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Anexos

8.1.
Anexo 1: Resultados da Análise Fatorial

Análise Fatorial por Componentes Principais considerando todos os dados

The FACTOR Procedure
Initial Factor Method: Principal Components

Prior Communality Estimates: ONE

Eigenvalues of the Correlation Matrix:
Total = 18 Average = 1

	Eigenvalue	Difference	Proportion	Cumulative
1	4.95271826	1.56591794	0.2752	0.2752
2	3.38680032	0.44835121	0.1882	0.4633
3	2.93844911	1.24153681	0.1632	0.6266
4	1.6969123	0.47567503	0.0943	0.7208
5	1.22123726	0.0788938	0.0678	0.7887
6	1.14234346	0.26948032	0.0635	0.8521
7	0.87286314	0.24056995	0.0485	0.9006
8	0.63229319	0.10043067	0.0351	0.9358
9	0.53186252	0.21095074	0.0295	0.9653
10	0.32091178	0.15956812	0.0178	0.9831
11	0.16134366	0.0865503	0.009	0.9921
12	0.07479336	0.00732173	0.0042	0.9963
13	0.06747163	0.06747163	0.0037	1
14	0	0	0	1
15	0	0	0	1
16	0	0	0	1
17	0	0	0	1
18	0	0	1	

4 factors will be retained by the NFACTOR criterion.

Análise Fatorial por Componentes Principais considerando todos os dados

Factor Pattern

	Factor1	Factor2	Factor3	Factor4
fx18_29	-0.50317	0.7561	-0.33274	0.00401
fx30_54	-0.21151	-0.56277	-0.20011	0.08447
fx55_	0.61105	-0.16412	0.45567	-0.07577
a_vista	-0.46785	-0.56317	-0.3283	-0.23062
prest2_5	0.40305	0.30043	-0.19095	0.50666
prest6_12	0.18351	0.41534	0.62745	-0.23372
LMR_merc	-0.06287	0.17643	0.82682	-0.1201
franq_O	0.11155	0.57848	0.09209	0.40384
sexo_m	0.63171	0.05121	0.00813	0.45763
renov_con	-0.26326	-0.1191	0.54616	0.54223
renov_sas	0.63439	0.07562	-0.53188	-0.4504
renov_novo	-0.77698	0.00894	0.27461	0.14021
estado_civil_s	-0.48983	0.80354	-0.23598	-0.12626
estado_civil_c	0.48983	-0.80354	0.23598	0.12626
bonus1234	-0.8392	-0.15037	0.23546	0.06457
bonus56789	0.8392	0.15037	-0.23546	-0.06457
valis	0.18476	0.01673	-0.50969	0.58176
ideveic	0.67305	0.40782	0.45967	-0.19329

Variance Explained by Each Factor

Factor1	Factor2	Factor3	Factor4
4.9527183	3.3868003	2.9384491	1.6969123

Final Communality Estimates: Total = 12.97488

fx18_29	fx30_54	fx55_	a_vista	prest2_5	prest6_12	LMR_merc
0.93559681	0.40862145	0.613691	0.69700468	0.5458718	0.65450273	0.73313441

franq_O	sexo_m	renov_con	renov_sas	renov_novo	estado_civil_s	estado_civil_c
0.51864962	0.6111649	0.67579538	0.89392958	0.69884311	0.95724299	0.95724299

bonus1234	bonus56789	valis	ideveic
0.78648362	0.78648362	0.63265143	0.86796987

Análise Fatorial por Componentes Principais considerando todos os dados

Orthogonal Transformation Matrix

	1	2	3	4
1	-0.49652	0.67373	0.3284	0.43783
2	0.78616	0.11671	0.50946	0.32982
3	-0.3506	-0.53383	0.75604	-0.14322
4	-0.11179	-0.49748	-0.24701	0.82402

Rotated Factor Pattern

	Factor1	Factor2	Factor3	Factor4
fx18_29	0.96046	-0.07513	-0.0326	0.08004
fx30_54	-0.27669	-0.14338	-0.52832	-0.17995
fx55_	-0.58372	0.18697	0.48027	0.08571
a_vista	-0.06956	-0.09095	-0.63179	-0.5336
prest2_5	0.04637	0.15649	0.0159	0.7204
prest6_12	0.04155	-0.04657	0.80397	-0.06512
LMR_merc	-0.10654	-0.4034	0.72401	-0.18672
franq_O	0.32196	-0.1074	0.30122	0.55922
sexo_m	-0.32741	0.19958	0.12665	0.6694
renov_con	-0.21502	-0.75257	0.13185	0.21404
renov_sas	-0.01871	0.94424	-0.04401	0.00774
renov_novo	0.28087	-0.73878	-0.07763	-0.26103
estado_civil_s	0.97177	-0.04745	0.10129	-0.01968
estado_civil_c	-0.97177	0.04745	-0.10129	0.01968
bonus1234	0.20869	-0.74077	-0.19014	-0.39754
bonus56789	-0.20869	0.74077	0.19014	0.39754
valis	0.03508	0.1091	-0.45985	0.6388
ideveic	-0.15312	0.35183	0.82407	0.20408

Variance Explained by Each Factor

Factor1	Factor2	Factor3	Factor4
3.6966248	3.5516003	3.1963074	2.5303475

Final Communality Estimates: Total = 12.97488

fx18_29	fx30_54	fx55_	a_vista	prest2_5	prest6_12	LMR_merc
0.93559681	0.40862145	0.613691	0.69700468	0.5458718	0.65450273	0.73313441

franq_O	sexo_m	renov_con	renov_sas	renov_novo	estado_civil_s	estado_civil_c
0.51864962	0.6111649	0.67579538	0.89392958	0.69884311	0.95724299	0.95724299

bonus1234	bonus56789	valis	ideveic
0.78648362	0.78648362	0.63265143	0.86796987

Análise Fatorial por Componentes Principais considerando os dados de validação

The Initial Factor Method: Principal Components

Prior Communality Estimates: ONE

Eigenvalues of the Correlation Matrix:
Total = 18 Average = 1

	Eigenvalue	Difference	Proportion	Cumulative
1	5.66153107	2.30392548	0.3145	0.3145
2	3.35760559	1.19643656	0.1865	0.5011
3	2.16116903	0.41295389	0.1201	0.6211
4	1.74821514	0.4628547	0.0971	0.7183
5	1.28536044	0.39960436	0.0714	0.7897
6	0.88575608	0.13490483	0.0492	0.8389
7	0.75085125	0.11485227	0.0417	0.8806
8	0.63599898	0.01918527	0.0353	0.9159
9	0.61681371	0.15844541	0.0343	0.9502
10	0.4583683	0.2266322	0.0255	0.9756
11	0.2317361	0.12538221	0.0129	0.9885
12	0.10635388	0.00611343	0.0059	0.9944
13	0.10024045	0.10024045	0.0056	1
14	0	0	0	1
15	0	0	0	1
16	0	0	0	1
17	0	0	0	1
18	0	0	1	

4 factors will be retained by the NFACTOR criterion.

Análise Fatorial por Componentes Principais considerando os dados de validação

Factor	Pattern			
	Factor1	Factor2	Factor3	Factor4
fx18_29	-0.84578	0.30779	-0.18592	-0.04613
fx30_54	-0.09391	-0.51746	-0.34869	0.61296
fx55_	0.66205	0.19583	0.40527	-0.45327
a_vista	-0.35397	-0.68105	-0.03778	-0.42208
prest2_5	0.49828	0.03171	-0.06841	0.55623
prest6_12	-0.09335	0.85458	0.12569	-0.06902
LMR_merc	-0.06654	0.66088	0.13109	0.20872
franq_O	0.04764	0.37156	0.09958	0.69742
sexo_m	0.45183	0.05099	0.56325	-0.11437
renov_con	-0.33161	-0.01196	0.68779	0.16344
renov_sas	0.66075	-0.00187	-0.62107	-0.17657
renov_novo	-0.71039	0.01699	0.23087	0.10292
estado_civil_s	-0.78279	0.42833	-0.25303	-0.09292
estado_civil_c	0.78279	-0.42833	0.25303	0.09292
bonus1234	-0.81549	-0.13246	0.21885	-0.02528
bonus56789	0.81549	0.13246	-0.21885	0.02528
valis	0.06534	-0.47938	0.57474	0.19438
ideveic	0.54302	0.74292	0.09085	-0.06899

Variance	Explained	by	Each	Factor
Factor1	Factor2	Factor3	Factor4	
5.6615311	3.3576056	2.161169	1.7482151	

Final	Communality	Estimates:	Total	=	12.928521	
fx18_29	fx30_54	fx55_	a_vista	prest2_5	prest6_12	LMR_merc
0.84676582	0.77388419	0.8463633	0.768699	0.56336056	0.75957681	0.50194249
franq_O	sexo_m	renov_con	renov_sas	renov_novo	estado_civil_s	estado_civil_c
0.63663924	0.53708612	0.60987891	0.85350001	0.56882898	0.86889003	0.86889003
bonus1234	bonus56789	valis	ideveic			
0.73110909	0.73110909	0.60218255	0.85981459			

Análise Fatorial por Componentes Principais considerando os dados de validação

Orthogonal Transformation Matrix

	1	2	3	4
1	-0.7376	-0.61262	0.1931	0.20819
2	0.44217	-0.12502	0.69189	0.55691
3	-0.48219	0.75772	0.1005	0.42809
4	-0.1671	0.18689	0.68841	-0.68062

Rotated Factor Pattern

	Factor1	Factor2	Factor3	Factor4
fx18_29	0.8573	0.33017	-0.00081	-0.05286
fx30_54	-0.09383	-0.02744	0.01077	-0.87419
fx55_	-0.52142	-0.2077	-0.00796	0.72889
a_vista	0.0487	0.19449	-0.83392	-0.18188
prest2_5	-0.41347	-0.2571	0.4942	-0.28647
prest6_12	0.39765	0.03269	0.53836	0.55727
LMR_merc	0.24321	0.09648	0.60127	0.26826
franq_O	-0.0354	0.13015	0.75639	-0.21521
sexo_m	-0.56321	0.12224	0.10041	0.44143
renov_con	-0.11965	0.75634	0.10932	0.1075
renov_sas	-0.15923	-0.90815	-0.05767	-0.00917
renov_novo	0.40298	0.62724	-0.03137	-0.10966
estado_civil_s	0.90432	0.21691	0.0558	0.0305
estado_civil_c	-0.90432	-0.21691	-0.0558	-0.0305
bonus1234	0.44163	0.67725	-0.24453	-0.13266
bonus56789	-0.44163	-0.67725	0.24453	0.13266
valis	-0.56977	0.49172	-0.12749	-0.13963
ideveic	-0.10432	-0.3696	0.58051	0.61264

Variance Explained by Each Factor

Factor1	Factor2	Factor3	Factor4
4.2879616	3.4791546	2.6687335	2.4926711

Final Communality Estimates: Total = 12.928521

fx18_29	fx30_54	fx55_	a_vista	prest2_5	prest6_12	LMR_merc
0.84676582	0.77388419	0.8463633	0.768699	0.56336056	0.75957681	0.50194249

franq_O	sexo_m	renov_con	renov_sas	renov_novo	estado_civil_s	estado_civil_c
0.63663924	0.53708612	0.60987891	0.85350001	0.56882898	0.86889003	0.86889003

bonus1234	bonus56789	valis	ideveic
0.73110909	0.73110909	0.60218255	0.85981459

8.2.
Anexo 2: Modelos Finais

Modelos que estimam a severidade para os agrupamentos obtidos através do algoritmo de sinistro

The GENMOD Procedure

Model Information

Data Set		WORK.MODELO_COMPLETO
Distribution		Gamma
Link Function		Log
Dependent Variable		Severidade
Scale Weight Variable		Nº de Sinistros
Observations	Used	126
	0	0
	0	0

Class Level Information

Class	Levels	Values
grp_23	6	2 5 8 18 20 99
reg_23	3	1 5 9
id_23	7	1 3 4 5 6 7 99

Criteria For Assessing Goodness Of Fit

Criterion	DF	Value	Value/DF	DF	Value	Value/DF	DF	Value	Value/DF
Deviance	112	205.1095	1.8313	108	14.1953	0.1314	111	20.1956	0.1819
Scaled Deviance	112	126.7066	1.1313	108	122.4749	1.134	111	125.621	1.1317
Pearson Chi-Square	112	205.7168	1.8368	108	14.1905	0.1314	111	19.1675	0.1727
Scaled Pearson	112	127.0818	1.1347	108	122.4335	1.1336	111	119.2259	1.0741
Log Likelihood		317.2299			84.6777			81.3705	

Algorithm converged.

Analysis Of Parameter Estimates

			Perda Parcial				Perda Total				Roubo/Furto			
Parameter	DF		Estimate	Standard Error	Chi-Square	P > ChiSq	Estimate	Standard Error	Chi-Square	P > ChiSq	Estimate	Standard Error	Chi-Square	P > ChiSq
Intercept	0	1	-2.2647	0.035	4195.75	<.0001	0.0246	0.0353	0.48	0.4871	-0.0799	0.0282	8.01	0.0046
grp_23	2	1	0.1542	0.0415	13.81	0.0002	0.0069	0.0303	0.05	0.8186	-0.0426	0.0321	1.76	0.1846
grp_23	5	1	0.1025	0.0282	13.22	0.0003	0.0606	0.0258	5.53	0.0187	0.0455	0.0238	3.66	0.0557
grp_23	8	1	0.005	0.0351	0.02	0.8869	0.0046	0.0306	0.02	0.8798	0.0559	0.0288	3.76	0.0525
grp_23	18	1	0.1346	0.0263	26.16	<.0001	0.0528	0.0266	3.93	0.0475	0.1388	0.0273	25.78	<.0001
grp_23	20	1	-0.0878	0.0436	4.06	0.044	-0.0747	0.0315	5.63	0.0177	-0.1086	0.0433	6.29	0.0121
grp_23	99	0	0	0 .		.	0	0	.	.	0	0 .		.
reg_23	1	1	0.0515	0.0271	3.61	0.0575	0.0322	0.0267	1.46	0.2266	0.0768	0.0178	18.64	<.0001
reg_23	5	1	0.0466	0.027	2.97	0.0847	0.0273	0.027	1.02	0.312	0.117	0.0271	18.6	<.0001
reg_23	9	0	0	0 .		.	0	0	.	.	0	0 .		.
id_23	1	1	-0.2187	0.03	53.14	<.0001	0.0252	0.0299	0.71	0.3998	-0.0378	0.0288	1.73	0.1888
id_23	3	1	0.0902	0.0399	5.13	0.0236	-0.0535	0.0361	2.2	0.1379	0.0519	0.0349	2.21	0.1368
id_23	4	1	0.242	0.0427	32.06	<.0001	-0.0478	0.0359	1.78	0.1824	0.0148	0.0355	0.17	0.6766
id_23	5	1	0.2266	0.0445	25.88	<.0001	0.003	0.0363	0.01	0.9335	0.0485	0.0369	1.72	0.1894
id_23	6	1	0.4204	0.0506	69.02	<.0001	-0.0024	0.0379	0	0.9501	0.0299	0.0364	0.68	0.4103
id_23	7	1	0.5015	0.0424	140	<.0001	0.0289	0.033	0.77	0.3814	0.0233	0.032	0.53	0.4657
id_23	99	0	0	0 .		.	0	0	.	.	0	0 .		.
Scale		1	0.6178	0.0774			8.6279	1.1004			6.2202	0.7829		

The scale parameter was estimated by maximum likelihood.

Modelos que estimam o número de sinistros para os agrupamentos obtidos através do algoritmo de sinistro

The GENMOD Procedure

Model Information 0

Data	Set	WORK.MODELO_COMPLETO
Link	Function	Log
Dependent	Variable	Nº de Sinistros
Offset	Variable	Exposição
Observation	Used	126

Class Level Information

Class	Levels	Values
grp_23	6	2 5 8 18 20 99
reg_23	3	1 5 9
id_23	7	1 3 4 5 6 7 99

Criteria For Assessing Goodness Of Fit

Criterion	DF	Value	Value/DF
Deviance	112	197.6449	1.7647
Scaled Deviance	112	197.6449	1.7647
Pearson Chi-Square	112	201.3863	1.7981
Scaled Pearson	112	201.3863	1.7981
Log Likelihood		83410.97	

Algorithm converged.

Analysis Of Parameter Estimates

			Perda Parcial				Perda Total				Roubo/Furto			
Parameter	DF	Estimate	Standard Error	Chi-Square	P > ChiSq	Estimate	Standard Error	Chi-Square	P > ChiSq	Estimate	Standard Error	Chi-Square	P > ChiSq
Intercept	1	-2.5097	0.0275	8319.94	<.0001	-5.5769	0.1042	2864.17	<.0001	-4.0038	0.0708	3199.04	<.0001
grp_23 2	1	0.1879	0.0323	33.77	<.0001	0.7019	0.0882	63.29	<.0001	0.4208	0.0782	28.93	<.0001
grp_23 5	1	-0.084	0.0224	14.08	0.0002	0.0742	0.0772	0.92	0.3365	0.3396	0.0592	32.93	<.0001
grp_23 8	1	0.0235	0.0278	0.72	0.3977	0.0375	0.0912	0.17	0.681	0.1571	0.0713	4.86	0.0275
grp_23 18	1	-0.021	0.0206	1.04	0.3076	0.1507	0.0779	3.75	0.0528	-0.1821	0.068	7.17	0.0074
grp_23 20	1	0.0045	0.034	0.02	0.8946	0.7864	0.0914	74.04	<.0001	-0.0883	0.1063	0.69	0.4061
grp_23 99	0	0	0	.	.	0	0	.	.	0	0	.	.
reg_23 1	1	-0.0306	0.0213	2.07	0.15	0.4785	0.0779	37.76	<.0001	-0.4186	0.0442	89.6	<.0001
reg_23 5	1	0.1485	0.0212	48.98	<.0001	0.5187	0.0789	43.17	<.0001	-1.7031	0.0675	637.34	<.0001
reg_23 9	0	0	0	.	.	0	0	.	.	0	0	.	.
id_23 1	1	0.1623	0.0235	47.61	<.0001	-0.1907	0.0876	4.75	0.0294	-0.2937	0.072	16.64	<.0001
id_23 3	1	-0.0696	0.0313	4.95	0.0261	0.0606	0.1059	0.33	0.567	0.0437	0.0867	0.25	0.6148
id_23 4	1	-0.108	0.0335	10.38	0.0013	0.2975	0.1053	7.98	0.0047	0.1574	0.0877	3.22	0.0728
id_23 5	1	-0.1161	0.035	11.02	0.0009	0.3763	0.1069	12.39	0.0004	0.0648	0.0916	0.5	0.4792
id_23 6	1	-0.2504	0.0396	39.88	<.0001	0.4235	0.1118	14.34	0.0002	0.3334	0.0897	13.8	0.0002
id_23 7	1	-0.3545	0.0335	111.93	<.0001	0.5248	0.0975	28.96	<.0001	0.3308	0.0788	17.61	<.0001
id_23 99	0	0	0	.	.	0	0	.	.	0	0	.	.
Scale	0	1	0			1	0			1	0		

The scale parameter was held fixed.

Modelos que estimam a severidade para os agrupamentos obtidos através do algoritmo de lucros

The GENMOD Procedure

Model Information

Data Set	WORK.MODELO_COMPLETO	
Distribution	Gamma	
Link Function	Log	
Dependent Variable	Severidade	
Scale Weight Variable	Nº de Sinistros	
Observations Used	458	
Missing Values	66	

Class Level Information

Class	Levels	Values
grp_14	10	2 3 5 8 10 12 14 18 20 99
reg_14	6	1 2 3 5 6 9
id_14	9	1 3 4 5 6 7 8 9 99

Criteria For Assessing Goodness Of Fit

		Perda Parcial			Perda Total			Roubo/Furto		
Criterion		DF	Value	Value/DF	DF	Value	Value/DF	DF	Value	Value/DF
Deviance		435	500.8984	1.1515	343	27.3426	0.0797	308	28.9978	0.0941
Scaled	Deviance	435	472.7077	1.0867	343	368.1529	1.0733	308	333.1384	1.0816
Pearson	Chi-Square	435	503.4692	1.1574	343	29.7771	0.0868	308	31.7931	0.1032
Scaled	Pearson	435	475.1338	1.0923	343	400.9313	1.1689	308	365.2523	1.1859
Log	Likelihood		847.6852			138.1798			137.6255	

Algorithm converged.

Analysis Of Parameter Estimates

			Perda Parcial				Perda Total				Roubo/Furto			
Parameter	DF	Estimate	Standard Error	Chi-Square	P > ChiSq	Estimate	Standard Error	Chi-Square	P > ChiSq	Estimate	Standard Error	Chi-Square	P > ChiSq
Intercept	0	1	-2.2297	0.0288	5980.71	<.0001	0.0204	0.0287	0.51	0.4773	-0.0217	0.0211	1.06	0.3044
grp_14	2	1	0.1892	0.0414	20.91	<.0001	-0.0178	0.0282	0.4	0.527	-0.0727	0.0261	7.79	0.0053
grp_14	3	1	-0.0348	0.0555	0.39	0.5306	-0.0218	0.0371	0.34	0.5571	0.0122	0.0312	0.15	0.6958
grp_14	5	1	0.1085	0.0244	19.82	<.0001	0.0789	0.0223	12.58	0.0004	0.0123	0.0184	0.45	0.5035
grp_14	8	1	0.0509	0.0318	2.57	0.109	-0.0384	0.0287	1.78	0.1816	0.0072	0.0254	0.08	0.7775
grp_14	10	1	0.0143	0.0428	0.11	0.7386	-0.0156	0.031	0.25	0.6142	-0.0386	0.0266	2.1	0.1469
grp_14	12	1	-0.116	0.0601	3.72	0.0538	-0.0678	0.0384	3.11	0.0778	-0.0842	0.0549	2.35	0.1249
grp_14	14	1	-0.1692	0.0287	34.66	<.0001	-0.0195	0.0286	0.47	0.4941	-0.04	0.0283	2	0.1575
grp_14	18	1	0.0959	0.0224	18.38	<.0001	0.0573	0.0224	6.54	0.0106	0.0909	0.0206	19.47	<.0001
grp_14	20	1	0.0251	0.0442	0.32	0.5692	-0.056	0.029	3.73	0.0534	0.0102	0.0365	0.08	0.7803
grp_14	99	0	0	0.	.	.	0	0.	.	.	0	0.	.	.
reg_14	1	1	0.0417	0.0228	3.34	0.0677	0.0371	0.0218	2.88	0.0895	0.0544	0.0135	16.19	<.0001
reg_14	2	1	0.1153	0.0353	10.68	0.0011	0.1146	0.0315	13.25	0.0003	0.0582	0.0272	4.57	0.0325
reg_14	3	1	0.0145	0.0243	0.36	0.5511	0.0237	0.0239	0.98	0.3214	0.0986	0.0265	13.85	0.0002
reg_14	5	1	0.0876	0.0256	11.74	0.0006	0.04	0.0246	2.65	0.1035	0.1054	0.0252	17.54	<.0001
reg_14	6	1	0.1179	0.0747	2.49	0.1143	0.0303	0.0463	0.43	0.5129	0.0506	0.1123	0.2	0.6525
reg_14	9	0	0	0.	.	.	0	0.	.	.	0	0.	.	.
id_14	1	1	-0.2077	0.0243	72.76	<.0001	0.0183	0.024	0.58	0.4464	-0.0233	0.0212	1.21	0.2712
id_14	3	1	0.0938	0.0323	8.44	0.0037	-0.0638	0.029	4.82	0.0281	0.0313	0.0257	1.48	0.2232
id_14	4	1	0.2054	0.0347	35.11	<.0001	-0.0005	0.0289	0	0.9864	0.0163	0.0262	0.39	0.533
id_14	5	1	0.2113	0.0363	33.96	<.0001	0.0227	0.0293	0.6	0.4392	0.0324	0.0272	1.42	0.2338
id_14	6	1	0.381	0.0417	83.44	<.0001	0.0044	0.0309	0.02	0.8876	0.0356	0.0269	1.76	0.1845
id_14	7	1	0.4298	0.0427	101.12	<.0001	0.0094	0.03	0.1	0.755	0.0333	0.0278	1.43	0.2319
id_14	8	1	0.4416	0.0597	54.75	<.0001	-0.0244	0.0396	0.38	0.5381	-0.0059	0.0341	0.03	0.8633
id_14	9	1	0.5009	0.0545	84.33	<.0001	0.0381	0.0359	1.13	0.2886	0.0391	0.0299	1.72	0.1901
id_14	99	0	0	0.	.	.	0	0.	.	.	0	0.	.	.
Scale		1	0.9437	0.0605			13.4644	0.9895			11.4884	0.8873		

The scale parameter was estimated by maximum likelihood.

Modelo que estimam o número de sinistros para os agrupamentos obtidos através do algoritmo de lucros

The GENMOD Procedure

Model Information

Data	Set	WORK.MODELO_COMPLETO
Distribution		Poisson
Link	Function	Log
Dependent	Variable	Nº de Sinistros
Offset	Variable	Exposição
Observation	Used	458
Missing	Values	66

Class Level Information

Class	Levels	Values									
grp_14	10	2	3	5	8	10	12	14	18	20	99
reg_14	6	1	2	3	5	6	9				
id_14	9	1	3	4	5	6	7	8	9	99	

Criteria For Assessing Goodness Of Fit

		Perda Parcial			Perda Total			Roubo/Furto		
Criterion		DF	Value	Value/DF	DF	Value	Value/DF	DF	Value	Value/DF
Deviance		435	565.4078	1.2998	343	311.0273	0.9068	308	367.2269	1.1923
Scaled	Deviance	435	565.4078	1.2998	343	311.0273	0.9068	308	367.2269	1.1923
Pearson	Chi-Square	435	684.9983	1.5747	343	369.7355	1.0779	308	429.3597	1.394
Scaled	Pearson	435	684.9983	1.5747	343	369.7355	1.0779	308	429.3597	1.394
Log	Likelihood		67093.328			1592.8316			4060.3244	

Algorithm converged.

Analysis Of Parameter Estimates

			Perda Parcial				Perda Total				Roubo/Furto			
Parameter	DF		Estimate	Standard Error	Chi-Square	P > ChiSq	Estimate	Standard Error	Chi-Square	P > ChiSq	Estimate	Standard Error	Chi-Square	P > ChiSq
Intercept		1	-2.5163	0.0282	7982.55	<.0001	-5.511	0.1056	2723.03	<.0001	-3.9445	0.0721	2989.73	<.0001
grp_14	2	1	0.1332	0.0402	10.97	0.0009	0.5901	0.1059	31.04	<.0001	0.5144	0.0873	34.68	<.0001
grp_14	3	1	-0.0624	0.0539	1.34	0.247	-0.0521	0.1425	0.13	0.7146	0.0596	0.1068	0.31	0.577
grp_14	5	1	-0.0888	0.0238	13.95	0.0002	0.0616	0.083	0.55	0.4575	0.2318	0.0621	13.91	0.0002
grp_14	8	1	0.0962	0.0306	9.87	0.0017	0.2039	0.1052	3.76	0.0525	-0.0185	0.0852	0.05	0.8283
grp_14	10	1	-0.0329	0.0419	0.62	0.4322	0.0957	0.1169	0.67	0.4132	0.142	0.0899	2.49	0.1143
grp_14	12	1	-0.1661	0.0582	8.15	0.0043	0.9227	0.1406	43.06	<.0001	0.1652	0.1849	0.8	0.3717
grp_14	14	1	0.0182	0.0279	0.43	0.514	0.2157	0.1048	4.23	0.0397	-0.1655	0.0955	3	0.083
grp_14	18	1	-0.0278	0.0216	1.65	0.1985	0.1324	0.0815	2.64	0.1042	-0.2702	0.0699	14.95	0.0001
grp_14	20	1	0.15	0.0424	12.5	0.0004	0.9557	0.1059	81.52	<.0001	0.2466	0.1218	4.1	0.0428
grp_14	99	0	0	0	.	.	0	0	.	.	0	0	.	.
reg_14	1	1	-0.0249	0.0221	1.27	0.2599	0.5385	0.0795	45.92	<.0001	-0.3046	0.0456	44.54	<.0001
reg_14	2	1	-0.1267	0.0342	13.72	0.0002	0.3751	0.1149	10.66	0.0011	-0.8596	0.0919	87.58	<.0001
reg_14	3	1	0.3056	0.0235	168.51	<.0001	0.5435	0.0876	38.49	<.0001	-1.5635	0.0896	304.22	<.0001
reg_14	5	1	0.0064	0.0248	0.07	0.7949	0.2682	0.0899	8.91	0.0028	-1.5863	0.0847	350.8	<.0001
reg_14	6	1	0.0359	0.0725	0.25	0.6204	1.5791	0.1701	86.19	<.0001	0.342	0.3812	0.81	0.3696
reg_14	9	0	0	0	.	.	0	0	.	.	0	0	.	.
id_14	1	1	0.1635	0.0236	48.1	<.0001	-0.2566	0.0878	8.54	0.0035	-0.3069	0.0723	18.03	<.0001
id_14	3	1	-0.0641	0.0313	4.18	0.0408	0.0306	0.1062	0.08	0.7731	0.0651	0.087	0.56	0.4541
id_14	4	1	-0.1002	0.0336	8.91	0.0028	0.2602	0.106	6.03	0.0141	0.2026	0.0881	5.29	0.0214
id_14	5	1	-0.1014	0.0351	8.33	0.0039	0.3881	0.1076	13.01	0.0003	0.1069	0.092	1.35	0.2453
id_14	6	1	-0.2256	0.0403	31.36	<.0001	0.4444	0.114	15.2	<.0001	0.371	0.0912	16.56	<.0001
id_14	7	1	-0.148	0.0416	12.65	0.0004	0.7252	0.1126	41.47	<.0001	0.3685	0.0954	14.94	0.0001
id_14	8	1	-0.2893	0.058	24.88	<.0001	0.7049	0.147	23.01	<.0001	0.4009	0.1165	11.84	0.0006
id_14	9	1	-0.523	0.0529	97.57	<.0001	0.3563	0.1381	6.66	0.0099	0.4266	0.1032	17.09	<.0001
id_14	99	0	0	0	.	.	0	0	.	.	0	0	.	.
Scale		0	1	0			1	0			1	0		

The scale parameter was held fixed.

Modelos que estimam a severidade para os agrupamentos obtidos através do algoritmo de exposição

The GENMOD Procedure

Model Information

Data Set		WORK.MODELO_COMPLETO
Distribution		Gamma
Link Function		Log
Dependent Variable		Severidade
Scale Weight Variable		Nº de Sinistros
Observations	Used	471
Missing Values		55

Class Level Information

Class	Levels	Values								
grp_14	9	2	5	8	10	11	12	18	20	99
reg_14	6	1	2	3	5	7	9			
id_14	10	0	1	3	4	5	6	7	8	10	99

Criteria For Assessing Goodness Of Fit

Criterion	DF	Value	Value/DF	DF	Value	Value/DF	DF	Value	Value/DF
Deviance	448	595.417	1.3291	334	32.9734	0.0987	291	35.4389	0.1218
Scaled Deviance	448	488.4924	1.0904	334	359.457	1.0762	291	316.5287	1.0877
Pearson Chi-Square	448	565.1449	1.2615	334	34.791	0.1042	291	37.5061	0.1289
Scaled Pearson	448	463.6565	1.0349	334	379.2716	1.1355	291	334.9928	1.1512
Log Likelihood		880.9032			107.4328			101.7361	

Algorithm converged.

Analysis Of Parameter Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	P > ChiSq	Estimate	Standard Error	Chi-Square	P > ChiSq	Estimate	Standard Error	Chi-Square	P > ChiSq
Intercept	0	1	-2.2553	0.0307	5399.92	<.0001	0.0441	0.0317	1.93	0.1645	-0.052	0.024	4.7	0.0301
grp_14	2	1	0.1913	0.0438	19.06	<.0001	0.0039	0.031	0.02	0.8992	-0.0451	0.0294	2.35	0.1249
grp_14	5	1	0.1212	0.0266	20.71	<.0001	0.1	0.0251	15.82	<.0001	0.032	0.0212	2.28	0.1311
grp_14	8	1	-0.0125	0.0268	0.22	0.6411	-0.0146	0.0251	0.34	0.5617	-0.0009	0.0237	0	0.9703
grp_14	10	1	0.0346	0.0394	0.77	0.3799	0.0006	0.0315	0	0.9857	-0.0212	0.0276	0.59	0.4417
grp_14	11	1	-0.1341	0.1182	1.29	0.2564	-0.0205	0.0657	0.1	0.7554	-0.0701	0.1378	0.26	0.6108
grp_14	12	1	-0.0121	0.0398	0.09	0.7614	-0.0863	0.0301	8.25	0.0041	-0.0669	0.0375	3.17	0.0749
grp_14	18	1	0.1448	0.0236	37.51	<.0001	0.0799	0.0247	10.45	0.0012	0.1123	0.0234	22.96	<.0001
grp_14	20	1	0.0763	0.0744	1.05	0.3051	0.0597	0.051	1.37	0.242	0.0645	0.0706	0.84	0.3607
grp_14	99	0	0	0 .		.	0	0 .		.	0	0 .		.
reg_14	1	1	0.0445	0.0245	3.3	0.0691	0.0299	0.0242	1.52	0.2172	0.0718	0.0153	21.94	<.0001
reg_14	2	1	0.1243	0.0378	10.8	0.001	0.0807	0.035	5.31	0.0212	0.076	0.0309	6.06	0.0138
reg_14	3	1	0.0073	0.0269	0.07	0.7858	0.0024	0.0274	0.01	0.9299	0.0829	0.0319	6.78	0.0092
reg_14	5	1	0.0799	0.0271	8.67	0.0032	0.0105	0.0268	0.16	0.6938	0.1126	0.0281	16.11	<.0001
reg_14	7	1	0.0171	0.0467	0.13	0.7147	0.0562	0.0444	1.6	0.2056	0.2615	0.078	11.25	0.0008
reg_14	9	0	0	0 .		.	0	0 .		.	0	0 .		.
id_14	0	1	-0.3187	0.03	113.23	<.0001	-0.0444	0.0316	1.97	0.1599	-0.0375	0.0304	1.53	0.2167
id_14	1	1	-0.1631	0.028	33.96	<.0001	-0.0023	0.0294	0.01	0.937	-0.0236	0.026	0.82	0.3643
id_14	3	1	0.0918	0.0346	7.04	0.008	-0.0675	0.0321	4.41	0.0356	0.0439	0.0291	2.27	0.1318
id_14	4	1	0.227	0.0371	37.37	<.0001	-0.0471	0.032	2.17	0.1403	0.0301	0.0297	1.03	0.3105
id_14	5	1	0.2191	0.0387	32.06	<.0001	-0.037	0.0325	1.29	0.2552	0.0518	0.0309	2.82	0.0931
id_14	6	1	0.3977	0.0441	81.22	<.0001	-0.0119	0.0341	0.12	0.7269	0.0435	0.0304	2.04	0.1532
id_14	7	1	0.4416	0.0451	95.87	<.0001	-0.0245	0.033	0.55	0.4581	0.0292	0.0313	0.87	0.3511
id_14	8	1	0.4727	0.0528	80.06	<.0001	-0.0179	0.0384	0.22	0.6413	0.0477	0.0337	2	0.157
id_14	10	1	0.4887	0.0638	58.71	<.0001	0.0225	0.0438	0.26	0.6069	0.0598	0.0356	2.83	0.0928
id_14	99	0	0	0 .		.	0	0 .		.	0	0 .		.
Scale	0	1	0.8204	0.0517			10.9014	0.8104			8.9317	0.7072		

The scale parameter was estimated by maximum likelihood.

Modelos que estimam o número de sinistros para os agrupamentos obtidos através do algoritmo de exposição

The GENMOD Procedure

Model Information

Data	Set	WORK.MODELO_COMPLETO
Distribution	Poisson	
Link	Function	Log
Dependent	Variable	Nº de Sinistros
Offset	Variable	Exposição
Observation	Used	314
Missing	Values	212

Class Level Information

Class	Levels	Values									
grp_14	9	2	5	8	10	11	12	18	20	99	
reg_14	6	1	2	3	5	7	9				
id_14	10	0	1	3	4	5	6	7	8	10	99

Criteria For Assessing Goodness Of Fit

Criterion	DF	Value	Value/DF	DF	Value	Value/DF	DF	Value	Value/DF
Deviance	291	330.1727	1.1346	334	316.1412	0.9465	448	532.0336	1.1876
Scaled Deviance	291	330.1727	1.1346	334	316.1412	0.9465	448	532.0336	1.1876
Pearson Chi-Square	291	342.7574	1.1779	334	388.5427	1.1633	448	549.627	1.2268
Scaled Pearson	291	342.7574	1.1779	334	388.5427	1.1633	448	549.627	1.2268
Log Likelihood		3989.2354			1464.6029			62634.266	

Algorithm converged.

Analysis Of Parameter Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	P > ChiSq	Estimate	Standard Error	Chi-Square	P > ChiSq	Estimate	Standard Error	Chi-Square	P > ChiSq
Intercept	0	1	-4.0075	0.0723	3070.93	<.0001	-5.5374	0.105	2781.68	<.0001	-2.5162	0.0279	8111.97	<.0001
grp_14	2	1	0.5953	0.087	46.85	<.0001	0.721	0.1051	47.04	<.0001	0.1433	0.0398	12.96	0.0003
grp_14	5	1	0.3307	0.0631	27.47	<.0001	0.1181	0.0842	1.97	0.1609	-0.0921	0.0242	14.44	0.0001
grp_14	8	1	0.0671	0.0692	0.94	0.3323	0.2086	0.0843	6.12	0.0133	0.086	0.0241	12.7	0.0004
grp_14	10	1	0.1952	0.0828	5.56	0.0184	0.1894	0.1071	3.13	0.0769	-0.0173	0.0362	0.23	0.6317
grp_14	11	1	0.6031	0.4109	2.15	0.1422	1.8811	0.2158	75.97	<.0001	-0.1828	0.1069	2.92	0.0873
grp_14	12	1	0.1246	0.1101	1.28	0.2577	0.8545	0.0987	74.9	<.0001	0.0433	0.0359	1.45	0.2279
grp_14	18	1	-0.1807	0.0698	6.7	0.0096	0.1764	0.0811	4.73	0.0296	-0.0229	0.0213	1.17	0.2803
grp_14	20	1	0.7861	0.2112	13.86	0.0002	1.2893	0.1703	57.28	<.0001	0.3703	0.0671	30.44	<.0001
grp_14	99	0	0	0 .		.	0	0 .		.	0	0 .		.
reg_14	1	1	-0.3027	0.0456	44.06	<.0001	0.5529	0.0794	48.53	<.0001	-0.0272	0.0221	1.51	0.2194
reg_14	2	1	-0.8842	0.0918	92.75	<.0001	0.3533	0.1149	9.45	0.0021	-0.134	0.0342	15.35	<.0001
reg_14	3	1	-1.5488	0.0951	265.33	<.0001	0.5356	0.09	35.39	<.0001	0.2682	0.0244	121.23	<.0001
reg_14	5	1	-1.6455	0.0832	391.08	<.0001	0.3248	0.0882	13.56	0.0002	-0.0003	0.0246	0	0.9897
reg_14	7	1	-0.6189	0.233	7.06	0.0079	1.2535	0.1464	73.3	<.0001	0.4879	0.0423	132.98	<.0001
reg_14	9	0	0	0 .		.	0	0 .		.	0	0 .		.
id_14	0	1	-0.4808	0.0913	27.76	<.0001	-0.1878	0.1043	3.24	0.0719	0.1887	0.027	48.9	<.0001
id_14	1	1	-0.1829	0.0778	5.53	0.0187	-0.2934	0.0966	9.23	0.0024	0.1384	0.0253	29.83	<.0001
id_14	3	1	0.0661	0.0868	0.58	0.446	0.0304	0.106	0.08	0.7741	-0.0698	0.0313	4.98	0.0256
id_14	4	1	0.1939	0.0879	4.87	0.0273	0.2503	0.1057	5.61	0.0179	-0.1095	0.0335	10.68	0.0011
id_14	5	1	0.0963	0.0917	1.1	0.2937	0.3367	0.1073	9.84	0.0017	-0.1106	0.035	9.99	0.0016
id_14	6	1	0.3637	0.0904	16.2	<.0001	0.3389	0.1135	8.91	0.0028	-0.2389	0.0399	35.93	<.0001
id_14	7	1	0.3432	0.0941	13.3	0.0003	0.5929	0.1115	28.28	<.0001	-0.1727	0.0409	17.81	<.0001
id_14	8	1	0.3366	0.1002	11.29	0.0008	0.3226	0.1282	6.34	0.0118	-0.3771	0.0481	61.54	<.0001
id_14	10	1	0.4433	0.1063	17.4	<.0001	0.2311	0.1461	2.5	0.1137	-0.6293	0.0578	118.71	<.0001
id_14	99	0	0	0 .		.	0	0 .		.	0	0 .		.
Scale			1	0			1	0			1	0		

The scale parameter was held fixed.