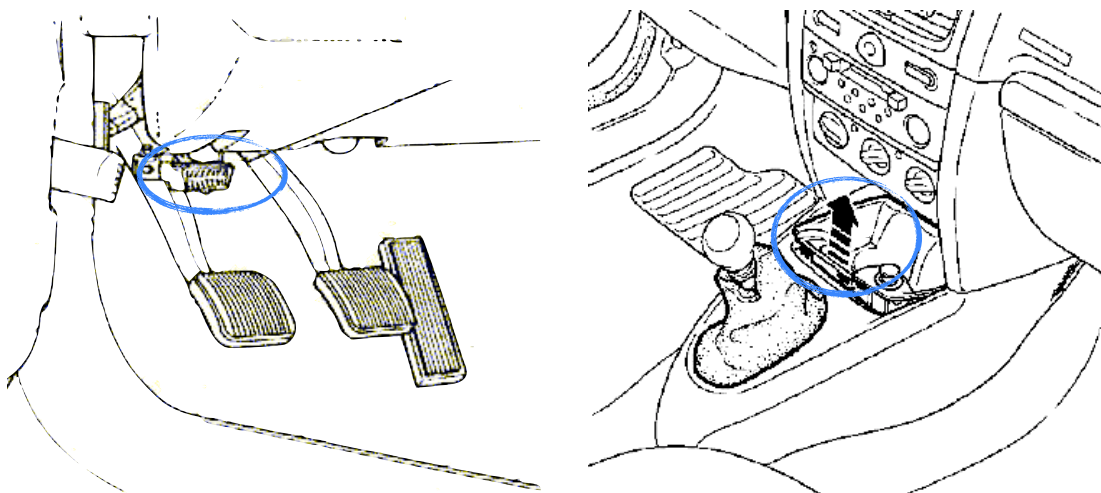
Installation costs continue to be a more complex issue for TSPs and insurers alike to solve because they are primarily based on relatively skilled human operations.

In the US, which benefit from a fully harmonised interface to the car network through the **On-Board Diagnostics port**, this has driven a **growing movement towards devices that customers can install themselves** by plugging these on the OBD-II port of the car.

These devices have their own challenges such as

- The inconvenient location of the port (see below),
- The implied difficulty to receive reliable signal from a sufficient number of GPS satellites,
- Risks of unintentional tampering with the equipment,
- The potential for fraud due to the conflict of interest between the insurer and the policyholder.

Figure 33: Typical locations of OBD ports are challenging places for a connected device



Source: OBD Codes, Fastchip

However, in Europe, certain automotive manufacturers or dealerships, for example BMW, have also raised the issue of a potential lapse in car warranty through the use of the OBD-II port.

While TSPs do not all agree on the exact compatibility of OBD devices on European vehicles, there have been issues in the past, which seem to further limit their potential in the EU.

However, we can easily envisage that **large vehicle dealerships** or **major leasing companies** could relatively easily and cheaply deploy these devices for all the vehicles they have. This would require them to test the device on the selected vehicles they market and potentially to amend their purchasing contracts with OEMs in a way that makes it possible.

In any case, the OBD solution would be an attractive option to completely remove implementation costs.

Furthermore, **OBD dongles generally cost less** than standard black boxes fit for insurance purposes. Typically, these devices are sold at prices between €70-100, depending on the level of configuration and customised required by the insurer.

c. Smartphone penetration

Asked what was Nokia's strategy to connect the car, a Nokia representative famously responded that cars were already connected because everybody owns a mobile phone and brings it in the car.

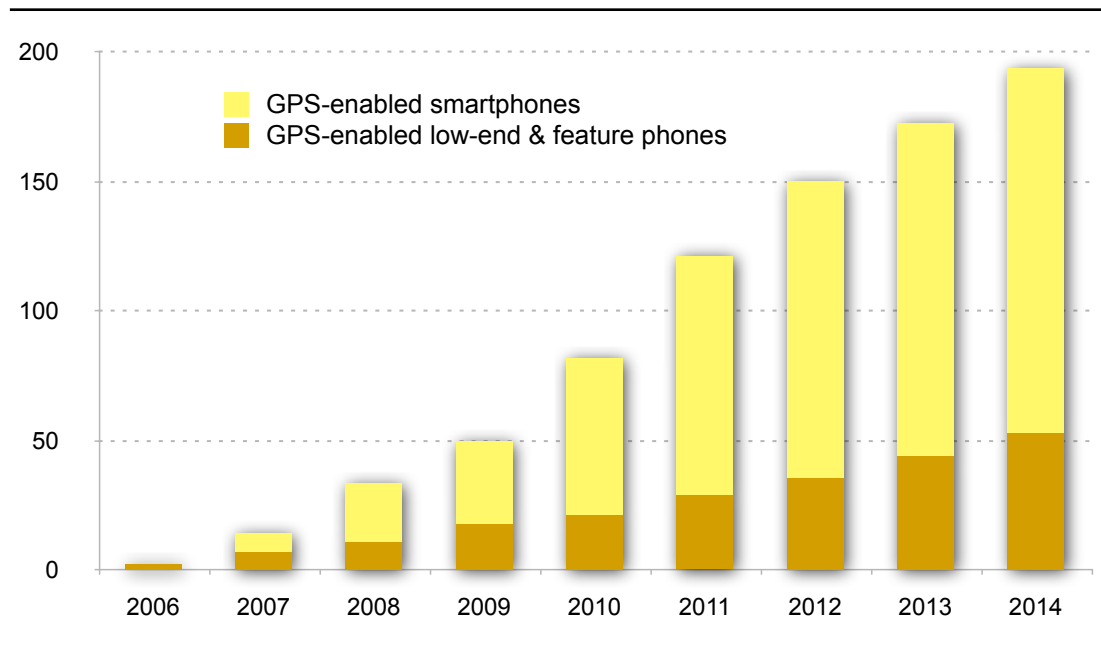
In a way, this is true and the potential of the mobile phone as an insurance data probe needs to be evaluated. Obviously, smartphones are the most obvious candidates for this application since almost 100% of these are equipped with positioning systems and come with a data bundle.

Smartphone everywhere

According to IDC, for the first time, smartphone shipments have exceeded those of feature- and entry-level phones in Europe in 2011.

As a result, GPS chipsets are increasingly finding their way into mobile phones. We are increasingly geo-located every time, everywhere, as analysed in depth in our [European Location Study](#).

Figure 34: Increasing use of GPS in mobile phones in Europe (in million units)



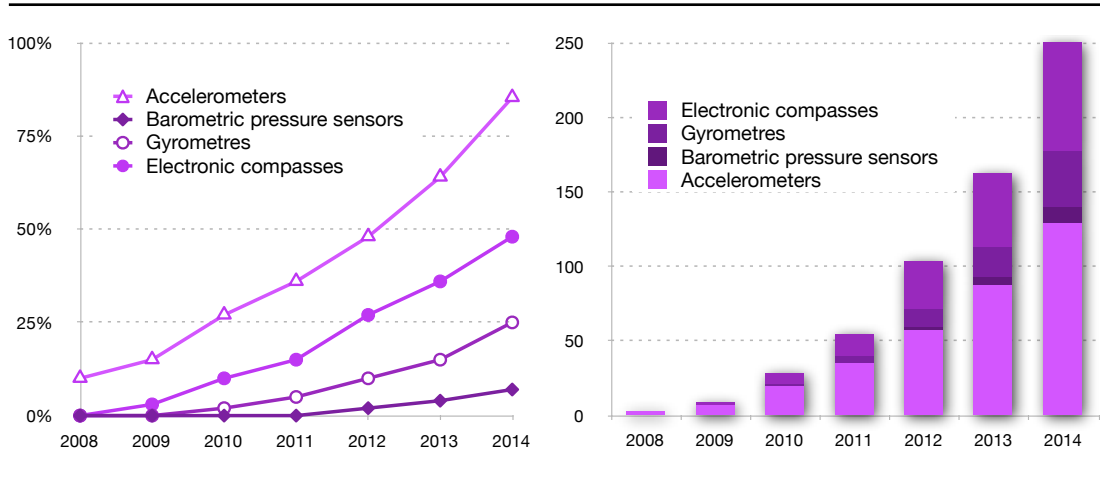
Source: PTOLEMUS (2010)

Above and beyond GPS, mobile devices are increasingly able to use **micro-electronic sensors** to determine where they are, how high they are and which direction they are facing. The penetration of **MEMS** (Micro-Electro-Mechanical Systems) in smartphones is growing rapidly, primarily driven by Apple and Samsung.

These include:

- **Accelerometers** which can record acceleration and braking patterns and instances of hard or sudden braking ,
- **Electronic compasses** that can help in navigation,
- **Gyroscopes**, used as dead reckoning sensors for indoor or in-tunnel navigation,
- **Barometric pressure sensors**, used to provide elevation in an outdoor or indoor context.

Figure 35: Penetration of MEMS in smartphones and volumes sold in Europe (in millions)



Source: PTOLEMUS (2010)

These developments then beg the question whether smartphones could be used as a data capturing and transmission tool for insurance telematics purposes? Could a smartphone replace the embedded telematic devices currently favoured by insurers in Europe?

Industry experts in Europe do not seem to think so. Most of the participants at the Insurance Telematics Europe conference in 2011 were dismissive about the practicality of using smartphones. Most of the insurers and TSPs we have interviewed have shown the same prudence about this.

The challenges of the smartphone data probe

Various **reasons** have been cited for their **reluctance** to use a smartphone as the OBU.

First, insurers are afraid that the smartphone data will not be **reliable** since it can be tampered with, intentionally or otherwise. Mobile operating systems have not been designed to deliver mission-critical services and offer to hackers possibilities of security breaches. This explains why a company such as Good Technology has developed a specific version of Android called *Secure Android* to have its messaging & recovery solution used by the US DoD (Department of Defense). It even required specific certification by the DISA (Defense Information Systems Agency).

Secondly, question marks exist over the **accuracy** of smartphone-generated data. Any data that is generated by a terminal that is not attached to the vehicle will be useless. Vibrations will prevent proper analysis of the driving patterns.

Thirdly, there is also a **potential conflict of interest** with the user. It is in the driver's interest not to have / switch on his mobile phone to reduce his/her insurance bill. Although this might be only a short-term profit, it cannot be excluded.

Fourth, even all these conditions are met, there remains the question of insuring the customer in case he/she **forgets** his mobile phone or has it **stolen**.

Furthermore, use of smartphones as an OBU alternative will necessitate a change in the method of pricing insurance; **instead of providing coverage per car, insurers will have to consider providing coverage to each driver**. It will also exclude the population that doesn't own a smartphone from the target market.

Thus, until smartphones can provide actuarially accurate and reliable data feeds and achieve a high penetration of the target market, insurers and service providers alike seem reluctant to deploy them.

Why the time of smartphones will come

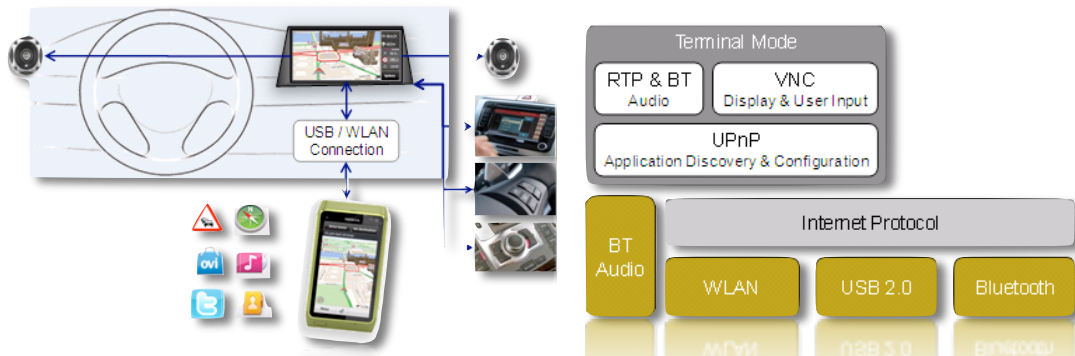
While all this is true, we believe that **the case for the smartphone needs to be revisited**. In our view, none of the obstacles that stand in the way are impossible to overcome. The pace of innovation in the smartphone industry could **make the smartphone relevant for insurance purposes within the next 3-5 years**.

For instance, Progressive has announced that it expects to launch a new telematics device that will include a **3-axis sensor** (forward, upward, lateral). Interestingly, the iPhone brought a 3-axis gyroscope in June 2010, i.e. before the dedicated insurance box.

In particular, improvements in the integration of the smartphone into the car could provoke a breakthrough in the user experience. The Car Connectivity Consortium, led by **Nokia**, could bring this much needed change by standardising the interfaces between the car and the smartphone.

MirrorLink (formerly named Terminal Mode) uses the car display to replicate the smartphone screen. As a result, the driver can control his smartphone from the car display and use his normal applications (make calls, use his phone navigation, etc.). In addition, the user benefits from a better sound and integration with the driving experience.

Figure 36: MirrorLink's functioning and high level architecture



Source: Car Connectivity Consortium, Fareastgizmos

The success of this initiative primarily depends on the adoption by automotive OEMs and their tier-1 suppliers.

Within 2 years, **almost all automotive OEMs have joined the consortium**, as shown in the next figure. This indicates that it is **likely to become the standard way to integrate the smartphone within the car**.

Figure 37: Car Connectivity Consortium members

Charter members	Core members	Adopters
<ul style="list-style-type: none"> Alpine General Motors Honda HTC Hyundai Kia Motors LG Electronics Mercedes Benz Nokia Panasonic PSA Peugeot Citroën Samsung Toyota Volkswagen 	<ul style="list-style-type: none"> Aisin AW BMW BT Software and Research Inc Clarion Delphi Denso Elmic Systems Ford Fiat Fujitsu Ten Jambit Ixonos Jambit KDDI Mitsubishi Electric Motorola Mobility Pioneer QNX RealVNC Renault Renesas Electronics Robert Bosch Sony Sony Ericsson Valeo 	<ul style="list-style-type: none"> Akita Electronics Systems AllGo Embedded Systems Audiovox Electronics Garmin Harman Huizhou Desay SV Auto. Huizhou Foryou Hyundai Mobis J & K Car Electronics MDS Technology OMRON Software Qisda Shanghai PATEO Shenzhen BYD Auto Skypine Electronics Technisat Digital Tokai Rika

Source: Car Connectivity Consortium

Given that Google is in the process of acquiring Motorola, this means that **Apple could now be the only major handset-maker that has not joined the consortium.**

In addition, the **MirrorLink system is now working** as is proven through Alpine's recent launch of a MirrorLink-enabled aftermarket device and Panasonic's in-car display.

Figure 38: Alpine's ICS-X8 App Link Station, launched at the Frankfurt Motor Show



Figure 39: Panasonic in-car display, compatible with MirrorLink and available for Toyota cars



Source: Alpine

Thus, we could expect vehicle manufacturers to gradually introduce compatible cars, which would also include adequate smartphone **docking stations**. Although this would have been impossible in the past (due to heterogeneous charging solutions), the emergence of the UCS standard (Universal Charging Solution) based on Micro-USB will permit **standard docking stations**. **All major smartphone makers, including Apple, have signed the European Commission's related MoU.**

Consequently, it could become possible to **properly attach a smartphone to the vehicle within the coming 3-5 years**.

Let us now compare the **accuracy** and **potential reliability** of smartphones as an in-vehicle data probe with standard OBUs.

To do this, we compared the world's most popular telematics insurance device i.e. the Clear Box manufactured by Meta System for Octo Telematics with the most popular smartphone, Apple's iPhone. A head-to-head comparison of the two devices is shown in the table below.

Figure 40: How they stack up - Octo's Clear Box 2.0 vs. Apple's iPhone 4S

Domains of superiority are highlighted in yellow

Particulars	Clear Box 2.0	iPhone 4S
Positioning technologies	A-GPS (+ EGNOS and WAAS assistance systems)	A-GPS, GLONASS, WiFi and Cell-ID (+ EGNOS and WAAS assistance systems)
Positioning accuracy	50% probability of a position in a circle with radius of 2 meters	N.a.
TTFF (Time-to-first-fix)	30-40 seconds on average (external GPS antenna)	1-5 seconds in urban environments thanks to WiFi positioning & Glonass
Accelerometer	3 axis with 10g scale	3 axis with $\pm 2g/\pm 4g/\pm 8g$ scale
Gyroscope	No	3-axis MEMS gyroscope
Digital Compass	No	Yes
Ambient light sensor	No	Yes
Processor	ARM7	ARM Cortex-A9 Dual-core 1 GHz
Memory	Typically 128-256 MB flash memory	500 MB RAM, 16 GB - 64 GB HDD
Data transmission	GPRS	GPRS, 3G HSPA
Display	None	3.5" TFT
Bluetooth connectivity	Yes	Yes (4.0 - Low-Energy)
CAN bus connectivity	Optional	No
Operating temperature	-30° to +85°C	0° to 35° C
Non-operating temperature	-40°C to +100°C	-20° to 45° C

Source: PTOLEMUS

From the technical analysis above, it is evident that the iPhone 4S matches and even exceeds Meta System's Clear Box in most critical requirements.

The only advantages of Meta System's device are its slightly more sensitive accelerometer and its ability to work under extreme temperature conditions. However, the sensitivity difference is minimal and a smartphone does not need to work at low or high temperatures in a vehicle, at least in most countries.

The iPhone 4S does also miss CAN bus connectivity, currently an optional feature on professionally installed devices but generally available on OBD plug-in devices. However, according to the Car Connectivity Consortium, this is being developed and the smartphone could be connected - via the MirrorLink standard - with various in-car data networks including the CAN bus in the near future.

Overall, the **iPhone capabilities exceed the Clear Box'** for 3 simple reasons.

First, the iPhone 4S is a brand new terminal whereas the Clear Box' is old, based on an ARM7 design and a chipset launched by STMicroelectronics in 2007, i.e. the year when the first iPhone was launched by Steve Jobs!

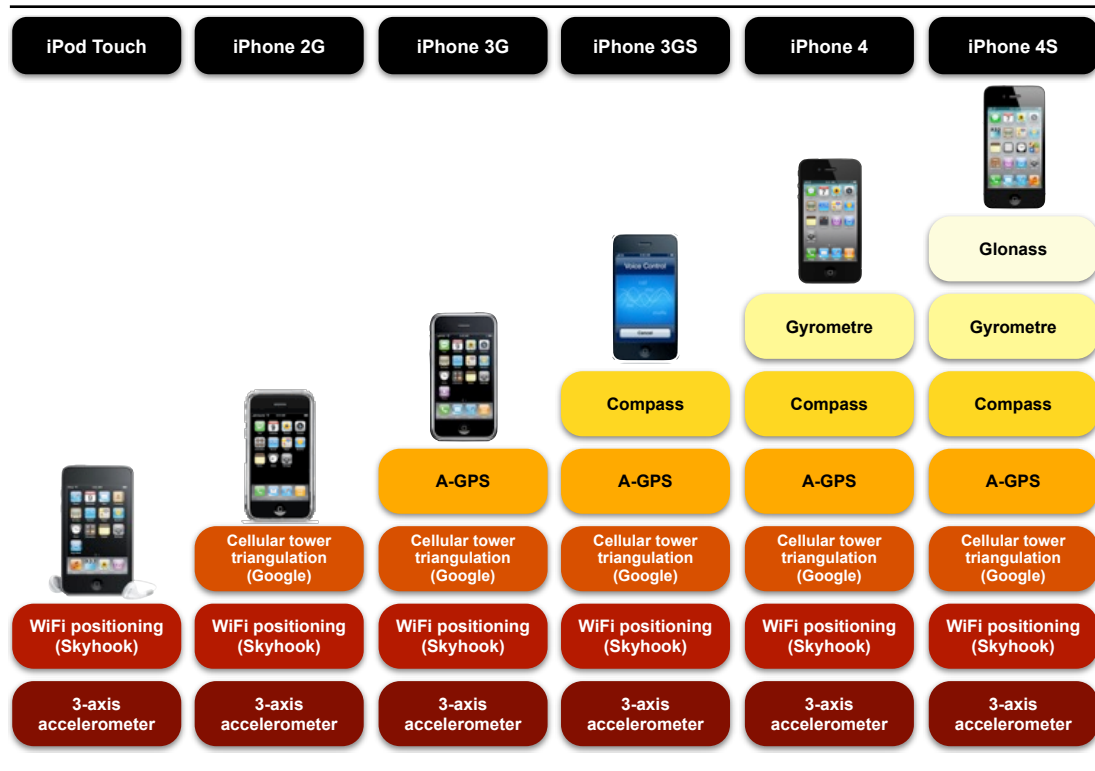
Secondly, the latest iPhone is sold in retail at €600-800 (without subsidy) whereas the Clear Box is sold by Meta System below €200 (and much less in large volumes).

Thirdly, all handset makers, from Apple to Nokia, have prioritised the improvement of positioning over numerous features.

As is detailed in the next figure, **Apple** has shown the way by introducing improved positioning for every single version of the iPhone.

To better understand why, please refer to our [European Location Study](#).

Figure 41: The iPhone - New positioning features launched every 10 months



Source: PTOLEMUS

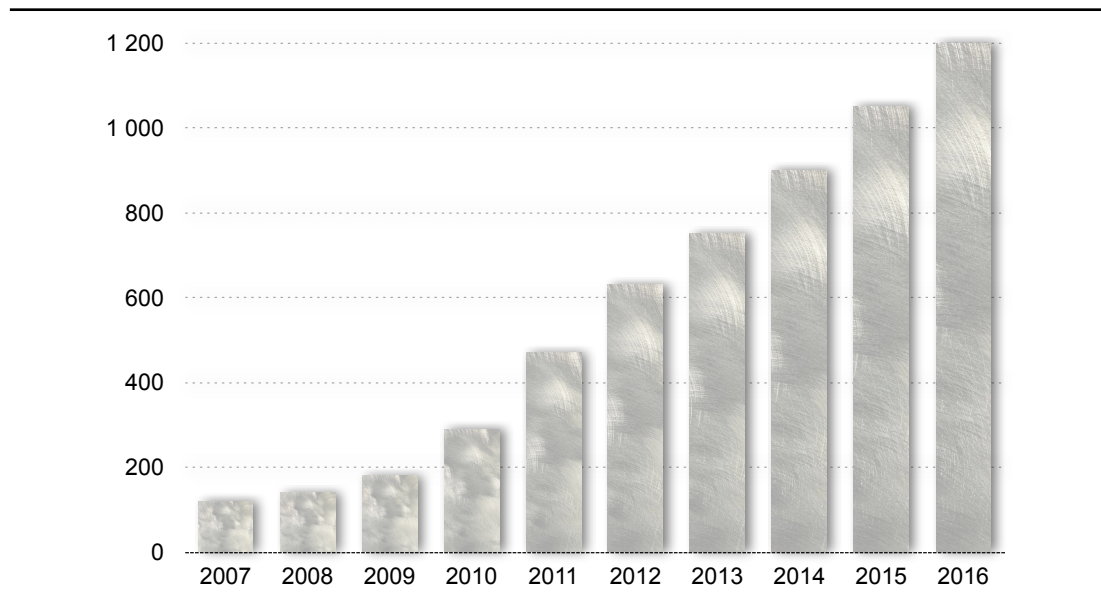
This sums up well the **challenge** for all non-smartphone device makers.

How to compete against devices that

- Are designed by the world's largest technology companies,
- Are then subsidised by mobile operators (in many developed countries),
- Will soon reach volumes of one billion unit (over 450 million in 2011) and
- Have a 12-16 month technology life cycle?

This challenge by the smartphone has already, to a certain extent, taken its toll on the Personal Navigation Device (PND) form factor. In 2011, according to TomTom, the combined North American and European markets declined by 29%.

Figure 42: Global smartphone shipments - The irresistible growth (in millions)



Source: PTOLEMUS estimates

Thus, the smartphone is certainly capable of becoming the next OBU for the insurance industry. Admittedly, implementation issues exist such as the elimination of noise in collected data and prevention of fraud but these are obstacles rather than permanent barriers.

Therefore, in our view, using the smartphone for insurance has not worked because nobody has really tried hard enough!

Using smartphones as the black box could indeed be revolutionary for the telematics-enabled insurance market.

For a start, it would eliminate the need for capital expenditures on a dedicated box thereby reducing the adoption costs for both insurers and consumers. It would also eliminate the hassle of installation and de-installation as it can be readily moved from one car to another and from one insurer to another. Thus, smartphone as an OBU could make insurance telematics even a more attractive and feasible proposition.

In our view, the use of the smartphone for insurance telematics is now a question of time. We are aware that several industry leaders, notably Progressive, Aviva and Octo Telematics are looking at ways to use the smartphone.

Interviewed by the Wall Street Journal, Glenn Renwick, Progressive's CEO, even indicates that "[Progressive has] the R&D done. How we will use it...we don't know. But mobile is a very interesting proposition for us. It's the next step."

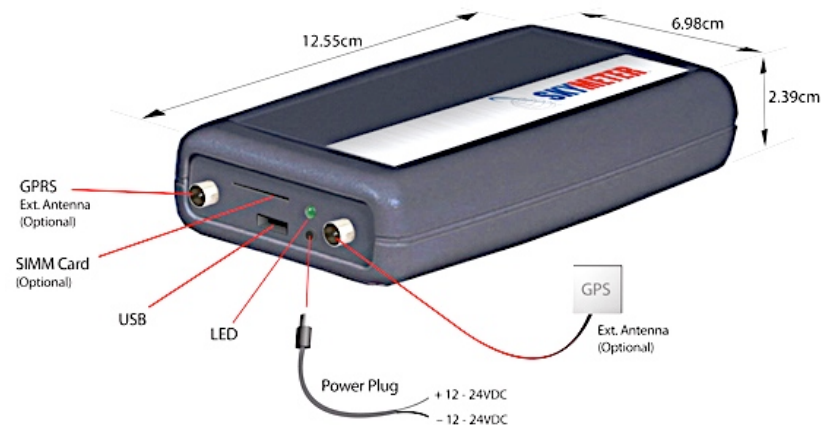
c. Reducing data costs

From a cost point of view, the optimum solution for insurers would be to see the **box pre-fitted** into the car at the manufacturer/dealer level itself.

The original on-board units (OBUs) were *thin clients* that simply collected data from the available sources such as the GPS antenna or CAN bus sensors and transmitted it to the TSPs. Now however, some telematic providers have developed *aggregating clients* that offer a sophisticated computing platform that enables service providers to install custom software modules inside the car. These systems add **in-car data aggregation capabilities** over the thin client platform.

Skymeter has developed one such device that combines the features of a Thin client and an Aggregating client to provide a hybrid functionality based on user requirements.

Figure 43: The Skymeter device works as both a Thin client and an Aggregating client



Source: Skymeter

Aggregating data helps to increase consumer privacy while also reducing the data transmission costs since all data is no longer transmitted in real-time. As a result, the device transmits the data only at periodic intervals.

Thanks to such optimised solutions, **SIM and M2M connectivity can now cost only a few Euros a year**, provided data exchanges between the OBU and the back-office server are kept under control.

d. Less impact on the back-office

According to a survey conducted in December 2008 by Exigen, the insurance software provider, among nearly 100 insurance executives, the first obstacle to the deployment of PAYD was the **cost of implementing core systems** for PAYD products (45%). The telematics device came third with only 17%.

This highlights the importance of back office costs for the success of insurance telematics.

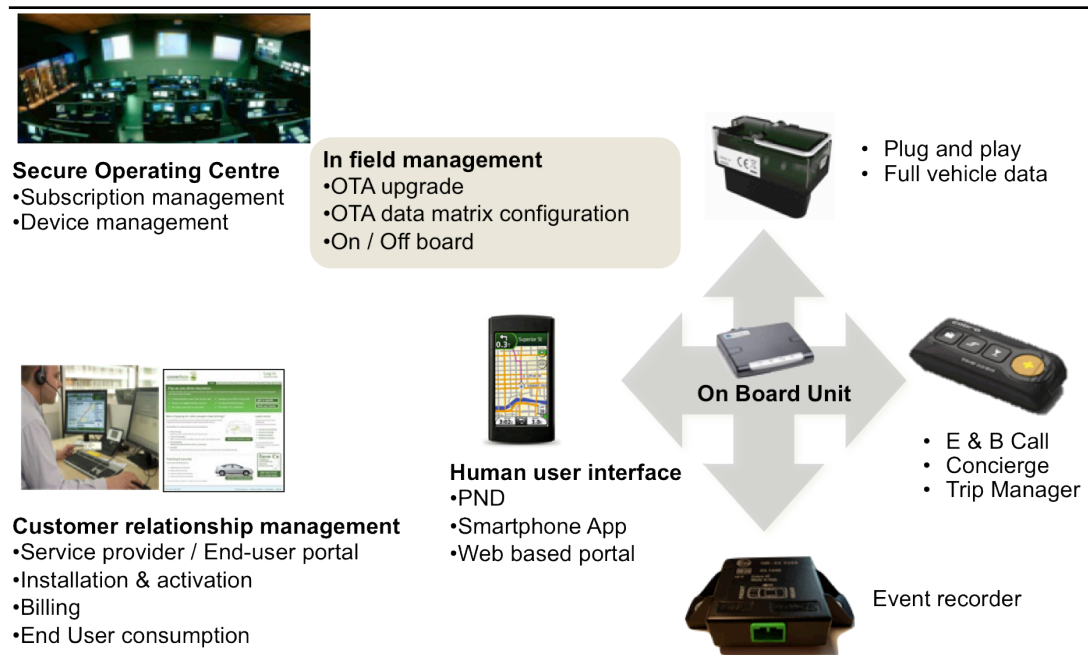
How have these costs evolved since then? Since all insurers continue to use legacy IT systems, transitioning to a modern technology-based platform can be a cumbersome and expensive process.

Use of modular solutions by TSPs and system integrators though can help to face this challenge. A modular design divides the total solution into more manageable units or modules that can be independently created and used. This allows functional partitioning of the system into scalable, reusable modules and permits reduction in costs due to faster learning curve and higher design flexibility.

Typical suppliers of such systems include TomTom Business Solutions, Mobile Devices and Lysanda. More details are provided in our Technology Solutions (Section IV).

While less "elegant", these pragmatic solutions help to reduce the time to launch for the UBI solution while remaining scalable to meet future needs.

Figure 44: A modular design can enable cost effectively setup operations



Source: PTOLEMUS

From our point of view, however, the **way to reduce the impact on the back office may end up being more radical** for incumbent insurers.

Small operations such as Insure the box and Coverbox in the UK have proven that an 8-figure software system is not required to do business in telematics.

This may push large insurers to **launch entirely separate IT systems to address the telematics opportunity**. This has been the strategy adopted by Amaguiz in France, which was launched as an almost completely independent start-up by Groupama. This is also what the Co-operative Insurance has done in the UK by using an external (Wunelli's) solution.

The benefits of this plan are clear. Insurers can invest in expensive systems only if they can find success in their telematics offering. In many ways, this resembles the strategy adopted by large insurers when they launched their online insurance units...

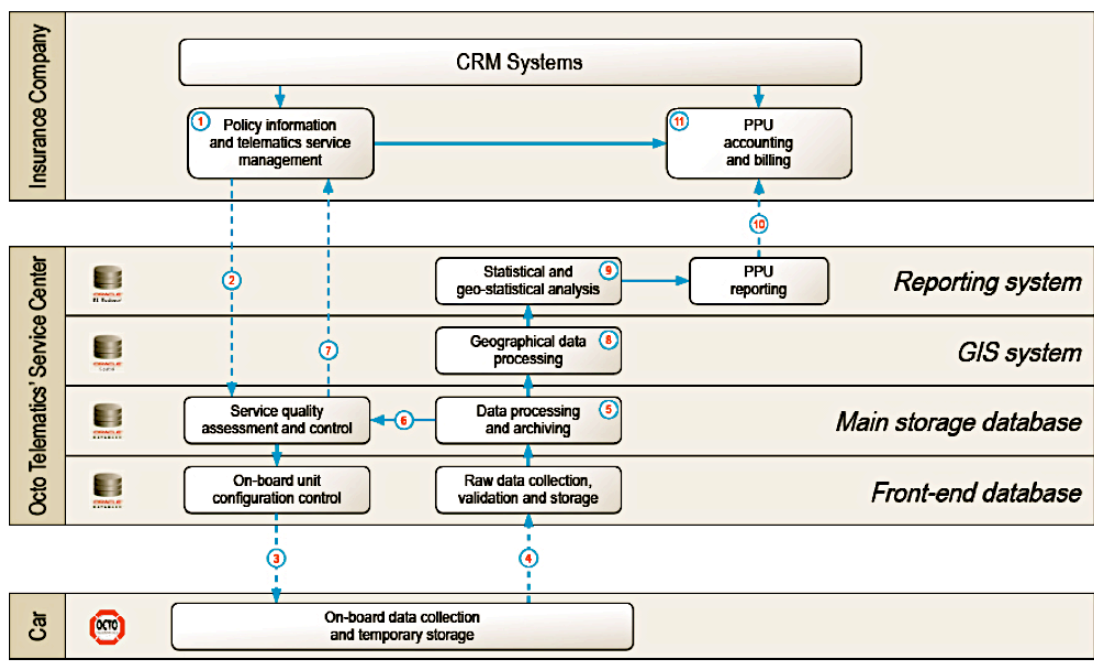
One TSP (Telematics Service Provider), **Octo Telematics**, has excelled at reducing complexity and costs for insurers **by providing an end-to-end solution**.

Octo Telematics' proposition to insurance companies includes 4 key components of a telematics back-office IT system:

- A front-end database that interfaces with the vehicle on-board units,
- A storage database to record all relevant usage and behaviour data, with a specific dataset for each insurer,
- A geographic information system (GIS) that translate latitude-longitude readings in actual mileage data and can provide information such as the road category,
- A reporting system that interfaces with the insurer's own pay-per-use (PPU) tariffing system.

The diagram below details Octo's back-office solution.

Figure 45: Octo Telematics' back-office architecture



Source: Oracle

In addition, for each new insurance customer, the IT system needs to control a number of other key processes, notably

- The device provisioning, SIM-provisioning and fitting, connectivity activation and testing process,
- The customer activation process, which is dependent on the proper installation of the on-board device in the customers' vehicle by a certified workshop,
- The customer des-activation process, which can be linked to the de-commissioning of the black box.

This is again something that is done by Octo Telematics. In other words, Octo's solution **avoid the need for each insurer to create its own telematics back-office system**. Insurers benefit from Octo's experience curve and economies of scale. Therefore the step is lower than with many other telematics suppliers.

This is very relevant for this initial stage of the market growth and it largely explains Octo's success so far. We expect an increasing number of telematics players to offer such packaged offerings, separately or together with integrators.

5. Economic drivers

a. Better risk management

Risk management is the heart of the insurance business and insurers are always looking for methods to improve their actuarial models and assess risk more accurately.

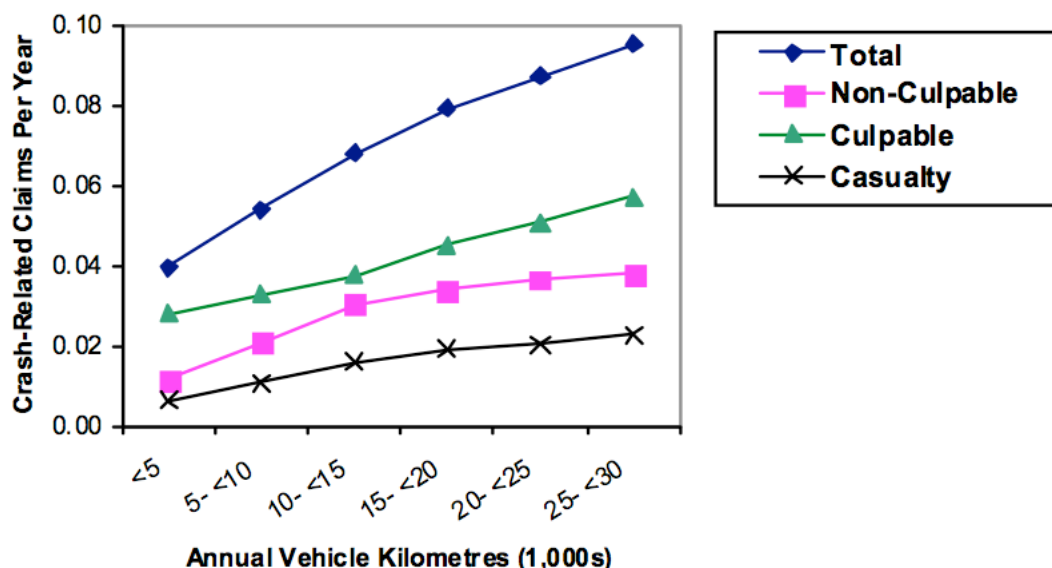
Although certain insurers have incorporated mileage-related rating factors such as commuting distance or annual mileage for several years now, none begins to approach actuarially accurate pricing.

Thanks to telematic equipment, insurers can measure the actual mileage and driving behaviour accurately and consistently enough for risk assessment.

Logic suggests that driving signatures and mileage should bear significant relation with the risk of occurrence of an accident. For example, if two drivers within the same risk class and with similar driving styles drive 1 000 miles and 5 000 miles a year respectively, then the latter should be far more likely to face an accident.

Initial data collected confirms this reasoning. Data based on independent odometer readings shows a strong relationship between mileage and claims within existing price categories. This was proven by Todd Litman as early as in 2001.

Figure 46: Probability of a crash-related claim increases with mileage in a given risk class



Source: Victoria Transport Policy Institute, Litman (2001)

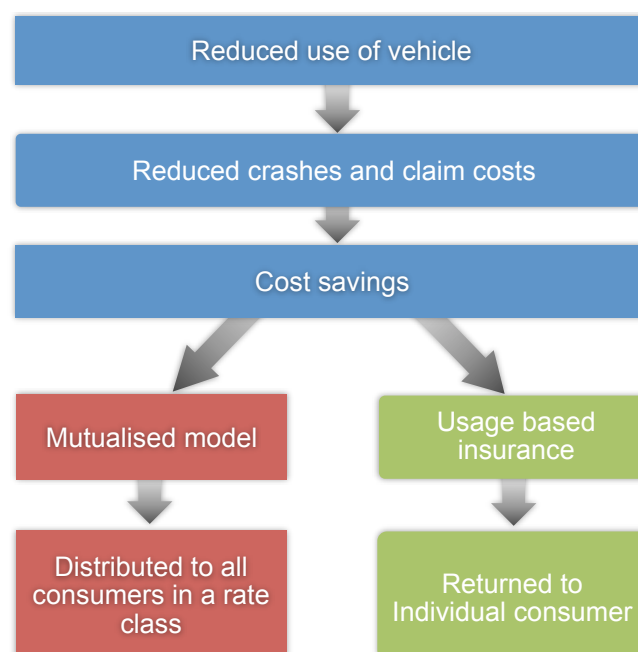
Note: Data created by matching annual mileage data collected at vehicle inspection stations with annual insurance claims data for more than 700,000 vehicle-years, in British Columbia.

Thus, one method for insurers to reduce claim costs would be to incentivise consumers to drive less. Lesser mileage translates into lower crashes and hence cost savings.

Under the present mutualised model however, these savings are distributed among all members of the associated risk class in the form of reduced premiums thereby significantly diluting the incentive to save.

Usage-based insurance models such as PAYD on the other hand correct this by employing **variable pricing which directly returns the cost savings to the individual consumer.**

Figure 47: Efficient risk pricing reinforces desired behaviour

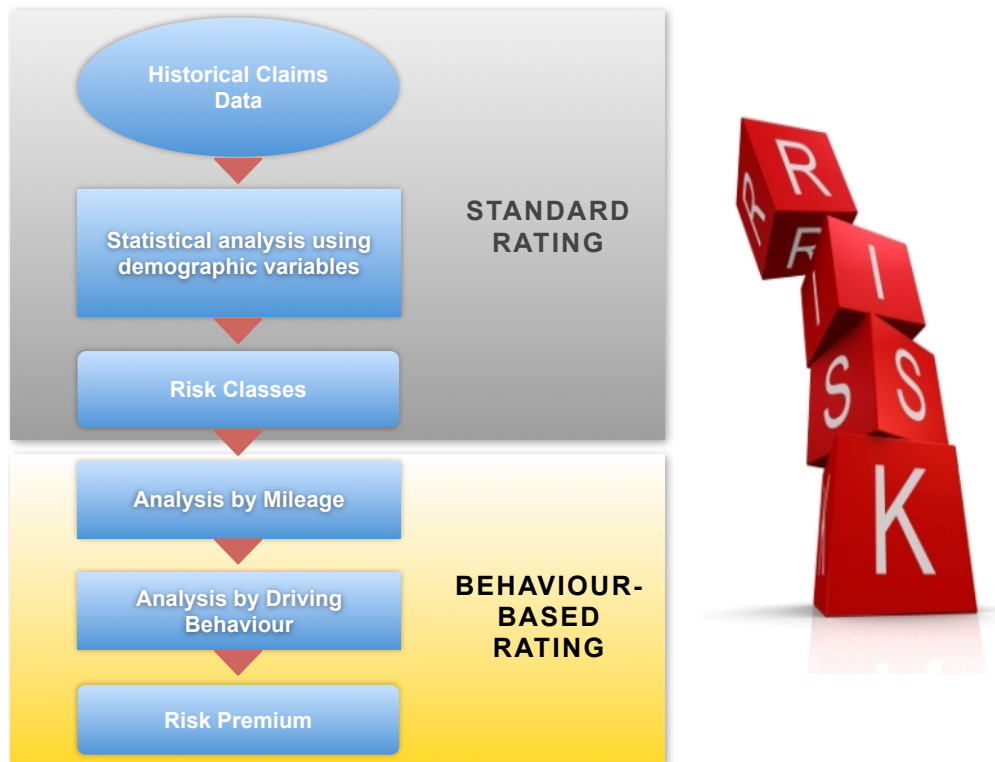


Source: PTOLEMUS

Contrary to the intuition, **PAYD / PHYD policies do not necessarily replace the risk classification of the mutualised system.** In fact, they can be considered **complementary** to the mutualised model and help in improving the accuracy of the risk pricing.

The following graph illustrates how mileage and driving behaviour can be used to refine the existing risk-pricing mechanism.

Figure 48: Existing risk pricing models augmented by use of telematics-captured data



Source: PTOLEMUS

Furthermore, this data can be collected in real-time and thus enables the insurer to **dynamically adjust the premium** if the level of risk represented by the insured changes significantly.

This contrasts with actuarial models, which are always based on at least 6-month-old data. A change in the environment (for example, reduced driving due to the economic recession which occurred in the UK in 2009) can be observed and factored in immediately.

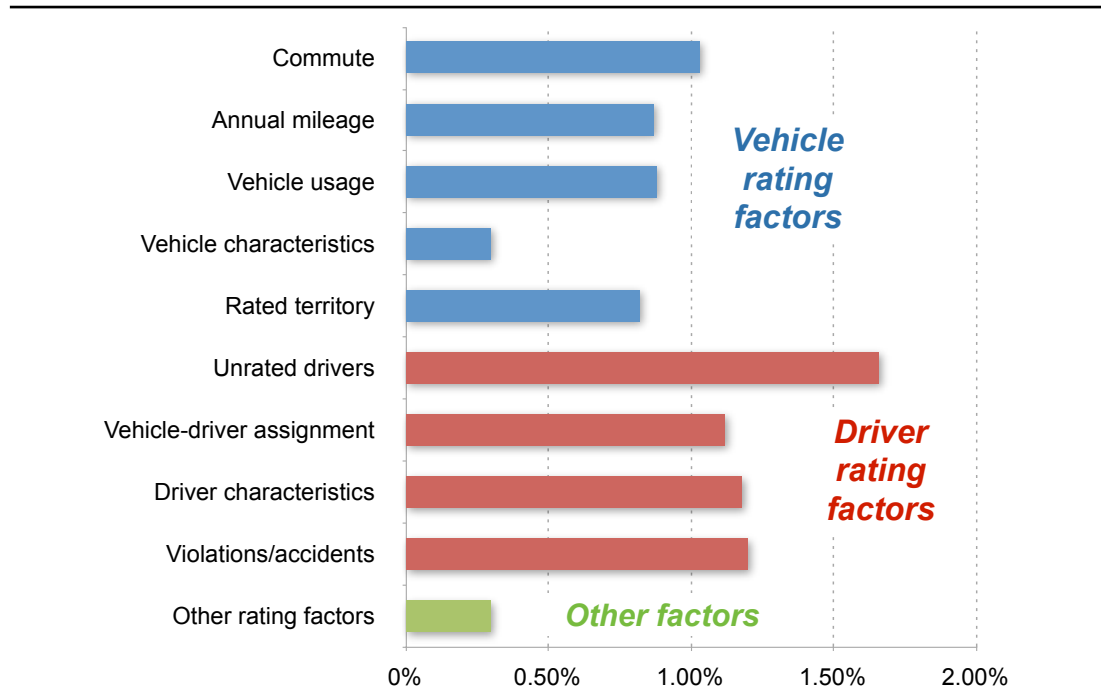
Quality Planning, a company that specialises in the validation of policyholder information, estimated that American personal motor insurers were on average making a **9.36% error in the premium evaluation** in 2010.

This was caused by two main factors:

- Changes in drivers' life (marriage, divorce, relocation, new occupation, etc.) and
- Misrepresentation by the customer or even the broker / agent (who would try and obtain a lower premium to secure the client).

Details behind this estimate of the underwriting error by rating factor are shown below.

Figure 49: Estimated premium loss by rating factor in the US market (2010)



Source: Quality Planning (based on the validation of 5 million policies)

As a result, American insurers lost \$15 billion in 2010 simply due to so-called "premium leakage". That amounts to almost **one-tenth of total collected premiums**.

In a way, this is the fatal result of a system that is primarily based on declarations rather than on facts!

Telematics allows information to be updated in real time thereby reducing this loss significantly.

Considering the underwriting losses faced by many major motor insurers over the last decade, we can expect to see an increased adoption of telematics to improve the risk assessment and management process.

b. Customer retention

Given the extremely competitive nature of the American and European motor insurance markets, customer retention is a key aspect in the commercial strategy of most insurers and many of them have invested heavily in improving their customer service with this in mind.

Due to the intangible and annualised nature of current motor insurance however, most customers only experience the service of an insurer in the event of a claim.

Thus, **there is only minimal contact between the insurance companies and their best customers** - those that do not make any claims.

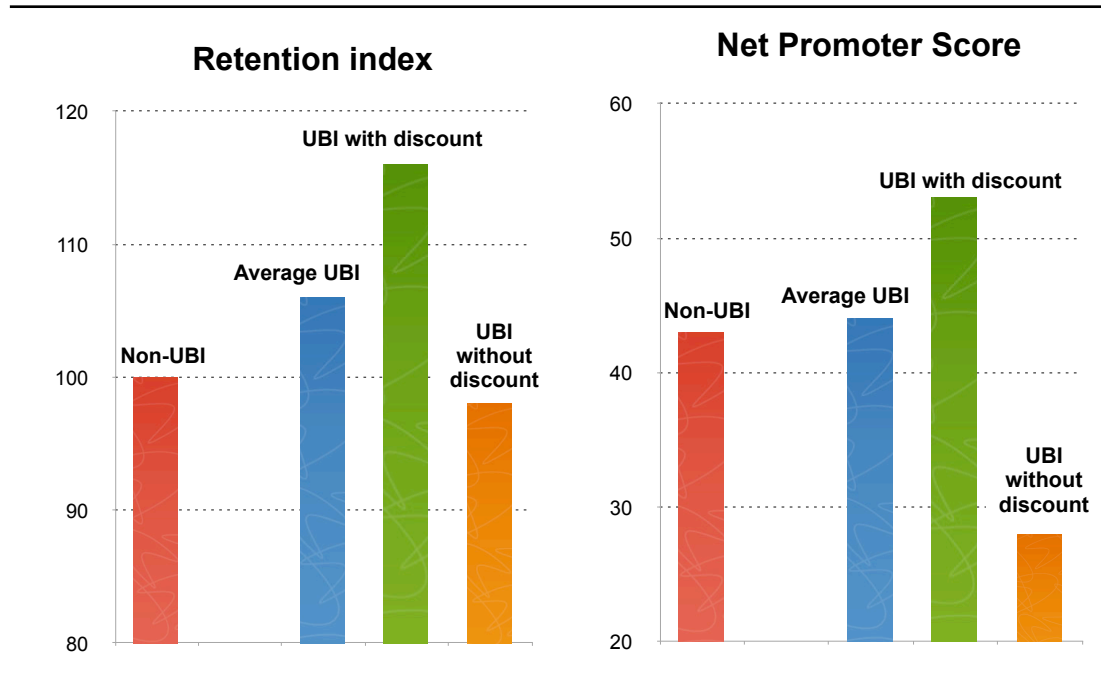
In the absence of any significant service element, this pushes the best customers to heavily rely on price when choosing their motor insurer.

Telematics, however, offers the possibility of a **regular interaction between the end-consumer and the insurance company**. By changing insurance from an annual to a monthly, weekly or even a daily activity, insurers can greatly increase the number of customer touch points.

Value-added services and web portals can further enhance customer relationship and cement loyalty.

US-based **Progressive Insurance** reported **significantly higher customer retention and customer satisfaction figures** through its *Snapshot* program. These statistics, shown in the figure hereafter, prove that the intuition is correct.

Figure 50: Progressive *Snapshot* improves customer retention and satisfaction



Notes:

- Retention is measured at the first renewal;
- The Net Promoter Score is an indicator developed by Satmetrix Systems to measure customer loyalty. It represents the response to the question: "How likely is it that you would recommend [Company X] to a friend or colleague?" Here, customers responded on a 0-to-100 point rating scale.

Source: Progressive Insurance

Quite naturally, customer satisfaction was significantly lower than the average for those *Snapshot* customers who did not receive a discount through the program. This suggests that financial savings may have been a key driver for the reported improvement in customer satisfaction. Interestingly, however, this only resulted in a small difference in the retention level.

Similar results are also seen in Europe.

A 2010 Accenture study revealed that the customer retention rate for British motor insurance companies was below 80%. On the other hand, Norwich Union reported a 90% retention rate for its PAYD policy despite the overall failure of the product.

Even the device installation process, often perceived as the "difficult" part of the PAYD experience, could create a psychological **exit barrier** for insurance customers. The same way most people do not change bank very often because this is a cumbersome process, the installation requirement in PAYD could convince people that changing their insurance policy is too much for them to handle.

c. Optimised risk selection

Another benefit of telematics is its **triple effect on risk selection**:

- Improved selection by insurers,
- Modified selection by brokers,
- Self-selection by customers.

Improved selection by insurers

Insurers that use telematic data can reduce the premiums of low risk drivers and charge risk-related premiums for high-risk drivers. As a result, the safest drivers are incentivised to join these insurers and leave their competitors.

These competitors end up holding an unbalanced risk portfolio with a disproportionate share of high-risk drivers which are likely to be unprofitable, even with high premiums.

Modified selection by brokers

Similarly to insurers, brokers who have several insurer relationships will tend to attribute high-risk drivers to the insurers who do not discriminate well risks.

They know that by doing so they can keep in their portfolio of customers a number of drivers who have high risks but will not be detected because the insurance company has no way to verify his/her driving behaviour.

As a result, insurance companies that do not have telematics offering will be led to endorse the highest risk customers and eventually obtain an increased proportion of claims.

Improved selection by drivers

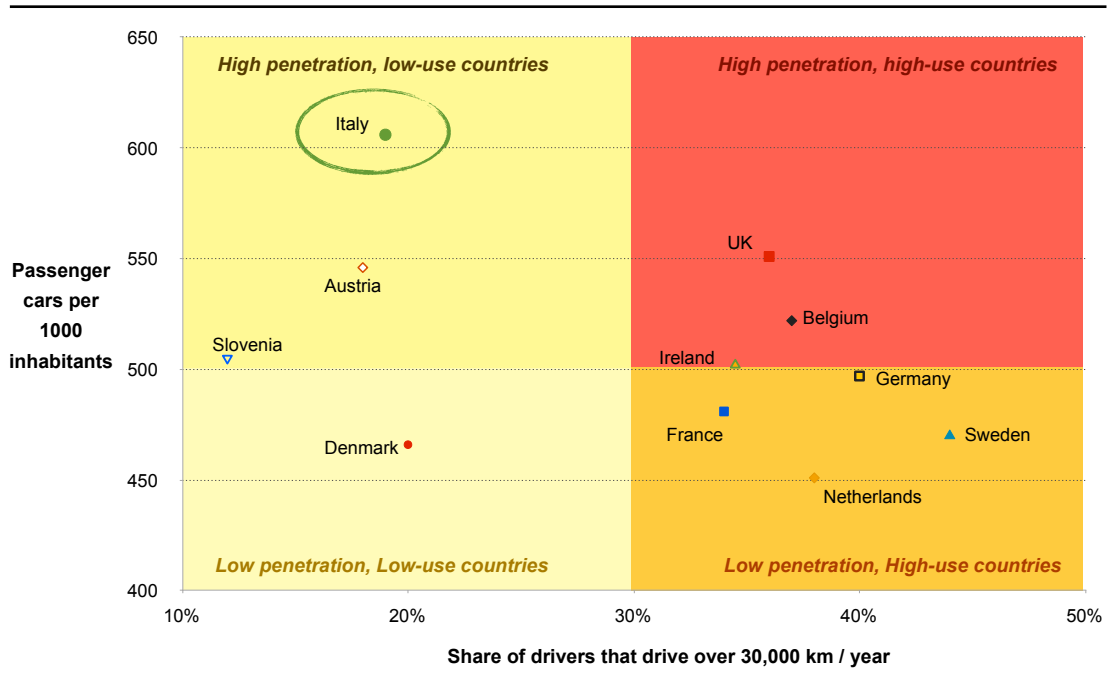
The intuition indicates that road warriors or dangerous drivers are unlikely to choose a PAYD or PHYD policy respectively. Conversely, customers are more likely to insure a low mileage car with a PAYD policy.

This is confirmed by reality.

For example, as early as in 2007, **Norwich Union was reporting 30% fewer claims** and up to 50% reduction in its claims ratio.

Similarly, **one of the reasons for the success of PAYD in Italy is its high motor density**, as shown in the following chart. This is combined with relatively low driving patterns, notably compared to Northern European countries. Numerous Italian households own a second car, which creates excellent conditions for mileage-based policies.

Figure 51: Italy combines a high car penetration with low average use



Source: PTOLEMUS based on CEA 2007 and CEDR 2006 statistics

Thus introducing a PAYD policy is likely to attract low mileage and low risk consumers who see an opportunity to reduce their insurance premiums. This improves the customer-mix on the insurer's books, driving down its overall claims costs.

Even customers who have a sub-optimal driving style and join a telematics scheme will be led to either improve their driving behaviour or change policy as they will be charged a higher premium than other customers.

In a way, this evolution is **similar** to what happened in countries that have established **consumer credit scoring databases**, such as the US or the UK.

In these countries, it is possible to obtain a loan without a credit score but the interest rate paid will be significantly higher. The reason is simple. Customers with a bad credit history will tend to request loans from institutions that do not require credit scores. In return, these lenders will offer high interest rates to take into account high default statistics.

Overall, the combination of these 3 factors can help telematics-enabled insurers to improve significantly their claims ratio.

It will also have major consequences on market dynamics, as the insurers that have no or less exposure to telematics in their portfolio will suffer from a major negative impact on their risk portfolio.

The business rationale for PAYD/PHYD is detailed further in Section III.D. of the report.

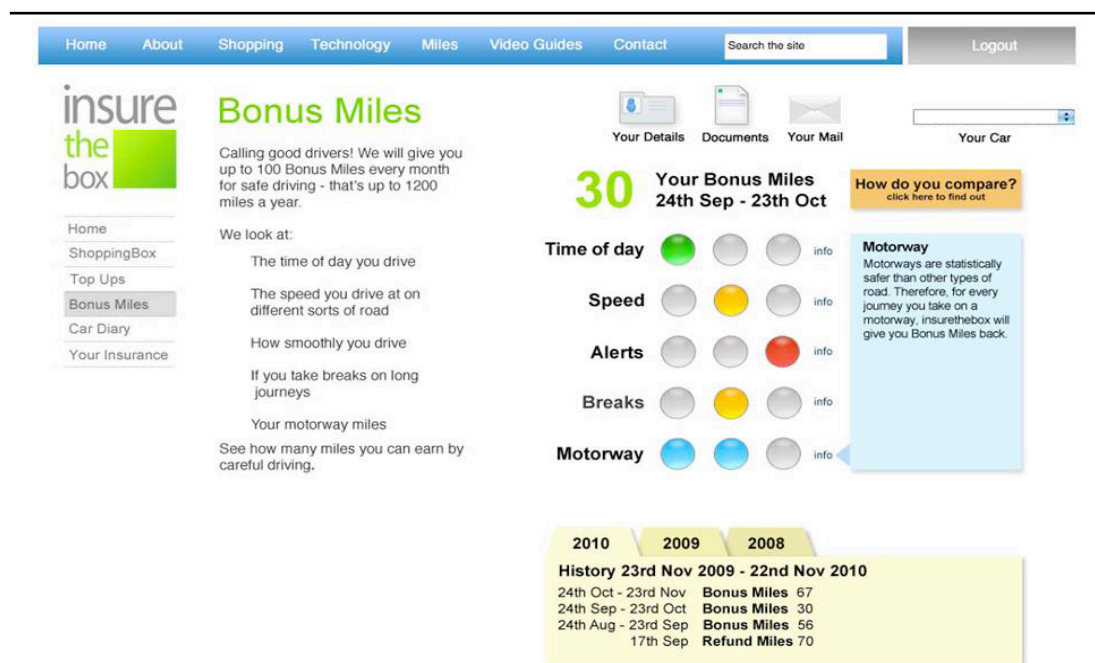
d. Customers' improvement in driving behaviour

Since all Pay How You Drive (PHYD) schemes measure the risk based on the actual driving behaviour (acceleration and braking patterns, driving time, type of roads driven and sometimes speed levels), they provide a strong incentive for drivers to improve their driving style.

Better driving behaviour equates to lower insurance premiums.

The improvement in driving behaviour is especially pronounced when the insurer provides real-time or daily feedback like **Insure the box** in the UK.

Figure 52: Insure the box' customer dashboard incentivises customers to drive safely



Source: Insure the box

The latest renewal statistics revealed by Insure the box show that about **two-thirds of the consumers received a cut** in their insurance premiums as compared to the previous year. The **average reduction was 22%** although some consumers saved up to £800. These results are even more noteworthy given the 30% rise in motor premiums in the UK in the past year.

Another example is US-based **Greenroad Technologies** which specialises in using telematics to improve driving behaviour by providing real-time feedback to the drivers. Some of their clients such as PHS Datashred in the UK have reduced crash costs by 33% through this system.

Several TSPs also help insurers provide a **synthetic measure of someone's driving**. For example, **Airmax Remote** provides to Royal & Sun Alliance's MORE TH>N unit a ranking from A to G, shown below.

Figure 53: MORE TH>N's Green Wheels customer dashboard



Source: MORE TH>N

This is also the case of **Young Marmalade**.

Specialised in helping UK's young drivers obtain affordable insurance premiums, it uses this synthetic rating to send young drivers immediate alerts when they switch from green to amber or from amber to red. If the insurance has been paid by the parents, the company even has a 3-way contract whereby parents also receive these warnings.

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2. Regulatory drivers

b. The Viterbo judgment (2006)

c. The Test-Achats gender ruling (2011)

d. The Mario Monti legislation in Italy (2012)

B. The mystery of PAYD – why it has not taken off yet

1. Challenges for insurers

a. Privacy issues

a. Regulatory barriers

b. Intellectual property issues

c. Lack of a clear business case

d.

e. Difficulty to convince indirect sales networks

f. A long deployment time

2. Challenges for consumers

a. Lack of sufficient and unbiased information

b.

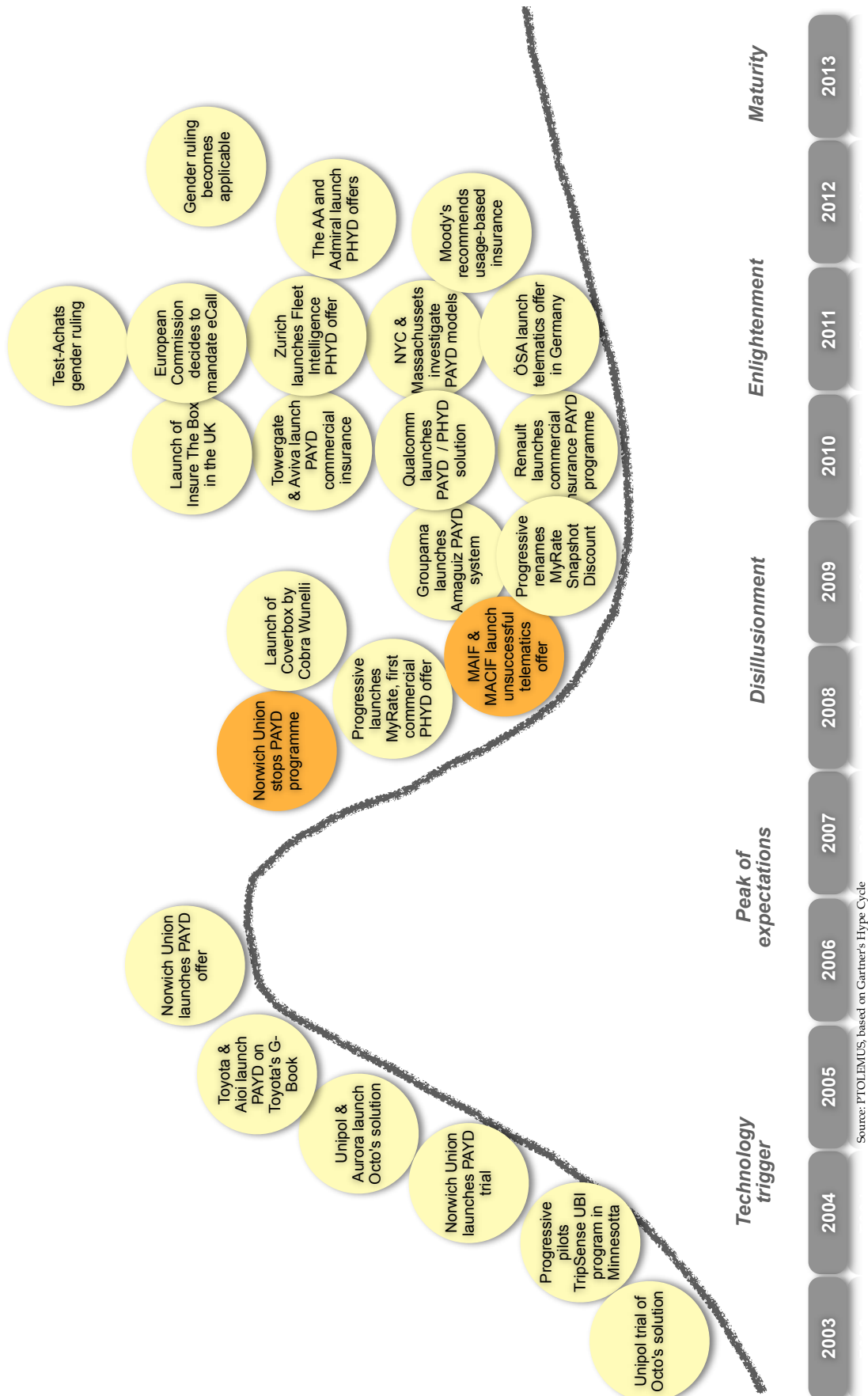
c. Privacy concerns

d. Potential conflict of interest

e. Financial uncertainty

3. What this means for the future

Figure 72: Insurance telematics has been through the peak & disillusionment phases



III. THE INEVITABLE INSURANCE REVOLUTION

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1. Learnings from the pioneering insurers

a. 2004-2008: Norwich Union

b. 2008-2012: MAIF / MACIF

c. 2007-2012: UNIQA

d. 2004-2011: Progressive

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b. Reasons for the Italian take-off

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d.

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c. The implication for the insurer's IT system

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2. What is the winning hardware combination?

While the OBD vs. OBU choice is crucial, the purchaser's choice is becoming more

3. What are the new differentiating features?

-

- F

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