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**The Relationship between Liability Costs and Government Health Spending**

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**Abstract**

Liability insurance is one of the primary mechanisms for compensating individuals who are injured in auto accidents, by products, and in a variety of other settings. An injured individual's propensity to seek compensation through the legal system depends on his or her expected payoff and access to other sources of compensation. A justification for social insurance programs that provide compensation to injured parties is the potential for such compensation to reduce the need for victims to seek compensation through the legal system. If such programs serve as substitutes for the legal system as sources of compensation, then we would expect that as spending on these programs decreases, liability costs will increase, and vice versa. Using state-level data for the U.S., and provincial-level data for Canada, we evaluate the relationship between government health/welfare spending and liability insurance costs. Our preliminary results suggest a weak substitute relationship in both countries. Information that substantiates a connection between these sources will be useful in public assistance decision-making.

## **The Relationship between Liability Costs and Government Health Spending**

### **Introduction**

Liability insurance is one of the primary mechanisms for compensating individuals who are injured in auto accidents, by products, and in a variety of other settings. An injured individual's propensity to seek compensation through the legal system depends on his or her expected payoff and access to other sources of compensation. Large non-economic losses and high probabilities of success increase the expected pay-off and increase the likelihood of filing a liability claim. But, to the extent that first party benefits, such as health and disability insurance, are available and sufficient to cover economic losses, the frequency of liability claims is expected to be reduced.

One potentially important factor in the equation is the existing social safety net. A reasonable justification for social programs that provide for compensation of injured parties is the potential for such compensation to reduce the need for victims to seek compensation in the legal system. This is particularly true given that there is mounting evidence that liability insurance is not an efficient way of providing compensation to injured parties. A study by Tillinghast-Towers Perrin (2003) indicates that only 22 cents of every liability premium dollar is paid to victims to compensate for economic loss. From a social welfare perspective, greater reliance on liability insurance for compensation will increase the total cost of compensation for society if liability insurance and social spending are substitutes.

If government social programs serve as substitutes for the legal system as sources of compensation, then we would expect that as spending on social programs decreases, liability costs will increase, and vice versa. Intuitively, persons injured either in auto accidents or other accidents will be more likely to make a liability claim and incur the potentially high costs of litigation if there are not other sources of compensation available. Kerr, Ma and Schmit (2006) examined this issue using country-level data for 24 countries and found a strong negative relationship between expenditures on government social programs and national liability insurance premiums. The authors note, "As

government payments rise, injured parties will see less value in undertaking the costly process of litigation.”

In this study, we examine the relationship between the availability of compensation from public programs and liability insurance costs. Using state-level data for the U.S., and provincial-level data for Canada, we empirically examine the relationship between government expenditures on social programs and liability insurance costs. We seek first to document whether these forms of compensation are substitutes, by exploring the variations in government expenditures over time as well as across states, and measuring the relationships between these variations and premiums and losses in the auto liability line. While it is beyond the scope of this research to determine the optimal approach to provide compensation for injured victims, information that substantiates a connection between these sources will be useful in public assistance decision-making.

We discuss the motivation for our research and important background information in the next section. This is followed by a discussion of relevant theories with which we develop our hypothesis, and a description of the Canadian and US data employed in the analysis. Our empirical approach and results of the analysis follow, along with our discussion and conclusions.

## **Background**

We are interested in the relationship between liability costs and government health spending for a variety of reasons. First, the number of Americans and Canadians that have unmet health needs, often due to being uninsured for health care, continues to increase. Despite intense focus on the health care industry, beginning most notably in the U.S. with efforts by the Clinton Administration over 15 years ago, health care costs keep rising. According to a recent joint Canada/United States Survey of Health, the number of Americans and Canadians who reported having an unmet health care need in the prior year was 13 percent and 11 percent, respectively. The researchers attribute the difference to the higher rate among uninsured Americans, 40% of whom reported an unmet need. Interestingly, the top reason

for unmet health care needs in Canada was a long waiting time, while costs were reported as the top reason in the U.S.

The approach toward healthcare financing is different in the two countries. Canada has a universal healthcare system that provides access to “necessary” care to all residents, and additional government sponsored support is available to low incomer individuals. In the U.S. private insurance is used to pay for healthcare for those who are insured, and government-sponsored support programs provide health care services for those who cannot afford it. One example of such a program in the U.S. is Medicaid. In 2004, state-run Medicaid programs, which are jointly funded by the federal and state governments, spent \$263 billion providing health services to over 58 million Medicaid enrollees.<sup>1</sup> For the decade from 1990 to 2001, spending increased 10.9 percent. More recently, from 2001 to 2004, spending increased 9.4 percent. State programs are struggling due to the rising number of uninsured persons and increasing medical costs, and many have had to make drastic changes in their programs, such as moving enrollees into managed care or offering subsidies to businesses to encourage them to provide health insurance to their employees.

Our interest in the relationship between liability costs and government health spending is further motivated by criticism of the US and Canadian legal systems. The primary goals of the tort liability system are deterrence and compensation, but critics cite long delays and complexities that result in suboptimal efforts to avoid liability<sup>2</sup> and inadequate compensation to victims. Here, we are most concerned with the latter criticism, the effects of which have been widely documented as the costs of the tort system continue to increase in both countries.<sup>3</sup> In particular, we note that only a small share of liability premium dollars is paid to victims to compensate for economic loss. Tillinghast estimates for 2001 indicate that only 46 percent of the total direct costs of the U.S. tort system go to victims in the

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<sup>1</sup> See NASBO (2004) and CNS (2007).

<sup>2</sup> Effort to avoid liability involves the allocation of resources to reduce the probability of accidents. Excessive liability may result in over-deterrence, which is inefficient (Porat, 2007).

<sup>3</sup> According to Tillinghast-Towers Perrin (2007), “Since 1950, growth in tort costs has exceeded growth in GDP by an average of slightly more than two percentage points.” In 2006 the U.S. tort system cost \$247 billion, or

form of economic (22 percent) and noneconomic (24 percent) damages; 54 percent go to transaction costs. Furthermore, these costs represent a large share of gross domestic product when compared to other industrialized countries. In 2003, for example, tort costs equaled 2.2 percent of gross domestic product in the United States, compared with 1.7 percent in Italy and 1.1 percent in Germany—the next two closest countries (Tillinghast – Towers Perrin, 2006). In contrast, Canadian tort costs are less than 0.6 percent of gross domestic product.

Efforts to control the rising costs of tort liability include a variety of legal reform measures at the state level in the U.S., and although Canada may not be experiencing the same cost increases, several provinces have also implemented rules to combat liability costs.<sup>4</sup> As we explore how liability costs are related to government health spending, we must account for the cross-state and cross-province variations in the legal environments. This is especially important if the measures are designed to reduce the amount recoverable in the legal system.<sup>5</sup>

Accepting that the legal system is not an efficient source of compensation for victims, we are primarily concerned with whether changes in government policies, in particular health care spending decisions, will drive more victims toward this less-desirable source of recovery.

## **Theoretical Framework**

The potential for a substitution effect between different sources of compensation has been examined by a number of researchers. We define three primary sources of compensation: private insurance, public programs, and the legal system, and consider the evidence that supports substitution across these sources. Theoretically, if there are constraints on accessing the resources in any of these

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roughly \$825 per person. Although the 2006 figures suggest a 5.5 percent reduction from 2005, the average annual increase in tort costs since 1951 is 9.2 percent.

<sup>4</sup> For example, in 2005 the B.C. Supreme Court implemented Rule 68, a pilot project in four registries, to fast-track litigation. The rule limited the evidence allowed to be called to the trial for claim amounts of less than Cdn\$100,000.

<sup>5</sup> Danzon (1986) notes that a monetary cap on the award of noneconomic damages, in particular, has a significant effect on lowering the number of medical malpractice claims filed.

three sources, such that one is either ineligible, or cannot claim adequate monetary compensation from one source, we would expect attempts to obtain compensation from one of the alternatives if income is held constant. Similar, we expect that a source that increases in generosity will attract claimants from the alternatives.

#### *Substitutions between public and private insurance sources*

There is substantial evidence regarding the substitution between alternative public programs, where substitution results from a change in one program's parameters, such as the eligibility requirements. For example, Campolieti and Krashinsky (2003) document a significant substitution between social programs in Canada that support disabled persons. They find, for example, that increases in per capita workers compensation benefit expenditures were associated with significant reductions in the number of Canada/Quebec Pension Plan disability beneficiaries.

In a study using data from the U.S. Current Population Survey, Ziliak (2004) finds strong evidence of substitution across wage, welfare and disability income sources. For example, an increase in the generosity of Social Security Income (SSI) relative to Aid to Families with Dependent Children (AFDC) accounts for about 40 percent of the increase in the growth of SSI from 1979-1999.

Biddle and Roberts (2003) examine whether other income replacements benefits and sources of medical insurance are viewed as substitutes for workers' compensation benefits. Evidence suggests that availability of potential substitute benefits is a factor in the claim filing decision. Over a quarter of all nonfilers reported access to other wage replacement benefits as a reason for not filing, and over a third said that one reason for not filing was the availability of other health insurance coverage

#### *Substitutions across public programs and the legal system*

More relevant to our research questions is the potential substitution effect between public or private insurance programs and the legal system. A report by the International Academy of Comparative Law (Reimann, 2003) notes that when other benefits are available, the incentive to litigate is far less."

Viscusi (1989) analyzes data on product liability claims for job-related injuries. He notes that the existence of privately provided compensation for injuries that were both product-related and work-related increased the likelihood that a product liability claim would be dropped (and also decreases both the settlement and litigation rates), but that government benefits did not have a significant effect. While workers compensation is a more prominent remedy, workers have increasing incentives to pursue a third-party lawsuit as the potential award increases. His results suggest that workers' compensation and tort liability have overlapping responsibilities and effects, and thus coordination problems are fundamental.

The medical malpractice area provides some examples of the potential for substitution between private insurance and the legal system as sources of compensation. For example, in a study of medical malpractice cases filed in Florida, Sloan and Hsieh (1995) find that claims for birth-related injuries were less likely to result when a family had health insurance.

To our knowledge, only one study directly links government spending on health care services to liability costs. Kerr, Ma and Schmit (2006), using country-level data for 24 countries, found a strong negative relationship between expenditures on government social programs and national liability insurance premiums.

#### *Private insurance vs. public programs – the “Crowding Out” problem*

Despite much success, public efforts to expand coverage to underserved populations have often been criticized for their potential for disrupting individual and employer incentives to purchase private insurance coverage. Evidence from several studies of the Medicaid expansions in the 1990s suggest a substitution effect referred to as “crowding out.” Dubay and Kenney (1996) assess the effect of the Medicaid expansions to children and pregnant women on employer-sponsored insurance and find that the increase in enrollment attributable to crowd-out for pregnant women and young children was about

14 percent and 17 percent, respectively.<sup>6</sup> In a similar analysis, Blumberg et al (2000) find that 23 percent of the movement from private coverage to Medicaid due to the expansions for children was attributable to this displacement.

Brown et al (2006) evaluate the effect of changes in qualifying income levels on the demand for private long term care insurance using data from the Health and Retirement Survey. Specifically, they focus on the variation in the level of assets that an individual can protect from Medicaid, which depends on an individual's state of residence, marital status and asset holdings to identify the impact of Medicaid on private long-term care insurance demand. They find that a \$10,000 reduction in the Medicaid asset disregards would increase private long-term care insurance coverage by 1.1 percentage points.

In a workers compensation claims study, Lakdawalla et. al (2005) evaluate the extent to which private health insurance coverage may discourage insured workers from filing workers compensation claims. Interestingly, they find that workers in firms that offer health insurance are more likely to file claims, suggesting that firm characteristics are more important than insurance status. Crowding out does not seem to result from the provision of workers compensation benefits when the workers compensation benefits and private insurance benefits are both provided by the employer.

Studies of the demand for insurance in other areas indicate a reduced incentive when there is the potential for a public assistance when a loss occurs. For example, findings in a study of the demand for flood insurance by Browne and Hoyt (1999) suggest that disaster relief efforts crowd out individual purchase of flood insurance. Kunreuther and Michel-Kerjan (2004) discuss the same phenomenon with the demand for terrorism risk insurance, as do Levmore and Logue (2003) and Lakdawalla and Zanjani (2004).

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<sup>6</sup> On the other hand, their findings indicate a positive finding as well: "more than 75 percent of the increase in Medicaid enrollment over the period was for children and pregnant women who would otherwise have been uninsured or would have lost their insurance as a result of secular declines in employer-sponsored coverage." (Dubay and Kenney, 1996: p. x)

We are not so concerned that crowding out exists if a public program results in a better system of protection for all. We are concerned when the benefits of the public program do not outweigh its costs, even if that includes some crowding out of private insurance. We note, as well, that for a given level of public spending on an expansion program, enrollment by those who would otherwise have private coverage reduces the potential number of uninsured people who can be covered. The costs of crowding out are higher if public safety net programs crowd out other well-functioning systems, i.e., by undermining informal systems of self-help and encouraging a culture of dependency among the poor.<sup>7</sup>

### *Hypothesis*

The previous discussion leads to the following two hypotheses:

H1: There is an inverse relationship between government expenditures on safety net programs and automobile liability insurance losses.

The hypothesis suggests that state variations in *ex post* losses incurred on liability coverage will reflect the variations in use of private insurance, public programs, or both in obtaining compensation for injuries. Since insurers establish premiums to equal expected claim costs, we expect that variations in premiums across states would likewise reflect variations in the use of the alternative sources of compensation for injuries. We focus on automobile liability because it represents the majority of liability exposure in North America on a premium basis.

There are many different factors that may influence liability costs, such as the characteristics of the legal environment and state demographics, such as the average income in the state. We control for these factors, discussed further below, in order to quantify the monetary trade-off between social spending and liability costs. The results will provide evidence of the responsiveness of changes in liability costs to changes in social spending, i.e., does a dollar reduction in government spending result in an increase in liability costs by *more than or less than a dollar*.

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<sup>7</sup> For further discussion of the public policy implications of crowding out, see Davidson et al (2004).

## **United States vs. Canada**

It is generally believed that the U.S. tort system is expensive and inefficient. In comparison to other countries, the U.S. relies more on private mechanisms to protect against health expenses and lost income, whereas other countries place greater emphasis on government social programs. (Kerr, Ma, and Schmit, 2006). In comparing the U.S. to Canada, this is also an important difference, although not as obvious as it may be in comparing the U.S. to other countries, since Canada's legal liability system is indeed very similar. Still, there are distinct differences that we anticipate could result in different results for the states compared to the provinces.

A main difference is the universal healthcare system in Canada. When persons are injured, they access care that is covered by provincial health plans. All "medically necessary" care is covered. For persons injured in auto accidents, treatment for soft tissue injuries (e.g. physical therapy and chiropractic care) often is not covered, or only minimally covered, and therefore people require an alternative to pay for this care. First party accident benefits provided in the auto policy<sup>8</sup> provide a second line of defense, and only if the two of these together are inadequate would a liability claim result seeking compensation for economic loss. However, even for minor injuries that are 100% covered by provincial health plans and/or first party accident benefits, injured persons may still bring a liability claim for non-economic loss. The incentive to do this increases as the pay-off increases.<sup>9</sup>

In the U.S., persons injured in an auto accident access care that is then paid for either by their own private insurance, by first party medical pay in their auto policy (if available), by government insurance (if lower income or over 65), or by bringing a liability claim against the other party. Due to the absence of universal health care, private health insurance is arguably more important. States that have greater coverage may experience lower liability costs..

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<sup>8</sup> These are mandatory in all private provinces except Newfoundland.

<sup>9</sup> In 2004 most provinces with private auto insurance instituted a cap on pain and suffering awards for minor injuries because the aggregate cost of these claims was having a significant impact on premiums.

A second important difference between Canada and the U.S. is lower awards for non-economic damages in Canada. Canada has had a cap on all pain and suffering awards for over 30 years. Awards are guided by precedent and do not exhibit the variability or the size potential of U.S. awards.

By examining state and provincial level data, we control for many of the factors that may differ across countries, such as legal and economic systems, yet are able to capture the extent to which different provinces/states have stronger social safety nets

## **Data**

Our analysis involves the use of two separate databases, one for Canada and one for the U.S. In order to facilitate comparison, each dataset contains the same variables, and are therefore limited to those elements that were available, and comparable, in each country. **The Canadian dataset contains xxx observations for the period 1984-2005** and the U.S dataset contains 348 observations covering the period 1997-2003.<sup>10</sup> The sample characteristics for both countries are shown in Table 1. The sources for our data are noted in the Appendix.

Our dependent variables include liability losses incurred and liability premiums earned per vehicle, by state/province, as reported by all auto liability insurers in each state/province. Liability insurance losses are determined by the frequency and severity of liability insurance claims. We hypothesize that these costs are related to the availability of other sources of compensation, most likely through the influence that other sources might have on claim filing behavior. Likewise, liability premiums should mirror liability losses to the extent that insurers are accurate in pricing liability coverage over time.

We include as covariates four variables to proxy the availability of other sources of compensation. First, we use two measures of per capita spending on social assistance programs: the per capita spending on healthcare and per capita spending on welfare compensation. We hypothesize that

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<sup>10</sup> Two years of data for Florida are missing from the analysis, because state expenditures on health and welfare were not reported.

higher funding of these programs will be associated with lower liability losses and premiums, all else equal. It is important to note that the spending in these programs is not limited to compensation for injuries in automobile accidents. For example, welfare spending is intended to compensate for lost wages for a variety of circumstances which may not include injury. However, we suspect that higher spending on public programs reflects higher state/province involvement, e.g., via the investment in clinics and hiring of support personnel, which consequently reflects greater opportunities for those injured in auto accidents to obtain services.

Variations in liability costs are also, theoretically, related to variations in private spending on health insurance and out-of-pocket health expenditures, all else equal. Our state- and province-level private insurance measure captures the extent to which the population has various insurance coverages, including managed care, disability insurance and supplemental health insurance. We also include a measure of per capita private health care spending by all payers. We expect that private health care expenditures and insurance coverage rates are negatively related to liability costs. Furthermore, we suspect that variations in these private coverage measures are related to variations in government programs.<sup>11</sup> Thus, while spending on government programs is our primary focus, the private insurance coverage measures proxy for jurisdictional differences in the need for these forms of public assistance.

We include as control variables several other factors previously shown to influence the frequency and severity of liability claims. Accident frequency, which we expect to be positively related to liability costs, is calculated as the number of property damage accidents per 1000 population for Canada. For the U.S., a proxy for accident frequency is created by dividing auto property damage losses by the number of vehicles (IRC, 200x), because accident statistics are not readily available at the state level. We include a set of state demographic variables that have been shown in other studies<sup>12</sup> to be related to claim filing behavior or claim severity in auto insurance: per capita income, cars per capita,

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<sup>11</sup> Born and Zawacki (2006) examined the provision of retiree health benefits by manufacturing firms and found that the availability of alternative sources of health insurance reduced the likelihood that firms would offer benefits.

<sup>12</sup> See for example Cummins and Tennyson (1996) and Browne and Schmit (2006).

population density, unemployment rate, percent of population female, percent of population over 65.

For example, population density is assumed correlated with access to lawyers, which suggests a positive relationship between liability costs and density.

Liability costs may depend on characteristics of the legal environment, which vary across states and provinces in two key ways. First, some states and provinces have no-fault rules for automobile accidents, whereby... No-fault states are expected to have fewer lawsuits filed than traditional tort liability states and higher average damage awards at trial. In 23 states (and the District of Columbia and Puerto Rico), the ability or incentive to file an automobile-related tort liability case is restricted by some variation of no-fault rules. A no-fault system, in which drivers are required to carry first-party insurance that compensates them for certain losses regardless of fault, is intended to take small claims out of the courts. Only under certain conditions can drivers in no-fault states sue for severe injuries. Of the 25 jurisdictions with no-fault rules, only 14 have mandatory no-fault systems. In contrast, three states give drivers a choice of selecting a no-fault insurance policy. Ten other states and the District of Columbia let drivers carry first-party insurance but do not restrict those drivers in filing a lawsuit (III, 2003). During the period analyzed using the U.S. data, there were no changes in no-fault statutes. Thus, the role of this statute, as it affects liability losses and premiums, is captured through our fixed state effects in the pooled regressions. The models are described below.

States also differ in the extent to which they have enacted various reforms intended to reduce the frequency and/or severity of tort claims. In particular, many states have enacted caps on noneconomic damages, modifications to the joint and several liability rule, and collateral sources rules. A recent study of commercial auto liability insurance losses indicates that these three reforms are associated with reduced liability losses (Hoyt et al, 2007). Since some states modified their tort environments during our sample period, we include a dummy variable that is equal to one if the state enacted one of these key reforms, zero otherwise. The Canadian provinces have had caps on noneconomic damages for over 30 years. More recently, lawmakers have considered similar reforms but, to date, no other reforms have been enacted.

## Empirical Approach

We apply multivariate regression analysis to empirically examine the relationship between automobile liability losses and government expenditures on social programs. A variety of state- or province-specific factors are likely omitted in our analysis. Hence, we include fixed effects for each state or province, along with year effects to capture a possible time trend. We estimate our models using a two-way fixed effects ordinary least squares approach. F tests following the regressions indicate that there are significant year and state/province effects, and thus ordinary least squares would be inappropriate. We estimate the following equation for each country:

$$PALiabLosses_{st} = \alpha + \beta_1 PCPubHealth_{st} + \beta_2 PCPubWelfare_{st} + \beta_3 PCPrivate_{st} + \beta_5 Ins_{st} + X_{st}\gamma_k + Y_t\eta_p + S_s\phi_q + \varepsilon_{st} \quad (1)$$

Where:

$PALiabLosses_{st}$  = auto liability losses per vehicle, respectively for state/province,  $s$ , at time  $t$ .

$PCPubHealth_{st}$  and  $PCPubWelfare_{st}$  = per capita expenditures on health and welfare, respectively, for state/province,  $s$ , at time  $t$ .

$PCPrivate_{st}$  = per capita spending on private health expenditures, for state/province,  $s$ , at time  $t$ .

$Ins_{st}$  = percent of population in the state/province with health insurance (supplemental health insurance for Canada), for state/province,  $s$ , at time  $t$ .

$X_{st}$  = a  $1 \times k$  vector of other control variables including state/province measures of real per capita income, cars per capita, accident rate, population density, unemployment rate, percent of female population, percent of population over 65, and tort reform.

$Y_t$  = a  $1 \times p$  vector of state/province invariant variables that vary only over time

$S_s$  = a  $1 \times q$  vector of time-invariant variables that vary only over state/province

$\varepsilon_{st}$  = disturbance term

Since we view the various sources of compensation as substitutes, we consider whether the amount spent on government programs, or private health spending, is correlated with the random error term in either equation. Hausman tests for endogeneity indicate that these variables are not endogenous, and therefore an instrumental variables approach is not warranted.

## Results

The results of estimating equation 1 are shown in Table 2. Overall, our results for the United States indicate a weak relationship between liability costs and the alternative sources of compensation, whether public or private. In the losses equation, only two of the estimated coefficients are significant. We note that a higher percentage of the population covered with health insurance is associated with lower auto liability losses, as expected, but the estimated coefficients on the other three sources are not significant. We also find that the rate of accidents is positively related to liability costs, as expected.

The results from a corresponding premium equation indicate a significant negative relationship between public health expenditures and liability premiums. This is consistent with the findings of Kerr, Ma and Schmit (2006). However, the magnitude of the estimated coefficient is quite small: a \$1 reduction in public health programs is associated with a \$0.06 increase in liability premium per vehicle – hardly a concern given that liability premiums per vehicle average \$556. Interestingly, the coefficient on private spending is significant and positive, indicating that states with higher spending on private health care also have higher liability premiums. We suspect that the variable may be capturing state variation in medical expenses. Two of the demographic variables – the unemployment rate and the percent of female population – are also significantly related to liability premiums. Since females are generally lower risk drivers than males, it is not surprising that a larger female population is associated with lower liability premiums. The unemployment rate is positively related to liability premiums, perhaps because insurers anticipate a higher rate of filing claims among the uninsured.

Our results for Canada indicate...

## **Conclusion and Discussion**

This study provides an assessment of the relationship between sources of support for automobile accident victims. We are primarily concerned with the use of the legal system over other possible alternatives, such as government sponsored health and welfare programs and private health insurance, since the legal system is likely to be the least efficient compensation mechanism. We note substantial variation across states and provinces in liability losses and premiums, as well as in the amount spent on health and welfare, and exploit this feature to measure the possible substitution by individuals seeking compensation for injuries. While our findings provide only weak support of our theory that the liability system is a substitute for other recovery mechanisms, we suggest that public policymakers use caution when cutting public health and welfare spending, as the transfer of claimants to the legal system from public programs should be avoided. At this point, however, we suspect the costs of filing claims in the legal system will continue to discourage a large shift to that form of recovery.

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**Table 1. Summary Statistics (Canadian Data)**

Variable	Canada (N=x)			United States (N=348)		
	Mean	St. Dev	Min/Max	Mean	St. Dev	Min/Max
Incurred Losses TPL/Earned Vehicles	376.44	89.20	219.32/625.87	369.49	117.54	100.42/986.21
Earned Premiums TPL/Earned Vehicles	259.05	58.28	151.15/476.64	556.46	156.69	192.92/1362.50
Public health expenditure per capita	3101.80	510.07	2257.7/4297.13	1039.71	306.90	448.28/2316.44
Public welfare expenditure per capita	951.43	188.32	590.36/1446.68	23.87	18.60	-5.01/91.11
Private health expenditure per capita	1737.2	2317.4	76.59/8190.24	4451.03	604.15	3076.69/6319.97
Percentage with Private/Supplemental Health Insurance	31.29	14.18	16.17/76.76	86.06	3.94	74.2/93.9
Disposable Income per capita				29851	4780	21266/46606
Population Density	11.16	7.51	1.27/24.42	180.44	245.66	1.06/1163.83
Accident Rate				-	-	-
PD losses per vehicle	-	-	-	270.70	72.72	144.34/736.58
Unemployment	11.39	4.16	3.9/20.4	4.62	1.18	2.2/7.8
Percent female	50.47	.505	49.45/51.35	0.51	0.01	0.48/0.52
Percent over age 65	12.03	1.47	8.66/14.31	0.12	0.02	0.05/0.18
Tort Reform	-	-	-	0.79	0.41	0/1

**Table 2. Two-way Fixed Effects Results**

	Canada		United States	
	Losses	Premiums	Losses	Premiums
Intercept			-1266.057 (2634.577)	5583.350* (2931.154)
PCPubhealth			-0.013 (0.025)	-0.064** (0.027)
PCPubwelfare			0.243 (0.249)	0.352 (0.277)
PCPrivate			-0.017 (0.023)	0.069*** (0.026)
Ins			-6.438*** (1.980)	-2.319 (2.203)
PCIncome			0.006 (0.005)	0.002 (0.005)
Accident Rate			0.743*** (0.060)	1.002*** (0.067)
PopDensity			-0.541 (0.398)	-0.420 (0.442)
UnempRate			1.658 (5.334)	10.540* (5.935)
PctFemale			4471.019 (5532.636)	-10962.870* (6155.451)
PctOver65			-2056.027 (2434.990)	2217.034 (2709.099)
Reform			-34.142 (25.351)	-21.704 (28.205)
R <sup>2</sup>			0.031	0.036

**APPENDIX: Table of Data Descriptions and Sources\***

<b>Variable</b>	<b>Canada</b>	<b>United States</b>
rpcloss	Real Provincial Total Auto Liability Losses Incurred Source: IBC, 1986-2005	State Total Auto Liability Losses Incurred Source: NAIC, 1989-2006
rpcprem	Real Provincial Total Auto Liability Premiums Earned Source: IBC, 1986-2005	State Total Auto Liability Premiums Earned Source: NAIC, 1989-2006
rpchealth	Per capita Provincial Government Health Expenditures Source: CIHI, 1975-2005	Per capita Total State Government Health Expenditures Source: Milbank Memorial, 1997-2003
rpcwelfare	Per capita spending on welfare Source: HRSDC, 1983-2002	Per Capita Total State Government Welfare Expenditures Source: U.S. Department of Health & Human Services, 1997-2006
rpcpriv	Provincial Private Health Care Expenditures Source: CIHI, 1975-2005	Per Capita State Total Personal Health Care Expenditures Source: US Department of Health & Human Services, 1991-2004
ins	Percent with supplemental health insurance Source: Canada Life and Health Insurance Assoc., 1990-2005	Percent insured in State Source: US Census Bureau, 1987-2005
rlipd	Provincial Total Auto Property Damage Losses Incurred Source: IBC, 1986-2005	Real State Total Auto Property Damage Losses Incurred Source: NAIC, 1989-2006
pop	Provincial Population Source: Statistics Canada, 1981-2006	State Population Source: US Census Bureau, 1990-2006
cars	Provincial Total Personal and Commercial Automobiles Source: <b>Transport Canada – years?</b>	State Total Personal and Commercial Automobiles Source: Federal Highway Administration, Office of Highway Policy Information, 1995-2005
rpcinc	Per Capita Disposable Income Source: Statistics Canada 1981-2006	Per Capita Personal Income Source: U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business, 1990-2006
popdens	Population per square kilometer Source: Statistics Canada, 1986 - 2006	State Population per square mile Source: US Census Bureau, 1990-2006
unemp	Percent Unemployed in Province Source: Statistics Canada, 1986-2006	Percent Unemployed in State Source: Bureau of Labor Statistics, 1990-2006
pctfem	Percent Female in Province Source: Statistics Canada, 1986- 2006	Percent Female in State Source: US Census Bureau, Intercensal State and County Characteristics
pctold	Percent of Population Over 65 Years of Age Source: Statistics Canada, 1986 - 2006	Percent of Population Over 65 Years of Age Source: US Census Bureau, Intercensal State and County Characteristics
tortref		1 if state has reformed Joint & Several Liability, Collateral Sources Rule, or Noneconomic Damages Cap, 0 otherwise Source: ATRA, 1984-2006

\* All amounts were converted to 2004 (?) dollars.