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Implementing Automotive Telematics for Insurance Covers of Fleets

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Abstract

The advantages of Usage-Based Insurance for automotive covers over conventional rating methods have been discussed in literature for over four decades. Notwithstanding their adoption in insurance markets has been slow. This paper seeks to establish the viability of introducing fleet Telematics-Based Insurance by investigating the perceptions of insurance operators, tracking service providers and corporate fleet owners. At its core, the study involves a SWOT-analysis to appraise Telematics-Based Insurance against conventional premium rating systems. Twenty five key stakeholders in Malta, a country with an insurance industry that represents others in microcosm, were interviewed to develop our analysis. We assert that local insurers have interests in such insurance schemes as enhanced fleet management and monitoring translate into an improved insurance risk. The findings presented here have implications for all stakeholders as we argue that telematics enhance fleet management, TBI improves risk management for insurers and adoption of this technology is dependent on telematics providers increasing the perceived control by insurers over managing this technology.

Keywords: telematics-based insurance; fleet management; risk management; motor insurance; technology adoption; usage-based insuranc

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Introduction

A typical economic transaction involves a known and quantifiable service or product being provided for a particular selling price. When purchasing insurance cover, a policyholder pays an insurer a premium to purchase a policy, which is an agreement that stipulates conditions under which the insurer would pay for own or third party damages within a stipulated timeframe. Conventional automotive fleet insurance differs from a typical economic transaction with respect to two key aspects. Firstly there is no knowledge of the magnitude of the service provided since the amount of claims paid (if any) is unknown. Secondly, by paying a lump sum premium depending on demographic and judgmental factors, drivers pay the same premium independent of usage. Bordoff and Noel (2008) compare this to a buffet restaurant that encourages more eating and explain that current conventional pricing encourages more driving which in turn increases claims and therefore premiums. Experience rating involve methods such that low-risk policyholders are rewarded (Brown & Gottlieb, 2007; Piquet, 2000), a typical example being no claims discounts applied to non-commercial drivers. Moreover Usage-Based Insurance Pricing has been extensively discussed in literature as an alternative to conventional insurance (Bomberg, Baker, & Goodin, 2009; Booth, et al., 1977; Bordoff & Noel, 2008; Craig, 2010; Eldin, 2003; Ippisch, 2010; Iqbal & Lim, 2008; Lahrmann, et al, 2012; Lindberg, et al., 2005; Litman, 2012; Vickrey, 1968; Wenzel, 1995)
Recent technological advances have permitted the implementation of telematics to price premiums for automotive fleets. Broadly speaking, telematics is a merge of the terms 'telecommunications' and 'informatics'. Nora and Minc (1978) coined this term in anticipation of cheap computers and robust worldwide communications that would allow lateral communication to emerge to the forefront.

In this paper we present a SWOT-analysis of the introduction of telematics to price insurance premiums for fleets. A SWOT-analysis is used to determine a project's health by pointing out its Strengths, Weaknesses, Opportunities and Threats (Kotler & Armstrong, 2010; Thompson, Strickland, & Thompson, 1999). Typically SWOT-analysis is applied for marketing audits (Piercy & Giles, 1989) but its application has been extended to other uses ranging from an analysis of the use of virtual reality for rehabilitation and therapy (Rizzo & Kim, 2005) to an analysis of betting exchanges (Koning & van Velzen, 2009).

In this context SWOT-analysis provides an overview of the market's situation whereby strengths involve the advantages TBI has to offer to key stakeholders over current rating systems, weaknesses refer to the shortcomings of such a system in relation to conventional methodologies, opportunities are current trends in the external market favouring the introduction of such alternative rating systems, and threats are trends opposing the adoption of TBI.

The following section describes conventional insurance pricing and the two broad categories of Usage-Based Insurance (UBI) pricing. This is followed by a brief discussion of our method. The final section of our report consists of a summary of our results and its implications.

Conventional and Usage-Based Insurance Pricing

Conventional insurance pricing initially assesses the best estimate of a pure premium, being the discounted present value of expected claims, based on the policyholder's characteristics such as type of car owned. As the expected claim is a function of frequency and severity, insurance compa-

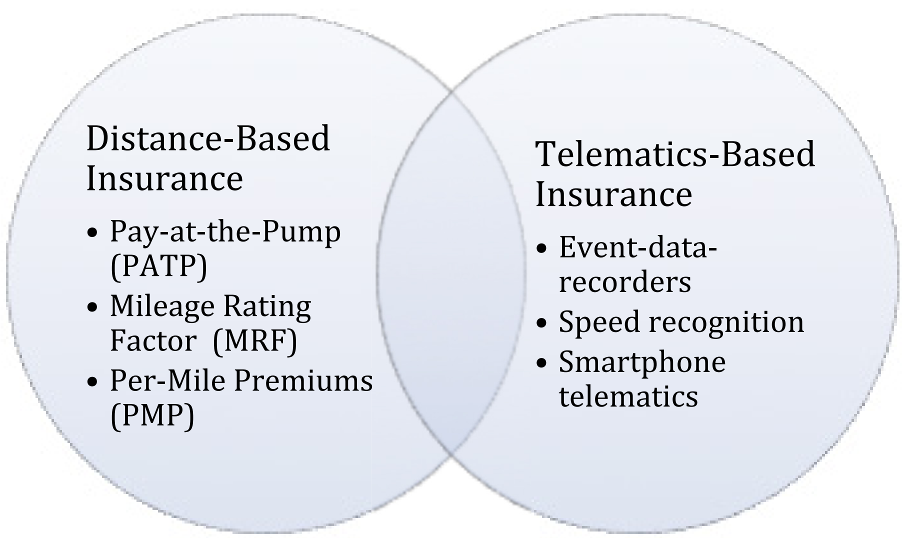

Figure 1: Usage-Based Insurance (Ippisch, 2010)

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nies tend to group policyholders in homogeneous groups in order to ease this process. The final gross premium involves the addition of loading factors such as fixed and variable administrative costs, claims handling costs, levies and taxes, commissions, reinsurance costs, investment income, profit and contingencies (Brown & Gottlieb, 2007; Bühlmann & Gisler, 2005; Cross, 2008; Michaelides, et al., 1997). Automotive fleet gross premiums are typically renewed annually using pre-set rates with adjustments made depending on fleet size, claims experience and the nature of extended cover (Cross, 2008).

A key critique to conventional premium pricing is that pricing is dependent on factors such as gender and age but not on the actual vehicle usage (Vickrey, 1968). This in turn results in consumers maximizing the use of their vehicles (Litman, 2012) which in turn raises risk and therefore premiums. Usage-Based Insurance differs from the conventional setting in that premium pricing is based on actual usage. Figure 1 shows some examples that the typical insurer can adopt, all of which are centred round UBI, which can be subdivided as Distance-Based Insurance (DBI) and Telematics-Based insurance (TBI) (Ippisch, 2010).

Distance Based Insurance

DBI compel insurance companies to charge policyholders according to distance travelled by the insured. Vickrey (1968) suggested that insurance payments be linked with gasoline purchases or tyre sales, typically a per gallon surcharge on gasoline sales. Such Pay-at-the-Pump (PATP) measures provide incentives to take shorter routes, decrease the risk to pedestrians, in turn posing a lower risk to the insurer, and, ultimately, generating lower premiums. This innovative contribution was never popular (Wenzel, 1995) even if premiums have been known to fluctuate in relation to fuel prices (Leefeldt, 2011). On reflection, this method would have resulted in significant administrative costs, is challenging to control in a fleet scenario as most fleet owners may purchase significant amount of fuel at one go and, as Litman (2012) points out, PATP lacks behaviour-related rating since risky drivers with fuel-efficient cars are undercharged and less risky drivers with fuel-inefficient cars are overcharged.

Alternatively an expectation of mileage to be travelled can be incorporated as a Mileage Rating Factor (MRF) within the rating factors used to price the net premium (Hundstad, Bernstein, & Turem, 1994). A key disadvantage for MRF is the lack of verification of actual mileage (Litman, 2012).

Per-Mile Premiums (PMP) involve insurance being sold as a cost per kilometre rather than the aforementioned vehicle-year based mileage rating factor (Edlin, 2003). This system would also factor in other risk features the fleet presents such as the number of vehicles, vehicle models, claims history and the risk management of the fleet. The payment of premium is prepaid for the expected travelled kilometres for the coming year, essentially a form of deposit premium. The total premium at policy expiration is calculated based on recorded mileage, then the insured will pay any outstanding kilometres or receive compensation for the declared kilometres which are left untravelled.

Odometer readings would be required in order to ensure that the mileage paid is correct (Edlin, 2003). This may also be incorporated with most periodic regulatory checks, such as the Ministry of Transport (MOT) test in the United Kingdom. This would enable dedicated personnel to check and validate odometers, ensuring no tampering is involved.

Telematics-Based Insurance

Drivers are generally reported to improve their driving method when monitored via telematic devices (Bolderdijk, et al., 2011; Bordoff & Noel, 2008; Fincham, Lambourn, & Kast, 1995; Wouters & John, 2000) resulting in improved economic efficiency as policyholders pay only for the risk they pose rather than a flat fee.

Time and location recognition systems are a hybrid between TBI and distance-based models, involving both mileage and driving conditions. Many refer to this as the Pay-as-you-Drive (PAYD) insurance system (Bolderdijk, et al., 2011; Bordoff, & Noel, 2008; Litman, 2012).

Lately, the initiative of Pay-as-you-Speed (PAYS) motor insurance emerged. It is an extension of the PAYD system as it uses the same technology with an added feature, recording speed behavioural practices. The device will alert the driver of speeding as the digital maps will contain speed limits (Hultkrantz, Nilsson, & Arvidsson, 2012). This structure will focus on recording dangerous driving; thus, premium is computed according to the driver's compliance with national road speed limits.

Iqbal and Lim (2006) explain how an event-data-recorder (EDR) logs frequency of hard braking, sharp turnings, sudden acceleration and over-speeding. The device is not a GPS device but an accelerometer referred to as the 'Black Box'. This enables the insurer to revise the premium to adjust it according to the risk the fleet's driving behaviour presents.

In this way more information is transmitted to the insurer and premiums better reflect the risk in question. As a Pay-how-you-Drive (PHYD) system, this model helps the insurer identify dangerous driving that increases the probability of accidents. In turn, the insurer can better predict accident claims and charge the corporate client accordingly. Such a model encourages the fleet owner to monitor routes, time taken and employee driving behaviour more rigidly (Iqbal & Lim, 2006) as well as any need for retraining.

Smartphone motor insurance policies may be viewed as an improvisation on PHYD insurance coverage as no expensive accelerometers are necessary, but only a mobile phone that records acceleration through its inbuilt accelerometer (Nichols, 2012). The phone's GPS can also be used to track speed and location. Real-time communication will be possible, and insurance providers can interact with drivers for advice on driving behaviour. This system will only function whilst a phone is in the vehicle; thus, the advantage of using location tracking of a stolen vehicle is not possible. Such insurance is still in its infancy, however Aviva are considering its introduction in the UK (Aviva.co.uk, 2012).

Method

Our analysis is based on interviews held with 25 stakeholders in Malta. Malta is a European Union country with a population of 416 110 and 311 947 vehicles, including 48 367 commercial vehicles, as at the end of 2011 (NSO, 2012). Insurance penetration in Malta is lower than the European average (Insurance Europe, 2013). However the high vehicle to population ratio together compulsory car insurance within the EU would recommend that Malta may be a good representative of other countries in which TBI has not yet been implemented.

Interviews with 25 stakeholders were used to generated the key themes which are deemed important by participants. We classified these themes as strengths, weaknesses, opportunities or threats in our SWOT-analysis. Only knowledgeable participants and those who posses special expertise relevant to the research were interviewed, being persons involved in underwriting, managing or tracking fleets. This resulted in a purposive, non-random and judgement procedure which is ideal when investigating the development of something that is little known (Kumar, 2005), in this case TBI being an emerging concept for Malta.

The stakeholders interviewed were:

- ten fleet owners since there are the main customers involved in our research,
- five insurance companies that underwrite and manage the risk – these companies account to more than 50% of gross premiums written for car insurances in Malta,
- three insurance brokers and two insurance agents that are involved acting as intermediates between insurance companies and fleet owners, and
- five companies that provide tracking systems for fleets.

SWOT-analysis

Strengths

The current rating system gauges vehicles on authorised ages, horsepower, tonnage and the like, which factors do not reflect the driver's risk exposure. Some fleet owners despise the fact that insurers judge company management culture and working structure to decide on premium loadings. Such assumptions have a high element of subjectivity that might diminish equity. The implementation of TBI rewards policyholders, in this scenario being fleets, for careful driving and therefore results in self-selection since fleets that are low-risk would pay lower premiums (Bordoff & Noel, 2008; Coroama & Höckl, 2004; Eldin, 2003; Lindberg, et al., 2005). This in turn might influence average to high-risk fleets with TBI to lower their risk profile since they are being monitored (Bolderdijk, Knockaert, Steg, & Verhof, 2011; Bordoff & Noel, 2008; Fincham, Lambourn, & Kast, 1995; Wouters & John, 2000) and in prospect of lower premiums (Lindberg, et al., 2005).

The prominent data collected by TBI relate to mileage, location, speed and driving behaviour. Our interviewees pointed out that mileage can be easily checked by other cheaper means, although the cost of telematics may be lower in a few years. Tracking providers adviced that a telematic device is less susceptible to tampering than a vehicle odometer used for the local mileage-based product. Location was dismissed by insurers and their intermediaries due to the small size of Malta (316km2). On the other hand, fleet owners think otherwise and feel this should be reflected in their premium as in populated areas the risk of third-party damages is higher. Tracking providers explained that this can be easily implemented through geo-fencing, that is a record when a car enters a particular zone (Reclus & Drouard, 2009). The key advantages that TBI offer over conventional methods are speed and driving behaviour, as all stakeholders pointed out.

Weaknesses

As discussed above, if TBI is implemented in a non-compulsory environment, fleets with low-insurance self-perceived risks are more likely to opt in. However the net premium evaluated under conventional methods accounts for low-risk policies and high-risk policies balancing out. This would mean that all pricing needs to be updated: TBI and non-TBI. The non-TBI policy data may be too sparse and increased pricing may lead to fleet owners changing insurer. Although the insurer may be perceived to be better off by reducing high-risk fleets, fleet insurance is usually provided with general business cover. In this respect the insurance company may be forfeiting losses from fleet coverage but also profits from the other insurance covers offered to the same client. TBI data would need to be aggregated for each fleet owner, which involves some technical challenges. Furthermore, in order to produce adequate TBI pricing, data collection needs to be implemented for a period of time, most insurers pointed out a minimum of three years, and at significant expenses in actuarial analysis. Furthermore each insurer may not have enough data to develop fully credible rating factors and no industry standards, such as the availability of mortality tables used in life insurance pricing, are available.

The telemetric unit could act as an all-time road speed-camera and the insurer would penalize according to the extent of speeding over and above specified national road limits. Fleet owners argued that road limits are unnecessarily stringent, also deliveries may take longer to be completed and 'time means money'. This emphasis is also dependent on the nature of the business conducted and reflects similar findings by Lahrmann et al (2012). Furthermore telematic data was criticized for not accounting for road circumstances, such as hard breaking justified by third parties' lack of driving skills.

The confidentiality of telematic data was not raised as a key issue by most fleet owners apart from garage hire firms and fleets that included management cars used for personal commute. Notwithstanding, insurers and tracking providers are bound by the Data Protection Act 2001 and commercial and insurance contracts should seal trust by their very nature. Furthermore, multiple insurers stated that they have no interest in looking at a proliferation of data unless there is a claim, and data for the day of the incident is requested.
Lack of economies of scale hinders the significance of a discount to fleet owners. Consequently fleet owners may not seek to implement a tracking reward. However, many new cars have inbuilt devices and the availability of this data may be the norm in a few years (SBD, 2012; Ernst&Young, 2013).

Opportunities

Telematics based devices provide the opportunity for a holistic risk management approach rather than just for pricing premiums. For example, Tesco UK installed speed tracking and drivers who exceeded the speed limit more than three times were sacked. In so doing, it reduced fuel consumption and accident occurrence and was then able to pass on this cost saving to its clients, in turn encouraging demand and improving profits (EMCC, 2011).

Insurers are seeking a change in the premium rating structure as they are recognizing that the value of the vehicle on which a rate is applied in order to determine policyholder's damages may no longer be sufficient to cater for partial losses, in a scenario where the price of spare parts are rising and market values decreasing.

Early-adopters of TBI will be geared-up for eCall Systems, which will become a compulsory feature of cars manufactured after 2015. The European Commission's eSafety movement is pilot testing this emergency call system where, upon the deployment of airbags, a call to emergency services is triggered. The unit also sends the exact geographical coordinates of the car and the 112 Centre operator will dispatch a police car, ambulance or fire engine as required (European Commission, 2012). An insurer adopting TBI schemes and incorporating an eCall button will be looked up to, as this is a contribution towards enhanced safety on the roads.

Finally TBI is a good exercise for corporate social responsibility as decreased vehicle use would result in better environmental conditions. Fuel consumption can be controlled by driving behaviour; such as hard braking, sharp turning and sudden acceleration; recorded by a telematic device. An insurer adopting this system and marketing this feature would enhance its corporate social responsibility image as it will be encouraging fleet owners to reduce their carbon-footprint. Fleet owners will perceive a ripple effect on to decreased fuel costs, encouraging them to demand a telematic device, possibly offered by their insurer. This may indirectly be a way of gaining market share for the fleet owner, as public awareness of the adoption of such systems puts the company in a positive light, due to its greener corporate philosophy. It may also provide an impression of efficiency to the early-adopters in this direction and positive spill-over effects to personal rather than commercial requests for TBI, especially in view that TBI may be the way forward for the industry that is currently experiencing high levels of competition and high loss ratios.

Threats

The high take-up of TBI by non-commercial drivers may not necessarily occur under a non-compulsory scenario. Lahrmann et al (2012) reported a low recruitment for young drivers for testing a telematics project even if drivers faced an opportunity of saving 30% of premium for not speeding.

Larger fleet clients are bound to have a good business relationship with their insurer and the dynamics of such a relationship may supersede any kind of technology. Claims involving third-party injuries will still need to be paid and since generally the own damage costs will represent the smallest proportion of a claim, the latter are ratified and paid without further adieu, even if negligence is involved. Furthermore, when asked if ex gratia payments would be offered on claims for own damages only, some industry experts confirmed that ex gratia payments are made on such claims too. This diminishes the significance of the function of a telematic device yielding proof of a collision to aid claims investigation.

An insurer advised that cameras can depict better ulterior proof of an incident and a judge in court would find it easier to watch a video to identify tort, rather than being presented with technical tracking data. Tracking providers argued that a normal camera installation will prove more expensive than installing a tracking unit, and the cost of a speed-identifying camera is excessively prohibitive. Given speed is something that all parties favour in TBI, cameras are not a threat to the introduction of telematics.

Discussion

We have investigated the introduction of automotive telematics based insurance products for fleets in a new insurance market through the use of a SWOT-analysis developed by comments raised during interviews held with 25 stakeholders in Malta. We established that fleet owners are willing to adopt TBI and tracking providers aspiring to assist in its implementation. Despite this, TBI for commercial lines of business is not on the Maltese insurance operator's agenda. Yet, the perceived benefits should instigate parties to commit themselves to introduce TBI. Insurers would be able to apply fairer pricing while fleet owners would obtain better control of their fleets. We argue that an introduction of TBI translates into benefits to society, insurance industry, as well as to the environment.

The cost of installing a telematic device is relatively low and initial technology adoption is generally a result of benefits heavily compensating for costs (Davis, 1989). Gupta and Xu (2010) show that customers display increased intent to adopt new technologies if they perceive control over the technology. Therefore the onus is on technology providers, being in-built and after-market telematics devices manufacturers or providers, to convince insurers that TBI increases their control in underwriting and policyholder management. In return, early-adopters will be geared for an impending change in automotive insurance pricing, at an advantage of securing future market-share. We envisage that in the case of non-adoption by local insurers, foreign insurers may sell TBI products in Malta easily due to European passporting rights (Council Directive 93/23/EEC, 1993).

Conclusions and Limitations

Literature and interview analysis has pointed out the inherent advantages of telematics and other UBI over conventional premium pricing. Nevertheless TBI has not been widely adopted by the insurance market, except in highly developed markets such as the United Kingdom (Aviva.co.uk, 2012) and the United States of America (Privat, 2012).

We have developed generic comments from commercial stakeholders in a European country with a relatively developed insurance market but no use of TBI even if automotive telematics are being sold to commercial and private clients. This presented a tabula rasa situation in Malta and the findings derived here are applicable to countries with a similarly developed market that has not yet introduced TBI.

This work has a number of limitations, derived by limited time and resources. A key limitation is the size of local companies that are relatively small in absolute measures. Our focus has been on developing a SWOT-analysis and we excluded the effect of stakeholders' characteristics on adopting TBI. Instead we have subdivided our interviewees in homogenous groups. However, future research can examine the relation of other factors, such as corporate culture and market share, to the adoption of TBI.

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