

A	B	C	D	E	F	G	H	I
FREQUENCY		1000	Mean	Normal				2
		1	StdDev					3
								4
SEVERITY	Assume claims (#) have a Log-Normal Distribution by claim amount							5
	Claims Log-Normal Distribution			Underlying Normal Distribution				6
Income	Median	50		mu	3.912	=LN(C7)		7
	Mean	100		mu+S^2/2	4.605	=LN(C8)		8
				Sigma^2	1.386	=2*(F8-F7)		9
					1.177	=SQRT(F9)		10
								11

Claim Freq (Norm, 1)		Claim Severity (LN, 2)		Aggregate: From Cells		Aggregate: From CDF	
Mean1	Std. Dev	Median2	Mean2	Median3	Mean3	Median4	Mean4
1000	1	50	100	50000.0	99357.3	49999.971	101142.0
	50000						

A	B	C	D	E	F	G	H	I
Scale	Loss\$	CDF#Count	CDF%Count	Loss\$	ROW	PDF	Mid-Point	Product
0.10	5,000	4.020E+05	0.025	5000	18	4.0E+05	2500	1.0E+09
0.20	10,000	1.371E+06	0.086	10000	19	9.7E+05	7,500	7.3E+09
0.30	15,000	2.450E+06	0.153	15000	20	1.1E+06	12,500	1.3E+10
0.40	20,000	3.489E+06	0.218	20000	21	1.0E+06	17,500	1.8E+10
0.50	25,000	4.445E+06	0.278	25000	22	9.6E+05	22,500	2.2E+10
0.60	30,000	5.312E+06	0.332	30000	23	8.7E+05	27,500	2.4E+10
0.80	40,000	6.794E+06	0.425	40000	24	1.5E+06	35,000	5.2E+10
1	50,000	7.996E+06	0.500	50000	25	1.2E+06	45,000	5.4E+10
2	100,000	1.155E+07	0.722	100000	26	3.6E+06	75,000	2.7E+11
3	150,000	1.319E+07	0.825	150000	27	1.6E+06	125,000	2.1E+11
4	200,000	1.408E+07	0.881	200000	28	8.9E+05	175,000	1.6E+11
5	250,000	1.462E+07	0.914	250000	29	5.4E+05	225,000	1.2E+11
6	300,000	1.497E+07	0.936	300000	30	3.5E+05	275,000	9.6E+10
7	350,000	1.521E+07	0.951	350000	31	2.4E+05	325,000	7.7E+10
8	400,000	1.538E+07	0.961	400000	32	1.7E+05	375,000	6.3E+10
10	500,000	1.559E+07	0.975	500000	33	2.1E+05	450,000	9.7E+10
12	600,000	1.572E+07	0.983	600000	34	1.3E+05	550,000	6.9E+10
15	750,000	1.582E+07	0.989	750000	35	1.1E+05	675,000	7.3E+10
20	1,000,000	1.591E+07	0.995	1000000	36	8.4E+04	875,000	7.4E+10
30	1,500,000	1.596E+07	0.998	1500000	37	5.6E+04	1,250,000	7.0E+10
40	2,000,000	1.598E+07	0.999	2000000	38	1.6E+04	1,750,000	2.8E+10
50	2,500,000	1.599E+07	1.000	2500000	39	8.0E+03	2,250,000	1.8E+10
60	3,000,000	1.599E+07	1.000	3000000	40	0.0E+00	2,750,000	0.0E+00
65	3,250,000	1.599E+07	1.000	3250000	41	4.0E+03	3,125,000	1.2E+10
70	3,500,000	1.599E+07	1.000	3500000	42	0.0E+00	3,375,000	0.0E+00
90	4,500,000	1.599E+07	1.000	4500000	43	0.0E+00	4,000,000	0.0E+00
100	5,000,000	1.599E+07	1.000	5000000	44	0.0E+00	4,750,000	0.0E+00
200	10,000,000	1.599E+07	1.000	10000000	45	0.0E+00	7,500,000	0.0E+00
300	15,000,000	1.599E+07	1.000	15000000	46	0.0E+00	12,500,000	0.0E+00
					47	0.0E+00		

B47 =A47*B\$15

C47 =COUNTIF(C\$60:EWW\$4058, "<"&B47)

D47 =C47/C\$47

G47 =C47-C46

H47 =E46+(E47-E46)/2

I47 =H47*G47

50,000 Median/cell		99,357 Mean/cell			4000 Bins-Freq		4000 Bins-Severity	
54	A60 =1/F52				C58 =1/H52			
55	B60 =NORM.INV(A60,C\$2,C\$3)				C59 =LOGNORM.INV(C\$58,\$F\$7,\$F\$10)			
56					C60 =\$B60*C\$59			
57	B	C	D	E	F	G	H	7
Product	Prob	0.00025	0.0005	0.00075	0.001	0.00125	0.0015	0.00175
Prob	X=N \ Y=LN	0.83	1.04	1.19	1.31	1.42	1.52	1.61
0.00025	996.52	827	1,035	1,186	1,310	1,417	1,513	1,601
0.0005	996.71	827	1,035	1,186	1,310	1,418	1,514	1,601
0.00075	996.83	827	1,035	1,186	1,310	1,418	1,514	1,601
0.001	996.91	827	1,035	1,187	1,311	1,418	1,514	1,601
0.00125	996.98	828	1,035	1,187	1,311	1,418	1,514	1,601
0.0015	997.03	828	1,035	1,187	1,311	1,418	1,514	1,602
0.00175	997.08	828	1,035	1,187	1,311	1,418	1,514	1,602
0.002	997.12	828	1,035	1,187	1,311	1,418	1,514	1,602
0.00225	997.16	828	1,035	1,187	1,311	1,418	1,514	1,602
0.0025	997.19	828	1,036	1,187	1,311	1,418	1,514	1,602
0.00275	997.22	828	1,036	1,187	1,311	1,418	1,514	1,602
0.003	997.25	828	1,036	1,187	1,311	1,418	1,514	1,602
0.00325	997.28	828	1,036	1,187	1,311	1,418	1,514	1,602
0.0035	997.30	828	1,036	1,187	1,311	1,419	1,514	1,602
0.00375	997.33	828	1,036	1,187	1,311	1,419	1,515	1,602
0.004	997.35	828	1,036	1,187	1,311	1,419	1,515	1,602
0.00425	997.37	828	1,036	1,187	1,311	1,419	1,515	1,602
0.0045	997.39	828	1,036	1,187	1,311	1,419	1,515	1,602
0.00475	997.41	828	1,036	1,187	1,311	1,419	1,515	1,602
0.005	997.42	828	1,036	1,187	1,311	1,419	1,515	1,602
0.00525	997.44	828	1,036	1,187	1,311	1,419	1,515	1,602
0.0055	997.46	828	1,036	1,187	1,311	1,419	1,515	1,602
0.00575	997.47	828	1,036	1,187	1,311	1,419	1,515	1,602
0.006	997.49	828	1,036	1,187	1,311	1,419	1,515	1,602
0.00625	997.50	828	1,036	1,187	1,311	1,419	1,515	1,602
0.0065	997.52	828	1,036	1,187	1,311	1,419	1,515	1,602
0.00675	997.53	828	1,036	1,187	1,311	1,419	1,515	1,602
0.007	997.54	828	1,036	1,187	1,311	1,419	1,515	1,602
0.00725	997.56	828	1,036	1,187	1,311	1,419	1,515	1,602
0.0075	997.57	828	1,036	1,187	1,311	1,419	1,515	1,602
0.00775	997.58	828	1,036	1,187	1,311	1,419	1,515	1,602
0.008	997.59	828	1,036	1,187	1,311	1,419	1,515	1,602
0.00825	997.60	828	1,036	1,187	1,311	1,419	1,515	1,602
0.0085	997.61	828	1,036	1,187	1,311	1,419	1,515	1,602
0.00875	997.62	828	1,036	1,187	1,312	1,419	1,515	1,603
0.009	997.63	828	1,036	1,187	1,312	1,419	1,515	1,603
0.00925	997.64	828	1,036	1,187	1,312	1,419	1,515	1,603
0.0095	997.65	828	1,036	1,187	1,312	1,419	1,515	1,603
0.00975	997.66	828	1,036	1,187	1,312	1,419	1,515	1,603
0.01	997.67	828	1,036	1,187	1,312	1,419	1,515	1,603
0.01025	997.68	828	1,036	1,187	1,312	1,419	1,515	1,603
0.0105	997.69	828	1,036	1,187	1,312	1,419	1,515	1,603
0.01075	997.70	828	1,036	1,187	1,312	1,419	1,515	1,603

Claim Freq (Normal)		Claim Severity (LN)		Aggregate: from cells		Aggregate: from CDF		
Mean1	Std. Dev	Median2	Mean2	Median3	Mean3	Median4	Mean4	
1000	1	50	100	50,000	99,357	50,000	101,142	
	CDF	CDF	CDF					
Loss\$	Actual	Cells	From CDF					
5,000	0.025	0.025	0.026					Correlation: Actual vs
10,000	0.086	0.085	0.088	Cells				0.999999 =CORREL(\$K\$6:\$K\$33,L\$6:L\$33)
15,000	0.153	0.152	0.155	CDF				0.999997 =CORREL(\$K\$6:\$K\$33,M\$6:M\$33)
20,000	0.218	0.217	0.220					
25,000	0.278	0.277	0.280					
30,000	0.332	0.331	0.333					
40,000	0.425	0.424	0.425					
50,000	0.500	0.500	0.500	Median	From Cells	From CDF		
100,000	0.722	0.723	0.720	Mean	50,000	50000		=L45
150,000	0.825	0.826	0.823		99,357	101,142		=N47
200,000	0.881	0.882	0.879					
250,000	0.914	0.915	0.912	Mu	10.82	10.82		=LN(P13)
300,000	0.936	0.937	0.934	mu+S^2/2	11.51	11.52		=LN(P14)
350,000	0.951	0.952	0.949	Sigma^2	1.37	1.41		=(P17-P16)*2
400,000	0.961	0.962	0.960	Sigma	1.17	1.19		=SQRT(P18)
500,000	0.975	0.975	0.974					
600,000	0.983	0.983	0.982					
750,000	0.989	0.990	0.989					
1,000,000	0.995	0.995	0.994					
1,500,000	0.998	0.998	0.998					
2,000,000	0.999	0.999	0.999					
2,500,000	1.000	1.000	1.000					
3,000,000	1.000	1.000	1.000					
3,250,000	1.000	1.000	1.000					
3,500,000	1.000	1.000	1.000					
4,500,000	1.000	1.000	1.000					
5,000,000	1.000	1.000	1.000					
10,000,000	1.000	1.000	1.000					

Claim Freq (Norm, 1)		Claim Severity (LN, 2)		Aggregate: from cells		Aggregate: from CDF		
Mean1	Std. Dev	Median2	Mean2	Median3	Mean3	Median4	Mean4	
1000	1	50	100	50,000	99,357	#####	101,142.0	

J	K	L	M	N	O	P	Q	R
1.	Calculate median Loss\$ from the CDF			K43	=VLOOKUP(0.5,D19:E47,1)			41
	CDF%Sum	Loss\$	Row	L43	=VLOOKUP(0.5,D18:E47,2)			42
	0.425	40000	7	M43	=MATCH(K43,D19:D47,)			43
	0.500	50000	8	K45	=(0.5-K43)/(K44-K43)			44
	1.000	50000		L45	=L43+K45*(L44-L43)			45
								46
2.	Calculate average Loss\$ from CDF			101,142	=SUM(I19:I46)/C47			47
								48
3.	Given the mean and median Loss\$, generate coefficients of the underlying log-normal mod							49
	Mu	10.82	=LN(L45)	Sigma^2	1.41	=(K51-K50)*2		50
	mu+S^2/2	11.52	=LN(N47)	Sigma	1.19	=SQRT(O50)		51