

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

Prepared for the Ontario Trial Lawyers Association

**Dr. Fred Lazar
Associate Professor, Economics
Schulich School of Business and
Faculty of Liberal Arts and Professional Studies
York University**

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Executive Summary

I have been asked by the OTLA to update my previous study on auto insurance company profitability 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. Hence, the need for estimates.

Based on my calculations using the latest publicly available data, auto insurance companies in Ontario made \$1.5 billion in pre-tax profits in 2016 an increase of 57% or \$534 million since 2012.

As I highlight in Table 2, this increase in profitability is likely the result of a widening gap between reductions in claims coverage costs and premiums. In 2011, for example, average claims per vehicle declined by 27%. Premiums, on the other hand, barely declined.

The average industry Return on Equity (ROE) for Ontario for auto insurance companies in 2016 was 15.9%, or, more than three times the 5.1% level that the regulated profitability should have been if the industry had been using the rolling 10-year average recommended to the regulator, the Financial Services Commission of Ontario (FSCO).

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 almost certainly have paid too much for their insurance coverage.

Cumulative premium overpayments might have been as high as \$9.2 billion since 2001 or approximately 6.5% of premiums – based on assumptions of lower operating costs and a more reasonable profitability benchmark. In the last five years alone, overpayments might have totaled \$5 billion – 9.5% of the total premiums paid during this past five years.

1.0 Introduction

I have been asked by OTLA to update the previous study (“Return on Equity for Automobile Insurance Companies in Ontario”, August 17, 2015) to include the latest data for 2015 and 2016.

I analyze in section 2.0 the financial data available for auto insurance companies in Ontario to update their ROEs and examine their financial performance since 2012.

In section 3.0, 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 4.0 using the same methodology employed in the previous study. In section 5.0, I address the critique that the premium overpayment estimates in the previous study ignored the years when the data indicated that auto insurance premiums appeared to be too low, and thus overestimated the potential overpayments.

I set out the conclusions in section 6.0.

2.0 Financial Performance Overview

As noted in the previous report for OTLA (August 17, 2015), 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. Hence, the need for estimates.

FSCO used a 2:1 rule between 2001 and 2012 to determine the equity base for auto insurance companies in the province. That is, each year the equity of auto insurance companies in Ontario was assumed to equal 0.5 times their net earned auto insurance premiums in the province. Starting in 2013, FSCO changed to a 1.7:1 rule, so that going forward the equity of auto insurance companies in Ontario is assumed to equal 0.588 times their net earned auto insurance premiums in the province. I applied this ratio of 0.588 to the financial data for 2013 to 2016.

The pre-tax underwriting profits/losses of a company are defined as: total earned premiums less total claims less 25%¹ of total earned premiums. I assumed that the share of the net total investment income of each Property and Casualty (“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. Throughout I use an average tax rate of 26.5%.²

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

Table 1 summarizes the ROE estimates for the auto insurance industry in Ontario for the periods 2012-2016. The aggregate ROEs were quite low in 2012 and 2013, but they have exceeded 10% since. In 2016, the ROE averaged almost 16%, indicating that there is room to reduce premiums and still allow the insurance companies to generate attractive ROEs.

When I exclude the companies with negative ROEs, the average ROEs for the remaining companies increase dramatically to 14.9% in 2012, 17.5% in 2013, 18.9% in 2014, 16.8% in 2015 and 16.3% in 2016. The companies that have been profitable have been very profitable during the past five years. And the ROEs do not seem to have been impacted by the premium reduction policy of the government. Indeed, the auto insurance companies appear to be doing very well.

Table 1: Average Industry ROEs, Auto Insurance Companies in Ontario, 2012-2016 (%)

	2012	2013	2014	2015	2016
All Companies	4.2	2.4	10.6	10.6	15.9
All Companies ex. Companies with Negative ROEs	14.9	17.5	18.9	16.8	16.3

See Appendix 1, Table A.

The auto insurance groups and individual companies (see Table A in the Appendix 1) 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; and**
- **99.1% of all earned premiums in 2016.**

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 still used by FSCO.

Furthermore, **the data in Table 2 suggest that the auto insurance companies did take advantage of the new laws starting in 2010 that greatly reduced claim costs. In 2011, average**

¹ FSCO assumption for operating costs used in rate filings.

² In 2016 for example, the average tax rate for all P&C companies that operated in the automobile insurance market in Ontario was 29.5%. The average tax rate for all such companies that had positive ROEs in their automobile insurance operations in the province was 22.9%.

claims per vehicle declined by 27%. Premiums, on the other hand, barely declined. Consequently, average underwriting profits per vehicle increased by \$346 (162%) – from \$212 in 2010 to \$559 in 2011.

While the underwriting profit has since declined to \$342 per vehicle, this is still about \$130 more than in 2010 and \$260 greater than in 2009. Between 2010 and 2016, average premiums per vehicle declined by 4.8%. But the decline in average claims per vehicle declined even more rapidly – 15.5%.

Table 2: 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 2010-2016

	% change average earned premium per vehicle	% change average claim per vehicle	Avg. earned premium per vehicle less average claim per vehicle	Pre-tax income - \$ millions (25% operating costs)
2009			\$81.67	
2010	13.0	3.4	212.46	
2011	-0.6	-27.2	558.64	
2012	2.2	-2.6	616.61	934.7
2013	0.0	7.6	546.68	947.1
2014	-1.8	1.2	507.12	1,126.9
2015	-3.4	8.0	375.67	1,193.6
2016	-1.3	1.3	342.15	1,468.9
2010-2016	-4.8	-15.5		

Source: Calculated by author

Not surprisingly, **aggregate pre-tax profits for the industry in Ontario increased steadily from \$935 million in 2012 to \$1.5 billion in 2016 – an increase of \$534 million or 57%. Profits rose, ROEs increased and average claims per vehicle declined.**

3.0 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%.

Several years ago, my colleague at the Schulich School of Business, Professor Eli Prisman, and I were retained by FSCO to determine whether the 12% benchmark continued to be appropriate in light of the changed financial and economic environments. In our study for FSCO, we estimated ROE caps for 2013 ranging between 4.2% and 5.3%, based on the Capital Asset Pricing Model (“CAPM”).

These ROEs were substantially below the 12% ROE benchmark. One could have argued at that time that the risk-free interest rate was abnormally low as the Bank of Canada continued to deal with the sluggish growth aftermath of the economic and financial crisis in 2008-09. Thus, the

forward rate based on the current levels for the risk-free interest rate might have underestimated what the risk-free rate would be in more “normal” economic and financial environments. But rates have remained at historically low levels since that time.

If the CAPM had been used by FSCO continuously from 1995 with the appropriate risk-free interest rates and market risk premiums in each year, the decline in the regulatory cap for the ROE would not have been so precipitous from one year to the next, other than between 1994 and 1995.

We recommended to FSCO that it should move to a rolling 10-year average for establishing the regulatory cap for the ROE in the province. We opted for the 10-year rolling average for three reasons. First of all, it is more consistent with using the 10-year average for the market risk premiums. Second, it produces a more stable pattern of ROEs. And finally, it is more in line with pricing/investment cycle for this industry.

Table 3: 10-Year Rolling Averages of Annual ROEs, 1995-2016

1995	11.7
1996	11.2
1997	10.6
1998	10.2
1999	9.6
2000	9.2
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

Source: Calculated by author.

The resulting 10-year rolling averages starting in 1995 are presented in Table 3. What ***the data in Table 3 tell us is that the auto insurance companies in Ontario have had a free ride during most of the past 20 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 2016. Even when we look 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 three years – the period during which the government has tried to reduce premiums by 15%.

The values presented in Table 3 were derived by taking 10-year averages of the annual ROEs calculated using an industry beta of 0.46 and the market risk premiums and forward risk-free interest rates presented in Table 4.

Table 4: Market Risk Premium (10-Year Average), Forward Risk-Free Rate, January 1995- January 2016

	Market Risk Premium	Forward Risk Free Rate
<i>January 1995</i>	0.84%	8.36%
<i>January 1996</i>	1.59	6.29
<i>January 1997</i>	2.44	5.56
<i>January 1998</i>	5.11	5.07
<i>January 1999</i>	3.29	4.57
<i>January 2000</i>	5.07	5.59
<i>January 2001</i>	7.83	4.94
<i>January 2002</i>	6.11	4.65
<i>January 2003</i>	5.59	4.06
<i>January 2004</i>	4.91	3.99
<i>January 2005</i>	6.88	3.67
<i>January 2006</i>	8.15	3.73
<i>January 2007</i>	7.06	3.81
<i>January 2008</i>	6.55	3.65
<i>January 2009</i>	3.94	1.98
<i>January 2010</i>	4.99	2.74
<i>January 2011</i>	5.91	2.43
<i>January 2012</i>	7.70	1.39
<i>January 2013</i>	9.92	0.96
<i>January 2014</i>	8.41	1.09
<i>January 2015</i>	8.13	0.98
<i>January 2016</i>	4.86	1.00

Sources: TSX and Bank of Canada.

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:

$$UW/P = [ROE - 0.06(1-t)]/[\alpha(1-t)]$$

FSCO used an average return on the investment portfolio of 6%. Hence the 0.06 in the formula. 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 α - a value of 2.0 up to 2012, and 1.7 thereafter.

Plugging in the appropriate values for the permissible ROE and α generates the underwriting profit margins reported in Table 5 in the FSCO column.

The underwriting profit margins in this Table under the revised column are produced by using the ROEs in Table 3 in lieu of the FSCO ROEs.

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 5: Underwriting Profit Margins, 2001-2016

	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

Source: Calculated by author.

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 3?

4.0 Possible Overpayments for Auto Insurance

I will start with the methodology used in the August 2015 report.

To produce the underwriting margins presented in Table 6, 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 6 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 6 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 5.

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 6). 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 6). 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 (see Table 7). 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 6: Aggregate Underwriting Margins – Actual, FSCO and Revised, All Coverages, Auto Insurance, Ontario, 2001-2016 (%)

	Actual 25%	Actual 20%	FSCO	Revised
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	-8.09	-4.42	5.16	1.47
2011	8.83	12.51	5.16	1.24
2012	11.00	14.67	5.16	1.07
2013	7.66	11.33	5.27	1.17
2014	6.22	9.89	5.27	1.07
2015	0.48	4.15	6.00	0.90
2016	-0.98	2.70	6.00	0.56

Source: Calculated by author.

Ontario drivers might have overpaid \$4.0 billion for their auto insurance between 2001 and 2016 (Table 7). This represents approximately 2.9% 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 nine years when the actual margins were greater (2004 to 2006 and 2011 to 2016) – Table 6. For these nine 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 8 summarizes the potential premium surcharges for the years 2004 to 2006 and 2011 to 2016.

Table 7: Potential Premium Surcharges, Auto Insurance, Based on 25% Operating Cost Margin, and “FSCO Premiums”, Ontario, 2001-2016 (\$ Millions)

2001	
2002	
2003	
2004	454
2005	499
2006	149
2007	
2008	
2009	
2010	
2011	677
2012	698
2013	766
2014	804
2015	
2016	
Total	4,048

For 2015 and 2016, where the actual underwriting profit margin were less than the FSCO margins, but greater than the revised margins, I used the actual earned premiums in those two years as the base from which I subtracted the estimated premiums using the revised underwriting profit margins.

In this case, Ontario drivers might have overpaid \$9.2 billion for their auto insurance between 2001 and 2016 (Table 8). This represents approximately 6.5% of the total premiums paid for auto insurance in the province during this period.

Table 8: Potential Premium Surcharges, Auto Insurance, Based on 20% Operating Cost Margin, and “FSCO” Premiums, Ontario, 2001-2016 (\$ Millions)

2001	
2002	
2003	
2004	914
2005	984
2006	1,042
2007	
2008	
2009	
2010	
2011	1,232
2012	1,245
2013	1,364
2014	1,415
2015	583

2016	386
Total	9,165

5.0 Critique of Possible Overpayments for Auto Insurance

One can challenge these 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. 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 our methodology in 1995, 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 9, 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 (Tables 5 or 6). These estimated premiums differed from the actual premiums in each of the years between 2001 and 2016.

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 2016 as a result of the use by FSCO of excessively high ROEs and commensurately higher underwriting margins. Over the entire period 2001 to 2016, the possible overpayments total \$10.7 billion – 6.9% of the total, hypothetical FSCO premiums. For the last five years alone (2012-2016), the possible overpayments total \$4.6 billion – 8.6% 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 \$9.4 billion in overpayments over the period 2001 to 2016. For the last five years alone, the possible overpayments total \$3.1 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 2016, the possible total overpayments are \$20.4 billion – 12.9% of the total, hypothetical FSCO premiums. For the last five years alone (2012-2016), the possible overpayments total \$7.7 billion – 14.4% of the total, hypothetical FSCO premiums during this time period.

However, the actual premiums paid and the hypothetical FSCO premiums have not been the same. In fact, over the entire 2001 to 2016 period, the actual net earned premiums totaled \$141 billion, or approximately \$15 billion less than the hypothetical FSCO premiums (Table 10). During the other two sub-periods – 2007-2016 and 2012-2016 – the net earned premiums also were less (\$9 billion between 2007 and 2016; and \$1 billion between 2012 and 2016).

Table 9: Hypothetical Premiums Based on FSCO Rules and Revised Hypothetical Premiums Based on Adjusted ROEs, Based on 25% Operating Cost Margins, Ontario, 2001-2016 (\$ 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	7,317	303	6,819	498	802
2002	8,846	8,449	398	7,877	572	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	12,618	11,750	868	10,991	758	1,626
2011	9,305	8,628	677	8,073	555	1,232
2012	9,224	8,526	698	7,980	546	1,245
2013	10,080	9,314	766	8,716	598	1,364
2014	10,343	9,539	804	8,928	611	1,415
2015	11,552	10,465	1,087	9,796	669	1,756
2016	12,017	10,819	1,199	10,131	687	1,886
2001-2016	155,690	144,955	10,735 (6.9%)	135,549	9,406 (6.5%)	20,141 (12.9%)
2007-2016	106,799	98,693	8,106 (7.6%)	92,344	6,349 (6.4%)	14,455 (13.5%)
2012-2016	53,217	48,663	4,554 (8.6%)	45,551	3,112 (6.4%)	7,666 (14.4%)

Source: Calculated by author.

When the revised premium estimates, using a 25% operating cost assumption, are compared to the actual earned premiums, the aggregate earned premiums would have been smaller by about \$4 billion over the entire period (2001-2016). Thus, how can I conclude that there have been overpayments in total? Even during the past 10 years, the earned premiums were approximately \$1 billion less than the revised premiums. Only during the past five years, have the earned premiums exceeded the revised premiums (using a 25% operating cost margin) – by \$3.8 billion (see Table 10).

The discrepancies between the FSCO premiums and the actual earned premiums almost disappear when the 20% operating cost assumption is used. Over the entire 2001-16 period, the

FSCO premiums exceed the actual premiums by \$4 billion, significantly less than when the 25% operating cost assumption is used. During the past five years, the actual earned premiums exceed the FSCO premiums, based on a 20% operating cost assumption, by \$3 billion. Thus, it is conceivable that operating costs have averaged much less than 25% over the entire time span and might have been much closer to 20% or perhaps even less. There has been much consolidation in the automobile insurance market in Ontario, and one of the primary drivers for horizontal mergers is to exploit economies of scale and reduce costs.

If we compare the premiums based on the revised ROEs and underwriting margins, and 20% operating costs to the actual premiums, we find that the actual premiums would have been greater by \$5.4 billion over the entire 2001-2016 period, or about 3% of the total premiums. This might be a more comprehensive estimate of the premium overpayments in the province since 2001, for this estimate includes the years when actual premiums were less than the revised premiums. This is less than the \$9.2 billion overpayment estimate in Table 8; but still a significant amount.

Table 10: Hypothetical Premiums Based on FSCO Rules and Revised Hypothetical Premiums Based on Adjusted ROEs, Based on 20% Operating Cost Margins, Ontario, 2001-2016 (\$ Millions)³

	2001-16	2007-16	2012-16
Net Earned Premiums	140,915	97,700	52,457
FSCO Premiums – 25% Margin	155,690	106,799	53,217
FSCO Premiums – 20% Margin	144,940	99,421	49,535
Revised Premiums – 25% Margin	144,955	98,693	48,663
Revised Premiums – 20% Margin	135,549	92,344	45,551
Revised Premiums (20% Margin) less Net Earned Premiums	5,365	5,357	6,906
% of Net Earned Premiums	2.97	5.48	13.16

Source: Calculated by author.

During the past five years, the potential aggregate loss is even greater -- \$6.9 billion or 13.2% of total premiums during this period. This larger overpayment estimate reflects the fact that ROEs should have been declining steadily since 2001 and should now be in the low 5% range and that actual premiums exceeded the estimated premiums in every year since 2012.

Yes, the overpayment estimates in Tables 7 and 8 can be challenged. But so too can the operating cost assumption of 25%, and underwriting margins based on inflated ROEs.

³ The possible premium overpayments during the past five years (\$6.9 billion in this table) are larger than the estimated possible premium overpayments over the entire 16-year period (\$5.4 billion in this table) because premiums paid have exceeded the premium estimates using the revised ROEs and underwriting margins in Tables 5 and 6 respectively. During the longer period of time, there were a number of years where actual premiums were lower than the estimated premiums.

6.0 Conclusions

In 2013, The Government of Ontario revised the *Automobile Insurance Rate Stabilization Act*. The key revisions are set in S. 2.1 (1) and (2):

“**2.1 (1)** This section establishes an industry-wide target for the reduction of rates that insurers are permitted to charge for the Personal Vehicles — Private Passenger Automobile category of automobile insurance.

(2) The target is a 15 per cent reduction in the average of the authorized rates that may be charged by all insurers. The average is to be determined in accordance with the regulations, and the reduction must be achieved during the period prescribed by regulation.”

Table 11 sets out the premium changes approved by FSCO following the revision. In 2014 and 2015, premiums were reduced more often than they were increased. The reductions were quite small. Following an average reduction of 3.1% in the first quarter of 2016, premiums were increased more often than they were reduced. Premiums have increased overall since the first quarter of 2016. Thus, it would appear that the government is unlikely to achieve its target reduction of 15% in automobile insurance premiums.

According to data available on the GISA website, it appears as if the province has had somewhat more success, but still has fallen short of its 15% target. Since peaking in 2013, averaged earned premiums per vehicle have declined by 6.4% -- from \$1,544 in 2013 to \$1,446 in 2016.

Is there room for further premium reductions?

Table 11: Rate Premium Changes Approved by FSCO, Q1 2014-Q4 2017

	Overall Market Impact % change in premiums	Market Share of Insurance Companies with Rate Approvals
2014		
Q1	-1.01	20.2
Q2	0.22	14.5
Q3	-0.11	26.6
Q4	-0.54	46.8
2015		
Q1	-0.95	73.5
Q2	0.60	52.8
Q3	-0.50	77.4
Q4	-0.15	51.2
2016		
Q1	-3.07	83.4
Q2	0.33	30.1
Q3	1.50	63.6
Q4	-0.14	24.2
2017		
Q1	1.24	87.9

Q2	0.76	54.9
Q3	-0.10	34.5
Q4	1.03	40.0

Source: FSCO website.

If we take a look at the return on equity of the major automobile insurance companies operating in Ontario, it appears as if the answer is yes.

The automobile insurance companies in Ontario that have been profitable have been very profitable during the past five years. Their average ROEs have been 14.9% in 2012, 17.5% in 2013, 18.9% in 2014, 16.8% in 2015 and 16.3% in 2016. And their ROEs do not seem to have been impacted by the premium reduction policy of the government. Indeed, the auto insurance companies appear to be doing very well.

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 \$9.2 billion for their auto insurance between 2001 and 2016. This represents approximately 6.5% 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. For example, using a 20% operating cost assumption to re-calculate the aggregate ROEs for all automobile insurance companies operating in Ontario (including those that lost money) results in the ROEs increasing from 10.6% to 16.8% in 2015, and from 15.9% to 22.2% in 2016.

It is reasonable to argue that a lower bound estimate of the potential overpayments since 2001 might have been \$5.4 billion. This is a more comprehensive estimate of the premium overpayments in the province since 2001, for this estimate includes the years when actual premiums were less than the revised premiums. This is less than the \$9.2 billion overpayment estimate; but still a significant amount.

During the past five years, this more comprehensive methodology generates a premium overpayment estimate of \$6.9 billion (13.2% of total premiums), which is larger than the \$5 billion estimate produced by my original methodology, which was subject to criticism.

Thus, is there room to reduce premiums further, and possibly achieve the 15% reduction target? The answer is yes. Start with more realistic estimates for ROEs and operating cost assumptions.

Appendix 1: Company ROEs

The after-tax ROEs presented in Table A are derived using individual company earned premiums and claims for auto insurance in Ontario, FSCO's 25% operating cost assumption, FSCO's premium-to-equity assumptions, and a 26.5% tax rate. Aggregate investment income for each company was allocated to its respective Ontario auto insurance unit based on the percentage of auto insurance in Ontario earned premiums to total company earned premiums.

Table A: ROEs, Auto Insurance Companies in Ontario, 2012-2016 (%)

	2012	2013	2014	2015	2016
Allstate	25.1	22.4	14.7	2.4	3.1
<i>Allstate Insurance</i>	22.8	23.0	14.0	2.3	2.0
<i>Pembridge Insurance</i>	29.9	15.6	8.7	-0.4	8.5
<i>Pafco Insurance</i>	46.6	29.9	36.1	8.6	4.0
Aviva	12.8	14.6	18.4	14.5	16.3
<i>Aviva Insurance</i>	-2.2	5.1	11.2	6.3	8.6
<i>Elite Insurance</i>	65.4	96.8	141.4	48.1	57.6
<i>Scottish & York</i>	39.2	48.2	25.1	19.1	14.9
<i>Traders General</i>	48.7	31.2	31.8	36.0	33.6
<i>Aviva General Insurance</i>					15.2
<i>Pilot Insurance</i>					
<i>S&Y Insurance</i>					152.2
<i>RBC General Insurance</i>	6.0	7.3	11.0	8.0	
<i>RBC Insurance Company</i>	-14.6	13.2	49.2		
Intact Financial	8.2	16.5	15.6	14.0	8.8
<i>Intact Insurance</i>	11.4	14.1	17.7	12.9	
<i>Jevco Insurance</i>	2.7	37.7	34.8	26.9	50.3
<i>Novex Insurance</i>	-8.8	14.1	1.2	10.2	11.3
<i>Trafalgar Insurance</i>	20.4	10.8	21.2	29.2	329.4
<i>Nordic Insurance</i>	0.6	19.5	5.4	13.2	1.3
Chubb Insurance				3.9	27.2
<i>ACE INA Insurance</i>	-48.3	-28.6	-24.8	22.7	
Chubb Insurance	22.9	20.7	20.1	0.8	
The Co-Operators Group	23.0	9.5	16.1	23.6	27.2
<i>Co-Operators General Insurance</i>	24.1	15.7	15.0	22.6	
<i>COSECO Insurance</i>	20.3	-31.9	25.2	52.2	
<i>CUMIS General Insurance</i>	13.1	14.0	4.7	-6.7	
<i>Sovereign General Insurance</i>	12.8	-67.3	-5.3	-44.4	
Desjardins Group	1.8	16.8	-1.7	7.4	23.8
<i>Personal Insurance</i>	1.9	17.8	-9.7	-3.8	3.7
<i>Certas Direct</i>	-42.6	15.3	7.2	1.1	-7.4
<i>Certas Home & Auto</i>			8.4	21.3	46.1
Echelon General Insurance	39.3	23.2	37.0	19.2	11.7
Economical Mutual	36.2	30.8	22.2	26.6	16.2
<i>Economical Mutual Insurance</i>	31.3	30.9	21.4	25.8	17.1
<i>Perth Insurance</i>	85.2	37.8	32.8	36.8	24.9
<i>Waterloo Insurance</i>	32.5	22.1	17.8	17.0	4.2

<i>Sonnet Insurance</i>					
<i>Missisquoi Insurance</i>				91.4	71.7
<i>Everest Insurance</i>				170.1	158.9
<i>Fairfax Financial</i>	-65.4	11.0	67.9	69.9	61.8
<i>Federated Insurance</i>	-0.2	5.8	33.0	24.5	-5.0
<i>Northbridge General Insurance</i>	-66.4	25.3	100.4	99.9	78.3
<i>Northbridge Personal Insurance</i>	-68.5	1.2	57.6	50.2	98.0
<i>Northbridge Commercial Insurance</i>	-22.4	-3.4	8.7	28.0	-15.2
<i>Zenith Insurance</i>	-181.6	6.0	85.0	50.0	96.0
<i>Gore Mutual Insurance</i>	3.6	12.1	19.2	2.8	21.8
<i>Guarantee Company</i>	14.1	-30.8	-18.9	25.9	10.7
<i>Heartland Farm Mutual</i>				-9.7	-2.1
<i>Motors Insurance</i>	41.5	43.6	727.6		
<i>Portage La Prairie Mutual</i>	23.3	-3.1	-27.8	9.3	37.9
<i>Royal Bank Group</i>	1.8	8.9	14.8		
<i>RSA Insurance</i>	-4.4	12.0	23.0	26.4	15.2
<i>Royal & Sun Alliance</i>	41.5	25.6	77.6	26.8	8.0
<i>Unifund Assurance</i>	-44.3	-0.7	-1.3	29.0	27.8
<i>Western Assurance</i>	33.0	34.7	25.1	13.7	-14.2
<i>TD Bank Group</i>	-21.0	-73.5	-30.8	-17.6	8.0
<i>Primum Insurance</i>	-7.8	-48.5	-32.6	-34.2	8.6
<i>Security National</i>	-22.9	-67.7	-29.9	-12.5	0.1
<i>TD General Insurance</i>	-40.8	-170.5	-17.4	-61.2	26.5
<i>TD Home & Auto</i>	-9.8	-84.4	-37.7	-11.1	127.5
<i>Travelers Insurance Group</i>				13.3	16.8
<i>Travelers Insurance of Canada</i>				-28.3	-1.7
<i>Dominion of Canada General</i>	8.8	13.0	4.8	13.3	16.8
<i>State Farm Mutual</i>	7.5	17.1	19.3		
<i>Wawanesa Mutual</i>	11.5	12.8	9.1	16.2	11.7
<i>North Waterloo Farmers Mutual</i>	-9.0	24.9	9.8		
<i>AIG Insurance</i>	10.4	37.7	24.6	22.4	15.2
<i>American Road Insurance</i>				68.4	57.0
<i>Cherokee Insurance</i>				-8.0	42.8
<i>Continental Casualty</i>	-20.6	10.0	-19.0	-1.8	7.2
<i>Federal Insurance</i>					-6.3
<i>Hartford Fire Insurance</i>				100.1	24.4
<i>Liberty Mutual</i>	-1.8	33.7	2.8	161.5	6.4
<i>Lloyd's Underwriters</i>				-75.7	-129.9
<i>Mitsui Sumitomo Insurance</i>				-89.9	57.5
<i>Old Republic Insurance</i>	-20.2	-0.8	19.3	24.6	-19.9
<i>Protective Insurance</i>				-188.6	0.3
<i>St. Paul Fire & Marine Insurance</i>	62.9	52.7	-22.1	-91.2	119.1
<i>Technology Insurance</i>				8.5	30.9
<i>Tokio Marine & Nichido Fire Insurance</i>				-21.6	7.0
<i>XL Insurance</i>				-4.0	-44.7
<i>Zurich Insurance</i>	83.8	-21.1	-84.4	-78.0	61.3

Appendix 2: Capital Availability

Table B compares equity estimates using the FSCO assumptions with estimates based on allocating the total equity of a company to its Ontario auto insurance operations based on the premium ratios.

If there is a capital constraint, it could show up as a deficiency between the equity estimates using the FSCO assumptions and the estimates based on the premium ratios.

Table B: Comparison of Possible Equity, Auto Insurance Companies in Ontario, 2010, 2012-2016 (\$ Millions)

	2010	2012	2013	2014	2015	2016
All Companies						
Based on Premiums and Equity	8,749	9,376	9,904	10,447	10,252	10,717
Based on FSCO Rules	5,071	7,173	7,590	7,621	7,588	7,726
Possible Excess Capital	3,679	2,203	2,315	2,827	2,664	2,991
All Companies ex. Companies with Negative ROEs						
Based on Premiums and Equity	5,563	7,994	8,337	8,572	8,951	10,623
Based on FSCO Rules	3,174	5,604	5,972	5,914	6,378	7,658
Possible Excess Capital	2,389	2,390	2,365	2,658	2,573	2,966
All Companies with Negative ROEs						
Based on Premiums and Equity	3,186	1,382	1,567	1,876	1,301	93
Based on FSCO Rules	1,896	1,569	1,617	1,706	1,210	68
Possible Excess Capital	1,289	-187	-50	169	91	25

For all companies in our sample, there appears to be a surplus of capital (i.e. equity) allocated to auto insurance in Ontario. According to our calculations, the surplus could have been \$3.7 billion in 2010, \$2.2 billion in 2012, \$2.3 billion in 2013, \$2.8 billion in 2014, \$2.7 billion in 2015, and almost \$3 billion in 2016. Thus, it does not seem as if the companies in this industry have been earning uncompetitive ROEs on their auto insurance operations in Ontario; otherwise, they would not have allocated excess capital to the auto insurance line in Ontario.

The same conclusions appear for the companies with positive ROEs. However, the companies with negative ROEs in 2012 and 2013 might have faced a capital constraint. If the parent companies cannot improve the performance of their Ontario auto insurance units, then according to standard economic theory, it is prudent for them to withdraw their capital from this industry.

Overall, there does not seem to be any capital problem for the auto insurance industry in Ontario. Indeed, the evidence suggests that the profitable companies have invested much more

in the industry than assumed by FSCO, and yet, these companies collectively have generated ROEs (see Table 2) well in excess of the FSCO caps.