

***Self Insured Medical Plan
Accruals***
Alan Hines and Kathlyn Herrick

pwc

Agenda

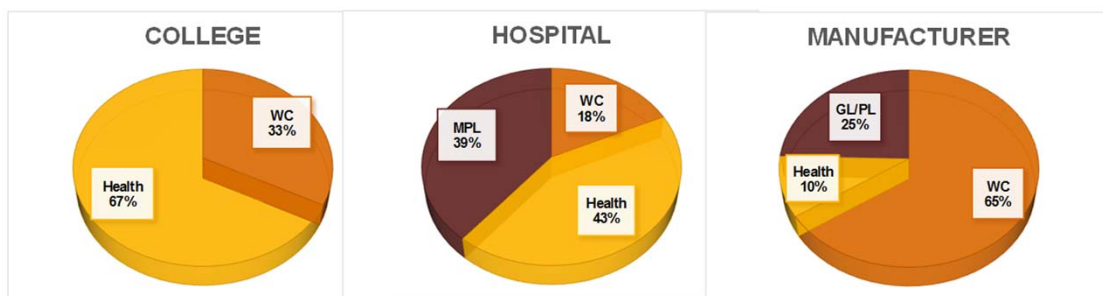
- Why is this Relevant
- Understanding the Exposure
- Client Considerations to Incorporate in the Analysis
- Actuarial Methods
- Claim Lag Method

Why is This Relevant?

- ACA Shifting the Burden of Health Care Costs
- Employers Can Not Absorb Increasing Insurance Costs
- Considering Alternative Financing
 - ✓ Large Deductible Plans with Buy-down Options
 - ✓ Self-Insuring Layers of Coverage
 - ✓ Using P&C Captive Insurers for their Self-Insured Health Coverage

PwC

Materiality of Health Care Accrual



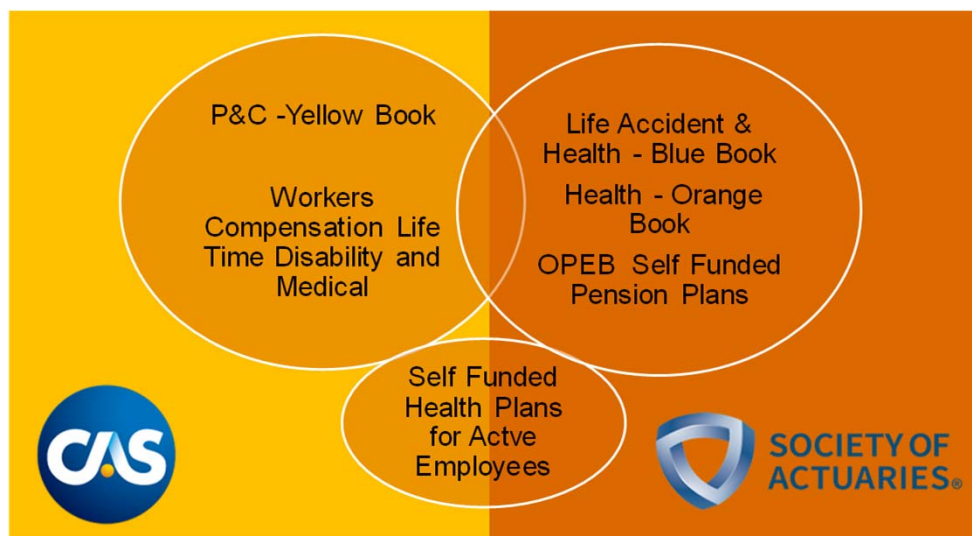
PwC

Understanding the Exposure

- Active Employee Plans vs. Other Post-Employment Benefit (OPEB) Plans
- Coverage Period
- Classes of Benefits – Health, Prescriptions (Rx), Dental, Vision
- Large Deductible Plans
- Medical Stop Loss (MSL) - Specific and Aggregate

PwC

Understanding the Exposure – CAS vs SOA Opinions



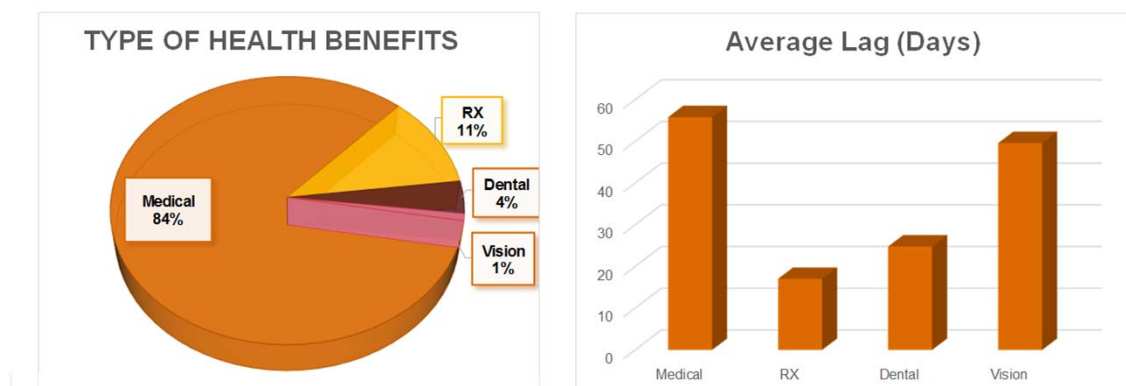
PwC

Understanding the Exposure – Coverage Period and Data Issues

- **Coverage Period - Defined by Liability In Employee's Policy**
- **Incurred Date: Date Service was Rendered or Initially Admitted**
 - * Extended Hospital Stays with Interim Billing
 - * Re-Admissions
 - * Home Health Care
 - * Physical Therapy
- **Shorter than WC Med. Occurrence, Longer than Claims Made**
- **Medical Stop Loss may be on Incurred or Paid Basis**

PwC

Classes of Benefits and Typical Lag Ratios



PwC

Medical Stop Loss

▪ **Specific Stop Loss**

- Limits the amount of a claim for an individual
- Insurers use “Lasering” to increase the attachment point for high risk individuals with known conditions

▪ **Plan Year Aggregate Stop Loss**

- Limits the self-insured losses for all employee claims during the plan year
- Lower coverage limits purchased by smaller to mid-size employers to stabilize costs

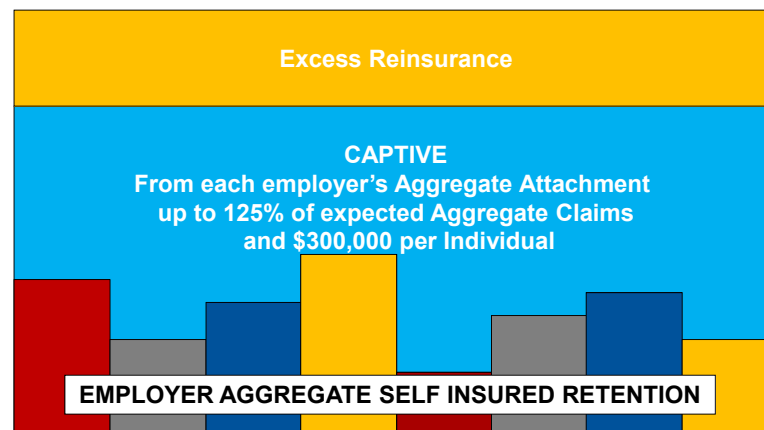
▪ **Contract Terms of Stop Loss May Impact Required Accrual**

- Paid Bases – Covers all claims paid during contract period, regardless when incurred
- Additional accrual needed if contract written on a 12/12, 18/12 or 24/12 basis

PwC

Coverage assumed by a Captive for a Multi-Employer Group

Small Employer Aggregate Structure



PwC

Client Considerations – Funding Method**Similar to Funding Self-Insured WC – May Have Prepaid Loss Fund**

- Administrative Service Contract (ASC) – Insurer Owns Loss Fund – Asset Established
- Administrative Service Only (ASO) – Sponsor Owns Loss Fund – Asset or Offset
- Retro - Plans Also Exist - Annual Adjustment

PwC

Client Considerations – Other

- **Large Deductible plans – Consider Impact of Seasonality**
- **Administrative Service Expense – Not Clear Under GAAP**
- **Risk Margins – Different Accounting Under Stat and GAAP**

Under Stat Accounting SSAP 55 – *Unpaid Claims Loss and Loss Adjustment Expense* include a risk margin in compliance with ASOP No. 5 - *Incurred Health and Disability Claims*. May be Explicit (confidence interval) or Implicit (Conservative Assumptions or Selection). Must use a consistent method from one year to next.

Under GAAP - Explicit risk margin may not be included. However, management best estimate may be conservative in consideration of variability of results.

PwC

Actuarial Methods for Medical Accruals

- **Paid Loss Development Method**
- **Paid Bornhuetter Ferguson Method**
- **Lag Ratio Method**

PwC

Lag Ratio IBNR Calculation

Month	Payments (1)	Payment Completion Factor (2)	Adjusted Payments (3) = (1)x(2)	Lag (Months) (4)	Lag Completion Factor (5)	Adjusted Lag (6) = (4)x(5)
Sep - 17						
Aug - 17						
Jul - 17						
Jun - 17						
May - 17						
Apr - 17						

PwC

Lag Ratio Payment Data

Incd in month	Paid in Month																					12-Month Total
	2016 Jan	2016 Feb	2016 Mar	2016 Apr	2016 May	2016 June	2016 July	2016 Aug	2016 Sep	2016 Oct	2016 Nov	2016 Dec	2017 Jan	2017 Feb	2017 Mar	2017 Apr	2017 May	2017 June	2017 July	2017 Aug	2017 Sep	
Jan-16	2,154	5,593	1,889	459	570	93	45	73	66	38	151	24	45	6	4	8	4	(1)	12	11	6	11,250
Feb-16		1,760	6,336	1,115	588	313	146	145	22	21	(71)	78	31	13	44	3	(1)	(10)	3	(47)	(1)	10,490
Mar-16			3,288	5,051	1,162	1,492	124	184	141	86	49	36	29	19	11	(0)	11	(6)	(0)	12	(1)	11,688
Apr-16				3,122	6,014	1,420	767	528	121	217	32	30	40	3	8	29	6	4	6	114	(0)	12,461
May-16					3,902	5,403	1,583	641	163	156	61	28	75	20	3	12	9	7	6	12	0	12,082
Jun-16						3,648	5,514	1,226	231	222	289	35	58	56	42	33	38	6	42	(3)	12	11,448
Jul-16							3,288	6,822	1,547	494	261	121	67	39	33	25	28	6	(4)	6	15	12,750
Aug-16								4,334	5,991	1,004	692	182	947	61	160	60	111	(21)	(1)	5	11	13,537
Sep-16									3,325	5,702	1,573	569	224	71	68	85	109	30	(45)	22	16	11,749
Oct-16										3,442	6,791	1,147	387	130	103	134	38	42	(2)	31	24	12,265
Nov-16											3,686	4,521	1,060	528	267	68	88	30	39	(0)	(2)	10,285
Dec-16												3,374	5,782	1,488	709	322	150	(90)	50	35	5	11,825
Jan-17													2,779	4,997	1,383	357	131	169	1,342	112	51	11,322
Feb-17														2,585	4,750	1,161	430	147	271	36	67	9,447
Mar-17															3,488	5,482	1,347	558	160	116	73	11,225
Apr-17																2,906	6,367	767	369	934	58	11,401
May-17																	3,878	4,878	1,015	580	70	10,420
Jun-17																		3,183	5,236	1,249	441	10,109
Jul-17																			2,653	6,330	907	9,891
Aug-17																				3,575	5,989	9,564
Sep-17																					3,461	3,461
Total	2,154	7,353	11,513	9,748	12,236	12,368	11,467	13,954	11,607	11,382	13,514	10,146	11,523	10,016	11,073	10,685	12,746	9,701	11,152	13,131	11,203	228,671

PwC

Lag Ratio Payment Data

Incd in month	Paid in Month																					12-Month Total
	2016 Jan	2016 Feb	2016 Mar	2016 Apr	2016 May	2016 June	2016 July	2016 Aug	2016 Sep	2016 Oct	2016 Nov	2016 Dec	2017 Jan	2017 Feb	2017 Mar	2017 Apr	2017 May	2017 June	2017 July	2017 Aug	2017 Sep	
Jan-16	2,154	5,593	1,889	459	570	93	45	73	66	38	151	24	45	6	4	8	4	(1)	12	11	6	11,250
Feb-16		1,760	6,336	1,115	588	313	146	145	22	21	(71)	78	31	13	44	3	(1)	(10)	3	(47)	(1)	10,490
Mar-16			3,288	5,051	1,162	1,492	124	184	141	86	49	36	29	19	11	(0)	11	(6)	(0)	12	(1)	11,688
Apr-16				3,122	6,014	1,420	767	528	121	217	32	30	40	3	8	29	6	4	6	114	(0)	12,461
May-16					3,902	5,403	1,583	641	163	156	61	28	75	20	3	12	9	7	6	12	0	12,082
Jun-16						3,648	5,514	1,226	231	222	289	35	58	56	42	33	38	6	42	(3)	12	11,448
Jul-16							3,288	6,822	1,547	494	261	121	67	39	33	25	28	6	(4)	6	15	12,750
Aug-16								4,334	5,991	1,004	692	182	947	61	160	60	111	(21)	(1)	5	11	13,537
Sep-16									3,325	5,702	1,573	569	224	71	68	85	109	30	(45)	22	16	11,749
Oct-16										3,442	6,791	1,147	387	130	103	134	38	42	(2)	31	24	12,265
Nov-16											3,686	4,521	1,060	528	267	68	88	30	39	(0)	(2)	10,285
Dec-16												3,374	5,782	1,488	709	322	150	(90)	50	35	5	11,825
Jan-17													2,779	4,997	1,383	357	131	169	1,342	112	51	11,322
Feb-17														2,585	4,750	1,161	430	147	271	36	67	9,447
Mar-17															3,488	5,482	1,347	558	160	116	73	11,225
Apr-17																2,906	6,367	767	369	934	58	11,401
May-17																	3,878	4,878	1,015	580	70	10,420
Jun-17																		3,183	5,236	1,249	441	10,109
Jul-17																			2,653	6,330	907	9,891
Aug-17																				3,575	5,989	9,564
Sep-17																					3,461	3,461
Total	2,154	7,353	11,513	9,748	12,236	12,368	11,467	13,954	11,607	11,382	13,514	10,146	11,523	10,016	11,073	10,685	12,746	9,701	11,152	13,131	11,203	228,671

PwC

Lag Ratio IBNR Calculation

Month	Payments (1)	Payment Completion Factor (2)	Adjusted Payments (3) = (1)x(2)	Lag (Months) (4)	Lag Completion Factor (5)	Adjusted Lag (6) = (4)x(5)
Sep - 17	11,203					
Aug - 17	13,131					
Jul - 17	11,152					
Jun - 17	9,701					
May - 17	12,746					
Apr - 17	10,685					

PwC

Payment Completion Ratio Calculation

Incd in month	Paid in Month																					12- Month Total
	2016 Jan	2016 Feb	2016 Mar	2016 Apr	2016 May	2016 June	2016 July	2016 Aug	2016 Sep	2016 Oct	2016 Nov	2016 Dec	2017 Jan	2017 Feb	2017 Mar	2017 Apr	2017 May	2017 June	2017 July	2017 Aug	2017 Sep	
Jan-16	2,154	5,593	1,889	459	570	93	45	73	66	38	151	24	45	6	4	8	4	(1)	12	11	6	11,250
Feb-16		1,760	6,336	1,115	588	313	146	145	22	21	(71)	78	31	13	44	3	(1)	(10)	3	(47)	(1)	10,490
Mar-16			3,288	5,051	1,162	1,492	124	184	141	86	49	36	29	19	11	(0)	11	(6)	(0)	12	(1)	11,688
Apr-16				3,122	6,014	1,420	767	528	121	217	32	30	40	3	8	29	6	4	6	114	(0)	12,461
May-16					3,902	5,403	1,583	641	163	156	61	28	75	20	3	12	9	7	6	12	0	12,082
Jun-16						3,648	5,514	1,226	231	222	289	35	58	56	42	33	38	6	42	(3)	12	11,448
Jul-16							3,288	6,822	1,547	494	261	121	67	39	33	25	28	6	(4)	6	15	12,750
Aug-16								4,334	5,991	1,004	692	182	947	61	160	60	111	(21)	(1)	5	11	13,537
Sep-16									3,325	5,702	1,573	569	224	71	68	85	109	30	(45)	22	16	11,749
Oct-16										3,442	6,791	1,147	387	130	103	134	38	42	(2)	31	24	12,265
Nov-16											3,686	4,521	1,060	528	267	68	88	30	39	(0)	(2)	10,285
Dec-16												3,374	5,782	1,488	709	322	150	(90)	50	35	5	11,825
Jan-17													2,779	4,997	1,383	357	131	169	1,342	112	51	11,322
Feb-17														2,585	4,750	1,161	430	147	271	36	67	9,447
Mar-17															3,488	5,482	1,347	558	160	116	73	11,225
Apr-17																2,906	6,367	767	369	934	58	11,401
May-17																	3,878	4,878	1,015	580	70	10,420
Jun-17																		3,183	5,236	1,249	441	10,109
Jul-17																			2,653	6,330	907	9,891
Aug-17																				3,575	5,989	9,564
Sep-17																					3,461	3,461
Total	2,154	7,353	11,513	9,748	12,236	12,368	11,467	13,954	11,607	11,382	13,514	10,146	11,523	10,016	11,073	10,685	12,746	9,701	11,152	13,131	11,203	228,671

Payment completion factors are used to bring the payments to ultimate, similar to an LDF.

PwC

Payment Completion Factor Calculation

Incurred month	Lag	Paid	
			Sep -16
Jan-16	8.25		66
Feb-16	7.25		22
Mar-16	6.25		141
Apr-16	5.25		121
May-16	4.25		163
Jun-16	3.25		231
Jul-16	2.25		1,547
Aug-16	1.25		5,991
Sep-16	0.25		3,325
Oct-16			
Nov-16			
Dec-16			
Jan-17			

Completion factor for 4-5 months as of September 2016 =

Sum of payments lag 0 to lag 5 in September 2016 =

Sum of payments lag 0 to lag 4 in September 2016

$$\underline{3,325+5,991+1,547+231+163+121 =}$$

$$3,325+5,991+1,547+231+163$$

1.011

PwC

Payment Completion Factor Triangle

Month	Lag Month															
	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20
Jun-16	1.008															
Jul-16	1.013	1.004														
Aug-16	1.014	1.011	1.005													
Sep-16	1.011	1.012	1.002	1.006												
Oct-16	1.014	1.020	1.008	1.002	1.003											
Nov-16	1.022	1.005	1.002	1.004	0.995	1.011										
Dec-16	1.012	1.003	1.003	1.003	1.004	1.008	1.002									
Jan-17	1.093	1.006	1.005	1.007	1.003	1.003	1.003	1.004								
Feb-17	1.007	1.006	1.004	1.006	1.002	1.000	1.002	1.001	1.001							
Mar-17	1.010	1.006	1.015	1.003	1.004	1.000	1.001	1.001	1.004	1.000						
Apr-17	1.007	1.013	1.008	1.006	1.002	1.003	1.001	1.003	1.000	1.000	1.001					
May-17	1.012	1.007	1.003	1.009	1.009	1.002	1.003	1.001	1.000	1.001	1.000	1.000				
Jun-17	1.018	0.991	1.003	1.004	1.003	0.998	1.001	1.001	1.001	1.000	0.999	0.999	1.000			
Jul-17	1.029	1.138	1.005	1.004	1.000	0.996	1.000	1.000	1.004	1.001	1.001	1.000	1.000	1.001		
Aug-17	1.009	1.003	1.009	1.003	1.000	1.002	1.002	1.000	1.000	1.000	1.001	1.009	1.001	0.996	1.001	
Sep-17	1.005	1.007	1.006	1.005	1.000	1.000	1.002	1.001	1.001	1.001	1.001	1.000	1.000	1.000	1.000	1.001
Average	1.018	1.015	1.006	1.005	1.002	1.002	1.002	1.001	1.001	1.001	1.000	1.002	1.000	0.999	1.000	1.001
Cumul	1.056	1.038	1.022	1.016	1.012	1.009	1.007	1.006	1.004	1.003	1.002	1.002	1.000	1.000	1.001	1.001

PwC

Payment Completion Factor Triangle

Month	Lag Month															
	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20
Jun-16	1.008															
Jul-16	1.013	1.004														
Aug-16	1.014	1.011	1.005													
Sep-16	1.011	1.012	1.002	1.006												
Oct-16	1.014	1.020	1.008	1.002	1.003											
Nov-16	1.022	1.005	1.002	1.004	0.995	1.011										
Dec-16	1.012	1.003	1.003	1.003	1.004	1.008	1.002									
Jan-17	1.093	1.006	1.005	1.007	1.003	1.003	1.003	1.003	1.004							
Feb-17	1.007	1.006	1.004	1.006	1.002	1.000	1.002	1.001	1.001	1.001						
Mar-17	1.010	1.006	1.015	1.003	1.004	1.000	1.001	1.001	1.004	1.000	1.000					
Apr-17	1.007	1.013	1.008	1.006	1.002	1.003	1.001	1.003	1.000	1.000	1.001					
May-17	1.012	1.007	1.003	1.009	1.009	1.002	1.003	1.001	1.000	1.001	1.000	1.000				
Jun-17	1.018	0.991	1.003	1.004	1.003	0.998	1.001	1.001	1.001	1.000	0.999	0.999	1.000			
Jul-17	1.029	1.138	1.005	1.004	1.000	0.996	1.000	1.000	1.004	1.001	1.001	1.000	1.000	1.001		
Aug-17	1.009	1.003	1.009	1.003	1.000	1.002	1.002	1.000	1.000	1.000	1.001	1.009	1.001	0.996	1.001	
Sep-17	1.005	1.007	1.006	1.005	1.000	1.000	1.002	1.001	1.001	1.001	1.001	1.000	1.000	1.000	1.000	1.001
Average	1.018	1.015	1.006	1.005	1.002	1.002	1.002	1.001	1.001	1.001	1.000	1.002	1.000	0.999	1.000	1.001
Cumul	1.056	1.038	1.022	1.016	1.012	1.009	1.007	1.006	1.004	1.003	1.002	1.002	1.000	1.000	1.001	1.001

PwC

Lag Ratio IBNR Calculation

Month	Payments (1)	Payment Completion Factor (2)	Adjusted Payments (3) = (1)x(2)	Lag (Months) (4)	Lag Completion Factor (5)	Adjusted Lag (6) = (4)x(5)
Sep - 17	11,203	1.000				
Aug - 17	13,131	1.001				
Jul - 17	11,152	1.001				
Jun - 17	9,701	1.000				
May - 17	12,746	1.000				
Apr - 17	10,685	1.002				

PwC

Lag Ratio IBNR Calculation

Month	Payments (1)	Payment Completion Factor (2)	Adjusted Payments (3) = (1)x(2)	Lag (Months) (4)	Lag Completion Factor (5)	Adjusted Lag (6) = (4)x(5)
Sep - 17	11,203	1.000	11,203			
Aug - 17	13,131	1.001	13,139			
Jul - 17	11,152	1.001	11,162			
Jun - 17	9,701	1.000	9,702			
May - 17	12,746	1.000	12,751			
Apr - 17	10,685	1.002	10,707			

PwC

Lag Calculation

Incd in month	Paid in Month																				Sep 17 Lag	
	2016 Jan	2016 Feb	2016 Mar	2016 Apr	2016 May	2016 June	2016 July	2016 Aug	2016 Sep	2016 Oct	2016 Nov	2016 Dec	2017 Jan	2017 Feb	2017 Mar	2017 Apr	2017 May	2017 June	2017 July	2017 Aug		2017 Sep
Jan-16	2,154	5,593	1,889	459	570	93	45	73	66	38	151	24	45	6	4	8	4	(1)	12	11	6	20.25
Feb-16		1,760	6,336	1,115	588	313	146	145	22	(71)	78	31	13	44	3	(1)	(10)	3	(47)	(1)	(1)	19.25
Mar-16			3,288	5,051	1,162	1,492	124	184	141	86	49	36	29	19	11	(0)	11	(6)	(0)	12	(1)	18.25
Apr-16				3,122	6,014	1,420	767	528	121	217	32	30	40	3	8	29	6	4	6	114	(0)	17.25
May-16					3,902	5,403	1,583	641	163	156	61	28	75	20	3	12	9	7	6	12	0	16.25
Jun-16						3,648	5,514	1,226	231	222	289	35	58	56	42	33	38	6	42	(3)	12	15.25
Jul-16							3,288	6,822	1,547	494	261	121	67	39	33	25	28	6	(4)	6	15	14.25
Aug-16								4,334	5,991	1,004	692	182	947	61	160	60	111	(21)	(1)	5	11	13.25
Sep-16									3,325	5,702	1,573	569	224	71	68	85	109	30	(45)	22	16	12.25
Oct-16										3,442	6,791	1,147	387	130	103	134	38	42	(2)	31	24	11.25
Nov-16											3,686	4,521	1,060	528	267	68	88	30	39	(0)	(2)	10.25
Dec-16												3,374	5,782	1,488	709	322	150	(90)	50	35	5	9.25
Jan-17													2,779	4,997	1,383	357	131	169	1,342	112	51	8.25
Feb-17														2,585	4,750	1,161	430	147	271	36	67	7.25
Mar-17															3,488	5,482	1,347	558	160	116	73	6.25
Apr-17																2,906	6,367	767	369	934	58	5.25
May-17																	3,878	4,878	1,015	580	70	4.25
Jun-17																		3,183	5,236	1,249	441	3.25
Jul-17																			2,653	6,330	907	2.25
Aug-17																				3,575	5,989	1.25
Sep-17																					3,461	0.25
Total	2,154	7,353	11,513	9,748	12,236	12,368	11,467	13,954	11,607	11,382	13,514	10,146	11,523	10,016	11,073	10,685	12,746	9,701	11,152	13,131	11,203	

The lag (in months) represents the average duration of the claim payments.

PwC

Lag Calculation

Incd in month	May Lag	Paid in Month						
		2017 Apr	2017 May	2017 June	2017 July	2017 Aug	2017 Sep	
Jan-16	16.25	8	4	(1)	12	11	6	
Feb-16	15.25	3	(1)	(10)	3	(47)	(1)	
Mar-16	14.25	(0)	11	(6)	(0)	12	(1)	
Apr-16	13.25	29	6	4	6	114	(0)	
May-16	12.25	12	9	7	6	12	0	
Jun-16	11.25	33	38	6	42	(3)	12	
Jul-16	10.25	25	28	6	(4)	6	15	
Aug-16	9.25	60	111	(21)	(1)	5	11	
Sep-16	8.25	85	109	30	(45)	22	16	
Oct-16	7.25	134	38	42	(2)	31	24	
Nov-16	6.25	68	88	30	39	(0)	(2)	
Dec-16	5.25	322	150	(90)	50	35	5	
Jan-17	4.25	357	131	169	1,342	112	51	
Feb-17	3.25	1,161	430	147	271	36	67	
Mar-17	2.25	5,482	1,347	558	160	116	73	
Apr-17	1.25	2,906	6,367	767	369	934	58	
May-17	0.25		3,878	4,878	1,015	580	70	
Jun-17				3,183	5,236	1,249	441	
Jul-17					2,653	6,330	907	
Aug-17						3,575	5,989	
Sep-17							3,461	
Total		10,685	12,746	9,701	11,152	13,131	11,203	

Weighted lag for May 2017 =

Sum product of lag and payments in May 2017 =

Total May 2017 payments

$$3,878 * 0.25 + 6,367 * 1.25 + 1,347 * 2.25 + \dots + 4 * 16.25 =$$

12,746

1.457

PwC

Lag Ratio IBNR Calculation

Month	Payments (1)	Payment Completion Factor (2)	Adjusted Payments (3) = (1)x(2)	Lag (Months) (4)	Lag Completion Factor (5)	Adjusted Lag (6) = (4)x(5)
Sep - 17	11,203	1.000	11,203	1.331		
Aug - 17	13,131	1.001	13,139	1.651		
Jul - 17	11,152	1.001	11,162	2.002		
Jun - 17	9,701	1.000	9,702	1.243		
May - 17	12,746	1.000	12,751	1.457		
Apr - 17	10,685	1.002	10,707	1.521		

PwC

Lag Completion Factor Calculation

Incd in month	Paid in Month																								12-Month Total
	2016 Jan	2016 Feb	2016 Mar	2016 Apr	2016 May	2016 June	2016 July	2016 Aug	2016 Sep	2016 Oct	2016 Nov	2016 Dec	2017 Jan	2017 Feb	2017 Mar	2017 Apr	2017 May	2017 June	2017 July	2017 Aug	2017 Sep	2017 Oct	2017 Nov	2017 Dec	
Jan-16	2,154	5,593	1,889	459	570	93	45	73	66	38	151	24	45	6	4	8	4	(1)	12	11	6	6	11,250		
Feb-16		1,760	6,336	1,115	588	313	146	145	22	21	(71)	78	31	13	44	3	(1)	(10)	3	(47)	(1)	10,490			
Mar-16			3,288	5,051	1,162	1,492	124	184	141	86	49	36	29	19	11	(0)	11	(6)	(0)	12	(1)	11,688			
Apr-16				3,122	6,014	1,420	767	528	121	217	32	30	40	3	8	29	6	4	6	114	(0)	12,461			
May-16					3,902	5,403	1,583	641	163	156	61	28	75	20	3	12	9	7	6	12	0	12,082			
Jun-16						3,648	5,514	1,226	231	222	289	35	58	56	42	33	38	6	42	(3)	12	11,448			
Jul-16							3,288	6,822	1,547	494	261	121	67	39	33	25	28	6	(4)	6	15	12,750			
Aug-16								4,334	5,991	1,004	692	182	947	61	160	60	111	(21)	(1)	5	11	13,537			
Sep-16									3,325	5,702	1,573	569	224	71	68	85	109	30	(45)	22	16	11,749			
Oct-16										3,442	6,791	1,147	387	130	103	134	38	42	(2)	31	24	12,265			
Nov-16											3,686	4,521	1,060	528	267	68	88	30	39	(0)	(2)	10,285			
Dec-16												3,374	5,782	1,488	709	322	150	(90)	50	35	5	11,825			
Jan-17													2,779	4,997	1,383	357	131	169	1,342	112	51	11,322			
Feb-17															2,585	4,750	1,161	430	147	271	36	67	9,447		
Mar-17																3,488	5,482	1,347	558	160	116	73	11,225		
Apr-17																	2,906	6,367	767	369	934	58	11,401		
May-17																		3,878	4,878	1,015	580	70	10,420		
Jun-17																			3,183	5,236	1,249	441	10,109		
Jul-17																				2,653	6,330	907	9,891		
Aug-17																					3,575	5,989	9,564		
Sep-17																						3,461	3,461		
Total	2,154	7,353	11,513	9,748	12,236	12,368	11,467	13,954	11,607	11,382	13,514	10,146	11,523	10,016	11,073	10,685	12,746	9,701	11,152	13,131	11,203	228,671			

Lag completion factor allows us to adjust earlier months without a complete view of payments.

PwC

Lag Completion Factor Calculation

Incurring month	Lag	Paid Sep -16
Jan-16	8.25	66
Feb-16	7.25	22
Mar-16	6.25	141
Apr-16	5.25	121
May-16	4.25	163
Jun-16	3.25	231
Jul-16	2.25	1,547
Aug-16	1.25	5,991
Sep-16	0.25	3,325
Oct-16		
Nov-16		
Dec-16		
Jan-17		

Lag completion factor for 4-5 months as of September 2016 =

Weighted Average Lag for the most recent 6 incurred months =

Weighted Average Lag for the most recent 5 incurred months

$$3,325 * 0.25 + 5,991 * 1.25 + 1,547 * 2.25 + 231 * 3.25 + 163 * 4.25 + 121 * 5.25$$

$$3,325 + 5,991 + 1,547 + 231 + 163 + 121$$

$$\frac{3,325 * 0.25 + 5,991 * 1.25 + 1,547 * 2.25 + 231 * 3.25 + 163 * 4.25}{3,325 + 5,991 + 1,547 + 231 + 163}$$

$$3,325 + 5,991 + 1,547 + 231 + 163$$

1.037

PwC

Lag Completion Factor Triangle

Month	Lag Month															
	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20
Jun-16	1.021															
Jul-16	1.040	1.015														
Aug-16	1.044	1.040	1.023													
Sep-16	1.037	1.050	1.009	1.031												
Oct-16	1.049	1.078	1.034	1.009	1.019											
Nov-16	1.069	1.017	1.010	1.018	0.970	1.073										
Dec-16	1.042	1.014	1.014	1.016	1.022	1.052	1.017									
Jan-17	1.279	1.018	1.018	1.027	1.016	1.013	1.015	1.023								
Feb-17	1.022	1.023	1.017	1.028	1.011	1.002	1.013	1.010	1.005							
Mar-17	1.030	1.024	1.065	1.015	1.021	1.002	1.005	1.007	1.032	1.003						
Apr-17	1.021	1.051	1.036	1.028	1.013	1.019	1.007	1.020	1.000	1.002	1.007					
May-17	1.044	1.030	1.015	1.049	1.053	1.014	1.021	1.006	1.004	1.008	0.999	1.003				
Jun-17	1.062	0.962	1.016	1.026	1.020	0.984	1.005	1.006	1.007	1.004	0.993	0.988	0.999			
Jul-17	1.094	1.454	1.012	1.011	0.999	0.983	1.000	0.998	1.022	1.003	1.004	1.000	1.002	1.009		
Aug-17	1.025	1.010	1.035	1.012	1.000	1.014	1.011	1.003	1.003	0.998	1.008	1.082	1.009	0.965	1.009	
Sep-17	1.020	1.030	1.031	1.027	1.003	0.999	1.017	1.012	1.009	1.013	1.011	1.000	1.000	0.999	0.999	1.008
Average	1.056	1.054	1.024	1.023	1.012	1.014	1.011	1.009	1.010	1.005	1.004	1.015	1.002	0.991	1.004	1.008
Cumul	1.270	1.203	1.141	1.114	1.089	1.076	1.061	1.049	1.039	1.029	1.024	1.020	1.006	1.003	1.012	1.008

PwC

Lag Completion Factor Triangle

Month	Lag Month															
	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20
Jun-16	1.021															
Jul-16	1.040	1.015														
Aug-16	1.044	1.040	1.023													
Sep-16	1.037	1.050	1.009	1.031												
Oct-16	1.049	1.078	1.034	1.009	1.019											
Nov-16	1.069	1.017	1.010	1.018	0.970	1.073										
Dec-16	1.042	1.014	1.014	1.016	1.022	1.052	1.017									
Jan-17	1.279	1.018	1.018	1.027	1.016	1.013	1.015	1.023								
Feb-17	1.022	1.023	1.017	1.028	1.011	1.002	1.013	1.010	1.005							
Mar-17	1.030	1.024	1.065	1.015	1.021	1.002	1.005	1.007	1.032	1.003						
Apr-17	1.021	1.051	1.036	1.028	1.013	1.019	1.007	1.020	1.000	1.002	1.007					
May-17	1.044	1.030	1.015	1.049	1.053	1.014	1.021	1.006	1.004	1.008	0.999	1.003				
Jun-17	1.062	0.962	1.016	1.026	1.020	0.984	1.005	1.006	1.007	1.004	0.993	0.988	0.999			
Jul-17	1.094	1.454	1.012	1.011	0.999	0.983	1.000	0.998	1.022	1.003	1.004	1.000	1.002	1.009		
Aug-17	1.025	1.010	1.035	1.012	1.000	1.014	1.011	1.003	1.003	0.998	1.008	1.082	1.009	0.965	1.009	
Sep-17	1.020	1.030	1.031	1.027	1.003	0.999	1.017	1.012	1.009	1.013	1.011	1.000	1.000	0.999	0.999	1.008
Average	1.056	1.054	1.024	1.023	1.012	1.014	1.011	1.009	1.010	1.005	1.004	1.015	1.002	0.991	1.004	1.008
Cumul	1.270	1.203	1.141	1.114	1.089	1.076	1.061	1.049	1.039	1.029	1.024	1.020	1.006	1.003	1.012	1.008

PwC

Lag Ratio IBNR Calculation

Month	Payments (1)	Payment Completion Factor (2)	Adjusted Payments (3) = (1)x(2)	Lag (Months) (4)	Lag Completion Factor (5)	Adjusted Lag (6) = (4)x(5)
Sep - 17	11,203	1.000	11,203	1.331	1.000	
Aug - 17	13,131	1.001	13,139	1.651	1.008	
Jul - 17	11,152	1.001	11,162	2.002	1.012	
Jun - 17	9,701	1.000	9,702	1.243	1.003	
May - 17	12,746	1.000	12,751	1.457	1.006	
Apr - 17	10,685	1.002	10,707	1.521	1.020	

PwC

Lag Ratio IBNR Calculation

Month	Payments (1)	Payment Completion Factor (2)	Adjusted Payments (3) = (1)x(2)	Lag (Months) (4)	Lag Completion Factor (5)	Adjusted Lag (6) = (4)x(5)
Sep - 17	11,203	1.000	11,203	1.331	1.000	1.331
Aug - 17	13,131	1.001	13,139	1.651	1.008	1.665
Jul - 17	11,152	1.001	11,162	2.002	1.012	2.027
Jun - 17	9,701	1.000	9,702	1.243	1.003	1.247
May - 17	12,746	1.000	12,751	1.457	1.006	1.465
Apr - 17	10,685	1.002	10,707	1.521	1.020	1.552

PwC

Lag Ratio IBNR Calculation

Month	Payments (1)	Payment Completion Factor (2)	Adjusted Payments (3) = (1)x(2)	Lag (Months) (4)	Lag Completion Factor (5)	Adjusted Lag (6) = (4)x(5)
Sep - 17	11,203	1.000	11,203	1.331	1.000	1.331
Aug - 17	13,131	1.001	13,139	1.651	1.008	1.665
Jul - 17	11,152	1.001	11,162	2.002	1.012	2.027
Jun - 17	9,701	1.000	9,702	1.243	1.003	1.247
May - 17	12,746	1.000	12,751	1.457	1.006	1.465
Apr - 17	10,685	1.002	10,707	1.521	1.020	1.552
Average			11,444			1.548
IBNR (7)=(3)x(6)						17,713

PwC

Questions?

PwC