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March 29, 2019

British Columbia Utilities Commission
Suite 410
900 Howe Street
Vancouver, BC V6Z 2N3

Attention: Mr. Patrick Wruck, Commission Secretary and Manager, Regulatory Services

**Re: Filing of Supplemental Information in the Response
to Information Request 2019.1 RR TLA.99.46**

Dear Mr. Wruck:

In review of ICBC's responses to Information Requests filed on March 8, 2019, it has come to ICBC's attention that the following supplemental information should also be included in the response to information request 2019.1 RR TLA.99.46 to aid in the analyses of the source data provided.

In the response to the aforementioned information request, the R² values were not provided.

Please find a revised Attachment A - Summary of Diagnostic Statistics for Technical Appendix D.0, with R² values provided, attached with this letter. A revised Microsoft Excel version of the attachment is also provided.

This additional information has no impact on the rate change to cover costs or on the proposed rate change of 6.3%.

Yours truly,

June Elder
Manager, Corporate Regulatory Affairs
jb/tj

Cc: Registered Interveners
Bill Carpenter, Vice President, Insurance, ICBC

Attachments



2019.1 RR TLA.99.46 – Attachment A – Summary of Diagnostic Statistics for Technical Appendix D.0

Basic Bodily Injury Frequency (Personal)

(a)

	(1)	(2)	(3)	(4) (3) - (2)	(5)	(6)	(7) (4) / (b)
Fiscal Loss	Rank	Actual	Fitted Value	Residual	Probability	Normal Z	Student Residual
2015Q1	16	1.18%	1.24%	0.06%	0.97	1.86	1.91
2015Q2	10	1.24%	1.25%	0.01%	0.59	0.24	0.22
2015Q3	12	1.52%	1.53%	0.02%	0.72	0.58	0.58
2015Q4	9	1.36%	1.35%	-0.01%	0.53	0.08	-0.17
2016Q1	3	1.32%	1.29%	-0.03%	0.16	-1.01	-0.87
2016Q2	5	1.32%	1.30%	-0.02%	0.28	-0.58	-0.72
2016Q3	8	1.61%	1.60%	-0.01%	0.47	-0.08	-0.24
2016Q4	1	1.47%	1.41%	-0.06%	0.03	-1.86	-1.96
2017Q1	2	1.37%	1.35%	-0.03%	0.09	-1.32	-0.94
2017Q2	6	1.37%	1.35%	-0.02%	0.34	-0.40	-0.55
2017Q3	4	1.69%	1.67%	-0.02%	0.22	-0.78	-0.76
2017Q4	15	1.43%	1.47%	0.04%	0.91	1.32	1.39
2018Q1	7	1.41%	1.40%	-0.01%	0.41	-0.24	-0.32
2018Q2	14	1.38%	1.41%	0.03%	0.84	1.01	1.08
2018Q3	11	1.72%	1.74%	0.01%	0.66	0.40	0.39
2018Q4	13	1.51%	1.53%	0.03%	0.78	0.78	0.80

(b) Standard deviation of residuals

0.032%

(c) R²

95%

(1) Ranking of the residuals from lowest to highest

(2) From 2019.1 RR TLA.99.48 Attachment A Page 1 column (7)

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank

Basic Property Damage Frequency (Personal)

(a)

Fiscal Loss Quarter	(1) Rank	(2) Actual	(3) Fitted Value	(4) Residual (3) - (2)	(5) Probability	(6) Normal Z	(7) Student Residual (4) / (b)
2014Q1	3	4.48%	4.37%	-0.11%	0.14	-1.09	-1.03
2014Q2	2	4.33%	4.18%	-0.14%	0.08	-1.38	-1.36
2014Q3	15	4.52%	4.62%	0.10%	0.81	0.86	0.95
2014Q4	14	4.26%	4.36%	0.10%	0.75	0.67	0.94
2015Q1	17	4.26%	4.42%	0.16%	0.92	1.38	1.56
2015Q2	11	4.21%	4.23%	0.02%	0.58	0.21	0.22
2015Q3	8	4.72%	4.67%	-0.05%	0.42	-0.21	-0.47
2015Q4	16	4.27%	4.41%	0.14%	0.86	1.09	1.37
2016Q1	6	4.53%	4.47%	-0.06%	0.31	-0.51	-0.53
2016Q2	9	4.33%	4.28%	-0.05%	0.47	-0.07	-0.44
2016Q3	5	4.82%	4.72%	-0.09%	0.25	-0.67	-0.90
2016Q4	4	4.56%	4.46%	-0.10%	0.19	-0.86	-0.98
2017Q1	7	4.57%	4.52%	-0.05%	0.36	-0.36	-0.48
2017Q2	10	4.34%	4.33%	-0.01%	0.53	0.07	-0.07
2018Q1	13	4.53%	4.57%	0.05%	0.69	0.51	0.44
2018Q2	18	4.20%	4.38%	0.18%	0.97	1.91	1.66
2018Q3	12	4.79%	4.83%	0.04%	0.64	0.36	0.38
2018Q4	1	4.72%	4.56%	-0.16%	0.03	-1.91	-1.47

(b) Standard deviation of residuals

0.106%

(c) R²

72%

(1) Ranking of the residuals from lowest to highest

(2) From 2019.1 RR TLA.99.48 Attachment A Page 3 column (7)

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank

Medical Rehabilitation Frequency (Personal)

(a)

	(1)	(2)	(3)	(4) (3) - (2)	(5)	(6)	(7) (4) / (b)
Fiscal Loss	Rank	Actual	Fitted Value	Residual	Probability	Normal Z	Student Residual
2015Q1	16	1.49%	1.55%	0.06%	0.97	1.86	1.57
2015Q2	9	1.58%	1.58%	0.00%	0.53	0.08	0.11
2015Q3	8	1.88%	1.88%	0.00%	0.47	-0.08	0.03
2015Q4	11	1.65%	1.66%	0.01%	0.66	0.40	0.38
2016Q1	3	1.63%	1.60%	-0.03%	0.16	-1.01	-0.81
2016Q2	5	1.65%	1.62%	-0.02%	0.28	-0.58	-0.60
2016Q3	13	1.90%	1.93%	0.03%	0.78	0.78	0.91
2016Q4	1	1.79%	1.71%	-0.08%	0.03	-1.86	-2.20
2017Q1	6	1.66%	1.64%	-0.02%	0.34	-0.40	-0.58
2017Q2	4	1.70%	1.67%	-0.03%	0.22	-0.78	-0.73
2017Q3	2	2.03%	1.98%	-0.05%	0.09	-1.32	-1.20
2017Q4	14	1.71%	1.75%	0.04%	0.84	1.01	1.13
2018Q1	7	1.69%	1.68%	-0.01%	0.41	-0.24	-0.31
2018Q2	15	1.67%	1.71%	0.05%	0.91	1.32	1.23
2018Q3	10	2.03%	2.04%	0.01%	0.59	0.24	0.21
2018Q4	12	1.77%	1.80%	0.03%	0.72	0.58	0.68

(b) Standard deviation of residuals

0.038%

(c) R²

93%

(1) Ranking of the residuals from lowest to highest

(2) From 2019.1 RR TLA.99.48 Attachment A Page 5 column (7)

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank

Basic Property Damage Severity (Personal)

(a)

Fiscal Loss Quarter	(1) Rank	(2) Actual	(3) Fitted Value	(4) (3) - (2) Residual	(5) Probability	(6) Normal Z	(7) (4) / (b) Student Residual
2013Q1	9	2,527	2,478	(49)	0.35	-0.37	-0.51
2013Q2	10	2,672	2,629	(43)	0.40	-0.26	-0.44
2013Q3	7	2,763	2,679	(84)	0.27	-0.61	-0.87
2013Q4	6	2,712	2,627	(84)	0.23	-0.74	-0.87
2014Q1	14	2,655	2,677	23	0.56	0.16	0.24
2014Q2	21	2,727	2,841	114	0.85	1.05	1.18
2014Q3	19	2,809	2,895	86	0.77	0.74	0.89
2014Q4	12	2,849	2,839	(10)	0.48	-0.05	-0.11
2015Q1	20	2,804	2,893	89	0.81	0.89	0.92
2015Q2	18	2,987	3,070	83	0.73	0.61	0.86
2015Q3	15	3,105	3,129	24	0.60	0.26	0.25
2015Q4	11	3,093	3,068	(25)	0.44	-0.16	-0.26
2016Q1	22	3,005	3,127	121	0.90	1.26	1.25
2016Q2	17	3,246	3,318	72	0.69	0.49	0.74
2016Q3	13	3,385	3,381	(4)	0.52	0.05	-0.04
2016Q4	2	3,461	3,315	(145)	0.06	-1.53	-1.50
2017Q1	5	3,482	3,379	(104)	0.19	-0.89	-1.07
2017Q2	1	3,744	3,585	(159)	0.02	-2.04	-1.64
2017Q3	16	3,611	3,654	42	0.65	0.37	0.44
2017Q4	23	3,442	3,583	141	0.94	1.53	1.45
2018Q1	4	3,760	3,651	(109)	0.15	-1.05	-1.12
2018Q2	3	3,996	3,874	(121)	0.10	-1.26	-1.25
2018Q3	8	4,018	3,948	(69)	0.31	-0.49	-0.71
2018Q4	24	3,697	3,871	175	0.98	2.04	1.80

(b) Standard deviation of residuals

97.0

(c) R²

96%

(1) Ranking of the residuals from lowest to highest

(2) From 2019.1 RR TLA.99.48 Attachment B Page 3 column (9)

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank

Medical Rehabilitation Severity (Personal)

(a)

Fiscal Loss Quarter	(1) Rank	(2) Actual	(3) Fitted Value	(4) (3) - (2) Residual	(5) Probability	(6) Normal Z	(7) (4) / (b) Student Residual
2011Q1	9	2,251	2,163	(89)	0.28	-0.57	-0.76
2011Q2	21	2,271	2,354	83	0.68	0.48	0.71
2011Q3	7	2,303	2,203	(101)	0.22	-0.78	-0.86
2011Q4	17	2,184	2,210	25	0.55	0.13	0.22
2012Q1	20	2,205	2,287	82	0.65	0.39	0.70
2012Q2	11	2,556	2,489	(66)	0.35	-0.39	-0.57
2012Q3	26	2,207	2,329	123	0.85	1.04	1.04
2012Q4	29	2,189	2,337	147	0.95	1.64	1.26
2013Q1	12	2,479	2,418	(61)	0.38	-0.30	-0.52
2013Q2	25	2,536	2,632	96	0.82	0.90	0.82
2013Q3	30	2,255	2,463	207	0.98	2.13	1.77
2013Q4	18	2,422	2,471	48	0.58	0.21	0.41
2014Q1	23	2,472	2,557	85	0.75	0.67	0.72
2014Q2	4	2,947	2,783	(164)	0.12	-1.19	-1.40
2014Q3	1	2,812	2,604	(207)	0.02	-2.13	-1.77
2014Q4	6	2,744	2,613	(131)	0.18	-0.90	-1.12
2015Q1	13	2,711	2,703	(8)	0.42	-0.21	-0.06
2015Q2	2	3,140	2,943	(198)	0.05	-1.64	-1.69
2015Q3	5	2,906	2,754	(152)	0.15	-1.04	-1.30
2015Q4	3	2,953	2,763	(190)	0.08	-1.38	-1.62
2016Q1	19	2,778	2,859	80	0.62	0.30	0.68
2016Q2	16	3,087	3,112	24	0.52	0.04	0.21
2016Q3	15	2,898	2,912	14	0.48	-0.04	0.12
2016Q4	10	2,992	2,921	(71)	0.32	-0.48	-0.60
2017Q1	8	3,117	3,023	(94)	0.25	-0.67	-0.80
2017Q2	28	3,152	3,290	138	0.92	1.38	1.18
2018Q1	14	3,196	3,196	(0)	0.45	-0.13	0.00
2018Q2	22	3,394	3,479	85	0.72	0.57	0.72
2018Q3	24	3,164	3,255	91	0.78	0.78	0.78
2018Q4	27	3,129	3,266	137	0.88	1.19	1.17

(b) Standard deviation of residuals

117.3

(c) R²

90%

(1) Ranking of the residuals from lowest to highest

(2) From 2019.1 RR TLA.99.48 Attachment B Page 5 column (9)

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank

Weekly Benefits Severity (Personal)

(a)

Fiscal Loss Quarter	(1) Rank	(2) Actual	(3) Fitted Value	(4) Residual (3) - (2)	(5) Probability	(6) Normal Z	(7) Student Residual (4) / (b)
2010Q4	2	8,746	7,380	(1,366)	0.05	-1.61	-1.61
2011Q1	10	7,892	7,587	(305)	0.34	-0.41	-0.36
2011Q2	15	8,438	8,387	(51)	0.52	0.04	-0.06
2011Q3	12	7,679	7,432	(246)	0.41	-0.23	-0.29
2011Q4	8	8,088	7,689	(398)	0.27	-0.62	-0.47
2012Q1	27	6,630	7,905	1,275	0.95	1.61	1.50
2012Q2	20	8,418	8,738	320	0.70	0.51	0.38
2012Q3	23	6,884	7,744	860	0.80	0.85	1.01
2012Q4	26	6,947	8,012	1,065	0.91	1.35	1.26
2013Q1	16	8,223	8,237	13	0.55	0.13	0.02
2013Q2	13	9,315	9,105	(210)	0.45	-0.13	-0.25
2013Q3	24	7,106	8,069	963	0.84	0.99	1.14
2013Q4	28	7,031	8,348	1,317	0.98	2.10	1.55
2014Q1	11	8,836	8,582	(254)	0.38	-0.32	-0.30
2014Q2	4	10,658	9,487	(1,171)	0.13	-1.15	-1.38
2014Q3	1	10,302	8,408	(1,895)	0.02	-2.10	-2.23
2014Q4	5	9,821	8,698	(1,123)	0.16	-0.99	-1.32
2015Q1	3	10,299	8,942	(1,357)	0.09	-1.35	-1.60
2015Q2	14	10,028	9,885	(143)	0.48	-0.04	-0.17
2015Q3	17	8,679	8,760	81	0.59	0.23	0.10
2015Q4	21	8,365	9,063	699	0.73	0.62	0.82
2016Q1	22	8,544	9,317	773	0.77	0.73	0.91
2016Q2	19	10,012	10,299	287	0.66	0.41	0.34
2016Q3	9	9,477	9,128	(350)	0.30	-0.51	-0.41
2016Q4	7	9,956	9,443	(513)	0.23	-0.73	-0.61
2017Q1	6	10,249	9,708	(541)	0.20	-0.85	-0.64
2017Q2	25	9,768	10,731	963	0.88	1.15	1.14
2017Q3	18	9,329	9,511	181	0.63	0.32	0.21

(b) Standard deviation of residuals

847.9

(c) R²

49%

(1) Ranking of the residuals from lowest to highest

(2) From 2019.1 RR TLA.99.48 Attachment B Page 7 column (9)

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank

Basic Bodily Injury Frequency (Commercial)

(a)

Fiscal Loss Quarter	(1) Rank	(2) Actual	(3) Fitted Value	(4) Residual (3) - (2)	(5) Probability	(6) Normal Z	(7) Student Residual (4) / (b)
2013Q1	3	1.55%	1.46%	-0.09%	0.10	-1.26	-1.25
2013Q2	18	1.46%	1.52%	0.06%	0.73	0.61	0.82
2013Q3	2	1.75%	1.65%	-0.10%	0.06	-1.53	-1.39
2013Q4	11	1.50%	1.47%	-0.03%	0.44	-0.16	-0.38
2014Q1	1	1.69%	1.55%	-0.14%	0.02	-2.04	-2.02
2014Q2	13	1.61%	1.61%	-0.01%	0.52	0.05	-0.07
2014Q3	23	1.66%	1.75%	0.09%	0.94	1.53	1.24
2014Q4	20	1.49%	1.56%	0.07%	0.81	0.89	0.99
2015Q1	24	1.50%	1.64%	0.14%	0.98	2.04	2.02
2015Q2	16	1.68%	1.70%	0.02%	0.65	0.37	0.33
2015Q3	9	1.88%	1.85%	-0.03%	0.35	-0.37	-0.49
2015Q4	22	1.57%	1.65%	0.08%	0.90	1.26	1.22
2016Q1	17	1.69%	1.73%	0.05%	0.69	0.49	0.70
2016Q2	14	1.79%	1.80%	0.01%	0.56	0.16	0.22
2016Q3	21	1.88%	1.96%	0.08%	0.85	1.05	1.11
2016Q4	5	1.81%	1.75%	-0.06%	0.19	-0.89	-0.92
2017Q1	12	1.84%	1.84%	-0.01%	0.48	-0.05	-0.09
2017Q2	4	1.98%	1.91%	-0.07%	0.15	-1.05	-0.98
2017Q3	15	2.06%	2.08%	0.02%	0.60	0.26	0.26
2017Q4	10	1.88%	1.85%	-0.03%	0.40	-0.26	-0.44
2018Q1	19	1.89%	1.95%	0.06%	0.77	0.74	0.83
2018Q2	8	2.06%	2.02%	-0.04%	0.31	-0.49	-0.65
2018Q3	7	2.25%	2.20%	-0.05%	0.27	-0.61	-0.78
2018Q4	6	2.01%	1.96%	-0.05%	0.23	-0.74	-0.78

(b) Standard deviation of residuals

0.068%

(c) R²

88%

(1) Ranking of the residuals from lowest to highest

(2) From 2019.1 RR TLA.99.48 Attachment A Page 11 column (7)

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank

Basic Property Damage Frequency (Commercial)

(a)

	(1)	(2)	(3)	(4) (3) - (2)	(5)	(6)	(7) (4) / (b)
Fiscal Loss	Rank	Actual	Fitted Value	Residual	Probability	Normal Z	Student Residual
2014Q1	3	7.37%	7.00%	-0.37%	0.14	-1.09	-1.40
2014Q2	1	7.60%	7.15%	-0.46%	0.03	-1.91	-1.72
2014Q3	4	7.46%	7.11%	-0.35%	0.19	-0.86	-1.30
2014Q4	9	6.74%	6.71%	-0.04%	0.47	-0.07	-0.14
2015Q1	18	6.75%	7.18%	0.43%	0.97	1.91	1.62
2015Q2	13	7.15%	7.33%	0.18%	0.69	0.51	0.66
2015Q3	12	7.14%	7.30%	0.16%	0.64	0.36	0.59
2015Q4	16	6.62%	6.88%	0.26%	0.86	1.09	0.98
2016Q1	14	7.15%	7.37%	0.22%	0.75	0.67	0.81
2016Q2	17	7.20%	7.52%	0.32%	0.92	1.38	1.20
2016Q3	15	7.24%	7.49%	0.24%	0.81	0.86	0.91
2016Q4	11	6.94%	7.06%	0.12%	0.58	0.21	0.45
2017Q1	6	7.66%	7.56%	-0.10%	0.31	-0.51	-0.39
2017Q2	8	7.76%	7.72%	-0.04%	0.42	-0.21	-0.14
2018Q1	5	7.96%	7.76%	-0.20%	0.25	-0.67	-0.76
2018Q2	10	7.93%	7.92%	-0.01%	0.53	0.07	-0.02
2018Q3	7	7.94%	7.88%	-0.06%	0.36	-0.36	-0.21
2018Q4	2	7.82%	7.43%	-0.39%	0.08	-1.38	-1.45

(b) Standard deviation of residuals

0.267%

(c) R²

62%

(1) Ranking of the residuals from lowest to highest

(2) From 2019.1 RR TLA.99.48 Attachment A Page 13 column (7)

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank

Medical Rehabilitation Frequency (Commercial)

(a)

Fiscal Loss Quarter	(1) Rank	(2) Actual	(3) Fitted Value	(4) (3) - (2) Residual	(5) Probability	(6) Normal Z	(7) (4) / (b) Student Residual
2011Q1	20	0.76%	0.77%	0.01%	0.61	0.28	0.23
2011Q2	16	0.80%	0.80%	-0.01%	0.48	-0.04	-0.19
2011Q3	2	0.96%	0.91%	-0.05%	0.05	-1.68	-1.17
2011Q4	18	0.84%	0.83%	0.00%	0.55	0.12	-0.06
2012Q1	5	0.83%	0.79%	-0.04%	0.14	-1.08	-0.97
2012Q2	4	0.87%	0.82%	-0.05%	0.11	-1.23	-1.15
2012Q3	19	0.95%	0.94%	0.00%	0.58	0.20	-0.01
2012Q4	10	0.89%	0.86%	-0.03%	0.30	-0.53	-0.65
2013Q1	25	0.79%	0.82%	0.04%	0.77	0.72	0.89
2013Q2	32	0.72%	0.85%	0.13%	0.98	2.15	3.19
2013Q3	26	0.94%	0.98%	0.04%	0.80	0.83	0.94
2013Q4	27	0.85%	0.89%	0.04%	0.83	0.95	0.97
2014Q1	14	0.86%	0.85%	-0.02%	0.42	-0.20	-0.41
2014Q2	9	0.91%	0.88%	-0.03%	0.27	-0.63	-0.70
2014Q3	13	1.03%	1.01%	-0.02%	0.39	-0.28	-0.45
2014Q4	1	0.99%	0.92%	-0.07%	0.02	-2.15	-1.88
2015Q1	31	0.82%	0.88%	0.06%	0.95	1.68	1.47
2015Q2	12	0.93%	0.91%	-0.02%	0.36	-0.36	-0.47
2015Q3	8	1.07%	1.04%	-0.03%	0.23	-0.72	-0.72
2015Q4	29	0.91%	0.95%	0.04%	0.89	1.23	0.97
2016Q1	24	0.88%	0.91%	0.02%	0.73	0.63	0.61
2016Q2	21	0.93%	0.94%	0.01%	0.64	0.36	0.24
2016Q3	22	1.07%	1.08%	0.01%	0.67	0.45	0.27
2016Q4	28	0.94%	0.98%	0.04%	0.86	1.08	0.97
2017Q1	3	0.98%	0.94%	-0.05%	0.08	-1.42	-1.15
2017Q2	7	1.01%	0.97%	-0.03%	0.20	-0.83	-0.87
2017Q3	23	1.10%	1.11%	0.01%	0.70	0.53	0.30
2017Q4	15	1.03%	1.02%	-0.01%	0.45	-0.12	-0.28
2018Q1	6	1.00%	0.97%	-0.04%	0.17	-0.95	-0.94
2018Q2	11	1.03%	1.00%	-0.02%	0.33	-0.45	-0.55
2018Q3	30	1.11%	1.15%	0.04%	0.92	1.42	0.99
2018Q4	17	1.05%	1.05%	0.00%	0.52	0.04	-0.10

(b) Standard deviation of residuals

0.039%

(c) R²

83%

(1) Ranking of the residuals from lowest to highest

(2) From 2019.1 RR TLA.99.48 Attachment A Page 15 column (7)

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank

Basic Property Damage Severity (Commercial)

(a)

Fiscal Loss Quarter	(1) Rank	(2) Actual	(3) Fitted Value	(4) (3) - (2) Residual	(5) Probability	(6) Normal Z	(7) (4) / (b) Student Residual
2011Q1	8	3,237	3,093	(145)	0.23	-0.72	-0.80
2011Q2	18	3,217	3,198	(20)	0.55	0.12	-0.11
2011Q3	11	3,595	3,484	(111)	0.33	-0.45	-0.61
2011Q4	4	3,756	3,548	(208)	0.11	-1.23	-1.15
2012Q1	1	3,604	3,271	(333)	0.02	-2.15	-1.84
2012Q2	21	3,320	3,382	63	0.64	0.36	0.35
2012Q3	2	3,997	3,685	(312)	0.05	-1.68	-1.72
2012Q4	23	3,634	3,753	120	0.70	0.53	0.66
2013Q1	31	3,145	3,460	315	0.95	1.68	1.74
2013Q2	22	3,509	3,578	68	0.67	0.45	0.38
2013Q3	29	3,651	3,898	247	0.89	1.23	1.36
2013Q4	30	3,672	3,970	298	0.92	1.42	1.64
2014Q1	25	3,536	3,660	124	0.77	0.72	0.68
2014Q2	32	3,422	3,784	362	0.98	2.15	2.00
2014Q3	26	3,982	4,123	141	0.80	0.83	0.78
2014Q4	10	4,316	4,199	(117)	0.30	-0.53	-0.65
2015Q1	27	3,697	3,871	174	0.83	0.95	0.96
2015Q2	3	4,232	4,002	(230)	0.08	-1.42	-1.27
2015Q3	14	4,435	4,361	(74)	0.42	-0.20	-0.41
2015Q4	20	4,397	4,441	44	0.61	0.28	0.24
2016Q1	24	3,972	4,094	122	0.73	0.63	0.68
2016Q2	7	4,389	4,233	(156)	0.20	-0.83	-0.86
2016Q3	19	4,619	4,613	(6)	0.58	0.20	-0.03
2016Q4	16	4,724	4,698	(27)	0.48	-0.04	-0.15
2017Q1	5	4,533	4,330	(203)	0.14	-1.08	-1.12
2017Q2	6	4,643	4,478	(165)	0.17	-0.95	-0.91
2017Q3	28	4,652	4,879	227	0.86	1.08	1.25
2017Q4	15	5,002	4,969	(33)	0.45	-0.12	-0.18
2018Q1	13	4,662	4,580	(82)	0.39	-0.28	-0.45
2018Q2	17	4,756	4,736	(20)	0.52	0.04	-0.11
2018Q3	12	5,250	5,160	(90)	0.36	-0.36	-0.50
2018Q4	9	5,380	5,255	(125)	0.27	-0.63	-0.69

(b) Standard deviation of residuals

181.2

(c) R²

90%

(1) Ranking of the residuals from lowest to highest

(2) From 2019.1 RR TLA.99.48 Attachment B Page 13 column (9)

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank

Medical Rehabilitation Severity (Commercial)

(a)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fiscal Loss	Rank	Actual	Fitted Value	Residual (3) - (2)	Probability	Normal Z	Student Residual (4) / (b)
2004Q1	54	1,288	1,670	382	0.89	1.24	0.88
2004Q2	44	1,446	1,721	275	0.73	0.60	0.63
2004Q3	15	2,053	1,735	(318)	0.24	-0.70	-0.73
2004Q4	30	1,597	1,654	57	0.49	-0.02	0.13
2005Q1	11	2,174	1,733	(441)	0.18	-0.93	-1.01
2005Q2	25	1,800	1,786	(14)	0.41	-0.23	-0.03
2005Q3	27	1,789	1,801	12	0.44	-0.15	0.03
2005Q4	26	1,713	1,717	4	0.43	-0.19	0.01
2006Q1	56	1,338	1,799	461	0.93	1.44	1.06
2006Q2	1	3,084	1,854	(1,230)	0.01	-2.39	-2.83
2006Q3	17	2,160	1,869	(291)	0.28	-0.60	-0.67
2006Q4	29	1,754	1,782	27	0.48	-0.06	0.06
2007Q1	16	2,159	1,867	(292)	0.26	-0.65	-0.67
2007Q2	41	1,684	1,924	240	0.68	0.45	0.55
2007Q3	59	1,294	1,940	646	0.98	1.96	1.48
2007Q4	37	1,680	1,849	169	0.61	0.27	0.39
2008Q1	32	1,854	1,937	84	0.53	0.06	0.19
2008Q2	21	2,181	1,997	(184)	0.34	-0.41	-0.42
2008Q3	12	2,437	2,013	(424)	0.19	-0.87	-0.97
2008Q4	49	1,610	1,919	309	0.81	0.87	0.71
2009Q1	39	1,814	2,010	196	0.64	0.36	0.45
2009Q2	55	1,671	2,072	401	0.91	1.33	0.92
2009Q3	51	1,743	2,089	346	0.84	1.00	0.80
2009Q4	52	1,629	1,992	363	0.86	1.07	0.83
2010Q1	6	2,768	2,087	(681)	0.09	-1.33	-1.57
2010Q2	33	2,050	2,151	101	0.54	0.10	0.23
2010Q3	10	2,657	2,168	(489)	0.16	-1.00	-1.12
2010Q4	2	3,111	2,067	(1,044)	0.03	-1.96	-2.40
2011Q1	19	2,377	2,165	(211)	0.31	-0.50	-0.49
2011Q2	28	2,206	2,232	26	0.46	-0.10	0.06
2011Q3	42	1,987	2,250	264	0.69	0.50	0.61
2011Q4	58	1,507	2,145	638	0.96	1.73	1.47
2012Q1	8	2,854	2,247	(607)	0.13	-1.15	-1.39
2012Q2	45	2,039	2,316	277	0.74	0.65	0.64
2012Q3	24	2,408	2,335	(72)	0.39	-0.27	-0.17
2012Q4	13	2,590	2,226	(364)	0.21	-0.81	-0.84
2013Q1	43	2,066	2,332	267	0.71	0.55	0.61
2013Q2	31	2,325	2,404	79	0.51	0.02	0.18
2013Q3	5	3,237	2,424	(813)	0.08	-1.44	-1.87
2013Q4	35	2,190	2,311	121	0.58	0.19	0.28
2014Q1	23	2,508	2,420	(87)	0.38	-0.32	-0.20
2014Q2	40	2,283	2,495	211	0.66	0.41	0.49
2014Q3	47	2,226	2,515	289	0.78	0.76	0.66
2014Q4	4	3,246	2,398	(848)	0.06	-1.57	-1.95
2015Q1	18	2,775	2,512	(263)	0.29	-0.55	-0.61
2015Q2	3	3,459	2,589	(869)	0.04	-1.73	-2.00
2015Q3	22	2,786	2,610	(176)	0.36	-0.36	-0.40
2015Q4	14	2,828	2,489	(339)	0.23	-0.76	-0.78
2016Q1	20	2,804	2,607	(197)	0.33	-0.45	-0.45
2016Q2	53	2,311	2,687	376	0.88	1.15	0.86
2016Q3	48	2,420	2,709	289	0.79	0.81	0.67
2016Q4	9	3,159	2,583	(576)	0.14	-1.07	-1.32
2017Q1	60	1,998	2,706	707	0.99	2.39	1.63
2017Q2	7	3,457	2,789	(668)	0.11	-1.24	-1.54
2017Q3	34	2,707	2,812	105	0.56	0.15	0.24
2017Q4	36	2,559	2,680	122	0.59	0.23	0.28
2018Q1	38	2,624	2,808	183	0.63	0.32	0.42
2018Q2	50	2,548	2,894	346	0.83	0.93	0.79
2018Q3	46	2,635	2,918	283	0.76	0.70	0.65
2018Q4	57	2,250	2,782	532	0.94	1.57	1.22

(b) Standard deviation of residuals 435.1
(c) R² 42%

- (1) Ranking of the residuals from lowest to highest
- (2) From 2019.1 RR TLA.99.48 Attachment B Page 15 column (9)
- (3) From ICBC internal analysis
- (5) Cumulative probability of each sample's rank using the bracket median method
- (6) Standard normal Z score associated with the probability of each sample's rank

Weekly Benefits Severity (Commercial)

(a)

Fiscal Loss Quarter	(1) Rank	(2) Actual	(3) Fitted Value	(4) Residual (3) - (2)	(5) Probability	(6) Normal Z	(7) (4) / (b) Student Residual
2004Q2	51	3,708	7,286	3,578	0.94	1.52	0.83
2004Q3	26	6,706	6,912	206	0.47	-0.07	0.05
2004Q4	18	9,052	7,636	(1,416)	0.32	-0.46	-0.33
2005Q1	7	12,919	6,465	(6,454)	0.12	-1.17	-1.50
2005Q2	6	14,685	7,537	(7,148)	0.10	-1.27	-1.67
2005Q3	22	7,878	7,150	(728)	0.40	-0.26	-0.17
2005Q4	30	6,890	7,899	1,010	0.55	0.12	0.24
2006Q1	43	4,503	6,688	2,185	0.79	0.80	0.51
2006Q2	44	5,610	7,796	2,186	0.81	0.86	0.51
2006Q3	37	5,736	7,396	1,660	0.68	0.46	0.39
2006Q4	3	16,009	8,171	(7,838)	0.05	-1.68	-1.83
2007Q1	9	11,562	6,918	(4,643)	0.16	-1.01	-1.08
2007Q2	41	6,002	8,065	2,062	0.75	0.67	0.48
2007Q3	50	4,207	7,651	3,443	0.92	1.38	0.80
2007Q4	46	6,040	8,452	2,412	0.84	1.01	0.56
2008Q1	21	7,889	7,157	(732)	0.38	-0.31	-0.17
2008Q2	1	27,736	8,342	(19,393)	0.01	-2.36	-4.52
2008Q3	27	7,568	7,914	346	0.49	-0.02	0.08
2008Q4	23	9,457	8,744	(713)	0.42	-0.21	-0.17
2009Q1	11	10,901	7,403	(3,498)	0.19	-0.86	-0.82
2009Q2	53	4,821	8,630	3,809	0.97	1.91	0.89
2009Q3	14	10,480	8,187	(2,293)	0.25	-0.67	-0.53
2009Q4	36	7,387	9,045	1,658	0.66	0.41	0.39
2010Q1	34	6,044	7,658	1,614	0.62	0.31	0.38
2010Q2	54	3,961	8,927	4,966	0.99	2.36	1.16
2010Q3	5	15,831	8,469	(7,362)	0.08	-1.38	-1.72
2010Q4	39	7,654	9,356	1,702	0.71	0.56	0.40
2011Q1	52	4,317	7,922	3,605	0.95	1.68	0.84
2011Q2	12	12,638	9,234	(3,404)	0.21	-0.80	-0.79
2011Q3	13	11,149	8,760	(2,389)	0.23	-0.73	-0.56
2011Q4	49	6,433	9,678	3,245	0.90	1.27	0.76
2012Q1	29	7,273	8,195	922	0.53	0.07	0.21
2012Q2	28	8,673	9,552	879	0.51	0.02	0.20
2012Q3	42	6,981	9,062	2,081	0.77	0.73	0.48
2012Q4	19	11,314	10,012	(1,303)	0.34	-0.41	-0.30
2013Q1	35	6,832	8,477	1,645	0.64	0.36	0.38
2013Q2	25	9,804	9,881	77	0.45	-0.12	0.02
2013Q3	2	17,382	9,374	(8,008)	0.03	-1.91	-1.87
2013Q4	47	7,192	10,356	3,165	0.86	1.09	0.74
2014Q1	33	7,202	8,769	1,567	0.60	0.26	0.37
2014Q2	45	7,866	10,222	2,355	0.82	0.93	0.55
2014Q3	48	6,485	9,697	3,212	0.88	1.17	0.75
2014Q4	4	18,284	10,713	(7,571)	0.06	-1.52	-1.76
2015Q1	16	11,218	9,071	(2,148)	0.29	-0.56	-0.50
2015Q2	10	15,048	10,574	(4,474)	0.18	-0.93	-1.04
2015Q3	38	8,351	10,031	1,680	0.69	0.51	0.39
2015Q4	31	9,916	11,082	1,166	0.56	0.16	0.27
2016Q1	24	9,622	9,383	(239)	0.44	-0.16	-0.06
2016Q2	20	11,798	10,938	(860)	0.36	-0.36	-0.20
2016Q3	40	8,636	10,376	1,741	0.73	0.62	0.41
2016Q4	15	13,755	11,464	(2,291)	0.27	-0.62	-0.53
2017Q1	32	8,301	9,706	1,406	0.58	0.21	0.33
2017Q2	8	17,751	11,314	(6,437)	0.14	-1.09	-1.50
2017Q3	17	12,213	10,734	(1,479)	0.31	-0.51	-0.34

(b) Standard deviation of residuals

4,290.6

(c) R²

12%

(1) Ranking of the residuals from lowest to highest

(2) From 2019.1 RR TLA.99.48 Attachment B Page 17 column (9)

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank

Manual Basic (Third Party Liability/ Part 7) Loss Cost

(a)

Fiscal Loss Year	(1) Rank	(2) Actual	(3) Fitted Value	(4) Residual (3) - (2)	(5) Probability	(6) Normal Z	(7) Student Residual (4) / (b)
2011	1	985	822	(163)	0.06	-1.53	-1.51
2012	5	875	914	39	0.56	0.16	0.36
2013	7	914	1,016	101	0.81	0.89	0.94
2014	6	1,062	1,129	66	0.69	0.49	0.62
2015	8	1,150	1,255	104	0.94	1.53	0.97
2016	4	1,366	1,394	28	0.44	-0.16	0.27
2017	3	1,653	1,550	(103)	0.31	-0.49	-0.96
2018	2	1,850	1,722	(127)	0.19	-0.89	-1.19

(b) Standard deviation of residuals

107.3

(c) R²

88%

(1) Ranking of the residuals from lowest to highest

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank

Manual Basic (Collision/ Specified Perils) Loss Cost

(a)

	(1)	(2)	(3)	(4) (3) - (2)	(5)	(6)	(7) (4) / (b) Student Residual
Fiscal Loss	Rank	Actual	Fitted Value	Residual	Probability	Normal Z	
2011	2	247	215	(32)	0.19	-0.89	-0.90
2012	8	190	246	56	0.94	1.53	1.58
2013	5	276	283	7	0.56	0.16	0.20
2014	1	376	325	(52)	0.06	-1.53	-1.46
2015	3	400	372	(28)	0.31	-0.49	-0.78
2016	7	401	427	26	0.81	0.89	0.73
2017	4	502	491	(11)	0.44	-0.16	-0.32
2018	6	543	563	20	0.69	0.49	0.55

(b) Standard deviation of residuals

35.5

(c) R²

87%

(1) Ranking of the residuals from lowest to highest

(3) From ICBC internal analysis

(5) Cumulative probability of each sample's rank using the bracket median method

(6) Standard normal Z score associated with the probability of each sample's rank