Supplementary Material for "Microscopic Traffic Models, Accidents, and Insurance Losses"

Sojung Kim, Marcel Kleiber & Stefan Weber

Leibniz Universität Hannover

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A Supplementary Material: Literature Review

In this online supplement, we include further references to the literature on traffic microsimulation. Microscopic traffic models can clearly be used to improve traffic efficiency in complex networks. Leveraging the simulator Aimsun, Osorio & Bierlaire (2013) address questions of this type; the authors develop a stochastic optimization framework based on coupling the Aimsun simulator with a metamodel to optimize signal plans in a city. Osorio & Nanduri (2015) extend the microscopic traffic model for fuel consumption to determine energy-efficient traffic management strategies. In addition to model building (if data are available), whether macroscopic or microscopic, calibration can be a challenge. Flötteröd, Bierlaire & Nagel (2011) propose a Bayesian approach to calibrating travel demand. Zhang, Osorio & Flötteröd (2017) discuss the calibration of large-scale traffic simulators; Osorio & Punzo (2019) focus on the calibration of car-following models for the simulation of a traffic network.

In addition to the traditional focus on efficiency, there is another strand of literature that evaluates the safety of transportation systems. Up to now, mainly historical data have been used to examine accident frequency and severity. For reviews, we refer to Lord & Mannering (2010) and Tsoi & Gabler (2015). Statistical modeling approaches permit inference when sufficient data are available on the level of the granularity of the analysis. For example, Yu et al. (2019) estimate the impact of microscopic traffic variables on crash risks. Ortelli, Lapparent & Bierlaire (2021) analyze the impact of public traffic policies on crash severity.

In the absence of data, physical models of traffic can be used to generate artificial data. In our research group, we have shown how perceptual errors can be added to microscopic traffic models to endogenously model the occurrence of accidents (cf. Berkhahn et al. (2018) and Berkhahn et al. (2022)) – a topic that is particularly relevant for sensors of autonomous vehicles. The models allow characterizing the trade-off between safety and efficiency of transportation systems.

B Supplementary Material: References to SUMO Documentation

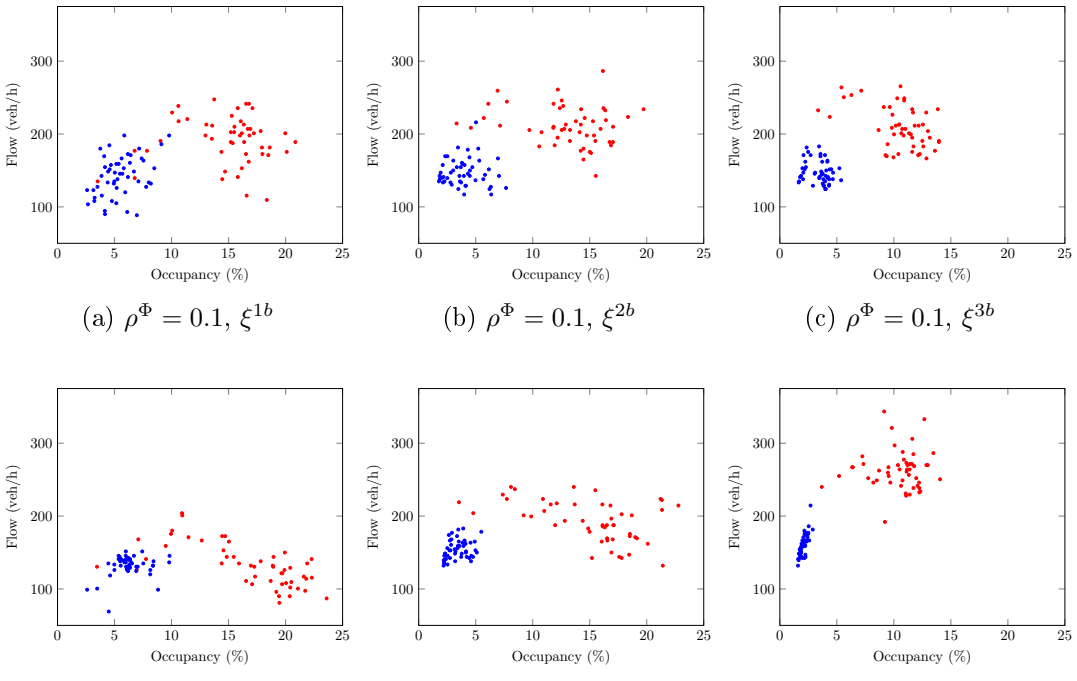
We provide specific references to the SUMO documentation regarding the generation of scenarios in Section 2.3.2.

- **Network**
  - Overview on network generation: `sumo.dlr.de/docs/index.html#network_building`:
  - Graphical network editor: `sumo.dlr.de/docs/Netedit/index.html`
  - Import from OpenStreetMap: `sumo.dlr.de/docs/Networks/Import/OpenStreetMap.html`
- **Demand**
  - Overview on traffic demand modeling: `sumo.dlr.de/docs/Demand/Introduction_to_demand_modelling_in_SUMO.html`
  - Generation of traffic demand: `sumo.dlr.de/docs/Demand/Activity-based_Demand_Generation.html`
  - Automated generation of a route file: `sumo.dlr.de/docs/Demand/activitygen.html`
- **Scenarios**
  - Vehicles: `sumo.dlr.de/docs/Definition_of_Vehicles.html`
  - Publicly available SUMO scenarios: `sumo.dlr.de/docs/Data/Scenarios.html`
- **Randomness**
  - Overview on randomness: `sumo.dlr.de/docs/Simulation/Randomness.html`

C Supplementary Material: Traffic System Performance

In this section, we investigate the impact of changes in fleet characteristics on the performance of the traffic system. Using the 40 induction loop detectors placed in the traffic system, we evaluate the values of selected traffic statistics (flow, average speed, and occupancy). Denoting them by $\chi_k^1, \dots, \chi_k^{40}$ for each scenario $k = 1, \dots, K$, we compute averages $\bar{\chi}_k = 1/40 \sum_{i=1}^{40} \chi_k^i$. Pairing flow-occupancy values and speed-occupancy values yields empirical fundamental diagrams on the urban level (see, e.g., Geroliminis & Daganzo (2008)). For the purpose of data exploration, we draw scatter plots of these pairs for the driving configurations $\xi^{1b}, \xi^{2b}, \xi^{3b}$ and fleet sizes $\rho^\Phi = 0.1, 0.9$ in Figure 1 and Figure 2. We recover the classical u-shape in the flow-occupancy plot. The blue points refer to the low volume traffic scenarios, the red points to the high volume traffic scenarios, as introduced in Section 4.1. This is also reflected by the fact that red points correspond to higher occupancy. Aggressiveness in driving decreases overall occupancy, increases speed, and increases flow, if the fleet is large.

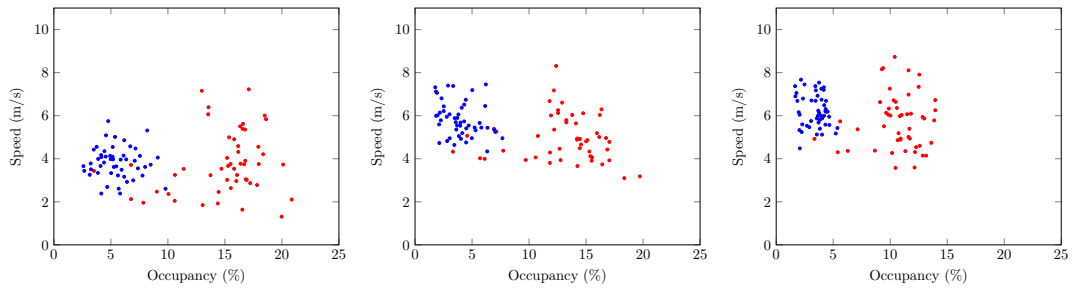
To better understand the impact of individual driving configurations and fleet sizes, we study the scenario averages $\mathbb{E}\left(\sum_{k=1}^K \mu_k \bar{\chi}_k\right) = \frac{1}{K} \sum_{k=1}^K \bar{\chi}_k$. The results are displayed in Figure 3. We see that the performance of the traffic system improves with the aggressiveness of driving in the considered case studies; flows and average speeds increase, and the occupancy decreases.



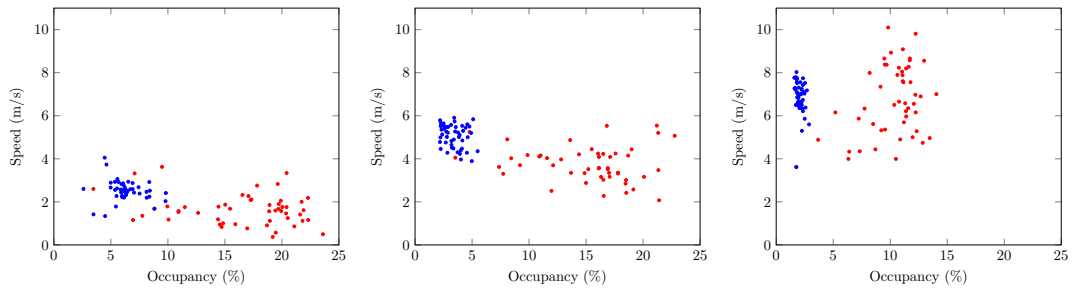
(a) $\rho^\Phi = 0.1$, ξ^{1b} (b) $\rho^\Phi = 0.1$, ξ^{2b} (c) $\rho^\Phi = 0.1$, ξ^{3b}

(d) $\rho^\Phi = 0.9$, ξ^{1b} (e) $\rho^\Phi = 0.9$, ξ^{2b} (f) $\rho^\Phi = 0.9$, ξ^{3b}

Figure 1: Flow-Occupancy Fundamental Diagrams (high traffic volume scenarios are highlighted in red and low traffic volume scenarios in blue).

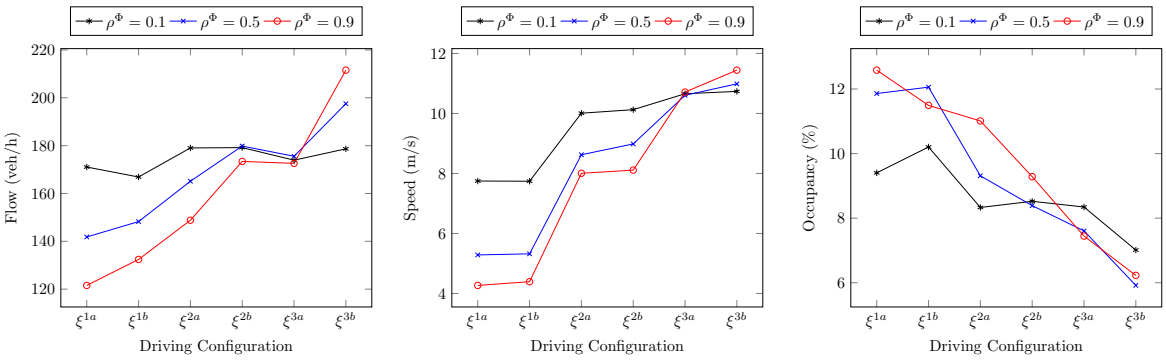


(a) $\rho^{\Phi} = 0.1$, ξ^{1b} (b) $\rho^{\Phi} = 0.1$, ξ^{2b} (c) $\rho^{\Phi} = 0.1$, ξ^{3b}



(d) $\rho^{\Phi} = 0.9$, ξ^{1b} (e) $\rho^{\Phi} = 0.9$, ξ^{2b} (f) $\rho^{\Phi} = 0.9$, ξ^{3b}

Figure 2: Speed-Occupancy Fundamental Diagrams (high traffic volume scenarios are highlighted in red and low traffic volume scenarios in blue).



(a) Flow (b) Speed (c) Occupancy

Figure 3: Impact of Fleet Size and Driving Configuration on Traffic System Performance.

D Supplementary Material: Number of Accidents

We present the expected number of accidents per scenario $\mathbb{E}(C^k)$, $k = 1, \ldots, K$, for both uniform and non-uniform accident occurrence. We also compute the expected total number of accidents $\mathbb{E}(\sum_{k=1^K} C^k)$. We note that, by definition, the involved expectations are equal for both Binomial and Poisson model and given by $\mathbb{E}(C^k) = N\mathbb{E}(\mu^k)p^k = N\mathbb{E}(\mu^k)\lambda^k$.

Uniform Accident Occurrence. For uniform accident occurrence, p^k only depends on the fleet size ρ^Φ. It neither depends on the scenario k, nor the driving configuration. This yields the values presented in Table 1.

Table 1: Expected Number of Accidents for Uniform Accident Occurrence.

ρ^Φ		
0.1	0.5	0.9
0.407	2.035	3.663

The expected number of accidents $\mathbb{E}(C^k) = N\mathbb{E}(\mu^k)p^k$ is computed for the different fleet sizes with uniform accident occurrence.

Non-Uniform Accident Occurrence. For non-uniform accident occurrence, the expected number of accidents depends on the scenario, fleet size, and the respective driving configuration. The values for the different fleet sizes are presented in Table 2, Table 3, and Table 4.

Total Number of Accidents. We contrast the expected total number of accidents for uniform and non-uniform accident occurrence in Table 5.

Table 2: Expected Number of Accidents for Non-Uniform Accident Occurrence and $\rho^{\Phi} = 0.1$.

Scenario	ξ^{1a}	ξ^{1b}	ξ^{2a}	ξ^{2b}	ξ^{3a}	ξ^{3b}	Scenario	ξ^{1a}	ξ^{1b}	ξ^{2a}	ξ^{2b}	ξ^{3a}	ξ^{3b}
1	0.011	0.012	0.030	0.033	0.082	0.098	51	0.015	0.016	0.047	0.048	0.117	0.178
2	0.023	0.021	0.064	0.063	0.161	0.239	52	0.031	0.031	0.100	0.092	0.216	0.270
3	0.020	0.019	0.068	0.056	0.153	0.196	53	0.033	0.029	0.091	0.079	0.228	0.345
4	0.017	0.014	0.073	0.067	0.179	0.214	54	0.029	0.026	0.109	0.111	0.294	0.352
5	0.027	0.027	0.069	0.058	0.156	0.183	55	0.035	0.030	0.132	0.130	0.284	0.373
6	0.018	0.021	0.062	0.062	0.162	0.158	56	0.047	0.046	0.120	0.132	0.349	0.442
7	0.018	0.018	0.049	0.061	0.135	0.158	57	0.049	0.045	0.133	0.129	0.305	0.484
8	0.042	0.038	0.046	0.046	0.137	0.135	58	0.063	0.057	0.151	0.157	0.405	0.565
9	0.019	0.017	0.041	0.042	0.119	0.118	59	0.059	0.058	0.155	0.167	0.455	0.568
10	0.025	0.023	0.059	0.040	0.107	0.147	60	0.091	0.083	0.187	0.156	0.573	0.572
11	0.023	0.023	0.059	0.048	0.213	0.160	61	0.063	0.068	0.196	0.206	0.515	0.638
12	0.020	0.014	0.056	0.043	0.118	0.129	62	0.061	0.064	0.210	0.183	0.567	0.577
13	0.030	0.029	0.076	0.043	0.180	0.155	63	0.056	0.074	0.203	0.227	0.616	0.585
14	0.026	0.026	0.073	0.041	0.152	0.134	64	0.054	0.062	0.220	0.200	0.693	0.655
15	0.028	0.037	0.055	0.045	0.169	0.182	65	0.071	0.071	0.262	0.213	0.705	0.627
16	0.049	0.043	0.069	0.050	0.210	0.233	66	0.083	0.088	0.250	0.191	0.621	0.538
17	0.024	0.027	0.061	0.060	0.184	0.216	67	0.084	0.077	0.233	0.213	0.656	0.696
18	0.031	0.030	0.082	0.051	0.184	0.222	68	0.081	0.113	0.232	0.248	0.625	0.688
19	0.031	0.031	0.076	0.069	0.200	0.217	69	0.085	0.088	0.251	0.207	0.653	0.490
20	0.028	0.034	0.098	0.108	0.176	0.228	70	0.069	0.094	0.274	0.278	0.650	0.798
21	0.033	0.041	0.064	0.089	0.191	0.251	71	0.077	0.086	0.239	0.199	0.745	0.558
22	0.024	0.023	0.085	0.075	0.223	0.243	72	0.098	0.101	0.277	0.278	0.644	0.595
23	0.031	0.024	0.065	0.076	0.221	0.237	73	0.066	0.115	0.217	0.226	0.637	0.610
24	0.037	0.033	0.084	0.076	0.185	0.207	74	0.071	0.105	0.241	0.251	0.789	0.676
25	0.024	0.030	0.071	0.065	0.226	0.206	75	0.090	0.083	0.209	0.251	0.803	0.638
26	0.031	0.030	0.068	0.067	0.162	0.144	76	0.102	0.079	0.249	0.223	0.672	0.575
27	0.034	0.033	0.071	0.064	0.196	0.227	77	0.082	0.103	0.177	0.256	0.627	0.579
28	0.027	0.033	0.083	0.071	0.216	0.188	78	0.091	0.074	0.256	0.198	0.774	0.497
29	0.031	0.030	0.071	0.075	0.179	0.317	79	0.101	0.095	0.286	0.227	0.793	0.676
30	0.031	0.024	0.064	0.078	0.108	0.223	80	0.090	0.072	0.226	0.223	0.782	0.605
31	0.032	0.026	0.076	0.067	0.142	0.245	81	0.099	0.077	0.236	0.244	0.891	0.622
32	0.029	0.028	0.088	0.080	0.181	0.260	82	0.115	0.085	0.231	0.257	0.772	0.454
33	0.032	0.025	0.073	0.073	0.208	0.246	83	0.116	0.048	0.252	0.269	0.713	0.820
34	0.026	0.031	0.097	0.072	0.204	0.217	84	0.094	0.077	0.207	0.225	0.807	0.738
35	0.027	0.032	0.075	0.095	0.200	0.228	85	0.084	0.117	0.208	0.274	0.687	0.909
36	0.039	0.036	0.071	0.067	0.221	0.223	86	0.076	0.098	0.203	0.167	0.682	0.601
37	0.033	0.042	0.072	0.068	0.165	0.209	87	0.101	0.133	0.216	0.237	0.866	0.622
38	0.026	0.026	0.069	0.054	0.197	0.232	88	0.104	0.116	0.271	0.268	0.623	0.513
39	0.029	0.038	0.069	0.077	0.197	0.232	89	0.123	0.099	0.220	0.238	0.664	0.507
40	0.028	0.031	0.072	0.071	0.210	0.231	90	0.124	0.075	0.192	0.213	0.582	0.603
41	0.039	0.037	0.085	0.118	0.157	0.242	91	0.109	0.074	0.199	0.260	0.595	0.617
42	0.023	0.027	0.063	0.108	0.218	0.251	92	0.139	0.085	0.233	0.231	0.711	0.607
43	0.034	0.035	0.075	0.135	0.196	0.200	93	0.122	0.084	0.233	0.203	0.773	0.680
44	0.030	0.046	0.099	0.137	0.220	0.261	94	0.103	0.098	0.267	0.271	0.745	0.767
45	0.029	0.038	0.107	0.098	0.193	0.228	95	0.100	0.098	0.286	0.232	0.751	0.679
46	0.031	0.041	0.139	0.104	0.203	0.225	96	0.088	0.100	0.283	0.226	0.642	0.736
47	0.033	0.035	0.101	0.109	0.198	0.196	97	0.101	0.111	0.283	0.310	0.647	0.802
48	0.044	0.061	0.105	0.102	0.172	0.218	98	0.081	0.095	0.314	0.325	0.638	0.691
49	0.021	0.032	0.114	0.135	0.175	0.175	99	0.110	0.102	0.329	0.308	0.696	0.703
50	0.016	0.028	0.087	0.077	0.159	0.120	100	0.050	0.081	0.168	0.257	0.500	0.494

The expected number of accidents $\mathbb{E}(C^k) = N\mathbb{E}(\mu^k)p^k$ is computed for the different driving configurations with non-uniform accident occurrence and $\rho^{\Phi} = 0.1$.

Table 3: Expected Number of Accidents for Non-Uniform Accident Occurrence and $\rho^{\Phi} = 0.5$.

Scenario	ξ^{1a}	ξ^{1b}	ξ^{2a}	ξ^{2b}	ξ^{3a}	ξ^{3b}	Scenario	ξ^{1a}	ξ^{1b}	ξ^{2a}	ξ^{2b}	ξ^{3a}	ξ^{3b}
1	0.063	0.067	0.158	0.178	0.424	0.512	51	0.087	0.094	0.244	0.261	0.613	0.888
2	0.128	0.126	0.287	0.312	0.926	1.236	52	0.165	0.172	0.512	0.509	1.277	1.791
3	0.076	0.088	0.317	0.362	0.753	1.004	53	0.133	0.131	0.407	0.563	1.539	2.188
4	0.070	0.063	0.340	0.343	0.957	1.228	54	0.149	0.141	0.526	0.650	1.617	1.980
5	0.136	0.126	0.270	0.289	0.747	0.934	55	0.191	0.156	0.563	0.593	1.808	2.274
6	0.078	0.102	0.264	0.284	0.971	0.930	56	0.218	0.231	0.522	0.639	1.959	2.337
7	0.102	0.107	0.211	0.235	0.533	0.702	57	0.204	0.233	0.684	0.735	1.429	2.032
8	0.119	0.122	0.225	0.194	0.561	0.705	58	0.223	0.173	0.561	0.652	1.922	2.272
9	0.138	0.121	0.217	0.271	0.628	0.772	59	0.213	0.268	0.707	0.941	2.604	2.524
10	0.130	0.123	0.299	0.251	0.606	0.999	60	0.240	0.214	0.784	0.858	2.953	2.798
11	0.111	0.123	0.265	0.286	1.073	1.048	61	0.278	0.217	0.817	1.036	2.687	2.537
12	0.122	0.133	0.211	0.294	1.050	0.819	62	0.272	0.349	0.898	0.958	2.813	3.100
13	0.168	0.196	0.305	0.264	0.840	0.726	63	0.297	0.350	0.873	0.924	3.373	2.500
14	0.158	0.124	0.205	0.214	0.980	0.789	64	0.404	0.346	0.840	1.063	2.989	2.898
15	0.170	0.123	0.323	0.214	0.799	0.632	65	0.360	0.329	0.836	1.045	3.003	2.649
16	0.148	0.134	0.352	0.243	1.009	0.621	66	0.319	0.384	0.963	1.025	2.705	3.167
17	0.159	0.121	0.326	0.199	0.933	0.666	67	0.376	0.332	1.340	1.066	3.366	3.661
18	0.206	0.164	0.365	0.315	1.006	0.945	68	0.411	0.292	1.028	1.117	3.318	3.275
19	0.148	0.154	0.351	0.428	0.994	0.770	69	0.380	0.464	0.810	1.245	3.744	3.216
20	0.180	0.110	0.360	0.362	0.912	0.929	70	0.513	0.483	1.062	1.217	2.970	3.024
21	0.164	0.179	0.330	0.330	1.054	0.646	71	0.401	0.437	1.452	1.598	2.989	4.208
22	0.189	0.139	0.490	0.409	1.001	0.918	72	0.391	0.401	1.032	1.269	2.794	3.274
23	0.208	0.221	0.557	0.380	1.132	0.839	73	0.512	0.437	1.600	1.558	3.549	2.930
24	0.158	0.178	0.429	0.278	0.755	0.672	74	0.336	0.520	1.319	1.372	2.913	3.336
25	0.214	0.208	0.575	0.365	1.175	0.881	75	0.478	0.481	1.127	1.616	3.185	2.219
26	0.233	0.224	0.507	0.420	0.798	0.777	76	0.410	0.561	1.271	1.367	2.591	2.516
27	0.120	0.176	0.458	0.426	1.130	0.946	77	0.354	0.433	1.284	1.130	2.289	3.011
28	0.263	0.199	0.549	0.317	1.305	1.108	78	0.551	0.416	1.220	0.890	2.830	2.836
29	0.149	0.164	0.361	0.401	0.957	0.659	79	0.389	0.523	0.990	1.293	2.546	4.131
30	0.158	0.190	0.353	0.337	0.960	0.763	80	0.357	0.552	1.213	1.126	2.879	3.642
31	0.155	0.190	0.514	0.361	1.059	0.796	81	0.351	0.515	1.200	0.961	3.724	2.900
32	0.154	0.215	0.683	0.385	0.611	0.711	82	0.390	0.428	1.186	1.323	3.836	3.237
33	0.127	0.142	0.525	0.401	0.483	0.736	83	0.327	0.394	1.577	1.278	3.975	3.375
34	0.100	0.172	0.571	0.384	0.873	0.810	84	0.371	0.427	1.633	1.169	3.878	3.206
35	0.185	0.149	0.599	0.286	0.676	0.750	85	0.376	0.219	1.395	1.258	4.207	2.876
36	0.177	0.206	0.521	0.416	0.980	0.681	86	0.433	0.352	1.616	0.914	3.997	3.670
37	0.152	0.126	0.551	0.290	1.049	0.743	87	0.443	0.214	1.480	1.073	3.792	4.043
38	0.160	0.174	0.446	0.349	0.922	0.694	88	0.403	0.253	1.307	0.911	2.677	4.091
39	0.220	0.198	0.442	0.328	0.760	0.776	89	0.386	0.196	0.987	1.118	3.054	4.438
40	0.139	0.150	0.444	0.333	0.937	0.730	90	0.374	0.408	1.080	1.298	3.068	3.832
41	0.143	0.213	0.515	0.410	1.088	1.004	91	0.411	0.320	1.053	1.053	3.353	4.813
42	0.135	0.147	0.624	0.482	0.961	0.744	92	0.374	0.481	1.105	1.343	3.303	5.189
43	0.139	0.150	0.494	0.723	0.958	0.926	93	0.380	0.496	1.243	1.317	3.400	4.766
44	0.169	0.162	0.441	0.539	0.922	0.887	94	0.408	0.450	1.172	1.382	4.417	5.476
45	0.227	0.180	0.584	0.489	1.168	0.837	95	0.265	0.432	1.132	1.571	4.071	4.528
46	0.122	0.127	0.481	0.320	1.455	0.679	96	0.274	0.440	1.029	1.450	3.714	4.625
47	0.186	0.159	0.519	0.490	0.990	0.740	97	0.416	0.391	0.776	1.287	3.569	3.219
48	0.253	0.164	0.460	0.447	0.852	0.716	98	0.276	0.584	1.393	1.487	3.659	3.135
49	0.155	0.138	0.455	0.476	0.804	0.954	99	0.555	0.467	1.267	1.379	3.765	2.717
50	0.077	0.066	0.301	0.292	0.563	0.238	100	0.145	0.157	0.598	0.986	1.552	1.396

The expected number of accidents $\mathbb{E}(C^k) = N\mathbb{E}(\mu^k)p^k$ is computed for the different driving configurations with non-uniform accident occurrence and $\rho^{\Phi} = 0.5$.

Table 4: Expected Number of Accidents for Non-Uniform Accident Occurrence and $\rho^{\Phi} = 0.9$.

Scenario	ξ^{1a}	ξ^{1b}	ξ^{2a}	ξ^{2b}	ξ^{3a}	ξ^{3b}	Scenario	ξ^{1a}	ξ^{1b}	ξ^{2a}	ξ^{2b}	ξ^{3a}	ξ^{3b}
1	0.210	0.248	0.404	0.437	0.914	0.990	51	0.260	0.298	0.535	0.667	1.451	1.711
2	0.287	0.314	0.477	0.530	1.549	1.770	52	0.406	0.439	0.762	0.868	2.164	3.144
3	0.163	0.166	0.544	0.583	1.633	1.527	53	0.376	0.382	0.754	0.957	2.538	3.412
4	0.143	0.190	0.591	0.668	1.814	1.801	54	0.301	0.322	0.998	1.153	2.934	3.744
5	0.226	0.246	0.471	0.613	1.449	1.896	55	0.259	0.450	0.784	1.321	2.952	4.352
6	0.309	0.285	0.406	0.539	1.652	1.492	56	0.423	0.486	1.059	1.127	3.487	3.803
7	0.242	0.257	0.493	0.508	1.580	1.517	57	0.535	0.482	0.872	1.300	3.307	4.277
8	0.251	0.224	0.393	0.393	1.250	1.218	58	0.424	0.446	1.226	1.110	3.606	4.653
9	0.263	0.270	0.410	0.402	1.139	1.274	59	0.371	0.434	1.061	1.428	5.064	5.213
10	0.277	0.283	0.485	0.390	1.280	1.149	60	0.596	0.531	1.130	1.416	4.542	4.558
11	0.251	0.250	0.690	0.485	2.027	1.528	61	0.371	0.478	1.172	1.469	5.310	6.026
12	0.232	0.396	0.643	0.438	1.789	1.191	62	0.478	0.453	1.431	1.583	5.881	6.296
13	0.244	0.287	0.553	0.474	2.114	1.350	63	0.493	0.500	1.762	1.832	6.149	5.773
14	0.296	0.327	0.668	0.440	2.016	1.140	64	0.471	0.522	1.392	2.168	6.499	6.421
15	0.402	0.387	0.497	0.365	1.706	1.208	65	0.518	0.481	1.697	2.105	6.589	5.943
16	0.327	0.313	0.867	0.469	1.834	1.105	66	0.590	0.608	1.666	1.725	5.099	6.180
17	0.380	0.271	0.613	0.467	2.007	1.234	67	0.720	0.572	1.969	1.838	5.481	5.559
18	0.215	0.270	0.641	0.434	1.632	1.260	68	0.709	0.439	1.681	2.332	5.331	7.396
19	0.227	0.264	0.581	0.386	2.032	1.187	69	0.620	0.506	1.937	1.692	5.138	6.560
20	0.416	0.365	0.657	0.496	2.012	1.342	70	0.559	0.600	1.447	2.172	5.150	6.256
21	0.220	0.320	0.572	0.402	2.080	1.366	71	0.648	0.593	1.776	2.041	6.764	7.774
22	0.260	0.286	0.695	0.531	2.215	1.675	72	0.744	0.612	2.249	1.709	6.999	5.912
23	0.271	0.342	0.895	0.738	2.302	1.458	73	0.738	0.831	1.805	1.920	6.551	6.062
24	0.280	0.400	0.620	0.715	1.869	1.230	74	0.669	0.615	2.074	2.042	6.351	5.598
25	0.239	0.350	0.662	0.699	1.993	1.370	75	0.574	0.621	1.762	2.243	4.736	7.480
26	0.260	0.496	0.725	0.436	1.753	1.155	76	0.588	0.614	1.858	2.150	6.260	7.337
27	0.283	0.332	0.565	0.540	2.034	1.317	77	0.529	0.476	2.130	1.893	5.756	5.461
28	0.260	0.324	0.898	0.529	1.974	1.049	78	0.507	0.560	1.881	2.278	4.603	5.212
29	0.495	0.294	0.662	0.570	1.873	1.331	79	0.479	0.633	1.965	2.036	4.229	5.506
30	0.350	0.289	0.963	0.433	2.010	1.215	80	0.491	0.754	1.414	2.478	4.102	6.615
31	0.398	0.268	0.574	0.632	1.641	1.359	81	0.366	0.692	2.418	2.221	4.906	4.359
32	0.321	0.314	0.438	0.847	2.325	1.564	82	0.585	0.739	2.081	2.322	5.959	6.304
33	0.338	0.272	0.428	1.309	1.897	1.637	83	0.592	0.627	2.665	1.675	4.790	6.161
34	0.369	0.270	0.286	0.623	2.006	1.366	84	0.680	0.673	1.780	2.044	5.923	6.777
35	0.466	0.456	0.467	0.887	1.964	1.387	85	0.619	0.513	1.458	1.512	7.145	6.888
36	0.371	0.293	0.754	0.640	2.163	1.318	86	0.414	0.614	1.707	1.731	6.458	7.630
37	0.411	0.233	0.684	0.681	1.902	1.182	87	0.618	0.575	1.713	1.955	7.100	5.358
38	0.398	0.281	0.678	0.743	1.838	1.249	88	0.462	0.490	2.347	1.834	6.681	7.801
39	0.396	0.269	0.558	0.528	1.883	1.513	89	0.416	0.680	2.425	2.981	6.499	4.090
40	0.524	0.375	0.741	0.751	1.979	1.452	90	0.499	0.629	1.539	3.613	5.169	5.765
41	0.362	0.284	0.772	0.667	2.446	1.071	91	0.648	0.644	1.859	3.113	4.926	4.817
42	0.441	0.310	0.857	0.757	1.996	1.653	92	0.458	0.657	2.884	3.438	6.093	4.222
43	0.457	0.303	0.919	0.975	1.944	1.471	93	0.530	0.700	3.324	2.417	5.460	5.895
44	0.463	0.461	0.829	0.640	1.966	1.383	94	0.829	0.780	3.284	2.561	5.435	5.650
45	0.666	0.340	0.591	0.702	2.016	1.261	95	0.446	0.766	2.211	2.420	5.502	6.146
46	0.683	0.596	0.826	0.617	2.132	1.203	96	0.822	0.641	2.095	1.994	4.905	6.230
47	0.690	0.650	0.511	0.777	1.819	1.264	97	0.708	0.504	2.410	1.986	5.911	6.273
48	0.543	0.338	0.676	0.584	1.874	1.120	98	0.425	0.428	1.741	2.001	5.398	6.954
49	0.449	0.319	0.523	0.722	1.743	1.264	99	0.533	0.512	2.714	2.325	6.597	7.637
50	0.245	0.164	0.488	0.466	1.586	0.810	100	0.213	0.234	1.043	1.066	4.294	4.861

The expected number of accidents $\mathbb{E}(C^k) = N\mathbb{E}(\mu^k)p^k$ is computed for the different driving configurations with non-uniform accident occurrence and $\rho^{\Phi} = 0.9$.

Table 5: Expected Total Number of Accidents.

	Uniform	Non-Uniform
$\rho^{\mathbf{\Phi}} = \mathbf{0.1}$:		
ξ^{1a}	40.7	5.5
ξ^{1b}	40.7	5.5
ξ^{2a}	40.7	14.5
ξ^{2b}	40.7	14.4
ξ^{3a}	40.7	39.7
ξ^{3b}	40.7	39.8
$\rho^{\mathbf{\Phi}} = \mathbf{0.5}$:		
ξ^{1a}	203.5	24.6
ξ^{1b}	203.5	25.3
ξ^{2a}	203.5	72.1
ξ^{2b}	203.5	72.3
ξ^{3a}	203.5	193.3
ξ^{3b}	203.5	199.1
$\rho^{\mathbf{\Phi}} = \mathbf{0.9}$:		
ξ^{1a}	366.3	43.6
ξ^{1b}	366.3	43.7
ξ^{2a}	366.3	118.9
ξ^{2b}	366.3	125.9
ξ^{3a}	366.3	352.8
ξ^{3b}	366.3	351.0

The expected total number of accidents is given by $\mathbb{E}(\sum_{k=1}^{K} C^k)$ and computed for uniform and non-uniform accident occurrence.

E Supplementary Material: Sampling Procedure

We provide a detailed pseudo-code for the procedure to obtain samples from L in Algorithm 1. In our case studies, we use $M' = M = 10,000$ samples of ψ in each scenario k to approximate its distribution $\mathcal{L}^k$. We note that, instead of this bootstrapping approach, one could also pre-sample sufficiently many values.

Algorithm 1 Sampling of Losses L.

Phase 1: Prior Evaluation of Traffic Model

for $k = 1, \dots, K$ **do**
  Run SUMO in scenario k.
  Obtain data to calculate p_r^k and λ_r^k for $r = 1, \dots, R$.
  Terminate SUMO.
  Set $p^k = \sum_{r=1}^R p_r^k$ and $\lambda^k = \sum_{r=1}^R \lambda_r^k$.
end for

Phase 2: Pre-Sampling of ψ conditional on scenario $k = 1, \dots, K$.

for $k = 1, \dots, K$ **do**
  for $j = 1, \dots, M'$ **do**
    Sample $\hat{t}_j = \text{Unif}(0, T)$.
    Sample $\hat{r}_j \sim \mathcal{R}$ where $P(\mathcal{R} = r) = p_r^k / p^k$ (or $P(\mathcal{R} = r) = \lambda_r^k / \lambda^k$).
  end for
  Sort $\hat{t}_1, \dots, \hat{t}_{M'}$ by size (again denoted by $\hat{t}_1, \dots, \hat{t}_{M'}$).
  Start SUMO in scenario k.
  for $j = 1, \dots, M'$ **do**
    Continue SUMO until time $\hat{t}_j$.
    Sample $\hat{i}_j \sim \text{Unif}\left(\mathcal{M}_{\hat{r}_j}^{\Phi}\left(\hat{t}_j\right)\right)$.
    Set $\hat{\psi}_j^k = v^{\hat{i}_j}(\hat{t}_j)$.
  end for
  Terminate SUMO.
  Store $\hat{\psi}_1^k, \dots, \hat{\psi}_{M'}^k$.
end for

Phase 3: Sampling of total losses L.

for $j = 1, \dots, M$ **do**
  Sample $\hat{y}^j$ with $P(y = g) = P(y = b) = 1/2$.
  for $n = 1, \dots, N$ **do**
    Sample $\hat{\nu}^{j,n} \sim \nu_{\hat{y}^j}$.
  end for
  for $k = 1, \dots, K$ **do**
    Set $(\hat{\mu}^k)^j = 1/N \sum_{n=1}^N \mathbb{1}\{\hat{\nu}^{j,n} = k\}$.
  end for
  for $k = 1, \dots, K$ **do**
    Sample $\left(\hat{C}^k\right)^j \sim \text{Bin}(p^k, N(\hat{\mu}^k)^j)$ (or $\left(\hat{C}^k\right)^j \sim \text{Poiss}(\lambda^k N(\hat{\mu}^k)^j)$).
    for $c = 1, \dots, \left(\hat{C}^k\right)^j$ **do**
      Sample $\hat{l} \sim \text{Unif}(\{1, \dots, M'\})$.
      Sample $\hat{X}_c^k \sim F^{\hat{\psi}_{\hat{l}}^k}$.
    end for
  end for
  Set $\hat{L}^j = \sum_{k=1}^K \sum_{c=1}^{(\hat{C}^k)^j} \hat{X}_c^k$.
end for

Output: $\hat{L}^1, \dots, \hat{L}^M$.

F Supplementary Material: Tables

We provide detailed tables that contain selected statistical functionals of the total loss in our different case studies. We evaluate

(i) *Expectation.* $\mathbb{E}(L)$,

(ii) *Variance.* $\mathrm{Var}(L) = \mathbb{E}(L^2) - \mathbb{E}(L)^2$,

(iii) *Skewness.* $\varsigma_L = \frac{\mathbb{E}\left[(L-\mathbb{E}(L))^3\right]}{(\mathrm{Var}(L))^{3/2}}$,

(iv) *Value-at-Risk.* $\mathrm{VaR}_p(L) = \inf\{x \in \mathbb{R} \colon P(L \leq x) \geq p\}$, $p = 0.9,\ 0.95,\ 0.99$,

(v) *Expected Shortfall.* $\mathrm{ES}_p(L) = \frac{1}{1-p}\int_p^1 \mathrm{VaR}_q(L)\,\mathrm{d}q$, $p = 0.9,\ 0.95,\ 0.99$.

These statistical functionals are presented for both unnormalized and normalized values of L. In total, we provide 18 tables, as shown in the list of tables below: The first 9 tables contain the statistical functionals for unnormalized total losses while the second 9 tables contain the results for normalized total losses.

List of Tables

Remarks on the Normalization. Recall that we normalize total losses in order to compare losses among fleet sizes $\rho^{\Phi} = 0.1,\ 0.5,\ 0.9$. More precisely, we normalize L by *100 expected insured vehicles* as follows:

- In the underlying SUMO scneario, the route files specify a number of vehicles for each *flow* belonging to the fleet Φ.
- For each traffic scenario k, we denote the sum of these values over all flows by n^k. We interpret this as the total number of insured vehicles in traffic scenario k. In our case studies, n^k takes two different values corresponding to the good and bad scenarios:

$$n^k = \begin{cases} n_g, & k = 1, \dots, 50, \\ n_b, & k = 51, \dots, 100. \end{cases}$$

- We denote the total number of insured vehicles by n^Φ. It is given by $n^\Phi = \sum_{k=1}^K \mu^k n^k$. Note that this number is random as μ is random.
- We evaluate the normalized total loss per 100 expected insured vehicles. According to our specific choice of μ, it is given by

$$\frac{L}{\frac{\mathbb{E}(n^\Phi)}{100}} = 100 \cdot \frac{L}{\sum_{k=1}^K n^k \mathbb{E}(\mu^k)} = \frac{200}{n_g + n_b} \cdot L.$$

Table 1: Expectation of the Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	546.7	544.7	544.2	547.0	544.2	546.5	545.5	546.7	546.2	543.4	547.2	542.5
ξ^{1b}	527.0	525.9	523.0	529.3	524.7	522.1	527.0	527.4	523.0	523.2	529.5	525.7
ξ^{2a}	1381.6	1376.5	1374.0	1384.3	1369.3	1367.1	1376.9	1377.7	1376.7	1376.1	1379.5	1364.3
ξ^{2b}	1399.7	1389.0	1380.1	1401.2	1387.2	1389.0	1395.5	1399.6	1392.0	1387.6	1394.9	1381.1
ξ^{3a}	2023.2	2009.8	2028.8	2027.8	2012.6	2019.9	2022.0	2026.4	2022.8	2003.2	2019.8	2002.1
ξ^{3b}	2168.9	2156.3	2148.7	2161.5	2144.3	2150.8	2163.1	2163.5	2158.5	2150.0	2164.1	2149.8
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	2173.0	2169.6	2174.0	2172.5	2170.7	2172.0	2174.9	2175.4	2176.2	2170.8	2165.0	2169.4
ξ^{1b}	2309.2	2312.7	2317.5	2310.9	2309.4	2311.8	2310.0	2314.6	2315.4	2309.9	2312.8	2308.5
ξ^{2a}	5712.1	5731.1	5753.4	5706.9	5719.8	5708.2	5715.9	5719.9	5707.2	5727.0	5705.6	5728.6
ξ^{2b}	7235.7	7258.7	7267.2	7260.1	7250.1	7281.1	7259.9	7262.6	7278.0	7246.7	7249.5	7243.4
ξ^{3a}	10020.9	10043.5	10034.8	10034.3	10012.5	10034.7	10037.9	10045.6	10028.9	10040.4	10040.6	10047.3
ξ^{3b}	13264.6	13275.8	13234.9	13271.4	13260.9	13277.3	13265.9	13272.4	13236.1	13251.3	13245.3	13241.8
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	3125.0	3133.0	3123.5	3130.7	3131.0	3119.0	3124.1	3128.5	3121.5	3128.1	3134.5	3133.0
ξ^{1b}	3772.7	3773.9	3768.3	3770.2	3778.0	3765.6	3778.6	3772.9	3770.4	3763.3	3773.1	3771.2
ξ^{2a}	10054.8	10066.1	10034.4	10069.6	10080.3	10060.3	10068.0	10065.4	10059.5	10054.0	10072.5	10104.8
ξ^{2b}	12538.0	12557.2	12527.5	12557.4	12545.2	12516.0	12554.5	12542.0	12552.6	12535.5	12555.9	12552.5
ξ^{3a}	20601.5	20620.3	20511.0	20585.1	20600.1	20587.4	20609.0	20571.2	20549.9	20562.7	20602.3	20603.8
ξ^{3b}	28596.4	28625.0	28470.8	28605.5	28633.4	28629.9	28595.0	28587.0	28595.0	28577.9	28647.2	28642.7
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	52.3	52.2	53.3	52.5	52.1	54.4	51.8	52.7	52.2	52.5	53.2	53.0
ξ^{1b}	52.9	52.7	52.3	52.9	52.0	52.8	52.6	52.3	52.6	52.4	52.0	54.1
ξ^{2a}	304.5	306.1	295.6	305.5	307.4	304.8	302.6	308.5	306.4	304.4	305.3	303.6
ξ^{2b}	325.5	328.6	331.2	322.7	329.7	324.6	327.2	325.4	327.8	327.3	325.1	322.0
ξ^{3a}	1003.9	1004.6	1006.5	1000.6	1010.8	1000.9	1003.4	993.5	1022.1	1006.5	1009.0	1008.5
ξ^{3b}	1208.6	1207.7	1202.9	1215.7	1207.0	1212.8	1206.1	1209.5	1196.5	1208.0	1211.4	1222.5
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	199.1	199.5	199.9	199.7	201.4	201.2	199.7	198.2	197.9	199.4	198.8	200.0
ξ^{1b}	228.6	228.0	229.6	229.5	229.7	226.7	228.3	227.7	229.3	227.2	228.5	230.2
ξ^{2a}	1577.8	1571.5	1578.4	1581.7	1576.2	1582.7	1579.1	1582.9	1583.0	1579.4	1579.2	1579.8
ξ^{2b}	1928.8	1912.8	1914.6	1923.6	1917.7	1911.4	1914.0	1917.7	1937.8	1913.3	1922.2	1911.7
ξ^{3a}	6946.2	6974.9	6913.7	6928.7	6937.4	6948.2	6945.0	6913.8	6942.0	6927.8	6943.6	6952.9
ξ^{3b}	9311.7	9349.5	9349.8	9329.4	9359.3	9343.5	9340.0	9330.0	9359.0	9334.5	9326.2	9308.5
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	335.7	335.2	335.6	335.0	335.1	333.7	334.7	334.7	334.3	337.0	336.5	334.9
ξ^{1b}	381.3	383.4	383.5	381.6	380.3	383.4	381.2	382.8	380.9	383.4	382.4	382.2
ξ^{2a}	2032.5	2020.2	2034.2	2030.7	2029.4	2040.2	2026.1	2022.3	2027.8	2025.6	2031.2	2035.6
ξ^{2b}	2562.1	2553.8	2550.5	2559.7	2556.1	2553.7	2562.5	2556.9	2568.5	2556.3	2567.8	2558.7
ξ^{3a}	12801.2	12825.5	12775.7	12795.2	12843.3	12815.3	12811.7	12808.1	12797.0	12818.1	12792.4	12772.1
ξ^{3b}	15767.8	15782.4	15757.3	15747.8	15789.4	15787.4	15766.4	15759.1	15736.7	15769.6	15744.5	15806.1

The expectation of the total loss is approximated using $10,000$ independent samples of L.

Table 2: Variance of the Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	18893.7	27665.8	63330.2	18797.9	28026.1	65488.9	18277.8	28087.5	63245.1	19071.7	28092.0	62943.3
ξ^{1b}	18087.2	26745.3	60657.5	18440.3	26108.7	61767.7	17887.3	26811.1	60802.6	17589.5	27311.8	61022.4
ξ^{2a}	173375.0	258237.7	600842.9	173092.1	258920.4	598414.0	172120.9	262482.2	613084.4	173021.5	265451.8	582242.0
ξ^{2b}	177214.8	265275.6	619897.7	178629.2	271430.9	631212.7	176634.1	272308.4	613676.7	174434.4	261582.3	590262.8
ξ^{3a}	485013.5	694041.4	1621207.6	499592.9	727156.0	1579947.2	495801.3	724757.7	1672718.2	495659.6	710318.7	1536261.7
ξ^{3b}	490118.8	722394.1	1688625.0	491584.1	734333.9	1711028.6	488696.3	721297.3	1687128.3	488968.6	752454.6	1606874.7
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	121040.6	157007.0	323289.6	120936.5	166813.1	330798.2	122103.1	161366.7	326131.8	121952.2	160241.5	307114.2
ξ^{1b}	181320.5	230611.6	464392.6	179740.3	236318.9	433770.2	181861.1	233756.7	466338.5	181687.0	239151.9	475013.2
ξ^{2a}	960580.4	1331588.1	2810898.4	976795.7	1347996.6	2838794.5	953983.0	1324593.2	2730096.3	975379.6	1367343.2	2723201.3
ξ^{2b}	1476836.9	1960914.4	3775938.1	1483347.2	1965754.2	3854527.9	1486437.1	1935028.3	3828259.5	1476619.6	1924502.1	3735207.0
ξ^{3a}	2993260.8	4217438.8	8673871.0	3068922.2	4221409.4	8880079.8	3014765.5	4205157.8	8801550.9	3067141.8	4212840.4	8536435.4
ξ^{3b}	4676662.8	6224116.1	12156646.2	4809676.1	6329363.3	12781771.6	4762692.2	6219709.2	12509905.8	4676895.4	6141764.0	12152976.1
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	230663.3	292653.8	557213.5	230110.7	299753.8	550714.7	223713.1	296432.7	556156.1	225082.5	298376.0	550281.9
ξ^{1b}	420227.2	514161.8	886441.8	419661.1	529744.0	890496.6	422378.1	506903.9	866223.8	410689.9	518008.1	838534.9
ξ^{2a}	3617972.2	4254283.7	6785282.6	3627251.6	4245970.8	6861536.3	3575807.1	4150777.2	6806228.4	3548344.3	4209067.1	6990333.1
ξ^{2b}	5148307.6	6076761.5	9320685.1	5301991.9	6039432.8	9419485.9	5157667.3	5835207.0	9384488.3	5055167.2	6010148.3	9398184.7
ξ^{3a}	13071136.0	15680586.9	24022504.1	13409575.9	15713162.4	25030090.4	13116476.7	15264724.3	25281776.3	12989610.2	15290800.5	25353912.1
ξ^{3b}	24501429.2	28291913.8	41813984.7	24611290.5	28767366.0	42224310.3	24362225.8	27467893.6	41963940.9	24379873.1	28203672.3	42459073.8
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	1438.0	2257.3	6100.2	1467.8	2237.1	6720.3	1440.0	2313.5	5776.6	1471.4	2425.6	5994.4
ξ^{1b}	1463.3	2378.6	5994.7	1455.2	2321.9	5858.0	1505.6	2300.6	5844.3	1413.0	2318.5	6845.5
ξ^{2a}	30953.2	49464.1	121528.1	31352.3	48965.0	109378.1	30342.7	49461.0	127032.7	30907.4	49753.9	111897.9
ξ^{2b}	33419.3	53075.3	143017.0	32834.7	55200.1	116193.0	34025.5	54202.3	135611.7	32757.6	54546.8	121344.0
ξ^{3a}	182937.0	295334.3	722181.9	184042.2	295803.4	738829.0	184663.6	288892.8	754295.9	184744.1	304452.4	796616.7
ξ^{3b}	222882.0	353001.2	886386.5	220849.6	360422.9	869560.6	218409.1	361988.8	862637.6	224628.2	344226.6	977182.7
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	5313.9	8478.7	21793.0	5388.0	8619.9	24533.1	5398.9	8642.4	21592.3	5472.4	8465.0	22170.3
ξ^{1b}	6306.7	9851.5	24822.5	6414.5	10070.0	22808.0	6176.6	10229.3	24183.2	6242.0	9831.1	25914.1
ξ^{2a}	160179.5	247943.9	626190.6	162067.5	247069.8	614713.4	159388.6	250341.3	621806.1	159415.6	248641.8	620170.1
ξ^{2b}	193822.7	309370.7	772896.4	196901.0	307477.8	776261.6	189283.6	304666.2	777809.5	196095.0	319014.4	742031.7
ξ^{3a}	1212501.9	1988777.5	4900976.8	1218271.7	1967587.9	4929170.8	1214816.6	1973115.9	4820241.3	1212656.8	1951271.1	5212245.7
ξ^{3b}	2193293.6	3252845.0	7162873.4	2244429.9	3255329.8	7542890.4	2213441.4	3230865.7	7360691.8	2272519.9	3139292.2	7205238.8
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	9418.1	14251.7	34904.2	8856.3	14557.9	32370.7	8959.2	14462.4	35612.6	9189.2	14733.7	35395.1
ξ^{1b}	10433.6	17198.0	41040.9	10625.6	16511.0	41640.4	10743.4	16890.3	41181.5	10870.6	17197.3	39666.6
ξ^{2a}	213730.9	326337.6	793409.8	210433.2	326920.7	848075.4	209536.2	325582.3	798698.7	213523.4	324714.3	804142.7
ξ^{2b}	246957.3	400989.1	989549.0	249269.2	399286.6	948864.4	249621.3	409990.9	984075.1	250842.2	410979.1	1030749.7
ξ^{3a}	2892886.1	4312952.8	9670130.8	2866821.7	4265176.9	9459010.8	2895553.5	4295589.2	9710683.1	2956058.6	4316705.3	9543766.6
ξ^{3b}	3320897.8	5093373.4	11733718.4	3380575.1	5108875.3	11667850.1	3205683.4	5100258.4	12004775.6	3294870.1	5014524.6	12241070.1

The variance of the total loss is approximated using $10,000$ independent samples of L.

Table 3: Skewness of the Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	0.306	0.533	0.869	0.320	0.679	1.904	0.327	0.454	0.858	0.386	0.536	1.728
ξ^{1b}	0.292	0.468	0.868	0.357	0.666	1.764	0.330	0.468	0.818	0.366	0.563	1.756
ξ^{2a}	0.409	0.609	1.095	0.451	0.733	2.822	0.403	0.573	1.109	0.451	0.785	2.221
ξ^{2b}	0.431	0.639	1.114	0.435	0.886	2.495	0.359	0.598	1.073	0.448	0.650	1.987
ξ^{3a}	0.451	0.640	1.234	0.503	0.803	2.269	0.430	0.687	1.297	0.497	0.773	2.171
ξ^{3b}	0.463	0.584	1.142	0.453	0.865	2.763	0.399	0.607	1.142	0.461	0.785	2.084
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	0.192	0.254	0.492	0.130	0.323	1.454	0.200	0.222	0.502	0.164	0.384	0.891
ξ^{1b}	0.330	0.458	1.120	0.326	0.576	1.658	0.350	0.532	1.032	0.341	0.679	3.431
ξ^{2a}	0.266	0.338	0.563	0.216	0.385	1.318	0.219	0.306	0.550	0.221	0.406	1.246
ξ^{2b}	0.208	0.323	0.515	0.196	0.290	0.942	0.209	0.257	0.484	0.184	0.307	0.919
ξ^{3a}	0.211	0.285	0.566	0.237	0.358	1.206	0.182	0.314	0.609	0.229	0.358	1.146
ξ^{3b}	0.194	0.264	0.496	0.187	0.323	1.166	0.235	0.242	0.532	0.193	0.263	0.972
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	0.265	0.380	0.795	0.261	0.402	1.359	0.257	0.397	0.746	0.292	0.436	1.418
ξ^{1b}	0.249	0.386	0.836	0.218	0.392	2.090	0.234	0.351	0.687	0.237	0.393	1.154
ξ^{2a}	0.143	0.209	0.391	0.145	0.212	0.755	0.150	0.230	0.382	0.125	0.195	0.979
ξ^{2b}	0.155	0.195	0.386	0.132	0.200	0.650	0.123	0.177	0.394	0.125	0.209	0.724
ξ^{3a}	0.142	0.194	0.370	0.119	0.231	0.652	0.125	0.191	0.384	0.147	0.209	0.791
ξ^{3b}	0.104	0.163	0.335	0.104	0.170	0.541	0.102	0.140	0.292	0.113	0.171	0.483
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	0.893	1.482	2.832	0.934	1.875	7.599	0.948	1.516	2.779	0.938	1.916	7.127
ξ^{1b}	0.916	1.463	2.841	0.931	2.016	5.193	0.970	1.385	2.789	0.908	1.875	6.440
ξ^{2a}	0.770	1.255	2.486	0.768	1.372	3.274	0.747	1.182	2.367	0.805	1.647	3.572
ξ^{2b}	0.778	1.070	2.370	0.739	1.503	3.182	0.717	1.181	2.276	0.753	1.600	3.484
ξ^{3a}	0.560	0.941	1.727	0.646	1.216	6.279	0.565	0.927	1.663	0.612	1.291	7.033
ξ^{3b}	0.602	0.848	1.639	0.550	1.169	2.945	0.501	0.857	1.578	0.591	1.013	5.332
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	0.502	0.733	1.364	0.510	0.931	5.395	0.488	0.761	1.502	0.508	0.975	2.945
ξ^{1b}	0.412	0.676	1.274	0.476	0.913	2.348	0.410	0.674	1.249	0.469	0.936	3.525
ξ^{2a}	0.333	0.561	0.993	0.377	0.660	2.152	0.299	0.522	1.045	0.417	0.711	2.155
ξ^{2b}	0.333	0.489	0.891	0.343	0.620	2.241	0.292	0.466	0.934	0.305	0.631	1.921
ξ^{3a}	0.209	0.362	0.663	0.222	0.507	1.711	0.199	0.429	0.664	0.188	0.446	2.234
ξ^{3b}	0.170	0.291	0.548	0.182	0.324	1.787	0.222	0.343	0.626	0.194	0.354	1.358
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	0.375	0.595	0.986	0.380	0.702	1.992	0.340	0.588	1.078	0.388	0.716	2.678
ξ^{1b}	0.386	0.562	0.975	0.393	0.689	2.316	0.374	0.556	1.006	0.359	0.751	2.101
ξ^{2a}	0.298	0.440	0.813	0.319	0.626	2.733	0.274	0.509	0.918	0.306	0.627	2.219
ξ^{2b}	0.251	0.420	0.759	0.270	0.517	1.567	0.260	0.363	0.743	0.315	0.585	2.460
ξ^{3a}	0.203	0.310	0.502	0.194	0.325	1.069	0.161	0.266	0.469	0.239	0.359	1.044
ξ^{3b}	0.145	0.235	0.437	0.138	0.316	1.084	0.096	0.218	0.440	0.129	0.280	1.006

The skewness of the total loss is approximated using $10,000$ independent samples of L.

Table 4: Value-at-Risk at Level $p = 0.9$ of the Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	726.8	766.2	882.9	727.7	763.1	861.4	725.3	772.8	887.0	723.0	771.9	851.7
ξ^{1b}	707.7	743.7	848.1	709.3	737.7	829.6	706.0	743.0	857.3	699.0	748.5	827.4
ξ^{2a}	1933.3	2052.4	2413.8	1937.5	2041.5	2288.0	1926.0	2058.1	2429.1	1928.5	2065.1	2267.1
ξ^{2b}	1958.5	2072.9	2437.3	1964.7	2070.4	2317.7	1958.2	2099.0	2451.4	1934.8	2083.1	2314.8
ξ^{3a}	2952.1	3134.7	3703.4	2987.1	3151.4	3531.9	2970.2	3154.5	3774.6	2949.0	3137.8	3483.6
ξ^{3b}	3112.3	3283.0	3887.7	3097.2	3288.6	3659.2	3096.9	3317.0	3921.2	3070.4	3328.9	3674.9
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	2639.3	2686.3	2929.1	2632.9	2708.7	2895.6	2637.8	2714.0	2927.2	2635.1	2687.8	2886.9
ξ^{1b}	2889.2	2953.6	3169.3	2880.1	2944.2	3121.2	2888.1	2957.7	3188.6	2891.1	2952.3	3114.5
ξ^{2a}	7028.2	7253.9	7995.6	7033.8	7242.1	7807.5	7029.6	7254.4	7909.1	7051.0	7260.4	7853.7
ξ^{2b}	8878.5	9109.5	9838.1	8901.2	9130.7	9830.7	8910.9	9109.8	9876.5	8890.4	9091.0	9780.9
ξ^{3a}	12338.0	12765.5	13936.0	12345.0	12762.5	13804.0	12337.5	12802.0	13882.5	12382.5	12750.5	13753.0
ξ^{3b}	16184.0	16600.0	17849.0	16194.5	16581.0	17812.0	16181.5	16578.0	17881.0	16130.5	16525.0	17747.0
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	3766.3	3847.8	4095.0	3777.0	3843.9	4045.0	3759.6	3856.4	4095.4	3762.1	3866.1	4065.3
ξ^{1b}	4643.1	4744.1	4968.7	4633.4	4743.4	4900.4	4641.6	4735.9	5007.1	4622.5	4740.3	4905.8
ξ^{2a}	12584.5	12848.5	13568.0	12590.5	12830.0	13436.5	12552.5	12775.0	13579.5	12541.5	12822.0	13505.5
ξ^{2b}	15531.0	15888.0	16692.0	15583.5	15805.0	16638.5	15568.0	15769.5	16635.5	15505.0	15797.5	16529.5
ξ^{3a}	25402.0	25952.0	27072.5	25422.0	25873.5	27115.0	25397.5	25802.5	27306.5	25371.0	25876.5	27061.0
ξ^{3b}	35096.5	35639.0	37232.0	35087.5	35789.5	37168.5	35042.0	35566.0	37240.0	35099.5	35698.5	37191.5
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	103.7	115.1	147.7	105.1	113.8	125.9	102.1	116.3	145.2	105.6	116.1	124.6
ξ^{1b}	105.0	119.7	147.2	104.8	113.7	124.5	105.2	118.3	144.5	103.0	114.6	125.3
ξ^{2a}	541.5	608.5	730.7	542.4	606.4	657.7	537.3	606.1	765.5	541.3	592.2	656.2
ξ^{2b}	569.6	644.4	809.9	568.4	631.2	686.1	577.3	633.0	808.1	573.4	634.3	691.4
ξ^{3a}	1576.8	1734.2	2138.4	1571.1	1715.8	1917.8	1582.2	1726.8	2173.7	1582.0	1725.8	1899.4
ξ^{3b}	1826.7	2013.5	2439.2	1835.4	2000.0	2240.9	1832.4	2007.2	2436.1	1841.4	1984.4	2258.1
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	295.1	322.5	396.1	295.2	324.0	360.6	297.5	321.2	392.9	296.8	319.7	365.7
ξ^{1b}	334.8	361.3	438.3	336.4	363.2	405.9	332.5	363.2	437.0	331.8	358.9	409.1
ξ^{2a}	2111.9	2219.1	2634.2	2112.9	2242.4	2526.6	2101.2	2244.4	2623.3	2098.1	2226.8	2509.3
ξ^{2b}	2512.1	2640.6	3081.1	2515.9	2653.5	2972.0	2484.1	2638.4	3128.9	2497.4	2669.7	2968.7
ξ^{3a}	8385.3	8836.3	9837.0	8360.5	8773.8	9648.6	8382.1	8764.2	9810.4	8361.8	8757.2	9736.3
ξ^{3b}	11227.5	11706.0	12932.0	11281.5	11695.0	12703.0	11290.5	11670.0	12979.0	11312.5	11630.0	12613.0
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	465.9	493.1	593.0	459.5	494.5	549.9	457.4	493.9	588.5	463.1	499.8	555.4
ξ^{1b}	516.2	557.2	661.0	517.7	549.2	621.4	517.8	555.6	654.1	523.6	554.4	624.3
ξ^{2a}	2645.5	2778.7	3241.0	2629.0	2781.6	3113.7	2623.5	2779.6	3242.5	2632.3	2784.2	3112.9
ξ^{2b}	3206.6	3388.2	3904.8	3213.4	3387.9	3760.7	3216.9	3408.2	3889.2	3209.2	3400.6	3760.1
ξ^{3a}	15023.5	15581.0	16960.0	15046.0	15562.5	16712.0	15090.0	15568.0	16927.0	15121.0	15542.5	16791.0
ξ^{3b}	18160.0	18762.0	20237.0	18102.0	18736.0	20122.0	18088.5	18705.5	20215.0	18106.5	18662.5	20252.5

The Value-at-Risk at level $p = 0.9$ of the total loss is approximated using $10,000$ independent samples of L.

Table 5: Expected Shortfall at Level $p = 0.9$ of the Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	801.9	866.5	1055.4	803.7	871.6	1096.5	797.8	868.0	1058.7	805.2	875.7	1079.0
ξ^{1b}	778.2	840.5	1025.3	786.6	844.8	1058.5	777.6	842.5	1022.9	773.4	853.6	1054.4
ξ^{2a}	2175.9	2378.3	2998.7	2184.2	2384.9	3029.9	2163.1	2372.4	3029.2	2170.4	2418.7	3010.3
ξ^{2b}	2205.7	2400.3	3026.6	2213.2	2441.4	3095.9	2186.3	2429.5	3030.8	2188.0	2411.8	3062.6
ξ^{3a}	3356.2	3661.7	4733.3	3395.1	3726.8	4760.5	3367.4	3718.1	4821.5	3361.2	3716.6	4715.2
ξ^{3b}	3513.6	3819.4	4899.6	3513.2	3879.1	4976.4	3494.5	3840.0	4904.8	3485.0	3924.3	4907.7
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	2799.2	2888.9	3270.3	2785.5	2935.4	3319.3	2799.9	2906.4	3278.1	2791.8	2899.6	3280.8
ξ^{1b}	3087.8	3225.4	3702.7	3090.7	3249.3	3646.8	3100.8	3248.5	3705.4	3098.0	3259.8	3668.1
ξ^{2a}	7510.7	7881.5	9017.4	7499.5	7906.8	9128.0	7490.1	7866.2	8908.5	7530.2	7925.5	9048.0
ξ^{2b}	9413.0	9842.3	11013.9	9434.8	9832.0	11238.5	9449.8	9817.9	11033.4	9422.1	9819.5	11135.3
ξ^{3a}	13182.2	13850.3	15809.1	13228.0	13870.7	16164.8	13168.1	13888.1	15843.7	13243.7	13869.9	16010.4
ξ^{3b}	17154.5	17851.0	19962.8	17194.5	17938.8	20513.8	17219.5	17833.8	20094.8	17124.6	17832.9	20268.2
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	3993.4	4143.9	4599.1	3996.1	4155.3	4613.5	3975.6	4152.8	4595.2	3989.6	4171.8	4612.8
ξ^{1b}	4912.4	5106.7	5633.6	4898.1	5119.9	5614.8	4915.7	5085.0	5590.8	4884.6	5102.2	5595.5
ξ^{2a}	13210.3	13668.8	14950.9	13273.1	13698.8	15088.9	13245.1	13701.9	14949.2	13177.9	13682.6	15224.2
ξ^{2b}	16347.2	16845.4	18250.6	16353.2	16839.6	18467.3	16314.3	16711.2	18310.7	16260.2	16831.1	18364.0
ξ^{3a}	26696.6	27567.5	29709.6	26704.5	27646.9	30247.4	26664.9	27421.2	30053.0	26627.2	27437.3	30369.4
ξ^{3b}	36557.6	37674.3	40459.2	36582.8	37775.4	40933.9	36529.7	37550.3	40509.2	36598.9	37750.6	40952.3
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	130.6	156.5	241.4	131.8	156.6	228.5	130.3	158.3	234.4	132.1	163.7	220.1
ξ^{1b}	131.5	160.8	239.2	131.0	158.5	220.7	133.3	158.4	235.4	130.1	160.0	230.1
ξ^{2a}	658.2	782.7	1109.9	662.3	788.1	1063.8	652.1	785.0	1135.4	661.0	791.9	1066.1
ξ^{2b}	692.2	815.4	1214.7	687.5	834.8	1100.9	695.5	820.5	1180.9	690.6	830.1	1110.8
ξ^{3a}	1838.5	2128.6	2906.0	1846.6	2164.8	2827.8	1847.1	2098.3	2995.7	1859.1	2182.8	2885.5
ξ^{3b}	2139.4	2420.7	3305.6	2126.6	2455.3	3272.6	2107.2	2437.5	3259.1	2137.0	2419.6	3328.8
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	339.7	383.8	523.7	342.2	390.8	527.5	340.6	386.0	520.0	342.7	388.3	528.1
ξ^{1b}	379.3	424.8	567.2	384.5	435.2	560.5	378.3	428.6	565.6	379.4	432.1	577.9
ξ^{2a}	2331.7	2538.8	3233.3	2342.4	2557.5	3280.3	2324.1	2555.6	3233.9	2336.6	2565.0	3267.6
ξ^{2b}	2753.2	2979.5	3705.3	2756.6	3011.0	3791.3	2730.9	2976.9	3753.3	2738.7	3030.6	3741.5
ξ^{3a}	8967.6	9655.6	11313.2	8955.7	9653.9	11593.3	8958.3	9595.8	11302.3	8922.0	9616.2	11665.8
ξ^{3b}	11979.9	12682.9	14571.5	12049.5	12751.3	14897.9	12063.2	12699.1	14705.5	12071.2	12689.7	14794.7
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	519.2	568.8	726.0	513.6	575.8	724.3	511.8	569.1	731.6	518.6	578.1	737.0
ξ^{1b}	574.4	640.2	806.4	576.4	634.2	821.1	576.8	636.2	805.5	579.1	645.1	813.9
ξ^{2a}	2897.3	3111.9	3856.7	2888.5	3159.2	3974.0	2875.6	3129.3	3868.2	2889.7	3156.2	3931.6
ξ^{2b}	3477.8	3761.0	4556.0	3481.6	3775.2	4613.1	3494.4	3763.1	4572.9	3489.5	3812.7	4679.3
ξ^{3a}	15904.3	16738.7	18784.8	15905.5	16719.6	19046.2	15883.1	16660.3	18772.6	15990.8	16718.3	19092.6
ξ^{3b}	19082.9	19943.9	22286.1	19081.7	19990.4	22609.8	18973.6	19903.4	22353.6	19040.1	19888.6	22843.3

The Expected Shortfall at level $p = 0.9$ of the total loss is approximated using $10,000$ independent samples of L.

Table 6: Value-at-Risk at Level $p = 0.95$ of the Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	781.9	840.4	1007.2	787.2	838.1	1012.7	779.0	844.5	1019.1	787.2	850.7	997.9
ξ^{1b}	760.3	818.7	982.2	769.6	814.9	978.3	760.0	820.8	978.6	757.8	823.5	977.2
ξ^{2a}	2119.8	2292.5	2840.8	2124.7	2275.7	2773.4	2097.7	2273.9	2865.1	2107.4	2305.6	2735.3
ξ^{2b}	2143.4	2317.1	2834.7	2152.1	2340.0	2803.0	2127.7	2344.1	2849.9	2118.2	2337.5	2805.7
ξ^{3a}	3251.4	3529.7	4454.2	3309.8	3561.7	4312.2	3262.0	3560.0	4545.6	3260.0	3560.8	4310.9
ξ^{3b}	3416.7	3691.4	4645.1	3414.2	3695.1	4506.5	3418.6	3704.2	4610.5	3374.7	3775.3	4425.9
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	2763.8	2834.9	3194.6	2752.6	2887.8	3166.0	2759.9	2857.7	3180.4	2757.9	2836.4	3154.5
ξ^{1b}	3035.9	3156.2	3517.7	3038.5	3165.7	3442.4	3063.8	3164.7	3533.1	3051.4	3165.4	3449.1
ξ^{2a}	7392.6	7719.9	8776.3	7392.8	7746.9	8611.8	7388.3	7723.1	8614.5	7427.2	7746.2	8626.5
ξ^{2b}	9288.1	9640.5	10722.0	9310.3	9654.7	10796.5	9298.9	9675.0	10743.0	9307.5	9662.4	10692.0
ξ^{3a}	13018.0	13556.5	15357.5	13035.5	13626.0	15409.5	12969.0	13618.0	15313.5	13044.5	13588.0	15245.5
ξ^{3b}	16932.0	17548.0	19415.5	16980.5	17664.0	19639.0	16992.0	17557.5	19533.5	16878.5	17556.5	19507.5
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	3938.9	4059.4	4430.8	3939.9	4069.6	4396.3	3921.6	4085.6	4449.4	3931.8	4094.0	4414.9
ξ^{1b}	4853.6	5023.9	5449.5	4833.3	5012.8	5355.8	4847.5	5015.1	5410.6	4819.0	5009.6	5345.6
ξ^{2a}	13059.5	13482.0	14591.5	13115.0	13535.0	14544.5	13117.5	13480.5	14580.5	13015.0	13508.5	14641.5
ξ^{2b}	16158.5	16606.0	17873.5	16176.0	16587.0	17866.0	16176.0	16490.0	17951.0	16087.5	16617.5	17774.5
ξ^{3a}	26393.5	27251.0	29085.5	26415.0	27246.5	29354.5	26378.5	27064.0	29458.0	26324.5	27095.0	29377.5
ξ^{3b}	36241.5	37249.0	39731.0	36210.5	37290.5	39735.0	36181.0	37099.5	39811.0	36260.0	37316.0	39890.0
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	123.5	144.5	210.9	124.6	141.3	183.1	123.4	146.4	206.3	125.3	148.4	177.3
ξ^{1b}	125.3	148.6	207.6	122.9	141.9	176.0	125.4	148.0	206.1	123.4	145.3	181.7
ξ^{2a}	626.3	730.9	989.5	634.1	733.8	917.8	618.9	730.9	1026.8	634.2	726.4	915.9
ξ^{2b}	659.5	772.7	1094.8	658.2	763.1	942.9	663.5	765.0	1054.2	654.6	772.0	932.8
ξ^{3a}	1771.6	2023.4	2654.7	1774.0	2043.9	2470.4	1780.2	2005.3	2778.8	1797.8	2043.5	2482.9
ξ^{3b}	2055.6	2300.0	3053.1	2040.2	2313.3	2804.2	2028.8	2307.4	2999.2	2048.2	2287.4	2877.1
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	330.2	366.6	488.5	331.5	371.9	454.9	329.6	371.2	480.8	331.4	367.1	458.4
ξ^{1b}	367.0	407.5	530.5	372.1	414.7	499.3	367.6	409.2	529.9	368.2	410.5	512.1
ξ^{2a}	2275.9	2471.3	3070.5	2288.4	2468.1	2996.2	2272.2	2477.4	3079.6	2270.2	2462.6	2942.6
ξ^{2b}	2697.7	2888.7	3504.4	2694.5	2911.8	3479.6	2668.7	2896.3	3584.6	2674.3	2923.4	3477.9
ξ^{3a}	8830.5	9463.1	10967.5	8813.8	9408.5	10854.0	8816.8	9377.5	10928.5	8760.9	9407.1	10932.5
ξ^{3b}	11796.5	12442.5	14155.5	11889.0	12499.0	13985.0	11885.0	12411.5	14236.0	11885.0	12410.0	13992.5
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	505.9	548.1	688.2	502.5	555.6	660.3	499.1	548.4	691.4	506.7	555.9	669.6
ξ^{1b}	558.4	620.2	765.3	560.2	610.1	741.1	562.4	613.7	765.2	562.5	620.3	749.9
ξ^{2a}	2844.1	3025.4	3710.1	2827.3	3054.6	3667.1	2818.9	3042.3	3679.9	2830.7	3055.9	3601.2
ξ^{2b}	3405.7	3671.3	4362.8	3413.2	3647.9	4343.6	3428.1	3674.9	4407.2	3418.0	3696.7	4324.0
ξ^{3a}	15668.5	16400.5	18286.0	15692.5	16435.0	18314.5	15650.0	16380.0	18291.5	15752.5	16465.0	18365.0
ξ^{3b}	18857.0	19640.0	21779.5	18820.5	19659.0	21783.5	18761.0	19613.0	21761.5	18853.0	19563.0	22036.5

The Value-at-Risk at level $p = 0.95$ of the total loss is approximated using $10,000$ independent samples of L.

Table 7: Expected Shortfall at Level $p = 0.95$ of the Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	851.6	934.7	1173.4	853.3	946.7	1262.1	845.7	931.5	1173.7	857.9	942.1	1242.0
ξ^{1b}	823.8	904.7	1144.5	835.0	916.0	1225.7	825.6	908.2	1133.5	821.0	922.4	1217.5
ξ^{2a}	2334.9	2594.2	3397.3	2344.5	2621.6	3559.6	2324.0	2589.8	3423.6	2332.3	2659.3	3547.2
ξ^{2b}	2366.7	2621.6	3437.6	2373.5	2696.0	3666.3	2339.4	2635.8	3425.6	2351.4	2626.8	3594.9
ξ^{3a}	3624.5	4006.8	5433.9	3665.2	4113.6	5655.5	3629.3	4097.5	5512.1	3636.9	4106.9	5601.3
ξ^{3b}	3777.9	4174.4	5577.8	3771.7	4291.1	5927.3	3752.1	4192.3	5583.6	3760.2	4323.6	5803.9
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	2898.7	3028.8	3498.3	2882.5	3077.2	3623.9	2904.3	3033.9	3516.1	2893.6	3043.4	3551.6
ξ^{1b}	3221.0	3416.3	4089.0	3233.5	3453.1	4030.9	3228.6	3441.0	4062.3	3234.1	3467.5	4065.1
ξ^{2a}	7826.8	8298.1	9708.8	7807.1	8337.4	10085.9	7789.9	8265.3	9599.9	7836.9	8362.8	9903.0
ξ^{2b}	9753.9	10322.3	11837.3	9778.9	10302.2	12208.7	9802.7	10280.7	11823.4	9755.0	10290.7	12088.7
ξ^{3a}	13710.3	14549.6	17042.7	13795.0	14599.6	17823.1	13735.7	14569.3	17153.8	13799.1	14636.8	17600.7
ξ^{3b}	17749.3	18688.9	21363.1	17828.7	18822.3	22410.6	17893.6	18635.4	21554.1	17764.5	18606.5	21964.2
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	4139.5	4334.8	4961.1	4140.0	4361.4	5018.8	4113.6	4347.7	4944.2	4139.6	4377.7	5009.2
ξ^{1b}	5085.8	5346.1	6103.3	5072.1	5372.5	6131.3	5104.2	5306.3	5999.9	5059.2	5341.5	6085.4
ξ^{2a}	13625.6	14201.9	15854.1	13753.8	14239.0	16235.7	13679.3	14260.6	15856.6	13592.9	14208.9	16426.1
ξ^{2b}	16787.7	17434.1	19231.3	16881.1	17471.0	19755.7	16864.2	17349.0	19389.1	16715.3	17492.8	19648.7
ξ^{3a}	27476.8	28605.6	31399.4	27584.1	28785.6	32373.0	27480.0	28547.4	31907.6	27436.2	28465.3	32590.9
ξ^{3b}	37482.8	39014.9	42578.5	37593.0	39062.6	43572.6	37505.9	38740.3	42632.3	37560.9	39069.8	43480.5
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	148.3	184.8	306.5	149.8	186.9	306.3	149.5	186.4	296.0	149.4	196.9	293.8
ξ^{1b}	149.3	189.2	302.9	149.0	190.4	294.6	152.0	184.6	299.0	148.2	191.9	311.7
ξ^{2a}	736.2	901.3	1374.9	741.1	911.8	1363.7	731.3	904.5	1394.5	739.1	929.9	1363.7
ξ^{2b}	774.1	930.9	1495.2	765.0	976.7	1410.5	774.1	948.6	1440.7	771.7	966.6	1422.6
ξ^{3a}	2013.8	2399.6	3446.4	2027.5	2469.6	3510.9	2023.9	2350.4	3541.5	2040.0	2496.7	3620.6
ξ^{3b}	2345.2	2693.1	3902.0	2330.7	2768.9	4055.8	2293.3	2735.5	3828.9	2334.5	2723.7	4141.1
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	368.9	424.7	609.5	373.6	437.1	652.1	369.4	429.0	607.5	372.4	436.4	651.4
ξ^{1b}	408.7	467.9	655.6	416.6	484.0	672.8	408.5	472.1	653.4	410.1	481.0	700.5
ξ^{2a}	2468.9	2748.0	3628.9	2491.4	2772.5	3838.4	2465.7	2763.6	3642.2	2497.0	2795.4	3828.2
ξ^{2b}	2909.2	3204.1	4134.0	2916.2	3244.9	4384.6	2880.8	3204.5	4180.7	2899.7	3277.2	4284.5
ξ^{3a}	9343.9	10179.6	12284.4	9346.8	10237.9	13004.8	9326.5	10148.6	12281.8	9304.3	10202.9	13054.7
ξ^{3b}	12470.7	13334.5	15670.3	12563.5	13421.6	16473.4	12562.4	13369.5	15857.4	12563.6	13378.6	16355.4
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	554.5	620.2	816.2	548.8	630.5	849.1	547.2	619.8	830.3	556.6	631.9	871.7
ξ^{1b}	613.5	694.9	903.0	615.3	691.5	969.5	615.3	689.6	906.8	616.9	707.2	945.7
ξ^{2a}	3059.7	3339.0	4261.7	3060.4	3408.5	4597.3	3040.1	3353.0	4287.3	3067.7	3402.9	4533.1
ξ^{2b}	3659.9	4002.8	5011.7	3657.2	4036.6	5229.1	3668.1	3994.5	5024.5	3675.0	4092.1	5359.3
ξ^{3a}	16481.6	17442.7	20001.9	16439.2	17472.6	20696.7	16424.2	17384.3	20015.2	16532.0	17528.5	20681.3
ξ^{3b}	19647.2	20706.5	23616.4	19686.9	20829.7	24327.4	19540.9	20700.7	23730.6	19638.1	20736.9	24616.0

The Expected Shortfall at level $p = 0.95$ of the total loss is approximated using $10,000$ independent samples of L.

Table 8: Value-at-Risk at Level $p = 0.99$ of the Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	896.9	993.6	1276.6	898.9	1011.2	1411.3	886.1	977.0	1268.0	898.6	1000.2	1361.8
ξ^{1b}	865.4	964.3	1243.6	877.0	978.3	1369.8	872.9	960.5	1221.0	861.4	989.1	1338.5
ξ^{2a}	2483.1	2785.0	3686.9	2480.7	2833.6	4035.2	2479.2	2796.8	3755.3	2454.1	2886.9	3928.3
ξ^{2b}	2502.4	2795.9	3782.1	2527.6	2892.2	4124.7	2472.4	2811.9	3794.3	2481.4	2822.8	4037.1
ξ^{3a}	3891.8	4298.1	5973.5	3862.8	4465.4	6474.9	3854.3	4423.5	6184.8	3858.0	4523.4	6162.8
ξ^{3b}	4002.2	4481.0	6078.6	4012.8	4705.7	6641.1	3961.6	4464.7	6227.3	3976.1	4671.3	6630.1
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	2983.6	3131.1	3669.1	2970.4	3185.2	3863.3	2995.2	3139.9	3693.8	2978.8	3165.8	3791.1
ξ^{1b}	3349.2	3566.6	4412.6	3353.6	3613.6	4262.1	3321.5	3600.9	4357.7	3348.4	3623.4	4227.9
ξ^{2a}	8123.4	8697.1	10350.5	8062.2	8689.8	10804.0	8020.9	8653.8	10244.0	8080.7	8718.1	10599.0
ξ^{2b}	10039.5	10750.5	12515.5	10080.5	10716.0	12941.5	10128.5	10630.5	12436.0	10036.5	10621.0	12809.0
ξ^{3a}	14135.5	15131.5	18185.0	14277.5	15237.0	18926.0	14166.5	15121.0	18225.0	14340.0	15289.5	18866.5
ξ^{3b}	18232.5	19448.5	22665.5	18393.0	19544.5	24125.0	18438.0	19333.0	22882.5	18341.5	19306.5	23424.0
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	4260.4	4513.9	5301.9	4264.1	4538.0	5334.1	4225.9	4521.6	5218.5	4273.4	4561.3	5270.7
ξ^{1b}	5214.1	5546.6	6478.4	5239.3	5570.9	6477.9	5244.6	5483.3	6321.1	5202.1	5531.9	6546.0
ξ^{2a}	13995.5	14677.0	16738.5	14017.0	14587.0	17082.5	14041.0	14698.0	16579.5	13956.0	14607.5	17239.5
ξ^{2b}	17127.0	17903.0	20093.0	17271.0	17958.5	20898.0	17082.0	17817.5	20230.0	17110.5	18015.5	20562.5
ξ^{3a}	28147.0	29476.0	32885.5	28145.5	29813.5	34001.0	28184.0	29512.5	33622.0	28210.0	29224.0	34144.5
ξ^{3b}	38280.5	40071.0	44148.5	38580.0	40146.5	45749.0	38445.5	39832.0	44320.5	38388.5	40163.5	45604.0
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	164.7	210.3	362.5	166.9	213.3	374.9	165.3	213.6	353.1	165.4	222.0	350.3
ξ^{1b}	162.8	215.6	368.3	162.8	219.5	354.2	170.3	210.9	352.9	162.5	219.4	360.9
ξ^{2a}	809.0	999.2	1578.1	798.9	1012.0	1633.8	806.4	1012.0	1614.9	798.6	1046.0	1609.6
ξ^{2b}	853.9	1032.2	1732.3	824.7	1094.7	1695.8	846.4	1068.5	1645.8	839.1	1079.1	1698.4
ξ^{3a}	2160.9	2632.2	3980.2	2152.6	2681.7	3944.5	2181.3	2549.9	4028.3	2194.5	2754.2	4270.2
ξ^{3b}	2528.6	2935.9	4423.7	2522.4	3079.8	4732.6	2455.9	3016.1	4325.9	2499.2	2972.0	4680.1
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	392.4	465.3	691.5	399.3	475.6	731.0	394.1	468.0	698.5	400.7	486.4	763.7
ξ^{1b}	432.8	505.9	731.0	444.1	534.3	765.1	431.6	508.3	728.0	438.3	519.2	766.9
ξ^{2a}	2587.3	2891.3	3999.6	2608.8	2943.8	4228.6	2591.8	2945.6	4027.3	2645.9	2976.1	4331.8
ξ^{2b}	3050.5	3416.1	4543.4	3048.4	3436.7	4781.1	3021.5	3379.9	4549.7	3042.7	3491.1	4740.8
ξ^{3a}	9704.1	10611.5	13158.0	9698.8	10755.5	13988.0	9638.0	10633.0	13285.5	9626.8	10727.0	14134.0
ξ^{3b}	12911.5	13951.0	16611.0	12950.5	13999.0	17784.0	12959.5	14000.0	16881.0	13007.0	14023.5	17559.5
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	587.6	668.5	895.8	579.0	675.1	956.9	581.6	658.2	915.9	585.4	671.7	952.1
ξ^{1b}	642.5	741.8	983.3	644.6	735.1	1094.2	650.5	737.8	995.0	651.0	762.9	1065.0
ξ^{2a}	3192.7	3530.3	4616.1	3207.8	3630.6	4960.2	3183.9	3525.8	4671.0	3196.6	3646.0	5106.1
ξ^{2b}	3806.4	4207.4	5450.8	3804.6	4281.5	5688.8	3812.2	4193.3	5422.1	3816.1	4332.2	5851.1
ξ^{3a}	16938.0	18022.0	21093.5	16977.5	18117.5	21646.0	16903.0	17944.5	20990.0	16987.5	18148.0	21973.0
ξ^{3b}	20123.5	21342.5	24736.5	20158.0	21620.5	25502.5	20014.5	21395.5	24993.5	20158.0	21397.0	25959.0

The Value-at-Risk at level $p = 0.99$ of the total loss is approximated using $10,000$ independent samples of L.

Table 9: Expected Shortfall at Level $p = 0.99$ of the Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	951.2	1084.1	1447.0	948.7	1127.3	1695.8	950.2	1059.9	1431.3	961.0	1078.2	1681.4
ξ^{1b}	915.9	1029.1	1413.4	928.7	1073.8	1659.5	920.4	1030.0	1374.7	918.9	1061.8	1648.4
ξ^{2a}	2654.9	3043.7	4297.2	2659.1	3128.0	5105.2	2650.5	3043.8	4364.6	2671.8	3207.2	5066.1
ξ^{2b}	2690.2	3103.9	4374.9	2698.3	3279.9	5353.4	2634.5	3090.6	4317.8	2693.4	3076.5	5001.7
ξ^{3a}	4187.5	4718.1	7110.1	4189.4	5017.0	8175.1	4131.5	4897.9	7083.8	4185.3	4955.8	7996.0
ξ^{3b}	4320.5	4866.9	7106.5	4324.5	5241.7	8614.3	4240.5	4894.3	7133.4	4357.5	5160.8	8317.0
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	3099.0	3309.4	3962.0	3070.2	3355.4	4425.6	3118.7	3296.9	4004.0	3096.6	3369.9	4227.4
ξ^{1b}	3505.7	3784.2	5074.4	3499.1	3904.6	5198.2	3487.4	3862.7	4992.3	3500.1	3993.5	5341.9
ξ^{2a}	8467.3	9158.7	11195.0	8377.4	9250.9	12681.4	8371.6	9053.2	11079.4	8452.7	9212.8	12179.8
ξ^{2b}	10421.0	11373.9	13474.1	10463.1	11298.2	14700.9	10463.5	11156.4	13432.2	10380.7	11198.0	14485.0
ξ^{3a}	14715.7	15947.6	19567.0	14843.1	16065.1	22068.2	14785.1	16096.1	20006.3	14838.7	16230.3	21487.1
ξ^{3b}	18891.3	20313.7	24232.7	19009.5	20538.2	27354.1	19170.6	20231.2	24565.4	19007.9	20150.4	26141.2
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	4421.5	4801.0	5886.6	4429.2	4820.3	6140.0	4389.9	4744.2	5773.8	4436.8	4802.4	6131.0
ξ^{1b}	5407.3	5833.0	7237.2	5420.8	5952.7	7674.0	5429.9	5757.1	7002.7	5401.7	5878.8	7461.1
ξ^{2a}	14427.3	15187.1	17553.2	14482.0	15437.3	19414.9	14476.1	15392.7	17721.5	14548.2	15239.8	19825.8
ξ^{2b}	17695.8	18550.5	21340.6	17778.1	18745.3	22878.3	17786.8	18480.9	21560.8	17579.8	18823.2	23142.6
ξ^{3a}	29304.2	30507.8	35084.0	28981.6	31022.9	37720.2	29094.8	30447.0	35160.0	29003.0	30561.7	37920.1
ξ^{3b}	39359.9	41395.3	46366.1	39618.1	41544.5	49882.2	39376.1	41024.1	46500.0	39576.5	41421.5	49062.2
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	185.2	249.7	461.4	188.1	260.3	568.9	187.8	255.0	453.6	187.6	279.5	529.1
ξ^{1b}	186.0	251.5	463.2	189.4	273.8	535.9	192.8	243.8	462.5	184.2	271.5	585.1
ξ^{2a}	906.6	1182.9	2021.8	908.6	1205.0	2183.3	893.1	1159.3	2036.2	906.1	1287.1	2234.7
ξ^{2b}	963.7	1182.3	2168.0	934.0	1332.0	2249.6	941.1	1230.0	2088.1	937.5	1282.9	2358.6
ξ^{3a}	2359.6	2954.8	4766.4	2422.3	3172.1	5564.7	2371.6	2903.7	4751.4	2397.0	3263.5	5842.4
ξ^{3b}	2770.6	3326.5	5297.6	2753.4	3547.2	6336.0	2673.2	3344.7	5124.3	2767.3	3409.4	6663.7
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	428.9	513.6	794.9	432.7	542.2	1069.6	431.4	514.0	815.0	437.0	544.7	1012.9
ξ^{1b}	469.3	558.6	843.1	480.6	595.6	1004.6	467.4	564.5	830.1	474.7	592.4	1071.8
ξ^{2a}	2755.9	3188.6	4490.2	2809.0	3234.4	5424.2	2757.9	3186.1	4545.0	2845.4	3314.1	5490.5
ξ^{2b}	3254.6	3696.7	5110.7	3239.9	3756.0	6132.3	3195.5	3677.9	5153.4	3229.7	3852.8	5744.2
ξ^{3a}	10075.0	11204.4	14320.5	10130.4	11480.0	16782.5	10063.9	11319.4	14315.2	10129.2	11383.8	17251.5
ξ^{3b}	13461.6	14719.7	17974.1	13510.3	14659.9	21196.4	13576.5	14764.1	18235.5	13562.2	14738.9	20600.3
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	630.7	730.5	1010.7	620.8	742.1	1178.7	623.7	728.3	1045.5	628.2	755.0	1266.3
ξ^{1b}	692.8	808.0	1122.2	697.0	819.4	1397.8	695.5	801.4	1120.5	697.2	842.6	1310.3
ξ^{2a}	3361.5	3787.5	5101.3	3412.6	3952.0	6459.9	3367.0	3806.7	5227.1	3399.7	3954.7	6271.1
ξ^{2b}	4017.8	4502.6	5993.1	4026.6	4604.9	6854.6	3989.4	4468.5	5904.9	4059.2	4717.9	7290.5
ξ^{3a}	17650.5	18979.3	22686.9	17523.6	18915.1	24851.9	17471.2	18754.6	22552.3	17703.0	18991.9	24740.3
ξ^{3b}	20759.0	22314.3	26371.2	20985.2	22672.7	28992.9	20625.9	22257.1	26754.0	20848.5	22388.8	29549.3

The Expected Shortfall at level $p = 0.99$ of the total loss is approximated using $10,000$ independent samples of L.

Table 10: Expectation of the Normalized Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	140.7	140.2	140.1	140.8	140.1	140.7	140.4	140.7	140.6	139.9	140.8	139.7
ξ^{1b}	135.7	135.4	134.6	136.2	135.1	134.4	135.6	135.8	134.6	134.7	136.3	135.3
ξ^{2a}	355.6	354.3	353.7	356.3	352.5	351.9	354.4	354.6	354.4	354.2	355.1	351.2
ξ^{2b}	360.3	357.5	355.2	360.7	357.1	357.5	359.2	360.2	358.3	357.2	359.0	355.5
ξ^{3a}	520.8	517.3	522.2	522.0	518.0	519.9	520.5	521.6	520.7	515.6	519.9	515.3
ξ^{3b}	558.3	555.0	553.1	556.4	551.9	553.6	556.8	556.9	555.6	553.4	557.0	553.4
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	128.8	128.6	128.8	128.7	128.6	128.7	128.9	128.9	129.0	128.6	128.3	128.6
ξ^{1b}	136.8	137.0	137.3	136.9	136.9	137.0	136.9	137.2	137.2	136.9	137.1	136.8
ξ^{2a}	338.5	339.6	340.9	338.2	339.0	338.3	338.7	339.0	338.2	339.4	338.1	339.5
ξ^{2b}	428.8	430.1	430.7	430.2	429.6	431.5	430.2	430.4	431.3	429.4	429.6	429.2
ξ^{3a}	593.8	595.2	594.7	594.6	593.3	594.7	594.8	595.3	594.3	595.0	595.0	595.4
ξ^{3b}	786.0	786.7	784.3	786.5	785.8	786.8	786.1	786.5	784.4	785.3	784.9	784.7
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	103.4	103.7	103.3	103.6	103.6	103.2	103.4	103.5	103.3	103.5	103.7	103.7
ξ^{1b}	124.8	124.9	124.7	124.7	125.0	124.6	125.0	124.8	124.7	124.5	124.8	124.8
ξ^{2a}	332.7	333.0	332.0	333.2	333.5	332.8	333.1	333.0	332.8	332.6	333.3	334.3
ξ^{2b}	414.8	415.5	414.5	415.5	415.1	414.1	415.4	415.0	415.3	414.7	415.4	415.3
ξ^{3a}	681.6	682.2	678.6	681.1	681.6	681.1	681.9	680.6	679.9	680.3	681.6	681.7
ξ^{3b}	946.1	947.1	942.0	946.4	947.3	947.2	946.1	945.8	946.1	945.5	947.8	947.7
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	13.5	13.4	13.7	13.5	13.4	14.0	13.3	13.6	13.4	13.5	13.7	13.6
ξ^{1b}	13.6	13.6	13.5	13.6	13.4	13.6	13.5	13.5	13.5	13.5	13.4	13.9
ξ^{2a}	78.4	78.8	76.1	78.6	79.1	78.4	77.9	79.4	78.9	78.4	78.6	78.1
ξ^{2b}	83.8	84.6	85.3	83.1	84.9	83.6	84.2	83.8	84.4	84.2	83.7	82.9
ξ^{3a}	258.4	258.6	259.1	257.6	260.2	257.6	258.3	255.7	263.1	259.1	259.7	259.6
ξ^{3b}	311.1	310.9	309.6	312.9	310.7	312.2	310.5	311.3	308.0	310.9	311.8	314.7
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	11.8	11.8	11.8	11.8	11.9	11.9	11.8	11.7	11.7	11.8	11.8	11.9
ξ^{1b}	13.5	13.5	13.6	13.6	13.6	13.4	13.5	13.5	13.6	13.5	13.5	13.6
ξ^{2a}	93.5	93.1	93.5	93.7	93.4	93.8	93.6	93.8	93.8	93.6	93.6	93.6
ξ^{2b}	114.3	113.4	113.5	114.0	113.6	113.3	113.4	113.6	114.8	113.4	113.9	113.3
ξ^{3a}	411.6	413.3	409.7	410.6	411.1	411.7	411.6	409.7	411.4	410.5	411.5	412.0
ξ^{3b}	551.8	554.0	554.1	552.9	554.6	553.7	553.5	552.9	554.6	553.2	552.7	551.6
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	11.1	11.1	11.1	11.1	11.1	11.0	11.1	11.1	11.1	11.2	11.1	11.1
ξ^{1b}	12.6	12.7	12.7	12.6	12.6	12.7	12.6	12.7	12.6	12.7	12.7	12.6
ξ^{2a}	67.2	66.8	67.3	67.2	67.1	67.5	67.0	66.9	67.1	67.0	67.2	67.3
ξ^{2b}	84.8	84.5	84.4	84.7	84.6	84.5	84.8	84.6	85.0	84.6	85.0	84.7
ξ^{3a}	423.5	424.3	422.7	423.3	424.9	424.0	423.9	423.8	423.4	424.1	423.2	422.6
ξ^{3b}	521.7	522.2	521.3	521.0	522.4	522.3	521.6	521.4	520.7	521.7	520.9	522.9

The expectation of the normalized total loss is approximated using 10,000 independent samples of L. Total losses are normalized by 100 expected insured vehicles.

Table 11: Variance of the Normalized Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	1251.8	1833.0	4195.9	1245.5	1856.9	4339.0	1211.0	1860.9	4190.3	1263.6	1861.2	4170.3
ξ^{1b}	1198.4	1772.0	4018.9	1221.8	1729.8	4092.4	1185.1	1776.4	4028.5	1165.4	1809.5	4043.0
ξ^{2a}	11486.9	17109.5	39808.8	11468.2	17154.7	39647.9	11403.9	17390.7	40619.8	11463.5	17587.5	38576.4
ξ^{2b}	11741.3	17575.8	41071.3	11835.1	17983.6	41820.9	11702.9	18041.8	40659.1	11557.1	17331.1	39107.8
ξ^{3a}	32134.5	45983.6	107412.9	33100.5	48177.6	104679.2	32849.3	48018.7	110825.8	32839.9	47062.1	101784.9
ξ^{3b}	32472.8	47862.1	111879.7	32569.9	48653.2	113364.0	32378.5	47789.5	111780.5	32396.6	49853.8	106463.3
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	425.1	551.4	1135.3	424.7	585.8	1161.7	428.8	566.7	1145.3	428.3	562.7	1078.5
ξ^{1b}	636.7	809.8	1630.8	631.2	829.9	1523.3	638.6	820.9	1637.6	638.0	839.8	1668.1
ξ^{2a}	3373.2	4676.1	9870.9	3430.2	4733.7	9968.9	3350.1	4651.5	9587.2	3425.2	4801.6	9563.0
ξ^{2b}	5186.1	6886.1	13259.8	5209.0	6903.1	13535.8	5219.9	6795.2	13443.5	5185.4	6758.2	13116.8
ξ^{3a}	10511.3	14810.2	30459.7	10777.0	14824.2	31183.8	10586.8	14767.1	30908.1	10770.8	14794.1	29977.1
ξ^{3b}	16422.8	21857.0	42690.0	16889.9	22226.6	44885.2	16725.0	21841.5	43930.5	16423.7	21567.8	42677.1
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	252.5	320.3	609.9	251.9	328.1	602.8	244.9	324.5	608.8	246.4	326.6	602.4
ξ^{1b}	460.0	562.8	970.3	459.4	579.9	974.8	462.3	554.9	948.2	449.6	567.0	917.9
ξ^{2a}	3960.3	4656.9	7427.4	3970.5	4647.8	7510.8	3914.2	4543.6	7450.3	3884.1	4607.4	7651.8
ξ^{2b}	5635.5	6651.8	10202.7	5803.7	6610.9	10310.9	5645.7	6387.4	10272.5	5533.5	6578.9	10287.5
ξ^{3a}	14308.1	17164.4	26295.8	14678.5	17200.1	27398.7	14357.7	16709.2	27674.2	14218.8	16737.8	27753.2
ξ^{3b}	26820.0	30969.2	45770.8	26940.3	31489.6	46220.0	26667.6	30067.2	45935.0	26686.9	30872.6	46477.0
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	95.3	149.6	404.2	97.2	148.2	445.3	95.4	153.3	382.7	97.5	160.7	397.2
ξ^{1b}	96.9	157.6	397.2	96.4	153.8	388.1	99.8	152.4	387.2	93.6	153.6	453.5
ξ^{2a}	2050.8	3277.2	8051.8	2077.2	3244.2	7246.8	2010.4	3277.0	8416.5	2047.8	3296.4	7413.8
ξ^{2b}	2214.2	3516.5	9475.6	2175.5	3657.3	7698.4	2254.4	3591.2	8984.9	2170.4	3614.0	8039.6
ξ^{3a}	12120.5	19567.3	47848.1	12193.7	19598.4	48951.0	12234.9	19140.6	49975.8	12240.2	20171.5	52779.8
ξ^{3b}	14767.0	23388.1	58727.4	14632.4	23879.8	57612.6	14470.7	23983.5	57154.0	14882.7	22806.7	64743.1
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	18.7	29.8	76.5	18.9	30.3	86.2	19.0	30.3	75.8	19.2	29.7	77.9
ξ^{1b}	22.1	34.6	87.2	22.5	35.4	80.1	21.7	35.9	84.9	21.9	34.5	91.0
ξ^{2a}	562.5	870.7	2199.0	569.1	867.6	2158.7	559.7	879.1	2183.6	559.8	873.1	2177.8
ξ^{2b}	680.6	1086.4	2714.1	691.4	1079.8	2726.0	664.7	1069.9	2731.4	688.6	1120.3	2605.8
ξ^{3a}	4257.9	6983.9	17210.6	4278.2	6909.5	17309.6	4266.0	6928.9	16927.0	4258.4	6852.2	18303.6
ξ^{3b}	7702.1	11422.9	25153.6	7881.7	11431.6	26488.1	7772.9	11345.7	25848.2	7980.3	11024.1	25302.3
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	10.3	15.6	38.2	9.7	15.9	35.4	9.8	15.8	39.0	10.1	16.1	38.7
ξ^{1b}	11.4	18.8	44.9	11.6	18.1	45.6	11.8	18.5	45.1	11.9	18.8	43.4
ξ^{2a}	234.0	357.2	868.5	230.3	357.9	928.3	229.4	356.4	874.3	233.7	355.4	880.2
ξ^{2b}	270.3	438.9	1083.2	272.9	437.1	1038.7	273.2	448.8	1077.2	274.6	449.9	1128.3
ξ^{3a}	3166.6	4721.1	10585.2	3138.1	4668.8	10354.1	3169.6	4702.1	10629.6	3235.8	4725.2	10446.9
ξ^{3b}	3635.2	5575.4	12844.1	3700.5	5592.3	12772.0	3509.0	5582.9	13140.8	3606.7	5489.0	13399.4

The variance of the normalized total loss is approximated using $10,000$ independent samples of L. Total losses are normalized by 100 expected insured vehicles.

Table 12: Skewness of the Normalized Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	0.306	0.533	0.869	0.320	0.679	1.904	0.327	0.454	0.858	0.386	0.536	1.728
ξ^{1b}	0.292	0.468	0.868	0.357	0.666	1.764	0.330	0.468	0.818	0.366	0.563	1.756
ξ^{2a}	0.409	0.609	1.095	0.451	0.733	2.822	0.403	0.573	1.109	0.451	0.785	2.221
ξ^{2b}	0.431	0.639	1.114	0.435	0.886	2.495	0.359	0.598	1.073	0.448	0.650	1.987
ξ^{3a}	0.451	0.640	1.234	0.503	0.803	2.269	0.430	0.687	1.297	0.497	0.773	2.171
ξ^{3b}	0.463	0.584	1.142	0.453	0.865	2.763	0.399	0.607	1.142	0.461	0.785	2.084
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	0.192	0.254	0.492	0.130	0.323	1.454	0.200	0.222	0.502	0.164	0.384	0.891
ξ^{1b}	0.330	0.458	1.120	0.326	0.576	1.658	0.350	0.532	1.032	0.341	0.679	3.431
ξ^{2a}	0.266	0.338	0.563	0.216	0.385	1.318	0.219	0.306	0.550	0.221	0.406	1.246
ξ^{2b}	0.208	0.323	0.515	0.196	0.290	0.942	0.209	0.257	0.484	0.184	0.307	0.919
ξ^{3a}	0.211	0.285	0.566	0.237	0.358	1.206	0.182	0.314	0.609	0.229	0.358	1.146
ξ^{3b}	0.194	0.264	0.496	0.187	0.323	1.166	0.235	0.242	0.532	0.193	0.263	0.972
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	0.265	0.380	0.795	0.261	0.402	1.359	0.257	0.397	0.746	0.292	0.436	1.418
ξ^{1b}	0.249	0.386	0.836	0.218	0.392	2.090	0.234	0.351	0.687	0.237	0.393	1.154
ξ^{2a}	0.143	0.209	0.391	0.145	0.212	0.755	0.150	0.230	0.382	0.125	0.195	0.979
ξ^{2b}	0.155	0.195	0.386	0.132	0.200	0.650	0.123	0.177	0.394	0.125	0.209	0.724
ξ^{3a}	0.142	0.194	0.370	0.119	0.231	0.652	0.125	0.191	0.384	0.147	0.209	0.791
ξ^{3b}	0.104	0.163	0.335	0.104	0.170	0.541	0.102	0.140	0.292	0.113	0.171	0.483
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	0.893	1.482	2.832	0.934	1.875	7.599	0.948	1.516	2.779	0.938	1.916	7.127
ξ^{1b}	0.916	1.463	2.841	0.931	2.016	5.193	0.970	1.385	2.789	0.908	1.875	6.440
ξ^{2a}	0.770	1.255	2.486	0.768	1.372	3.274	0.747	1.182	2.367	0.805	1.647	3.572
ξ^{2b}	0.778	1.070	2.370	0.739	1.503	3.182	0.717	1.181	2.276	0.753	1.600	3.484
ξ^{3a}	0.560	0.941	1.727	0.646	1.216	6.279	0.565	0.927	1.663	0.612	1.291	7.033
ξ^{3b}	0.602	0.848	1.639	0.550	1.169	2.945	0.501	0.857	1.578	0.591	1.013	5.332
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	0.502	0.733	1.364	0.510	0.931	5.395	0.488	0.761	1.502	0.508	0.975	2.945
ξ^{1b}	0.412	0.676	1.274	0.476	0.913	2.348	0.410	0.674	1.249	0.469	0.936	3.525
ξ^{2a}	0.333	0.561	0.993	0.377	0.660	2.152	0.299	0.522	1.045	0.417	0.711	2.155
ξ^{2b}	0.333	0.489	0.891	0.343	0.620	2.241	0.292	0.466	0.934	0.305	0.631	1.921
ξ^{3a}	0.209	0.362	0.663	0.222	0.507	1.711	0.199	0.429	0.664	0.188	0.446	2.234
ξ^{3b}	0.170	0.291	0.548	0.182	0.324	1.787	0.222	0.343	0.626	0.194	0.354	1.358
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	0.375	0.595	0.986	0.380	0.702	1.992	0.340	0.588	1.078	0.388	0.716	2.678
ξ^{1b}	0.386	0.562	0.975	0.393	0.689	2.316	0.374	0.556	1.006	0.359	0.751	2.101
ξ^{2a}	0.298	0.440	0.813	0.319	0.626	2.733	0.274	0.509	0.918	0.306	0.627	2.219
ξ^{2b}	0.251	0.420	0.759	0.270	0.517	1.567	0.260	0.363	0.743	0.315	0.585	2.460
ξ^{3a}	0.203	0.310	0.502	0.194	0.325	1.069	0.161	0.266	0.469	0.239	0.359	1.044
ξ^{3b}	0.145	0.235	0.437	0.138	0.316	1.084	0.096	0.218	0.440	0.129	0.280	1.006

The skewness of the normalized total loss is approximated using 10,000 independent samples of L. Total losses are normalized by 100 expected insured vehicles.

Table 13: Value-at-Risk at Level $p = 0.9$ of the Normalized Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	187.1	197.2	227.2	187.3	196.4	221.7	186.7	198.9	228.3	186.1	198.7	219.2
ξ^{1b}	182.2	191.4	218.3	182.6	189.9	213.5	181.7	191.3	220.7	179.9	192.7	213.0
ξ^{2a}	497.6	528.3	621.3	498.7	525.5	588.9	495.7	529.8	625.2	496.4	531.6	583.6
ξ^{2b}	504.1	533.6	627.4	505.7	532.9	596.6	504.1	540.3	631.0	498.0	536.2	595.8
ξ^{3a}	759.9	806.9	953.3	768.9	811.2	909.1	764.5	812.0	971.6	759.1	807.7	896.7
ξ^{3b}	801.1	845.0	1000.7	797.2	846.5	941.9	797.2	853.8	1009.3	790.3	856.9	945.9
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	156.4	159.2	173.6	156.0	160.5	171.6	156.3	160.8	173.5	156.2	159.3	171.1
ξ^{1b}	171.2	175.0	187.8	170.7	174.5	185.0	171.1	175.3	189.0	171.3	175.0	184.6
ξ^{2a}	416.5	429.9	473.8	416.8	429.2	462.7	416.6	429.9	468.7	417.8	430.2	465.4
ξ^{2b}	526.1	539.8	583.0	527.5	541.1	582.6	528.1	539.8	585.3	526.8	538.7	579.6
ξ^{3a}	731.1	756.5	825.8	731.6	756.3	818.0	731.1	758.6	822.7	733.8	755.6	815.0
ξ^{3b}	959.1	983.7	1057.7	959.7	982.6	1055.5	958.9	982.4	1059.6	955.9	979.3	1051.7
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	124.6	127.3	135.5	125.0	127.2	133.8	124.4	127.6	135.5	124.5	127.9	134.5
ξ^{1b}	153.6	157.0	164.4	153.3	156.9	162.1	153.6	156.7	165.7	152.9	156.8	162.3
ξ^{2a}	416.4	425.1	448.9	416.6	424.5	444.5	415.3	422.7	449.3	414.9	424.2	446.8
ξ^{2b}	513.8	525.7	552.3	515.6	522.9	550.5	515.1	521.7	550.4	513.0	522.7	546.9
ξ^{3a}	840.4	858.6	895.7	841.1	856.0	897.1	840.3	853.7	903.4	839.4	856.1	895.3
ξ^{3b}	1161.2	1179.1	1231.8	1160.9	1184.1	1229.7	1159.4	1176.7	1232.1	1161.3	1181.1	1230.5
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	26.7	29.6	38.0	27.1	29.3	32.4	26.3	29.9	37.4	27.2	29.9	32.1
ξ^{1b}	27.0	30.8	37.9	27.0	29.3	32.1	27.1	30.5	37.2	26.5	29.5	32.3
ξ^{2a}	139.4	156.6	188.1	139.6	156.1	169.3	138.3	156.0	197.0	139.3	152.4	168.9
ξ^{2b}	146.6	165.9	208.5	146.3	162.5	176.6	148.6	162.9	208.0	147.6	163.3	178.0
ξ^{3a}	405.9	446.4	550.4	404.4	441.7	493.6	407.2	444.5	559.5	407.2	444.2	488.9
ξ^{3b}	470.2	518.3	627.8	472.4	514.8	576.8	471.7	516.7	627.0	474.0	510.8	581.2
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	17.5	19.1	23.5	17.5	19.2	21.4	17.6	19.0	23.3	17.6	18.9	21.7
ξ^{1b}	19.8	21.4	26.0	19.9	21.5	24.1	19.7	21.5	25.9	19.7	21.3	24.2
ξ^{2a}	125.1	131.5	156.1	125.2	132.9	149.7	124.5	133.0	155.5	124.3	132.0	148.7
ξ^{2b}	148.9	156.5	182.6	149.1	157.2	176.1	147.2	156.4	185.4	148.0	158.2	175.9
ξ^{3a}	496.9	523.6	582.9	495.4	519.9	571.8	496.7	519.4	581.4	495.5	518.9	577.0
ξ^{3b}	665.3	693.7	766.3	668.5	693.0	752.8	669.1	691.6	769.1	670.4	689.2	747.4
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	15.4	16.3	19.6	15.2	16.4	18.2	15.1	16.3	19.5	15.3	16.5	18.4
ξ^{1b}	17.1	18.4	21.9	17.1	18.2	20.6	17.1	18.4	21.6	17.3	18.3	20.7
ξ^{2a}	87.5	91.9	107.2	87.0	92.0	103.0	86.8	92.0	107.3	87.1	92.1	103.0
ξ^{2b}	106.1	112.1	129.2	106.3	112.1	124.4	106.4	112.8	128.7	106.2	112.5	124.4
ξ^{3a}	497.1	515.5	561.1	497.8	514.9	552.9	499.3	515.1	560.0	500.3	514.2	555.5
ξ^{3b}	600.8	620.7	669.5	598.9	619.9	665.7	598.5	618.9	668.8	599.1	617.5	670.1

The Value-at-Risk at level $p = 0.9$ of the normalized total loss is approximated using 10,000 independent samples of L. Total losses are normalized by 100 expected insured vehicles.

Table 14: Expected Shortfall at Level $p = 0.9$ of the Normalized Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	206.4	223.0	271.7	206.9	224.4	282.2	205.3	223.4	272.5	207.3	225.4	277.7
ξ^{1b}	200.3	216.3	263.9	202.5	217.4	272.4	200.1	216.9	263.3	199.1	219.7	271.4
ξ^{2a}	560.1	612.2	771.9	562.2	613.9	779.9	556.8	610.7	779.7	558.7	622.6	774.8
ξ^{2b}	567.7	617.8	779.1	569.7	628.4	796.9	562.8	625.4	780.1	563.2	620.8	788.3
ξ^{3a}	863.9	942.5	1218.4	873.9	959.3	1225.4	866.8	957.0	1241.1	865.2	956.7	1213.7
ξ^{3b}	904.4	983.1	1261.2	904.3	998.5	1280.9	899.5	988.4	1262.5	897.0	1010.1	1263.2
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	165.9	171.2	193.8	165.1	173.9	196.7	165.9	172.2	194.3	165.4	171.8	194.4
ξ^{1b}	183.0	191.1	219.4	183.2	192.5	216.1	183.8	192.5	219.6	183.6	193.2	217.4
ξ^{2a}	445.1	467.1	534.4	444.4	468.6	540.9	443.9	466.1	527.9	446.2	469.7	536.2
ξ^{2b}	557.8	583.2	652.7	559.1	582.6	666.0	560.0	581.8	653.8	558.3	581.9	659.9
ξ^{3a}	781.2	820.8	936.8	783.9	822.0	957.9	780.3	823.0	938.9	784.8	821.9	948.8
ξ^{3b}	1016.6	1057.8	1183.0	1018.9	1063.0	1215.6	1020.4	1056.8	1190.8	1014.8	1056.8	1201.1
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	132.1	137.1	152.2	132.2	137.5	152.6	131.5	137.4	152.0	132.0	138.0	152.6
ξ^{1b}	162.5	169.0	186.4	162.1	169.4	185.8	162.6	168.2	185.0	161.6	168.8	185.1
ξ^{2a}	437.1	452.2	494.7	439.1	453.2	499.2	438.2	453.3	494.6	436.0	452.7	503.7
ξ^{2b}	540.9	557.3	603.8	541.0	557.1	611.0	539.8	552.9	605.8	538.0	556.9	607.6
ξ^{3a}	883.3	912.1	982.9	883.5	914.7	1000.7	882.2	907.2	994.3	881.0	907.8	1004.8
ξ^{3b}	1209.5	1246.5	1338.6	1210.4	1249.8	1354.3	1208.6	1242.4	1340.3	1210.9	1249.0	1354.9
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	33.6	40.3	62.1	33.9	40.3	58.8	33.5	40.7	60.3	34.0	42.1	56.6
ξ^{1b}	33.9	41.4	61.6	33.7	40.8	56.8	34.3	40.8	60.6	33.5	41.2	59.2
ξ^{2a}	169.4	201.5	285.7	170.5	202.9	273.8	167.8	202.1	292.2	170.1	203.8	274.4
ξ^{2b}	178.2	209.9	312.7	177.0	214.9	283.4	179.0	211.2	304.0	177.8	213.7	285.9
ξ^{3a}	473.2	547.9	748.0	475.3	557.2	727.9	475.5	540.1	771.1	478.5	561.9	742.7
ξ^{3b}	550.7	623.1	850.9	547.4	632.0	842.4	542.4	627.4	838.9	550.1	622.8	856.8
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	20.1	22.7	31.0	20.3	23.2	31.3	20.2	22.9	30.8	20.3	23.0	31.3
ξ^{1b}	22.5	25.2	33.6	22.8	25.8	33.2	22.4	25.4	33.5	22.5	25.6	34.2
ξ^{2a}	138.2	150.4	191.6	138.8	151.6	194.4	137.7	151.4	191.6	138.5	152.0	193.6
ξ^{2b}	163.2	176.6	219.6	163.4	178.4	224.7	161.8	176.4	222.4	162.3	179.6	221.7
ξ^{3a}	531.4	572.2	670.4	530.7	572.1	687.0	530.9	568.6	669.8	528.7	569.9	691.3
ξ^{3b}	709.9	751.6	863.5	714.0	755.6	882.8	714.9	752.5	871.4	715.3	752.0	876.7
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	17.2	18.8	24.0	17.0	19.1	24.0	16.9	18.8	24.2	17.2	19.1	24.4
ξ^{1b}	19.0	21.2	26.7	19.1	21.0	27.2	19.1	21.0	26.6	19.2	21.3	26.9
ξ^{2a}	95.9	103.0	127.6	95.6	104.5	131.5	95.1	103.5	128.0	95.6	104.4	130.1
ξ^{2b}	115.1	124.4	150.7	115.2	124.9	152.6	115.6	124.5	151.3	115.5	126.1	154.8
ξ^{3a}	526.2	553.8	621.5	526.2	553.2	630.1	525.5	551.2	621.1	529.1	553.1	631.7
ξ^{3b}	631.4	659.8	737.3	631.3	661.4	748.1	627.7	658.5	739.6	629.9	658.0	755.8

The Expected Shortfall at level $p = 0.9$ of the normalized total loss is approximated using $10,000$ independent samples of L. Total losses are normalized by 100 expected insured vehicles.

Table 15: Value-at-Risk at Level $p = 0.95$ of the Normalized Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	201.2	216.3	259.3	202.6	215.7	260.7	200.5	217.4	262.3	202.6	219.0	256.9
ξ^{1b}	195.7	210.7	252.8	198.1	209.7	251.8	195.6	211.3	251.9	195.1	212.0	251.5
ξ^{2a}	545.6	590.1	731.2	546.9	585.8	713.9	539.9	585.3	737.5	542.5	593.4	704.1
ξ^{2b}	551.7	596.4	729.6	554.0	602.3	721.5	547.7	603.4	733.6	545.2	601.7	722.2
ξ^{3a}	836.9	908.5	1146.5	852.0	916.8	1110.0	839.6	916.3	1170.1	839.1	916.5	1109.6
ξ^{3b}	879.5	950.2	1195.6	878.8	951.1	1160.0	880.0	953.5	1186.7	868.6	971.8	1139.2
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	163.8	168.0	189.3	163.1	171.1	187.6	163.5	169.3	188.5	163.4	168.1	186.9
ξ^{1b}	179.9	187.0	208.5	180.1	187.6	204.0	181.6	187.5	209.4	180.8	187.6	204.4
ξ^{2a}	438.1	457.5	520.1	438.1	459.1	510.3	437.8	457.7	510.5	440.1	459.0	511.2
ξ^{2b}	550.4	571.3	635.4	551.7	572.1	639.8	551.0	573.3	636.6	551.6	572.6	633.6
ξ^{3a}	771.4	803.3	910.1	772.5	807.5	913.2	768.5	807.0	907.5	773.0	805.2	903.4
ξ^{3b}	1003.4	1039.9	1150.5	1006.3	1046.8	1163.8	1006.9	1040.4	1157.5	1000.2	1040.4	1156.0
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	130.3	134.3	146.6	130.4	134.6	145.5	129.7	135.2	147.2	130.1	135.5	146.1
ξ^{1b}	160.6	166.2	180.3	159.9	165.8	177.2	160.4	165.9	179.0	159.4	165.7	176.9
ξ^{2a}	432.1	446.1	482.8	433.9	447.8	481.2	434.0	446.0	482.4	430.6	446.9	484.4
ξ^{2b}	534.6	549.4	591.3	535.2	548.8	591.1	535.2	545.6	593.9	532.3	549.8	588.1
ξ^{3a}	873.2	901.6	962.3	873.9	901.5	971.2	872.7	895.4	974.6	871.0	896.4	972.0
ξ^{3b}	1199.1	1232.4	1314.5	1198.0	1233.8	1314.6	1197.1	1227.4	1317.2	1199.7	1234.6	1319.8
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	31.8	37.2	54.3	32.1	36.4	47.1	31.8	37.7	53.1	32.2	38.2	45.6
ξ^{1b}	32.2	38.3	53.4	31.6	36.5	45.3	32.3	38.1	53.0	31.8	37.4	46.8
ξ^{2a}	161.2	188.1	254.7	163.2	188.9	236.2	159.3	188.1	264.3	163.2	187.0	235.8
ξ^{2b}	169.7	198.9	281.8	169.4	196.4	242.7	170.8	196.9	271.4	168.5	198.7	240.1
ξ^{3a}	456.0	520.8	683.3	456.6	526.1	635.9	458.2	516.2	715.3	462.8	526.0	639.1
ξ^{3b}	529.1	592.0	785.9	525.1	595.4	721.8	522.2	593.9	772.0	527.2	588.8	740.6
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	19.6	21.7	28.9	19.6	22.0	27.0	19.5	22.0	28.5	19.6	21.8	27.2
ξ^{1b}	21.7	24.2	31.4	22.1	24.6	29.6	21.8	24.3	31.4	21.8	24.3	30.3
ξ^{2a}	134.9	146.5	182.0	135.6	146.3	177.6	134.7	146.8	182.5	134.5	145.9	174.4
ξ^{2b}	159.9	171.2	207.7	159.7	172.6	206.2	158.1	171.6	212.4	158.5	173.2	206.1
ξ^{3a}	523.3	560.8	649.9	522.3	557.5	643.2	522.5	555.7	647.6	519.2	557.5	647.9
ξ^{3b}	699.1	737.3	838.8	704.5	740.7	828.7	704.3	735.5	843.6	704.3	735.4	829.2
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	16.7	18.1	22.8	16.6	18.4	21.8	16.5	18.1	22.9	16.8	18.4	22.2
ξ^{1b}	18.5	20.5	25.3	18.5	20.2	24.5	18.6	20.3	25.3	18.6	20.5	24.8
ξ^{2a}	94.1	100.1	122.8	93.5	101.1	121.3	93.3	100.7	121.8	93.7	101.1	119.1
ξ^{2b}	112.7	121.5	144.3	112.9	120.7	143.7	113.4	121.6	145.8	113.1	122.3	143.1
ξ^{3a}	518.4	542.6	605.0	519.2	543.8	605.9	517.8	541.9	605.2	521.2	544.7	607.6
ξ^{3b}	623.9	649.8	720.6	622.7	650.4	720.7	620.7	648.9	720.0	623.8	647.2	729.1

The Value-at-Risk at level $p = 0.95$ of the normalized total loss is approximated using $10,000$ independent samples of L. Total losses are normalized by 100 expected insured vehicles.

Table 16: Expected Shortfall at Level $p = 0.95$ of the Normalized Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	219.2	240.6	302.0	219.6	243.7	324.9	217.7	239.8	302.1	220.8	242.5	319.7
ξ^{1b}	212.0	232.9	294.6	214.9	235.8	315.5	212.5	233.8	291.8	211.3	237.4	313.4
ξ^{2a}	601.0	667.7	874.5	603.5	674.8	916.2	598.2	666.6	881.2	600.3	684.5	913.0
ξ^{2b}	609.2	674.8	884.8	610.9	693.9	943.7	602.2	678.5	881.8	605.2	676.1	925.3
ξ^{3a}	932.9	1031.4	1398.7	943.4	1058.8	1455.7	934.2	1054.7	1418.8	936.1	1057.1	1441.8
ξ^{3b}	972.4	1074.5	1435.7	970.8	1104.5	1525.7	965.8	1079.1	1437.2	967.9	1112.9	1493.9
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	171.8	179.5	207.3	170.8	182.4	214.7	172.1	179.8	208.4	171.5	180.3	210.5
ξ^{1b}	190.9	202.4	242.3	191.6	204.6	238.9	191.3	203.9	240.7	191.7	205.5	240.9
ξ^{2a}	463.8	491.7	575.3	462.6	494.1	597.7	461.6	489.8	568.9	464.4	495.6	586.8
ξ^{2b}	578.0	611.7	701.5	579.5	610.5	723.5	580.9	609.2	700.6	578.1	609.8	716.4
ξ^{3a}	812.5	862.2	1009.9	817.5	865.2	1056.2	814.0	863.4	1016.5	817.7	867.4	1043.0
ξ^{3b}	1051.8	1107.5	1266.0	1056.5	1115.4	1328.0	1060.4	1104.3	1277.3	1052.7	1102.6	1301.6
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	137.0	143.4	164.1	137.0	144.3	166.0	136.1	143.8	163.6	137.0	144.8	165.7
ξ^{1b}	168.3	176.9	201.9	167.8	177.7	202.9	168.9	175.6	198.5	167.4	176.7	201.3
ξ^{2a}	450.8	469.9	524.5	455.0	471.1	537.2	452.6	471.8	524.6	449.7	470.1	543.5
ξ^{2b}	555.4	576.8	636.3	558.5	578.0	653.6	558.0	574.0	641.5	553.0	578.8	650.1
ξ^{3a}	909.1	946.4	1038.9	912.6	952.4	1071.1	909.2	944.5	1055.7	907.7	941.8	1078.3
ξ^{3b}	1240.1	1290.8	1408.7	1243.8	1292.4	1441.6	1240.9	1281.7	1410.5	1242.7	1292.6	1438.6
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	38.2	47.6	78.9	38.6	48.1	78.8	38.5	48.0	76.2	38.4	50.7	75.6
ξ^{1b}	38.4	48.7	78.0	38.4	49.0	75.8	39.1	47.5	77.0	38.1	49.4	80.2
ξ^{2a}	189.5	232.0	353.9	190.8	234.7	351.0	188.2	232.8	359.0	190.2	239.4	351.0
ξ^{2b}	199.3	239.6	384.9	196.9	251.4	363.1	199.2	244.2	370.8	198.6	248.8	366.2
ξ^{3a}	518.4	617.7	887.1	521.9	635.7	903.7	521.0	605.0	911.6	525.1	642.7	932.0
ξ^{3b}	603.7	693.2	1004.4	599.9	712.7	1044.0	590.3	704.1	985.6	600.9	701.1	1065.9
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	21.9	25.2	36.1	22.1	25.9	38.6	21.9	25.4	36.0	22.1	25.9	38.6
ξ^{1b}	24.2	27.7	38.8	24.7	28.7	39.9	24.2	28.0	38.7	24.3	28.5	41.5
ξ^{2a}	146.3	162.8	215.0	147.6	164.3	227.5	146.1	163.8	215.8	148.0	165.7	226.9
ξ^{2b}	172.4	189.9	245.0	172.8	192.3	259.8	170.7	189.9	247.7	171.8	194.2	253.9
ξ^{3a}	553.7	603.2	728.0	553.9	606.7	770.7	552.7	601.4	727.8	551.4	604.6	773.6
ξ^{3b}	739.0	790.2	928.6	744.5	795.4	976.2	744.4	792.3	939.7	744.5	792.8	969.2
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	18.3	20.5	27.0	18.2	20.9	28.1	18.1	20.5	27.5	18.4	20.9	28.8
ξ^{1b}	20.3	23.0	29.9	20.4	22.9	32.1	20.4	22.8	30.0	20.4	23.4	31.3
ξ^{2a}	101.2	110.5	141.0	101.3	112.8	152.1	100.6	110.9	141.8	101.5	112.6	150.0
ξ^{2b}	121.1	132.4	165.8	121.0	133.6	173.0	121.4	132.2	166.2	121.6	135.4	177.3
ξ^{3a}	545.3	577.1	661.8	543.9	578.1	684.8	543.4	575.2	662.2	547.0	579.9	684.2
ξ^{3b}	650.0	685.1	781.4	651.3	689.2	804.9	646.5	684.9	785.1	649.7	686.1	814.4

The Expected Shortfall at level $p = 0.95$ of the normalized total loss is approximated using $10,000$ independent samples of L. Total losses are normalized by 100 expected insured vehicles.

Table 17: Value-at-Risk at Level $p = 0.99$ of the Normalied Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	230.9	255.8	328.6	231.4	260.3	363.3	228.1	251.5	326.4	231.3	257.4	350.5
ξ^{1b}	222.8	248.2	320.1	225.7	251.8	352.6	224.7	247.2	314.3	221.7	254.6	344.5
ξ^{2a}	639.2	716.9	949.0	638.5	729.4	1038.6	638.1	719.9	966.6	631.7	743.1	1011.2
ξ^{2b}	644.1	719.7	973.5	650.6	744.5	1061.7	636.4	723.8	976.7	638.7	726.6	1039.2
ξ^{3a}	1001.8	1106.3	1537.6	994.3	1149.4	1666.7	992.1	1138.6	1592.0	993.1	1164.3	1586.3
ξ^{3b}	1030.2	1153.4	1564.6	1032.9	1211.2	1709.4	1019.7	1149.2	1602.9	1023.4	1202.4	1706.6
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	176.8	185.5	217.4	176.0	188.7	228.9	177.5	186.1	218.9	176.5	187.6	224.7
ξ^{1b}	198.5	211.4	261.5	198.7	214.1	252.6	196.8	213.4	258.2	198.4	214.7	250.5
ξ^{2a}	481.4	515.4	613.4	477.8	515.0	640.2	475.3	512.8	607.1	478.9	516.6	628.1
ξ^{2b}	594.9	637.1	741.7	597.4	635.0	766.9	600.2	630.0	736.9	594.8	629.4	759.1
ξ^{3a}	837.7	896.7	1077.6	846.1	902.9	1121.5	839.5	896.1	1080.0	849.8	906.0	1118.0
ξ^{3b}	1080.4	1152.5	1343.1	1090.0	1158.2	1429.6	1092.6	1145.7	1356.0	1086.9	1144.1	1388.1
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	141.0	149.3	175.4	141.1	150.1	176.5	139.8	149.6	172.7	141.4	150.9	174.4
ξ^{1b}	172.5	183.5	214.3	173.3	184.3	214.3	173.5	181.4	209.1	172.1	183.0	216.6
ξ^{2a}	463.0	485.6	553.8	463.8	482.6	565.2	464.5	486.3	548.5	461.7	483.3	570.4
ξ^{2b}	566.7	592.3	664.8	571.4	594.2	691.4	565.2	589.5	669.3	566.1	596.0	680.3
ξ^{3a}	931.2	975.2	1088.0	931.2	986.4	1124.9	932.5	976.4	1112.4	933.3	966.9	1129.7
ξ^{3b}	1266.5	1325.8	1460.7	1276.4	1328.3	1513.6	1272.0	1317.8	1466.4	1270.1	1328.8	1508.8
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	42.4	54.1	93.3	43.0	54.9	96.5	42.6	55.0	90.9	42.6	57.1	90.2
ξ^{1b}	41.9	55.5	94.8	41.9	56.5	91.2	43.8	54.3	90.8	41.8	56.5	92.9
ξ^{2a}	208.2	257.2	406.2	205.6	260.5	420.6	207.6	260.5	415.7	205.6	269.2	414.3
ξ^{2b}	219.8	265.7	445.9	212.3	281.8	436.5	217.9	275.0	423.6	216.0	277.8	437.2
ξ^{3a}	556.2	677.5	1024.5	554.1	690.3	1015.3	561.5	656.4	1036.9	564.9	708.9	1099.2
ξ^{3b}	650.9	755.7	1138.7	649.3	792.7	1218.2	632.2	776.4	1113.5	643.3	765.0	1204.7
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	23.3	27.6	41.0	23.7	28.2	43.3	23.4	27.7	41.4	23.7	28.8	45.3
ξ^{1b}	25.6	30.0	43.3	26.3	31.7	45.3	25.6	30.1	43.1	26.0	30.8	45.4
ξ^{2a}	153.3	171.3	237.0	154.6	174.4	250.6	153.6	174.6	238.7	156.8	176.4	256.7
ξ^{2b}	180.8	202.4	269.2	180.6	203.7	283.3	179.1	200.3	269.6	180.3	206.9	280.9
ξ^{3a}	575.1	628.8	779.7	574.7	637.4	828.9	571.1	630.1	787.3	570.5	635.7	837.6
ξ^{3b}	765.1	826.7	984.4	767.4	829.6	1053.9	768.0	829.6	1000.4	770.8	831.0	1040.6
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	19.4	22.1	29.6	19.2	22.3	31.7	19.2	21.8	30.3	19.4	22.2	31.5
ξ^{1b}	21.3	24.5	32.5	21.3	24.3	36.2	21.5	24.4	32.9	21.5	25.2	35.2
ξ^{2a}	105.6	116.8	152.7	106.1	120.1	164.1	105.3	116.7	154.5	105.8	120.6	168.9
ξ^{2b}	125.9	139.2	180.3	125.9	141.7	188.2	126.1	138.7	179.4	126.3	143.3	193.6
ξ^{3a}	560.4	596.3	697.9	561.7	599.4	716.2	559.2	593.7	694.5	562.0	600.4	727.0
ξ^{3b}	665.8	706.1	818.4	666.9	715.3	843.8	662.2	707.9	826.9	666.9	707.9	858.9

The Value-at-Risk at level $p = 0.99$ of the normalized total loss is approximated using $10,000$ independent samples of L. Total losses are normalized by 100 expected insured vehicles.

Table 18: Expected Shortfall at Level $p = 0.99$ of the Normalized Total Loss.

	Binomial Model						Poisson Model					
	Gamma			Log-Normal			Gamma			Log-Normal		
	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$	$c_v = 0.5$	$c_v = 1.0$	$c_v = 2.0$
Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	244.8	279.0	372.4	244.2	290.2	436.5	244.6	272.8	368.4	247.4	277.5	432.8
ξ^{1b}	235.8	264.9	363.8	239.0	276.4	427.1	236.9	265.1	353.9	236.5	273.3	424.3
ξ^{2a}	683.4	783.4	1106.1	684.5	805.2	1314.1	682.2	783.5	1123.5	687.7	825.5	1304.0
ξ^{2b}	692.5	798.9	1126.1	694.5	844.3	1378.0	678.1	795.5	1111.4	693.3	791.9	1287.4
ξ^{3a}	1077.9	1214.4	1830.1	1078.4	1291.4	2104.3	1063.4	1260.7	1823.4	1077.3	1275.6	2058.2
ξ^{3b}	1112.1	1252.7	1829.2	1113.1	1349.2	2217.3	1091.5	1259.8	1836.1	1121.6	1328.4	2140.8
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	183.6	196.1	234.8	181.9	198.8	262.3	184.8	195.4	237.3	183.5	199.7	250.5
ξ^{1b}	207.7	224.3	300.7	207.4	231.4	308.0	206.7	228.9	295.8	207.4	236.7	316.6
ξ^{2a}	501.8	542.7	663.4	496.4	548.2	751.5	496.1	536.5	656.6	500.9	545.9	721.8
ξ^{2b}	617.5	674.0	798.5	620.0	669.5	871.2	620.1	661.1	796.0	615.2	663.6	858.4
ξ^{3a}	872.0	945.0	1159.5	879.6	952.0	1307.7	876.2	953.8	1185.6	879.3	961.8	1273.3
ξ^{3b}	1119.5	1203.8	1436.0	1126.5	1217.1	1621.0	1136.0	1198.9	1455.7	1126.4	1194.1	1549.1
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	146.3	158.8	194.8	146.5	159.5	203.1	145.2	157.0	191.0	146.8	158.9	202.8
ξ^{1b}	178.9	193.0	239.4	179.3	196.9	253.9	179.6	190.5	231.7	178.7	194.5	246.9
ξ^{2a}	477.3	502.5	580.8	479.1	510.7	642.3	478.9	509.3	586.3	481.3	504.2	655.9
ξ^{2b}	585.5	613.7	706.1	588.2	620.2	756.9	588.5	611.4	713.3	581.6	622.8	765.7
ξ^{3a}	969.5	1009.4	1160.8	958.9	1026.4	1248.0	962.6	1007.3	1163.3	959.6	1011.1	1254.6
ξ^{3b}	1302.2	1369.6	1534.0	1310.8	1374.5	1650.4	1302.8	1357.3	1538.5	1309.4	1370.4	1623.2
Non-Uniform Accident Occurrence												
$\rho^{\Phi} = \mathbf{0.1}$:												
ξ^{1a}	47.7	64.3	118.8	48.4	67.0	146.4	48.3	65.6	116.8	48.3	72.0	136.2
ξ^{1b}	47.9	64.7	119.2	48.7	70.5	137.9	49.6	62.8	119.1	47.4	69.9	150.6
ξ^{2a}	233.4	304.5	520.4	233.9	310.2	562.0	229.9	298.4	524.1	233.2	331.3	575.2
ξ^{2b}	248.1	304.3	558.1	240.4	342.9	579.1	242.2	316.6	537.5	241.3	330.2	607.1
ξ^{3a}	607.4	760.6	1226.9	623.5	816.5	1432.4	610.4	747.4	1223.0	617.0	840.0	1503.8
ξ^{3b}	713.1	856.2	1363.6	708.7	913.1	1630.9	688.1	860.9	1319.0	712.3	877.6	1715.2
$\rho^{\Phi} = \mathbf{0.5}$:												
ξ^{1a}	25.4	30.4	47.1	25.6	32.1	63.4	25.6	30.5	48.3	25.9	32.3	60.0
ξ^{1b}	27.8	33.1	50.0	28.5	35.3	59.5	27.7	33.5	49.2	28.1	35.1	63.5
ξ^{2a}	163.3	189.0	266.1	166.5	191.7	321.4	163.4	188.8	269.3	168.6	196.4	325.4
ξ^{2b}	192.9	219.1	302.9	192.0	222.6	363.4	189.4	218.0	305.4	191.4	228.3	340.4
ξ^{3a}	597.0	664.0	848.6	600.3	680.3	994.5	596.4	670.8	848.3	600.3	674.6	1022.3
ξ^{3b}	797.7	872.3	1065.1	800.6	868.7	1256.1	804.5	874.9	1080.6	803.7	873.4	1220.8
$\rho^{\Phi} = \mathbf{0.9}$:												
ξ^{1a}	20.9	24.2	33.4	20.5	24.6	39.0	20.6	24.1	34.6	20.8	25.0	41.9
ξ^{1b}	22.9	26.7	37.1	23.1	27.1	46.2	23.0	26.5	37.1	23.1	27.9	43.4
ξ^{2a}	111.2	125.3	168.8	112.9	130.8	213.7	111.4	125.9	172.9	112.5	130.8	207.5
ξ^{2b}	132.9	149.0	198.3	133.2	152.4	226.8	132.0	147.8	195.4	134.3	156.1	241.2
ξ^{3a}	584.0	627.9	750.6	579.8	625.8	822.2	578.0	620.5	746.1	585.7	628.3	818.5
ξ^{3b}	686.8	738.3	872.5	694.3	750.1	959.2	682.4	736.4	885.2	689.8	740.7	977.6

The Expected Shortfall at level $p = 0.99$ of the normalized total loss is approximated using $10,000$ independent samples of L. Total losses are normalized by 100 expected insured vehicles.

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