

Log Model-response and distance logged, month and toll interactions-- Best Model

The GLIMMIX Procedure

Model Information	
Data Set	WORK.CAB
Response Variable	log_tip
Response Distribution	Gaussian
Link Function	Identity
Variance Function	Default
Variance Matrix	Not blocked
Estimation Technique	Restricted Maximum Likelihood
Degrees of Freedom Method	Kenward-Roger
Fixed Effects SE Adjustment	Kenward-Roger

Class Level Information		
Class	Levels	Values
month	12	1 2 3 4 5 6 7 8 9 10 11 12
pickup_time	24	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
dropoff_time	24	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
toll_ind	2	0 1
pickup_location_id	50	P1 P10 P11 P12 P13 P14 P15 P16 P17 P18 P19 P2 P20 P21 P22 P23 P24 P25 P26 P27 P28 P29 P3 P30 P31 P32 P33 P34 P35 P36 P37 P38 P39 P4 P40 P41 P42 P43 P44 P45 P46 P47 P48 P49 P5 P50 P6 P7 P8 P9
dropoff_location_id	50	D1 D10 D11 D12 D13 D14 D15 D16 D17 D18 D19 D2 D20 D21 D22 D23 D24 D25 D26 D27 D28 D29 D3 D30 D31 D32 D33 D34 D35 D36 D37 D38 D39 D4 D40 D41 D42 D43 D44 D45 D46 D47 D48 D49 D5 D50 D6 D7 D8 D9
rate_code	3	1 2 5
passenger_count	6	1 2 3 4 5 6

Number of Observations Read	67193
Number of Observations Used	64850

Dimensions	
G-side Cov. Parameters	4
R-side Cov. Parameters	1
Columns in X	39
Columns in Z	148
Subjects (Blocks in V)	1
Max Obs per Subject	64850

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Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	4
Lower Boundaries	4
Upper Boundaries	0
Fixed Effects	Profiled
Residual Variance	Profiled
Starting From	Data

Iteration History					
Iteration	Restarts	Evaluations	Objective Function	Change	Max Gradient
0	0	4	70699.646251	.	4183.668
1	0	9	70664.965612	34.68063926	694.3969
2	0	5	70662.506613	2.45899906	378.8909
3	0	9	70660.660713	1.84589969	264.712
4	0	7	70660.246082	0.41463091	304.5161
5	0	2	70659.593384	0.65269839	390.9575
6	0	3	70659.473103	0.12028070	269.6078
7	0	2	70659.442621	0.03048173	470.6923
8	0	4	70659.365244	0.07737692	47.24947
9	0	3	70659.363562	0.00168227	10.26549
10	0	3	70659.36295	0.00061196	10.2969
11	0	2	70659.362393	0.00055728	3.039476

Convergence criterion (GCONV=1E-8) satisfied.

Fit Statistics	
-2 Res Log Likelihood	70659.36
AIC (smaller is better)	70669.36
AICC (smaller is better)	70669.36
BIC (smaller is better)	70678.92
CAIC (smaller is better)	70683.92
HQIC (smaller is better)	70673.00
Generalized Chi-Square	11168.39
Gener. Chi-Square / DF	0.17

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Covariance Parameter Estimates		
Cov Parm	Estimate	Standard Error
pickup_location_id	0.001953	0.000439
dropoff_location_id	0.008176	0.001754
pickup_time	0.000220	0.000270
dropoff_time	0.004434	0.001497
Residual	0.1723	0.000958

Solutions for Fixed Effects									
Effect	month	toll_ind	rate_code	passenger_count	Estimate	Standard Error	DF	t Value	Pr > t
Intercept					2.1484	0.09645	23391	22.27	<.0001
log_dist					0.2588	0.01972	64544	13.12	<.0001
passenger_count				1	0.01712	0.008697	64704	1.97	0.0490
passenger_count				2	0.02067	0.009602	64707	2.15	0.0313
passenger_count				3	0.008685	0.01191	64705	0.73	0.4660
passenger_count				4	0.001709	0.01514	64699	0.11	0.9101
passenger_count				5	-0.00111	0.01089	64699	-0.10	0.9185
passenger_count				6	0
month	1				-0.01757	0.01036	64695	-1.70	0.0899
month	2				-0.02712	0.01028	64678	-2.64	0.0083
month	3				-0.02525	0.01036	64694	-2.44	0.0148
month	4				-0.01138	0.01039	64677	-1.10	0.2735
month	5				-0.02196	0.01058	64675	-2.07	0.0380
month	6				-0.03529	0.01060	64685	-3.33	0.0009
month	7				-0.03601	0.01060	64690	-3.40	0.0007
month	8				-0.04178	0.01062	64685	-3.94	<.0001
month	9				-0.02568	0.01043	64677	-2.46	0.0139
month	10				-0.02595	0.01042	64684	-2.49	0.0127
month	11				-0.01089	0.01035	64679	-1.05	0.2925
month	12				0
toll_ind		0			-0.7765	0.04394	64062	-17.67	<.0001
toll_ind		1			0
rate_code			1		-1.0239	0.08348	64748	-12.27	<.0001
rate_code			2		-0.6313	0.08565	64367	-7.37	<.0001
rate_code			5		0
log_dist*month	1				-0.00751	0.009404	64692	-0.80	0.4246

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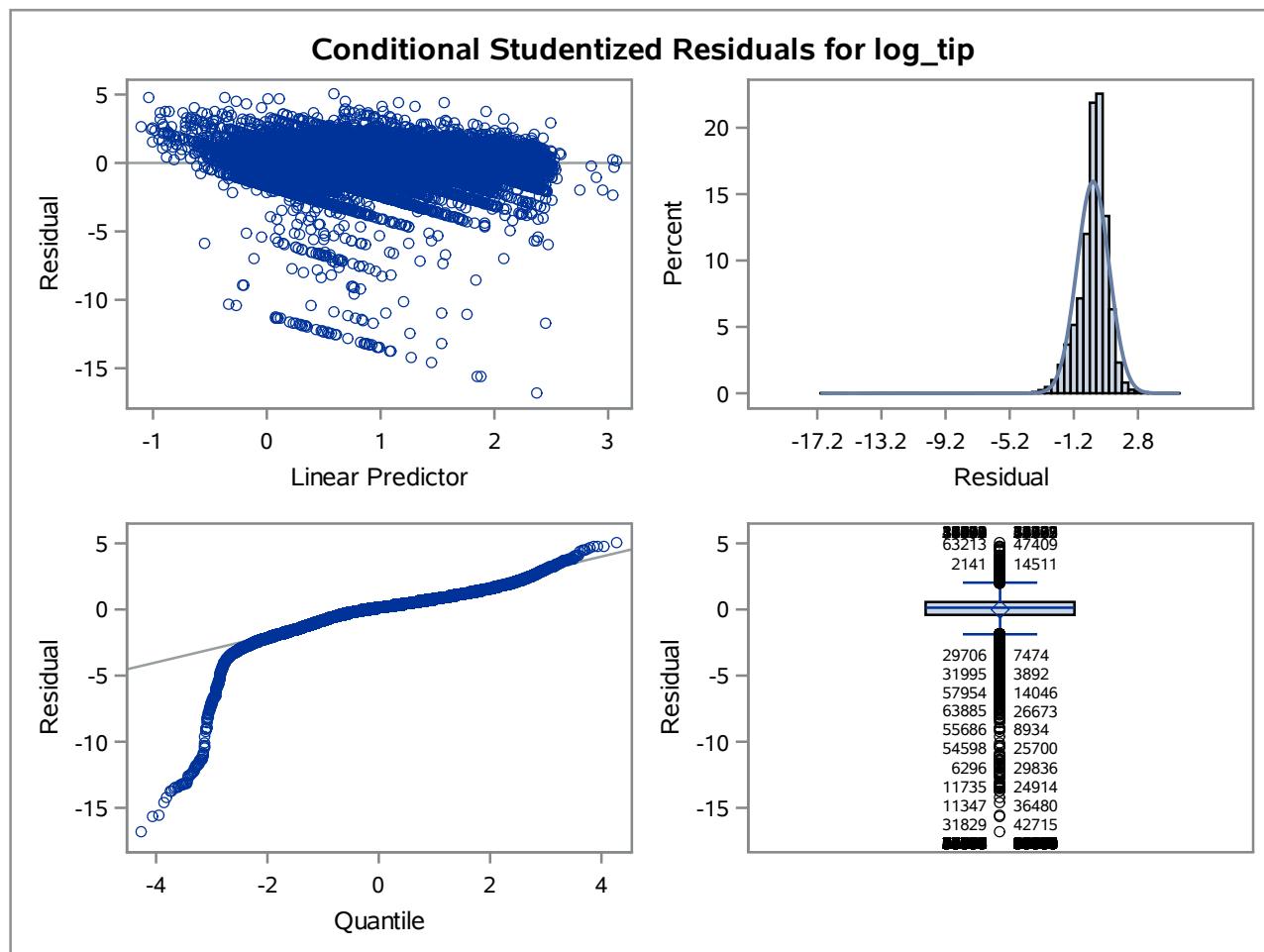
The GLIMMIX Procedure

Solutions for Fixed Effects									
Effect	month	toll_ind	rate_code	passenger_count	Estimate	Standard Error	DF	t Value	Pr > t
log_dist*month	2				-0.00231	0.009417	64699	-0.25	0.8058
log_dist*month	3				-0.00859	0.009330	64706	-0.92	0.3573
log_dist*month	4				-0.01674	0.009326	64707	-1.79	0.0727
log_dist*month	5				0.000755	0.009431	64699	0.08	0.9362
log_dist*month	6				0.01643	0.009415	64696	1.75	0.0810
log_dist*month	7				-0.00474	0.009481	64705	-0.50	0.6170
log_dist*month	8				0.009602	0.009486	64667	1.01	0.3114
log_dist*month	9				0.009905	0.009372	64692	1.06	0.2906
log_dist*month	10				0.006912	0.009309	64681	0.74	0.4578
log_dist*month	11				0.01187	0.009324	64704	1.27	0.2031
log_dist*month	12				0
log_dist*toll_ind		0			0.2346	0.01865	64629	12.58	<.0001
log_dist*toll_ind		1			0

Type III Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
log_dist	1	64101	1575.69	<.0001
passenger_count	5	64699	2.63	0.0222
month	11	64680	2.53	0.0035
toll_ind	1	64062	312.27	<.0001
rate_code	2	19431	202.77	<.0001
log_dist*month	11	64703	2.20	0.0120
log_dist*toll_ind	1	64629	158.30	<.0001

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Variance Matrix	Not blocked
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Degrees of Freedom Method	Kenward-Roger
Fixed Effects SE Adjustment	Kenward-Roger

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dropoff_location_id	50	D1 D10 D11 D12 D13 D14 D15 D16 D17 D18 D19 D2 D20 D21 D22 D23 D24 D25 D26 D27 D28 D29 D3 D30 D31 D32 D33 D34 D35 D36 D37 D38 D39 D4 D40 D41 D42 D43 D44 D45 D46 D47 D48 D49 D5 D50 D6 D7 D8 D9
rate_code	3	1 2 5
passenger_count	6	1 2 3 4 5 6

Number of Observations Read	67193
Number of Observations Used	64850

Dimensions	
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R-side Cov. Parameters	1
Columns in X	39
Columns in Z	100
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Max Obs per Subject	64850

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries	2
Upper Boundaries	0

The GLIMMIX Procedure

Optimization Information	
Fixed Effects	Profiled
Residual Variance	Profiled
Starting From	Data

Iteration History					
Iteration	Restarts	Evaluations	Objective Function	Change	Max Gradient
0	0	4	71705.245322	.	3355.399
1	0	9	71683.351559	21.89376272	721.8293
2	0	5	71680.416071	2.93548755	183.017
3	0	3	71680.342455	0.07361597	28.31855
4	0	4	71680.326926	0.01552917	24.94845
5	0	2	71680.32538	0.00154637	0.523386
6	0	3	71680.325378	0.00000175	0.0163

Convergence criterion (GCONV=1E-8) satisfied.

Fit Statistics	
-2 Res Log Likelihood	71680.33
AIC (smaller is better)	71686.33
AICC (smaller is better)	71686.33
BIC (smaller is better)	71692.06
CAIC (smaller is better)	71695.06
HQIC (smaller is better)	71688.51
Generalized Chi-Square	11365.50
Gener. Chi-Square / DF	0.18

Covariance Parameter Estimates		
Cov Parm	Estimate	Standard Error
pickup_location_id	0.002288	0.000509
dropoff_location_id	0.007070	0.001523
Residual	0.1753	0.000975

The GLIMMIX Procedure

Solutions for Fixed Effects									
Effect	month	toll_ind	rate_code	passenger_count	Estimate	Standard Error	DF	t Value	Pr > t
Intercept					2.1372	0.09615	647056	22.23	<.0001
log_dist					0.2578	0.01989	64589	12.97	<.0001
passenger_count				1	0.01624	0.008770	64727	1.85	0.0640
passenger_count				2	0.02169	0.009677	64728	2.24	0.0250
passenger_count				3	0.008644	0.01201	64726	0.72	0.4717
passenger_count				4	0.001900	0.01527	64729	0.12	0.9010
passenger_count				5	-0.00084	0.01098	64724	-0.08	0.9391
passenger_count				6	0
month	1				-0.01531	0.01045	64723	-1.46	0.1430
month	2				-0.02841	0.01037	64723	-2.74	0.0061
month	3				-0.02402	0.01045	64724	-2.30	0.0215
month	4				-0.01181	0.01048	64722	-1.13	0.2599
month	5				-0.02289	0.01067	64723	-2.14	0.0320
month	6				-0.03818	0.01069	64724	-3.57	0.0004
month	7				-0.03832	0.01069	64727	-3.58	0.0003
month	8				-0.04430	0.01071	64728	-4.14	<.0001
month	9				-0.02539	0.01052	64727	-2.41	0.0158
month	10				-0.02637	0.01051	64724	-2.51	0.0121
month	11				-0.01178	0.01044	64724	-1.13	0.2592
month	12				0
toll_ind	0				-0.7701	0.04431	64158	-17.38	<.0001
toll_ind	1				0
rate_code		1			-1.0007	0.08418	64785	-11.89	<.0001
rate_code		2			-0.6089	0.08637	64487	-7.05	<.0001
rate_code		5			0
log_dist*month	1				-0.00635	0.009485	64730	-0.67	0.5033
log_dist*month	2				-0.00056	0.009497	64743	-0.06	0.9529
log_dist*month	3				-0.00668	0.009409	64737	-0.71	0.4780
log_dist*month	4				-0.01472	0.009405	64743	-1.56	0.1177
log_dist*month	5				0.002077	0.009511	64727	0.22	0.8271
log_dist*month	6				0.01840	0.009495	64727	1.94	0.0526
log_dist*month	7				-0.00149	0.009561	64728	-0.16	0.8765
log_dist*month	8				0.01250	0.009567	64724	1.31	0.1912
log_dist*month	9				0.01094	0.009452	64732	1.16	0.2472
log_dist*month	10				0.008159	0.009389	64728	0.87	0.3848

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Solutions for Fixed Effects									
Effect	month	toll_ind	rate_code	passenger_count	Estimate	Standard Error	DF	t Value	Pr > t
log_dist*month	11				0.01278	0.009403	64739	1.36	0.1740
log_dist*month	12				0
log_dist*toll_ind		0			0.2276	0.01880	64639	12.11	<.0001
log_dist*toll_ind		1			0

Type III Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
log_dist	1	64182	1526.71	<.0001
passenger_count	5	64728	2.51	0.0277
month	11	64724	2.87	0.0009
toll_ind	1	64158	302.09	<.0001
rate_code	2	20920	195.45	<.0001
log_dist*month	11	64735	2.12	0.0157
log_dist*toll_ind	1	64639	146.54	<.0001

