

**Price Regulation and Possible Premium Overpayments:
Automobile Insurance Companies in Ontario**

Prepared for the Ontario Trial Lawyers Association

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December 2019

Table of Contents

Executive Summary

- 1.0 Introduction
- 2.0 Key Variables
- 3.0 Financial Performance Overview
- 4.0 Alternative ROE Regulatory Benchmarks
- 5.0 Possible Overpayments for Auto Insurance
- 6.0 Conclusions

Appendix 1: Formulas for Determining the Underwriting Profit Margin

Appendix 2: Critique of Possible Overpayments for Auto Insurance

Appendix 3: Pre-Tax Income Measures

List of Tables

1: Average Industry ROEs, Auto Insurance Companies in Ontario with Positive ROEs 2012-2018 (%)

2: Financial Performance, Ten Largest Auto Insurance Companies in Ontario, 2017 and 2018 (25% Expense Ratio)

3: Ten Largest Auto Insurance Companies in Ontario, Auto Insurance ROEs in Ontario Compared to Total Business ROEs, 2016-2018 (25% Expense Ratio)

4: Financial Performance, Ten Largest Auto Insurance Companies in Ontario, 2017 and 2018 (20% Expense Ratio)

5: Percentage Change Earned Premiums per Vehicle and Claims per Vehicle, by Type of Coverage, Automobile Insurance in Ontario, 2010-2018 (%)

6: Sensitivity of Premiums to Various Assumptions for Key Variables (Premium per \$100 in Claims)

7: Deviations of Premiums from Base Case, Various Assumptions for Key Variables (%)

8: Possible Premium Overpayments, Based on 5% ROE, 2018 (\$ Millions)

9: Expenses as % of Premiums (based on OSFI), 2018

10: Gross Commission as % of Direct Premiums Written, Auto Insurance, Canada, 2017 and 2018

11: Average Industry ROEs, Auto Insurance Companies in Ontario, 2012-2018 (%)

12: Average Industry ROEs, Auto Insurance Companies in Ontario, 2017-2018 (%)

13: Changes in Average Premiums per Vehicle, Claims per Vehicle and Underwriting Profits per Vehicle (%), and Total Pre-Tax Profits of Automobile Insurance Companies in Ontario, Selected Years 2010-2018

14: Seven-Year Moving Averages, Earned Premiums per Vehicle Less Claims per Vehicle (Pre-Operating Expense Profit per Vehicle), by Type of Coverage, Automobile Insurance in Ontario, 1998-2018

15: 10-Year Rolling Averages of Annual ROEs, 1995-2018

16: Underwriting Profit Margins, 2001-2018

17: Aggregate Underwriting Margins – Actual, FSCO and Revised, All Coverages, Auto Insurance, Ontario, 2001-2018 (%)

18: Potential Premium Surcharges, All Coverages, Auto Insurance, Based on 25% and 20% Operating Cost Margin, and “FSCO Premiums”, Ontario, 2001-2018 (\$ Millions)

A: Hypothetical Premiums Based on FSCO Rules and Revised Hypothetical Premiums Based on Adjusted ROEs, Based on 25% Operating Cost Margins, Ontario, 2001-2018 (\$ Millions)

B: Pre-Tax Income and Tax Rates (based on OSFI), 2018

Executive Summary

I have been asked by the OTLA to update my previous report (April 24, 2018) on auto insurance company profitability in Ontario.

Table 1 replicates and updates my estimates for after-tax return on equity (“ROE”) for all auto insurance companies operating in Ontario that had positive ROEs. Also included in this table are the ROEs that would be reasonable for this industry (see Table 15).

Table 1: Average Industry ROEs, Auto Insurance Companies in Ontario with Positive ROEs 2012-2018 (%)

	2012	2013	2014	2015	2016	2017	2018
<i>All Companies with Positive ROEs</i>	14.9	17.5	18.9	16.8	16.3	10.5	8.6
<i>Appropriate Industry ROEs</i>	6.0	5.9	5.7	5.5	5.1	4.8	4.5

The ROEs for these companies have declined further in 2017 and 2018. But throughout the 2012 to 2018 period, the ROEs have greatly exceeded what would have been reasonable ROEs for this industry, based on the overall risk profile of the industry. Even in 2018, the ROE for these companies is almost double what is considered to be an acceptable ROE.

Table 2 summarizes the financial performance of the ten largest auto insurance companies operating in Ontario (based on direct premiums earned). All auto insurance companies operating in Ontario made pre-tax profits of \$1.3 billion in 2017, and another \$1 billion in 2018. The top ten accounted for most of the pre-tax profits in each year.

Table 2: Financial Performance, Ten Largest Auto Insurance Companies in Ontario, 2017 and 2018 (25% Expense Ratio)

	2018			2017		
	<i>DPE</i> <i>(\$ M)</i>	<i>Pre-Tax</i> <i>Income</i> <i>(\$M)</i>	<i>ROE</i>	<i>DPE</i> <i>(\$M)</i>	<i>Pre-Tax</i> <i>Income</i> <i>(\$M)</i>	<i>ROE</i>
Aviva	1,971	96.4	8.7	1,899	-19.8	-2.0
Desjardins	1,848	82.6	5.5	1,688	342.4	18.0
Intact	1,706	31.1	2.3	2,119	35.4	2.0
TD	1,534	175.1	14.1	1,538	156.7	7.4
Economical	1,233	83.9	6.9	1,131	0.5	0.0
Allstate	1,069	152.1	19.6	1,039	213.3	24.3
Co-Operators	1,062	-7.4	-0.9	925	101.1	13.4
RSA	672	41.0	7.7	629	45.9	7.0
Travelers	647	16.1	2.0	570	164.5	21.5
Fairfax	463	61.9	8.8	469	176.9	22.1
Top 10	12,205	732.9	7.3	12,007	1,216.7	10.2
All P&C	13,529	999.6	6.6	13,227	1,335.7	8.3

The top ten collectively had ROEs larger than the industry as a whole in both years, and well above what I have calculated to be reasonable ROEs for this industry in each of these years.

The IBC has reported aggregate ROEs for all property and casualty (“P&C”) insurance companies in Canada of 7.3% in 2017, and 4.6% in 2018. These ROEs are less than those I estimated for auto insurance companies operating in Ontario in these two years, and especially so

for the ten largest. The absence of profitability is definitely not a problem for auto insurance companies in Ontario. Rather, *it seems as if the Ontario auto insurance business is propping up the P&C industry's overall financial performance.*

The data in Table 3 reinforce this conclusion.

Table 3: Ten Largest Auto Insurance Companies in Ontario, Auto Insurance ROEs in Ontario Compared to Total Business ROEs, 2016-2018 (25% Expense Ratio)

	2018		2017		2016	
	<i>Total Business ROE</i>	<i>Ontario Auto Insurance ROE</i>	<i>Total Business ROE</i>	<i>Ontario Auto Insurance ROE</i>	<i>Total Business ROE</i>	<i>Ontario Auto Insurance ROE</i>
Aviva	2.5	8.7	-2.6	-2.0	12.6	22.5
Desjardins	4.7	5.5	4.5	18.0	8.9	11.5
Intact	10.6	2.3	11.1	2.0	7.9	7.0
TD	8.1	14.1	9.4	7.4	2.4	8.4
Economical	-4.0	6.9	-4.7	0.0	-0.9	10.0
Allstate	16.5	19.6	25.0	24.3	9.8	3.0
Co-Operators	-2.2	-0.9	7.8	13.4	10.3	24.1
RSA	5.0	7.7	9.6	7.0	5.9	14.4
Travelers	-0.5	2.0	8.9	21.5	3.3	10.1
Fairfax	1.8	8.8	11.9	22.1	9.0	27.6
Top 10	4.4	7.3	7.6	10.2	6.9	12.4
All P&C	6.8	6.6	7.2	8.3	3.6	11.5

For all *top 10 combined*, their Ontario auto insurance ROEs have been larger than their total Canada-wide insurance business ROEs in each of the years 2016 to 2018. In 2016, the Ontario auto insurance ROE for the top 10 was 12.4%, while their total business ROE was 6.9%. In 2018, even though the Ontario auto insurance ROE for the top 10 had declined from both the 2016 and 2017 levels, the ROE was still higher than the total business ROE for these companies (7.3% vs. 4.4%).

The top ten are even more profitable, as is the industry as a whole, when I substitute a 20% expense ratio (Table 4). Aggregate pre-tax profits are now \$2 billion and \$1.7 billion in 2017 and 2018 respectively, with the top ten generating most of these profits. And the ROEs for the top ten auto insurance companies far exceed what are reasonable ROEs, and the ROEs reported for the entire P&C industry across Canada.

Table 4: Financial Performance, Ten Largest Auto Insurance Companies in Ontario, 2017 and 2018 (20% Expense Ratio)

	2018		2017	
	<i>Pre-Tax Income (\$ M)</i>	<i>ROE</i>	<i>Pre-Tax Income (\$ M)</i>	<i>ROE</i>
Aviva	194.9	17.6	75.1	7.4
Desjardins	175.0	11.6	426.8	22.5
Intact	116.4	8.5	141.3	7.9
TD	251.9	20.2	233.6	11.0
Economical	145.6	12.0	57.0	4.5
Allstate	205.6	26.5	265.3	30.2

Co-Operators	45.7	5.6	147.4	19.5
RSA	74.6	14.0	77.4	11.7
Travelers	48.5	6.1	193.0	25.2
Fairfax	85.1	12.0	200.3	25.1
Top 10	1,343.2	13.3	1,817.1	15.2
All P&C	1,676.1	11.2	1,997.1	12.5

Moreover, as I highlight in Table 13, average premiums per vehicle have increased by 2.4% between 2010 and 2018, while average claims per vehicle have declined by 10%. Thus, over this period, the gap between average premiums and average claims per vehicle has been \$417 per vehicle insured in Ontario.

The data in Tables 5 and 14 provide an even more interesting story of what has happened since 2010. *Claims per vehicle were lower in 2018 than in 2010 for third party liability (2.0% lower); bodily injury (32.9% lower); accident benefits (42.4% lower); total mandatory coverage (24.9% lower); and total all coverages (10% lower).* With the exception of accident benefits, premiums per vehicle were higher in 2018 than 2010, even though claims had declined. And in the case of accident benefits, premiums declined by much less than claims per vehicle (18.3% versus 42.4%).

In the cases of property damage and collision coverages, claims per vehicle were much higher in 2018 than in 2010 (40.1% higher for property damage; and 68.1% for collision). While premiums also were higher in 2018 than in 2010, the increases in premiums were well below the increases in claims.

Table 5: Percentage Change Earned Premiums per Vehicle and Claims per Vehicle, by Type of Coverage, Automobile Insurance in Ontario, 2010-2018 (%)

	Third party liability	Bodily injury	Property damage	Accident benefits	Total mandatory coverage	Collision	Total all coverages
<i>Premiums</i>	17.2	20.8	18.3	-18.3	0.9	5.6	2.4
<i>Claims</i>	-2.0	-32.9	40.1	-42.4	-24.9	68.1	-10.0

In Table 14, I have noted the following:

- In the case of *bodily injury*, the underwriting profits per vehicle have increased steadily since the 2001 to 2007 period, from an average of \$15.95 per vehicle to an average of \$206.91 per vehicle over the period 2012 to 2018. By comparison, underwriting profits per vehicle averaged \$55.49 during the 2004 to 2010 period, and this has increased by an average of \$151 per vehicle since that time.
- In the case of *collision coverage*, the underwriting profits per vehicle have declined steadily from an average of \$101.71 over the 2003 to 2009 period to an average of \$28.87 over the most recent 2012 to 2018 period.

Profit levels permitted by the regulator since 2001 have exceeded the ROEs that Professor Prisman and I estimated for the industry. Without changes, this large gap will likely remain for many years to come.

Given the levels of excessive profitability, consumers certainly have paid too much for their insurance coverage.

Could the possible overpayments have been greater? Yes, when we compare the possible rates set by the regulator, using its assumptions for ROEs and acquisition and operating expenses, and the rates that should have been set using more appropriate values for these two critical assumptions.

In my 2018 report to OTLA, I concluded that drivers in Ontario might have overpaid for insurance by at least \$4 billion between 2001 and 2016, with the overpayments totaling at least \$2.9 billion between 2011 and 2016 alone. These estimates were based on GISA data, where I assumed that total acquisition and operating expenses, which include taxes, averaged 25% of premiums.

Using the same data source, and the same assumption regarding acquisition and operating costs, there did not appear to be any further overpayments for auto insurance in 2017 and 2018. However, the updated data did generate much larger estimates for the possible overpayments. Now it appears that ***drivers might have overpaid by at least \$7.6 billion between 2001 and 2018, and \$5.6 billion between 2011 and 2018*** (Table 18).

The 25% acquisition and operating expense ratio is in line with the estimates produced by the IBC, when a 4% tax rate is used rather than their 13% rate. But as I argued in my previous report and continue to do so now, undoubtedly, technology has enabled the well-managed auto insurance companies to reduce these expenses. Indeed, a 20% expense ratio more likely represents the experience of the best companies in this field.

For example, in Table 9, total other and general expenses¹ accounted for 10% or less of direct premiums written for Aviva, Intact and RSA across all their lines of business in Canada. In Table 10, Allstate had the lowest ratio of gross commissions to direct premiums written for all of its auto insurance operations across Canada – 7%. If we combine these ratios and add another 4% for taxes, we end up with an aggregate expense ratio of 21% or less. ***The regulation of premiums should provide incentives for all auto insurance companies to strive to replicate and improve upon the best practices in the industry.***

Using the GISA data together with an acquisition and operating expense ratio of 20% greatly increases the possible overpayments for auto insurance by drivers in Ontario. Between 2001 and 2018, the total overpayments might have been as large as \$12.7 billion, although it is reasonable to argue that the expense ratio might have been closer to 25% than 20% during the first decade of this century. The total overpayments between 2011 and 2016 might have been \$8.4 billion, with an additional \$749 million in overpayments in 2017 and 2018 (Table 18).

Drivers in this province definitely have paid too much for auto insurance.

As I emphasized in my previous report, ***estimating the possible overpayments is exacerbated by a lack of transparency in the data reported to and by the government for automobile insurance companies operating in Ontario.*** These companies do not report publicly the equity allocated to their auto insurance operations in Ontario, the net investment income attributable to such operations, or their actual operating expenses. Hence, the need for estimates. Nothing has changed since my last report.

If I estimate the possible overpayments for auto insurance, based on the data for the companies with positive ROEs, the possible overpayments for 2017 and 2018 total \$783 million and \$482

¹ There does not seem to be any consistency among the insurance companies in what they include in general operating expenses and separately in other expenses. OSFI and FSRA should insist on a common set of definitions for what should be included in both of these categories.

million respectively. These compare to no additional overpayments for these two years using the GISA data.

The possible overpayments are much larger, as expected, when I incorporate the more reasonable expense ratio of 20%. The overpayments might now be as large as \$1.4 billion in 2017 (compared to the \$355 million estimate using GISA), and \$1.1 billion in 2018 (compared to \$394 million using GISA). Data sources and estimates for expenses do matter.

1.0 Introduction

I have been asked by OTLA to update my previous study to include the latest data for 2017 and 2018.

In section 2.0, I focus on the importance of several key variables in driving price regulation in Ontario, and the implications for premiums and consumers of using possibly outdated assumptions.

I analyze in section 3.0 the financial data available for auto insurance companies in Ontario to update their ROEs and examine their financial performance since 2012.

In section 4.0, I incorporate the most recent data for market returns and the risk-free interest rate to update the estimates for what the regulated ROE should have been. This analysis sets the stage for estimating the potential premium overpayments in the province.

I update the potential premium overpayment estimates in section 5.0 using the same methodology employed in the previous study. I set out the conclusions in section 6.0.

In Appendix 1, I set out the various formulas that are critical for the analysis I undertake in this report. I address the critique that the premium overpayment estimates might be overestimated in Appendix 2. In Appendix 3, I include a table comparing incomes for insurance companies based on data submitted to OSFI.

2.0 Key Variables

Appendix 1 defines profits, underwriting profits and return on equity for automobile insurance companies in general. The key variables used by FSCO in the past, and now I assume by its successor FSRA, Financial Services Regulatory Authority, are the following:

- ROE: return on equity;
- ROI: return on investments;
- T: the average corporate tax rate;
- α : acquisition and general expenses as a proportion of premiums; and
- E: equity base for automobile insurance in Ontario.

Table 6 shows the sensitivity of premiums, based on claims of \$100, to various assumptions with regards to ROE, ROI and α . In calculating the values in this table, I assumed that equity is defined as premiums divided by 1.7, and the average corporate tax rate is 26.5%.

The base case – ROE of 11%, ROI of 6% and an aggregate expenses ratio (α) of 25% – produces a premium of \$143.42 per \$100 in expected claims. As the expense ratio declines – from 25% to 20% – the premiums decline regardless of the original ROE and ROI assumptions.

As well, as the ROE declines, so too do the premiums, regardless of the original ROI and expense ratio assumptions. A lower ROI however, leads to higher premiums.

Table 7 shows the deviation in the premiums, for various combinations of the key variables, from the base case. For example, compared to the base case, the premium would be lower by 6.9% if an aggregate expense ratio of 20% were used instead of 25%. The combination of a 5% ROE and an aggregate expense ratio of 20% would reduce premiums by as much as 12.3%. A 4% ROI together with a 5% ROE and aggregate expense ratio of 25% would reduce premiums by 4.9%.

It is obvious from Tables 6 and 7 that assumptions are critical. Indeed, I have argued before, and I do again, that the ROE should have declined over time, and so too should the aggregate expense ratio.

Table 6: Sensitivity of Premiums to Various Assumptions for Key Variables (Premium per \$100 in Claims)

		α	α	α
ROE	ROI	0.25	0.23	0.2
11%	6%	\$143.42	\$139.42	\$133.82
	4%	145.88	141.74	135.96
9%	6%	140.20	136.38	131.02
	4%	142.55	138.60	133.07
7%	6%	137.12	133.46	128.32
	4%	139.37	135.59	130.29
5%	6%	134.18	130.67	125.74
	4%	136.33	132.71	127.63

Table 7: Deviations of Premiums from Base Case, Various Assumptions for Key Variables (%)

		α	α	α
ROE	ROI	0.25	0.23	0.2
11%	6%		-3.0%	-6.9%
	4%	1.7	-1.2	-5.2
9%	6%	-2.2	-4.9	-8.6
	4%	-0.6	-3.4	-7.2
7%	6%	-4.4	-6.9	-10.5
	4%	-2.8	-5.5	-9.2
5%	6%	-6.4	-8.9	-12.3
	4%	-4.9	-7.5	-11.0

According to GISA, earned premiums for all coverages for auto insurance in Ontario in 2018 was \$11.3 billion. Applying the potential deviations in the premiums from the regulated premiums at a 5% ROE (Table 7) to the aggregate earned premiums in 2018, *I can estimate potential premium overpayments ranging between \$556 million and \$1.4 billion in 2018 alone* (see Table 8). Assumptions do matter!

Table 8: Possible Premium Overpayments, Based on 5% ROE, 2018 (\$ Millions)

	α	α	α
ROI	0.25	0.23	0.2
6%	725	1,000	1,387
4%	556	840	1,239

In Section 4.0, I will discuss why the ROE in 2018 should be just under 5%. But what about the acquisition and operating expense ratio?

Acquisition and operating expenses consist of commissions, taxes, general expenses and other expenses. According to the IBC ("2019 Facts of the Property and Casualty Insurance Industry in

Canada”), operating expenses averaged 21.6% of the net written premiums of all insurance companies in Canada over the period 2012 to 2018. Operating expenses include facility costs, IT, market research, distribution costs (commissions) and employee compensation. The IBC also stated that taxes and levies accounted for an additional 13.6% of the net written premiums between 2012 and 2018.

How do these numbers compare to other sources of data?

Property and Casualty insurance companies report to OFSI. Using the data filed, which covers all types of P&C insurance issued across Canada, I can estimate each of the components of acquisition and general expenses as a percentage of revenues for 2018 (Table 9).

For the total Canadian P&C industry, gross commissions accounted for 15.7% of total direct and reinsurance assumed written premiums. This ratio varied between 9.1% for Allstate to 19.2% for TD. Taxes generally accounted for under 4% of total underwriting revenues. General expenses accounted for 9.1% of total underwriting revenues, ranging from 2% for RSA to 15.4% for Echelon. Total other and general expenses accounted for 12.9% of total underwriting revenues, ranging from 7.3% for RSA to 16.3% for Economical. Total acquisition and general expenses accounted for 31.4% of total underwriting revenues, ranging from 28.4% for Allstate to 37.7% for Travelers.

The OSFI data indicate overall operating expenses higher than the IBC reported. But the average tax costs are much lower than those presented by IBC. If we combine the IBC operating expense ratio with the OSFI tax ratio, we end up with an aggregate acquisition and operating expense ratio of slightly more than 25%. So, has FSCO been right in assuming an operating expense ratio of 25%?

Table 9: Expenses as % of Premiums (based on OSFI), 2018

	<i>Net claims and adjustments</i>	<i>Gross Commission</i>	<i>Taxes</i>	<i>General Expenses</i>	<i>Total other and general expenses</i>	<i>Total acquisition and general expenses</i>
Total Canadian P&C	69.1	15.7	3.9	9.1	12.9	31.4
Allstate	67.9	9.1	3.3	5.9	15.5	28.4
Aviva	70.1	17.4	3.9	10.3	10.3	31.3
Cooperators	72.7	16.4	3.5	10.2	14.3	31.8
Desjardins	71.0	15.2	3.5	6.6	11.1	27.1
Echelon	64.7	14.6	3.3	15.4	15.4	36.2
Economical	75.4	15.3	3.6	14.8	16.3	36.8
Intact	67.1	17.5	3.9	7.6	10.5	30.3
Northbridge	61.7	15.4	3.9	6.9	13.5	33.7
RSA	70.1	18.1	4.4	2.0	7.3	30.6
TD	64.6	19.2	4.6	11.3	15.0	28.8
Travelers	68.4	17.1	3.5	11.6	16.2	37.7

The data used in this report to estimate the ROEs for auto insurance operations in Ontario by company suggest that commissions as a percentage of direct premiums written for all auto insurance across Canada averaged 11.5% in 2018 for all P&C companies in Canada, and 10.5%

in 2017. The ratios ranged between 7.2% and 16.6% in 2018.

Table 10: Gross Commission as % of Direct Premiums Written, Auto Insurance, Canada, 2017 and 2018

	<i>2017</i>	<i>2018</i>
Total P&C	10.5	11.5
Allstate	6.9	7.2
Aviva	13.9	13.9
Cooperators	10.0	10.9
Desjardins	10.9	11.0
Echelon	14.0	14.2
Economical	11.1	10.4
Intact	12.1	12.1
Northbridge	10.5	9.6
RSA	16.8	16.6
TD	2.6	12.1
Travelers	12.7	12.5

If I combine a commission expense ratio of 10% with a tax ratio of 4%, we are then up to a combined ratio of 14%. Given the technological advances in directly reaching potential customers online (consider Amazon, Uber, Expedia, etc.), and in improving the productivity of employees, it might not be unreasonable to assume that commission rates will decline sharply over time, and general operating expenses also will decline, although not as sharply. Thus, *to reach a 20% aggregate operating expense ratio only would require an average tax rate of 4%, a gross commission rate of 7% to 8%, and general and other operating expenses of 8% to 9% of revenues. Allstate did achieve a gross commission rate of 7% or less. RSA did achieve a general and other operating expense ratio of 7%.* Regulators should create incentives for companies to reduce acquisition and operating costs by incorporating a much lower aggregate operating expense ratio into regulating and setting premiums.

3.0 Financial Performance Overview

A company's return on equity is defined as the ratio of its after-tax profits (underwriting and investment) to its shareholders equity. In the case of companies selling auto insurance in Ontario, calculating their ROEs requires estimating the following:

- The portion of the total equity of each company that is allocated to its auto insurance business in Ontario;
- The total net investment income of each company that is attributable to the auto insurance subsidiary or division operating in Ontario; and
- The operating expenses for their auto insurance business in Ontario.

There is a lack of transparency in the data reported to and by the government for automobile insurance companies operating in Ontario. These companies do not report publicly the equity allocated to their auto insurance operations in Ontario, the net investment income attributable to such operations, or their actual operating expenses. And even the public data available on the consolidated operations of Property and Casualty Insurance companies are not standardized and do not always appear to be logical.² Hence, the need for estimates.

² This time I examined data submitted to the federal regulator, OSFI. There did not appear to be consistency among the insurance companies in how they reported their data, in particular with regards to other and general expenses.

The pre-tax underwriting profits/losses of a company are defined as: total earned premiums less total claims less 25% of total earned premiums. I assumed that the share of the net total investment income of each P&C insurance company allocated to each company's auto insurance operations in Ontario equals the ratio of the total earned auto insurance premiums in Ontario to the total Canada-wide earned P&C premiums. I used the same assumption to allocate a company's aggregate equity base to its automobile insurance operations in Ontario. Throughout I use an average tax rate of 26.5%.

The ROE is after-tax income divided by the equity base.

Table 11 summarizes the ROE estimates for the auto insurance industry in Ontario for the periods 2012 to 2018. They have trended downwards since 2016, when they reached a level of 16%.

When I exclude the companies with negative ROEs, the average ROEs for the remaining companies are much higher. The companies that have been profitable have been very profitable.

Table 11: Average Industry ROEs, Auto Insurance Companies in Ontario, 2012-2018 (%)

	2012	2013	2014	2015	2016	2017	2018
<i>All Companies</i>	4.2	2.4	10.6	10.6	15.9	8.3	6.6
<i>All Companies ex. Companies with Negative ROEs</i>	14.9	17.5	18.9	16.8	16.3	10.5	8.6

The auto insurance groups and individual companies that had positive ROEs accounted for:

- ***73.7% of all earned premiums in the province in 2012;***
- ***82.8% of all earned premiums in 2013;***
- ***77.5% of all earned premiums in 2014;***
- ***84.1% of all earned premiums in 2015;***
- ***99.1% of all earned premiums in 2016***
- ***83.3% of all earned premiums in 2017; and***
- ***89.8% of all earned premiums in 2018.***

To highlight once more the importance of assumptions, especially with regards to aggregate expense ratios, I re-calculated the ROEs for 2017 and 2018 using different aggregate expense ratios. The ROEs increase as the aggregate expense ratio declines, exactly as expected. For example, in 2018 the ROE increases from 6.6% for all companies, based on an expense ratio of 25%, to 11.2% based on an expense ratio of 20%. I also included the ROEs based on the consolidated income statements of these companies.

Even with an assumed aggregate expense ratio of 25%, the ROEs for automobile insurance companies operating in Ontario almost matched the consolidated ROE. For the companies with positive ROEs on their auto insurance operations in Ontario, the aggregate ROE exceeded their consolidated ROE – 8.6% vs. 5.3% (Table 12). The automobile insurance market in Ontario seems to be as profitable, and for some companies even more profitable, than all of their other insurance operations combined across Canada.

And each company seemed to include different revenues and costs in calculating their pre-tax incomes, resulting in their pre-tax incomes differing from a simple summation of underwriting income and investment income (see table in Appendix 3).

The IBC reported aggregate ROEs for all P&C companies in Canada of 7.3% in 2017 and only 4.6% in 2018. These ROEs are less than those estimated for auto insurance companies operating in Ontario in these two years.

Table 12: Average Industry ROEs, Auto Insurance Companies in Ontario, 2017-2018 (%)

	2017	2018	2018 Consolidated
<i>All Companies</i>			
25%	8.3	6.6	6.8
23%	10.0	8.4	
20%	12.5	11.2	
<i>All Companies ex. Companies with Negative ROEs</i>			
25%	10.5	8.6	5.3
23%	11.2	10.1	4.6
20%	13.7	13.0	4.7

But *the data in Table 3 highlight that the 10 largest auto insurance companies in Ontario collectively have generated larger ROEs than their total Canada-wide insurance business ROEs in each of the years 2016 to 2018.* In 2016, the Ontario auto insurance ROE for the top 10 was 12.4%, while their total business ROE was 6.9%. In 2018, even though the Ontario auto insurance ROE for the top 10 had declined from both the 2016 and 2017 levels, the ROE was still higher than the total business ROE for these companies (7.3% vs. 4.4%).

Among the top 10 companies, *six of them (Aviva, Desjardins, Economical, Co-Operators, Travelers and Fairfax/Northbridge)* had higher ROEs on their Ontario auto insurance business than they did on their entire insurance businesses in each of the years 2016 to 2018. *TD and RSA* had higher ROEs on their Ontario auto insurance business in two of the three years. Only *Intact* had lower ROEs on their Ontario auto insurance business in each of three years.

In 2018, *nine of the ten insurance companies* had higher ROEs on their Ontario auto insurance business than on their entire business. *The largest companies seem to do very well on their auto insurance business in Ontario, even better than they seem to do in all their lines of business across Canada. Indeed, for most of the top 10 auto insurance companies operating in Ontario, their auto insurance business in Ontario appears to subsidizing the rest of their insurance operations. Drivers in Ontario may be paying for the privilege of making these companies even more profitable.*

These findings are not surprising. We should expect well-managed companies to find ways to improve their profitability. One avenue for doing so is to control operating costs. Thus, it would be surprising to find that these companies have not reduced their operating costs below the 25% of premium assumptions used by FSCO.

Furthermore, *the data in Table 13 suggest that the auto insurance companies did take advantage of the new rules in 2010 that greatly reduced claim costs. In 2013, average claims per vehicle declined by 24%. Premiums, on the other hand, increased by 5%. Consequently, average underwriting profits per vehicle increased by \$369 (195%) – from \$189 in 2010 to \$559 in 2011.*

The underwriting profit margin peaked at 67% of the average earned premium per vehicle in 2012 (\$617 per vehicle). In 2017 and 2108, the underwriting profit margin was approximately 31% in each year (\$342 and \$348 per vehicle in 2017 and 2018 respectively).

Table 13: Changes in Average Premiums per Vehicle, Claims per Vehicle and Underwriting Profits per Vehicle (%), and Total Pre-Tax Profits of Automobile Insurance Companies in Ontario, Selected Years 2010-2018

	% change average earned premium per vehicle	% change average claim per vehicle	Avg. earned premium per vehicle less average claim per vehicle	% of average earned premium per vehicle	Pre-tax underwriting income - \$ millions (23% operating costs)
2010	6.6	1.4	189.28	15.2	-921.8
2011	5.3	-23.6	558.64	58.8	1,406.9
2012	2.2	-2.6	616.61	66.6	1,771.0
2013	0.0	7.6	546.98	54.9	1,316.1
2014	-1.8	1.4	504.79	49.9	1,086.4
2015	-3.4	8.6	367.03	33.5	214.5
2016	-1.5	4.1	300.01	26.3	-231.3
2017	-0.7	-4.6	342.13	31.4	95.2
2018	2.5	2.8	348.09	31.1	79.5
2010-2018	2.4	-10.0	417.08	39.1	4,816.3

Between 2010 and 2018, average premiums per vehicle increased by 2.4%, whereas, average claims per vehicle declined by 10%. Over this entire period, the underwriting profit margin averaged 39% of the average earned premium per vehicle.

Combining the underwriting profit margins in Table 13 with an aggregate expense ratio of 23% generates the pre-tax underwriting incomes reported in Table 13. Over the 2010 to 2018 period, the additional, aggregate underwriting profits of automobile insurance companies operating in Ontario might have totaled just under \$5 billion.

A closer look at Table 13 might lead one to conclude that the reforms in 2010 did help the auto insurance companies in the province – their underwriting profits per vehicle increased from \$189.28 in 2010 to a high of \$616.61 in 2012. Thereafter, the underwriting profits per vehicle declined to \$300.01 in 2016, and have recovered slightly in 2017 and 2018. But the underwriting profits per vehicle in 2018 are approximately \$268 below the 2012 peak.

The data in table 5 indicate that the decline in underwriting profits per vehicle resulted from the poor performance for collision and property damage coverages. Claims per vehicle were lower in 2018 than in 2010 for **third party liability** (2.0% lower); **bodily injury** (32.9% lower); **accident benefits** (42.4% lower); **total mandatory coverage** (24.9% lower); and **total all coverages** (10% lower). With the exception of accident benefits, premiums per vehicle were higher in 2018 than 2010, even though claims had declined. And in the case of accident benefits, premiums declined by much less than claims per vehicle (18.3% versus 42.4%).

In the cases of **property damage** and **collision coverages**, claims per vehicle were much higher in 2018 than in 2010 (40.1% higher for property damage; and 68.1% for collision). While premiums also were higher in 2018 than in 2010, the increases in premiums were well below the increases in claims.

Insurance companies estimate their expected claim costs each year based on their expectations of a longer-term cyclical trend. Their actual claim experience in any one year likely will deviate from the longer-term trend for any of a number of possible reasons. However, over the longer-term cycle, insurance companies likely should estimate their total claim costs over this cycle quite accurately.

In constructing Table 14, I have assumed a seven-year cycle. I have set out seven-year rolling averages of the differences between premiums (per vehicle) and claims (per vehicle) for several different types of auto insurance coverage in Ontario. The coverages include: third party liability, bodily injury, property damage, accident benefits, collision, total mandatory coverage and the total for all coverages. I started with the period 1998 to 2004, and continued year-by-year to the final time period 2012 to 2018.

Table 14: Seven-Year Moving Averages, Earned Premiums per Vehicle Less Claims per Vehicle (Pre-Operating Expense Profit per Vehicle), by Type of Coverage, Automobile Insurance in Ontario, 1998-2018

	Third party liability	Bodily injury	Property damage	Accident benefits	Total mandatory coverage	Collision	Total all coverages
1998-2004	\$36.69	16.93	5.68	19.07	65.53	58.94	157.34
1999-2005	55.44	9.46	6.16	25.69	91.04	65.25	192.56
2000-2006	80.98	3.19	6.44	34.17	124.92	75.23	237.27
2001-2007	104.63	15.95	6.86	40.46	154.26	85.00	275.86
2002-2008	129.23	31.66	7.26	40.33	178.54	93.78	307.25
2003-2009	149.12	46.13	7.39	25.48	183.44	101.71	317.33
2004-2010	157.81	55.49	7.11	8.34	174.74	101.37	305.61
2005-2011	166.07	68.25	6.67	15.87	190.86	93.58	309.12
2006-2012	179.48	84.30	6.44	32.83	222.62	87.24	332.11
2007-2013	194.45	102.44	6.39	50.58	256.96	78.79	356.36
2008-2014	214.21	124.55	6.40	70.04	297.89	71.76	389.92
2009-2015	227.70	145.03	6.17	82.57	325.55	63.02	409.28
2010-2016	242.52	170.24	6.10	110.18	369.68	50.22	440.48
2011-2017	256.66	194.63	6.14	130.09	405.21	39.07	462.31
2012-2018	258.81	206.91	6.00	110.19	388.18	28.87	432.23

The differences between premiums per vehicle and claims per vehicle are the underwriting profits per vehicle for each type of coverage. There are several interesting outcomes.

- *The underwriting profits per vehicle have increased steadily for third party liability, from an average of \$36.69 during the initial period (1998 to 2004) to an average of \$258.81 over the period 2012 to 2018.*
- *In the case of bodily injury, the underwriting profits per vehicle have increased steadily since the 2001 to 2007 period, from an average of \$15.95 per vehicle to an average of \$206.91 per vehicle over the period 2012 to 2018. By comparison, underwriting profits per vehicle averaged \$55.49 during the 2004 to 2010 period, and this has increased by an average of \$151 per vehicle since that time.*
- In the case of **accident benefits coverage**, the underwriting profits per vehicle increased from an average of \$8.34 during the period 2004 to 2010 to an average of \$130.09 during the period 2011 to 2017. The underwriting profits declined between the period 2011 to 2017 and the following period, 2012 to 2018.

- *In the case of collision coverage, the underwriting profits per vehicle have declined steadily from an average of \$101.71 over the 2003 to 2009 period to an average of \$28.87 over the most recent 2012 to 2018 period.*
- For both **total mandatory coverage** and **total all coverages**, the underwriting profits per vehicle increased, more or less steadily, from the earliest period to the second most recent period (2011 to 2017). The profits declined between the 2011 to 2017 period and the most recent 2012 to 2018 period. For both types of coverage, the underwriting profits per vehicle were significantly higher during the 2012 to 2018 period than during the 1998 to 2004 period and the 2004 to 2010 period as well (for example, for mandatory coverage – \$388.18 per vehicle during the 2012 to 2018 period versus \$65.53 during the 1998 to 2004 period, and \$174.74 during the 2004 to 2010 period).

4.0 Alternative ROE Regulatory Benchmarks

FSCO had been using a ROE benchmark of 12% between 1996 and 2012. It appears that FSCO reduced this benchmark to 11% in 2013. Since FSCO changed its rate approval process in 2015, it is difficult to determine the implicit ROE that FSCO allows. However, it does not seem as if the ROE is less than 11%.³

I replicated and updated the calculations made by my colleague at the Schulich School of Business, Professor Eli Prisman, and me, based on the Capital Asset Pricing Model, and using a rolling 10-year average for what should be the appropriate ROE for automobile insurance companies in Ontario. The resulting ROEs are presented in Table 15.

Table 15: 10-Year Rolling Averages of Annual ROEs, 2001-2018

2001	8.8
2002	8.4
2003	7.9
2004	7.3
2005	7.1
2006	7.1
2007	7.2
2008	7.1
2009	6.9
2010	6.6
2011	6.2
2012	6.0
2013	5.9
2014	5.7
2015	5.5
2016	5.1
2017	4.8
2018	4.5

What the data in Table 15 tell us is that the auto insurance companies in Ontario have had a free ride for many years. Indeed, the companies with positive ROEs have had ROEs far in excess of what should have been allowed by the regulators between 2012 and 2018. Even when we look

³ I have calculated the implicit ROE based on underwriting profit margins of 6% and 5%, and ROIs of 6% and 4%. The resulting implicit ROEs ranged between 9.2% (underwriting profit margin of 5% and ROI and of 4%) and 11.9% (underwriting profit margin of 6% and ROI and of 6%).

at all auto insurance companies, including those with negative ROEs, the industry as a whole has had ROEs in excess of the 10-year rolling averages in each of the last five years – the period during which the government has tried to reduce premiums by 15%.

How much might have consumers of auto insurance in Ontario over-paid since 2001 as a result of FSCO maintaining ROEs above the levels set out in Table 15?

5.0 Possible Overpayments for Auto Insurance

The FSCO formula for determining the underwriting profit margin (the ratio of after-tax underwriting profits to earned premiums) – UW/P – for setting premiums is set out in the following equation:

$$UW/P = [ROE - ROI(1-T)]/[\beta(1-T)]$$

FSCO used an average return on the investment portfolio (ROI) of 6%. The average tax rate is represented by T (26.5%). And FSCO assumed, as I do, that the equity allocated to the automobile insurance operations in Ontario equals the premiums divided by β -- a value of 2.0 up to 2012, and 1.7 thereafter.

Plugging in the appropriate values for the permissible ROE and β generates the underwriting profit margins reported in Table 16 in the FSCO column. The underwriting profit margins in this table under the revised column are produced by using the ROEs in Table 15 in lieu of the FSCO ROEs and a ROI value of 5% for 2017 and 2018.

There has been a significant and growing gap between the FSCO underwriting margins and those based on generally acceptable ROEs for this industry. This suggests that ***there is room to reduce rates by using a more realistic estimate for ROE and underwriting margins in setting premiums.***

Table 16: Underwriting Profit Margins, 2001-2018

	FSCO	Revised
2001	5.2	3.0
2002	5.2	2.7
2003	5.2	2.4
2004	5.2	2.0
2005	5.2	1.8
2006	5.2	1.8
2007	5.2	1.9
2008	5.2	1.8
2009	5.2	1.7
2010	5.2	1.5
2011	5.2	1.2
2012	5.2	1.1
2013	5.3	1.2
2014	5.3	1.1
2015	6.0	0.9
2016	6.0	0.6
2017	6.0	0.9
2018	6.0	0.7

To produce the underwriting margins presented in Table 17, I proceeded as follows. I calculated the “actual”, after-tax underwriting profit margins of all auto insurance companies in Ontario using GISA data for earned premiums and claims, together with FSCO’s 25% operating expense assumption and a 26.5% tax rate.

The after-tax, underwriting profit margins presented in Table 17 under the column titled “Actual, 25%” were calculated as follows: $[(1-0.265) \times (\text{Earned premiums less claims less } 25\% \text{ of earned premiums})] / \text{Earned premiums}$.

The after-tax, underwriting profit margins presented in Table 17 under the column titled “Actual, 20%”, used a 20% operating expense assumption instead. The last two columns in this table are the corresponding values in Table 16.

The actual, after-tax underwriting profit margins (based on a 25% operating expense assumption) exceeded the permissible FSCO margin only in six years (those highlighted in red in Table 17). The actual margins, based on a 20% operating expense assumption, exceeded the FSCO margin in seven years, also highlighted in red. These likely are the years when consumers overpaid for auto insurance in the Ontario.

When compared to the revised underwriting profit margins, the actual margins (for the 25% operating expense assumption) were greater in seven years: 2004 to 2006 and 2011 to 2014 (Table 17). For these seven years, I calculated what the aggregate premiums might have been if the auto insurance companies in Ontario had been restricted to the revised profit margins. For 2006, where the actual underwriting profit margin was less than the FSCO margin, but greater than the revised margin, I used the actual earned premiums as the base from which I subtracted the estimated premiums using the revised underwriting profit margin.

Table 17: Aggregate Underwriting Margins – Actual, FSCO and Revised, All Coverages, Auto Insurance, Ontario, 2001-2018 (%)

	Actual	Actual	FSCO	Revised
	25%	20%		
2001	-17.43	-13.76	5.16	2.99
2002	-17.59	-13.91	5.16	2.71
2003	-2.40	1.28	5.16	2.37
2004	9.75	13.43	5.16	1.95
2005	6.45	10.13	5.16	1.82
2006	2.85	6.53	5.16	1.85
2007	-2.98	0.69	5.16	1.88
2008	-5.27	-1.60	5.16	1.82
2009	-13.91	-10.23	5.16	1.67
2010	-8.67	-5.00	5.16	1.47
2011	8.83	12.51	5.16	1.24
2012	11.00	14.67	5.16	1.07
2013	7.67	11.35	5.27	1.17
2014	6.11	9.78	5.27	1.07
2015	0.05	3.72	6.00	0.90
2016	-3.09	0.59	6.00	0.56
2017	-0.82	2.86	6.00	0.94
2018	-0.95	2.72	6.00	0.67

Ontario drivers might have overpaid \$7.6 billion for their auto insurance between 2001 and 2018 (Table 18). This represents approximately 4.7% of the total premiums paid for auto insurance in the province during this period.

Repeating this exercise when comparing the actual margins (for the 20% operating expense assumption) to the revised underwriting profit margins, I now had 11 years when the actual margins were greater (2004 to 2006 and 2011 to 2018) – Table 17. For these 11 years, I calculated what the aggregate premiums might have been if the auto insurance companies in Ontario had been restricted to the revised profit margins. Table 18 summarizes the potential premium surcharges for the years 2004 to 2006 and 2011 to 2018.

Table 18: Potential Premium Surcharges, Auto Insurance, Based on 25% and 20% Operating Cost Margins, and “FSCO Premiums”, Ontario, 2001-2018 (\$ Millions)

	25%	20%
2001		
2002		
2003		
2004	1,211	1,671
2005	707	1,191
2006	149	664
2007		
2008		
2009		
2010		
2011	1,394	1,965
2012	1,914	2,460
2013	1,271	1,869
2014	978	1,590
2015		506
2016		5
2017		355
2018		394
Total	7,622	12,671

In this case, Ontario drivers might have overpaid \$12.7 billion for their auto insurance between 2001 and 2018 (Table 18). This represents approximately 7.8% of the total premiums paid for auto insurance in the province during this period.

6.0 Conclusions

Auto insurance companies in Ontario have had a relatively free ride during the past 20 years. The ROEs permitted by FSCO since 2001 have exceeded the ROEs Professor Prisman and I estimated for the auto insurance industry. This in turn has produced a significant and growing gap between the FSCO underwriting margins and those based on generally acceptable ROEs for this industry. This suggests that ***there is room to reduce rates by using a more realistic estimate for ROE and underwriting margins in setting premiums.***

It is conceivable that premiums have been too high and as a result, consumers in Ontario have paid too much for auto insurance. ***Based on revised ROE estimates and an operating cost assumption of 20% in lieu of 25%, Ontario drivers might have overpaid \$12.7 billion for their***

auto insurance between 2001 and 2018. This represents approximately 7.8% of the total premiums paid for auto insurance in the province during this period.

These overpayment estimates can be challenged. But so too can the operating cost assumption of 25%, and underwriting margins based on inflated ROEs.

If I estimate the possible overpayments for auto insurance, based on the data for the companies with positive ROEs, the possible overpayments for 2017 and 2018 total \$783 million and \$482 million respectively. These compare to no additional overpayments for these two years using the GISA data.

The possible overpayments are much larger when I incorporate the more reasonable expense ratio of 20%. The overpayments might now be as large as \$1.4 billion in 2017 (compared to the \$355 million estimate using GISA), and \$1.1 billion in 2018 (compared to \$394 million using GISA). Data sources and estimates for expenses do matter.

All auto insurance companies operating in Ontario made pre-tax profits of \$1.3 billion in 2017, and another \$1 billion in 2018. The top ten accounted for most of the pre-tax profits in each year. When I substitute a 20% expense ratio, aggregate pre-tax profits are now \$2 billion and \$1.7 billion in 2017 and 2018 respectively, with the top ten generating most of these profits. And the ROEs for the top ten auto insurance companies far exceed what are reasonable ROEs and the ROEs reported for the entire P&C industry across Canada.

For all **top 10 combined**, their Ontario auto insurance ROEs have been larger than their total Canada-wide insurance business ROEs in each of the years 2016 to 2018. Among the top 10 companies, **six of them (Aviva, Desjardins, Economical, Co-Operators, Travelers and Fairfax/Northbridge)** had higher ROEs on their Ontario auto insurance business than they did on their entire insurance businesses in each of the years 2016 to 2018. **TD and RSA** had higher ROEs on their Ontario auto insurance business in two of the three years. Only **Intact** had lower ROEs on their Ontario auto insurance business in each of three years.

In 2018, **nine of the ten insurance companies** had higher ROEs on their Ontario auto insurance business than on their entire business.

The absence of profitability is definitely not a problem for auto insurance companies in Ontario. Rather, *it seems as if the Ontario auto insurance business is propping up the P&C industry's overall financial performance.*

Thus, is there room to reduce premiums further? The answer is yes. Start with more realistic estimates for ROEs and operating cost assumptions.

Finally, one can conclude that the reforms in 2010 did help the auto insurance companies in the province – their underwriting profits per vehicle increased from \$189.28 in 2010 to a high of \$616.61 in 2012. However, it might appear that the benefits have eroded since 2012, with the underwriting profits per vehicle in 2018 approximately \$268 below the 2012 peak.

The decline in underwriting profits per vehicle resulted from the poor performance for collision and property damage coverages. Claims per vehicle were lower in 2018 than in 2010 for **third party liability** (2.0% lower); **bodily injury** (32.9% lower); **accident benefits** (42.4% lower); **total mandatory coverage** (24.9% lower); and **total all coverages** (10% lower). With the exception of accident benefits, premiums per vehicle were higher in 2018 than 2010, even though claims had declined. And in the case of accident benefits, premiums declined by much less than claims per vehicle (18.3% versus 42.4%).

In the cases of **property damage** and **collision coverages**, claims per vehicle were much higher in 2018 than in 2010 (40.1% higher for property damage; and 68.1% for collision). While premiums also were higher in 2018 than in 2010, the increases in premiums were well below the increases in claims. Consequently:

- *The pre-operating expense profits per vehicle have increased steadily for third party liability, from an average of \$36.69 during the initial period (1998 to 2004) to an average of \$258.81 over the period 2012 to 2018.*
- *In the case of bodily injury, the pre-operating expense profits per vehicle have increased steadily since the 2001 to 2007 period, from an average of \$15.95 per vehicle to an average of \$206.91 per vehicle over the period 2012 to 2018. By comparison, pre-operating expense profits per vehicle averaged \$55.49 during the 2004 to 2010 period, and this has increased by an average of \$151 per vehicle since that time.*
- In the case of **accident benefits coverage**, the pre-operating expense profits per vehicle increased from an average of \$8.34 during the period 2004 to 2010 to an average of \$130.09 during the period 2011 to 2017. The pre-operating expense profits declined between the period 2011 to 2017 and the following period, 2012 to 2018.
- *In the case of collision coverage, the pre-operating expense profits per vehicle has declined steadily from an average of \$101.71 over the 2003 to 2009 period to an average of \$28.87 over the most recent 2012 to 2018 period.*

Appendix 1: Formulas for Determining the Underwriting Profit Margin

After-tax profits (Π) are defined as follows:

$$(1) \quad \Pi = (1-T)(P - C - \alpha P + ROI * E)$$

Where T represents the average corporate income tax rate, P are the aggregate earned premiums, C are total claims costs and E represents the equity base.

The return on equity (ROE) is:

$$(2) \quad ROE = \Pi / E$$

Or

$$(3) \quad \Pi = ROE * E$$

Substituting into (1)

$$(4) \quad ROE * E = (1-T)(P - C - \alpha P + ROI * E)$$

Assuming that $E = P/1.7$

$$(5) \quad ROE * P/1.7 = (1-T)(P - C - \alpha P + ROI * P/1.7)$$

$$(6) \quad ROE * P = 1.7(1-T)[(1-\alpha)P - C + ROI * P/1.7]$$

$$(7) \quad P[1.7(1-T)(1-\alpha) + (1-T)ROI - ROE] = 1.7(1-T)C$$

$$(8) \quad \mathbf{P = 1.7(1-T)C/[1.7(1-T)(1-\alpha) + (1-T)ROI - ROE]}$$

The underwriting profit margin (UW/P) is defined as follows:

$$(9) \quad UW/P = [P - C - \alpha P] / P = ((1-\alpha)P - C) / P$$

Or

$$(10) \quad UW/P = ((1-\alpha) - C/P)$$

$$(11) \quad \mathbf{C/P = (1-\alpha) - UW/P}$$

Re-writing (11)

$$(12) \quad P[UW/P] = (1-\alpha)P - C$$

$$(13) \quad P[(1-\alpha) - (UW/P)] = C$$

$$(14) \quad \mathbf{P = C/[(1-\alpha) - (UW/P)]}$$

The FSCO underwriting profit margin is:

$$(15) \quad \text{ROE} = (1-T)(\text{UW} + 0.06\text{E})/\text{E}$$

From this we can derive:

$$(16) \quad (\text{UW}/\text{P})^{\text{F}} = (\text{ROE} - \text{ROI}(1-T))/(\text{1.7}(1-T))$$

Or

$$(17) \quad \text{ROE} = (\text{1.7}(1-T))(\text{UW}/\text{P}) + \text{ROI}(1-T)$$

Appendix 2: Critique of Possible Overpayments for Auto Insurance

One can challenge the potential overpayment estimates, claiming that drivers in the province might have underpaid in the other years when the actual underwriting margins were less than both the FSCO and revised margins. But in those years, if auto insurers set premiums below the FSCO caps, they did so voluntarily, perhaps to attract money to be invested or to compete aggressively for market share. On the other hand, the dismal performance of the auto insurance companies might have been the result of underestimating risks and mis-pricing of risks, or of internal transfer pricing to reduce the parent company's tax liabilities. Regardless, FSCO regulation cannot explain the poor outcomes. If FSCO had adopted the CAPM methodology for setting ROEs in the 1990s, premiums in most years likely would have been lower. This would not necessarily have translated into even lower underwriting margins and profits for the auto insurance companies in Ontario. They might have been compelled to become more efficient both in their operations and in their pricing for risks.

Nevertheless, let us take another look at the data. In Table A, I have set out what the annual aggregate premiums might have been if they had been set according to the FSCO rules, using a 25% operating cost assumption; or according to the revised underwriting premiums, using a 25% operating costs assumption; or according to the revised underwriting premiums, using a 20% operating costs assumption. These estimated premiums differed from the actual premiums in each of the years between 2001 and 2018.

Column C contains the annual differences between the hypothetical FSCO premiums and the revised premiums (using the 25% operating cost assumption). The differences provide another possible estimate of the premium overpayments between 2001 and 2018 as a result of the use by FSCO of excessively high ROEs and commensurately higher underwriting margins. Over the entire period 2001 to 2018, the possible overpayments total \$13.2 billion – 7.3% of the total, hypothetical FSCO premiums. For the last seven years alone (2012-2018), the possible overpayments total \$7.0 billion – 8.9% of the total, hypothetical FSCO premiums during this time period.

Column E contains the annual differences resulting from the use of a lower operating cost assumption and based entirely on the revised ROEs and underwriting margins. With multiple distribution channels and the potential of the Internet to lessen the dependence of consumers on brokers and agents, and continued consolidation in this industry, it is conceivable that sales costs likely have declined below FSCO's 25% operating cost margin. Reducing the operating cost assumption generates an additional \$10.8 billion in overpayments over the period 2001 to 2018. For the last seven years alone, the possible overpayments total \$4.6 billion.

Combining the effects of revised ROEs and resulting underwriting margins, and a lower operating cost assumption yields the overpayment estimates in column F – the sum of the possible overpayment estimates in columns C and E. Over the entire period 2001 to 2018, the possible total overpayments are \$24 billion – 13.3% of the total, hypothetical FSCO premiums. For the last seven years alone, the possible overpayments total \$11.6 billion – 14.7% of the total, hypothetical FSCO premiums during this time period.

Table A: Hypothetical Premiums Based on FSCO Rules and Revised Hypothetical Premiums Based on Adjusted ROEs, Based on 25% Operating Cost Margins, Ontario, 2001-2018 (\$ Millions)

	FSCO Premiums 25% Op. Margin	Revised Premiums 25% Op. Margin	A-B	Revised Premiums 20% Op. Margin	B-D	A-D
	A	B	C	D	E	F
2001	7,620	7,303	317	6,819	484	802
2002	8,846	8,433	414	7,877	556	970
2003	8,481	8,033	449	7,506	527	975
2004	7,521	7,066	454	6,606	460	914
2005	7,961	7,462	499	6,977	485	984
2006	8,462	7,936	526	7,420	516	1,042
2007	9,464	8,881	583	8,304	577	1,161
2008	10,127	9,492	635	8,876	616	1,251
2009	12,068	11,279	788	10,549	731	1,519
2010	12,021	11,194	827	10,471	722	1,549
2011	9,305	8,644	661	8,073	571	1,232
2012	9,224	8,526	698	7,980	546	1,245
2013	10,077	9,311	766	8,713	598	1,364
2014	10,366	9,561	806	8,948	613	1,419
2015	11,641	10,545	1,095	9,872	674	1,769
2016	12,456	11,214	1,242	10,502	712	1,955
2017	12,203	11,063	1,140	10,355	707	1,848
2018	12,850	11,595	1,255	10,857	738	1,993
2001- 2018	180,694	167,538	13,156 (7.3%)	156,704	10,833 (6.5%)	23,990 (13.3%)
2012- 2018	78,818	71,815	7,003 (8.9%)	67,226	4,589 (6.4%)	11,592 (14.7%)

Source: Calculated by author.

Yes, the overpayment estimates can be challenged. But so too can the operating cost assumption of 25%, and underwriting margins based on inflated ROEs.

Appendix 3: Pre-Tax Income Measures

Table B: Pre-Tax Income and Tax Rates (based on OSFI), 2018

	<i>Pre-Tax Income 1</i>	<i>Pre-Tax Income 2</i>	<i>Tax Rate</i>
Total Canadian P&C	1,281.6	1,534.4	15.8
Allstate	220.0	221.8	23.9
Aviva	-50.7	51.0	14.3
Cooperators	-96.5	-86.1	45.9*
Desjardins	45.6	96.5	14.2
Echelon	1.8	2.0	35.0
Economical	-117.8	-135.5	38.2*
Intact	535.0	525.9	20.9
Northbridge	19.4	25.4	-29.5
RSA	77.1	88.3	23.1
TD	75.7	81.0	27.2
Travelers	-9.6	-8.6	29.1*

Pre-Tax Income 1 was derived from the OSFI data by adding the net investment incomes and the underwriting incomes. Pre-Tax Income 2 was the reported net income before taxes. The two measures of pre-tax income should have been the same. The differences, which in some cases are significant, are the result of additional costs and revenues included in the calculation of the Pre-Tax Income 2 measure.