VIDEO F-07 (045)

Scenarios 5,6

5. No Change in Product Mix

6. Change in Product Mix

6	= current time	Std.S5.LOB1+5-6	Simlation RESULTS directly below:
6	= end time	Standard Simulation	

Fr-07 (045) Scenario 5 (LOB1 + 5%)

Line of Business 1 (5% EP growth)						
Amounts	Paid Loss	Development Year				
AY	1	2	3	4	5	6
1	90	227	309	342	360	360
2	95	238	324	359	378	
3	99	250	340	377		
4	104	263	357			
5	109	276		*paid tail length = 5*		
6	115			*(set by simulation)*		

Paid Estimates			est.	real
CY	CY	CY	AY	AY
EP	EE	PLR	ULR	ULR
600.0	1.0	15.0%	60.0%	60.0%
630.0	1.0	36.7%	60.0%	60.0%
661.5	1.0	49.1%	60.0%	60.0%
694.6	1.0	53.9%	60.0%	60.0%
729.3	1.0	56.4%	60.0%	60.0%
765.8	1.0	56.4%	60.0%	60.0%

Line of Business 1 (5% EP growth)						
Amounts	Rptd Loss	Development Year				
AY	1	2	3	4	5	6
1	144	286	360	360	360	360
2	151	301	378	378	378	
3	159	316	397	397		
4	167	331	417			
5	175	348		*rptd tail length = 3*		
6	184			*(set by simulation)*		

Line of Business 1 (5% EP growth)						
LDFs	for Paid Loss		age => age			
AY	1-2	2-3	3-4	4-5	5-6	6-ult
1	2.52	1.36	1.11	1.05	1.00	
2	2.52	1.36	1.11	1.05		
3	2.52	1.36	1.11			
4	2.52	1.36				
5	2.52					
6						
avg	2.52	1.36	1.11	1.05	1.00	
avg: wtd	2.52	1.36	1.11	1.05	1.00	
median	2.52	1.36	1.11	1.05	1.00	
avg: x-HL	2.52	1.36	1.11			
avg: 3	2.52	1.36	1.11			
select	2.52	1.36	1.11	1.05	1.00	
age => ult (CDF)	4.00	1.59	1.17	1.05	1.00	1.00
ultimate	459	438	417	397	378	360
AY ==>	6	5	4	3	2	1

Rptd Estimates			est.	real
CY	CY	CY	AY	AY
EP	EE	RLR	ULR	ULR
600.0	1.0	24.0%	60.0%	60.0%
630.0	1.0	46.6%	60.0%	60.0%
661.5	1.0	57.7%	60.0%	60.0%
694.6	1.0	57.7%	60.0%	60.0%
729.3	1.0	57.7%	60.0%	60.0%
765.8	1.0	57.7%	60.0%	60.0%

Line of Business 1 (5% EP growth)						
LDFs	for Rptd Loss		age => age			
AY	1-2	2-3	3-4	4-5	5-6	6-ult
1	1.99	1.26	1.00	1.00	1.00	
2	1.99	1.26	1.00	1.00		
3	1.99	1.26	1.00			
4	1.99	1.26				
5	1.99					
6						
avg	1.99	1.26	1.00	1.00	1.00	
avg: wtd	1.99	1.26	1.00	1.00	1.00	
median	1.99	1.26	1.00	1.00	1.00	
avg: x-HL	1.99	1.26	1.00			
avg: 3	1.99	1.26	1.00			
select	1.99	1.26	1.00	1.00	1.00	
age => ult (CDF)	2.50	1.26	1.00	1.00	1.00	1.00
ultimate	459	438	417	397	378	360
AY ==>	6	5	4	3	2	1

Scenario 5: LOB 1

Loss Ratio: 60% for all AYs
Case Strength: consistent for all CYs
EP for LOB 1: 5% growth

RESULT

Paid Devlpt: 100% accurate
Rptd Devlpt: 100% accurate

6	= current time	Std.S5.LOB2+5-6	Simlation RESULTS directly below:
6	= end time	Standard Simulation	

Fr-07 (045) Scenario 5 (LOB2 + 5%)

Line of Business 2 (5% EP growth)						
Amounts	Paid Loss	Development Year				
AY	1	2	3	4	5	6
1	69	251	387	447	469	480
2	72	263	406	469	492	
3	76	277	426	492		
4	79	290	448			
5	83	305		*paid tail length = 6*		
6	88			*(set by simulation)*		

Paid Estimates			est.	real
CY	CY	CY	AY	AY
EP	EE	PLR	ULR	ULR
600.0	1.0	11.4%	80.0%	80.0%
630.0	1.0	40.4%	80.0%	80.0%
661.5	1.0	60.9%	80.0%	80.0%
694.6	1.0	69.5%	80.0%	80.0%
729.3	1.0	72.5%	80.0%	80.0%
765.8	1.0	74.0%	80.0%	80.0%

Line of Business 2 (5% EP growth)						
Amounts	Rptd Loss	Development Year				
AY	1	2	3	4	5	6
1	96	321	434	480	480	480
2	101	337	456	504	504	
3	106	354	479	529		
4	111	372	502			
5	117	390		*rptd tail length = 4*		
6	123			*(set by simulation)*		

Line of Business 2 (5% EP growth)						
LDFs	for Paid Loss		age => age			
AY	1-2	2-3	3-4	4-5	5-6	6-ult
1	3.66	1.54	1.16	1.05	1.02	
2	3.66	1.54	1.16	1.05		
3	3.66	1.54	1.16			
4	3.66	1.54				
5	3.66					
6						
avg	3.66	1.54	1.16	1.05	1.02	
avg: wtd	3.66	1.54	1.16	1.05	1.02	
median	3.66	1.54	1.16	1.05	1.02	
avg: x-HL	3.66	1.54	1.16			
avg: 3	3.66	1.54	1.16			
select	3.66	1.54	1.16	1.05	1.02	
age => ult (CDF)	7.00	1.91	1.24	1.07	1.02	1.00
ultimate	613	583	556	529	504	480
AY ==>	6	5	4	3	2	1

Rptd Estimates			est.	real
CY	CY	CY	AY	AY
EP	EE	RLR	ULR	ULR
600.0	1.0	16.0%	80.0%	80.0%
630.0	1.0	51.7%	80.0%	80.0%
661.5	1.0	68.8%	80.0%	80.0%
694.6	1.0	75.4%	80.0%	80.0%
729.3	1.0	75.4%	80.0%	80.0%
765.8	1.0	75.4%	80.0%	80.0%

Line of Business 2 (5% EP growth)						
LDFs	for Rptd Loss		age => age			
AY	1-2	2-3	3-4	4-5	5-6	6-ult
1	3.34	1.35	1.11	1.00	1.00	
2	3.34	1.35	1.11	1.00		
3	3.34	1.35	1.11			
4	3.34	1.35				
5	3.34					
6						
avg	3.34	1.35	1.11	1.00	1.00	
avg: wtd	3.34	1.35	1.11	1.00	1.00	
median	3.34	1.35	1.11	1.00	1.00	
avg: x-HL	3.34	1.35	1.11			
avg: 3	3.34	1.35	1.11			
select	3.34	1.35	1.11	1.00	1.00	
age => ult (CDF)	5.00	1.50	1.11	1.00	1.00	1.00
ultimate	613	583	556	529	504	480
AY ==>	6	5	4	3	2	1

Scenario 5: LOB 2

Loss Ratio: 80% for all AYs
Case Strength: consistent for all CYs
EP for LOB 2: 5% growth

RESULT

Paid Devlpt: 100% accurate
Rptd Devlpt: 100% accurate

6	= current time	**Sum of simulations**
6	= end time	**No change in product mix**

Simlation RESULTS directly below:

Fr-07 (045) Scenario 5 (SUM)

Line of Business 1+2 (no change in mix)

Amounts	Paid Loss	Development Year				
AY	1	2	3	4	5	6
1	159	478	695	789	829	840
2	166	502	730	828	870	
3	175	527	767	869		
4	184	553	805			
5	193	581				
6	202					

Paid Estimates			est.	real
CY	CY	CY	AY	AY
EP	EE	PLR	ULR	ULR
1,200	2.0	13.2%	70.0%	70.0%
1,260	2.0	38.5%	70.0%	70.0%
1,323	2.0	55.0%	70.0%	70.0%
1,389	2.0	61.7%	70.0%	70.0%
1,459	2.0	64.4%	70.0%	70.0%
1,532	2.0	65.2%	70.0%	70.0%

Line of Business 1+2 (no change in mix)

Amounts	Rptd Loss	Development Year				
AY	1	2	3	4	5	6
1	240	607	794	840	840	840
2	252	638	834	882	882	
3	265	670	875	926		
4	278	703	919			
5	292	738				
6	306					

Line of Business 1+2 (no change in mix)

LDFs	for Paid Loss		age => age			
AY	1-2	2-3	3-4	4-5	5-6	6-ult
1	3.01	1.46	1.13	1.05	1.01	
2	3.01	1.46	1.13	1.05		
3	3.01	1.46	1.13			
4	3.01	1.46				
5	3.01					
6						
avg	3.01	1.46	1.13	1.05	1.01	
avg: wtd	3.01	1.46	1.13	1.05	1.01	
median	3.01	1.46	1.13	1.05	1.01	
avg: x-HL	3.01	1.46	1.13			
avg: 3	3.01	1.46	1.13			
select	3.01	1.46	1.13	1.05	1.01	
age => ult	5.30	1.76	1.21	1.07	1.01	1.00
(CDF)						
ultimate	1,072	1,021	972	926	882	840
AY ==>	6	5	4	3	2	1

Rptd Estimates			est.	real
CY	CY	CY	AY	AY
EP	EE	RLR	ULR	ULR
1,200	2.0	20.0%	70.0%	70.0%
1,260	2.0	49.2%	70.0%	70.0%
1,323	2.0	63.3%	70.0%	70.0%
1,389	2.0	66.6%	70.0%	70.0%
1,459	2.0	66.6%	70.0%	70.0%
1,532	2.0	66.6%	70.0%	70.0%

Scenario 5: LOB 1 + LOB 2

Loss Ratio: 70% for all AYs
EP for LOB 1: 5% growth
EP for LOB 2: 5% growth
(no change in product mix here)

RESULT

Paid Devlpt: 100% accurate
Rptd Devlpt: 100% accurate

Line of Business 1+2 (no change in mix)

LDFs	for Rptd Loss		age => age			
AY	1-2	2-3	3-4	4-5	5-6	6-ult
1	2.53	1.31	1.06	1.00	1.00	
2	2.53	1.31	1.06	1.00		
3	2.53	1.31	1.06			
4	2.53	1.31				
5	2.53					
6						
avg	2.53	1.31	1.06	1.00	1.00	
avg: wtd	2.53	1.31	1.06	1.00	1.00	
median	2.53	1.31	1.06	1.00	1.00	
avg: x-HL	2.53	1.31	1.06			
avg: 3	2.53	1.31	1.06			
select	2.53	1.31	1.06	1.00	1.00	
age => ult	3.50	1.38	1.06	1.00	1.00	1.00
(CDF)						
ultimate	1,072	1,021	972	926	882	840
AY ==>	6	5	4	3	2	1

6	= current time	**Std.S5.LOB2+30-6**	**Simlation RESULTS directly below:**
6	= end time	**Standard Simulation**	

Fr-07 (045) Scenario 6 (LOB1 + 30%)

Line of Business 2 (30% EP growth)

Amounts	Paid Loss	Development Year				
AY	1	2	3	4	5	6
1	69	251	387	447	469	480
2	89	326	503	581	609	
3	116	424	653	755		
4	151	551	850			
5	196	717		*paid tail length = 6*		
6	255			*(set by simulation)*		

Paid Estimates			est.	real
CY	CY	CY	AY	AY
EP	EE	PLR	ULR	ULR
600	1.0	11.4%	80.0%	80.0%
780	1.0	34.8%	80.0%	80.0%
1,014	1.0	48.2%	80.0%	80.0%
1,318	1.0	52.7%	80.0%	80.0%
1,714	1.0	54.0%	80.0%	80.0%
2,228	1.0	54.5%	80.0%	80.0%

Line of Business 2 (30% EP growth)

Amounts	Rptd Loss	Development Year				
AY	1	2	3	4	5	6
1	96	321	434	480	480	480
2	125	417	564	624	624	
3	162	542	734	811		
4	211	705	954			
5	274	917		*rptd tail length = 4*		
6	356			*(set by simulation)*		

Line of Business 2 (30% EP growth)

LDFs	for Paid Loss		age => age			
AY	1-2	2-3	3-4	4-5	5-6	6-ult
1	3.66	1.54	1.16	1.05	1.02	
2	3.66	1.54	1.16	1.05		
3	3.66	1.54	1.16			
4	3.66	1.54				
5	3.66					
6						
avg	3.66	1.54	1.16	1.05	1.02	
avg: wtd	3.66	1.54	1.16	1.05	1.02	
median	3.66	1.54	1.16	1.05	1.02	
avg: x-HL	3.66	1.54	1.16			
avg: 3	3.66	1.54	1.16			
select	3.66	1.54	1.16	1.05	1.02	
age => ult (CDF)	7.00	1.91	1.24	1.07	1.02	1.00
ultimate	1,782	1,371	1,055	811	624	480
AY ==>	6	5	4	3	2	1

Rptd Estimates			est.	real
CY	CY	CY	AY	AY
EP	EE	RLR	ULR	ULR
600	1.0	16.0%	80.0%	80.0%
780	1.0	44.8%	80.0%	80.0%
1,014	1.0	56.0%	80.0%	80.0%
1,318	1.0	59.5%	80.0%	80.0%
1,714	1.0	59.5%	80.0%	80.0%
2,228	1.0	59.5%	80.0%	80.0%

Scenario 5: LOB 2

Loss Ratio: 80% for all AYs
Case Strength: consistent for all CYs
EP for LOB 2: 30% growth

RESULT

Paid Devlpt: 100% accurate
Rptd Devlpt: 100% accurate

Line of Business 2 (30% EP growth)

LDFs	for Rptd Loss		age => age			
AY	1-2	2-3	3-4	4-5	5-6	6-ult
1	3.34	1.35	1.11	1.00	1.00	
2	3.34	1.35	1.11	1.00		
3	3.34	1.35	1.11			
4	3.34	1.35				
5	3.34					
6						
avg	3.34	1.35	1.11	1.00	1.00	
avg: wtd	3.34	1.35	1.11	1.00	1.00	
median	3.34	1.35	1.11	1.00	1.00	
avg: x-HL	3.34	1.35	1.11			
avg: 3	3.34	1.35	1.11			
select	3.34	1.35	1.11	1.00	1.00	
age => ult (CDF)	5.00	1.50	1.11	1.00	1.00	1.00
ultimate	1,782	1,371	1,055	811	624	480
AY ==>	6	5	4	3	2	1

6	= current time	**Sum of simulations**	**Simlation RESULTS directly below:**
6	= end time	**Change in product mix**	

Line of Business 1+2 (WITH change in mix)

Amounts	Paid Loss	Development Year				
AY	1	2	3	4	5	6
1	159	478	695	789	829	840
2	184	564	827	940	987	
3	215	674	994	1,132		
4	255	814	1,207			
5	305	992				
6	369					

Paid Estimates			est.	real
CY	CY	CY	AY	AY
EP	EE	PLR	ULR	ULR
1,200	2.0	13.2%	70.0%	70.0%
1,410	2.0	35.7%	71.0%	71.1%
1,675	2.0	48.5%	71.9%	72.1%
2,013	2.0	53.1%	72.6%	73.1%
2,443	2.0	54.7%	72.3%	74.0%
2,994	2.0	55.0%	68.8%	74.9%

Line of Business 1+2 (WITH change in mix)

Amounts	Rptd Loss	Development Year				
AY	1	2	3	4	5	6
1	240	607	794	840	840	840
2	276	718	942	1,002	1,002	
3	321	858	1,130	1,208		
4	378	1,037	1,370			
5	449	1,265				
6	540					

Line of Business 1+2 (WITH change in mix)

LDFs	for Paid Loss		age => age			
AY	1-2	2-3	3-4	4-5	5-6	6-ult
1	3.01	1.46	1.13	1.05	1.01	
2	3.07	1.46	1.14	1.05		
3	3.13	1.47	1.14			
4	3.19	1.48				
5	3.25					
6						
avg	3.13	1.47	1.14	1.05	1.01	
avg: wtd	3.15	1.47	1.14	1.05	1.01	
median	3.13	1.47	1.14	1.05	1.01	
avg: x-HL	3.13	1.47	1.14			
avg: 3	3.19	1.47	1.14			
select	3.13	1.47	1.14	1.05	1.01	
age => ult	5.57	1.78	1.21	1.07	1.01	1.00
(CDF)						
ultimate	2,059	1,765	1,461	1,205	1,001	840
AY ==>	6	5	4	3	2	1

Rptd Estimates			est.	real
CY	CY	CY	AY	AY
EP	EE	RLR	ULR	ULR
1,200	2.0	20.0%	70.0%	70.0%
1,410	2.0	45.6%	71.1%	71.1%
1,675	2.0	56.7%	72.1%	72.1%
2,013	2.0	58.9%	72.4%	73.1%
2,443	2.0	59.0%	72.4%	74.0%
2,994	2.0	59.0%	67.4%	74.9%

Scenario 6: LOB 1 + LOB 2

EP for LOB 1: 5% growth

EP for LOB 2: 30% growth

(product mix ***changes*** *)*

RESULT

Paid Devlpt:	low =>	**SSE =**	0.41%
Rptd Devlpt:	low =>	**SSE =**	0.59%

Both methods produce estimates that are *<u>too low</u>* *because LOB 2 is growing faster and has higher LDFs*

Line of Business 1+2 (WITH change in mix)

LDFs	for Rptd Loss		age => age			
AY	1-2	2-3	3-4	4-5	5-6	6-ult
1	2.530	1.308	1.058	1.000	1.000	
2	2.601	1.313	1.063	1.000		
3	2.673	1.317	1.069			
4	2.745	1.322				
5	2.816					
6						
avg	2.67	1.31	1.06	1.00	1.00	
avg: wtd	2.70	1.32	1.06	1.00	1.00	
median	2.67	1.31	1.06	1.00	1.00	
avg: x-HL	2.67	1.31	1.06			
avg: 3	2.74	1.32	1.06			
select	2.67	1.31	1.06	1.00	1.00	
age => ult	3.74	1.40	1.06	1.00	1.00	1.00
(CDF)						
ultimate	2,019	1,768	1,457	1,208	1,002	840
AY ==>	6	5	4	3	2	1