Some Issues for Insurers on the Use of Event Data Recorders*

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Abstract: This paper presents information about event data recorders (EDRs) as well as arguments for and against the use of EDRs, and explores the right of information access against concerns of information privacy. The results of an opinion survey related to the use of EDRs are also presented. These issues are of importance to insurance companies that seek to use EDR information in pricing insurance products and resolving claims. [Key Words: event data recorder, black box, information privacy.]

AN EXAMINATION OF THE USE OF EVENT DATA RECORDERS

Introduction to EDRs

Event data recorders (EDRs) are small electronic devices that record data about the operation of automobile systems, environmental variables, the actions of the driver, and the operation of safety devices installed in the automobile. The EDR continuously records relevant information,1 and in the instance of an event that meets a predetermined threshold of severity, makes eight seconds of pre-event and six seconds of post-event information available for retrieval. EDR-type devices (also called “electronic on-board recorders” or “black boxes”) have long been used in the aviation, marine, and railroad sectors; and since their introduction, automobile
EDRs have become increasingly sophisticated with respect to the extent and type of information that can be recorded.

Automobile EDRs have great potential in improving driving habits and highway safety. EDRs were initially introduced by General Motors (GM) in 1974 for the limited purpose of monitoring air bag deployment. The increasing sophistication and decreasing cost of information technology subsequently resulted in the creation of augmented EDRs. In 1990, GM launched augmented EDRs capable of recording and recreating in chronological sequence details about air bag operation, speed of the vehicle, whether the driver was wearing a seatbelt at the time of a crash, accelerator and brake application, and the deployment of anti-lock brakes, traction control devices, and rollover protection mechanisms. EDR technology has made substantial improvements over the capabilities of the original “black boxes.” Consumer Reports (2006), Garfinkel (2006), Roosevelt (2006), and Mele (2007) report on the enhanced capabilities of various augmented EDR-type devices.

In 1997, the National Transportation Safety Board (NTSB) recommended that the National Highway Traffic Safety Administration (NHTSA) and automobile manufacturers develop and implement a plan to gather better information on automobile parameters in the event of a crash, using crash sensing and recording devices. Subsequently, the NHTSA published a request for comments (Federal Register, v. 67, n. 198, p. 63493) on October 11, 2002, and a notice of proposed rulemaking (Federal Register, v. 69, n. 113, p. 32932) on June 14, 2004. The NHTSA proposal required that EDRs record a minimum set of specified data elements, specified requirements for data format, specified standards on the survivability of EDRs and their recorded data, and required manufacturers to enable crash investigators to retrieve data from EDRs. The NHTSA proposal also required manufacturers to inform customers whether a vehicle is equipped with an EDR and describe the purpose of the EDR. The final rule (Federal Register, v. 71, n. 166, p. 50998) became effective on October 27, 2006.

Morton (2007) reports that the European Union is currently investigating the benefits of EDR-type devices similar to those installed in the U.S. and has recently completed a pilot project known as Vehicle Event Recording based On Intelligent Crash Assessment (VERONICA).

The NHTSA estimated that in 2004 more than 40 million vehicles in the U.S. had EDRs (Federal Register, v. 69, n. 113, p. 32942, June 14, 2004) and that between 65 and 90 percent of model-year 2004 passenger cars and other light vehicles had EDRs installed (Federal Register, v. 69, n. 113, p. 32933, June 14, 2004). EDR technology will enable interested parties, including automobile manufacturers, car rental companies, insurance
companies, litigators and courts, vehicle owners and operators, law enforcement agencies, and insurance regulators and safety regulators, to understand how crashes happen, how injuries are sustained, and the effectiveness of occupant protection features. An understanding of the circumstances of the crash, including pre-crash vehicle activity and driver reaction, measures of crash severity, and the performance of advanced safety systems, is especially relevant in analyzing crash outcomes for occupants, and may lead to improvements in automobile design and development of crash avoidance and injury mitigation technology. Awareness of the possibility that data from augmented EDR systems may be used by insurance companies or law enforcement agencies to the detriment of the operator may modify driving behavior, conserve gas, and reduce emissions. Vehicle operators may drive more carefully when they understand that the damage they cause can be easily attributed to them. In addition, the existence of EDRs may ensure that vehicle operators closely comply with existing regulation—for example, seat belt usage and speed limits.

The Use of EDR Data by Insurance Companies

Insurance markets are often characterized by information asymmetry that affects availability and affordability of coverage. Rothschild and Stiglitz (1976), Puelz and Snow (1994), Ligon and Thistle (1996), Doherty and Posey (1998), Barrett and Conlon (2003), Harless and Hoffer (2003), Finkelstein and Poterba (2004), Wang (2004), and van Kleef, van de Ven, and van Vliet (2006) suggest that information asymmetry—adverse selection and moral hazard—may be inherent in insurance markets, but Chiappori and Salanié (2000), Dionne, Gouriéroux and Vanasse (2001), and Saito (2006) find that the adverse selection phenomenon exists only to a very limited extent. Although Saito (2006, p. 354) found no sign of either adverse selection or moral hazard, he states: “Although we find no evidence of residual asymmetric information, it does not mean that there is no adverse selection or no moral hazard in this market. We do not doubt that they exist and matter in some cases: we can easily find articles on insurance frauds in the daily newspaper, for example. What our study indicates is that adverse selection or moral hazard can be managed if insurance companies use some basic mechanisms.”

Insurance companies are interested in information that will help them reduce information asymmetry and properly assess the risks they underwrite. Some of the basic mechanisms used by insurers to reduce information asymmetry include appraisals, screening, effective underwriting, monitoring, policy conditions and exclusions, and risk sharing. Insurers routinely collect data from their applicants and policy holders through
the application process, direct questionnaires, or motor-vehicle accident reports. This information is then used to segment policy holders by risk category and to price insurance on the basis of those risk categories. The cornerstone of the argument in favor of making EDR information available to insurance companies is the concept of fair discrimination. Insurers should try to measure the risk associated with a particular policy risk as accurately as possible and to charge exactly for it, no more and no less. Wortham (1986, p. 361) states that “to do so is fair discrimination … not to do so is unfair discrimination.” From an insurer’s point of view, EDR data are like any other information—essential for mitigating the consequences of information asymmetry, for predicting claim costs and settling claims, and for pricing insurance products by linking premiums to driving behavior.

EDR technology has the potential to provide operators with information about their driving habits and thus influence driving behavior. Love (2004) reports on the pilot programs conducted by Progressive Insurance Company in the United States and Norwich Union in the United Kingdom. Progressive provided five thousand volunteer policy-holders with an augmented EDR-type data-logging device, which recorded automotive “usage” and uploaded the data to the insurance company, for up to twenty-five percent in potential savings. Norwich Union provided five thousand volunteer policy-holders with an augmented EDR-type data-logging device to transmit “usage” information about where, when, and how they drive, to validate their belief that consumers are willing to trade privacy for lower auto-insurance costs. The results of the pilot programs, as reported by Progressive and Norwich Union, indicate that participants like learning about their driving habits and being able to have some control over the cost of their auto insurance.

Two common sources of information used in pricing insurance are motor-vehicle accident reports and the citations database. This information represents driving behavior that has been observed and recorded by a law enforcement officer. EDR data, on the other hand, represent driving behavior that may or may not have been observed and recorded. The use of EDR information as a risk-factor input into pricing insurance premiums may thus provide an incentive to improve driving behavior. The use of EDR information as a determinant of insurance premiums is similar to the Pay-as-You-Drive (Litman, 2005) and the Pay-at-the-Pump (Khazzoom, 2000) concepts, where the price of insurance depends on the manner in which the insurance service is used. The use of EDR data provides the much needed “how well do you drive” risk-factor to complement other sources of information used in pricing auto insurance. Thus, besides achieving
higher actuarial accuracy, the use of EDR information achieves the regulatory policy objective of public safety.

As with any new technology, insurance companies should exercise cautious discretion in implementing the use of EDR information. Requiring the installation of EDRs or the subsequent use of EDR information may raise concerns related to privacy and infringement of individual liberties, especially if insurance companies use EDR data against clients who participate in EDR data sharing or adopt punitive pricing towards non-participants. Hennosy (2006), in a public policy analysis and opinion, states that insurers and some consumer groups have applauded while other consumer privacy groups have cringed at the rules adopted by the NHTSA. Hennosy states that consumer advocacy groups such as Public Citizen have criticized the NHTSA for not requiring the use of EDRs in all vehicles, and in particular, heavy vehicles, while the Electronic Privacy Information Center believes that it is only a matter of time before EDRs morph into surveillance devices capable of collecting multi-purpose data.

The use of customer information for business-related activities such as market segmentation or promotion can be justified as long as such information remains within the boundaries of a business organization. However, in today’s business environment, defining the boundaries of large multinational organizations together with affiliates, partners, assignees, and survivors is a difficult, if not impossible, task. It would be difficult to predict how EDR information will be shared, leaving the car owners with little control over the manner in which the information is interpreted or used. Another related concern is the validity and reliability of EDR data and data safeguards. EDR data integrity may be compromised in the process of collection, storage, retrieval, and application.

The ownership and control of information recorded by EDRs are central to the issue of privacy. Tangible property is made up of physical things that are capable of being possessed. Information, unlike tangible property, is subject to universal possession. A person can transfer information to others and yet retain all rights to the whole. In order to retain all rights, it is not necessary to exclude it from the possession of anyone else. Competing claims to EDR data raise a number of issues related to the creation of EDR information, allocation of the rights to EDR information among the interested parties, and preservation of information value. An immediately evident observation is that the owner of the vehicle has possession of EDR data. However, the question of ownership of EDR data may often become murky—for example, when a car is totaled in an accident and an insurance company takes ownership of the car. Schmidt-Cotta, Ciano, and Rae (2005) discuss the legal and political implications associated with mandating the installation of automotive EDR-type devices, specifi-
cally, data privacy, product liability, and the process of discovery associated with the use of EDR data. Schmidt-Cotta et al. state that insurance companies have recognized the EDR as an important tool in designing risk-managing strategies and detecting insurance fraud, and suggest that current legal decisions serve as strong endorsement for the use of EDR data in litigation.

The debate related to the production, preservation, and ownership of EDR data, the rights of competing parties, and the manner in which EDR data may be used is indeed complex. It is therefore all the more important for insurance companies and regulators to consider the current perceptions of the “producers” of this information—vehicle operators who depend on automobiles as a mode of personal transportation.

**Public Perception of EDRs: Survey Results**

The data used in this study were collected from responses to a survey mailed to two thousand randomly selected residents in a small metropolitan statistical area in the Midwest. Respondents were assured that responses would be anonymous and would be used in aggregated form to ascertain public perception of the use of this technology. The single-contact survey produced 159 usable responses (an 8% response rate). In order to preserve the anonymity of respondents, they were neither tracked nor contacted for follow-up. No incentives were offered for completing the survey. The responses to this survey make it possible to analyze and thus understand the extent to which the public is aware of EDR technology and to make inferences related to public perceptions about the use of EDR information.

Forty-eight percent of respondents were male and forty-two percent were female. Fifty-one percent of respondents had household income less than or equal to fifty thousand dollars and forty-nine percent had household income greater than fifty thousand dollars. Thirty percent of respondents had some high school or vocational training; and thirty-five percent had completed college or had some graduate level college experience.

Forty-seven percent of male respondents and sixty-six percent of female respondents were not aware of the existence of EDRs. Sixty-eight percent of lower-income respondents and forty percent of higher-income respondents were not aware of the existence of EDRs. Overall, the responses presented in Table 1 show that fifty-four percent of respondents were not aware of the existence of EDRs before our survey made them aware of EDR technology and the use of EDR information.

Thirty-four percent of respondents did not know if their automobile had an EDR installed, while sixty-two percent of respondents were
convinced that their automobile did not have an EDR installed. Thirty-nine percent of respondents would prefer not to have an EDR installed in their automobile while thirty-four percent were indifferent to whether an EDR is installed in their automobile.

These results highlight important facets of respondents’ knowledge of and understanding about EDRs. The respondents exhibited a mix of ignorance and apathy towards the use of EDRs. A large proportion of respondents (fifty-four percent) were not aware of the existence of EDRs. Only four percent of respondents believed that their vehicle was equipped with an EDR, while ninety-six percent of respondents either did not know or believed that their vehicle was not equipped with an EDR. A large proportion of respondents (thirty-nine percent), perhaps concerned with cost or invasion of privacy or unaware of the benefits of EDRs, would prefer that their vehicle not be equipped with an EDR. The hesitation on the part of respondents to unequivocally endorse or condemn the use of EDRs may also be attributed to an appreciation of the potential benefits of EDR technology tempered by a fear of an Orwellian loss of privacy. Respondents may like the use of EDR data for some purposes and favorable situations, but may fear the use of EDR data otherwise.

One of the interesting results of the survey was the attitude of respondents towards sharing EDR information. The results presented in Table 2 show that forty-two percent of respondents believed that in the event of an accident, insurance companies have a right to information recorded by EDRs, forty percent believed that insurance companies had no right to this information, and eighteen percent were neutral. While consumers did not unequivocally believe that insurance companies had the right to information recorded by EDRs, they exhibited willingness to share information

### Table 1. Awareness of EDR Technology

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No (%)</th>
<th>Other response</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>Were you aware of the existence of automobile EDR technology?</td>
<td>72 (46%)</td>
<td>84 (54%)</td>
<td>N/A</td>
<td>156</td>
</tr>
<tr>
<td>Is your automobile equipped with an EDR?</td>
<td>6 (4%)</td>
<td>93 (62%)</td>
<td>50* (34%)</td>
<td>149</td>
</tr>
<tr>
<td>Would you prefer to have an EDR installed in your automobile?</td>
<td>42 (27%)</td>
<td>61 (39%)</td>
<td>52b (34%)</td>
<td>155</td>
</tr>
</tbody>
</table>

*Don’t know. bIndifferent
recorded by EDRs with insurance companies. Fifty-six percent of respondents were willing to share EDR information with their insurance company to determine fault in an accident, while forty-eight percent were willing to share EDR information with their insurance company to determine insurance premiums.

Table 2. Attitude of Respondents Towards Sharing EDR Information

<table>
<thead>
<tr>
<th>Panel A. Attitudes and perceptions in dealings with insurance companies</th>
<th>Yes</th>
<th>No</th>
<th>Neutral</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobile owners believe that insurance companies have the right to EDR information in the event of an accident</td>
<td>66 (42%)</td>
<td>64 (40%)</td>
<td>29 (18%)</td>
<td>159</td>
</tr>
<tr>
<td>Automobile owners would be willing to share EDR information to determine insurance premiums</td>
<td>76 (48%)</td>
<td>57 (36%)</td>
<td>26 (16%)</td>
<td>159</td>
</tr>
<tr>
<td>Automobile owners would be willing to share EDR information to determine fault in an accident</td>
<td>87 (56%)</td>
<td>36 (23%)</td>
<td>32 (21%)</td>
<td>155</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Panel B. Attitudes and perceptions in dealings with other entities</th>
<th>Yes</th>
<th>No</th>
<th>Neutral</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobile owners believe that automobile manufacturers have the right to EDR information to locate defective parts for recall</td>
<td>108 (68%)</td>
<td>36 (23%)</td>
<td>15 (9%)</td>
<td>159</td>
</tr>
<tr>
<td>Automobile owners believe that automobile manufacturers have the right to EDR information to determine compliance with warranties</td>
<td>75 (47%)</td>
<td>49 (31%)</td>
<td>34 (22%)</td>
<td>158</td>
</tr>
<tr>
<td>Automobile owners believe that the government has a right to EDR information to improve automobile and highway transportation safety</td>
<td>85 (54%)</td>
<td>53 (33%)</td>
<td>20 (13%)</td>
<td>158</td>
</tr>
<tr>
<td>Automobile owners believe that the government has a right to EDR information to resolve court cases</td>
<td>58 (37%)</td>
<td>69 (44%)</td>
<td>31 (19%)</td>
<td>158</td>
</tr>
</tbody>
</table>
Entities other than insurance companies are interested in obtaining and using EDR information. Public perceptions of the rights of automobile manufacturers and the government are also presented in Table 2. Sixty-eight percent of respondents believed that automobile manufacturers have the right to monitor EDR information to locate defective parts for the purpose of recall. Forty-seven percent of respondents believed that automobile manufacturers have the right to use EDR information to determine compliance with warranties. Fifty-four percent of respondents believed that the government has the right to use EDR information to improve automobile and highway transportation safety. Only thirty-seven percent of respondents believed that the government had the right to use EDR information to resolve court cases.

The survey data were disaggregated by gender, household income, and level of education, in the belief that partitioning data on the basis of demographic profiles would assist insurance companies in designing effective communication strategies targeted to specific customers. Chi-square tests were utilized to determine whether gender, household income, and level of education affected consumer perceptions towards the use of EDR information by insurance companies. The survey results indicate that household income and level of education have no impact on consumer perception, while gender did influence consumer perception. Female respondents were more likely to believe that insurance companies have a right to EDR information and also showed greater willingness to share information with insurance companies to determine premiums and to determine fault in an accident.4

**Insurance Companies and Information Privacy**

The previous section has reported consumer attitudes and perceptions on the use of EDR data by insurance companies and other parties. The lack of a clear understanding of the legal issues associated with the use of this technology underscores the need for regulatory concern on the manner in which insurance companies utilize EDRs as a credible source of information. Insurance companies would like to incorporate EDR information to mitigate information asymmetry in offering insurance coverage, pricing insurance, and resolving claims. Insurance regulators would like to ensure that the use of EDR information does not violate the general statutory prohibition on “unfairly discriminatory” pricing and to ensure that the pricing structure is equitable and transparent. Insurance companies should therefore consider the benefits of their use of EDR information against the potential for litigation and increased regulation stemming from consumer concerns about information privacy.
Policy guidelines pertaining to the use of EDR information need to address the question of who owns the data and how the data will be collected, processed, and stored. Policy guidelines also need to strike a balance between preserving the benefits of information collection and legitimate business use against the risk of misuse.

The Electronic Privacy Information Center (2003) presented privacy guidelines that were originally developed by the Organization for Economic Cooperation and Development (OECD) as an effective framework for addressing the privacy issues surrounding EDRs. These guidelines incorporate eight core principles that should be specifically considered by insurance companies and insurance regulators in the formulation of information privacy policy:

1. **Collection limitation principle**: There should be limits to the collection of personal data, and any such data should be obtained by lawful and fair means and, where appropriate, with the knowledge or consent of the data subject.

2. **Data quality principle**: Personal data should be relevant to the purpose for which they are to be used and, to the extent necessary for these purposes, should be accurate, complete, and kept up-to-date.

3. **Purpose specification principle**: The purposes for which personal data are collected should be specified not later than at the time of collection and the subsequent use limited to the fulfillment of those purposes or such others as are not incompatible with those purposes and as are specified on each occasion of change of purpose.

4. **Use limitation principle**: Personal data should not be disclosed, made available, or otherwise used for any purpose other than that specified, except with the consent of the data subject or by the authority of law.

5. **Security safeguards principle**: Personal data should be protected by reasonable security safeguards against such risks as loss or unauthorized access, destruction, use, modification, or disclosure of data.

6. **Openness principle**: There should be a general policy of openness about developments, practices, and policies with respect to personal data. Means should be readily available for establishing the existence and nature of personal data, and the main purposes of their use, as well as the identity and usual residence of the data controller.

7. **Individual participation principle**: An individual should have the right to obtain confirmation of whether or not the data controller has data relating to him and to verify that data are in a form that is readily
intelligible to him, the right of recourse in the event of dispute, and the right to challenge data relating to him and, if the challenge is successful, to have the data erased, rectified, completed, or amended.

8. **Accountability principle**: A data controller should be accountable for complying with measures, which give effect to the principles stated above.

Nehf (2003) argues that information privacy has many of the defining characteristics of societal values. Schmidt-Cotta et al. (2005, p. 380) explicitly suggest that information privacy in the context of EDRs is a societal issue. Nehf’s defining characteristics of the societal view of privacy has the following interpretation in relation to the use of EDR technology:

9. **Involuntary and unavoidable risk**: Consumers have little or no control of the type and amount of information collected by EDRs, and they cannot avoid the potential risks stemming from its collection and use.

10. **Difficulty in identifying individual harm**: The harm from sharing EDR information is difficult to identify and quantify. It is likely that the harm resulting from breach of confidentiality may stay dormant for many years.

11. **Obstacles to tracing injury to its cause**: Even if a consumer discovers harm, the latent nature of the harm would make it difficult for the consumer to trace the exact source of the harm, making redress difficult to obtain.

12. **Inadequacy of monetary damages**: Even if an aggrieved consumer is able to seek redress, monetary damages may not completely compensate that consumer.

13. **Externalities**: An externality, spillover, or consequential damage may arise if misuse of EDR technology imposes additional costs on the consumers or on society.

14. **Non-economic costs of the harm**: It is difficult to assess monetary value to the harm caused to reputation by the use or misuse of EDR technology.

The privacy concerns outlined by Nehf were intended to cover a broad spectrum of information technology and were not specific to EDR technology. In Nehf’s opinion, the “public interest” model rather than the “individual concern” model is a better fit to address concerns about information privacy. In the context of EDRs, this concern necessitates consideration of the tradeoff between the societal and individual benefits of EDRs against
the loss of individual privacy and the establishment of a government agency responsible for enforcement of the norms established by the privacy guidelines. Attaining the benefits of EDR technology is predicated on the creation of administrative and regulatory institutions analogous to the Environmental Protection Agency, Federal Drug Administration, Securities Exchange Commission, and Equal Employment Opportunity Commission.

The American Insurance Association (2004) recommends that the Drivers Privacy Protection Act for motor vehicle records (DPPA) could be used as a model for the collection, storage, protection, and limited disclosure of EDR information.

The Legal Environment

Gabler, Gabauer, Newell, and O’Neill (2004), in a report prepared for the National Cooperative Highway Research Program/Transportation Research Board, state that the increasing use of EDRs and the increasing scope of information collected have presented four legal issues: (1) whether the Fourth Amendment to the constitution bars collection of EDR data; (2) whether the U.S. Department of Transportation has the authority to require installation of EDRs and regulate the collection of data; (3) whether EDR data is admissible in court; and (4) whether installation of EDRs and collection of data violates individual privacy rights.

Gabler et al. (2004) conclude that the USDOT may require the installation of devices that demonstrably improve highway safety or advance some other significant public policy interest; the police or other government crash investigators may seize EDR devices or otherwise collect EDR data without a warrant during post-accident investigation; and while the data may be owned by the automobile owner or lessee, there is nothing within the Federal Rules of Evidence or the Fifth Amendment protection against self-incrimination that would exclude the use of EDR data in either civil or criminal cases.

As more states enact laws to regulate the use of EDR devices, it becomes important for insurance companies to monitor new regulation to ensure that it does not restrict their ability to retrieve and use EDR information in pricing insurance and in settling claims.

Schmidt-Cotta et al. (2004, p. 370) report that California was the first state to enact a bill to regulate the use of EDRs. The California bill clarified that EDR data belonged to the registered owner of the vehicle and could be retrieved only by consent of the owner or by order of a court. Other states (Arkansas, Colorado, Connecticut, Maine, New Hampshire, New York, Nevada, North Dakota, Oregon, Texas, and Virginia) have enacted similar laws. The North Dakota regulation is unique in that it specifically
bars insurance companies from using EDR data to price insurance products. Reddick (2005) summarizes the regulation of EDRs and states that EDRs have the potential to settle claims, fight fraud, and settle court cases, but it is imperative to address the issue of balancing privacy rights of vehicle owners and the rights of society as a whole. Harris Technical Services (2007) reports that EDR data have been admitted as evidence by the courts both in civil and criminal cases.

CONCLUDING COMMENTS

EDR technology is here to stay. Almost all vehicles now have some form of embedded monitoring and recording technology. In response to the growing practice in the motor vehicle industry of installing EDRs in an increasing number of light vehicles, the NHTSA now specifies uniform requirements for the accuracy, collection, storage, survivability, and retrievability of event data in passenger cars and other light vehicles equipped with EDRs. These and other commercially available augmented EDR-type devices could provide insurance companies with additional information relevant to pricing insurance products and resolving claims, and some insurance companies have experimented with the use of this information.5

This paper highlights the need for insurance companies to balance the benefits of EDR technology against the loss of individual privacy, to ensure care in handling and interpreting EDR data, and to influence public understanding about the societal values of the EDR technology. This balancing act is especially relevant as insurance companies experiment with and expand the “usage” based pricing of insurance services.

NOTES

1 While we acknowledge the differences, the terms “data” and “information” are used interchangeably throughout this paper.
2 Bucks, Kennickell, and Moore (2006, p. 22) report that according to the 1994 Federal Reserve Bank Survey of Consumer Finances, 86% of families own an automobile, 4% lease an automobile, and 8% are provided an automobile by their employer.
3 The sampling procedure, the choice of geographical area, the low response rate, and the small absolute number of responses may result in sample bias.
4 The small number of respondents prevents us from making viable inferences about the significance of gender, income, and level of education in determining the nature of consumer perceptions and attitudes concerning the use of EDR information by insurance companies and other constituents.
We leave for future research the measurement of the incremental benefit arising from the use of EDR information versus the traditional information used in determining insurance premiums, influencing driving behavior, and resolving claims.

REFERENCES


