



NOVA SCOTIA RISK SHARING POOL

MARCH 2020 OPERATIONAL REPORT

ACTUARIAL HIGHLIGHTS

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ACTUARIAL HIGHLIGHTS
RSP NOVA SCOTIA
OPERATIONAL REPORT
MARCH 2020

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1 Summary

Key Points

- (a) The 2019 Q4 valuation was completed and implemented into the results this month, with a \$1.7 million unfavourable impact, or 2.1% of beginning policy liabilities (policy liabilities ended at \$81 million) and 20.4 points of year-to-date earned premium;
- (b) The updated valuation loss ratios do NOT include any incurred impacts of adjustments related to COVID-19; any associated impacts and changes will be initially reflected in our March 31, 2020 valuation which will be implemented in the May 2020 Operational Reports; and
- (c) The month’s current accident year (CAY) claims activities were generally higher than the associated projections from last month for both recorded and paid activity. This was reviewed and verified, and attributed to process variance. Our projections do NOT take into account any specific impacts that might arise due to the COVID-19 pandemic (FA is still in the process of considering impacts, which will be reflected in future projections, as deemed appropriate).

1.1 Valuation Schedule (Fiscal Year 2020)

The March 2020 Operational Report incorporates the results of an updated valuation (as at December 31, 2019) – the impact of the implementation of the valuation is discussed in section 1.2. The table below summarizes the valuation implementations scheduled for fiscal year 2020.

NOVA SCOTIA RISK SHARING POOL FISCAL YEAR 2020 – SCHEDULE OF VALUATIONS			
Valuation Date	Discount Rate (per annum)	Operational Report	Description of Changes
Sep. 30, 2019 (completed)	1.46% mfad 25 bp	Oct. 2019	updated valuation (roll forward) : accident year 2019 loss ratio <u>increased</u> 1.0 points to 97.8%; discount rate <u>increased</u> 5 basis points; no change to selected margins for adverse deviations
Dec. 31, 2019	1.64% mfad 25 bp	Mar. 2020	update valuation: 2019 loss ratio <u>increased</u> 2.7 points to 100.5%; accident year 2020 loss ratio <u>increased</u> 4.5 points to 103.1%; discount rate <u>increased</u> 18 basis points; no change to selected margins for adverse deviations
Mar. 31, 2020	% mfad -- bp	May 2020	update valuation (roll-forward)
Jun. 30, 2020	% mfad -- bp	Aug. 2020	update valuation
Sep 30, 2020	% mfad -- bp	Oct. 2020	update valuation (roll-forward)

Under the proposed schedule for fiscal year 2020, the off-half valuation quarters ending March 31, 2020 and September 30, 2020 would not reflect a full valuation update of assumptions, but

would rather roll-forward key assumptions from the previous valuation.

1.2 New Valuation

A valuation of the Nova Scotia Risk Sharing Pool (“RSP”) as at December 31, 2019 has been completed since last month’s Operational Report and the results of that valuation have been incorporated into this month’s Report. The valuation was completed by the Facility Association’s internal actuarial group in conjunction with, and approved by, the Appointed Actuary, under the hybrid model for actuarial services. Additional detail will be provided in an “Actuarial Highlights – Quarterly Valuation” report which we anticipate will be posted to the FA website in June 2020.

The valuation implementation impact is summarized in the tables below and at the top of the next page, where the abbreviations PAYs refers to prior accident years, CAY refers to the current accident year (2020), and Prem Def refers to premium deficiency / deferred acquisition costs impacts.

Summary of Impact (\$000s) of Implementing Result of Valuation as at Dec. 31, 2019¹

NS	unfav / (fav) for the month and ytd					
	IMPACT in \$000s from changes in:					
	ults & payout patterns			dsct rate	margins	
	Nominal	apv adj.	sub-tot	apv adj.	apv adj.	TOTAL
[1]	[2]	[3]	[4]	[5]	[6]	
PAYs	693	86	779	(209)	-	570
CAY	378	22	400	(38)	-	362
Prem Def	771	53	824	(76)	-	748
TOTAL	1,842	161	2,003	(323)	-	1,680

As indicated in the table above, the incorporation of the new valuation had an estimated **\$1.7 million unfavourable impact** on the month’s net result from operations, adding an estimated 20.4 points (see table at the top of the next page) to the **year-to-date Combined Operating Ratio** to end at **152.9%**.

¹In these tables, “PAYs” refers to prior accident years, “CAY” refers to the current accident year, and “Prem Def” refers to the provision for premium deficiency or the deferred policy acquisition asset (as applicable). “Nominal” refers to changes excluding any actuarial present value adjustments, whereas “apv adj.” refers to actuarial present value adjustments.

The columns under the heading “ults & payout patterns” reflect the impact of changes in the valuation selected ultimates and claims payment patterns (i.e. based on unchanged selection of discount rates and margins for adverse deviation). The column “dsct rate” reflects the impact of the change in the selected discount rate and the column “margins” reflects the impact of any changes in selected margins for adverse deviations.

Summary of Impact (% YTD EP) of Implementing Result of Valuation as at Dec. 31, 2019

NS	ytd EP 8,228 (actual)					
	IMPACT unfav / (fav) as % ytd EP from changes in:					
	ults & payout patterns			dsct rate	margins	
	Nominal	apv adj.	sub-tot	apv adj.	apv adj.	TOTAL
[1]	[2]	[3]	[4]	[5]	[6]	
PAYs	8.4%	1.0%	9.5%	(2.5%)	-	6.9%
CAY	4.6%	0.3%	4.9%	(0.5%)	-	4.4%
Prem Def	9.4%	0.6%	10.0%	(0.9%)	-	9.1%
TOTAL	22.4%	2.0%	24.3%	(3.9%)	-	20.4%

The impact of the **nominal changes** is shown in column [1] of the two preceding summary tables. The change in the selected nominal ultimates was **unfavourable by \$1.8 million** overall. This reflects the impact attributable to the changes in the selected ultimate loss ratios (i.e. for each accident year, it is the product of life-to-date earned premium for the accident year and the change in the selected ultimate loss ratio).

The **PAYs** overall showed a **\$0.7 million unfavourable** nominal variance or 1.4% of the PAYs nominal unpaid balance of \$51.5 million determined at the end of last month beginning, driven by favourable claims development and updates to a priori loss ratios to include more recent data and updated trends. While the valuation implementation impact does differ from the valuation changes themselves (as they apply to different periods), the valuation result by government line provides insight into the relative PAYs nominal changes. In particular, the PAY valuation summary table below includes only accident years 2018 and prior (indicating a \$0.1 million favourable impact), this is in contrast to the **unfavourable** implementation summary PAY impact (which includes the \$0.9 million **unfavourable** nominal impact for accident year 2019).

Valuation as at Dec. 31, 2019 – PAYs Nominal Changes by Government Line

Nova Scotia RSP - valuation changes in selected ultimate
(favourable) / unfavourable during Quarter

Accident Year	Third Party Liability	Accident Benefits	Other Coverages	Total
2014 & Prior	(60)	16	-	(44)
2015	(56)	11	(2)	(47)
2016	(161)	353	(8)	184
2017	(21)	(6)	(4)	(31)
2018	(241)	19	20	(202)
TOTAL	(539)	393	6	(140)

The CAY and premium deficiency impacts are a result of the change in the selected loss ratios for accident year **2020** (increased 4.5 points to **103.1%**) reflecting accident year **2021** (increased 4.7 points to 106.8%).

The impacts related to actuarial present value (“apv”) adjustments are split into the impact prior to any change in the selected discount rate and selected margins for adverse deviations or “MfADs” (at the

level they were selected i.e. coverage and accident half-year), the impact of then updating the discount rate, and finally the impact of any changes to the MfADs (at the level they were selected). The changes in actuarial present value adjustments are shown in the summary tables on the two previous pages in columns [2], [4], and [5].

Column [2] recognizes that changing the nominal selections also changed the unpaid estimates (including changes to the relative mix by government line, which had an impact on the weighted-average MfADs). It also reflects the fact that we updated the projected emergence of claims payments, resulting in a change in the projected cash flows. These changes generated an unfavourable change of \$161 thousand in the actuarial present value adjustments, prior to any changes in the selected discount rate and/or MfADs.

Updated projected cash flows were reviewed against the selected risk-free yield curve, derived from Government of Canada benchmark bond yields monthly series using values for December 2019. Column [4] accounts for the change in the **discount rate** selected (increased 18 basis point to **1.64%**), indicating a favourable impact of \$323 thousand. The impact *related only to claims liabilities* (i.e. PAYs plus CAY) was \$247 thousand at March 2020 – this compares to the \$260 thousand change one would estimate as the impact by interpolation using the interest rate sensitivity table provided in last month's Actuarial Highlights.

Column [5] accounts for any changes to selected MfADs. The selected **investment rate MfAD** was **left unchanged at 25 basis points** and the selected **claims development MfADs** at the coverage and accident year level were also left unchanged (as per our usual practice, development margins are reviewed with the June 30 valuation).

Consideration was given to recent legal decisions and changes in legislation / regulation as outlined in section 1.4.

1.3 Appointed Actuary and Hybrid Actuarial Services Model

Mr. Cosimo Pantaleo of Ernst & Young LLP (EY) was appointed as Actuary by the FA Board at its February 18, 2020 meeting.

Facility Association operates under a hybrid model in relation to the management and provision of actuarial services. Under this model, actuarial services are performed by both Facility Association's internal staff and its external actuarial consulting firm. The hybrid model approach maximizes the efficiency of resource allocation while providing access to additional expertise and capacity as needed.

1.4 Consideration of Recent Legal Decisions and Changes in Legislation / Regulation²

There have been no changes in these descriptions since last month's Highlights.

Consideration and assessment of potential impacts of legal decisions and changes in legislation / regulation constitutes a regular part of the valuation process. Descriptions of some of the more recent (i.e. within the last five years) changes are provided below.

The **Nova Scotia Court of Appeal** confirmed, in a unanimous decision released on **January 18, 2019** in relation to **Sparks v Holland (2019 NSCA 3)**, that future Canada Pension Plan (CPP) disability

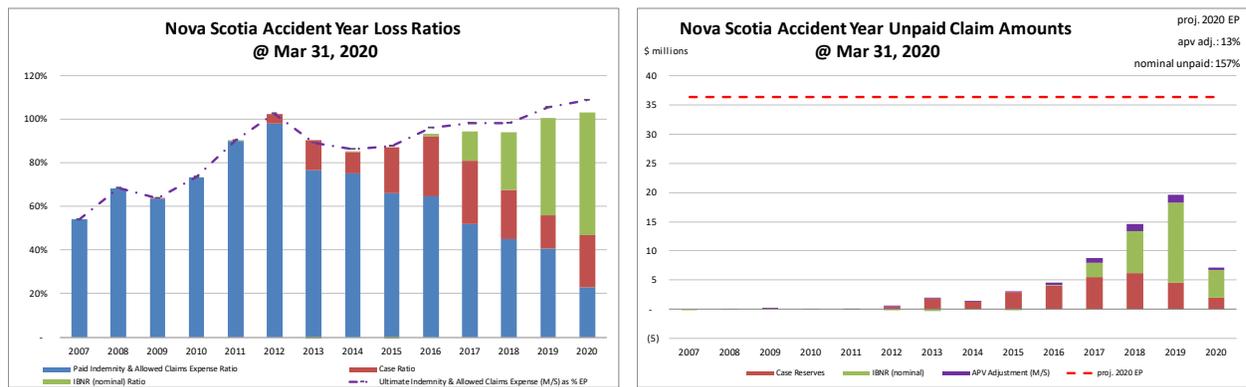
²This url to a pdf is to a helpful guide on how bills become laws: <https://www.ola.org/sites/default/files/common/how-bills-become-law-en.pdf>.

benefits are deductible from future income loss awards in motor-vehicle accident claims in that province. Sparks sustained injuries as a result of a motor vehicle accident in Nova Scotia and sought damages for personal injuries and loss of income. The decision supported an earlier decision (Tibbets v Murphy, 2017 NSCA 35) that both past and future CPP disability benefits are deductible under section 133A of the Insurance Act.

At the current time, no adjustments have been made to our valuation estimates as a result of this decision.

1.5 Current Provision Summary

The charts immediately below show the current levels of claim liabilities³ booked by accident year. The left chart displays life-to-date payments, case reserves, IBNR, and the total including actuarial present value adjustments against accident year earned premium. The right chart shows the associated dollar amounts for the components of the claim liabilities and the current projected amount of 2020 full year earned premium (the red hash-mark line) to provide some perspective.



“M/S” refers to “Member Statement” values – that is, actuarial present value adjustments at the selected discount rate.

The current actuarial present value adjustments balance (\$4.7 million – see below) represents 13% of the earned premium projected for the full year 2020 (see the upper right corner of the right chart above). If our current estimates of the nominal unpaid amounts prove to match actual claims payments, the actuarial present value adjustments will be released into the net operating result over future periods.

claim liabilities (\$000s)

	amt	%
case	29,077	47.1%
ibnr	27,937	45.3%
M/S apv adjust.	4,717	7.6%
M/S total	61,731	100.0%

The table to the left breaks down the Member Statement (M/S) claim liabilities total into component parts, showing that the majority of the claim liabilities for this RSP is in case reserves. Approximately 66% of the IBNR balance relates to accident years 2019 and 2020 (see Exhibit B). Approximately 89% of the M/S total claim

liabilities are related to accident years 2016-2020 inclusive (i.e. the most recent 5 accident years), and just over 0% is related to accident years 2010 and prior (i.e. prior to the most recent 10 accident years).

³Claim liabilities refer to provision for unpaid indemnity and allowed claims expenses. Allowed claims expenses are first party legal and other expenses as listed in the RSP Claims Guide. Claims expenses paid through the member company expense allowance are NOT included in this discussion.

The tables below summarize the premium liabilities and the total policy liabilities.

premium liabilities (\$000s)			policy liabilities (\$000s)		
	amt	%		amt	%
unearned prem	17,095	89.9%	claim	57,014	70.6%
prem def/(dpac)	794	4.2%	premium	17,889	22.2%
M/S apv adjust.	1,117	5.9%	M/S apv adjust.	5,834	7.2%
M/S total	19,006	100.0%	M/S total	80,737	100.0%

2 Activity During the Month of March 2020

2.1 Recorded Premium and Claims Activity

The table immediately below summarizes the extent to which premiums and claims amounts recorded during the month differ from projections reflected in the prior month’s Operational Report⁴.

Nova Scotia RSP Actual vs Projected Summary: Recorded Transaction Amounts (\$ thousands)

Accident Year	Earned Premium		Paid Indemnity & Allowed Claims Expense		Case increase / (decrease)		Recorded increase / (decrease)	
	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected
Prior	(32)	(32)	692	474	(467)	(327)	225	147
2018	(42)	(42)	437	155	(556)	(496)	(119)	(341)
2019	(56)	(56)	664	302	(706)	(727)	(42)	(425)
2020	2,857	(72)	1,368	563	865	53	2,232	617
TOTAL	2,727	(202)	3,160	1,494	(864)	(1,497)	2,296	(3)

(Recorded transaction amounts exclude IBNR & other actuarial provisions)

It is unusual to see actual earned premium transactions affecting prior accident years beyond the first prior at this time in the calendar year – we have investigated and determined that the prior accident years changes in the month reflects system sweep activity undertaken by a member in responding to audit findings.

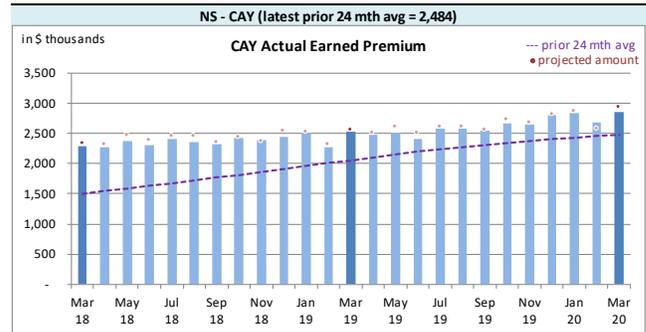
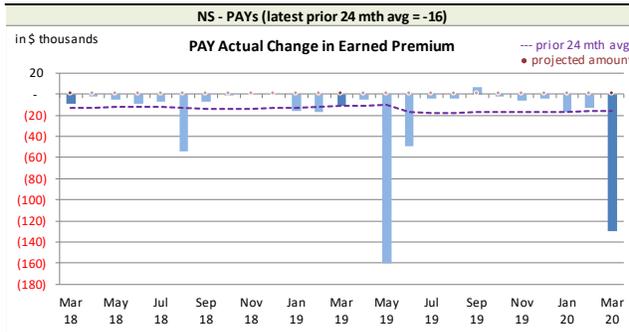
Claims transaction activity is generally volatile and changes from one month to the next are anticipated due to this natural “process variance” (i.e. random variation), and this is particularly true where volumes are low as found in this RSP. Each month, the projection variances are reviewed for signs of projection bias and to identify potential ways to reduce the level of the variance. Commentary from our review is provided in the sub-sections that follow.

2.1.a Actual vs. Projected (AvsP): Earned Premium

The charts at the top of the next page show actual **earned premium**⁵ activity in each of the most recent 25 calendar months, along with a “prior 24-month average” to show how each month’s actual compares with the average amount of the preceding 24 calendar months.

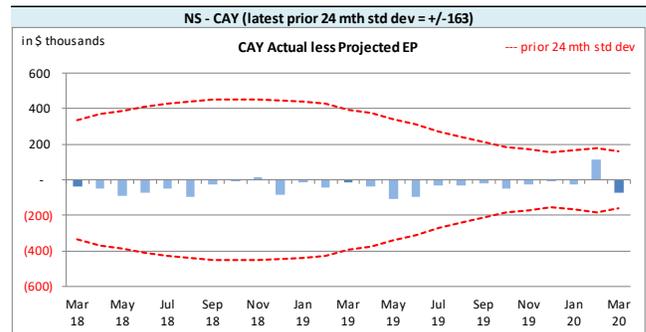
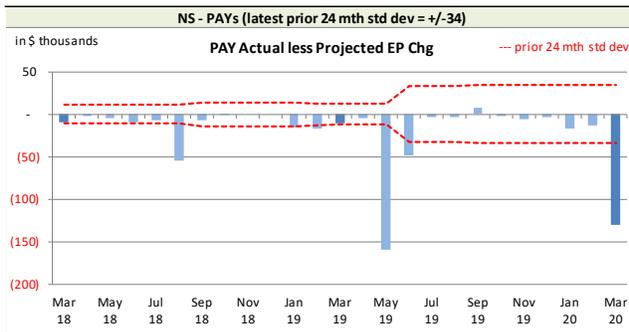
⁴There may be rounding differences in values in this document compared with the associated Bulletin and/or Operational Report.

⁵Premium is earned on a daily basis based on the transaction term measured in days. As a result, months with 31 days earned relatively more than those with 30 days, and February earns the least.

Nova Scotia RSP Actual Earned Premium by Calendar Month


Earned premium changes during a given calendar month in relation to prior accident years tend to be at modest levels, although relatively high levels generally occur at the beginning of each year.

The associated variance between the actual changes and the projections from the previous month are shown in the charts immediately below. **Earned premium** change projections are all attributed to the current accident year as the projection upload does not accept **earned premium** changes for other accident years. We do not see this limitation as being significant for our purposes, but it does mean that the actual less projection variance will equal the actual **earned premium** change in relation to prior accident years.

Nova Scotia RSP Actual vs. Projected Summary: Earned Premium Variances by Calendar Month


On Latest \$ thousands		
Earned Premium	PAYs	CAY
Mthly Avg EP Chg (prior 24 mths)	(16)	2,484
std dev	34	163
A-P <> std dev	6	-
% <> std dev	24.0%	0.0%
norm <> std dev	31.7%	31.7%
performance vs 24-mth avg:	better	better

We project **earned premium** changes from known unearned premium balances and projected written premium levels, but upload the total projections as current accident year (CAY). This process has generated prior accident years' (PAYs) bias⁶, with actuals generally lower than projected, although the magnitude is not high relative to monthly premium. In addition to the PAYs' bias, the CAY has also shown bias⁷, with actuals being generally lower than projected, and we have modified our projections processes in response. Over time, we may consider other projection approaches to narrow monthly

⁶The PAYs' variances will show bias as the projection upload forces all earned premium projections to be attributed to the CAY.

⁷We measure bias based on a 95% confidence range for a binominal distribution with trials based on the range being considered (25 in this case) and 50% probability of success. The rolling 25-month CAY variances at March 2020 has only 2 months where the actuals were higher than projected, and as the 95% confidence range is 8 to 17, bias continues to be indicated.

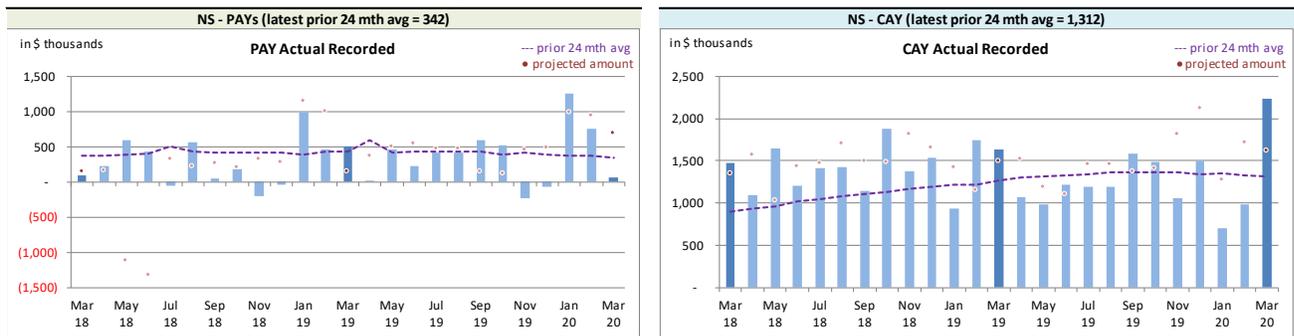
variance levels further, but it is not currently deemed a priority.

The PAY **earned premium** variance was outside of the one standard deviation band this month (see left chart above). The activity was reviewed and verified, and attributed to system sweep activity undertaken by a member in responding to audit findings.

2.1.b AvsP: Recorded Indemnity & Allowed Claims Expense

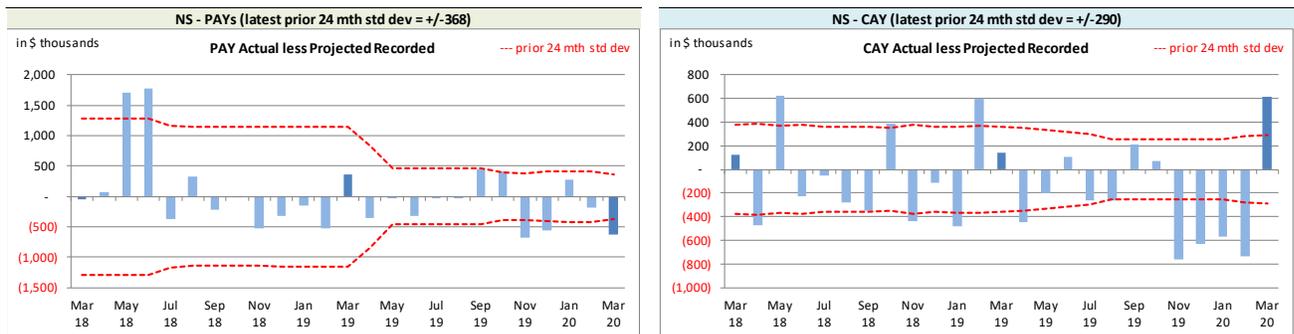
The charts immediately below show actual **recorded** activity (**paid** and case reserve changes), in each of the most recent 25 calendar months, along with a “prior 24-month average” to show how each month’s actual compares with the average amount of the preceding 24 calendar months.

Nova Scotia RSP Actual Recorded by Calendar Month



Recorded activity variances from the previous month’s projections are shown in the charts below including the “prior 24-month standard deviation” levels to show how the variances from projection compare with historical standard deviations.

Nova Scotia RSP Actual vs Projected Summary: Recorded Variances by Calendar Month



On Latest \$ thousands		
Recorded	PAYs	CAY
Mthly Avg Recorded (prior 24 mths)	342	1,312
std dev	368	290
A-P <> std dev	6	13
% <> std dev	24.0%	52.0%
norm <> std dev	31.7%	31.7%
performance vs 24-mth avg:	better	worse

With respect to **recorded** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look unusual and generate relatively significant variances that in nominal value terms are not that significant in relative or overall terms. That said, 24% of prior accident

years’ (PAYs) **recorded** variances over the last 25 calendar months have fallen outside of one standard deviation of the actual **recorded** amounts (see table above), suggesting the projection process has

performed better than simply projecting the prior 24-month average amount (assuming it follows a normal distribution). Bias has not been indicated at a 95% confidence level on a rolling 25-month basis (8 of 25 variances are positive).

The PAY **recorded** variance was outside of the one standard deviation band this month (see left chart at bottom of the prior page). The activity was reviewed and verified, and attributed to the settlement of one large claim.

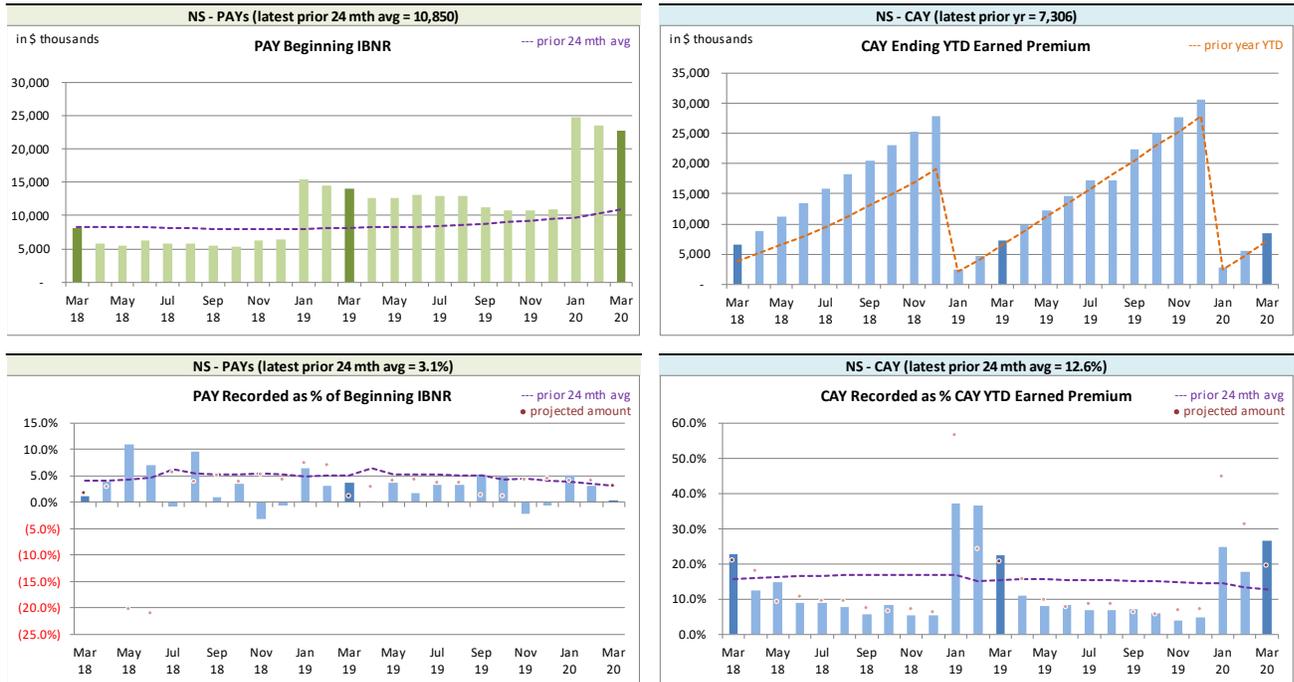
The current accident year (CAY) **recorded** variances fell outside of one standard deviation 52% of the time over the last 25 calendar months (see table above), suggesting that the projection process has performed worse than simply projecting the prior 24-month average amount. We are considering ways to improve our projection process as a result, but efforts so far have fallen short (although rapid growth may be hampering our projection capabilities). Bias has not been indicated at a 95% confidence level on a rolling 25-month basis (9 of 25 variances are positive).

The CAY **recorded** variance was outside of the one standard deviation band this month (see right chart at bottom of the prior page). Being the highest of the 25 calendar months, the activity was reviewed and verified, and attributed to process variance.

The method for establishing IBNR adjusts automatically for changes in **earned premium** and **recorded** claims activity level (see sections 2.2 and 3).

We have included, for reference, additional charts at the top of the next page related to levels influencing **recorded** activity. Note in particular the increase in the level of PAY beginning IBNR. Part of this will be as a response to valuations and showing up as a beginning IBNR change one month after the valuation is implemented (i.e. April, June, September, and November), and part will also reflect the maturity level of the RSP.

Nova Scotia RSP Levels that influence⁸ Recorded activity by Calendar Month



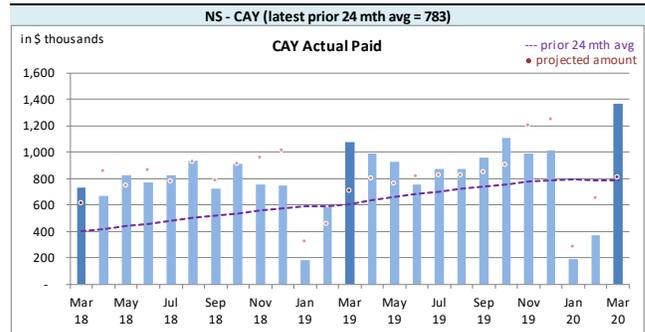
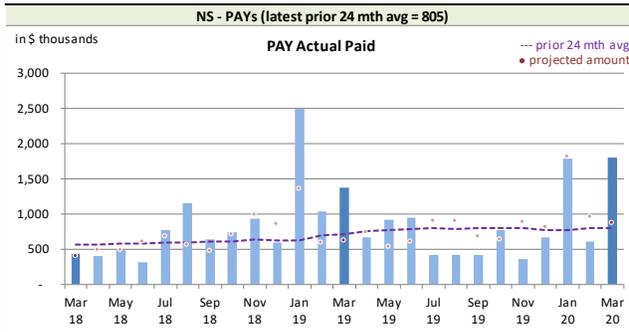
We track PAY beginning IBNR as **recorded** activity comes out of IBNR. Changes in the PAY beginning IBNR (see left chart above) occur for several possible reasons:

- to offset actual **recorded** activity (through loss ratio matching);
- the annual switchover as a CAY becomes a PAY (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of PAYs’ ultimates (will show up as a beginning IBNR change one month after the valuation is implemented, i.e. the change will generally show in April, June, September, and November).

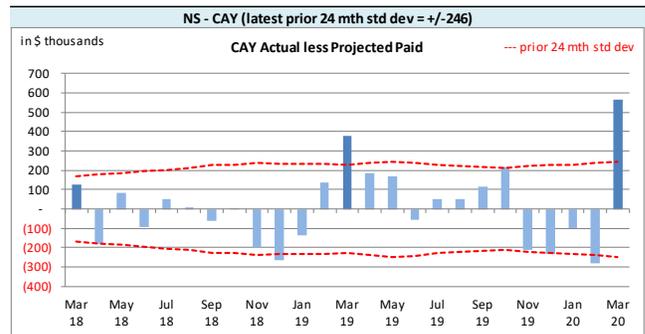
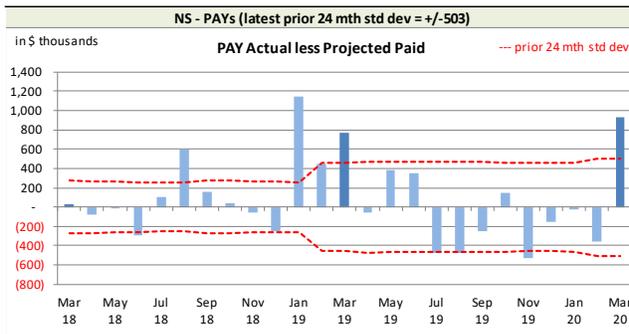
2.1.c AvsP: Paid Indemnity & Allowed Claims Expense

The charts at the top of the next page show actual **paid** activity in each of the most recent 25 calendar months, along with a “prior 24-month average” to show how each month’s actual compares with the average amount of the preceding 24 calendar months.

⁸Our recorded activity projections for the prior accident years are based on selected ratios of recorded activity to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date IBNR to year-to-date selected ultimate (i.e. selected LR x earned premium), deriving year-to-date recorded as selected ultimate less IBNR. In both cases, the ratio selection is based on our review of the more recent recorded activity and recent AvsP analyses.

*Nova Scotia RSP Actual **Paid** by activity Calendar Month*


Paid activity variances from the previous month’s projections are shown in the charts below, including the “prior 24-month standard deviation” levels to show how the variances from projection compare with historical standard deviations.

*Nova Scotia RSP Actual vs Projected Summary: **Paid** Variances by Calendar Month*


On Latest \$ thousands			
	Paid	PAYs	CAY
Mthly Avg Paid (prior 24 mths)		805	783
std dev		503	246
A-P <> std dev		8	6
% <> std dev		32.0%	24.0%
norm <> std dev		31.7%	31.7%
performance vs 24-mth avg:		no better	better

With respect to **paid** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look unusual and generate relatively significant variances that in nominal value terms are not that significant in relative or overall terms. That said, 32% of the prior accident

years’ (PAYs) variances over the last 25 calendar months have fallen outside of one standard deviation of the actual **paid** amounts (see table on above), suggesting the projection process has performed no better than simply projecting the prior 24-month average amount (assuming it follows a normal distribution). Bias has not been indicated at a 95% confidence level on a rolling 25-month basis (12 of 25 variances are positive).

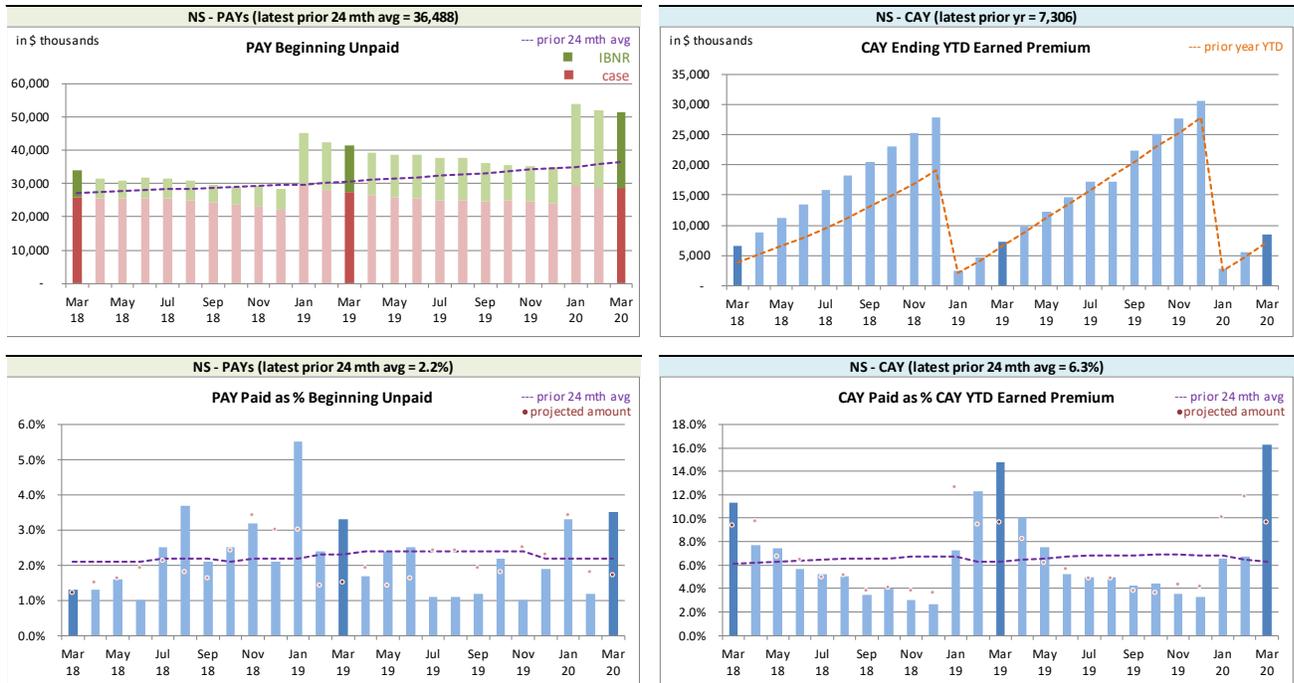
The PAY **paid** variance was outside of the one standard deviation band this month (see right chart above). The activity was reviewed and verified, and attributed to the settlement of one large claim.

The current accident year (CAY) **paid** variances fell outside of one standard deviation 20% of the time over the last 25 calendar months (see table above), suggesting that the projection process has performed better than simply projecting the prior 24-month average amount. Bias has not been indicated at a 95% confidence level on a rolling 25-month basis (14 of 25 variances are positive).

The CAY **paid** variance was outside of the one standard deviation band this month (see right chart at bottom of prior page). Being the highest of the 25 calendar months, the activity was reviewed and verified, and attributed to process variance.

We have included, for reference, additional charts below related to levels influencing **paid** activity. Both case and IBNR increases contribute to the increase of PAY beginning unpaid. This is somewhat expected, given the maturity level of the RSP.

Nova Scotia RSP Levels that influence⁹ Paid activity by Calendar Month



We track the PAY beginning unpaid balance (case and IBNR) as **paid** activity comes out of the unpaid balance. Changes in the PAY beginning unpaid balance (see upper left chart above) occur for several possible reasons:

- to offset actual **paid** activity (may reduce case or IBNR or both);
- the annual switchover as a CAY becomes a PAY (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of PAYs’ ultimates (will show up as a beginning unpaid balance change one month after the valuation is implemented, i.e. the change will generally show in April, June, September, and November).

2.2 Actuarial Provisions

An ultimate loss ratio matching method (described in section 3) was used to determine the month’s

⁹Our paid projections for the prior accident years are based on selected ratios of paid to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date paid to year-to-date selected ultimate indemnity (i.e. selected LR x earned premium). In both cases, the ratio selection is based on our review of the more recent recorded activity and recent AvsP analyses.

IBNR¹⁰, and factors were applied to the nominal unpaid claims liability (case plus IBNR) to determine the discount amount (shown as a negative value to indicate its impact of reducing the liability) and the Provisions for Adverse Deviations. The loss ratios and the factors used to determine the current month’s provisions and projections were based on the applicable valuation.

The table below summarizes variances in provisions included in this month’s Operational Report and the associated one-month projections from last month’s Report.

Nova Scotia RSP Actual vs Projected Summary: IBNR and APV Amounts (\$ thousands)

Table 02

Accident Year	IBNR		actuarial present value adjustments				IBNR + actuarial present value adjustments	
	Actual	Actual less Projected	Discount Amount		Provisions for Adverse Deviations		Actual	Actual less Projected
			Actual	Actual less Projected	Actual	Actual less Projected		
Prior	2,347	(114)	(534)	(60)	2,154	(50)	3,967	(224)
2018	7,285	108	(497)	(41)	1,658	(69)	8,446	(2)
2019	13,576	1,192	(801)	(109)	2,267	114	15,042	1,197
2020	4,729	(310)	(343)	(29)	813	(37)	5,199	(376)
TOTAL	27,937	876	(2,175)	(239)	6,892	(42)	32,654	595

The IBNR provision is \$0.9 million higher than projected from last month, counterbalancing the recorded claims activity and adjusting for the earned premium variance impacts indicated in section 2.1, and due to the valuation implementation.

Exhibit G shows the accident year IBNR amount change from last month to this month broken down into:

- (i) the change projected last month;
- (ii) the additional change due to variances in earned premium (because we apply a loss ratio to earned premium in determining ultimate level) and/or recorded claims (as IBNR is calculated as ultimate less recorded) differences; and
- (iii) the additional change due to valuation implementation impacts (as applicable)

The variances associated with (ii) above are discussed in sections 2.1.a and 2.1.b.

The table at the top of the next page summarizes the variances in the provisions for premium deficiency liability / (deferred policy acquisition cost asset) included this month’s Operational Report and the one-month projections from last month’s Report. This RSP is in a premium deficiency position (shown as a positive amount) prior to and after actuarial present value adjustments. Actuarial present value adjustments increase the liability value as the adjustments increase the expected future policy obligations (costs) associated with the unearned premium. The variances noted are mainly driven by the unearned premium variance, and due to the valuation implementation.

¹⁰For ease of discussion, “IBNR” is used in place of “provisions for incurred but not recorded (IBNR) and development”.

Nova Scotia RSP Actual vs Projected Summary: Premium Deficiency / (DPAC) Amounts (\$ thousands)

Table 03

	Premium Deficiency / (Deferred Policy Acquisition Costs)		actuarial present value adjustments		Premium Deficiency / (DPAC) including actuarial present value adjustments	
	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected
balance:	794	772	1,117	(31)	1,911	741
balance as % unearned premium:	4.6%	4.5%	6.5%	(0.1%)	11.2%	4.4%
actual unearned premium:	17,095					
less projected:	(119)					

3 Ultimate Loss Ratio Matching Method

An “ultimate loss ratio matching method” continues to be applied to the current month and two projected months shown in the Operational Reports, with IBNR determined by accident year as follows:

- (a) Earned premium to-date
- (b) Ultimate loss¹¹ ratio per latest valuation
- (c) Estimated ultimate incurred = (a) x (b)
- (d) Recorded indemnity & allowed claims expense to-date
- (e) IBNR = (c) – (d)

4 Calendar Year-to-Date Results

The table at the top of the next page summarizes the calendar year-to-date results for indemnity & allowed claims expenses¹², including IBNR.

In calculating the amounts as percentages of earned premium, the calendar year-to-date earned premium has been used, which includes not only the earned premium associated with the current accident year, but also earned premium adjustments related to prior accident years. Specifically, the current accident year (CAY) ratio in the table is 105.1% rather than 103.1% (the valuation ultimate ratio for accident year 2020), as the calendar year-to-date earned premium includes prior accident year earned premium adjustments. (Note that the ratios in this table may differ slightly from those shown in the Nova Scotia RSP Summary of Operations due to rounding.)

¹¹“Loss” here refers to indemnity and allowed claims expenses, but does not include the claims expense allowance included in member company overall expense allowances (“Expense Allowance” in the Operational Report).

¹²Allowed claims expenses are first party legal and other expenses as listed in the RSP Claims Guide. Claims expenses paid through the member company expense allowance are NOT included in this analysis.

Nova Scotia RSP Calendar Year-to-Date Indemnity & Allowed Claims Expense Summary (\$ thousands)

Table 04	YTD Nominal Values		YTD actuarial present value adjustment		YTD Total		Change from Prior Month YTD	
	Amount	% EP	Amount	% EP	Amount	% EP	Amount	LR pts
PAYs	539	6.6%	(250)	(3.0%)	289	3.5%	275	3.2%
CAY	8,649	105.1%	470	5.7%	9,119	110.8%	3,289	4.8%
TOTAL	9,188	111.7%	220	2.7%	9,408	114.3%	3,564	8.1%

(“% EP” based on 2020 calendar year-to-date earned premium; ratios may not total due to rounding)

In general, prior accident years (PAYs) changes from last month are due to the release of the actuarial present value adjustments with claims payments, except when valuations are implemented. The loss ratio change year-to-date in Table 04 reflects not only changes in the prior accident year levels, but also the increase in the calendar year-to-date earned premium with an additional month’s earned premium, and due to the valuation implementation.

For the current accident year (CAY), changes in the year-to-date total reflects the additional month’s exposure and regular changes to actuarial present value adjustments as the year ages, and due to the valuation implementation.

5 Current Operational Report – Additional Exhibits

Section 6 provides exhibits pertaining to the actuarial provisions reflected in the current month’s Operational Report.

IBNR (including actuarial present value adjustments) presented in section 6, Exhibit A, were derived on a discounted basis, and therefore reflect the time value of money and include an explicit provision for adverse deviations in accordance with accepted actuarial practice in Canada.

IBNR presented in section 6, Exhibit B, does NOT include any actuarial present value adjustments. The “Total IBNR” from this exhibit is shown in the Operational Report as “Undiscounted IBNR”.

The ultimate loss ratios detailed in section 6, Exhibit B, refer to the estimates derived on the basis of various actuarial methodologies applied to the experience of the Nova Scotia Risk Sharing Pool for the purposes of the most recent quarterly valuation. As discussed in section 3, IBNR reflected in the current month’s Operational Report was derived as the difference between the estimated ultimate for the claims amount (i.e. earned premium x ultimate loss ratio) and the associated current recorded amounts (life-to-date payments plus current case reserves).

6 EXHIBITS

The exhibits listed below are provided on the pages that follow:

- EXHIBIT A IBNR for Member Sharing – includes Actuarial Present Value Adjustments
- EXHIBIT B IBNR
- EXHIBIT C Premium Liabilities
- EXHIBIT D Projected Year-end Policy Liabilities
- EXHIBIT E Discount Rate & Margins for Adverse Deviations
- EXHIBIT F Interest Rate Sensitivity
- EXHIBIT G Components of IBNR Change During Month

EXHIBIT A

IBNR for Member Sharing – includes Actuarial Present Value Adjustments

TABLE EXHIBIT A

		Amounts in \$000s				
IBNR + M/S actuarial present value adjustments	Accident Year	Actual Feb. 2020	Actual Mar. 2020	Projected Apr. 2020	Projected May. 2020	Projected Dec. 2020
	2007	(1)	(1)	(1)	(1)	(1)
	2008	2	2	2	2	2
	2009	10	11	11	11	10
	2010	4	4	4	4	4
	2011	8	17	17	17	17
	2012	114	40	39	40	36
	2013	(136)	(170)	(167)	(165)	(142)
	2014	102	142	141	141	130
discount rate 1.64%	2015	280	92	91	90	84
	2016	487	586	577	567	473
	2017	3,419	3,244	3,208	3,042	2,510
interest rate margin 25 basis pts	2018	8,697	8,446	8,215	8,097	6,608
	2019	14,258	15,042	14,606	14,182	11,887
	2020	4,142	5,199	7,003	9,176	16,928
	TOTAL	31,386	32,654	33,746	35,203	38,546
	Change		1,268	1,092	1,457	

Please see Exhibit G, page 1 for Components of Change during Current Month

EXHIBIT B

IBNR

TABLE EXHIBIT B

Amounts in \$000s

IBNR	Ultimate Loss Ratio	Accident Year	Actual Feb. 2020	Actual Mar. 2020	Projected Apr. 2020	Projected May. 2020	Projected Dec. 2020
	53.9%	2007	(1)	(1)	(1)	(1)	(1)
	68.3%	2008	2	2	2	2	2
	63.8%	2009	5	5	5	5	5
	73.4%	2010	4	4	4	4	4
	90.2%	2011	6	16	16	16	16
	102.2%	2012	72	(3)	(3)	(3)	(3)
	88.1%	2013	(262)	(287)	(284)	(281)	(248)
	85.2%	2014	(17)	41	41	41	38
	86.0%	2015	35	(121)	(120)	(119)	(107)
	93.2%	2016	54	177	172	167	138
	94.3%	2017	2,641	2,514	2,489	2,330	1,864
	93.9%	2018	7,399	7,285	7,066	6,960	5,611
	100.5%	2019	12,767	13,576	13,169	12,774	10,641
	103.1%	2020	3,766	4,729	6,383	8,399	15,058
		TOTAL	26,471	27,937	28,939	30,294	33,018
		Change		1,466	1,002	1,355	

Please see Exhibit G, page 2 for Components of Change during Current Month

EXHIBIT C

Premium Liabilities

TABLE EXHIBIT C

	Amounts in \$000s				
	Actual Feb. 2020	Actual Mar. 2020	Projected Apr. 2020	Projected May. 2020	Projected Dec. 2020
Premium Liabilities					
(1) unearned premium (UP)	17,091	17,095	17,481	18,233	21,589
FOR MEMBER SHARING					
(2) expected future costs ratio {% of (1)}	106.7%	111.2%	111.4%	111.7%	114.9%
(3) expected future costs {(1) x (2)}	18,230	19,006	19,471	20,362	24,801
(4) premium deficiency / (deferred policy acquisition cost)	1,139	1,911	1,990	2,129	3,212
Excluding Actuarial Present Value Adjustments					
(5) expected future costs ratio {% of (1)}	100.0%	104.6%	104.8%	105.1%	108.1%
(6) expected future costs {(1) x (5)}	17,093	17,889	18,327	19,166	23,344
(7) premium deficiency / (deferred policy acquisition cost)	2	794	846	933	1,755

EXHIBIT D

Projected Year-end Policy Liabilities

The table below presents the projected policy liabilities as at December 31, 2020, broken down by component.

Nova Scotia		Projected Balances as at Dec. 31, 2020 (\$000s)								
ending 2020		nominal values			actuarial present value adjustments (apvs)					
Acc Yr	Case	IBNR	Total Unpaid	discount	investment PfAD	nominal development PfAD	development PfAD discount	development PfAD	Total apvs	TOTAL
2007	-	(1)	(1)	-	-	-	-	-	-	(1)
2008	-	2	2	-	-	-	-	-	-	2
2009	59	5	64	(1)	-	6	-	6	5	69
2010	-	4	4	-	-	-	-	-	-	4
2011	-	16	16	(1)	-	2	-	2	1	17
2012	511	(3)	508	(13)	2	51	(1)	50	39	547
2013	1,692	(248)	1,444	(40)	6	144	(4)	140	106	1,550
2014	1,169	38	1,207	(31)	5	121	(3)	118	92	1,299
2015	2,606	(107)	2,499	(60)	7	250	(6)	244	191	2,690
2016	3,323	138	3,461	(93)	14	426	(12)	414	335	3,796
2017	5,235	1,864	7,099	(227)	35	866	(28)	838	646	7,745
2018	5,912	5,611	11,523	(426)	58	1,417	(52)	1,365	997	12,520
2019	4,832	10,641	15,473	(681)	108	1,903	(84)	1,819	1,246	16,719
PAYs (sub-total):	25,339	17,960	43,299	(1,573)	235	5,186	(190)	4,996	3,658	46,957
CAY (2020)	11,670	15,058	26,728	(1,363)	214	3,181	(162)	3,019	1,870	28,598
claims liabilities:	37,009	33,018	70,027	(2,936)	449	8,367	(352)	8,015	5,528	75,555
	Unearned Premium	Premium Deficiency / (DPAC)	Total Provision	discount	investment PfAD	nominal development PfAD	development PfAD discount	development PfAD	Total apvs	TOTAL*
premium liabilities:	21,589	1,755	23,344	(876)	115	2,306	(88)	2,218	1,457	24,801
policy liabilities:			93,371	(3,812)	564	10,673	(440)	10,233	6,985	100,356

*Total may not be sum of parts, as apvs apply to future costs within UPR

EXHIBIT E

Discount Rate & Margins for Adverse Deviations

The tables below present selected margins for adverse development by coverage (the total is a weighted average, based on the unpaid claims projection for December 31, 2020 from the valuation), followed by the selected discount rate and the associated margin for investment income.

Selected Claims Development MfADs (Dec. 31,
2019)

Accident Year	Third Party Liability Margins	Accident Benefits Margins	Other Coverages Margins	Total Margins
2007	10.0%	10.0%	10.0%	10.0%
2008	10.0%	10.0%	10.0%	10.0%
2009	10.0%	10.0%	10.0%	10.0%
2010	10.0%	10.0%	10.0%	10.0%
2011	10.0%	10.0%	10.0%	10.0%
2012	10.0%	10.0%	10.0%	10.0%
2013	10.0%	10.0%	10.0%	10.0%
2014	10.0%	10.0%	10.0%	10.0%
2015	10.0%	10.0%	10.0%	10.0%
2016	12.5%	10.0%	12.5%	12.3%
2017	12.5%	10.0%	9.0%	12.2%
2018	12.5%	10.0%	11.3%	12.3%
2019	12.5%	10.0%	8.2%	12.3%
2020	12.4%	10.0%	5.5%	11.9%
<u>prem liab</u>	<u>11.9%</u>	<u>10.0%</u>	<u>5.1%</u>	<u>10.0%</u>

discount rate: 1.64%
margin (basis points): 25

EXHIBIT F
Interest Rate Sensitivity

The tables below present sensitivity to the member statement claims liability as projected to Dec. 31, 2020 from the latest valuation date (projections in exhibits A to D are to Dec. 31, 2020, and are based on more up-to-date information). We have included the most recent valuation selection (1.64%), the prior valuation assumption (1.46%) and the prior fiscal year end valuation assumption (1.46%) for comparative purposes. A 25 basis point margin for investment return adverse deviation is used in all scenarios presented.

\$ Format: \$000s

Actuarial Present Value of Provisions at Various Discount Rates - Dec. 31, 2020 projected Unpaid								
AY	0.64%	1.14%	1.64%	2.14%	2.64%	3.14%	1.46%	1.46%
2008	-	-	-	-	-	-	-	-
2009	54	54	54	53	53	53	54	54
2010	-	-	-	-	-	-	-	-
2011	124	123	122	120	119	118	122	122
2012	454	451	447	444	440	437	448	448
2013	720	714	708	702	696	690	710	710
2014	578	573	569	564	560	555	570	570
2015	2,072	2,057	2,042	2,027	2,013	1,999	2,047	2,047
2016	3,671	3,641	3,611	3,583	3,554	3,527	3,622	3,622
2017	6,779	6,712	6,647	6,583	6,520	6,458	6,670	6,670
2018	12,449	12,305	12,164	12,026	11,891	11,759	12,215	12,215
2019	18,681	18,427	18,179	17,940	17,703	17,473	18,269	18,269
2020	25,959	25,546	25,148	24,764	24,388	24,019	25,293	25,293
Total	71,541	70,603	69,691	68,806	67,937	67,088	70,020	70,020
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

Dollar Impact Relative to Valuation Assumption								
AY	0.64%	1.14%	1.64%	2.14%	2.64%	3.14%	1.46%	1.46%
Total	1,850	912	-	(885)	(1,754)	(2,603)	329	329
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

Percentage Impact Relative to Valuation Assumption								
AY	0.64%	1.14%	1.64%	2.14%	2.64%	3.14%	1.46%	1.46%
2008	-	-	-	-	-	-	-	-
2009	-	-	-	(1.9%)	(1.9%)	(1.9%)	-	-
2010	-	-	-	-	-	-	-	-
2011	1.6%	0.8%	-	(1.6%)	(2.5%)	(3.3%)	-	-
2012	1.6%	0.9%	-	(0.7%)	(1.6%)	(2.2%)	0.2%	0.2%
2013	1.7%	0.8%	-	(0.8%)	(1.7%)	(2.5%)	0.3%	0.3%
2014	1.6%	0.7%	-	(0.9%)	(1.6%)	(2.5%)	0.2%	0.2%
2015	1.5%	0.7%	-	(0.7%)	(1.4%)	(2.1%)	0.2%	0.2%
2016	1.7%	0.8%	-	(0.8%)	(1.6%)	(2.3%)	0.3%	0.3%
2017	2.0%	1.0%	-	(1.0%)	(1.9%)	(2.8%)	0.3%	0.3%
2018	2.3%	1.2%	-	(1.1%)	(2.2%)	(3.3%)	0.4%	0.4%
2019	2.8%	1.4%	-	(1.3%)	(2.6%)	(3.9%)	0.5%	0.5%
2020	3.2%	1.6%	-	(1.5%)	(3.0%)	(4.5%)	0.6%	0.6%
Total	2.7%	1.3%	-	(1.3%)	(2.5%)	(3.7%)	0.5%	0.5%
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

EXHIBIT G

Page 1 of 2

Components of Member Statement IBNR (i.e. “Discounted”) Change During Month

RSP Nova Scotia
AccountCode Desc IBNR - Discounted

M/S IBNR - in \$000s

AccYear	Values				Sum of Total Change	Sum of % Total Change	Sum of Current Month Final Amount
	Sum of Prior Month Actual Amount	Sum of Projected Change	Sum of Change Due to AvsP Variances	Sum of Change Due to Valuation Implementation			
2007	(1)	-	-	-	-	-	(1)
2008	2	-	-	-	-	-	2
2009	10	-	-	1	1	10.0%	11
2010	4	-	-	-	-	-	4
2011	8	-	10	(1)	9	112.5%	17
2012	114	(1)	(38)	(35)	(74)	(64.9%)	40
2013	(136)	2	(30)	(6)	(34)	25.0%	(170)
2014	102	(1)	47	(6)	40	39.2%	142
2015	280	(3)	(111)	(74)	(188)	(67.1%)	92
2016	487	(6)	(65)	170	99	20.3%	586
2017	3,419	(89)	(36)	(50)	(175)	(5.1%)	3,244
2018	8,697	(249)	283	(285)	(251)	(2.9%)	8,446
2019	14,258	(413)	341	856	784	5.5%	15,042
2020	4,142	1,433	(738)	362	1,057	25.5%	5,199
Grand Total	31,386	673	(337)	932	1,268	4.0%	32,654

EXHIBIT G

Components of IBNR (i.e. “Undiscounted”) Change During Month

RSP		Nova Scotia						IBNR - in \$000s
AccountCode Desc		IBNR - Undiscounted						
AccYear	Values							Sum of Current Month Final Amount
	Sum of Prior Month Actual Amount	Sum of Projected Change	Sum of Change Due to AvsP Variances	Sum of Change Due to Valuation Implementation	Sum of Total Change	Sum of % Total Change		
2007	(1)	-	-	-	-	-	(1)	
2008	2	-	-	-	-	-	2	
2009	5	-	-	-	-	-	5	
2010	4	-	-	-	-	-	4	
2011	6	-	10	-	10	166.7%	16	
2012	72	(1)	(35)	(39)	(75)	(104.2%)	(3)	
2013	(262)	3	(28)	-	(25)	9.5%	(287)	
2014	(17)	-	58	-	58	(341.2%)	41	
2015	35	-	(100)	(56)	(156)	(445.7%)	(121)	
2016	54	(1)	(54)	178	123	227.8%	177	
2017	2,641	(79)	(29)	(19)	(127)	(4.8%)	2,514	
2018	7,399	(222)	301	(193)	(114)	(1.5%)	7,285	
2019	12,767	(383)	370	822	809	6.3%	13,576	
2020	3,766	1,273	(688)	378	963	25.6%	4,729	
Grand Total	26,471	590	(195)	1,071	1,466	5.5%	27,937	