

A Appendix

Figure A.1 shows an example of dependence among three of the selected variables. Figure A.1 depicts the vehicle types in relation to their values and ages. It is possible to notice that *vehicle value* and *vehicle body* are dependent (clearly, the type of vehicle influences their price), while *vehicle value* and *vehicle age* present a negative dependence (older vehicles have in general lower value, as indicated by the yellow dots in the bottom of the graph). For what concerns the other risk factors, we observed weak forms of dependence (not shown here).

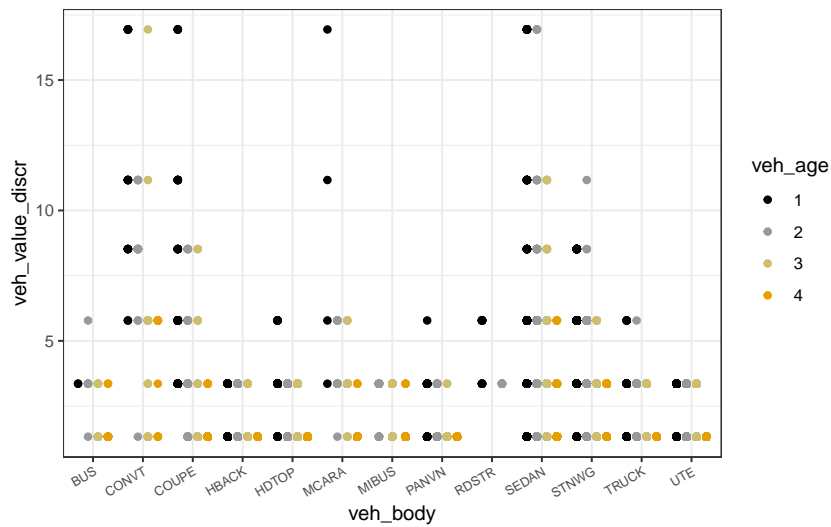


Figure A.1: Discretised vehicle value (in tranches of \$10000) with respect to its type and age. Different colours of the bullets represent the various ages, going from the youngest (1) to the oldest (4).

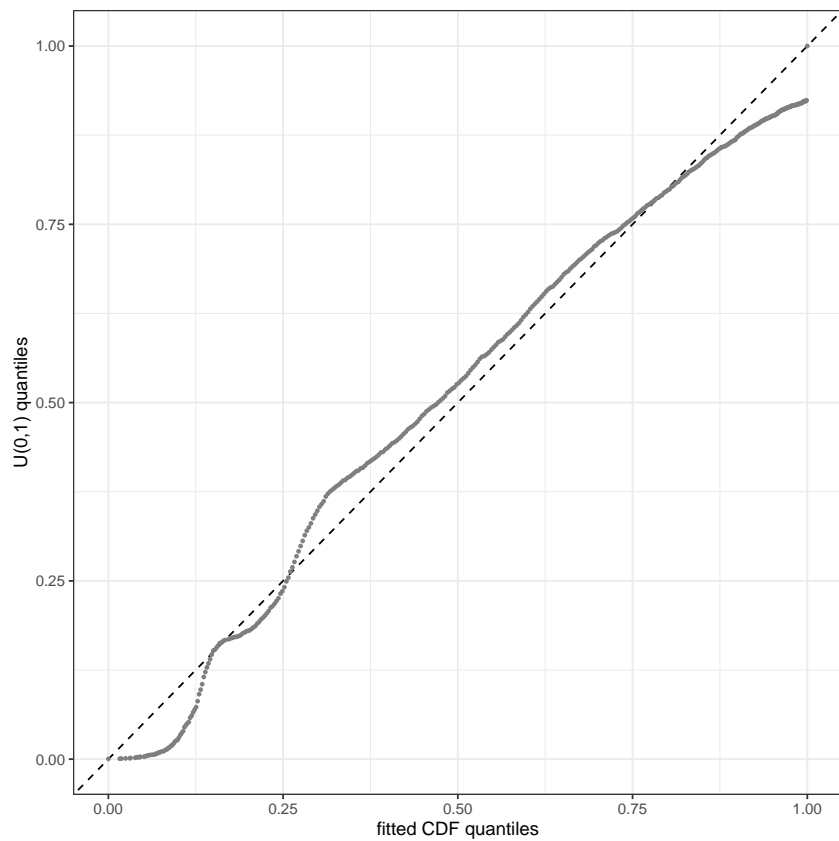


Figure A.2: QQ plot of the quantiles of a standard Uniform distribution and the predicted quantiles of the parametric quantile regression model. This comparison has been proposed by Frumento and Bottai (2016). The alignment is acceptable.

Table A.1: Parameters estimates obtained with the Logit GLM.

	Estimate	Std. Error	z value	p-value
(Intercept)	-0.194	0.457	-0.42	6.71E-01
veh_age2	0.033	0.052	0.63	5.28E-01
veh_age3	-0.096	0.053	-1.82	6.86E-02
veh_age4	-0.197	0.057	-3.45	5.53E-04
veh_value	0.009	0.019	0.47	6.41E-01
veh_bodyCONVT	-1.858	0.769	-2.42	1.56E-02
veh_bodyCOUPE	-0.746	0.471	-1.58	1.13E-01
veh_bodyHBACK	-1.273	0.449	-2.83	4.62E-03
veh_bodyHDTOP	-1.060	0.458	-2.31	2.07E-02
veh_bodyMCARA	-0.524	0.553	-0.95	3.43E-01
veh_bodyMIBUS	-1.240	0.479	-2.59	9.59E-03
veh_bodyPANVN	-1.166	0.470	-2.48	1.30E-02
veh_bodyRDSTR	-1.099	0.917	-1.20	2.30E-01
veh_bodySEDAN	-1.234	0.449	-2.75	5.99E-03
veh_bodySTNWG	-1.165	0.449	-2.60	9.45E-03
veh_bodyTRUCK	-1.239	0.459	-2.70	6.91E-03
veh_bodyUTE	-1.410	0.453	-3.11	1.84E-03
agecat2	-0.215	0.064	-3.34	8.25E-04
agecat3	-0.279	0.063	-4.45	8.54E-06
agecat4	-0.315	0.062	-5.04	4.74E-07
agecat5	-0.543	0.069	-7.89	3.09E-15
agecat6	-0.530	0.078	-6.77	1.26E-11
areaB	0.091	0.050	1.83	6.66E-02
areaC	0.036	0.045	0.80	4.22E-01
areaD	-0.099	0.061	-1.63	1.03E-01
areaE	-0.026	0.067	-0.38	7.03E-01
areaF	0.070	0.078	0.90	3.70E-01
genderM	-0.023	0.035	-0.66	5.11E-01

Table A.2: Parameters estimates obtained with the QR.

	Estimate	Std. Error	<i>t</i> value	p-value
(Intercept)	7.618	0.624	12.211	0.000
veh_age2	0.210	0.083	2.535	0.011
veh_age3	0.277	0.085	3.269	0.001
veh_age4	0.394	0.092	4.269	0.000
veh_value	0.002	0.033	0.051	0.960
veh_bodyCONVT	1.220	1.215	1.004	0.315
veh_bodyCOUPE	0.657	0.646	1.017	0.309
veh_bodyHBACK	0.422	0.610	0.692	0.489
veh_bodyHDTOP	0.145	0.627	0.231	0.817
veh_bodyMCARA	-0.969	0.778	-1.246	0.213
veh_bodyMIBUS	0.101	0.667	0.152	0.879
veh_bodyPANVN	0.020	0.649	0.031	0.975
veh_bodyRDSTR	-0.432	1.423	-0.303	0.762
veh_bodySEDAN	0.173	0.609	0.285	0.776
veh_bodySTNWG	0.178	0.609	0.293	0.770
veh_bodyTRUCK	0.261	0.628	0.416	0.677
veh_bodyUTE	0.314	0.616	0.510	0.610
agecat2	-0.338	0.102	-3.329	0.001
agecat3	-0.341	0.099	-3.445	0.001
agecat4	-0.405	0.099	-4.094	0.000
agecat5	-0.511	0.111	-4.621	0.000
agecat6	-0.465	0.126	-3.676	0.000
areaB	-0.080	0.081	-0.993	0.321
areaC	0.043	0.074	0.582	0.561
areaD	-0.036	0.100	-0.365	0.715
areaE	0.201	0.109	1.842	0.065
areaF	0.324	0.126	2.575	0.010
genderM	0.109	0.056	1.925	0.054

Table A.3: Parameters estimates obtained with the Gamma GLM .

	Estimate	Std. Error	<i>t</i> value	p-value
(Intercept)	7.166	0.589	12.16	1.60E-33
veh_age2	0.077	0.078	0.99	3.24E-01
veh_age3	0.097	0.080	1.21	2.27E-01
veh_age4	0.167	0.087	1.92	5.54E-02
veh_value	-0.000	0.031	-0.01	9.96E-01
veh_bodyCONVT	0.727	1.148	0.63	5.27E-01
veh_bodyCOUPE	0.749	0.610	1.23	2.19E-01
veh_bodyHBACK	0.522	0.576	0.91	3.64E-01
veh_bodyHDTOP	0.433	0.592	0.73	4.64E-01
veh_bodyMCARA	-0.671	0.734	-0.91	3.61E-01
veh_bodyMIBUS	0.741	0.630	1.18	2.40E-01
veh_bodyPANVN	0.505	0.613	0.82	4.10E-01
veh_bodyRDSTR	-0.514	1.344	-0.38	7.02E-01
veh_bodySEDAN	0.402	0.575	0.70	4.85E-01
veh_bodySTNWG	0.394	0.575	0.69	4.93E-01
veh_bodyTRUCK	0.596	0.593	1.01	3.15E-01
veh_bodyUTE	0.473	0.582	0.81	4.16E-01
agecat2	-0.176	0.096	-1.83	6.69E-02
agecat3	-0.277	0.093	-2.96	3.07E-03
agecat4	-0.261	0.093	-2.80	5.15E-03
agecat5	-0.381	0.104	-3.65	2.63E-04
agecat6	-0.298	0.119	-2.50	1.25E-02
areaB	-0.041	0.076	-0.54	5.89E-01
areaC	0.063	0.069	0.91	3.62E-01
areaD	-0.019	0.094	-0.20	8.39E-01
areaE	0.152	0.103	1.47	1.42E-01
areaF	0.398	0.119	3.35	8.09E-04
genderM	0.173	0.053	3.24	1.20E-03

Table A.4: Parameters estimates obtained with the Parametric QR.

	(Intercept)	Std. Error	slp1	Std. Error
(Intercept)	5.140	0.299	1.565	0.484
veh_age2	0.005	0.051	0.098	0.058
veh_age3	0.014	0.053	0.161	0.059
veh_age4	0.002	0.063	0.246	0.064
veh_value	0.029	0.023	-0.021	0.018
veh_bodyCONVT	-0.946	0.592	1.090	0.666
veh_bodyCOUPE	-0.393	0.339	0.685	0.501
veh_bodyHBACK	-0.495	0.288	0.584	0.472
veh_bodyHDTOP	-0.353	0.294	0.275	0.480
veh_bodyMCARA	0.161	0.343	-0.803	0.588
veh_bodyMIBUS	0.198	0.366	0.082	0.522
veh_bodyPANVN	-0.236	0.336	0.301	0.567
veh_bodyRDSTR	-0.619	0.605	0.183	0.481
veh_bodySEDAN	-0.417	0.287	0.452	0.471
veh_bodySTNWG	-0.308	0.286	0.331	0.469
veh_bodyTRUCK	-0.229	0.291	0.347	0.488
veh_bodyUTE	-0.333	0.291	0.414	0.481
agecat2	0.023	0.068	-0.239	0.075
agecat3	0.058	0.067	-0.276	0.071
agecat4	0.079	0.067	-0.321	0.072
agecat5	0.101	0.072	-0.394	0.080
agecat6	0.189	0.084	-0.412	0.086
areaB	-0.040	0.051	0.016	0.057
areaC	-0.042	0.047	0.052	0.052
areaD	0.132	0.059	-0.095	0.066
areaE	0.141	0.067	-0.003	0.081
areaF	0.189	0.076	0.092	0.093
genderM	-0.012	0.035	0.088	0.040

Table A.5: Wald Test for $b(\theta)$.

	χ^2	df	p-value
(Intercept)	90112	28	<2e-16 ***
slp1	10523	28	<2e-16 ***