THE ECONOMICS OF ROAD SAFETY AND INSURANCE

Private insurers can help improve road safety if given the right incentives, argues **Richard Tooth**

Over 100 people on average are killed on Australian roads each month and thousands more are hospitalised. Families and friends are left devastated. Young people are disproportionately represented among the number killed or injured. The annual social cost has been estimated at around $30 billion.[1]

There has been substantial progress in road safety. Despite population growth the annual road toll has fallen by around one-third since 2000. However, in Australia and many regions overseas there has been a recent reversal of this trend.

An ongoing challenge is that road safety depends heavily on the vehicle choices and behaviour of drivers who are, on the whole, overconfident in their ability. The safer the road system, the less incentive drivers have to take care. Regulations that attempt to manage the choices and behaviour of drivers can also impose significant costs on society.

Technological advances ranging from driving assistance to autonomous vehicles offer new hope in limiting the importance of driver behaviour. But challenges remain. There is the question of how best to encourage the introduction of such technologies and how long it will take before they start having an impact. Road safety technologies can be expensive. It is often older, more risk-averse people who can afford them. The young, who tend to be higher-risk drivers and more financially constrained, are more likely to be drawn towards the cheaper secondhand vehicle fleet.

A different approach

In light of technological progress, it is timely to re-examine how motor vehicle insurance affects the choices and behaviour of individuals. Through insurance, drivers are largely protected from the significant financial liability that can come with a road crash. At first glance it would appear that insurance reduces individual incentives for safer road use. However, insurers are potentially a key part of the solution.

At a recent Australasian College of Road Safety annual conference I presented and discussed the hypothesis that:

> The most significant cost-effective policy to reduce the road toll involves reforming vehicle insurance markets.

By 'cost-effective policy' I mean a policy where, from society's viewpoint, the benefits exceed the costs. If we didn't care about costs

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addressing the road toll would be simple. While it remains a hypothesis—that is, something to be examined—it is not an unreasonable proposition. There are good reasons to believe the hypothesis is true even if preceded by the words 'by a large margin'.

So what kind of reform does the hypothesis point to? In a nutshell it involves improving (from society's perspective) the incentives for private vehicle insurers to manage road safety.

The rationale is simple:

- The current incentives for insurers to address road safety are less than optimal.
- There is a lot insurers can do to address road safety and they can do so much more effectively than government or some central agency.

Furthermore, vehicle insurance reform appears to provide a foundation for managing many pressing road safety issues including the introduction of autonomous vehicles and other new safety technologies.

Incentives for insurers

Around the world road safety incentives for insurers are not aligned with those of society. Incentives for insurers to prevent road crashes come (primarily) from their liability to pay for claims. For vehicle damage, the claims liability relates to the cost of repair or replacement and thereby aligns closely to the value of preventing the crash. However when considering risks to humans, the societal value of prevention is typically much greater than the claims liability. For example, the societal value of preventing a random road fatality is often estimated in excess of $7 million but the average claims costs associated with a fatality are around $0.5 million.[2]

More closely aligning insurers' incentives for road safety with those of society should not be overly difficult. For example, we might provide additional rewards to insurers whose policyholders cause fewer road crashes and penalties to those policyholders who cause more.

However, rather than improving insurers' incentives for road safety, vehicle insurance regulation in Australia does the reverse.

The Australian regulatory environment

In Australia vehicle owners take out two broad types of insurance: insurance to cover property damage (for example, damage to vehicles) and insurance to cover the human costs of road crashes (for example, medical costs, loss of earnings etc). The insurance cover for human costs is mandated and is commonly known as compulsory third party (CTP) insurance.[3]

In all jurisdictions except NSW,[4] the CTP premium for a vehicle type (for example, passenger vehicles) is fixed regardless of driver behaviour and vehicle choice.[5] Thus, for instance, the premium will be the same regardless of whether the insurance covers a heavy vehicle that is driven recklessly and frequently or a compact vehicle that is driven rarely and carefully.

In contrast, in most developed countries (including Europe and the United States), vehicle owners purchase a single vehicle insurance product that includes an optional level of cover for vehicle damage and a compulsory level of third-party liability for human costs. With a few exceptions, insurers are largely free to price insurance premiums based on their assessment of risk.

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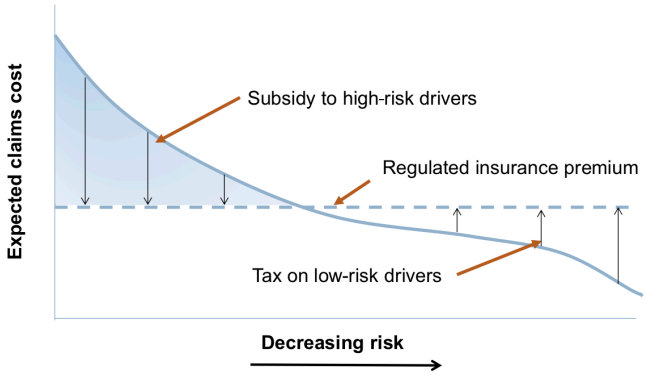
Relative to a system in which premiums vary with the expected cost of claims,[6] regulation in Australia has the effect of increasing premiums for low-risk drivers (that is, those with a low expected claims cost) and reducing premiums for high-risk drivers. As the schemes are designed to recover costs, the effect is to tax safe road users in order to subsidise unsafe road users.

This effect is illustrated in Figure 1 overleaf. The curved line depicts the expected claims cost of vehicle owners, ordered in terms of their risk (which determines expected claims cost). Those at the left hand side of the Figure are high-risk; those at the right, low-risk.

Figure 1: Expected insurance claims cost in order of risk



As reflected in the Figure, while all drivers pose some safety risk, there can be substantial variation between the highest and lowest expected claims cost. For example, as commonly recognised, young inexperienced drivers are much more likely to have a road crash than a middle-aged person with a good driving record. In the absence of price regulation, a competitive insurance market would set premiums that mirror the expected claims costs. However (as depicted by the dashed line in the figure), the regulated CTP insurance premium is largely constant regardless of risk.

There do not appear to be any good arguments for retaining the existing system. A possible concern is that people would drive uninsured if premiums were uncapped. However, the European experience suggests this need not be a factor.

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Furthermore there is no benefit in terms of reducing costs. The evidence from the United States (where regulation can vary by state) is that rate regulation results in adverse consequences including more frequent insurance claims and *higher* insurance premiums.[7] Consequently most experts strongly support allowing insurance premiums to reflect accident risk and be determined by market forces.[8]

What can insurers do about road safety?

For a long time, insurers have rewarded safe driving with no-claim discounts and encouraged safer driving by requiring claimants to pay an excess. Due to advances in technology, the significance of what insurers can do is increasing.

The capability of insurers to influence how we drive and how much we drive has changed markedly with the introduction of telematics, in-vehicle technology that can be used by insurers to monitor vehicle usage. This has led to usage-based insurance (UBI) products whereby insurers offer policyholders rewards for driving less and more safely. Telematics technology in the insured's vehicle provides the insurer with information on measures that may include speed, location, time of travel, distance travelled, acceleration and deceleration. Those who drive less, more safely and at safer times (for example, not at night) are rewarded.

The available empirical evidence is limited but suggests that such insurance policies can significantly improve safety outcomes. One UK insurer, insurethebox, estimates that, after controlling for normal improvement in young drivers (as they gain more experience), the effect of telematics-enabled UBI has been to reduce the rate of accidents involving young motorists (drivers aged 17 to 21) by 35% to 40%.[9]

UBI policies are growing rapidly in popularity. It is estimated they currently make up around 5% of insurance policies in the US and 10% in Italy. Importantly, UBI is most attractive to high-risk drivers, such as the inexperienced, who receive the most significant reductions in their insurance premium for safer driving. With annual growth rates of around 40%,[10] in some countries by the end of the decade the majority of high-risk drivers may be covered by a telematics-enabled UBI policy.

In Australia our vehicle insurance regulation is a major barrier to the widespread adoption of UBI. There are some UBI policies available for vehicle insurance but it does not appear feasible to have a UBI policy for a CTP insurance policy.

Insurers can also influence the type of vehicle people drive. In the UK where insurance premiums are more closely aligned to risk, young people have large financial incentives (literally hundreds

of pounds) to drive less powerful vehicles.[11] Similarly UK insurers offer cheaper insurance for vehicles with safety devices installed (such as auto emergency braking).

Furthermore, the financial incentives are aligned with risk; the riskier (primarily younger) drivers get larger insurance premium discounts for choosing less aggressive vehicles and better safety options. In contrast in Australia, due to CTP regulation the insurance benefits for driving less aggressive cars are more limited.[12]

The advantages of private insurers

In effect, with UBI private insurers are contributing to road safety regulation and enforcement. Relative to traditional enforcement (for example, police, speed cameras), telematics offer a clear advantage in having constant real-time monitoring and enforcement. UBI has other social benefits, including in alleviating congestion by reducing incentives to drive. Similarly, by providing premium discounts for safer vehicles, private insurers are contributing to the regulation of vehicle safety.

There are good reasons for wanting private insurers involved in managing road safety. In theory, it might seem possible for governments to employ telematics technology. However, privacy is a barrier. Whereas people willingly volunteer their driving behaviour information to insurers to get lower insurance premiums it seems likely that privacy concerns would restrict governments from collecting such information.

Regardless, there are other reasons for wanting private insurers involved. Insurers can more flexibly trial different initiatives and innovations. Importantly, with the right incentives, insurers would compete to innovate and identify the best programs, vehicles and technologies that improve safety without being overly burdensome or unreasonably restricting freedoms. With the right incentives, those insurers that failed to determine and enforce safe driving practices would face higher costs and be forced to modify their policies. Those insurers that enforce unnecessarily burdensome conditions would lose business to those that didn't.

We may well ask if there are any advantages—aside from ensuring that drivers are insured—to traditional road safety regulation and enforcement over private insurance markets. The answer may be very little. Rather, relative to existing regulation and enforcement, a market-based insurance approach has the potential to be more efficient, fair and effective. A step change improvement—potentially a 'silver bullet' solution—to road safety (while reducing the burden of road safety regulation) may be achieved through greater insurance industry involvement. Furthermore, such reform may lead to less efficient interventions being removed or modified. For example, with appropriate insurance regulation we might question the need for some burdensome heavy vehicle regulations.

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A research priority

The case for vehicle insurance reform seems compelling. The potential benefits appear large and (based on discussions with insurers, road-safety experts, technology providers, policymakers, economists and even politicians) there do not appear to be any major costs or issues. As with all reforms there would be some winners and losers, but even this issue does not seem overly important. Further research would help to flesh out any such issues and further attention would increase reform momentum.

In 2013, the Australian College of Road Safety argued for further research and debate on the use of insurance markets to improve road safety.[13] However, despite this and the potential significance, there has been little (barely any) attention given to vehicle insurance market reforms. This should change.

Endnotes

1 This cost represents an estimate of society's willingness to pay to reduce the *risk* of road-crashes.

2 The societal value of preventing a random road fatality is estimated from people's willingness to pay (either observed, or in response to surveys) to avoid small risks to life.

3 Third-party liability insurance schemes vary by jurisdiction. In NSW, Queensland, ACT and South Australia there are competing CTP providers. Other jurisdictions (Victoria, Tasmania, Northern Territory, Western Australia) operate a government scheme.
4 In NSW some limited risk-based pricing is possible.
5 There are other small variations: for example in Victoria, the scheme premiums can vary by postcode; in Tasmania there is a discount for pensioners.
6 The 'expected cost' simply refers to the average forecast cost.
7 See, for example, Mary A. Weiss, Sharon Tennyson and Laureen Regan, 'The Effects of Regulated Premium Subsidies on Insurance Costs: An Empirical Analysis of Automobile Insurance', *Journal of Risk and Insurance* 77:3 (September 2010), 597-624.
8 Insurance Research Council, 'Expert Views of Auto Insurance Rate Regulation', News Release (21 August 2013), http://www.insurance-research.org/research-publications/expert-views-auto-insurance-rate-regulation.
9 Insurethebox, 'Telematics Motor Insurance Cuts Young Driver Accident Risk by up to 40%', Media Release (2 May 2012).
10 http://www.canadianunderwriter.ca/insurance/insurance-telematics-policies-force-north-america-expected-grow-6-3-million-q4-2015-42-1-million-2020-report-1004095141/
11 The costs and choices facing young drivers are illustrated in a recent news article. See Kate Palmer, 'The Five Cheapest Cars for Teens to Insure—and What They Actually Drive', *The Telegraph* (4 May 2016), http://www.telegraph.co.uk/insurance/car/the-five-cheapest-cars-for-teens-to-insure--and-what-they-actual/
12 A concern is that safety features add to the cost of repairing the vehicle thereby increasing the cost of insuring the vehicle.
13 See National Action recommendation number 13 in the Australasian College of Road Safety's 2013 Submission to Federal Parliamentarians available at http://acrs.org.au/2013/04/2013-acrs-submission-to-federal-parliamentarians-released/