May 18, 2022

Oliver Wyman

120 Bremner Boulevard, Suite 800,

Toronto, Ontario

M5J 0A8

Attention: Paula Elliott

RE: FA NL **Taxis and Limousines Rate Application – Category 2** – Response to email May 9, 2022

Dear Ms. Elliott,

Facility Association (FA) received IR#2 questions in regard to FA Newfoundland and Labrador Taxis and Limousines Rate Filing in 2022. Our responses to the IR#2 questions are provided on the pages that follow.

Best regards

Liqing Yang, FCIA, FCAS

Pricing Actuary

Expenses

OW Question 1 *The Board previously directed FA to include consideration of the finance fee revenues paid by policyholders to the servicing carriers in calculating the rate level change need. In A. I.3 (2019), the Board stated, "In the Board's view finance fee revenues should be reflected in the rates since they are revenues collected by insurers in premiums paid monthly." In conclusion, the Board stated, "The Board does not accept the exclusion of finance fees revenues."*

Given the clear position of the Board, provide the rate indications including a provision for the finance fee revenues to be collected for taxis.

FA Response to OW Question 1

We would like to reiterate our position that the finance fees should not be considered in the calculation of the rate level change need. For details of our position, please refer to our answer to Question 2.2. of IR #1.

This being said, as requested and based on the information from our single Servicing Carrier (Intact) regarding payment plan, FA policyholders will pay 3% of finance fees for taxis. The net finance fee revenues assuming a 1.5% handling cost for providing payment plan for each rating class would be 1.5%.

The table below provides rate indications assuming a net finance fee revenue of 1.5% for taxis as an offset to the variable expenses, no other changes.

NL TX alternative indications assuming a 1.5% net finance fee revenue, no other change

	Per Submitted Filing - TX			OW IR#2 Question 1
Coverage	mgmt assumps @ 12% ROE & 2.8% RoI [1]	mgmt assumps @ 6% ROP & 2.8% RoI [2]	mgmt assumps & @ 6% ROP & 2.8% RoI Proposed Rate Change [3]	mgmt assumps @ 6% ROP & 2.8% RoI + alternative 1.5% finance fee revenue [4]
Bodily Injury	16.0%	14.1%	14.1%	11.8%
Property Damage	16.0%	14.1%	14.1%	11.8%
DCPD	16.0%	14.1%	14.1%	11.8%
Third Party Liability				
Accident Benefits	13.0%	11.1%	11.1%	8.9%
Uninsured Automobile	16.1%	14.2%	14.2%	11.9%
Underinsured Motorist	-	-	-	-
Collision	11.3%	9.5%	9.5%	7.3%
Comp	22.2%	20.2%	20.2%	17.8%
Specified Perils	(32.2%)	(33.3%)	(33.3%)	(34.6%)
All Perils	n/a	n/a	n/a	n/a
Total	**15.1%**	**13.3%**	**13.3%**	**11.0%**

Loss Development

OW Question 2 *Is our understanding of FA's response to prior IR#1, Q 7.2 correct that the net-zero IBNR Method was selected for the 2013-2 to 2017-2 period because it has been selected in the past for multiple prior evaluations, and that FA would find the Incurred Method to be reasonable? Does FA find the Incurred Method more reasonable in this circumstance?*

FA Response to OW Question 2

IR#1 Q7.2 was not applicable to FA's Taxi filing. Please refer to our answers to IR#2 Question 1 for the Miscellaneous Vehicles filing which addresses the same question.

OW Question 3 *If downward development does exist for the FA portfolio of claim amount estimates, what is the rationale of presenting or considering a Net Zero IBNR Method for FA?*

FA Response to OW Question 3 (similar response to Misc IR#2 Q2)

The net zero IBNR method is generally considered in two types of situations:

1) Recent accident periods where a significant portion of the reported claim amount is related to large losses at or near policy limits. In such cases, it might be reasonable to consider zero IBNR as other methods which produce positive IBNR might be overly conservative.
2) For older accident periods, which are close to, or fully, developed. If the development pattern is volatile at these older development periods, it may be reasonable to assume no further development/Net Zero IBNR .

OW Question 4 *FA makes the statement, "It is generally believed among our subject matter experts that the COVID pandemic and subsequent restrictions on public mobility and economic activity have likely created delays in the process of claims development." Contrary to this position, another view is that the pandemic-induced decline in claim frequency led to more speedy claim settlement process (proportionately more claims handling resources available for fewer claims) for some coverages and commensurate lower development patterns emerging for those claims. Has FA considered the actual recent emergence patterns in making its response statement?*

FA Response to OW Question 4

We have examined actual recent emergence patterns in making this response statement. There are a number of competing factors but to expand on our prior statement, for some coverages, access to treatments or courts were restricted, and claimants may also have been more hesitant to enter public settings such as treatment facilities or repair shops. These factors could contribute to delayed claim

settlements irrespective of claims handling resources. More recently there has also been anecdotal evidence of staffing challenges and turnover within claims departments. We continue to regularly monitor the experience and emergence patterns. As a note, for all coverages, we have not made any exclusions to the loss development factors in response to Covid-19.

OW Question 5 (consists 2 questions) *In the prior 2018 taxi filing, FA selected a TPL estimate of ultimate loss amounts for 2016, 2017 and 2018 at $3.159 million, $ 3.890 million, and $2.920 million, respectively. In our review of that filing, we found those selections appeared to be high in consideration of the range of estimates presented.*

In this filing, the estimated ultimate loss amounts for 2016, 2017 and 2018 reduced to $2.688 million, $ 3.055 million, and $2.401 million, respectively; or decreases of 15%, 21%, and 18%, respectively. Which in hindsight, may be evidence the prior ultimate loss amounts were too high based on the method results selected by FA.

5.1 Can FA explain why the original ultimate loss amount estimates for each of these three years (2016 to 2018) are significantly lower in this review?

FA Response to OW Question 5.1

We are unable to identify/reconcile the AY 2016-2018 TPL loss amounts referred to above. Could you provide a reference as to which exhibits/documents these amounts were obtained from?

OW Question 5 (continue)

5.2 Given this, does FA continue to find its selection of the Expected Loss Ratio Method instead of the B-F Method to be reasonable?

FA Response to OW Question 5.2

We will need to examine the data once clarification to question 5.1 is provided. Generally speaking, we find the expected loss ratio method reasonable especially when estimating losses on a long-tailed, small volume book of business. This is especially true in cases where we have some concern over the applicability of our loss development pattern, such as during the Covid-19 pandemic.

<u>Loss Trend</u>

OW Question 6 *FA's Exhibit D-5b estimate of the modelled loss cost for TPL includes a loss cost provision for bodily injury, and the same loss cost estimate for each of property damage and DCPD. For example, for 2020, the bodily injury is $206.20, property damage is $98.96, and DCPD is $98.96; for a total TPL loss cost of $404.12. Is there an inadvertent double counting of the $98.96 which should be*

the total for both property damage and DCPD, and instead is counted twice? If that is the case, then the loss trend factors calculated based on these TPL loss cost amounts may be incorrect.

Please confirm if there is a double counting oversight, and provide any corrections necessary to the rate indications, as well as responses to IR#1 as appropriate.

FA Response to OW Question 6

We revisited GISA notes and you are right, the industry PD experience data still includes DCPD, even though DCPD was implemented on January 1, 2020. We apologize for this oversight.

The NL TX indication has been updated with the revised TPL loss cost and the table below provides the revised TPL loss cost with no other changes.

NL TX revised indications with updated TPL loss cost trend, no other change

	Per Submitted Filing - TX			OW IR#2 Question 6
Coverage	mgmt assumps @ 12% ROE & 2.8% RoI [1]	mgmt assumps @ 6% ROP & 2.8% RoI [2]	mgmt assumps & @ 6% ROP & 2.8% RoI Proposed Rate Change [3]	mgmt assumps @ 6% ROP & 2.8% RoI + revised TPL Loss Cost Trend [4]
Bodily Injury	16.0%	14.1%	14.1%	12.9%
Property Damage	16.0%	14.1%	14.1%	12.9%
DCPD	16.0%	14.1%	14.1%	12.9%
Third Party Liability				
Accident Benefits	13.0%	11.1%	11.1%	11.1%
Uninsured Automobile	16.1%	14.2%	14.2%	14.2%
Underinsured Motorist	-	-	-	-
Collision	11.3%	9.5%	9.5%	9.5%
Comp	22.2%	20.2%	20.2%	20.2%
Specified Perils	(32.2%)	(33.3%)	(33.3%)	(33.3%)
All Perils	n/a	n/a	n/a	n/a
Total	**15.1%**	**13.3%**	**13.3%**	**12.3%**

To be efficient, we will provide revised the indication with the final PUB decision assumptions.

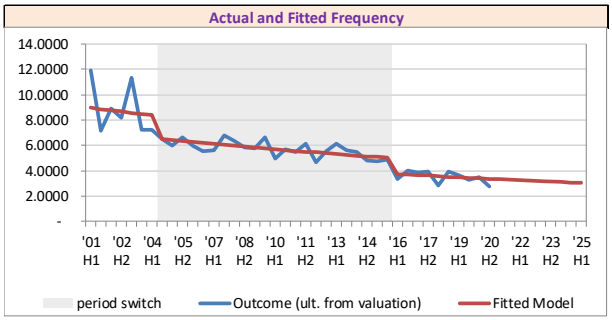
OW Question 7 (consists of 2 questions) *In response to IR#1, Q#10.2, FA estimates that by removing the bodily injury scalar parameter at 2016-1, this serves to reduce the frequency trend rate, from -2.3% to -4.8%.*

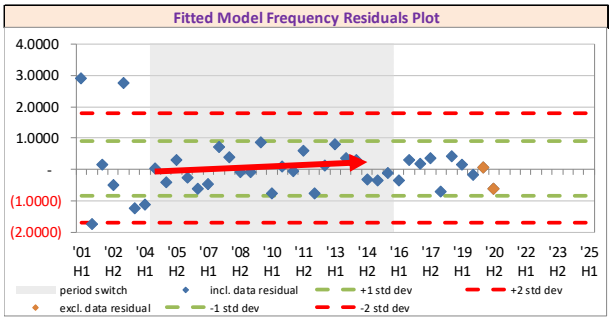
7.1 Does FA find this frequency model (without the scalar parameter) to be statistically supported?

FA Response to OW Question 7.1

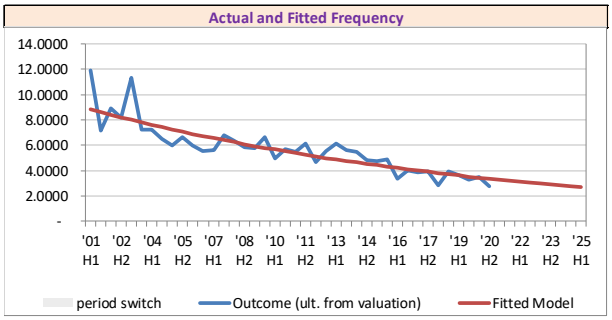
Yes, the alternative BI frequency model without the scalar parameter is statistically valid. However, we believe this alternative model is sub-optimal compared to FA selected model due to its lower adjusted R^2 (0.7829 vs 0.8469), and this alternative model residual plot indicates upward trend from 2004 to 2013 (see the charts on the next page).

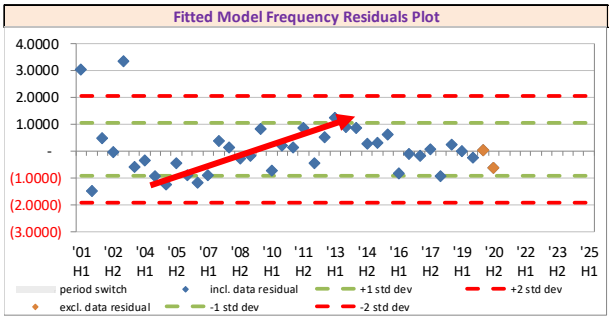
FA selected BI Frequency





Alternative BI Frequency





We were (and continue to be) satisfied with our selected frequency and severity models and believe the combined FA selected BI frequency and severity models appropriately models BI loss costs.

OW Question 7 (continued)

7.2 What rationale is there for a scalar parameter in the PPV frequency trend model at 2009-2, and a scalar parameter in the CV model at 2016-1 – both associated with drops in the frequency level that result in a higher loss trend rate after the scalar is included in the model? Specifically, why is it reasonable that there is a drop in the bodily injury frequency at two separate time periods for each of PPV and CV risks?

FA Response to OW Question 7.2

FA has a rigorous trend modelling process that includes testing various competing models, with consideration of other factors, using all of the available experience to reduce the impact of small sample sizes and generally improving coefficient estimation and estimation stability over time.

We tested the CV BI frequency model with both trend and scalar parameters at 2016-1 and the PPV BI frequency model with both trend and scalar parameters at 2009-2. Both models indicate the trend parameters are not statistically significant at 5% level, where the p-value is 99.1% for CV trend parameter at 2016 and 53.0% for PPV trend parameter at 2009-2 (please see the charts on the top of the next page).

Industry NL CV & PPV December 31, 2020 – BI Frequency

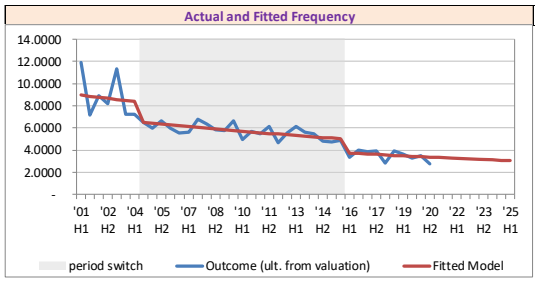
CV BI Freq (FA f0a – OW Q7.2) – alternative

FITTED TREND STRUCTURE REGRESSION STATISTICS						
Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9270	**0.8593**	**0.8423**	0.1233	38	2	5

Runs-Test Result: 1.4796 RESIDUALS RUNS RANDOM ; residuals normal

parameters with p-value >5%: 1 (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. 95% Lower	C.I. 95% Upper	Selected Coeff.
	1	2					
Intercept	48.398	15.309	3.161	0.3%	17.252	79.545	48.398
Season	-	-	-	n/a	-	-	-
All Years	(0.023)	0.008	(3.020)	0.5%	(0.039)	(0.008)	(0.023)
Scalar 1	(0.245)	0.078	(3.137)	0.4%	(0.404)	(0.086)	(0.245)
Trend 1	-	-	-	n/a	-	-	-
Scalar 2	(0.284)	0.101	(2.800)	0.8%	(0.490)	(0.078)	(0.284)
Trend 2	0.000	0.039	0.011	99.1%	(0.079)	0.079	0.000
Scalar 3	-	-	-	n/a	-	-	-
Trend 3	-	-	-	n/a	-	-	-
Scalar 4	-	-	-	n/a	-	-	-
Trend 4	-	-	-	n/a	-	-	-



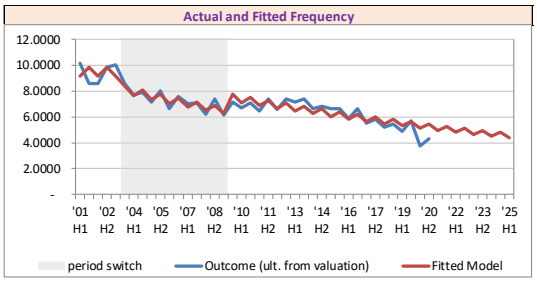
PPV BI Freq (FA f0a – OW Q7.2) - alternative

FITTED TREND STRUCTURE REGRESSION STATISTICS						
Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9378	**0.8794**	**0.8605**	0.0638	38	2	6

Runs-Test Result: 1.7967 RESIDUALS RUNS RANDOM ; residuals normal

parameters with p-value >5%: 1 (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. 95% Lower	C.I. 95% Upper	Selected Coeff.
	1	2					
Intercept	2.210	0.030	74.344	0.0%	2.149	2.271	2.210
Season	0.076	0.021	3.654	0.1%	0.034	0.119	0.076
All Years	-	-	-	n/a	-	-	-
Scalar 1	(0.149)	0.047	(3.170)	0.3%	(0.244)	(0.053)	(0.149)
Trend 1	(0.040)	0.011	(3.711)	0.1%	(0.062)	(0.018)	(0.040)
Scalar 2	0.160	0.046	3.451	0.2%	0.066	0.255	0.160
Trend 2	0.007	0.012	0.636	53.0%	(0.016)	0.031	0.007
Scalar 3	-	-	-	n/a	-	-	-
Trend 3	-	-	-	n/a	-	-	-
Scalar 4	-	-	-	n/a	-	-	-
Trend 4	-	-	-	n/a	-	-	-



We do not know why there is a drop in the bodily injury frequency at two separate time periods for PPV and CV risks. Industry data shows the BI frequency drop at different time for PPV and CV and FA's trend analysis utilizes Industry data to take advantage of the greater inherent stability of the larger body of data.

OW Question 8 (consists of 2 questions) *Has FA considered that other models may show a scalar to be significant at different time periods, with good statistical support?.*

8.1 If a scalar was added at 2007-1 and the 2016-1 scalar removed from FA's model, (with maintaining the scalar at 2004-2) what would the statistics of this model show, and would FA consider this model reasonable?

FA Response to OW Question 8.1

FA's trend analysis process prefers to stay with a previously selected model structure unless there was a compelling reason to change the trend structure, doing this will avoid the estimated trend rates from changing significantly from year to year.

The charts below compare the FA selected BI frequency model and the requested alternative BI frequency model.

Industry NL CV & PPV December 31, 2020 – BI Frequency

BI Freq (FA f0a) – basis of FA selection

Final period trend: -2.3% +/-0.7%

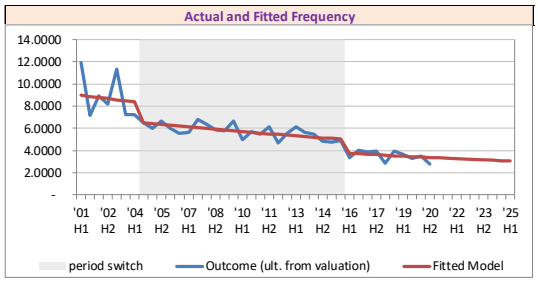
FITTED TREND STRUCTURE REGRESSION STATISTICS

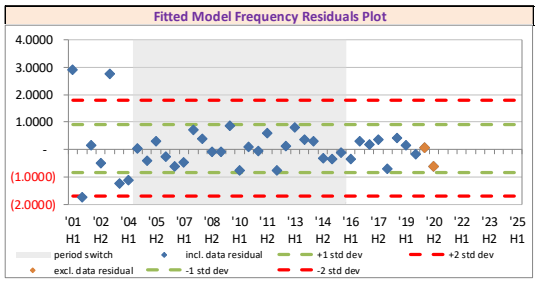
Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9270	**0.8593**	**0.8469**	0.1214	38	2	4

Runs-Test Result: 1.4796 **RESIDUALS RUNS RANDOM** ; residuals normal

parameters with p-value >5% **0** (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. 95% Lower	C.I. 95% Upper	Selected Coeff.
	1	2					
Intercept	48.365	14.787	3.271	0.2%	18.315	78.415	48.365
Season	-	-	-	n/a	-	-	-
All Years	(0.023)	0.007	(3.125)	0.4%	(0.038)	(0.008)	(0.023)
Scalar 1	(0.245)	0.076	(3.220)	0.3%	(0.400)	(0.091)	(0.245)
Trend 1	-	-	-	n/a	-	-	-
Scalar 2	(0.283)	0.076	(3.732)	0.1%	(0.437)	(0.129)	(0.283)
Trend 2	-	-	-	n/a	-	-	-
Scalar 3	-	-	-	n/a	-	-	-
Trend 3	-	-	-	n/a	-	-	-
Scalar 4	-	-	-	n/a	-	-	-
Trend 4	-	-	-	n/a	-	-	-





BI Freq (OW IR#2 Q8.1) - alternative

Final period trend: -5.2% +/-0.7%

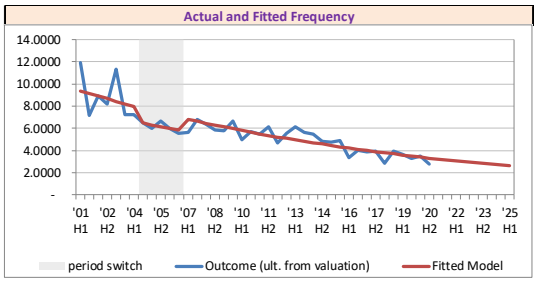
FITTED TREND STRUCTURE REGRESSION STATISTICS

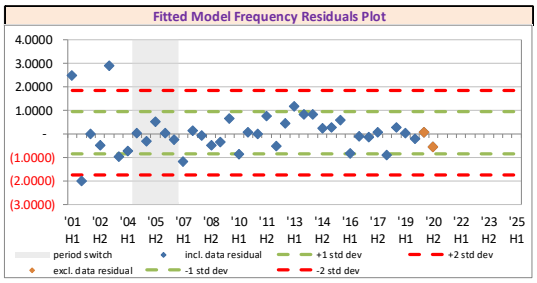
Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9090	**0.8264**	**0.8111**	0.1349	38	2	4

Runs-Test Result: 0.8972 **RESIDUALS RUNS RANDOM** ; residuals normal

parameters with p-value >5% **0** (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. 95% Lower	C.I. 95% Upper	Selected Coeff.
	1	2					
Intercept	109.413	13.949	7.844	0.0%	81.065	137.762	109.413
Season	-	-	-	n/a	-	-	-
All Years	(0.054)	0.007	(7.689)	0.0%	(0.068)	(0.039)	(0.054)
Scalar 1	(0.186)	0.082	(2.277)	2.9%	(0.352)	(0.020)	(0.186)
Trend 1	-	-	-	n/a	-	-	-
Scalar 2	0.187	0.085	2.199	3.5%	0.014	0.360	0.187
Trend 2	-	-	-	n/a	-	-	-
Scalar 3	-	-	-	n/a	-	-	-
Trend 3	-	-	-	n/a	-	-	-
Scalar 4	-	-	-	n/a	-	-	-
Trend 4	-	-	-	n/a	-	-	-





Both models are statistically valid. As there are many possible regression models that are valid and reasonable, and the ultimate selection of models is a matter of judgment and interpretation that can differ among actuaries even when modeling the same data.

We were (and continue to be) satisfied with our selected frequency and severity models and believe the combined FA selected BI frequency and severity models appropriately models BI loss costs.

OW Question 8 (continued)

8.2 And if the statistics of the above noted model were similar to FA's model (i.e., adjusted R squared >80% p-values <5%, and residuals are random) what would this mean regarding the placement of scalars in a model?

FA Response to OW Question 8.2

As per response to IR#2 question 8.1, the ultimate selection of models is a matter of judgment and interpretation that can differ among actuaries even when modeling the same data. FA's proposed model selections have been discussed with the Appointed Actuary and FA Actuarial Advisory Committee prior to final selection, as such we were (and continue to be) satisfied with our selected frequency and severity models and believe the combined FA selected BI frequency and severity models appropriately models BI loss costs.

OW Question 9 *The estimate of the ultimate number of bodily injury claims for each accident semester is relatively small, at an average of approximately 60 each semester over the last ten years. Using FA's full credibility standard for bodily injury of 2,164, the credibility of the bodily injury data in each semester is relatively low, at approximately 17%. Given this, what consideration has FA given to the concept that the scalar for the downward shift at 2016-1 is more "noise" due to lack of credibility and is simply part of the pattern of a continued decline in the frequency level instead of a one-time shift (i.e., scalar).*

FA Response to OW Question 9

Considering that FA's trend analysis utilizes Industry data to take advantage of the greater inherent stability of the larger body of data, we did not incorporate a credibility procedure in the trend analysis due to the nature of the approach taken. We also believe that there is no other available data source we can rely on for the trend analysis or to incorporate within a credibility procedure.

However, based on FA's trend analysis process, we would test the significance of parameters and remove a parameter if its p-value is greater than 5%. We tested a CV BI frequency model with trend and scalar at 2016-1 (see the chart on the right), and the model statistic results indicate the trend parameter at 2016-1 is not statistically significant, but the scalar at 2016-1 is statistically significant, as a result, we will remove trend and keep scalar at 2016-1.

FITTED TREND STRUCTURE REGRESSION STATISTICS

Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.9270	**0.8593**	**0.8423**	0.1233	38	2	5

Runs-Test Result: 1.4796 RESIDUALS RUNS RANDOM ; residuals normal

parameters with p-value >5%: 1 (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. 95% Lower	C.I. 95% Upper	Selected Coeff.
	1	2					
Intercept	48.398	15.309	3.161	0.3%	17.252	79.545	48.398
Season	-	-	-	n/a	-	-	-
All Years	(0.023)	0.008	(3.020)	0.5%	(0.039)	(0.008)	(0.023)
Scalar 1	(0.245)	0.078	(3.137)	0.4%	(0.404)	(0.086)	(0.245)
Trend 1	-	-	-	n/a	-	-	-
Scalar 2	(0.284)	0.101	(2.800)	0.8%	(0.490)	(0.078)	(0.284)
Trend 2	0.000	0.039	0.011	99.1%	(0.079)	0.079	0.000
Scalar 3	-	-	-	n/a	-	-	-
Trend 3	-	-	-	n/a	-	-	-
Scalar 4	-	-	-	n/a	-	-	-
Trend 4	-	-	-	n/a	-	-	-

OW Question 10 *FA's bodily injury severity model has a low adjusted R-squared value of 24%. As a sensitivity test, can FA provide the bodily injury severity model with a scalar parameter at 2013-1. Does FA find this model to be statistically reasonable and an improvement over FA's model?*

FA Response to OW Question 10

The charts below compare the FA selected model and the requested alternative model with a forced reform impact at 2020-1, where the alternative model All Years parameter is not statistically significant with p-value of 64.0%, it is removed from the alternative model.

Industry NL PPV December 31, 2020 – BI Severity

BI Sev (FA s0a) – basis of FA selection

Final period trend: +2.6% +/-0.6%

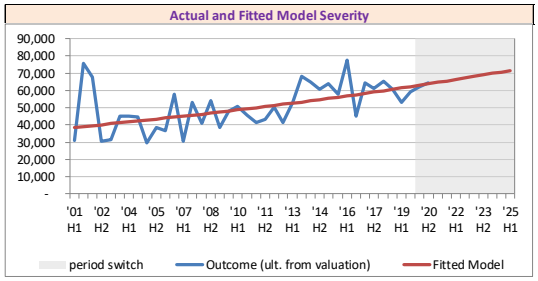
FITTED TREND STRUCTURE REGRESSION STATISTICS						
		Adjusted	S.E. of	# of Obs.	# of Obs.	# parameters
Multiple R	R^2	R^2	Estimate	n	Excluded	p
0.5353	**0.2866**	**0.2458**	0.2321	38	2	3

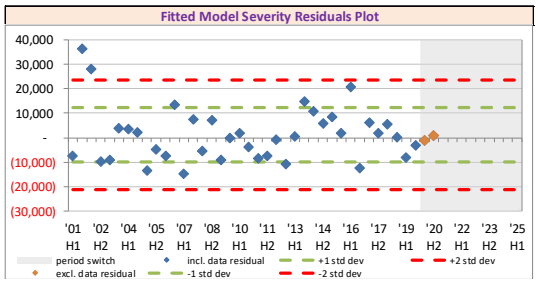
Runs-Test Result: 0.8077 RESIDUALS RUNS RANDOM #NUM!

parameters with p-value >5%: 1 (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. 95% Lower	C.I. 95% Upper	Selected Coeff.
	1	2					
Intercept	(40.970)	13.048	(3.140)	0.3%	(67.459)	(14.480)	(40.970)
Season	-	-	-	n/a	-	-	-
All Years	0.026	0.006	3.968	0.0%	0.013	0.039	0.026
Scalar 1	-	-	-	100.0%	-	-	**(0.041)**
Trend 1	-	-	-	n/a	-	-	-
Scalar 2	-	-	-	n/a	-	-	-
Trend 2	-	-	-	n/a	-	-	-
Scalar 3	-	-	-	n/a	-	-	-
Trend 3	-	-	-	n/a	-	-	-
Scalar 4	-	-	-	n/a	-	-	-
Trend 4	-	-	-	n/a	-	-	-

Scalar 1 to get reform impact (-4% per OW report)





BI Sev (FA s0a - OW IR#2 Q10) - alternative

Final period trend: 0.0% +/-n/a

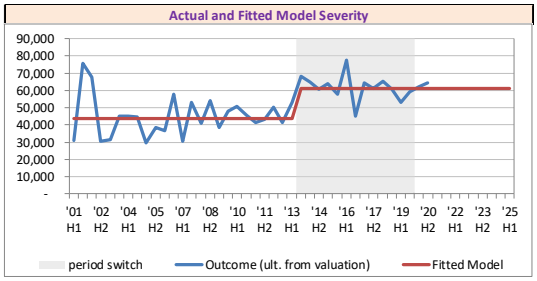
FITTED TREND STRUCTURE REGRESSION STATISTICS						
		Adjusted	S.E. of	# of Obs.	# of Obs.	# parameters
Multiple R	R^2	R^2	Estimate	n	Excluded	p
0.6095	**0.3714**	**0.3355**	0.2179	38	2	3

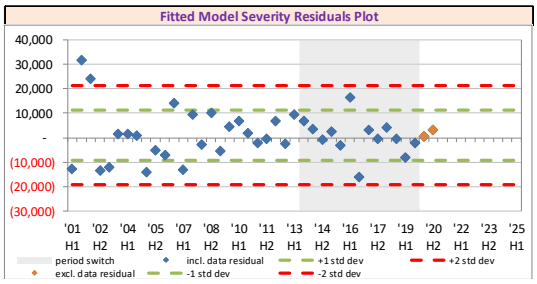
Runs-Test Result: 1.8296 RESIDUALS RUNS RANDOM #NUM!

parameters with p-value >5%: 1 (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. 95% Lower	C.I. 95% Upper	Selected Coeff.
	1	2					
Intercept	10.683	0.041	260.158	0.0%	10.600	10.767	10.683
Season	-	-	-	n/a	-	-	-
All Years	-	-	-	n/a	-	-	-
Scalar 1	0.339	0.070	4.826	0.0%	0.196	0.481	0.339
Trend 1	-	-	-	n/a	-	-	-
Scalar 2	-	-	-	100.0%	-	-	(0.041)
Trend 2	-	-	-	n/a	-	-	-
Scalar 3	-	-	-	n/a	-	-	-
Trend 3	-	-	-	n/a	-	-	-
Scalar 4	-	-	-	n/a	-	-	-
Trend 4	-	-	-	n/a	-	-	-

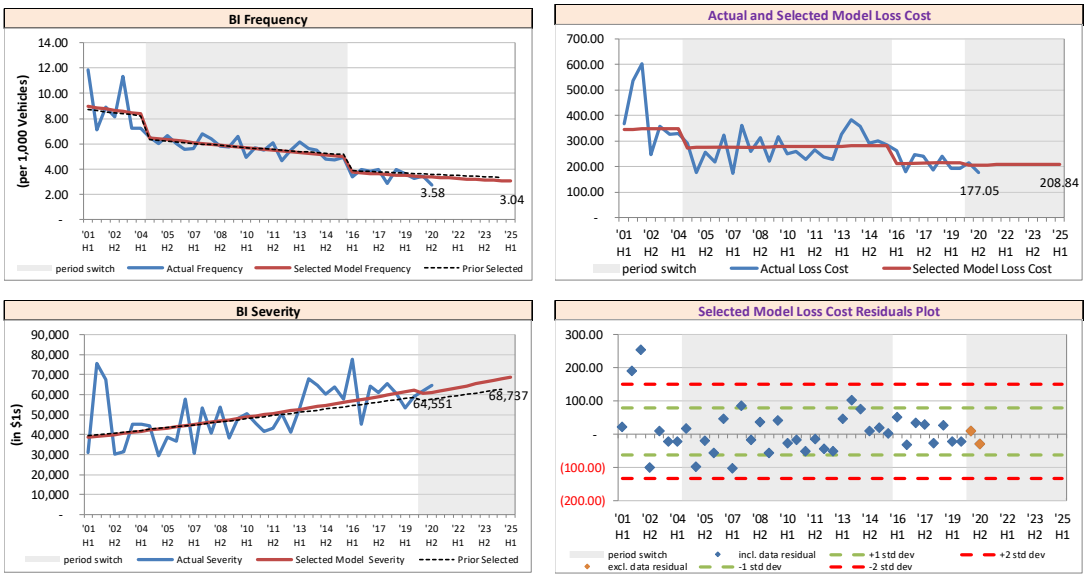
Scalar 2 to get reform impact (-4% per OW report)





Both models are valid and reasonable. As there are many possible regression models that are valid and reasonable, and the ultimate selection of models is a matter of judgment and interpretation that can differ among actuaries even when modeling the same data. FA's trend analysis process prefers to stay with a previously selected model structure unless there was a compelling reason to change the trend structure, doing this will avoid the estimated trend rates from changing significantly from year to year.

We believe the combined selected BI frequency and severity models appropriately models BI loss costs (see the charts below).



We were (and continue to be) satisfied with our selected frequency and severity models and believe the combined FA selected BI frequency and severity models appropriately models BI loss costs.

OW Question 11 *In the case of property damage frequency, did FA consider that there may be a change in the trend rate around 2014-1 whereby the more recent time frame since 2014-1 has a steeper declining trend rate? As a sensitivity test, provide an alternative frequency model to that selected by FA, but that has a change in the trend rate beginning 2014-1.*

FA Response to OW Question 11

The charts on the next page compare the FA selected model and the requested alternative model.

Industry NL CV December 31, 2020 – PD Frequency

PD Freq (FA f0a) – basis of FA selection

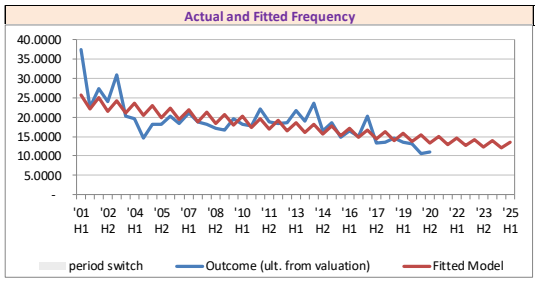
Final period trend: -2.6% +/-0.5%

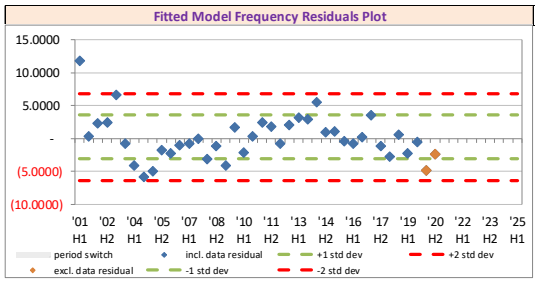
FITTED TREND STRUCTURE REGRESSION STATISTICS						
Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.7419	**0.5504**	**0.5247**	0.1541	38	2	3

Runs-Test Result: 2.4257 RESIDUALS RUNS NOT RANDOM; residuals normal

parameters with p-value >5%: 0 (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. 95% Lower	C.I. 95% Upper	Selected Coeff.
	1	2					
Intercept	56.628	9.173	6.174	0.0%	38.007	75.250	56.628
Season	(0.134)	0.050	(2.674)	1.1%	(0.235)	(0.032)	(0.134)
All Years	(0.027)	0.005	(5.846)	0.0%	(0.036)	(0.017)	(0.027)
Scalar 1	-	-	-	n/a	-	-	-
Trend 1	-	-	-	n/a	-	-	-
Scalar 2	-	-	-	n/a	-	-	-
Trend 2	-	-	-	n/a	-	-	-
Scalar 3	-	-	-	n/a	-	-	-
Trend 3	-	-	-	n/a	-	-	-
Scalar 4	-	-	-	n/a	-	-	-
Trend 4	-	-	-	n/a	-	-	-





PD Freq (FA f0a – OW Q11) – alternative

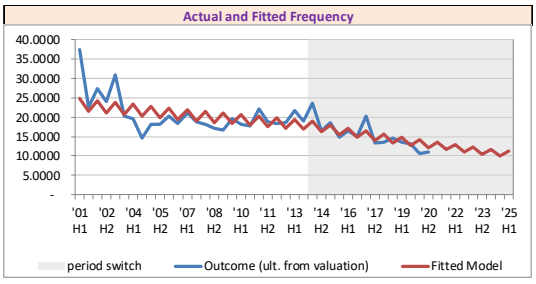
Final period trend: -4.7% +/-1.8%

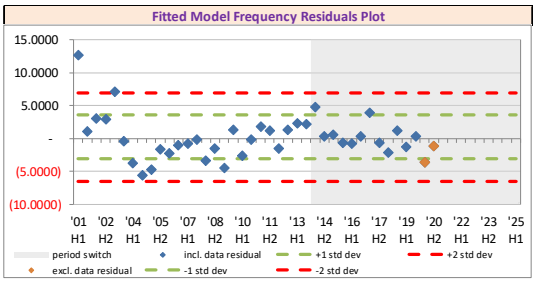
FITTED TREND STRUCTURE REGRESSION STATISTICS						
Multiple R	R^2	Adjusted R^2	S.E. of Estimate	# of Obs. n	# of Obs. Excluded	# parameters p
0.7548	**0.5697**	**0.5317**	0.1529	38	2	4

Runs-Test Result: 2.4257 RESIDUALS RUNS NOT RANDOM; residuals normal

parameters with p-value >5%: 1 (intercept specifically not included)

	Coefficients	S.E.	t-Stat	p-value	C.I. 95% Lower	C.I. 95% Upper	Selected Coeff.
	1	2					
Intercept	43.438	14.037	3.095	0.4%	14.912	71.964	43.438
Season	(0.133)	0.050	(2.671)	1.2%	(0.234)	(0.032)	(0.133)
All Years	(0.020)	0.007	(2.876)	0.7%	(0.034)	(0.006)	(0.020)
Scalar 1	-	-	-	n/a	-	-	-
Trend 1	(0.028)	0.023	(1.235)	22.5%	(0.074)	0.018	(0.028)
Scalar 2	-	-	-	n/a	-	-	-
Trend 2	-	-	-	n/a	-	-	-
Scalar 3	-	-	-	n/a	-	-	-
Trend 3	-	-	-	n/a	-	-	-
Scalar 4	-	-	-	n/a	-	-	-
Trend 4	-	-	-	n/a	-	-	-





The required alternative model with a trend parameter at 2014-1 is not statistically valid; the trend parameter at 2014-1 is not statically significant as its p-value of 22.5% is greater than 5% level and it should be removed from the model.

We were (and continue to be) satisfied with our selected frequency and severity models and believe the combined FA selected PD frequency and severity models appropriately models PD loss costs.