Returns on Equity for Automobile Insurance Companies in Ontario

Prepared for the Ontario Trial Lawyers Association

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March 30, 2015

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Executive Summary

On behalf of the Ontario Trial Lawyers Association ("OTLA") we have examined the following:

1. The financial performance of Ontario auto insurance companies since 2001, at both the aggregate and individual company levels.
2. The costs to Ontario consumers of a profitability benchmark of a 12% cap on the after-tax return on equity ("ROE") for these companies when financial market conditions pointed to increasingly lower profitability benchmarks.
3. The methodology employed by KPMG in reviewing ROEs for auto insurance companies in Ontario, and the study's findings.
4. The flows of capital into the auto insurance business in Ontario.
5. The implications of a recent rate filing change by the regulator in Ontario to replace the ROE benchmark with a return on premium benchmark.

1. Financial Performance of Auto Insurance Companies in Ontario

At an aggregate level, ROEs for Ontario auto insurance companies have been quite low – negative on average between 2001 and 2011, and positive in both 2012 and 2013. However, when we exclude the companies with negative ROEs, the average ROEs for the remaining companies increase dramatically to 9.7% over the period 2001-11, 14.9% in 2012 and 17.5% in 2013.

Obviously, the companies that have been profitable have been very profitable, especially in the last two years, with their average ROEs well in excess of the Financial Services Commission of Ontario ("FSCO") regulatory cap.

The profitable companies dominate the industry. The auto insurance groups and individual companies that had positive ROEs accounted for:

- 62.5% of all earned premiums in the province during the 2001-11 period;
- 73.7% of all earned premiums in the province in 2012; and
- 82.8% of all earned premiums in the province in 2013.

It is reasonable to focus only on the profitable companies and ignore those with consistent negative ROEs – the chronically unprofitable companies. Economic theory and common business sense dictate that unless a company earns at least a risk-adjusted, competitive ROE over time, it will exit the industry. Few of these companies ever left the industry, and most that remained invested even more capital into the market.

For a company with negative or sub-par ROEs to remain in the industry, either the accounting rules employed understate its profitability – a company operating in many product and geographic markets has an incentive to transfer profits around to the market(s) with the lowest tax rates, and accounting rules do not preclude the company from doing so; or this company is one of many business units of the parent company, and negative or low ROEs are tolerated because this unit acts as a loss leader for the parent as a whole – in other words the real profitability of this business unit is seriously understated.

2. How Much Have Consumers in Ontario Overpaid

The ROEs permitted by FSCO since 2001 have increasingly exceeded the ROEs we estimated to be reasonable for the auto insurance industry in the province. Consequently, premiums have been too high, and consumers in Ontario have been paying too much for auto insurance.

We estimate that consumers in Ontario may have overpaid for auto insurance by between $3 and $4 billion for auto insurance over the period 2001 to 2013.

In 2013 alone consumers likely overpaid by $840 million.

There is significant room to reduce rates. The combination of a ROE cap of 5.8% (the 10-year rolling average for 2013) and a lower operating cost assumption could reduce auto insurance premiums by at least 7.9% based on 2013 data.

The regulator has not changed the operating cost assumption even though the Internet and technology enable companies to reach consumers more directly using less expensive distribution channels. A modest reduction in the operating cost assumption can produce savings in the hundreds of millions annually for consumers of auto insurance in the province.

3. KPMG Study

We found the KPMG study of profitability of auto insurance companies to be lacking in several significant ways. The conclusions are misleading because of the use of incorrect assumptions. We note that even actuaries retained by the insurance industry could not replicate the KPMG results.

KPMG did not look at the performance of individual companies and groups. If they had done so, they would have discovered, as we did, that most companies operating in Ontario have been very profitable. Consequently, KPMG was able to ignore addressing why chronically unprofitable and underperforming companies remained in this business.

And so, KPMG did not reconcile or address the inconvenient fact that auto insurance companies have invested excess capital into their Ontario operations. Companies that experienced the sub-par performance suggested by KPMG would not have maintained their capital levels, let alone attract new capital.

4. Flows of Capital

There appears to be a surplus of capital allocated to auto insurance in Ontario, as much as $2 billion in 2013.

If profits were actually as poor as KPMG suggested, we should have expected the auto insurance companies in the province to have greatly reduced their investments in this industry, and hence increasingly restrict their business in Ontario. We definitely would not have expected this industry to attract more capital and expand its business in the province.

It appears instead, that the auto insurance market in Ontario has been highly profitable for most companies, if not for all of them, and as a result, they have had little difficulty in attracting more capital investment and increasing the scale of their operations.

5. Implications of the New FSCO Rules

In October 2014, FSCO implemented a “Return on Premium” benchmark to replace “Return on Equity” in reviewing insurance company rate filings. Instead of an 11% ROE, the new measure is a 6% return on premium.

The 6% return on premium benchmark is out of line with current financial market realities. Our recommended 5.7% ROE benchmark for 2014 is equivalent to a return on premium cap of only 1.8%. The 6% return on premium translates into at least a 12% ROE.

A 6% return on premium benchmark likely will result in significant cost increases for all policyholders. We have estimated that aggregate premiums in 2014 could have been $275 million greater if this new rule had been in place last year.

The picture is even worse when we compare the results to our recommended maximum return on premium of 1.8%. By not reducing the ROE benchmark to a level reflecting market realities, and replacing the 11% ROE cap with a 6% return on premium cap, consumers in Ontario could be overpaying for their auto insurance by $855 million. The overpayment could be even more ($200 to $300 million annually) since the operating cost assumption remains fixed and does not reflect changes in technology and distribution strategies.

1.0 Introduction

We have been retained by the Ontario Trial Lawyers Association to determine the returns on equity earned by auto insurance companies operating in Ontario. The key questions posed by OTLA are as follows:

- Despite a regulatory cap of 12% on the after-tax ROE,[1] what has been the real experience of auto insurance companies in Ontario?
- Has the 12% ROE benchmark in Ontario actually constrained the profitability of auto insurance companies in the province?
- As a result of the reforms introduced in 2010, has the profitability of the industry changed?

In section 2.0, we analyze the financial data available for auto insurance companies in Ontario in order to estimate the ROEs for these companies. We rely primarily on the data submitted to OSFI and made available through its Beyond 20/20 data base.

In section 3.0, we look at whether the industry is capital-constrained.

In our work for the Financial Services Commission of Ontario,[2] a common argument that auto insurance companies put forth was that too low a ROE would constrain the availability of capital for this industry. The auto insurance market in Ontario competes with other insurance markets and other financial service industries for capital, not only in Ontario, but also across Canada and globally. OTLA asked us to examine whether the auto insurance industry in Ontario is indeed capital-constrained.

In section 4.0, we examine the analysis we undertook for FSCO to explore what the regulated ROE should have been if FSCO had adopted in 1995 the classic Finance methodology and used real-time market values for establishing the ROE for this industry. FSCO did subscribe to our recommendation to use the classic Finance methodology and current day market realities starting in 2013. This helps put the actual experience of the auto insurance companies into perspective. That is, even if many had not been able to achieve the regulatory cap of 12% during the past 10 to 13 years, they might actually have exceeded, for some if not for all years, more realistic regulatory caps.

FSCO replaced the ROE benchmark with a new return on premium benchmark. Apparently, this new benchmark will be 6% of premiums in lieu of 11% ROE. In section 5.0 we intend to examine the implications of a 6% return on premium benchmark for auto insurance premiums in the province.

We also have been asked to look at the KPMG study[3] on ROEs for private passenger auto insurance companies in Ontario, and assess the study's findings.

We present our critique of the KPMG study in section 6.0 and our conclusions in section 7.0.

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[1] FSCO used an after-tax return on equity benchmark in the rate determination process for rate filings by auto insurance companies in the province. The benchmark was initially established at 12.5% in 1988. In 1996 the ROE benchmark was reduced to 12%, and to 11% starting in 2013.

[2] "Review of Profit Provisions for Automobile Insurance in Ontario: Calculating the Return on Equity for Automobile Insurance Companies", June 14, 2013.

[3] KPMG, "Analysis of Ontario Private Passenger Automobile Insurance Results 2008 to 2012", April 11, 2013, Commissioned by the Insurance Bureau of Canada, also referenced in the KPMG Interim Report prepared for the Ontario Ministry of Finance (April 2014), "Automobile Insurance Accountability and Transparency Expert Report".

2.0 ROEs For Auto Insurance Companies in Ontario

A company's return on equity is defined as the ratio of its after-tax profits (underwriting and investment) to its shareholders equity as measured on its balance sheet. 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, and
- The total net investment income of each company that is attributable to the auto insurance subsidiary or division operating in Ontario.[4]

Insurance companies do not report publicly the equity allocated to their auto insurance operations in Ontario, or the net investment income attributable to such operations. Hence, the need for estimates.

Over the period of interest, 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[5] 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[6] their net earned auto insurance premiums in the province. ***We applied this ratio of 0.588 to the financial data for both 2012 and 2013. By doing so, we deliberately reduced the ROEs for 2012 since this ratio produces a larger equity estimate.***

The pre-tax income of a company is defined as: Underwriting profits/losses plus net investment income.

The pre-tax underwriting profits/losses of a company are defined as: Total earned premiums[7] less total claims[8] less 25%[9] of total earned premiums.

We assume, as we did in our FSCO report, that the share of the net total investment income[10] of each Property and Casualty 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.[11]

For example, let's look at the Dominion of Canada General Insurance Company in 2012. The earned auto insurance premiums in Ontario for this company accounted for 52% of the company's total earned premiums from all lines of business across Canada. The company generated $121 million in net investment income in 2012. Thus, we allocated 52% of the aggregate net investment income, $63 million in total, to the company's auto insurance business in Ontario. This allocated net investment income was added to the company's reported underwriting loss of $19 million for its auto insurance business in Ontario to produce the pre-tax

[4] In our work for FSCO, we found only one company that engaged solely in auto insurance in Ontario. All the others were either property and casualty insurance companies involved in more than auto insurance and operating beyond Ontario or banks.
[5] The inverse of 2:1.
[6] The inverse of 1.7:1.
[7] Page 67.20 ("Provincial and Territorial Exhibit of Earned Premiums"), line 29, column 06.
[8] Page 67.30 ("Provincial and Territorial Exhibit of Claims Incurred Including Adjustment Expenses"), line 29, column 06.
[9] FSCO assumption for operating costs used in rate filings.
[10] Page 20.30 ("Statement of Income"), line 39.
[11] Page 67.20 ("Provincial and Territorial Exhibit of Earned Premiums"), line 79, column 19.

income in 2012 of $44 million for its auto insurance business in Ontario.

We also could have allocated the total equity of a P&C company[12] to its auto insurance line in Ontario using the same ratio of earned Ontario auto insurance premiums to total Canada-wide P&C premiums. We did this in S. 3.0 to examine the availability of capital issue. But in this section we used the FSCO assumptions for establishing the equity base for each company:

- For the period, 2001-2011, the equity base for auto insurance in Ontario equaled 50% of each company's earned premiums from auto insurance in Ontario;
- For the years 2012 and 2013, the equity base for auto insurance in Ontario equaled 58.8% of each company's earned premiums from auto insurance in Ontario.

When pre-tax income (the sum of the pre-tax underwriting profit/loss and the net investment income) was positive, we assumed an average tax rate of 26.5% to estimate the net income of each auto insurance company in Ontario. When pre-tax income was negative, we used this estimate directly, although we could have reduced it by 26.5% on the assumption that losses could be offset against other income of each company either in the same year as the loss was incurred or in future years with loss carry-forward provisions. Once more, to be conservative in our estimates of ROEs, we chose not to reduce losses by 26.5%, which in turn would have resulted in larger ROEs than those we present in this report.

The ROE is after-tax income divided by the equity base. The values we present below (Table 2) are biased downwards for the two reasons we have highlighted above.

Competition drives the financial cycle for the P&C industry, much more so than the long-tails in claims. Thus, it is important to examine the profitability of this industry over a longer period of time – 10 years for example – in order to average out the cyclical swings in profitability resulting from cyclical swings in net investment returns and pricing.

The National Association of Insurance Commissioners (NAIC) has stated the following:[13]

> "Most industries are cyclical to some extent. The property/casualty (P/C) insurance industry cycle is characterized by periods of soft market conditions, in which premium rates are stable or falling and insurance is readily available, and by periods of hard market conditions, where rates rise, coverage may be more difficult to find and insurers' profits increase. A dominant factor in the P/C insurance cycle is intense competition within the industry. Premium rates drop as insurance companies compete vigorously to increase market share. As the market softens to the point that profits diminish or vanish completely, the capital needed to underwrite new business is depleted. In the up phase of the cycle, competition is less intense, underwriting standards become more stringent, the supply of insurance is limited due to the depletion of capital and, as a result, premiums rise. The prospect of higher profits draws more capital into the marketplace leading to more competition and the inevitable down phase of the cycle."

The cycle is driven by the returns on the investment portfolios. When investments generate above-average returns (returns greater than anticipated by actuaries), premium rates tend to fall as the insurance companies compete to attract more business and premiums for investment. When investment returns fall below levels anticipated by actuaries, total profits drop sharply, as underwriting profits likely have disappeared as well, as a result of aggressive pricing.

[12] As reported on page 20.20 ("Liabilities and Equity"), line 49, column 01.
[13] www.naic.org

The cycle appears to repeat itself and profitability fluctuates wildly for the industry as a whole. This competitive behavior seems to be one of the greatest risks, if not the greatest risk, facing the industry. Consequently, the investment returns might play a greater role in driving the annual profitability of this industry than the claims experience.

Table 1 sets out the year-over year total returns based on investing in a portfolio of stocks that comprise the S&P TSX Composite Index.[14] It is quite clear that the annual returns on investments in equities fluctuate widely from year-to-year. Therefore, we should expect the annual ROEs of auto insurance companies also to fluctuate from year-to-year, although not necessarily as much as the annual returns on equity investments.

Table 1 also includes the annual changes in average earned premiums and average claims per vehicle for auto insurance in Ontario, as reported by GISA.

It is interesting to note the following in this table:

- ***With some exceptions (2004, 2008, 2010, and 2011), increases in premiums tended to follow a year with poor investment returns (2002, 2003, 2009, 2012 and 2013), and decreases in premiums tended to follow years with very strong investment returns (2005, 2006, and 2007).***
- ***With more exceptions (2004, 2006, 2007, 2011, 2012 and 2013), average premiums per vehicle tended to increase when average claims increased one year prior, and decreased when average claims decreased one year prior.***

Overall, premiums tend to be driven, albeit not perfectly, by a combination of claims and investment returns in the previous year.

Table 1: Annual Changes in Total Market Returns Based on S&P TSX Composite Index, and Annual Changes in Average Earned Premium per Vehicle and Average Claim per Vehicle, 2001-2013 (%)

	Total Market Return		Annual Change in Average Earned Premiums per Vehicle		Annual Change in Average Claim per Vehicle
2001	-9.8	***2002***	13.7	***2001***	3.9
2002	-10.3	***2003***	20.1	***2002***	14.0
2003	25.5	***2004***	11.8	***2003***	-5.0
2004	12.2	***2005***	-3.3	***2004***	-11.8
2005	27.4	***2006***	-3.2	***2005***	3.7
2006	15.7	***2007***	-1.3	***2006***	4.0
2007	10.4	***2008***	0.7	***2007***	9.7
2008	-31.6	***2009***	3.5	***2008***	4.7
2009	32.7	***2010***	6.6	***2009***	18.3
2010	16.0	***2011***	5.3	***2010***	-0.3
2011	-6.3	***2012***	2.2	***2011***	-21.5
2012	5.7	***2013***	0.2	***2012***	-3.9

[14] P&C companies generally adopt a much more conservative investment strategy and invest more heavily in bonds than equities.

2013	23.6				

The companies with consistently above-average profitability might be companies that assume greater risks in their investment portfolios,[15] and either match market returns or outperform the markets – the Warren Buffett case. The companies with below-average returns might invest more conservatively and/or underperform the markets with their investment strategies and decisions. Of course, companies with above-average ROEs also might be better managed – more cost efficient[16] and more adept in assessing, pricing and managing risks.

Table 2 summarizes our ROE estimates for the auto insurance industry in Ontario for the periods 2001-2011, 2012 and 2013. The aggregate ROEs have been quite low – negative on average between 2001 and 2011, and positive in both 2012 and 2013.[17] If we exclude State Farm Mutual from our sample in the 2001 to 2011 period, the average ROE for the remaining companies was positive – 4.6%. Indeed, this ROE is larger than the corresponding ROEs in 2012 and 2013.

When we exclude the companies with negative ROEs, the average ROEs for the remaining companies increase dramatically to 9.7% over the period 2001-11, 14.9% in 2012 and 17.5% in 2013. Obviously, the companies that have been profitable have been very profitable, especially in the last two years, with their average ROEs in excess of the FSCO regulatory cap.

Table 2: Average Industry ROEs, Auto Insurance Companies in Ontario, 2001-2011, 2012, and 2013 (%)

	2001-11[1]	**2012[1]**	**2013[1]**
All Companies	-1.1[2]	4.2	2.4
All Companies ex. Companies with Negative ROEs	9.7	14.9	17.5

1. See Appendix 1, Table A.
2. Excluding State Farm, the average ROE for the remaining companies was 4.6%.

The auto insurance groups and individual companies (see Table A in the Appendix 1) that had positive ROEs accounted for:

- ***62.5% of all earned premiums in the province during the 2001-11 period;***
- ***73.7% of all earned premiums in the province in 2012; and***
- ***82.8% of all earned premiums in the province in 2013.***

It is reasonable to exclude the companies with negative ROEs, especially over an 11-year period, and focus on the profitable ones. Economic theory is quite clear that unless a company earns at least a risk-adjusted, competitive rate of return over time, the company will exit the industry. For a company with negative ROEs to remain in the industry, either the accounting rules employed understate its profitability from an economic perspective, or the business unit with a negative ROE generates value for one or more other business units in the company.[18]

Perhaps, some companies offer auto insurance as a loss leader in order to sell other types of insurance and/or other financial products (e.g., the banks), with these other lines being quite profitable. Maybe the auto insurance lines cover some (perhaps even a disproportionate share) of

[15] Invest more in equities than in bonds.
[16] Have operating costs less than 25% of their earned premiums.
[17] The sample of companies we used were limited to those companies with at least $5 million in earned premiums each year prior to 2012, and companies with at least $10 million in earned premiums in 2012 and 2013.
[18] Each P&C company has the accounting flexibility to move profits around to minimize tax liabilities. Indeed, all multi-divisional and multi-geographic companies have this flexibility.

the fixed costs of the parent company or entire group, thus enhancing the reported profitability of other units within the company/group. The parent company could be engaged in transfer pricing to shift profits, even generating losses, in order to minimize aggregate tax liabilities. There might be other "positive" externalities within a company whose auto insurance business in Ontario appears to consistently underperform.

Furthermore, the reported or estimated ROEs might be quite misleading with regards to the ability of a company to attract capital to a particular line. As well, without detailed information about the intricacies of intra-corporate transfer pricing and other accounting practices, it is very difficult to measure the real profitability of any one line of business for a P&C company.

Five companies stand out in the 2001-11 period. Fairfax, TD, Royal, State Farm and Wawanesa all recorded negative ROEs over this period (see Table A in Appendix 1). Fairfax, Royal and Wawanesa have been able to turn around the profitability of their respective auto insurance operations in 2012 and/or 2013. Although State Farm also did turn around its profitability, its losses during the 2001 to 2011 period stand out. Perhaps, the company's financial performance led its U.S.-based parent company to decide to sell the Canadian division. Finally, TD's auto insurance operations in Ontario continue to lose money. While the amounts are small for the parent company, the losses might be tolerable because TD is able to sell other services and products to its auto insurance clients. TD's auto insurance business might serve as a loss leader for the entire group.

Table 3 summarizes the claims ratios for auto insurance companies in Ontario.

Did the reforms in 2010 lower the claims ratios? For all companies, the evidence is not conclusive, especially if we eliminate State Farm from the mix. On the other hand, ***the claims ratios have declined significantly for the companies with positive ROEs.***

Table 3: Average Industry Claims Ratios, Auto Insurance Companies in Ontario, 2001-2011, 2012, and 2013 (%)

	2001-11[1]	**2012[1]**	**2013[1]**
All Companies	84.0[2]	78.2	77.8
All Companies ex. Companies with Negative ROEs	78.1	63.6	68.5

1. See Appendix 1, Table B.
2. Excluding State Farm, the average claims ratio for the remaining companies was 80.6%.

The data in Table 4 provide a clearer picture of the trends in claims ratios. The data in this table are taken from GISA.

In all categories, the claims ratios declined between 2001 and 2010, and then dropped further in 2012. However, with the exception of property damage, the claims ratios all increased in 2013. Thus, ***at this time, it is difficult to conclude whether there has been a permanent improvement in the claims ratios, although the evidence for bodily injury, accident benefits and total mandatory coverage suggests that there has been a significant improvement.***

Table 4: Claims Ratios, Auto Insurance Companies in Ontario, 2001, 2010, 2012, 2013 (%)

	2001	**2010**	**2012**	**2013**
Third party liability	105	79	68	74
Bodily injury	127	90	73	81
Property damage	62	56	52	48

Direct compensation	84	63	59	63
Accident benefits	116	114	51	58
Total mandatory coverage	108	95	60	67
All coverages	99	88	62	69

Source: GISA

3.0 Capital Availability

Table 5 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.

For example, consider again the Dominion of Canada General Insurance Company in 2012. As we noted above, the earned auto insurance premiums in Ontario for this company accounted for 52% of the company's total earned premiums from all lines of business across Canada. The balance sheet total shareholders' equity of this company in 2012 was $850 million. Thus, we estimated the equity of its auto insurance business in Ontario as 52% of its total equity of $850 million, yielding $442 million.[19] We repeated these calculations for all of the insurance companies in our sample for the years 2010, 2012 and 2013.

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 5: Comparison of Possible Equity, Auto Insurance Companies in Ontario, 2010, 2012, 2013 ($ Millions)

	2010	**2012**	**2013**
All Companies			
Based on Premiums and Equity	8,749.4	9,376.1	9,904.2
Based on FSCO Rules	5,070.8	7,173.1	7,589.6
Possible Excess Capital	3,678.6	2,203.0	2,314.6
All Companies ex. Companies with Negative ROEs			
Based on Premiums and Equity	5,563.4	7,994.1	8,337.3
Based on FSCO Rules	3,174.0	5,603.9	5,972.5
Possible Excess Capital	2,389.3	2,390.2	2,364.8
All Companies with Negative ROEs			
Based on Premiums and Equity	3,186.1	1,382.0	1,566.9
Based on FSCO Rules	1,896.8	1,569.2	1,617.1
Possible Excess Capital	1,289.3	-187.2	-50.2

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 and $2.3 billion in 2013. 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

[19] This compares with an equity estimate based on the FSCO assumption of $370 million for 2012.

to standard economic theory, it is prudent for them to withdraw their capital from this industry. But as we noted above, Fairfax, Royal and Wawanesa have turned around the performance of their units, and so they might be prepared to commit more capital to these divisions.[20]

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.

If we accept the thesis that there has not been any shortage of capital committed to the auto insurance market in Ontario, and that the actual capital employed has been greater than assumed by FSCO, the realized ROEs have been lower than the estimates presented in Table 2 above. If this was the case, then we should have expected auto insurance companies to argue that the FSCO 2:1 rule was inappropriate, and should be revised. For example, in the case of the companies with positive ROEs (using the estimates for 2010 in Table 5), the premium to equity ratio should have been reduced to approximately 1.2:1.[21] Since this did not take place, either the capital committed was in line with FSCO's assumptions, or the auto insurance companies in Ontario did not want any thorough analysis of their profitability; for such an analysis might have revealed much higher ROEs even on higher capital bases.

4.0 Alternative ROE Regulatory Benchmarks

As discussed previously, FSCO had been using a ROE benchmark of 12% between 1996 and 2012. We were retained by FSCO to determine whether the benchmark remained appropriate in light of the current 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").[22]

These ROEs were substantially below the 12% ROE benchmark in place. 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 underestimate what the risk-free rate might be under normal economic and financial environments. In retrospect, and especially with the collapse of oil prices, it appears that the risk-free interest rate is likely to remain at or near historically low levels in Canada for 12 to 30 months more.

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 (see Table C in Appendix 2), 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 (from the prevailing 12% benchmark to the 8.6% to 8.7% range). However, the resulting ROEs would have bounced around from year-to-year, changing by more than 150 basis points in some years (see Table D in Appendix 2).

[20] In 2012, it appears as if Fairfax might have contributed $224 million in excess capital to its auto insurance businesses in Ontario; and Wawanesa might have contributed $245 million in excess capital. On the other hand, RBC might have had a capital deficiency of $63 million.

[21] Using FSCO's methodology for establishing the average underwriting profit margin, and thus the average premiums, reducing the premium to equity ratio from 2:1 to 1.2:1 increases this margin from 5.2% to 8.6%.

[22] Based on our estimated equity betas (0.33 to 0.46) for auto insurance in Ontario, and the latest risk-free forward rate (1.35%), and 10-year average for the market risk premium (8.61%).

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.[23] 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.

The resulting 10-year rolling averages starting in 1995 are presented in Table 6.[24] The ROEs in this table would have been the resulting ROEs if FSCO had moved to a 10-year rolling average starting 1995, using the ROE values we estimated for each year since 1995 (Table D, Appendix 2).

What ***the data in Table 6 tell us is that the auto insurance companies in Ontario have had a free ride during part of the past 20 years.*** Indeed, the companies with positive ROEs on average over the 2001-11 period had ROEs (9.7%) far in excess of what should have been allowed by the regulators – somewhere around 7.3% on average over this period. The gaps are even larger for 2012 and 2013 (14.9% vs. 6.0% in 2012, and 17.5% vs. 5.8% in 2013).

Table 6: 10-Year Rolling Averages of Annual ROEs, 1995-2015

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	6.3
2012	6.0
2013	5.8
2014	5.7
2015	5.5

The FSCO formula for determining the underwriting profit margin (the ratio of after-tax underwriting profits to earned premiums) for setting premiums currently incorporates a ROE of 11%, a premium-to-equity ratio of 1.7:1, and an average return on the investment portfolio of 6%.

[23] With a 10-year rolling average, the ROE in year t (e.g. the year 2000) would have been the average of the ROEs over the period t-9 to t (the years 1991 to 2000). The average for year t+1 (e.g. 2001) would have been the average over the period t-8 to t+1 (1992 to 2001). That is, year t+1 would be added and year t-9 would be dropped in calculating the new rolling average ROE for year t+1.
[24] These values are based on beta=0.46. This beta produced higher ROEs.

Using the FSCO formula[25] yields an underwriting profit margin of 5.3%. If we use a ROE of 5.7%, the value for 2014 in Table 6, the resulting underwriting profit margin drops to 1.0%. This suggests that ***there is room to reduce rates by using a more realistic estimate for ROE***. ***Using the 2013 GISA data for earned premiums and claims, a reduction in the permissible underwriting profit margin from 5.3% to 1.0% leads to an average reduction in auto insurance premiums of 6.7%*** (see Appendix 3 for a discussion).

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 6? According to the calculations presented in Table G in Appendix 3, ***the possible over-payments ranging between $0 (in seven of the years) and a high of $685 million in 2013,[26] with total over-payments of approximately $3.1 billion.***

For the years where there do not seem to have been over-payments (2001-03, and 2006-10), the actual underwriting profit margins were below the allowable FSCO margins. This should not be interpreted as consumers in Ontario having under-paid for their auto insurance in those years. The estimated underwriting profit margins might have been below the allowable FSCO margins for any of the following reasons:

- Actual operating costs were less than the FSCO 25% assumption resulting in under-estimates of the actual underwriting profit margins;
- Aggressive pricing because of actual and/or expected above average returns on investments;
- Underestimates of losses.

If operating costs actually were only 20% of earned premiums throughout this period, rather than FSCO's assumed 25%, the annual premium overpayments might have been an additional 3.7% greater each year – between $297 million more in 2006 to $389 million more in 2013, or about $4 billion in total over the period 2001 to 2013 (see Table H in Appendix 3).

With multiple distribution channels and the potential of the Internet to lessen the dependence of consumers on brokers and agents, it is conceivable that sales costs likely have declined below the 10% to 12% range implicit in FSCO's 25% operating cost margin. Henceforth, FSCO might consider using a lower value for operating costs. This would put pressure on the auto insurance companies in the province to become more cost efficient, and at the same time, lower premiums for consumers. ***A reduction of the operating cost assumption from 25% to 23% alone should reduce premiums by 1.5%, or about $156 million annually*** (based on the 2013 data).

The combination of a ROE cap of 5.8% (the 10-year rolling average for 2013 – see Table 6) and an operating cost assumption of 23% could reduce auto insurance premiums by at least $840 million, or 7.9% based on 2013 data.

5.0 Comments on FSCO Rate Filing Change

FSCO has replaced the ROE benchmark with a new return on premium benchmark. Apparently, this new benchmark will be 6% of premiums in lieu of 11% ROE.

[25] The FSCO formula is: [(ROE/(1-0.265)) - 0.06]/Earned Premiums. The average tax rate is assumed to be 26.5% (0.265 in the formula), and the investment portfolio is expected to earn on average 6% (0.06 in the formula) each year.

[26] This is based on an operating cot of 25%. The overpayments would have been much larger if a lower operating cost had been used by FSCO in rate filings.

As we have noted in the previous section, the current 11% ROE benchmark together with a premium-to-equity ratio of 1.7:1, and an average return on the investment portfolio of 6% produces only a 5.3% return on premium. Thus, what are the implications of a 6% return on premium benchmark for the implicit ROE?

If we assume that FSCO is retaining the current premium-to-equity ratio of 1.7:1, an 11% ROE is compatible with a 6% return on premium if the average return on the investment portfolio is reduced to 4.7%. However, if this is the new benchmark for the expected average return on an insurance company's portfolio, an 11% after-tax ROE appears even more inflated. An 11% ROE does not reflect the current market realities.

If we use a 4.7% average return on the investment portfolio together with a 5.7% ROE for 2014 (this value is more realistic and reflective of current market conditions), the resulting return on premium is only 1.8%, well below the 6% benchmark.

We can estimate the impacts on aggregate earned premiums for auto insurance in Ontario using the 2013 data for premiums and claims and the methodology discussed in Appendix 3. The actual aggregate earned premiums in 2013 were $10.6 billion (Table E). ***The maximum for these premiums based on the existing FSCO benchmarks and assumptions (yielding a return on premium of 5.3%) could have been $10.7 billion (approximately $116 million more than the actual). A 6% return on premium could have resulted in aggregate premiums of $10.9 billion – $275 million more than the actual premiums earned and $159 million more than under the existing FSCO rules. Obviously, the new return on premium benchmark would increase the burden on consumers of auto insurance in the province.***

The picture is even worse when we compare the results to a return on premium of 1.8%, which we believe could have been in place. This value results in a maximum for premiums in 2013 of only $10.0 billion – $581 million less than the actual premiums in 2013, and $855 million less than the maximum possible with a 6% return on premium benchmark.

Finally, if we retain the current FSCO assumptions of a premium-to-equity ratio of 1.7:1, and an average return on the investment portfolio of 6%, a 6% return on premium becomes the equivalent of a 12% ROE, a definite step backwards.

6.0 Critique of KPMG Study

The KPMG study is seriously flawed, and hence the conclusions of this study are at best problematic. KPMG relied on incorrect assumptions, and failed to address a critical strategic and economic question; namely, why would companies that consistently lose money remain in the market? In fact, why would companies remain in this industry if their realized ROEs actually were as low as KPMG estimated? Economic theory is unambiguously clear that companies would exit such an industry.

We start with operating expenses. ***KPMG did not discuss at all why they did not use the FSCO assumption for operating expenses of 25% of net earned premiums.*** Since the expense ratios reported by KPMG in the table in their Appendix (p. 10) consistently exceeded 25%, we would have expected the auto insurance companies in Ontario to point out this discrepancy to FSCO, and to recommend to FSCO that the expense assumption should be increased. Otherwise, these companies could not generate ROEs approximating the regulatory caps. There is no evidence to suggest that the companies did try to persuade FSCO to change this assumption. Indeed, as we have suggested, an even lower operating expense assumption might have been warranted.

Companies that could achieve lower expense rates than assumed by FSCO were able to generate much higher ROEs.

We now turn to a series of comparisons of the KPMG results with results based on other assumptions.

Table 7 compares KPMG's ROEs with ROEs that would result from substituting FSCO's expense assumption (25% of net earned premiums) into KPMG's financial numbers as reported in their Appendix table (p. 10). ***Substituting FSCO's 25% expense rate results in higher ROEs in every year, with the ROE in 2012 reaching 7.5%.***

Table 7: Comparison of KPMG ROEs with KPMG Expense Assumptions and FSCO Expense Assumption (%)

	KPMG Expenses	FSCO Expenses
2012	4.0	7.5
2011	1.3	4.1
2010	-11.7	-9.3
2009	-6.1	-3.7
2008	-3.5	-0.7

We were unable to replicate KPMG's data for 2012 even though we used the same data for that year. Consequently, we re-ran the numbers using the earnings and claims data we had available,[27] and substituting FSCO's expense assumption. Table 8 compares the results for 2012. Even though the claims cost ratio was marginally greater using our data (77.3% vs. KPMG's 77%), the ROE was larger using our data for 2012 (5.1% vs. KPMG's 4%). We derived the same ROE of 5.1% if we used only the companies in our sample for 2010.

Table 8: Comparison of KPMG Data with Data Available for Our Study, 2012 (Using KPMG Equity) ($ millions)

	KPMG	Lazar/Prisman
Net direct premiums earned	11,292	12,710
Net claims and adjustments	8,692	9,824
Expenses	3,273	3,178
Underwriting income (loss)	-672	-292
Investment income	1,198	957
Pre-tax income	525	666
After-tax income	417	527
ROE	4.0%	5.1%

We are not the only ones that could not replicate KPMG's results. Joe Cheng produced different financial numbers in his study for the IBC (March 28, 2013). Moreover, he relied on the FSCO 25% expense assumption in his calculations. His ROEs were larger in every year between 2008 and 2012 than were those estimated by KPMG. In 2012, Cheng's estimated ROE was 5.5%. This compares to KPMG's 4% and our estimates of 5.1% (Table 8), and 7.5% (Table 7).

Overall, KPMG's findings tend to err on the low side. More importantly, KPMG's analysis falls short in two very important ways.

[27] In this exercise, we used the entire sample of PC1 and PC2 companies.

If the ROEs are as low as KPMG believes, then KPMG should have addressed the capital availability question. Why would auto insurance companies in Ontario maintain their capital/equity levels in the face of negative or otherwise sub-par ROEs? Rational behavior results in companies reducing their investments in markets where they are unable to earn the appropriate ROE. Since most insurance companies operating in auto insurance in Ontario are diversified in other types of insurance markets, by both product and geography, they should have redeployed their capital to those markets where they were generating higher ROEs.

However, this does not appear to have happened. Capital levels, according to KPMG, did increase steadily between 2008 and 2010 in the auto insurance market in Ontario even though ROEs were negative. The capital levels did decline in 2011, but have recovered in 2012 despite very low ROEs, according to KPMG. There is a logical inconsistency at work, and KPMG did not address this.

Secondly, ***by not looking at individual company performance, KPMG ignored the fact that many companies have been quite successful in generating attractive ROEs***, as we pointed out in S. 2.0 and in Appendix 1 that follows. The aggregate performance of the companies with positive ROEs, even very low ROEs, has been very positive. The average ROE for these companies over the 2001 to 2011 period was 9.7%. In 2012 the ROE increased to 14.9%, well above the KPMG estimate, and increased further in 2013 to 17.5%.

7.0 Conclusions

When we exclude the companies with negative ROEs, the average ROEs for the remaining auto insurance companies in Ontario increase dramatically to 9.7% over the period 2001-11, 14.9% in 2012 and 17.5% in 2013. Obviously, the companies that have been profitable have been very profitable, especially in the last two years, with their average ROEs in excess of the FSCO regulatory cap.

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

- ***62.5% of all earned premiums in the province during the 2001-11 period;***
- ***73.7% of all earned premiums in the province in 2012; and***
- ***82.8% of all earned premiums in the province in 2013.***

At this time, it is difficult to conclude whether there has been a permanent improvement in the claims ratios since the reforms in 2010, although the evidence for bodily injury, accident benefits and total mandatory coverage suggests that there has been a significant improvement. Furthermore, the claims ratios have declined significantly for the companies with positive ROEs.

For all companies in our sample, ***there appears to be a surplus of capital (i.e. equity) allocated to auto insurance in Ontario***. 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.

Auto insurance companies in Ontario have had a relatively free ride during the past 20 years. Since the ROEs permitted by FSCO since 2001 exceeded the ROEs we estimated for the auto insurance industry, it is conceivable that premiums have been too high and as a result, consumers in Ontario have paid too much for auto insurance. ***The possible over-payments range as high as $685 million, with total over-payments of approximately $3.1 billion between 2001 and 2013.***

If operating costs actually were only 20% of earned premiums throughout this period, rather than FSCO's assumed 25%, then the annual premium overpayments might have been an additional 3.7% greater each year, or about $4 billion in total between 2001 and 2013.

There is room to reduce rates by using a more realistic estimate for ROE. Using the 2013 GISA data for earned premiums and claims, a reduction in the permissible underwriting profit margin from 5.3% to 1.0%, the result of reducing the ROE from 11% to 5.8%, leads to an average reduction in auto insurance premiums of 6.7%. A reduction of the operating cost assumption from 25% to 23% would reduce premiums an additional 1.5%, or about $156 million annually (based on the 2013 data).

The ***combination of a ROE cap of 5.8% (the 10-year rolling average for 2013 – see Table 6) and an operating cost assumption of 23% could reduce auto insurance premiums by at least $840 million, or 7.9% based on 2013 data.***

FSCO intends to replace the ROE benchmark with a new return on premium benchmark. Apparently, this new benchmark will be 6% of premiums in lieu of 11% ROE. What are the implications?

The actual aggregate earned premiums for auto insurance in Ontario in 2013 were $10.6 billion. The maximum for these premiums based on the existing FSCO benchmarks and assumptions (yielding a return on premium of 5.3%) could have been $10.7 billion (approximately $116 million more than the actual). FSCO's new 6% return on premium could have resulted in aggregate premiums of $10.9 billion – $275 million more than the actual premiums earned and $159 million more than under the existing FSCO rules. Obviously, the new return on premium benchmark would increase the burden on consumers of auto insurance in the province.

The picture is even worse when we compare the results to a return on premium of 1.8%, which we believe should have been in place. This value results in a maximum for premiums in 2013 of only $10.0 billion – $581 million less than the actual premiums in 2013, and $855 million less than the maximum possible with a 6% return on premium benchmark.

If the ROEs are as low as KPMG believes, then KPMG should have addressed the capital availability question. Why would auto insurance companies in Ontario maintain capital/equity levels in the face of negative or otherwise sub-par ROEs? Capital levels, according to KPMG, did increase steadily between 2008 and 2010 even though ROEs were negative. The capital levels did decline in 2011, but have recovered in 2012 despite very low ROEs, according to KPMG. There is a logical inconsistency at work, and KPMG did not address this.

Secondly, by not looking at individual company performance, KPMG ignored the fact that many companies have been quite successful in generating attractive ROEs,

Finally, average premiums per vehicle tend to increase more (or decrease less) than the corresponding increases (decreases) in average claims one year prior. Increases in premiums tend to follow a year with poor investment returns, and decreases in premiums tend to follow years with very strong investment returns. Overall, premiums tend to be driven by a combination of claims and investment returns in the previous year.

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 (2:1 for all years prior to 2012 and 1.7:1 for 2012 and 2013), and a 26.5% tax rate. Aggregate investment income for each company was allocated to their respective Ontario auto insurance units based on the percentage of auto insurance in Ontario earned premiums to total company earned premiums.

The following companies generated positive ROEs on average over the 2001-11 period:

- Allstate
- Aviva
- Intact
- CAA
- Chubb
- Co-Operators Group
- Dominion of Canada
- Echelon General
- Economical
- Farmers Mutual
- Gore Mutual
- Guarantee
- Motors
- Portage La Prairie
- RSA
- Chartis
- North Waterloo Farmers Mutual, and
- Optimum.

Several of these companies generated ROEs in excess of the 12% regulatory cap – Allstate (17.3%), Intact (13.1%), Chubb (26.1%), Echelon General (12.5%), Motors (22.6%), Chartis (15.0%), North Waterloo Farmers (22.1%) and Optimum (13.5%).

Table A: ROEs, Auto Insurance Companies in Ontario, 2001-2011, 2012, and 2013 (%)

	2001-11	**Time Period**	**2012**	**2013**
Allstate	**17.3**		**25.1**	**22.4**
Allstate Insurance	14.1	01-11	22.8	23.0
Pembridge Insurance	30.1	01-11	29.9	15.6
Pafco Insurance	20.2	04-11	46.6	29.9
Aviva	**6.1**		**12.8**	**14.6**
Aviva Insurance	7.2	01-11	-2.2	5.1
Elite Insurance	17.3	01-11	65.4	96.8
Scottish & York	-9.0	01-11	39.2	48.2
Traders General	8.6	01-11	48.7	31.2
Intact Financial	**13.1**		**8.2**	**16.5**
AXA Insurance	5.0	01-11		
AXA Pacific Insurance	-26.7	01-03, 08-11		

Belair Insurance	-47.1	01-11		
Intact Insurance	8.8	01-11	11.4	14.1
Jevco Insurance	10.1	01-11	2.7	37.7
Novex Insurance	8.7	01-11	-8.8	14.1
Trafalgar Insurance	5.0	01-11	20.4	10.8
Nordic Insurance	73.0	03-11	0.6	19.5
CAA Insurance	**6.0**	01-11		
Chubb Insurance	**26.1**	01-11	**22.9**	**20.7**
Coachman Insurance	**-9.1**	01-11		
The Co-Operators Group	**8.8**		**23.0**	**9.5**
Co-Operators General Insurance	13.6	01-11	24.1	15.7
COSECO Insurance	-8.5	01-11	20.3	-31.9
CUMIS General Insurance	-6.6	01-11	13.1	14.0
Dominion of Canada General	**7.6**	01-11	**8.8**	**13.0**
Echelon General Insurance	**12.5**	01-11	**39.3**	**23.2**
Economical Mutual	**8.7**		**36.2**	**30.8**
Economical Mutual Insurance	9.2	01-11	31.3	30.9
Perth Insurance	5.4	01-11	85.2	37.8
Waterloo Insurance	9.0	01-11	32.5	22.1
Farmers Mutual Insurance	**8.4**	01-11		
Fairfax Financial	**-11.5**		**-65.4**	**11.0**
Federated Insurance	32.8	01-11	-0.2	5.8
Northbridge General Insurance	-21.7	01-11	-66.4	25.3
Northbridge Personal Insurance	-9.2	01-11	-68.5	1.2
Northbridge Commercial Insurance			-22.4	-3.4
Zenith Insurance	1.5	01-11	-181.6	6.0
Gore Mutual Insurance	**9.8**	01-11	**3.6**	**12.1**
Guarantee Company	**10.3**	01-11	**14.1**	**-30.8**
Motors Insurance	**22.6**	01-11	**41.5**	**43.6**
Desjardins Group	**-5.1**		**1.8**	**16.8**
Personal Insurance	-3.2	01-11	1.9	17.8
Certas Direct	-9.4	01-11	-42.6	15.3
Portage La Prairie Mutual	**9.0**	01-11	**23.3**	**-3.1**
TD Bank Group	**-10.3**		**-21.0**	**-73.5**
Primmum Insurance	0.3	01-11	-7.8	-48.5
Security National	3.4	01-11	-22.9	-67.7
TD General Insurance	-55.2	01-11	-40.8	-170.5
TD Home & Auto	-10.3	01-11	-9.8	-84.4
Royal Bank Group	**-6.4**		**1.8**	**8.9**
RBC General Insurance	**-6.4**	01-11	6.0	7.3
RBC Insurance Company			-14.6	13.2
RSA Insurance	**1.5**		**-4.4**	**12.0**
Royal & Sun Alliance	1.0	01-11	41.5	25.6
Unifund Assurance	-5.1	01-11	-44.3	-0.7
Western Assurance	20.8	01-11	33.0	34.7
State Farm Mutual	**-42.2**	01-11	**7.5**	**17.1**
Unica Insurance	**-10.8**	01-11		
Wawanesa Mutual	**-7.1**	01-11	**11.5**	**12.8**
Chartis Insurance	**15.0**	08-11		
North Waterloo Farmers Mutual	**22.1**	04-11	**-9.0**	**24.9**
Optimum Insurance	**13.5**	05-11		

AIG Insurance			**10.4**	**37.7**
ACE INA Insurance			**-48.3**	**-28.6**
Old Republic Insurance			**-20.2**	**-0.8**
Sovereign General Insurance			**12.8**	**-67.3**
Continental Casualty			**-20.6**	**10.0**
Liberty Mutual			**-1.8**	**33.7**
St. Paul Fire & Marine Insurance			**62.9**	**52.7**
Zurich Insurance			**83.8**	**-21.1**

The following companies realized ROEs in excess of 12% in either 2012 or 2013 or both years:

- Allstate (2012 and 2013)
- Aviva (2012 and 2013)
- Intact (2013)
- Chubb (2012 and 2013)
- Co-Operators Group (2012)
- Dominion of Canada (2013)
- Echelon (2012 and 2013)
- Economical Mutual (2012 and 2013)
- Guarantee (2012)
- Motors (2012 and 2013)
- Desjardins Group (2013)
- Portage La Prairie (2012)
- State Farm (2013)
- Wawanesa (2013)
- North Waterloo (2013)
- Liberty Mutual (2013)
- St. Paul (2012 and 2013), and
- Zurich (2012.

Several of these companies and some other auto insurance companies in Ontario have improved their profitability between the 2001-11 period and 2012-13 period, among them: Allstate, Aviva, Co-Operators Group, Dominion of Canada, Echelon, Economical Mutual, Fairfax, Motors, Desjardins Group, Royal Bank Group, RSA, State Farm, and Wawanesa.

Other than the TD Group, it does not appear as if any other auto insurance company has experienced a steady decline in its ROE in Ontario.

There appears to be some weak evidence that the claims ratios have declined between 2001-11 and 2012-13. For example, the following companies have had consistently lower claims ratios in 2102 and 2103 than they did in the 2001-11 period:

- Allstate
- Aviva
- Intact
- Co-Operators Group
- Echelon
- Economical Mutual
- Motors
- Desjardins Group
- Royal Bank Group
- State Farm, and

- Wawanesa.

Table B: Claims Ratios, Auto Insurance Companies in Ontario, 2001-2011, 2012, and 2013 (%)

	2001-11	2012	2013
Allstate	**73.4**	**63.0**	**63.8**
Allstate Insurance	75.2	64.6	63.1
Pembridge Insurance	67.8	64.7	70.9
Pafco Insurance	69.3	47.9	57.9
Aviva	**80.6**	**71.5**	**65.7**
Aviva Insurance	80.7	81.5	73.3
Elite Insurance	70.7	32.4	2.5
Scottish & York	90.8	61.3	39.1
Traders General	78.5	44.0	52.0
Intact Financial	**78.2**	**74.3**	**66.7**
AXA Insurance	79.5		
AXA Pacific Insurance	97.6		
Belair Insurance	105.2		
Intact Insurance	74.5	69.9	67.2
Jevco Insurance	83.0	87.6	54.9
Novex Insurance	77.9	85.9	68.0
Trafalgar Insurance	82.7	64.5	69.9
Nordic Insurance	82.9	80.8	68.6
CAA Insurance	**79.8**		
Chubb Insurance	**67.4**	**68.2**	**67.6**
Coachman Insurance	**92.2**		
The Co-Operators Group	**77.2**	**67.1**	**74.9**
Co-Operators General Insurance	74.9	66.1	70.0
COSECO Insurance	85.7	71.2	101.1
CUMIS General Insurance	83.2	71.0	70.4
Dominion of Canada General	**77.7**	**78.0**	**81.9**
Echelon General Insurance	**73.3**	**62.0**	**63.9**
Economical Mutual	**77.4**	**53.7**	**56.3**
Economical Mutual Insurance	77.4	57.5	56.1
Perth Insurance	77.5	15.2	51.1
Waterloo Insurance	77.8	57.1	63.6
Farmers Mutual Insurance	**78.5**		
Fairfax Financial	**89.3**	**112.3**	**67.9**
Federated Insurance	64.8	81.0	73.4
Northbridge General Insurance	95.8	114.8	54.7
Northbridge Personal Insurance	85.8	115.5	80.4
Northbridge Commercial Insurance		78.9	74.8
Zenith Insurance	85.8	180.7	71.5
Gore Mutual Insurance	**75.4**	**77.8**	**74.8**
Guarantee Company	**79.5**	**77.1**	**111.6**
Motors Insurance	**76.8**	**64.2**	**53.7**
Desjardins Group	**87.1**	**81.7**	**66.4**
Personal Insurance	85.4	81.6	65.5
Certas Direct	90.8	106.7	67.7
Portage La Prairie Mutual	**76.1**	**64.1**	**87.9**

TD Bank Group	**85.2**	**93.5**	**117.8**
Primmum Insurance	81.3	85.3	107.4
Security National	77.4	94.1	111.9
TD General Insurance	109.6	108.6	183.5
TD Home & Auto	90.5	88.2	129.4
Royal Bank Group	**85.7**	**78.9**	**72.2**
RBC General Insurance	85.7	76.3	74.1
RBC Insurance Company		86.5	67.1
RSA Insurance	**82.2**	**83.6**	**71.0**
Royal & Sun Alliance	85.4	51.8	63.9
Unifund Assurance	82.4	105.2	79.2
Western Assurance	74.6	55.5	53.8
State Farm Mutual	**109.0**	**84.1**	**77.4**
Unica Insurance	**83.8**		
Wawanesa Mutual	**88.9**	**79.3**	**73.2**
Chartis Insurance	**81.4**		
North Waterloo Farmers Mutual	**65.0**	**83.7**	**55.7**
Optimum Insurance	**71.7**		
AIG Insurance		**93.3**	**69.1**
ACE INA Insurance		**117.5**	**113.8**
Old Republic Insurance		**94.1**	**81.3**
Sovereign General Insurance		**73.7**	**120.8**
Continental Casualty		**97.9**	**78.1**
Liberty Mutual		**97.0**	**66.3**
St. Paul Fire & Marine Insurance		**46.8**	**54.9**
Zurich Insurance		**19.7**	**94.7**

The improvements in profitability for many of these companies seem to be related to the improvements in their claims ratios. However, it should be kept in mind that returns on equity investments also improved between 2011 and 2012 and 2013 (see Table 1).

There is a much smaller subset of companies for which the claims ratios have declined steadily between 2001-11 and 2012 and 2013: Aviva, Intact, Motors, Desjardins, Royal Bank, State Farm and Wawanesa.

Appendix 2: Estimating ROEs for Regulators

Capital Asset Pricing Model

The U.S. Task Force on Rate of Return of the Casualty Committee of the Actuarial Standards Board produced the "Actuarial Standard of Practice, No. 30: Treatment of Profit and Contingency Provisions and the Cost of Capital in Property/Casualty Insurance Ratemaking", which was adopted by the Actuarial Standards Board in July 1997.

This Task Force defined the cost of capital as follows: "The rate of return that capital could be expected to earn in alternative investments of equivalent risk; also known as opportunity cost."[28]

The Task Force added:[29]

> "In estimating the cost of capital, the actuary should consider the relationship between risk and return. The methods used for estimating the cost of capital should reflect the risks involved in the risk transfer under consideration. These risks may include insurance, investment, inflation, and regulatory risks, as well as diversification, debt structure, leverage, reinsurance, market structure, and other appropriate aspects of the social, economic, and legal environments."

The Task Force also pointed out that there are several methodologies available to estimate the cost of capital, including, "but not limited to the following":[30]

> "1. Comparable Earnings Model—The comparable earnings model is used to analyze historical returns on equity for entities or industries of comparable risk. The cost of capital is related to the average rate of return over a historical period.
> 2. Discounted Cash Flow Model—One form of the discounted cash flow model, the dividend discount model, is used to analyze the current prices and dividend levels of publicly traded securities that pay dividends. The cost of capital is calculated as the sum of the expected first-year dividend yield plus the expected annual growth rate in dividends.
> 3. Risk Premium Model—The risk premium model is used to analyze the spread in returns for investments of different risk. The cost of capital is estimated as the sum of the expected return on a reference investment plus a margin to reflect relative risk. One widely used form of risk premium analysis is known as the capital asset pricing model, in which the reference security is a risk free Treasury security, and the risk margin is determined using a measure of risk known as *beta*, defined as the covariance of an investment's return with returns in capital markets as a whole."

We opt for the Capital Asset Pricing Model. It has become the most widely used model in Finance to calculate the cost of equity capital. Regulators in the UK and Australia use the CAPM to establish a risk premium for equity holders. The CAPM, while not free of some deficiencies, is widely used in valuing and assessing risk, and determining the risk premiums for assets.

The CAPM is a market based approach and hence is an objective approach that relates to actual conditions in financial markets. The CAPM has a strong theoretical foundation in the academic

[28] Task Force on Rate of Return of the Casualty Committee of the Actuarial Standards Board, "Actuarial Standard of Practice, No. 30: Treatment of Profit and Contingency Provisions and the Cost of Capital in Property/Casualty Insurance Ratemaking" (Doc. No. 057, July 1997), p.1.
[29] Ibid, p. 3.
[30] Ibid, p. 7.

finance literature. Major stock exchanges provide estimates for betas for all companies listed on the exchanges. Finally, implementing the CAPM is relatively simple and requires use of data that are readily available.

In financial markets, a "fair" or correct price of an asset, or a financial instrument, is the price that does not induce free lunches in an economy. This notion of a correct price is not only derived from economic intuition, but is also supported by rigorous arguments and characterizations of no-arbitrage in financial markets. The absence of arbitrage opportunities is the cornerstone of modern Financial Economics.

Consider a risk-free environment, such as the debt market consisting of short-term, Government of Canada bonds. In this case, the present value of the future cash flows of a bond is calculated by discounting them at the risk-free rate to obtain the present value.

The value, or the correct price, of a risky asset that promises an uncertain cash flow is also the present value of its future cash flows. However, in a risky environment discounting cannot be done at a risk-free rate. Thus, a risk adjusted discount factor must be used. Obviously, a future risky dollar is worth less than a sure dollar. Hence, if the discount factor for the sure dollar is $1/(1 + r)$, where r is the risk free rate, the discount factor for a risky dollar must be $1/(1 + r + r_p)$, where r_p is a positive constant representing the risk premium.

In competitive markets, investors who hold a risky asset must be compensated for the risk they bear; otherwise, they would have no incentive to prefer this asset to the risk free asset. This compensation is usually presented in the form of the expected rate of return. The expected rate of return on a risky asset, E(R), must be greater than the rate of return offered by the risk free asset, R_f. Hence, $E(R) > R_f$ and the difference $E(R) – R_f$ is termed the risk premium.

The Capital Asset Pricing Model is credited with the contribution of calculating the risk premium and its relation to the "risk" assumed by the investors who hold the asset. In the CAPM, the risk of an asset is measured by its beta ("β"). The beta of an asset measures the sensitivity of the expected rate of return of a risky asset to the expected rate of return of the "market" (R_M). The "market" is usually represented by an index that captures the market. The CAPM specifies the risk premium of an asset as a function of the excess rate of return of the market over the risk free rate. That is

$$\text{Risk Premium} = E(R) – R_f = (E(R_M) – R_f) \qquad (1)$$

Hence, the security market line is given by

$$E(R) = R_f + \beta(E(R_M) – R_f) \qquad (2)$$

The beta, as a sensitivity measure, tells us the change in the risk premium of an asset for each percentage change in the market return.

Given the above relation, the risk premium of an asset for public companies can be estimated by a regression. Having observations on the rate of return of the market and of the risky asset, beta is estimated by trying to fit the observations to the linear relation

$$R_t = \alpha + \beta R_{Mt} + \varepsilon_t \qquad (3)$$

Beta is therefore the slope of the "best line" that fits the observed coordinates (R_t, R_{Mt}) where t denotes the time index of the observation. The beta of a firm thus tells us the risk premium that should be used in evaluating the firm.

The risk measured by a beta that is estimated from stock prices, β_e, (referred to as equity beta) measures not only business risk but also financial risk. The risk of a company that has no debt (commonly referred to as unlevered beta, β_u) is implicit in β_e. Under some simplifying assumptions:

$$\beta_e = \beta_u (1 + D/E) \qquad (4)$$

where D/E is the debt-equity ratio.

In a regulated environment in which a regulator aims to set a fair rate of return, the allowed rate of return is set to be $R_f + \beta(E(R_M) - R_f)$, when $D/E = 0$. Fixing the allowed rate of return in such a way compensates for the assumed risk with the appropriate risk premium.

Critique of the CAPM

But this model is not without problems and critics.

The after-tax income for property and casualty insurance companies in general, and auto insurance companies in particular, consists of the sum of net underwriting income and net investment income. However, for P&C insurance companies that are not pure auto insurance companies, and the companies we used in performing our calculations are not pure auto insurance companies, the allocation of their total equity across the various lines of business poses problems.

Professor Basil Kalymon suggested using the level of reserves as the basis for allocating the total equity of a P&C insurance company among its various lines. In his testimony to the Ontario Automobile Insurance Board (June 20, 1988), he argued the following:[31]

> "The allocation of equity to any given line of business should recognize the principle of treating that business on a stand-alone basis. Specifically, the level of equity attributed to automobile insurance should be sufficient to sustain that business in the absence of the other components of activity. Similarly, a fair distribution of the equity of a multi-line firm must be made to the non-auto lines of business so that these elements are similarly self-sufficient. In this manner, auto insurance equity will neither be supporting nor supported by other non-regulated activities of the firm and cross-subsidization is avoided.
> One allocator of the total equity of a company to its various lines of business and to auto insurance in particular, which is adopted in this study, is the level of reserves required to sustain each business. The reserves to equity ratio for each line of business is assumed to be the same for every line…The level of reserves for each line of business is an actuarial measure of the expected liabilities arising from the particular line of business. Thus, reserves measure the extent of exposure to claims arising from a line of business or the underwriting exposure of the activity. Generally, insurance regulators require that insurers hold at least a minimum level of capital or special reserves in addition to the actuarial reserve to assure the solvency of the firm. In essence, this is the role of the equity capital of an insurer, which provides the investment that must bear the risks of the business. Allocation of total equity

[31] Testimony of Professor Basil Kalymon, Faculty of Management, University of Toronto, to the Ontario Automobile Insurance Board, June 20, 1988, p. 12, 13.

> proportionally to the actuarial reserves of each line of business recognizes an equal degree of solvency protection across lines."

An alternative, to avoid the problem of deciding how to allocate the total equity of a P&C company among its various lines, is to use the full information beta methodology pioneered by Ehrhardt and Bhagwat[32] and used by Cummins and Phillips for the U.S. P&C market.[33] Zhang and Nielson used this methodology to estimate the underwriting betas of property insurance, auto insurance, and liability insurance for Canadian P&C insurance companies.[34]

There is no need to disentangle a company's total equity among its various lines when using this methodology. The CAPM can be used to estimate a beta for the entire company and the betas for the individual lines can be derived from the aggregate company beta using the distribution of written premiums among the various lines. As pointed out by Zhang and Nielson:[35] "the underwriting beta of an insurer is the weighted average of the betas of its distinct business lines", where the weights are the proportion of total written premiums by line.

There are disagreements regarding the appropriateness of the basic CAPM to estimate the aggregate risks facing a company. The relation suggested by the CAPM falls into what is referred to as a one-factor model as the ROE in it depends on one factor. The main multifactor model in the literature is the Arbitrage Pricing Model ("APT"), which does not specify its factors. Usually the factors are identified by a statistical procedure called the principal component procedure.

Doron Nissim has noted:[36]

> "For many years, the most common approach for estimating the cost of equity capital has been the Capital Asset Pricing Model (CAPM), in spite of extensive research that demonstrates problems with this method. Over the years, as evidence contradicting the CAPM has accumulated, the market model has been extended to include additional macro factors such as unexpected inflation, unexpected changes in interest rates, and the returns on factor-mimicking portfolios. Under these models, the risk premium is calculated as the sum of the products of the stock's sensitivity to each factor and the premium associated with that factor. The primary additional factors that are currently used are the size and book-to-market factor-mimicking portfolios."

The latter extension of the CAPM – the Fama-French three-factor model[37] – has gained support, especially among P&C insurance companies.

The Fama-French three-factor model ("2F3" model) has been extended further to calculate sumbetas. Lagged values are included among the independent variables, and the sumbetas are the sum of the betas on the coincident and lagged values of each of the variables.

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[32] Ehrhardt, M. C., and Y. N. Bhagwat, "A Full-Information Approach for Estimating Divisional Betas, Financial Management", (1991) 20: 60-69.
[33] Cummins, J. D., & Phillips, R. D., "Estimating the Cost of Equity Capital for Property-Liability Insurers", *Journal of Risk and Insurance*, 2005, 72(3), 441-478.
[34] Li Zhang and Norma Nielson, "The Pricing of Multiple Line P&C Insurance Based on the Full Information Underwriting Beta", Insurance and Risk Management, October 2009-January 2010, vol. 77 (3-4), 237-264.
[35] Ibid, p. 243.
[36] Doron Nissim, "Analysis and Valuation of Insurance Companies", Columbia Business School Center for Excellence in Accounting and Security Analysis, November 2010.
[37] In a series of papers starting in 1992, Fama and French developed a three factors model.

Critique of the Fama-French Three-Factor Model ("2F3")

The APT model puts a greater demand on data and does not specify the "factors". Hence, while it has a sound theoretical foundation, it is harder to interpret economically. On the other hand, while there is no theoretical basis for the 2F3 model, the suggested economic justification is that the book-to-market variable provides a proxy for financial distress, and thus allows for additional compensation to shareholders for this risk that is not captured in the basic CAPM. The size variable compensates for the fact that small market cap companies are riskier (less diversified) and thus must offer added compensation in terms of expected return.[38]

In spite of the absence of a theoretical basis, the 2F3 model is supported by empirical evidence that indicates that adding these factors better explains the variations of ROE across companies. It is well known in econometrics that adding more variables should improve the goodness of fit and possibly the predictive powers of the resulting estimates. But this does not imply that the added variables are the right "missing" variables, or that indeed, there are "missing" variables.

Further, one should expect that the effect of these two additional variables should be neutral on the overall, average industry beta, or level of risk. While smaller companies might be viewed by investors as more risky on average, larger companies should be viewed as less risky on average. Similarly, while companies with high book-to-market values might be viewed as more risky, those with lower values for this variable should be viewed as less risky on average. It is also conceivable that the equity prices, and hence the market values of companies with high book-to-market values, have taken a hit because of the perceived higher level of financial distress, and so, going forward investors in such companies might not necessarily face any additional risks.

Some researchers claim that the "superior" results of the 2F3 model are the result of "data snooping" whose bias could be immense[39] and/or a selection (survival) bias.

Advocates of the 2F3 model claim that a ROE based on the CAPM will not allow small companies and/or those in financial distress to survive in the market. Investors in the market will not invest in these riskier companies if they are not compensated for the additional risk. Consequently, if a regulator relies on the 2F3 model to set company-specific ROEs, the regulator should increase the likelihood of survival of small companies and/or of those in financial distress. Presumably, the additional ROE allowed for these insurers would translate into higher premiums that they would be allowed to charge their customers.

The customers, on the other hand, would not be getting substantially different services from these companies than what would be available in the market from all other insurance companies. Thus, competition will drive consumers to move to the "cheaper" larger companies and/or those in a strong financial position. Consequently, the survival of small companies, or those that are under financial distress is questionable.

Furthermore, for about two decades the after-tax ROE for auto insurers in Ontario was set at 12%. Yet we see that insurers of different sizes survived in the market for a long period. Therefore the claims of the 2F3 advocates that utilizing the CAPM for allowable ROE will cause a market failure is questionable, at least in the Ontario auto insurance market.

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[38] Liebenberg and Sommer (2008) developed and tested a model that explains insurers' performance as a function of line-of-business diversification and other variables using a sample of property-liability insurers over the period 1995-2004. Interestingly, their results indicate that undiversified insurers consistently outperform diversified insurers. In terms of accounting performance, the diversification penalty was at least 1% of return on assets 2% of return on equity.

[39] Lo and MacKinlay (1990).

Other Issues

While the methodology for calculating the unlevered ROE is quite straightforward, applying the methodology likely will encounter several problems. In applying the CAPM, there are two key variables:

- Risk free rate
- Market return premium

The risk-free rate can equal the sum of the real yield on the Government of Canada real return bond and the average annual inflation forecast derived from the nominal yield on five-year Government of Canada bonds. The real yield should be averaged over a period of time, the appropriate period depending on economic conditions and monetary policy. An alternative for estimating the risk free rate is to use prices of "zero coupon" Government of Canada bonds.

However, is it appropriate to set the risk free rate according to the current spot rates, or based on the forward rates, or perhaps on some average of rates as justified by the mean reverting property of interest rates?

It might be reasonable to assume that the spot rate, which is at historically low levels, should not be used as it is not a fair representation of the rate likely to prevail over the next several years. The decision should therefore be between:

- The forward rate, as it is an estimate of the spot rate that will prevail in the future;
- Some historical average of spot rates; or
- Even a longer term rate (e.g., the yield on five-year Government of Canada Bonds) since this can be considered as an average of the short-term rates.

The forward rate is considered a good estimate for a future spot rate. Thus an estimate of the spot interest rate at a future date t (measured in years), spanning the time interval $[t,u]$ is the forward rate $r(t,u)$. Given the discrete observations on the zero coupon curve,[40] a continuous function $h(t)$ can be fitted to the observations. The forward rate will thus be $(1+r(t,u))^{u-t} = \frac{(1+h(t))^t}{(1+h(u))^u}$.

The time period for which the beta and the market risk premium should be estimated is also an issue. The CAPM studies generally estimate betas based on the last 60 months, but the market risk premium also might be based on a much longer-term average (e.g. market returns averaged over a 30, 50 or even a 100 year period).

There is also the question of what stock market index should be used to estimate the market risk premium. Zhang and Nielson calculated the equity market return from the S&P/TSX composite total return index using annual changes in this index.

Nevertheless, while there are legitimate areas for disagreement in applying the CAPM – the time period for measuring the risk free rate, the time period for measuring the market equity return, and the sample of companies for measuring beta – the CAPM is the most widely accepted methodology in the finance literature for determining the risk premiums for individual companies.

Results

[40] A simplified version of the above will be just to use the yields on Government of Canada bonds in order to derive forward rates.

We used the CAPM and accounting data in our study for FSCO. When we exclude the companies with at least one negative beta, the resulting Ontario auto insurance betas averaged over the remaining 32 companies were:

- FSCO equity allocation: 0.55
- Reserves equity allocation: 0.46
- Premiums equity allocation: 0.44
- Modified FSCO equity allocation: 0.42.

In the "reserves equity allocation case", we allocated the total equity of a company to its auto insurance line in Ontario using its Canada-wide reserves (for unearned premiums and unpaid claims) for auto insurance as a proportion of total Canada-wide reserves for all types of insurance.[41]

In the "modified FSCO equity allocation case", the equity of auto insurance companies in Ontario was assumed to equal two-thirds of their net written auto insurance premiums in the province. In other words, we assumed a premium-to-equity ratio of 1.5:1.

By comparison, the average Ontario auto insurance beta derived from our modified FIB model was 0.330, based on 47 auto insurance companies, and 0.326 based on 52 companies.[42]

We recommended to FSCO the following:

1. Going forward, FSCO should consider moving to a 10-year rolling average for the ROE benchmark using the CAPM results we have estimated and the annual estimates of the risk-free and market risk premium rates.
2. More specifically, we would recommended using either the FIB equity beta (0.33) or the equity betas based on the 32-company sample for either the reserves equity allocation case or the modified FSCO equity allocation case.
3. The forward risk-free rate should be based on the methodology we describe in S. 3.3 of our report, except that we suggested using a 10-year average of this rate.
4. The market risk premium should be the simple average of the past 10 years.

Table C sets out the 10-year averages for the market risk premiums and the forward risk-free rates that we used to estimate the annual ROEs for the years 1995 to 2014. Combining these rates with two of the betas that we estimated and using equation 2 above, generated the annual ROEs reported in Table D.

Table C: Market Risk Premium (10-Year Average), Forward Risk-Free Rate, January 1995-January 2015

	Market Risk Premium	Forward Risk Free Rate
January 1995	0.84%	8.36%
January 1996	1.59	6.29
January 1997	2.44	5.56
January 1998	5.11	5.07

[41] This implicitly assumes that for every company either the ratio of reserves for auto insurance in a province to reserves for all lines of insurance in that province is the same for every province, or the ratio of reserves for auto insurance in a province to reserves for all lines of insurance in Canada is the same for every province. Obviously, thee ratios can differ among companies, but not among provinces.

[42] See Fred Lazar and Eli Prisman, "Estimating Beta in the Absence of "Pure Players": Theory and Empirical Evidence from Determination of Return on Equality of Automobile Insurance in Ontario", *Risk Management and Insurance Review* (forthcoming 2015).

January 1999	3.29	4.57
January 2000	5.07	5.59
January 2001	7.83	4.94
January 2002	6.11	4.65
January 2003	5.59	4.06
January 2004	4.91	3.99
January 2005	6.88	3.67
January 2006	8.15	3.73
January 2007	7.06	3.81
January 2008	6.55	3.65
January 2009	3.94	1.98
January 2010	4.99	2.74
January 2011	6.35	2.43
January 2012	6.83	1.35
January 2013	8.61	1.35
January 2014	8.57	1.09

Table D: Theoretical Annual ROEs, Selected Equity Betas, January 1995-January 2015

	Beta=0.46	**Beta=0.33**
January 1995	8.7	8.6
January 1996	7.0	6.8
January 1997	6.7	6.4
January 1998	7.4	6.8
January 1999	6.1	5.6
January 2000	7.9	7.3
January 2001	8.5	7.5
January 2002	7.5	6.7
January 2003	6.6	5.9
January 2004	6.2	5.6
January 2005	6.8	5.9
January 2006	7.5	6.4
January 2007	7.1	6.1
January 2008	6.7	5.8
January 2009	3.8	3.3
January 2010	5.0	4.4
January 2011	5.4	4.5
January 2012	4.5	3.6
January 2013	5.3	4.2
January 2014	5.0	3.9

Appendix 3: Possible Over-Payments

Since the ROEs permitted by FSCO since 2001 exceeded the ROEs we estimated for the auto insurance industry (Table D in Appendix 2) and the 10-year averages for these ROEs (Table 6), it is conceivable that premiums have been too high and as a result, consumers in Ontario have paid too much for auto insurance. In Table F below, it is clear that the underwriting profit margins, based on FSCO's ROEs for the industry and its formula for calculating the underwriting profit margin, have been consistently larger than what they could have been using the 10-year ROE averages we presented in Table 6.

To examine this issue, we proceeded as follows. We calculated the "actual", after-tax underwriting profit margins of all auto insurance companies in Ontario using GISA data for earned premiums and claims (re-produced in Table E), together with FSCO's 25% operating expense assumption and a 26.5% tax rate.

Table E: Aggregate Net Earned Premiums and Claims Incurred, All Coverages, Auto Insurance, Ontario, 2001-2013 ($ Millions)

	Net Earned Premiums	Claims Incurred
2001	5,245	5,178
2002	6,076	6,011
2003	7,363	5,763
2004	8,278	5,110
2005	8,168	5,409
2006	8,084	5,750
2007	8,134	6,430
2008	8,374	6,881
2009	8,730	8,199
2010	9,410	8,262
2011	10,039	6,575
2012	10,442	6,426
2013	10,586	7,259
Total	108,928	83,253

The after-tax, underwriting profit margins presented in Table F under the column titled "Actual, 25%" were calculated as follows: [(1-0.265)*(Earned premiums less claims less 25% of earned premiums)]/Earned premiums.

The after-tax, underwriting profit margins presented in Table F under the column titled "Actual, 20%", used a 20% operating expense assumption.

The actual, after-tax underwriting profit margins (based on a 25% operating expense assumption) exceeded the permissible FSCO margin only in four years (those highlighted in red in Table F). The actual margins, based on a 20% operating expense assumption, exceeded the FSCO margin in six years.

Table F: Aggregate Underwriting Margins – Actual, FSCO and Revised, All Coverages, Auto Insurance, Ontario, 2001-2013 (%)

	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	1.97
2005	6.45	10.13	5.16	1.83
2006	2.85	6.53	5.16	1.83
2007	-2.98	0.69	5.16	1.90
2008	-5.27	-1.60	5.16	1.83
2009	-13.91	-10.23	5.16	1.69
2010	-9.41	-5.74	5.16	1.49
2011	6.99	10.66	5.16	1.29
2012	9.89	13.57	5.16	1.27
2013	4.72	8.40	5.27	1.11

When compared to the revised underwriting profit margins, the actual margins (for both the 20% and 25% operating expense assumptions) were greater in six years: 2004 to 2006 and 2011 to 2013. For these six years, we calculated what the aggregate premiums might have been if the auto insurance companies in Ontario had been restricted to the revised profit margins.

For example, for 2004 FSCO's underwriting profit margin (Table F) was 5.16% (0.0516), the revised underwriting profit margin (Table F) was 1.83% (0.0183), and the claims incurred were $5,110 million (Table E). The underwriting profit margin (UW) is:

UW = [(1-tax rate)*(earned premiums – claims – operating expenses)]/earned premiums

We can manipulate this equation to produce the following:

Earned premiums = [(1-tax rate)*claims]/[(1-operating expense ratio)-UW]

Using a 26.5% tax rate (0.265), the FSCO assumption that operating expenses equal 25% (0.25) of earned premiums, an underwriting profit margin of 5.16% and claims of $5,110 million, we derive for 2004:

Earned premiums = (0.735*$5,110)/(0.551 – 0.0516) = $7,517 million.

Repeating this exercise using the revised underwriting profit margin of 1.83%:

Earned premiums = (0.735*$5,110)/(0.551 – 0.0183) = $7,082 million.

The difference between these two estimates of earned premiums is an estimate of the possible over-payment of premiums by drivers in Ontario in 2004 – $434 million or 5.2% of the total earned premiums in 2004.

We repeated these calculations for each of the other years where the actual underwriting profit margin exceeded the FSCO margin (2005, 2011 and 2012). For the years 2006 and 2013, where the actual underwriting profit margins were less than the FSCO margins, but greater than the revised margins, we used the actual earned premiums as the base from which we subtracted the estimated premiums using the revised underwriting profit margin.

Table G summarizes the potential premium surcharges for the years 2004 to 2006 and 2011 to 2013.

Table G: Potential Premium Surcharges, All Coverages, Auto Insurance, Ontario, 2001-2013

	$ Millions	%
2001		
2002		
2003		
2004	434	5.2
2005	480	5.9
2006	137	1.7
2007		
2008		
2009		
2010		
2011	674	6.7
2012	662	6.3
2013	685	6.5
Total	3,073	2.8

One can challenge our 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. The data in Table 1 suggest that there might be some merit to this counter-argument for the years 2007, and 2009 and 2010, but not necessarily for the other years. 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.

Table H summarizes the ***potential premium savings if FSCO had used an assumption for operating expenses of 20% of earned premiums instead of its 25% assumption. The potential savings work out to be 5% (difference between 25% and 20%) times one minus the tax rate of 26.5%, or 3.68% of earned premiums each year. With a 23% operating expenses assumption, the annual savings would have been 2% times one minus the tax rate of 26.5%, or 1.48%.***

Table H: Potential Premium Surcharges Based on Operating Expenses, All Coverages, Auto Insurance, Ontario, 2001-2013 ($ Millions)

2001	$193
2002	223
2003	271
2004	304
2005	300
2006	297
2007	299
2008	308
2009	321
2010	346

2011	369
2012	384
2013	389
Total	4,003