Automobile Insurance Rate Structure

Overall effect on California petroleum use		Affects Petroleum Demand Through Intermediate Indicators:	
Magnitude	High	**Primary**	Distance Traveled
Certainty	High	**Secondary**	System Operations Efficiency
Applicable Level of Government	State		
Relevant Laws or Cases Affecting Factor	10 CCR § 2632.5		
Overall Time-Horizon of Reversal	Medium-term, with some short-term support needed to facilitate the transition. In 2009, the California Department of Insurance finalized regulation that specifies how insurance companies may charge per mile, based on either estimated or verified reports of distance traveled. As of September 2012, five California insurers offer pay-as-you-drive programs (California Department of Insurance, 2012).		
Relevant Topics	Automobile insurance, marginal cost of driving		
Summary	A transition to per-mile insurance premium calculations would increase the variable cost of each mile driven and lead to lower premiums for a majority of drivers and lead to a significant reduction in driving per capita.		

Introduction

In 2010, Californians spent $21.2B on automobile insurance premiums and $45.9B on gasoline (California Department of Insurance, 2011) and (U.S. Energy Information Administration, 2012). By comparison, California's new and used car dealers brought in $39.0B in taxable sales (California Board of Equalization, 2012). Because automobile insurance is a significant transportation expenditure, the rate structure has significant implications for travel in California.

Automobile insurance rates rarely factor actual distance traveled. When insurers do consider annual distance traveled in setting rates, the insured has an incentive to underreport this estimate. Thus, many insurance agencies underweight distance traveled versus other risk factors when setting insurance rates. Underweighting distance traveled reduces the variable cost of each mile driven and increases the fix cost of automobile ownership, increasing distance traveled per automobile. Transitioning to per-mile automobile insurance rates would increase the variable cost of each mile driven and reduce

By Juan M. Matute and Stephanie S. Pincetl

distance traveled.

Scholarly studies highlight how per-mile, or pay-as-you-drive insurance, can lead to reductions in distance traveled. Parry (2005) finds that "[Pay-As-You-Drive] provides incentives to drive less, but not to improve fuel economy" and that nationally, reductions in distance traveled due to per-mile insurance rates would reduce gasoline demand by 9.1% and improve social welfare by a value of $19.3B annually. A transition to per-mile insurance compares favorably with Parry's analysis of raising the federal gasoline tax from 18 to 45 cents per gallon. While the gasoline tax increase would produce a similar reduction in gasoline demand, it would only result in $6.2B in welfare gains. Bordoff and Noel (2008a) estimate transitioning to per-mile automobile insurance would lead to an 8% reduction in national vehicle travel. Cambridge Systematics (2009) estimates that requiring all policies nationwide to be priced per mile by 2025 would reduce GHGs by 2,233 million metric tons of CO_2-equivalent, making it one of the top ten most potent policies the firm analyzed.

At least two researchers have studied to quantify how a shift to per-mile insurance in would impact California. California-specific and national studies consistently find the impact to be an 8% to 10% reduction in vehicle miles traveled. Most of the studies are based on economic analysis of broad national data, so it's possible that future studies based on more precise local data will improve projections.

Bordoff and Noel (2008b) project that saturating the California market with pay-as-you-drive policies would produce several changes. Sixty-four percent of California households would pay lower insurance premiums. Vehicle miles traveled would decline by 8% and statewide gasoline consumption would reduce by 1.338B gallons in 2020. The transition would generate 7 to 9% of total reductions needed to meet AB 32 greenhouse gas emissions reduction targets for 2020. Congestion-related costs would decline by $1.446B, versus 2006 conditions. Bordoff and Noel estimate the total social benefits to be $21.1B in 2020, or $658 per car.

Edlin (1998) estimates that California's per-mile insurance charge would be between 3.7 and 4.1 cents (in 1995 dollars) and lead to a 9.0 to 9.8% reduction in vehicle reductions. He also estimates $5.7B in national congestion reduction benefits, again in 1995 dollars (Edlin, 2003).

Potential rebound effect on vehicle ownership

One concern with the transition to per-mile automobile insurance rates is that it could increase the number of vehicles available. Reducing fixed costs for low-mileage, low-income drivers may support their retention or acquisition of additional automobiles. Because annual *ad-valorem* vehicle license fees are lower for older, depreciated vehicles, the insurance premiums may be a high proportion of annual fixed costs. A transition to per-mile insurance could cause households at the margins of automobile ownership to acquire an additional vehicle or retain a vehicle they planned to dispose. While such households may have more vehicles available relative to the status quo, they would have a greater disincentive to drive. Demand for residential parking will likely increase if the transition occurs in absence of measures that will reduce household demand for vehicle ownership, such as robust carshare.

California Regulations

A July 31, 2009 amendment to the California Code of Regulations (10 CCR § 2632.5) allows insurers to use estimated and verified mileage data in adjusting premiums. Specifically, (2) F vii, allows insurers who verify vehicle mileage to advertise per-mile rates.

Edlin and Karaca-Mandic argue that assessing insurance premiums not only on distance based on distance traveled, but also other risk factors such as travel in highly dense areas, would create further disincentive for driving in congested areas (Edlin & Karaca-Mandic, 2006). The result would be akin to insurer-assessed congestion pricing, reducing traffic congestion beyond what would occur under reduced travel distances alone.

Two clauses in California's regulations reduce the potential for additional congestion reduction and fuel savings. First, 10 CCR § 2632.5(c)(2).F.5.B prohibits insurers from collecting vehicle location information. However, 10 CCR § 2632.5(d)(15-16) allows insurers to set premiums, including per-mile premiums, based on the relative frequency and severity of accidents in the zip code where the vehicle is garaged. The result is that per-mile premiums could be lower for a vehicle garaged in a suburban location versus a vehicle garaged in an urban location, even as the vehicles travel through the same congested area at the same time. Though these vehicles may have identical per-mile risk profiles when traveling through the congested area, the suburban driver could pay less per mile. While the suburban driver on a per-mile rate would have some incentive to reduce driving, this incentive would remain constant for trips into congested areas for which robust transit alternatives may exist. A driver residing in a congested area but traveling to the suburban area could pay a higher total premium for the same automobile trip than the suburban driver. However, the higher per-mile charge might cause the driver to seek out travel alternatives for local trips within the congested urban area.

Adoption in California

Research indicates the potential for exponential adoption rates for pay-as-you-drive insurance policies in California. Bordoff and Noel (2008a) show that low-mileage drivers cross-subsidize high-mileage drivers under the status quo. Because driving per capita is not normally distributed, more than half of California's drivers travel fewer annual miles than the statewide average (Parry, Walls, & Harrington, 2006). These drivers have a financial incentive to switch to per-mile policies. Because of this incentive, State Farm anticipated that 25% of its 3.3 million auto policyholders would make the switch when it began offering per-mile policies in 2011 (California Department of Insurance, 2010).

The virtuous adoption cycle will continue as low-mileage drivers shifting to per-mile insurance rates will raise premiums for the remaining drivers on traditional premiums plans. Faced with premium increases, more will switch to per-mile plans. Bordoff and Noel (2008b) estimate 64% of Californians will save money if they switch to a per-mile plan. The adoption cycle will continue as drivers at the margins continue to switch and drivers on legacy plans face annual premium increases as the risk pool narrows.

Early support may be necessary to overcome initial adoption barriers. First, consumers must learn about pay-as-you-drive options in order to enroll in programs. Second, insurers need data from real-world experiences in order to calculate actuarial risk and per-mile premiums. Third, Edlin and Karaca-Mandic (2006) claim an inter-insurer externality exists: an insurer offering per-mile pricing will see their customers drive less. The reduction in driving lowers risks and claims for all drivers, benefit other insurers and those on legacy plans. The insurer offering the per-mile policy cannot internalize this benefit, indicating the potential need for policy intervention.

To overcome these barriers, Bordoff and Noel (2008a) suggest $15 million in federal funding for a 5-year pilot program and a $100 per-policy tax credit for the first 5 million per-mile policies issued. California could look toward similar measures to induce statewide adoption.

Works Cited

Bordoff, J. E., & Noel, P. J. (2008a). *Pay-as-you drive auto insurance; a simple way to reduce driving-related harms and increase inequality.* Brookings Institution.

Bordoff, J. E., & Noel, P. J. (2008b). *The impact of pay-as-you-drive auto insurance in california.* Brookings Institution.

California Board of Equalization. (2012). Table 1. Statewide taxable sales, by type of business, 2010. Sacramento, CA.

California Department of Insurance. (2010, December 2). *Insurance commissioner poizner approves california's first-ever pay-as-you-drive auto insurance program.* Retrieved from http://www.insurance.ca.gov/0400-news/0100-press-releases/2010/release138-10.cfm

California Department of Insurance. (2011, April 25). *2010 California P&C premium and loss summary.* Retrieved from http://www.insurance.ca.gov/0400-news/0200-studies-reports/0100-market-share/2010/upload/MktShrSummary2010.pdf

California Department of Insurance. (2012). *Insurance commissioner Jones announces approval of esurance filing to offer pay-drive program.* Retrieved from http://www.insurance.ca.gov/0400-news/0100-press-releases/2012/release120-12.cfm

Cambridge Systematics. (2009). *Moving Cooler: An analysis of transportation strategies for reducing greenhouse gas emissions.* Washington, DC.: Urban Land Institute.

Edlin, A. (1998). *Per-mile premiums for auto insurance (No. w6934).* National Bureau of Economic Research.

Edlin, A. (2003). Per mile premiums for auto insurance. In *Economics for an Imperfect World, Essays in Honor of Joseph Stiglitz.* Cambridge: MIT Press.

Edlin, A., & Karaca-Mandic, P. (2006). The accident externality from driving. *Journal of Political Economy, 114*(5), 931-955. Retrieved from http://ideas.repec.org/a/ucp/jpolec/v114y2006i5p931-955.html

Parry, I. (2005). Is pay-as-you drive insurance a better way to reduce gasoline than gasoline taxes? *American Economic Review 95:2*, pp. 288-293.

Parry, I., Walls, M., & Harrington, W. (2006). *Automobile externalities and policies.* Washington, DC: Resources for the Future.

U.S. Energy Information Administration. (2012, December 3). *California gasoline and diesel retail prices.* Retrieved from http://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_sca_w.htm

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