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# ONTARIO AUTO INSURANCE REFORM: A GAME OF “WHACK-A-MOLE”

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Résumé de l'article

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## ONTARIO AUTO INSURANCE REFORM: A GAME OF “WHACK-A-MOLE”\*

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### ■ ABSTRACT

Reform of Ontario's partial no-fault auto insurance product has occurred multiple times since its introduction in 1990. The objectives of these reforms have been to improve affordability and accessibility, with some reforms targeting the product itself and others focused on improving the claims process. This article provides a review of the reforms, their expected outcomes, and the actual impact

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on losses and premiums. Overall we find that the success of each reform has been short-lived, and by 2014 the average combined first-party and third-party personal injury loss per vehicle was 50 percent higher in real terms than in 1991. Further examination reveals that the Greater Toronto Area (GTA) is responsible for most of the claims growth over this time period, while there has only been marginal growth in both claim frequency and severity in other parts of the province. The presence of generous benefits in the absence of controls to mitigate moral hazard appear to have led to excessive and abusive claiming behaviours on the part of both claimants and medical providers, contributing to the explosion in loss costs in the GTA.

*Keywords: Automobile insurance; reform; no-fault.*

## INTRODUCTION

Auto insurance in Canada is regulated provincially, resulting in a variety of systems across the country. Among the six provinces in Canada with private auto insurance, Ontario is the only one with no-fault insurance; the remaining five (Alberta, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador) have tort-based systems.<sup>1</sup> Ontario's mandatory automobile insurance product, provided on a no-fault basis since 1990, offers one of the most comprehensive ranges of benefits in Canada. Although modified several times since its introduction, it has remained a partial no-fault system that incorporates both monetary and verbal thresholds. By providing first-party compensation and limiting lawsuits, the primary goals of no-fault insurance when implemented were to provide quick and certain payment for injuries and substantially reduce the costs of claim settlement, including litigation.

Ontario is the largest province (population-wise) in Canada, accounting for almost 40 percent of the country's population and 50 percent of private company auto insurance premiums nationwide. Because of the size of the Ontario auto insurance market—approximately 25 percent of all non-life premiums written in Canada—profitability in Ontario auto insurance is essential for the well-being of many insurers. Due to its mandatory nature as well as the importance of Ontario auto to many insurers, the government stringently regulates both the pricing and the design of the auto insurance product.

Unfortunately, despite regular efforts to change and improve the no-fault product over time, it has not proven to be the solution that policy makers were seeking. Although Ontario roads are among the

safest in North America and the number of fatalities and serious injuries from car crashes have been falling over time, average insurance premiums in Ontario have continued to climb. Between 1991 and 2014 auto insurance premiums increased (in real terms) 23 percent, and drivers in Ontario have paid higher premiums and experienced more price volatility than in other provinces. There have been five major reforms from 1990 until 2010 and each reform has led to new problems with the insurance product, creating a game of regulatory whack-a-mole.

The growth in claims costs and the failure of regulation to control this growth is the subject of our research. This article provides a summary and analysis of reforms enacted between 1990 and 2010 and examines the performance (in terms of loss costs and premiums) of the Ontario auto insurance system in light of these reforms. Our approach is similar to Grace, Klein and Tennyson (2013): we describe the short and long-term impacts—beneficial and detrimental—of regulatory change within a highly regulated jurisdiction and offer insights into the problems created by this approach to auto insurance reform.

The typical pattern we see is that individual reforms reduced claim costs in the short run, but in almost every instance, the effect is short lived. Our analysis helps to explain the various factors that contributed to this pattern over the years. As in most troubled auto insurance systems, we find that cost growth in Ontario stems largely from an increase in injury benefit costs, primarily first-party accident benefit claims. We also find that this cost growth occurred largely in the Greater Toronto Area (GTA) rather than province-wide. We observe patterns that suggest that a “lottery mentality” associated with no-fault thresholds (Cummins and Tennyson 1992) and a claiming culture arising from generous first-party benefits appear to be the key drivers of excess insurance costs in Ontario. In order to achieve a sustainable auto insurance market, system-wide reforms are recommended to control moral hazard and fraud in the system.

The remainder of the paper is organized as follows. The next section provides a discussion of the evolution of reforms during the 1990 to 2010 time period and the predicted impact of these reforms. We then analyze the actual effect of the reforms in Ontario and on the different geographic regions in Ontario, highlighting patterns indicating the “lottery mentality”. In the concluding section we summarize and interpret the results and present policy implications.

# BRIEF ANALYSIS OF REFORMS

## Overview of Reforms and Impact

The introduction of no-fault insurance in Ontario was preceded by a period of fast-rising premiums in the late 1980s. Concerns about affordability, fairness and an increase in the cost to settle claims led to the creation of the Ontario Motorist Protection Plan (OMPP), a partial no-fault scheme. The auto insurance product created included a generous range of benefits and four mandatory coverages: a minimum (\$200,000) of third-party liability coverage for both bodily injury and property damage; first-party (no-fault) accident benefits; first-party coverage for not-at-fault damage to one's own automobile (direct compensation-property damage or DC-PD); and first-party coverage against personal injury and property damage caused by at-fault uninsured drivers.<sup>2</sup> The level of first-party accident benefits available to anyone injured in an automobile accident is defined by the no-fault statutory accident benefits schedule (SABS) and if a monetary threshold is met, claimants can sue for economic losses that exceed the first-party benefits. A unique aspect of the current Ontario system is that the maximum amount of first-party benefits available is a function of the level of impairment of the individual (since 1996), and individuals with catastrophic impairment<sup>3</sup> are entitled to up to \$1 million in medical and rehabilitation benefits and \$1 million for attendant care. Otherwise benefits (since 2013) are capped at \$50,000 for medical and rehabilitation benefits and \$36,000 for attendant care.

The introduction of no-fault insurance in June 1990 was predicated on the notion that, from a health outcomes perspective, first-party benefits are preferred to tort-based compensation.<sup>4</sup> The OMPP contained both a verbal threshold and a monetary threshold, allowing access to the liability system if injuries were severe enough or if costs were greater than first-party benefits. It was anticipated that the no-fault coverage would increase the average AB and BI severity and that this would be offset by a reduction in the frequency of BI claims and savings arising from lower claim settlement costs.<sup>5</sup> Hence, total loss costs were not expected to increase. However, relief from rising claims costs (and corresponding premium increases) did not materialize.

In response, Ontario has engaged in significant reform efforts over time. Persistent concerns regarding affordability, stability and sustainability highlight the fact that the frequent reforms did not achieve the intended objectives. The multi-faceted reforms to counter cost growth problems over the years have addressed threshold definitions, benefit

levels and the settlement process. A summary of these reforms, along with the government rationale for each reform and the expected impact of the reform, is provided in Table 1. An expanded discussion of reforms is found in the Appendix: Details of Auto Insurance Reform – 1990-2010. We focus on reforms that impact accident benefits (AB) and bodily injury liability (BI) claims costs as these are the main drivers of auto insurance costs.

Briefly, the major reforms preserved the no-fault mandate and attempted to correct shortcomings with the auto insurance product by:

- Improving coverage (1994);
- Reducing assessment costs (2003, 2006 and 2010);
- Reducing high first-party AB costs (1996 and 2010); and
- Reducing abusive and fraudulent claiming behaviour (2006, 2010).

The analysis that follows demonstrates that the expected impact of the reforms often were realized in the short-term, but any long lasting effects on controlling the cost of claims and stabilizing premiums were not achieved.

**■ TABLE 1** *A Summary of Auto Insurance Reform in Ontario from 1990 to 2010 and the Expected Impacts*

YEAR	BILL	RATIONALE FOR REFORM	WORDING FOR VERBAL THRESHOLD	RIGHT TO SUE FOR NON-ECONOMIC LOSSES
1990	Bill 68	Improve accessibility and affordability, correct shortcomings in tort system.	Sustained permanent and serious disfigurement or sustained permanent serious impairment of an important bodily function	Yes, if injury meets verbal threshold
1994	Bill 164	Cover more injured claimants, move closer to pure no-fault coverage.	Serious disfigurement or serious impairment of an important physical, mental or psychological function	Yes, if injury meets verbal threshold, \$10,000 deductible applies
1996	Bill 59	Reduce costs associated with high first-party AB claims. Increase tools available for insurers to combat fraud and abuse	Permanent serious disfigurement or permanent serious impairment of an important physical, mental or psychological function	Yes, if injury meets verbal threshold, \$15,000 deductible applies
2003	Bill 198	Improve affordability and accessibility by decreasing assessment costs.	Introduced definitions for “serious,” “important,” and “permanent” to tighten threshold	Yes, if injury meets verbal threshold, \$30,000 deductible applies
2006	Elimination of DACs	Reduce costs by eliminating Designated Assessment Centres (DACs).	No change from Bill 198	No change from Bill 198
2010	Bill 16	Reduce costs associated with high first-party AB claims. Reduce expenses in assessment process.	No change from Bill 198	No change from Bill 198

RIGHT TO SUE FOR ECONOMIC LOSSES	FIRST-PARTY (AB) REFORMS	IMPACT ON BI CLAIMS	IMPACT ON AB CLAIMS
Yes, if they exceed first-party benefits	\$500,000 limit on medical benefits, disability benefits for both employed and unemployed	↓ in frequency;  ↑ in severity	No change in frequency;  ↑ in severity
No	\$1 million limit on medical benefits, increased disability benefits, introduction of caregiver and housekeeping benefits	↑ in frequency;  ↓ in severity	No change or ↑ in frequency;  ↑ in severity
Yes, if they exceed first-party benefits. Health care expenses can only be claimed for catastrophic injuries	Introduction of two-tiered benefits: \$100,000 limit on medical benefits for most injuries, but \$1 million limit for catastrophic impairments.	Ambiguous impact on frequency;  ↑ in severity	No change or ↓ in frequency;  ↓ in severity
No change from Bill 59	Small change in benefits, but expansion of the definition of “catastrophic”; Non catastrophically injured can claim cost of future care.	↓ in frequency;  No change in severity	No change or ↓ in frequency;  Ambiguous impact on severity
No change from Bill 59	No change from Bill 198	No change in frequency;  No change in severity	No change in frequency;  Uncertain impact on severity
No change from Bill 59	Sharp reduction in benefits for “non-catastrophic” impairments; \$2,000 cap on fees and expenses for assessments; caps on minor injury claims	↑ in frequency;  Ambiguous impact on severity	No change in frequency;  ↓ in severity

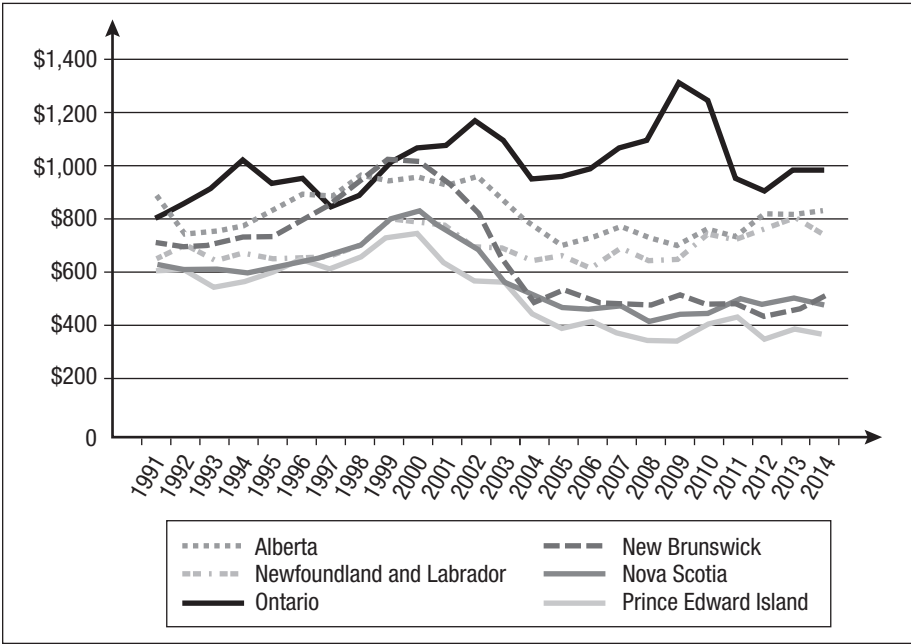


## Impact of Reforms on Claim and Cost Trends: Ontario versus Tort Provinces

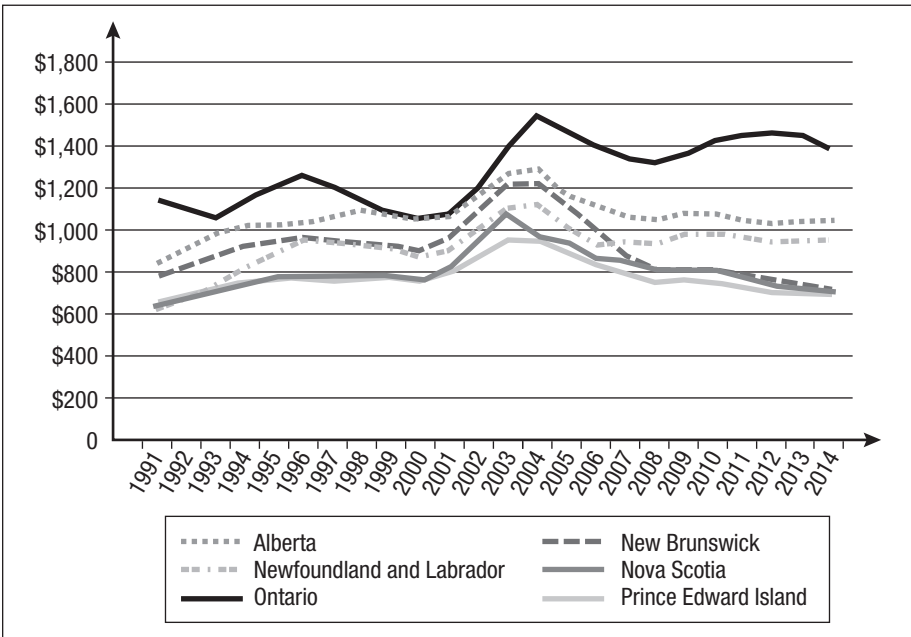
To assess the actual impact of reforms, we use data provided by the General Insurance Statistical Agency (GISA) to examine trends in Ontario claiming behaviour and insurance costs.<sup>6</sup> For 1991 to 2014, we analyze trends in the number of claims, premium levels and the severity of loss (total loss and loss adjustment costs divided by number of claims) per insured vehicle, for both AB (first-party) and BI (third-party) coverages. Monetary data are converted to constant 2010 dollars using the Consumer Price Index (CPI) for each province in order to net out general price changes within and between provinces.

We begin with a brief comparison of Ontario to the tort auto insurance markets in the rest of the country. By comparing provincial outcomes across the country we account for external demographic and market factors such as countrywide trends that reflect changes in cost of services, road safety initiatives, and the number of road users. The differences in product design between Ontario and the five tort provinces in Canada have resulted in startling divergences in both loss and premium levels between the provinces, as is illustrated in Figure 1. Panels A and B display the trends in average auto insurance loss costs and premiums for Ontario and the tort provinces of Alberta, New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador for years 1991 to 2014.<sup>7</sup> Although slightly higher, Ontario auto insurance costs in 1991 were comparable to costs in other provinces. The maximum difference in average loss cost for all coverages (in constant 2010 dollars) was approximately \$200 between Ontario and Prince Edward Island in 1991, but over \$600 in 2014. Higher losses translate directly into persistently higher premiums. Ontario has consistently had the highest average premiums, except for 1999 when average premiums in Ontario were \$9 lower than Alberta. In contrast to Ontario, the impact from significant product reform that was undertaken between 2002 and 2004 in all of the tort provinces is evident in both panels of Figure 1 – as overall losses fell, and premiums also fell. As shown, the effect of these did not deteriorate in the long term, and in 2014, real loss costs in 4 of the 5 tort provinces were below those in 1991 (Newfoundland and Labrador saw an increase in loss costs by roughly \$100). Equally evident in the figure is the transitory impact of the reforms that have occurred in Ontario.

■ FIGURE 1 Panel A: Average Loss Costs (All Coverages) in Constant 2010 \$



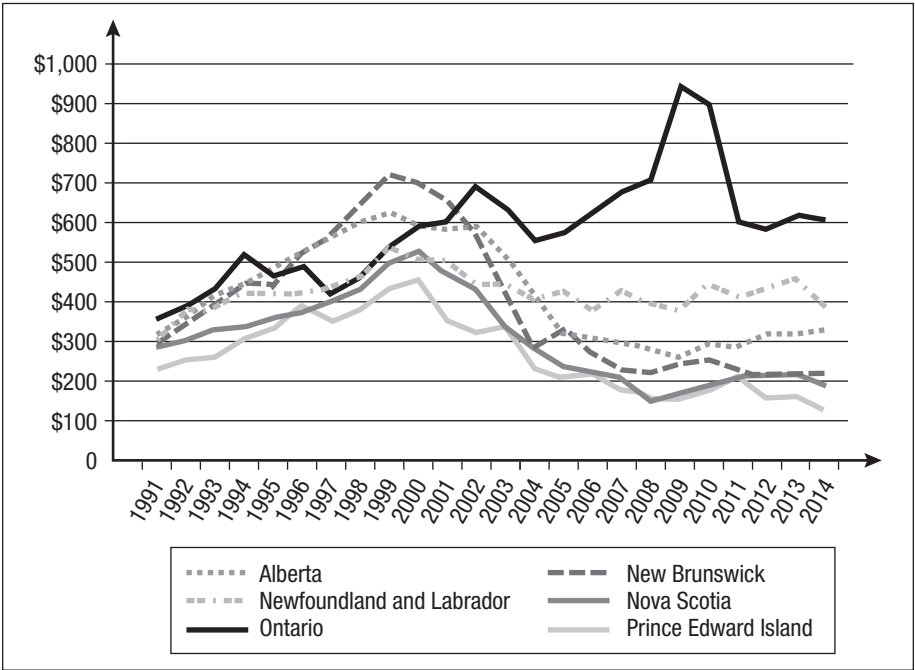
■ FIGURE 1 Panel B: Average Premium (All Coverages) in Constant 2010 \$



Source: Authors' calculations from GISA data

Figure 2 presents average loss costs for AB and BI, in constant 2010 dollars. Ontario saw average costs in constant dollars grow from \$354 in 1991 to \$941 in 2009 before falling to \$604 in 2014. In contrast, the private tort provinces (Alberta, New Brunswick, Nova Scotia and Prince Edward Island) saw real declines in the personal injury loss costs (both first and third party). Total loss costs are driven largely by personal injury costs, and the increase over the period from 2004 to 2010 created yet another push for reform.

■ **FIGURE 2**    *Average Loss Costs (AB + BI) in Constant 2010 \$*



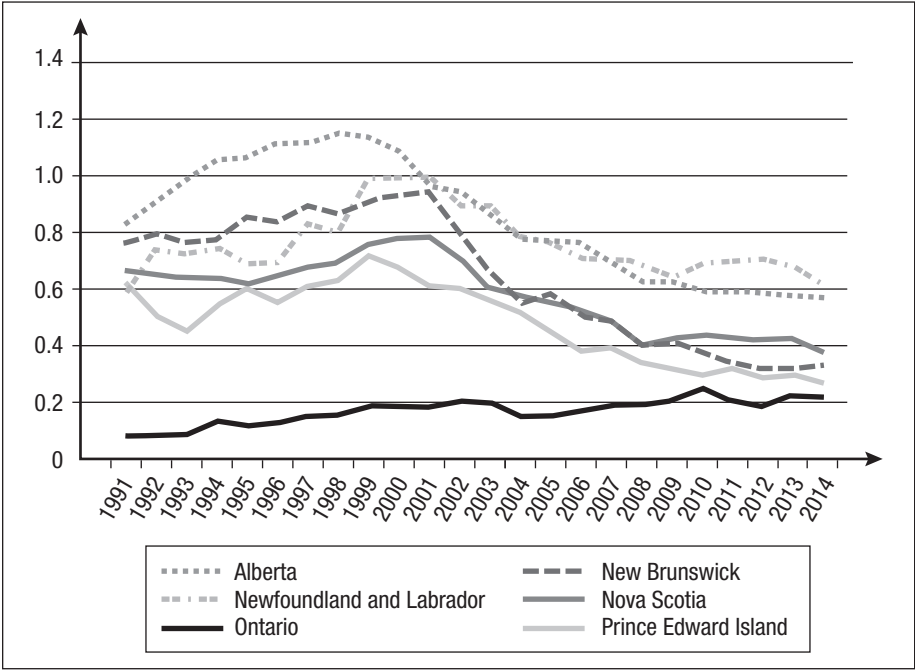
Source: Authors' calculations from GISA data

In order to understand what drives the difference in experience between Ontario and the other provinces with privately provided auto insurance, we examine trends in the frequency and severity of losses separately – in particular BI liability claims, and first-party AB claims for non-medical and medical losses.

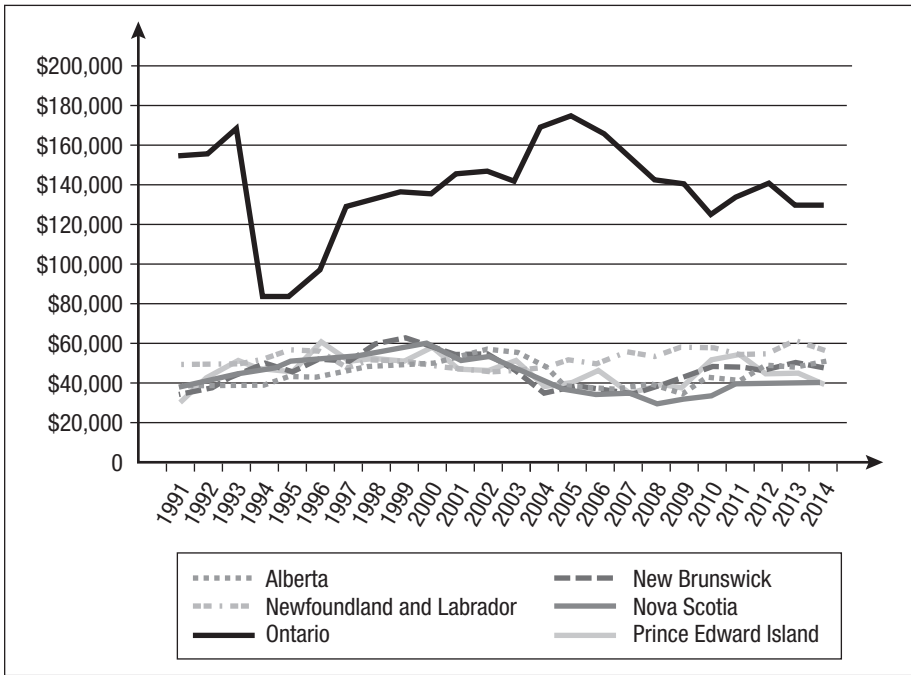
Bodily Injury Liability

Panels A and B of Figure 3 display, respectively, the frequency and severity of BI claims over the period 1991 to 2014. Historically, because of the combined monetary and verbal thresholds, the frequency of BI claims in Ontario was significantly lower than in the tort provinces. Despite the country-wide decrease in the number of fatal collisions and the number of collisions causing personal injury, Panel A shows an upward trend in the frequency of BI claims in Ontario since the introduction of no-fault, reflecting the weakening of both the verbal and monetary thresholds over time.

■ FIGURE 3 *Panel A – Number of BI Claims per 100 Vehicles*



■ **FIGURE 3** *Panel B – Average BI Costs per Claim in Constant 2010 \$*



Source: Authors' calculations from GISA data

Since 1991 the number of BI claims per 100 vehicles has increased steadily in Ontario from 0.08 to 0.21 in 2014. Over the same time period, the average number of BI claims per 100 vehicles in the tort provinces has decreased from 0.69 to 0.51, driven largely by effective reform of the auto insurance product in each of the tort provinces. Further evidence of the increasingly litigious environment in Ontario was provided by a large national insurer that analyzed the level of attorney involvement in auto insurance claims in both Ontario and Alberta. The insurer reported that in Alberta in 2010 only 0.2 percent of first-party AB claims involved a lawyer, whereas in Ontario it was 21.4 percent.<sup>8</sup>

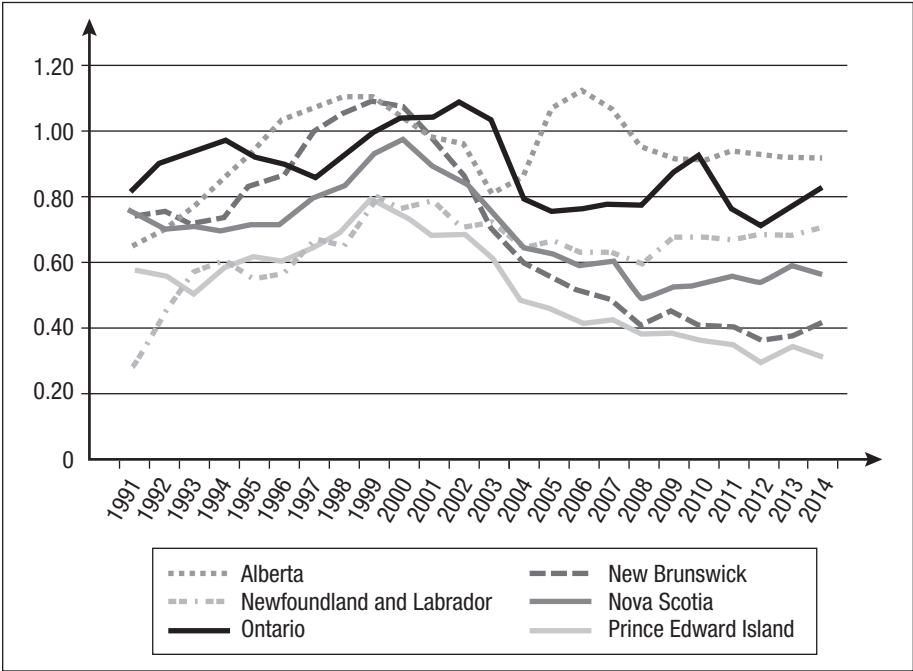
The average annual BI costs per claim are shown in Panel B of Figure 3. These data indicate that average claims severities are significantly higher in Ontario than in the tort provinces, which should be expected due to the verbal threshold. As well, repeated attempts at product reform have resulted in higher variability in BI claim severity in Ontario. Specifically, the 1994 removal of the right to sue for economic loss greatly reduced the average size of BI claim payments;

average BI severity remained low until the right to sue for economic losses was restored in 1996. Steady growth in average severity led to reforms in 2003, which had an immediate, but short-lived impact in reducing claims costs. Claim severity rose rapidly before trending downward following the 2006 reforms. The impact of the 2010 reforms had little impact on the severity of claims, whereas the frequency increased as expected. Figure 3 clearly shows how much higher average BI costs are in Ontario compared to the tort provinces, and how much more variable.

### Statutory Accident Benefits

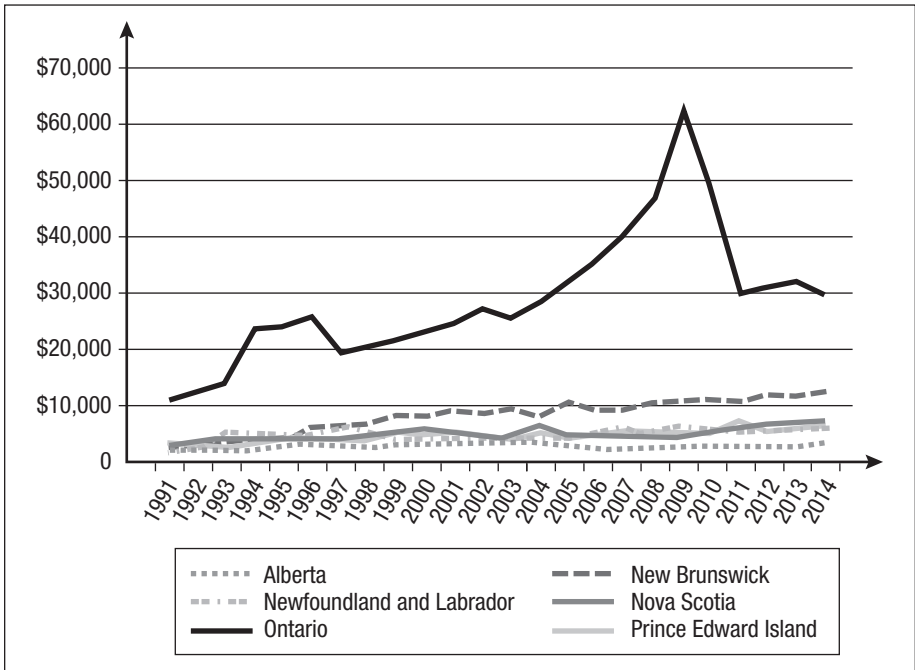
The second component of injury costs is accident benefits. In order to identify cost drivers, we present the data separately for medical costs benefits and non-medical benefits (primarily income replacement, care-giver benefits, non-wage earner benefits and attendant care). Figure 4 displays provincial trends in medical cost claim frequency and severity.

**FIGURE 4** *Panel A: Number of Medical Benefits Claims per 100 Vehicles – Provincial Comparisons*



Source: Authors' calculations from GISA data

■ **FIGURE 4** *Panel B: Average Medical and Rehabilitation Expenses Costs per Claim in Constant 2010 \$ – Provincial Comparisons*



All provinces in Canada, even those with tort-based auto insurance, provide for some level of first-party medical and non-medical benefits. Figure 4 shows that for much of the study period, the frequency of claims for medical benefits in Ontario was about the same, or a little higher than, most of the other provinces. This is problematic given the lower accident rates in Ontario compared with other provinces. In addition, the frequency of medical benefit claims should be unrelated to product reform; however, this does not appear to be the case. Figure 4 illustrates that claim frequency changes after each Ontario reform, even though the number of people eligible to claim has not changed, implying that changes in the generosity of benefits affect the frequency of claiming.

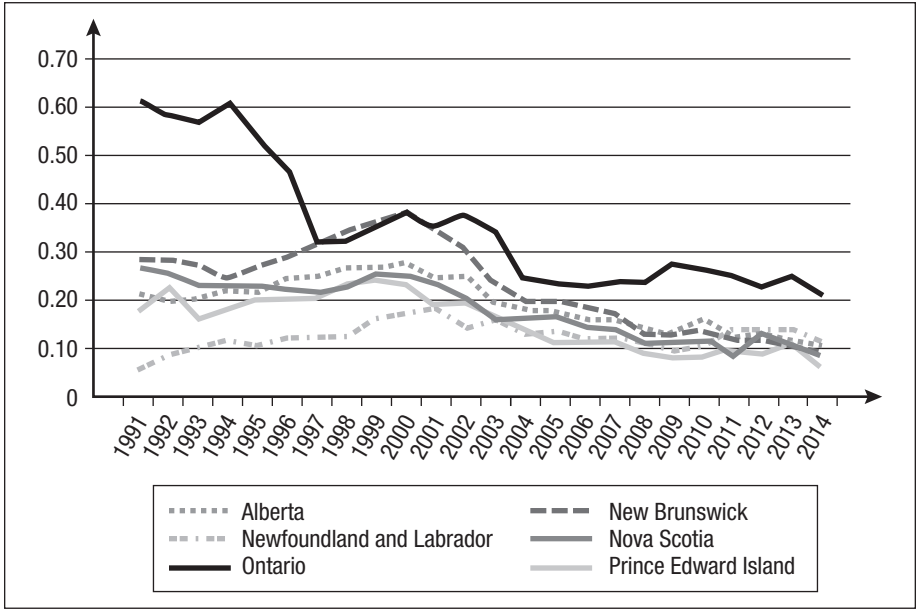
Panel B of Figure 4 shows that average medical benefits claims costs in Ontario (presented in constant 2010 dollars) are substantially higher than those of tort provinces. Further, Ontario has experienced dramatic

increases in costs over time, both relative to general inflation and relative to other provinces. This may not be unreasonable, given the higher first-party benefits and the verbal threshold. However, over the 20 year period, there have only been two real decreases in claim severity: the first in 1996 after the introduction of the two-tiered schedule of accident benefits, and in 2010 with the further reduction in benefits for those not catastrophically injured. By 2011, the cap on first-party benefits in Ontario (\$50,000 for non-catastrophic injuries) was the same as the first-party accident benefits available in New Brunswick, yet there is a large difference in the average claim severity between these two provinces: in 2014, average severity was \$12,525 in New Brunswick versus \$29,833 in Ontario.

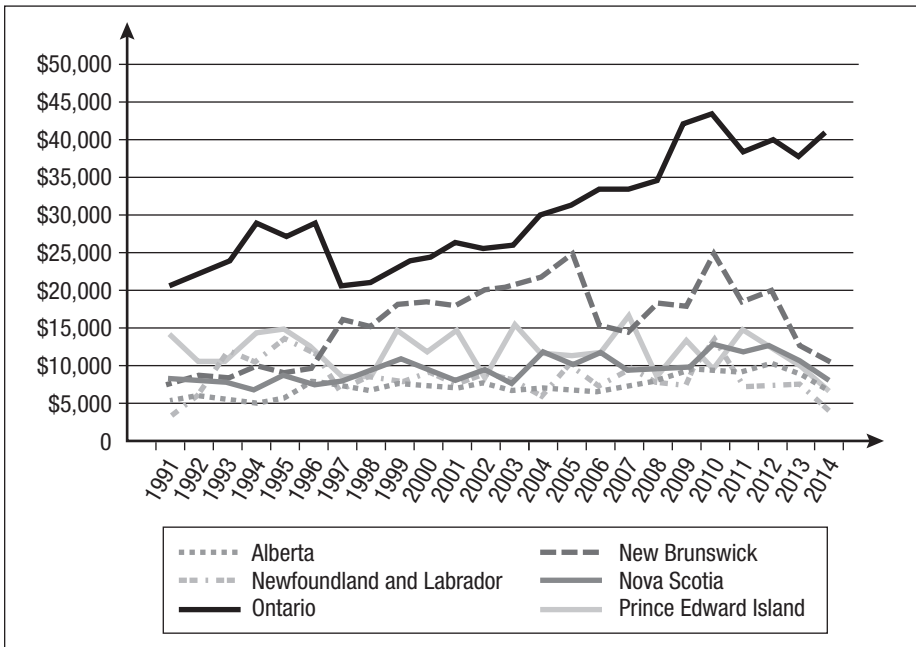
Figure 5 displays the between-province trends for frequency and severity of income replacement, attendant care, and other non-medical benefits. In Ontario, the frequency of non-medical benefits claims has declined markedly over time, from 0.62 per 100 vehicles in 1991 to 0.21 per 100 vehicles in 2014. Nonetheless, the claim frequency is still significantly higher in Ontario than the other provinces. In 2014, the average frequency in the five tort provinces was 0.105 non-medical benefits claims per 100 vehicles. The patterns over time suggest that declines occurred in response to insurance reforms. The number of non-medical benefit claims declined from 1991 to 1993 and then increased in 1994, after the introduction of weekly ‘wage’ replacement benefits to a larger group of insureds (unemployed, caregivers, and students). The reduction in 1996 coincides with the introduction of the two-tiered benefit schedule and the requirement that the claimant must be catastrophically injured to receive future care costs. The frequency of claims increased gradually after 1996 until 2003, when another steep decline was observed. Although those not catastrophically injured could claim future care costs after 2003, other initiatives aimed at reducing moral hazard associated with AB claims appear to have been moderately successful.



**FIGURE 5** *Panel A – Number of Non-Medical Benefits Claims per 100 Vehicles – Provincial Comparisons*



**FIGURE 5** *Panel B – Average Non-Medical Benefits Costs per Claim in Constant 2010 \$ – Provincial Comparisons*



Source: Authors' calculations from GISA data

The average claim severity for non-benefit medical claims is consistently higher in Ontario as is shown in Panel B of Figure 5. Non-medical benefits are significantly more generous in Ontario. In particular, housekeeping and attendant care benefits can both be paid to family members and limited oversight of these benefits may contribute to moral hazard problems. This graph provides another example of the immediate effect of Ontario's various auto insurance reforms. Claim severity increased gradually from 1991 until the introduction in 1996 of the two-tiered schedule of payments in Bill 59. Since 1997, claim severity has risen in real terms in every year until the reforms in 2010, which strictly curtailed benefits to those not catastrophically injured. The Ontario Auto Insurance Anti-Fraud Task Force (2011) notes that the biggest increases from 2006 to 2010 in these non-medical benefits costs per insured vehicle have been in housekeeping awards (an increase of 178 percent) and attendant care (increase of 67 percent). Overall, during the period 1991–2011 average non-medical claim severity increased 27 percent in real terms (prior to the 2010 reforms the increase was nearly 110 percent). The effect of the reforms was a reduction in severity from a high of \$43,511 in 2010 to \$37,974 in 2013; however severity increased again in 2014, up to \$40,777, raising some doubt as to the long term effect. Upcoming reforms in Ontario to be introduced in 2016 specifically address the caps on attendant care services.

This brief inter-provincial comparison suggests that the use of regulatory reform to achieve the objectives of affordability, stability and sustainability has been generally ineffective in Ontario. While both frequency and severity of losses have responded initially to reforms, the desired effect is typically short-lived, providing only a temporary reduction in premiums and losses. Reform in Ontario has not achieved sustained affordability or stability of premiums. This is despite the relative success in other Canadian jurisdictions in controlling automobile insurance costs.

### 4.3 Trends within Ontario

The previous analysis indicates that Ontario's auto insurance system faces a number of problem areas in terms of loss costs, and that reforms in Ontario have not been effective over the long run. However, given the diversity and size of Ontario (415,600 square miles, with population of 13.6 million people), it is reasonable to expect that claims experience will vary across the province. Factors such as weather conditions, traffic density, the ratio of urban to rural roads and per capita income

are known to impact claim frequency and severity. In addition, claims increase with access to legal services (Browne and Puelz, 1996), and the incentive to file claims is greater in areas with greater unemployment (Cummins and Tennyson, 1996).

In order to compare the experience of the largest urban centres within Ontario and the remainder of the province (which we label *rest of ON*), we use GISA premium and claim data by statistical territory from 2000 to 2014. Statistics Canada lists the four largest Census Metropolitan Areas in Ontario as Toronto/Mississauga (the Greater Toronto Area or GTA), Ottawa/Gatineau, Hamilton/Burlington, and Kitchener-Waterloo/Cambridge.<sup>9</sup> The GTA is by far the largest metropolitan area in Canada. In 2014, the GTA accounted for 36 percent of earned vehicles in the province, 47 percent of total premiums collected, 46 percent of incurred losses and 40 percent of the number of claims.<sup>10</sup> Our analysis at the statistical territory level focuses on AB claims since these appear to be the main cost driver of losses in Ontario.

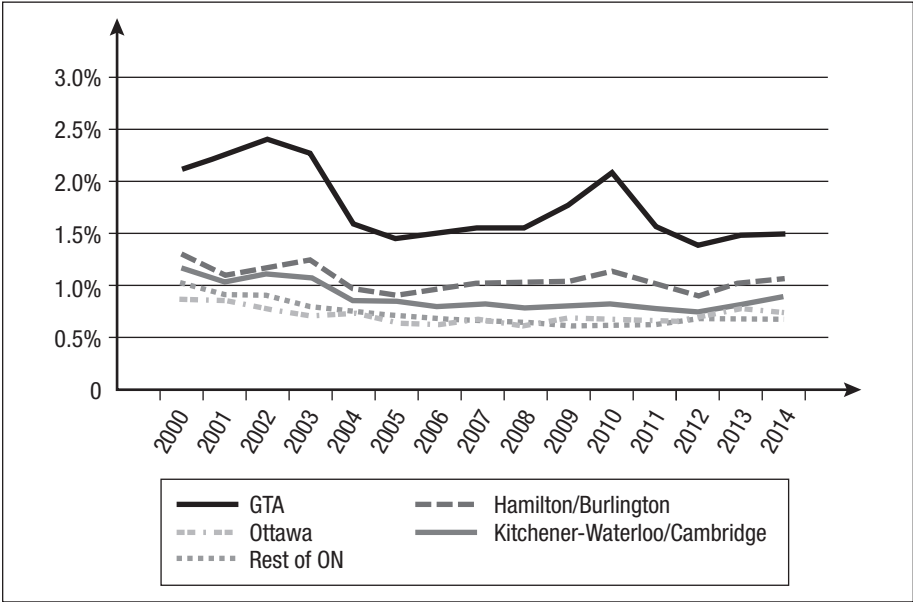
Figure 6 displays the frequency (Panel A) and severity (Panel B) of AB claims for the four largest urban areas and the rest of Ontario. The frequency of AB claims in the GTA is almost double that of the rest of the province, and this trend has persisted throughout the 14 year period for which we have data. We correlated this frequency of AB claims with the most current underlying motor vehicle accident rates provided by the Ontario Ministry of Transportation (2012). The number of people injured in accidents per 100 vehicles is 1.34 in the GTA compared to 0.63 in Ottawa and 0.69 in Waterloo-Wellington region (which roughly coincides with census metropolitan area, Kitchener-Waterloo/Cambridge). The crash rate in the GTA was roughly double the crash rate in both Kitchener-Waterloo/Cambridge and Ottawa, but the frequency of AB claims in 2012 in the GTA was more than 2.5 times the frequency of AB claims in Ottawa. Since the higher frequency of claims in the GTA is not driven by accident rates, it is not surprising that reforms introduced in 2003 and 2010 to reduce excessive claiming behaviour had more of an impact in the GTA than the rest of the province.

Panel B of Figure 6 graphs the average AB severity per claim (in constant 2010 dollars) for the four largest urban areas in Ontario and the remainder of the province. All territories exhibit an upward growth, suggesting that reforms have not been successful in containing first-party benefit costs at the individual claims level. Road safety data published by the Ontario Ministry of Transportation (2012) shows a decline

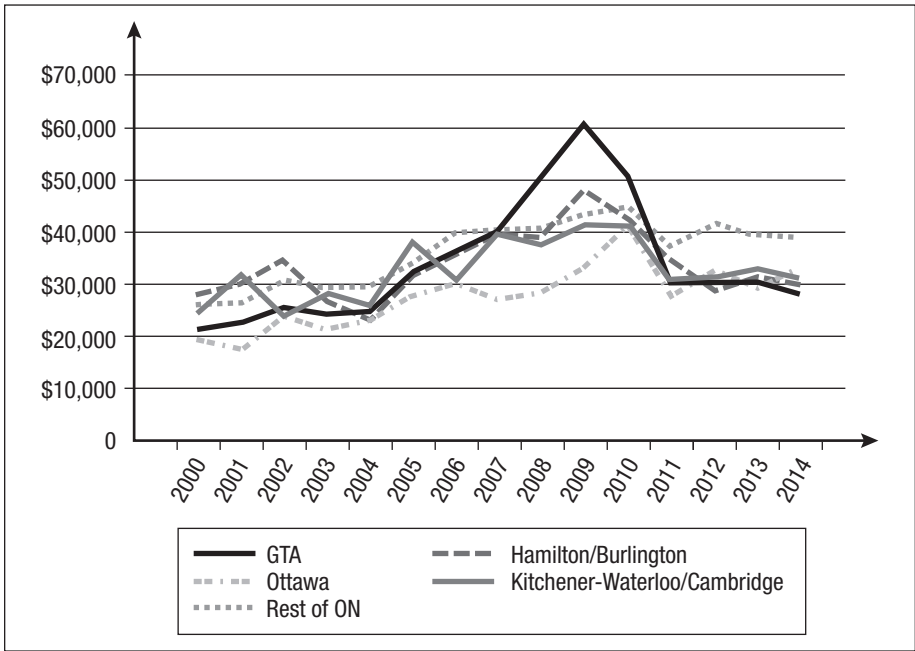
in the total number of reported collisions between 2002 and 2012. In 2000, there were 240,630 reported collisions in the province with 849 persons killed and 85,009 injured. In 2012, there were 172,868 reported collisions, with 568 fatalities and 61,001 reported injuries. Hence, the increase in AB severity is not caused by an increase in accidents.

The growth in claim costs in the GTA is particularly problematic. The 2003 reforms provided short-term relief to claims growth, but by 2007 claims were again at 2002 levels. After reaching a high point of \$60,237 in 2009, AB severity fell to \$50,689 in 2010 and then further to \$28,549 in 2014. However, even after this dramatic decrease, claims in the GTA in 2011 remained 35 percent higher than 2000 claims levels. Previous studies (Kochanowski and Young, 1985; and Kelly, Kleffner and Tomlinson, 2010) have shown that higher population density is correlated with fewer serious accidents, especially when it is associated with more inner city and less rural interstate driving (Cummins, Phillips and Weiss, 2001). Given that we expect less severe accidents in the GTA, this suggests that there may be excessive or abusive claiming or outright fraudulent claiming behaviour in the GTA.<sup>11</sup>

■ FIGURE 6 Panel A – Ontario Accident Benefits Frequency



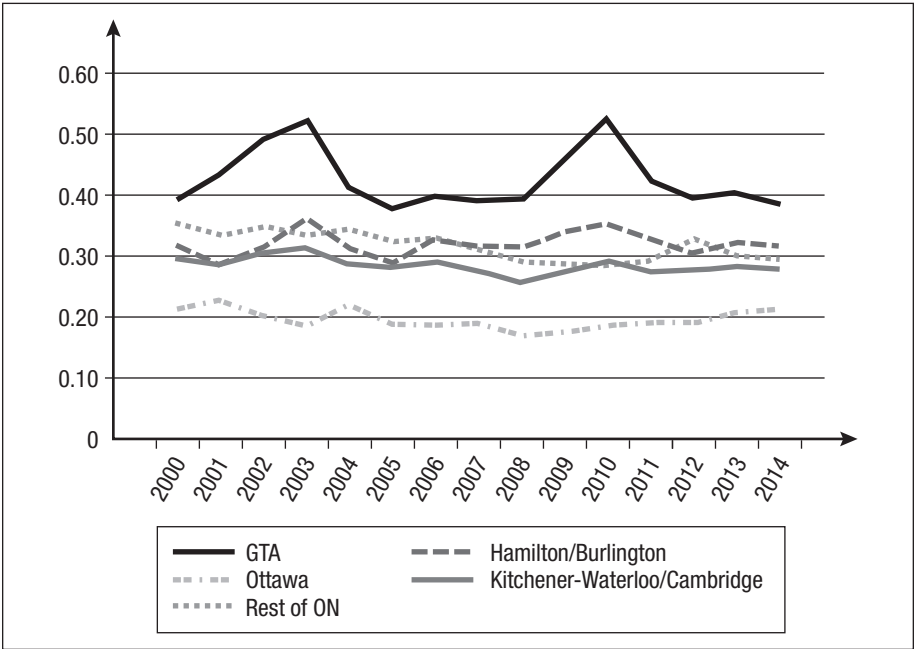
■ **FIGURE 6** *Panel B – Ontario Comparison Accident Benefits Costs per Claim in Constant 2010 \$*



Source: Authors' calculations from GISA data

Figure 7 displays the ratio of AB claims to not-at-fault first-party property damage (DC-PD) claims, and as such examines almost all accidents that give rise to claims.<sup>12</sup> Consistent with the earlier graph of AB claims, the GTA has the highest ratio of AB to DC-PD claims. In 2012, the ratio of AB to DC-PD claims in the GTA was 0.397, indicating that almost 40 percent of accidents involved personal injury. The Ministry of Transportation (2012) crash data shows that the ratio of accidents with personal injury (including fatality) for the GTA is only 35 percent. This is a significant improvement from 2010, when the ratio of AB to DC-PD claims was 52.5 percent, but Ministry of Transportation (2010) crash data showed that only 24 percent of accidents involved injury. While it is expected that slight differences between the two ratios will exist,<sup>13</sup> in the absence of abusive claiming behaviour it is difficult to reconcile the differences in ratios for the GTA prior to the 2010 reforms.

■ FIGURE 7 *Ontario Comparison Number of AB Claims per 100 DC-PD Claims*



Source: Authors' calculations from GISA data

The 2011 Report of the Office of the Auditor General of Ontario opines that the problem of fraud and abuse is worse in Ontario than elsewhere in Canada, and that fraud and abuse in the GTA is worse than in the rest of the province. The Anti-Fraud Task Force report indicates, on page 3, that “*After accounting for health care inflation, the ‘unexplained’ amount of accident benefits in 2010 amounted to \$2 billion (\$300 per registered passenger vehicle) in Ontario and \$1.7 billion (\$700 per registered passenger vehicle) in the GTA.*” Such growth in AB losses is both unsustainable and inconsistent with underlying crash statistics. Based on data to 2014, it appears that the 2010 reforms have been successful in reducing accident benefits paid out in the GTA. Only time will tell whether these reforms will succeed or whether old patterns will eventually emerge.

## 5 Discussion

Ontario auto insurance reform since 1990 has primarily been aimed at improving compensation and stabilizing the cost of insurance. However, in 2014, the average premium in Ontario was over \$1500, and as shown above, past reforms have been ineffective at permanently reducing losses and therefore premiums. Our analysis of claim frequency and severity trends for the different auto insurance coverages identifies two primary drivers of higher loss costs: a dramatic increase in BI frequency and explosive AB severity growth. These trends cannot be easily explained by underlying accident trends – as both frequency and severity of reported collisions have been falling over time. Moreover, while the growth in loss costs has been substantially greater in Ontario than in other provinces, total personal injury losses per vehicle have been relatively flat across all parts of Ontario except for the GTA. The analysis of territorial data within Ontario indicates that this is less a province-wide problem and more a problem in the GTA. The fact that claims experience in the GTA changes rapidly after product reform is an indication that other issues beyond accidents are driving insurance costs.

Based on our analysis, the Ontario experience provides a number of lessons, all of which reinforce the importance of considering economic incentives when designing insurance products and their regulation. First, although the intent of the overall product design (and subsequent reforms) is to direct compensation with minimal frictions (in terms of both time to payment and adjustment expenses) towards those that need it, multiple hurdles may create an insurance lottery mentality. That is, in systems which limit access to benefits based on claimants meeting a monetary and/or injury-based threshold, over time these may be seen as barriers for claimants to overcome in order to be eligible to receive greater benefits. The presence of generous benefits above the threshold requires controls be implemented in order to mitigate moral hazard.

From a policy perspective and in order to control costs, two insurance design features are critical: clarity in defining the threshold, and vigilance on the part of companies *and* government in enforcing the threshold. Our findings demonstrate that excessive cost and claims growth appears mainly in the GTA. The frequency of AB claims in the GTA has consistently been much higher than in other parts of Ontario and has shown the greatest responsiveness to reform, yet no reform has yielded sustained cost containment in the long term. Indeed, the tripling of average medical benefit claims in the GTA would appear to

indicate the deliberate overuse of benefits or the filing of fictitious or exaggerated claims, and not just a lottery mentality on the part of isolated individuals. It is worth noting that the nine rehabilitation clinics charged by the Financial Services Commission of Ontario (FSCO) in 2012 for fraudulent behavior were all located within the GTA. What makes the experience in the GTA different from the rest of the province? Cummins and Tennyson (1992, p. 108) provide a potential answer:

“... insurance lotteries are most likely to develop in areas where ... physicians and lawyers are easily accessible, information about playing the lottery can be widely disseminated, the utility value of winnings is high, and the cost of drivers’ time is low. In short, insurance lotteries are most likely to develop in densely populated areas with economic problems and court systems that favor the plaintiff.”

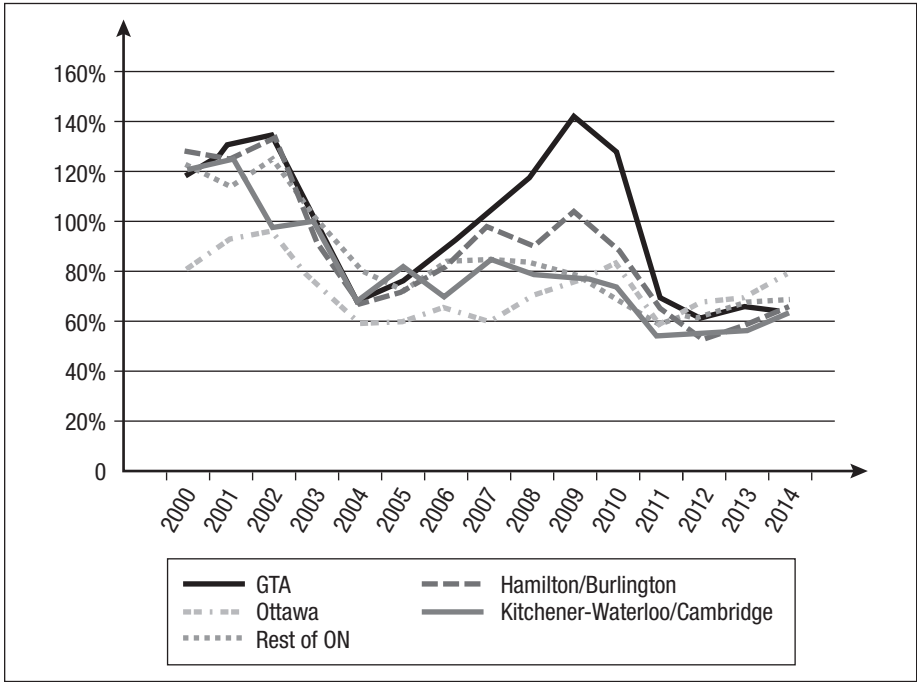
Government restrictions on insurance pricing may also contribute to cost problems in the GTA, which constitutes the second lesson. Regulations that limit auto insurance rates with an eye toward holding down costs for the highest-cost areas can exacerbate cost growth. Theory shows that when premium increases do not reflect loss experience, moral hazard in claiming increases (Tennyson, 2010). The result is higher cost growth in subsidized areas as observed in the GTA, and this outcome is not unique to Ontario. Derrig and Tennyson (2011), in a study of Massachusetts, find that cities that had the greatest regulatory subsidies (that is cities in which the regulated premiums did not cover the losses for those cities) experienced the highest growth in losses over time.

Ontario auto insurers are prevented from charging premiums in the GTA commensurate with drivers’ risk.<sup>14</sup> Specifically, the FSCO (2015) requires insurers to cap annual territorial differential changes at 10 percent. However, until 2010, the average growth in losses in the GTA exceeded 10 percent: between 2000 and 2002, the average annual AB loss per vehicle growth rate was 18 percent. Losses declined between 2002 and 2005 by 4 percent annually, and then grew at an annual rate of 24.8 percent from 2005 to 2009. The restrictions on underlying premium growth prevented insurers from increasing premiums commensurate with changes in the underlying risk. The regulations effectively created premium subsidies to high-cost behaviors. Such premium subsidies for GTA drivers must be paid for by above-cost premiums for others or by lower returns for the owners of insurance companies.



In dramatically reducing losses the current reforms have succeeded in bringing the ratio of losses to premiums (the *loss ratio*) in the GTA in line with those of other areas of Ontario. In the GTA the average AB cost per vehicle fell from a high of \$1056 in 2010 to \$457.77 in 2013, while average premiums rose from \$700.94 in 2010 to \$764.87 in 2013. As can be seen in Figure 8, since the reforms of 2010, loss ratios across all regions are very similar, which means that the rest of the provinces are no longer paying for the loss experience of the GTA. Regulatory reforms to permit future premiums to rise in relation to loss costs would assure continuing premium equity across regions and would encourage stronger market (or voter) discipline to restrain cost growth.

■ FIGURE 8 *Ontario Comparison Average Loss Ratio (AB + BI)*



Source: Authors' calculations from GISA data

The third lesson arises from the benefit payments system. A system that places a priority on paying benefits quickly, does not provide strict oversight of benefit providers, and does not subject claims to the scrutiny of the legal system creates great opportunities for over-utilization and fraud. The potential for such problems become more likely when – as in Ontario – claimants receive money directly from the insurer to pay for benefits. It is not uncommon for an infrastructure for fraudulent

and excessive claiming to develop in such an environment – in which clinics, paralegals, and healthcare providers understand how to manage (or manipulate) a claim to maximize the payout. This has been documented in other no-fault auto insurance systems including New York (Papa and Basile, 2000) and Massachusetts (Derrig, Weisberg and Chen, 1994), and evidence suggests that this is occurring in the GTA (Anti-Fraud Task Force, 2012). A good example is attendant care benefits, which can currently be paid to family members. This clearly creates moral hazard issues.

Preserving the popular no-fault auto system depends critically on finding long term solutions to cost growth. Given the cost drivers and cost growth patterns, the anti-fraud initiatives established in 2013 as a result of the 2012 Report of the Anti-Fraud Task Force are a positive development. These initiatives expand and modernize the investigation and enforcement authority of the Financial Services Commission of Ontario with a strong focus on fraud prevention. New reforms have also been announced in 2015 to be effective in 2016, further targeting accident benefit costs. The definition of catastrophic injury is altered, introducing a new process for combining physical with mental and behavioural impairments. The key reform is for lower caps in non-medical accident benefits. Attendant care will no longer be a stand-alone benefit, and will be included with medical and rehabilitation benefits. For non-catastrophic injuries, the cap for the combined coverage will increase from \$50,000 to \$65,000. In addition, the duration for receiving these benefits has been decreased from 10 years to 5 years. For catastrophic injuries, the combined medical, rehabilitation and attendant care services will be capped at \$1 million.

Yet, the persistent problems in assuring affordability leads inevitably to the question: can no-fault auto insurance work in Ontario? The evidence suggests that more than marginal adjustments will be required. When it was first enacted – in Ontario and elsewhere – no-fault automobile insurance was widely viewed as a way to combat the high costs of automobile injury claims. However, private market no-fault systems today are consistently among the highest-cost auto insurance jurisdictions. Reducing use of the liability system to compensate injury claims has not lowered insurance costs in the way that was envisioned by its designers. Success, in terms of cost containment, has only been achieved by strictly limiting no-fault benefits such as in most U.S. states, and/or turning to a government-run insurance program such as in Quebec, Manitoba and Saskatchewan and workers' compensation coverage in all Canadian provinces. Given the inherent tension between what individuals are willing pay (and what they claim they need for

compensation) before an accident occurs, and what they would like to receive after being injured, a robust process in which claimants prove their need for benefits (especially long-term care) is essential to prevent overcompensation. A single-payer government insurer appears to be much more able to accomplish this than the private insurance market—with its separation of who pays for a service, who provides the service, and who oversees the process.

Inevitably, when stricter benefit limits and approval processes are put in place, some legitimate claimants face difficulties in collecting benefits. This may result in greater frustration and complaints that insurers are not treating claimants fairly. In high-cost and high cost-growth environments such as the GTA, it may be especially difficult to limit benefits and permit premium growth commensurate with cost growth. Roughly 40 percent of Ontarians live in the GTA, and although it only accounts for 0.66 percent of the province by size, the GTA receives the lion's share of the provincial government's political attention. The future character of Ontario's auto insurance system depends on the political appetite of the provincial government to support such initiatives in the face of potential voter dissatisfaction.

## REFERENCES

- Browne, M.J., and R. Puelz (1996). Statutory Rules, Attorney Involvement, and Automobile Liability Claims. *The Journal of Risk and Insurance* **63**(1): 77–94.
- Cummins, J.D. and S. Tennyson (1992). Controlling Automobile Insurance Costs. *Journal of Economic Perspectives* **6**(2): 95–115.
- Cummins, J. D., & Tennyson, S. (1996). Moral hazard in insurance claiming: evidence from automobile insurance. *Journal of Risk and Uncertainty*, **12**(1), 29–50.
- Cummins, J. D., R.D. Phillips, and M.A. Weiss (2001). The Incentive Effects of No-Fault Automobile Insurance. *Journal of Law and Economics* **44**(2): 427–464.
- Derrig, R.A. and S. Tennyson (2011). The Impact of Rate Regulation on Claims: Evidence from Massachusetts Automobile Insurance. *Risk Management and Insurance Review* **14**(2): 173–200.
- Derrig, R.A., H.I. Weisberg, and X. Chen (1994). Behavioral Factors and Lotteries under No-Fault with a Monetary Threshold: A Study of Massachusetts Automobile Claims. *The Journal of Risk and Insurance* **61**(2): 245–275.

Financial Services Commission of Ontario (2015). *Technical Notes for Automobile Insurance Rate and Risk Classifications Filings*. Available online at <http://www.fsco.gov.on.ca/en/auto/filing-guidelines/Documents/Technical-Notes.pdf>

Grace, M.F., R.W. Klein and S. Tennyson (2013). The Effects of Regulatory Reforms in The South Carolina Auto Insurance Market. *Journal of Insurance Regulation* **32**(1): 1-30.

Insurance Act (1990). R.S.O., c. I.8, Article 266. Ontario.

Insurance Act (2010). O. Reg. 34/10. Statutory Accident Benefits Schedule. Ontario.

Kelly, M., A.E. Kleffner, and M. Tomlinson. (2010). First-party versus Third-party Compensation for Automobile Accidents: Evidence from Canada. *Risk Management and Insurance Review* **13**(1): 21-44.

Kochanowski, P. S., and M.V. Young (1985). Deterrent Aspects of No-Fault Automobile Insurance: Some Empirical Findings. *The Journal of Risk and Insurance* **52**(2): 269–288.

Office of the Auditor General of Ontario (2011). *2011 Annual Report*. Toronto, ON: Auditor General.

Ontario Auto Insurance Anti-Fraud Task Force (2012). Final Report of the Steering Committee. Available online at: <http://www.fin.gov.on.ca/en/autoinsurance/final-report.pdf>

Ontario Ministry of Transportation (2010). *Ontario Road Safety Annual Report 2010*. Toronto, ON: MTO.

Ontario Ministry of Transportation (2012). *Ontario Road Safety Annual Report 2012*. Toronto, ON: MTO.

Osborne, C. A. (1988). *Report of inquiry into motor vehicle accident compensation in Ontario*. Toronto: Ontario Ministry of the Attorney General.

Papa, L.J. and A. Basile (2000). *No-fault Insurance Fraud: An Overview*. *Touro Law Review*: 611-637.

Tennyson, S. (2010). Incentive Effects of Community Rating in Insurance Markets. Evidence from Massachusetts Automobile Insurance. *The Geneva Risk and Insurance Review* **35**(1): 19-46.

Transport Canada (2015). *2013 Canadian Motor Vehicle Traffic Collision Statistics*. T45-3/2010E-PDF. Available online at [http://tc.gc.ca/media/documents/roadsafety/cmvts2013\\_eng.pdf](http://tc.gc.ca/media/documents/roadsafety/cmvts2013_eng.pdf).

Transport Canada (2004). *2003 Canadian Motor Vehicle Traffic Collision Statistics*. TP 3322. Available online at [www.tc.gc.ca/eng/roadsafety/tp-tp3322-2003-menu-630.htm](http://www.tc.gc.ca/eng/roadsafety/tp-tp3322-2003-menu-630.htm).

## APPENDIX: DETAILS OF AUTO INSURANCE REFORM – 1990-2010

**Bill 68 (1990)** The original partial no-fault scheme, Bill 68 or the Ontario Motorist Protection Plan (OMPP) took effect on June 22, 1990. The scheme provided for both a verbal and a monetary threshold. The verbal threshold ensured that insured parties had access to legal recovery for non-economic damages if they sustained permanent and serious disfigurement or sustained permanent serious impairment of an important bodily function. If the monetary threshold was met, the claimant also had full right to sue for recovery of economic losses that exceeded the first-party benefits. The scheme provided for \$0.5 million in medical benefits not covered by universal healthcare. Replacement wage benefits to employed persons were generous, 80 percent of gross weekly income up to a maximum of \$600 a week for three years, but were minimal or non-existent for many groups (unemployed, caregivers and students).

It was anticipated that OMPP should reduce the frequency of BI claims, but increase average severity of these claims due to the stringent liability threshold. AB claim frequency was not expected to change unless more generous benefits resulted in an increased propensity to claim, but the average severity of AB claims was expected to increase due to more generous benefits. However, whether the overall average severity of AB plus BI claims (that is the total paid out for personal injury) would be increase or decrease was unclear because of changes in both the frequency and severity of first-party and third-party claims.

**Bill 164 (1994)** This bill (January 1, 1994 to October 31, 1996) expanded the previous verbal threshold by removing the “permanent” requirement and by including mental and psychological injuries, thus allowing more injured persons obtained the right to sue for non-economic damages. The right to sue for economic loss was eliminated in its entirety, but first-party benefits were greatly increased. For example, weekly income replacement benefits were increased to 90 percent of net income to a maximum of \$1,000 per week and weekly income benefits were also introduced for those previously not covered. The upper limit for medical and rehabilitation costs was significantly increased to \$1 million. In addition, to address disputes between claimants and insurers over the medical and non-medical needs of an injured person, Designated Assessment Centres (DACs) were established. DACs were authorized to conduct independent and binding assessments about the extent of a claimant’s injuries and the accident benefits that apply to these injuries.

These reforms were expected to increase the frequency of BI claims arising from the weakened eligibility threshold. However, because the right to sue for economic loss was eliminated, BI claim severity should fall. Increased first-party accident benefit levels should lead to higher claim severity, but in the absence of moral hazard, a change in the frequency of AB claims should not be expected.

**Bill 59 (1996)** The Auto Insurance Rate Stability Act became law on November 1, 1996 targeting a 15 percent reduction in the average rate that insurers could charge. To support this reduction, cost control measures were introduced. A central database of claims information was created and measures were introduced to track insurance fraud and abuse committed by claimants, auto-body repair shops and health-service providers.

With respect to the product itself, the verbal threshold was tightened, re-introducing the word “permanent” for both disfigurement and impairment. This bill also restored the right to sue for economic damages if losses exceeded the compensation available under the statutory accident benefits schedule. The reintroduction of the right to sue for economic damages was necessary as statutory benefits were drastically reduced: for example, weekly income benefits were capped at 80 percent of net income up to \$400 a week. More importantly, Bill 59 introduced a two-tiered schedule of first-party benefits based on the level of injury of the claimants. Individuals who were catastrophically impaired (as defined in the SABS) had access to a higher level of medical and rehabilitation benefits (\$1 million instead of \$100,000), and only those catastrophically injured, as certified through a medical assessment, could claim future care costs. For all injuries, in order to contain costs, medical providers had to obtain approval from the insurance company for the treatment plan before they could start therapy.

The introduction of the two-tiered (catastrophic versus non-catastrophic) system should reduce the average severity of first-party AB losses. Some of this reduction should be offset by higher loss adjustment expenses that will arise because of greater need for assessment of impairment levels to determine benefits eligibility. The reforms were not expected to impact the frequency of AB claims unless the reduced benefits and increased anti-fraud measures reduced abusive claiming practices.

The impact on BI claim frequency was ambiguous: a stricter verbal threshold should decrease the number of BI claims; however the reintroduction of the right to sue for economic damages combined with

the reduction in statutory benefits could result in an increase in the number of liability claims. Overall, the severity of third-party claims was expected to increase.

**Bill 198 (2003)** On November 26, 2003 the new Liberal government introduced the Automobile Insurance Rate Stabilization Act which froze insurers' rates for three months. Reforms were targeted at both the auto insurance product and the process by which claims were settled. Product reforms included an increase in the deductible for non-economic damages that could be claimed through the tort process and the removal of the need to have a catastrophic injury to claim future care costs. Further, although the wording of the verbal threshold was unaffected, the revised Insurance Act provided definitions for the threshold to reduce moral hazard. Serious was defined as "substantially interfere with a person's ability to continue regular employment, interfere with most of the person's activities of daily living." Importance was defined as "important to most of the person's usual activities of daily living" and permanent was defined to mean "expected to continue without substantial improvement when sustained by persons in similar situations." The definition of catastrophic impairment was slightly expanded.

Most significant changes impacted the claims process: the assessment process for some injuries were simplified by the introduction of pre-approved framework guidelines, fees that could be charged by healthcare professionals were reduced, prior approval of assessments was required, and increased controls were introduced to reduce excessive or abusive claiming behaviour associated with AB claims.

The primary intent of the latter reforms was to decrease assessment costs and costs arising from medical treatments. If successful, these reforms would lead to lower loss adjustment expenses for AB claims and the frequency of first-party claims would also be reduced if the controls were successful. The clarity provided to the terms in the verbal threshold was meant to decrease the number of BI claims, and the increase in the deductible for non-economic damages was expected to decrease the average severity of liability claims.

**Elimination of DACs (2006)** As noted previously, DACs were created in 1994 to provide neutral opinions on automobile injuries and treatment plans. However, insurers and regulators complained that the DAC system instead was adversarial, costly, time consuming, and complex and it did not improve health outcomes.<sup>15</sup> Hence, on March 1, 2006, DACs were eliminated and the medical assessment system was privatized. Claimants used their own medical providers to obtain an assessment of injuries and oversight of assessment providers was



removed from the insurance regulator, the FSCO and moved to the health professional associations. The increased flexibility in the assessment system was intended to improve the efficiency of the assessment process and reduce loss adjustment costs.

In theory, there should be no impact on AB claim sizes due to this change. However, the medical profession argued that because DACs provided consumer protection and minimized delays until treatment, their removal would actually increase costs. Thus, the expected impact of the removal of DACs is unclear. If the insurance industry and government were correct, then loss adjustment costs would decrease and there would be no other impact on AB claims. If the medical profession was correct, then the removal of DACs would result in higher AB claims.

**Bill 16 (2010)** The reforms in Bill 16 were aimed at reducing first-party AB claims costs and included the implementation of a cap of \$3,500 on minor injury medical and rehabilitation expenses, the development of standardized guidelines for treatment of minor injuries, the inclusion of medical assessment costs in coverage limits, and stricter oversight of fees charged by healthcare providers and assessors. Benefits for non-catastrophic injuries were reduced to \$50,000 for medical and rehabilitation expenses (including assessment costs), compared to \$100,000 (excluding assessment costs) under the previous policy, and attendant care benefits were also halved. There was no change in benefits for those catastrophically injured.

These reforms were expected to decrease the severity of AB claims, both because of the reduction in benefits available and the anticipated reduction in moral hazard associated with non-catastrophic injury claiming behaviour. Frequency should be unaffected since specific benefits were reduced and not removed. The number of BI claims is expected to increase because more claims could pierce the monetary threshold, however the expected impact on average severity is unclear.

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## NOTES

1. Mandatory auto insurance coverage is offered by government-run monopolies in British Columbia, Saskatchewan, and Manitoba. In Quebec, private insurers compete to offer property damage coverages and the government is the sole provider of bodily injury coverage.

2. Optional coverage includes at-fault collision damage for the vehicle, comprehensive insurance for non-collision losses, underinsured motorist coverage, higher limits for liability and additional coverage for first-party accident benefits.



3. A catastrophic impairment is defined in regulations for both physical and mental injuries. A physical catastrophic impairment is defined to be paraplegia or quadriplegia, the total loss of use of one limb or total loss of vision. A mental impairment is a score of 9 or less on the Glasgow Coma Scale administered "within a reasonable time after the accident", or a score of 2 or 3 in the Glasgow Outcome Scale administered more than 6 months after the accident, or an impairment that results in marked or extreme impairment due to mental or behavioural disorder. Finally a catastrophic impairment can also be defined as a combination of impairments that result in at least a 55 percent impairment of the whole person (Insurance Act, O. Reg 34/10).

4. According to the Osborne Report (1988), because rehabilitation was an essential feature of a compensation system, it could not be achieved within the framework of an at-fault system. Osborne wrote *"the tort system, involving as it does delayed lump sum compensation, provides a disincentive to rehabilitation ... I think the evidence is overwhelming that rehabilitation must be a first party obligation."* (p. 520).

5. In Canada, the cost to settle claims (loss adjustment expense) is not reported separately from amounts paid to claimants. Thus our definition of severity includes the settlement costs, and we are unable to separately examine the effect of reforms on loss adjustment expenses.

6. The General Insurance Statistical Agency (GISA) acts as the statistical agent on behalf of the insurance regulatory authorities for all private insurance market provinces in Canada. All insurers that write auto insurance in the private market provinces are required to submit claims and premium data to GISA.

7. It is worth noting that higher costs in Ontario are not a result of greater crash risk: statistics collected by Transport Canada (2015) suggest that Ontario roads are consistently the safest in the country. In 2013 the number of road fatalities per 100,000 population was 3.5 in Ontario, 8.5 in Nova Scotia, 6.6 in New Brunswick, and 8.9 in Alberta.

8. Private communication.

9. Statistics Canada categorizes the combined area of Ottawa, Ontario, and Gatineau, Quebec as a single Census Metropolitan Area. We examine the claims costs trends by statistical territories (defined by GISA) and define the Greater Toronto Area (GTA) as statistical territories 710 (Oshawa, Aurora, Newmarket, and Orangeville) and 717 (Metropolitan Toronto and Markham, Richmond Hill, Vaughan, and Peel). Ottawa is statistical territory 711. Hamilton/Burlington comprises most of statistical territory 704 and the tri-cities of Kitchener-Waterloo/ Cambridge are in statistical territory 706, which also includes the cities of Guelph and Brantford.

10. This is an improvement over 2010, when the GTA accounted for 37 percent of vehicles, 58 percent of incurred losses and 44 percent of the number of claims.

11. In 2012, FSCO charged nine rehabilitation clinics with offenses under Ontario Insurance Act for fraudulent behaviour. (<http://www.fSCO.gov.on.ca/en/pubs/News-Releases/Pages/20120223-GTA-rehab.aspx>, <http://www.fSCO.gov.on.ca/en/pubs/News-Releases/Pages/20120525-rehab-clinics.aspx>).

12. Accidents that only involve a collision claim would not be captured.

13. Figure 7 does not account for at-fault crashes that involve a collision claim only. Some of these crashes are not reported to the police, as only accidents that result in personal injury or greater than \$1000 in property damage must be reported to the police. Thus it is reasonable that the insurance ratios may be slightly higher than the Ministry of Transportation ratios.

14. Differentials refer to factors used to develop the experience of a class of exposures relative to the base risk class. For example, a relativity factor of 5.0 for a given class of risk indicates that expected losses for that class are expected to be 5 times the expected losses of the base risk class.

15. See, for example, <http://www.canadianunderwriter.ca/news/demise-of-the-dac/1000198100/>