Dataset Structure

The CONTENTS Procedure

Data Set Name	WORK.SWEDISH_INSURANCE	*Observations*	2182
Member Type	DATA	*Variables*	7
Engine	V9	*Indexes*	0
Created	06/14/2025 17:33:23	*Observation Length*	56
Last Modified	06/14/2025 17:33:23	*Deleted Observations*	0
Protection		*Compressed*	NO
Data Set Type		*Sorted*	NO
Label			
Data Representation	SOLARIS_X86_64, LINUX_X86_64, ALPHA_TRU64, LINUX_IA64		
Encoding	utf-8 Unicode (UTF-8)		

Engine/Host Dependent Information

Data Set Page Size	131072
Number of Data Set Pages	1
First Data Page	1
Max Obs per Page	2334
Obs in First Data Page	2182
Number of Data Set Repairs	0
Filename	/saswork/SAS_work29CC0000CBEB_odaws02-usw2-2.oda.sas.com/SAS_work8B100000CBEB_odaws02-usw2-2.oda.sas.com/swedish_insurance.sas7bdat
Release Created	9.0401M7
Host Created	Linux
Inode Number	1342177416
Access Permission	rw-r--r--
Owner Name	u64256136
File Size	256KB
File Size (bytes)	262144

Alphabetic List of Variables and Attributes

#	*Variable*	*Type*	*Len*	*Format*	*Informat*
3	Bonus	Num	8	BEST12.	BEST32.
6	Claims	Num	8	BEST12.	BEST32.
5	Insured	Num	8	BEST12.	BEST32.
1	Kilometres	Num	8	BEST12.	BEST32.
4	Make	Num	8	BEST12.	BEST32.
7	Payment	Num	8	BEST12.	BEST32.
2	Zone	Num	8	BEST12.	BEST32.

Sample of Swedish Motor Insurance Data

Obs	*Kilometres*	*Zone*	*Bonus*	*Make*	*Insured*	*Claims*	*Payment*
1	1	1	1	1	455.13	108	392491
2	1	1	1	2	69.17	19	46221
3	1	1	1	3	72.88	13	15694
4	1	1	1	4	1292.39	124	422201
5	1	1	1	5	191.01	40	119373
6	1	1	1	6	477.66	57	170913
7	1	1	1	7	105.58	23	56940
8	1	1	1	8	32.55	14	77487
9	1	1	1	9	9998.46	1704	6805992
10	1	1	2	1	314.58	45	214011

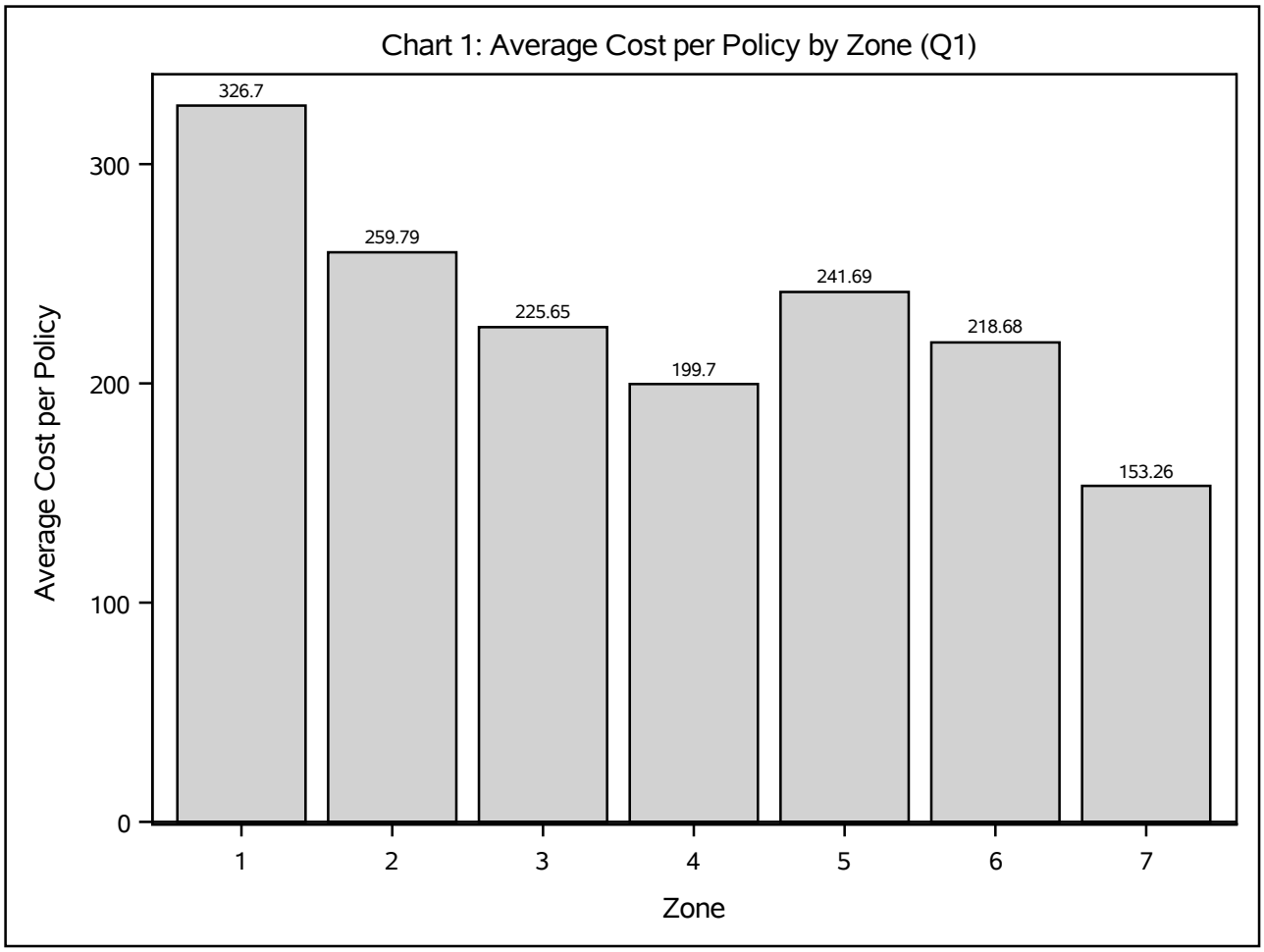


Chart 1: Average Cost per Policy by Zone (Q1)
Average Cost per Policy
0
100
200
300
326.7
259.79
225.65
199.7
241.69
218.68
153.26
1
2
3
4
5
6
7
Zone

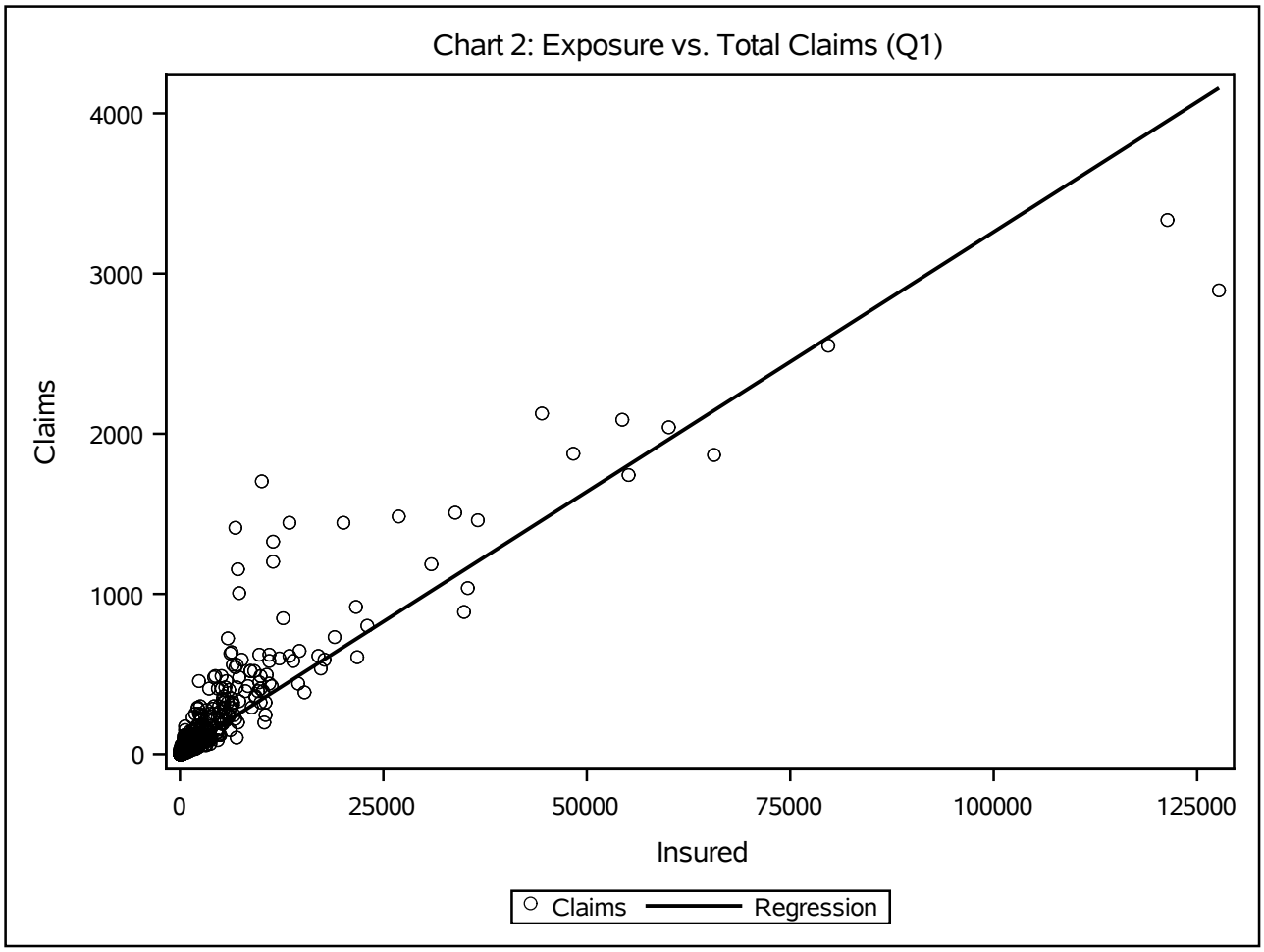


Chart 2: Exposure vs. Total Claims (Q1)
Claims
4000
3000
2000
1000
0
0
25000
50000
75000
100000
125000
Insured
Claims
Regression

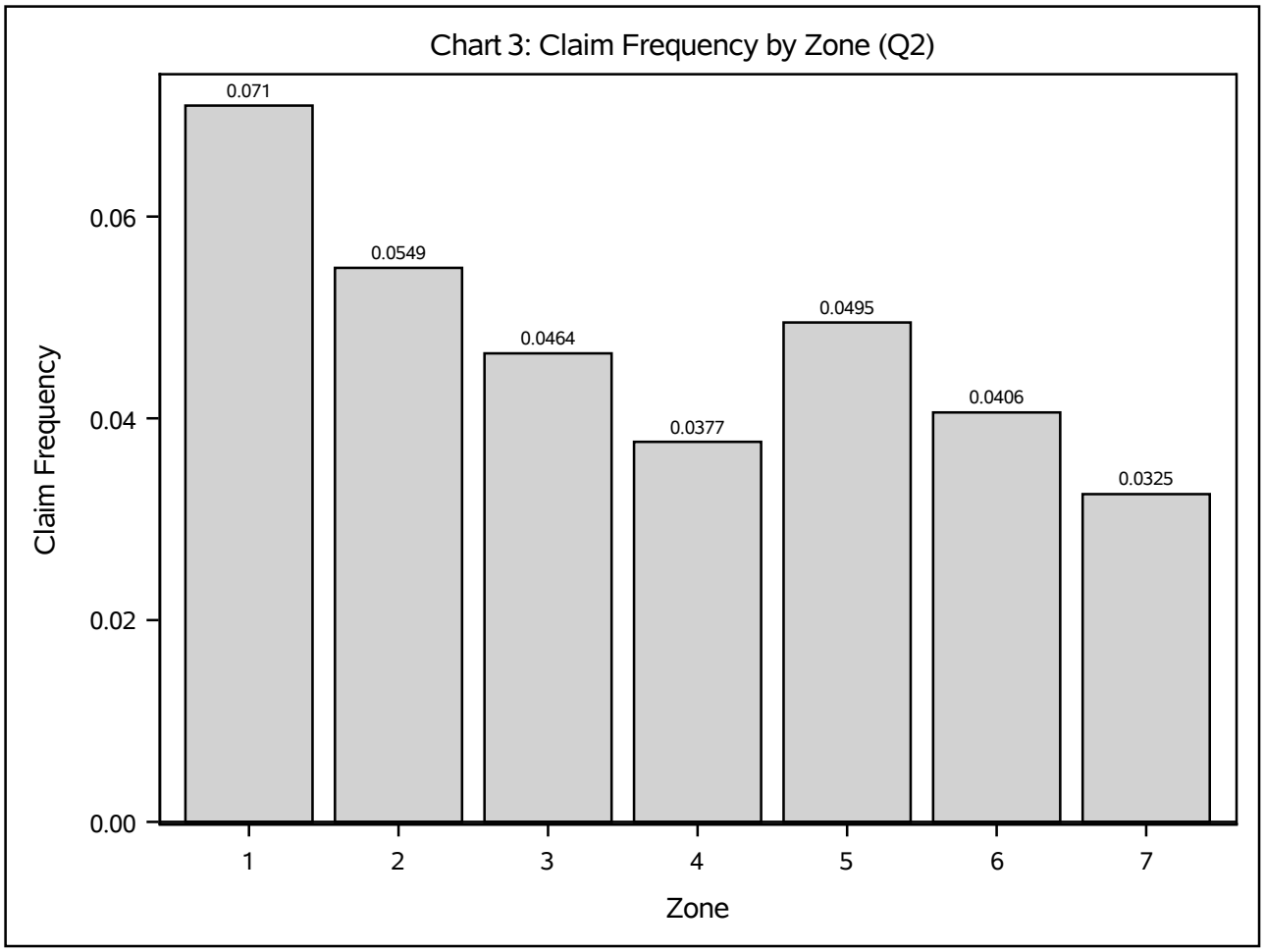


Chart 3: Claim Frequency by Zone (Q2)
Claim Frequency
0.00
0.02
0.04
0.06
0.071
0.0549
0.0464
0.0377
0.0495
0.0406
0.0325
1
2
3
4
5
6
7
Zone

Correlation: Frequency vs. Severity (Q2)

The CORR Procedure

2 Variables: Claim_Frequency Claim_Severity

Simple Statistics

Variable	*N*	*Mean*	*Std Dev*	*Sum*	*Minimum*	*Maximum*
Claim_Frequency	7	0.04751	0.01279	0.33260	0.03249	0.07100
Claim_Severity	7	4926	302.09673	34480	4601	5388

Pearson Correlation Coefficients, N = 7
Prob > |r| under H0: Rho=0

	Claim_Frequency	*Claim_Severity*
Claim_Frequency	1.00000	-0.55373 0.1972
Claim_Severity	-0.55373 0.1972	1.00000

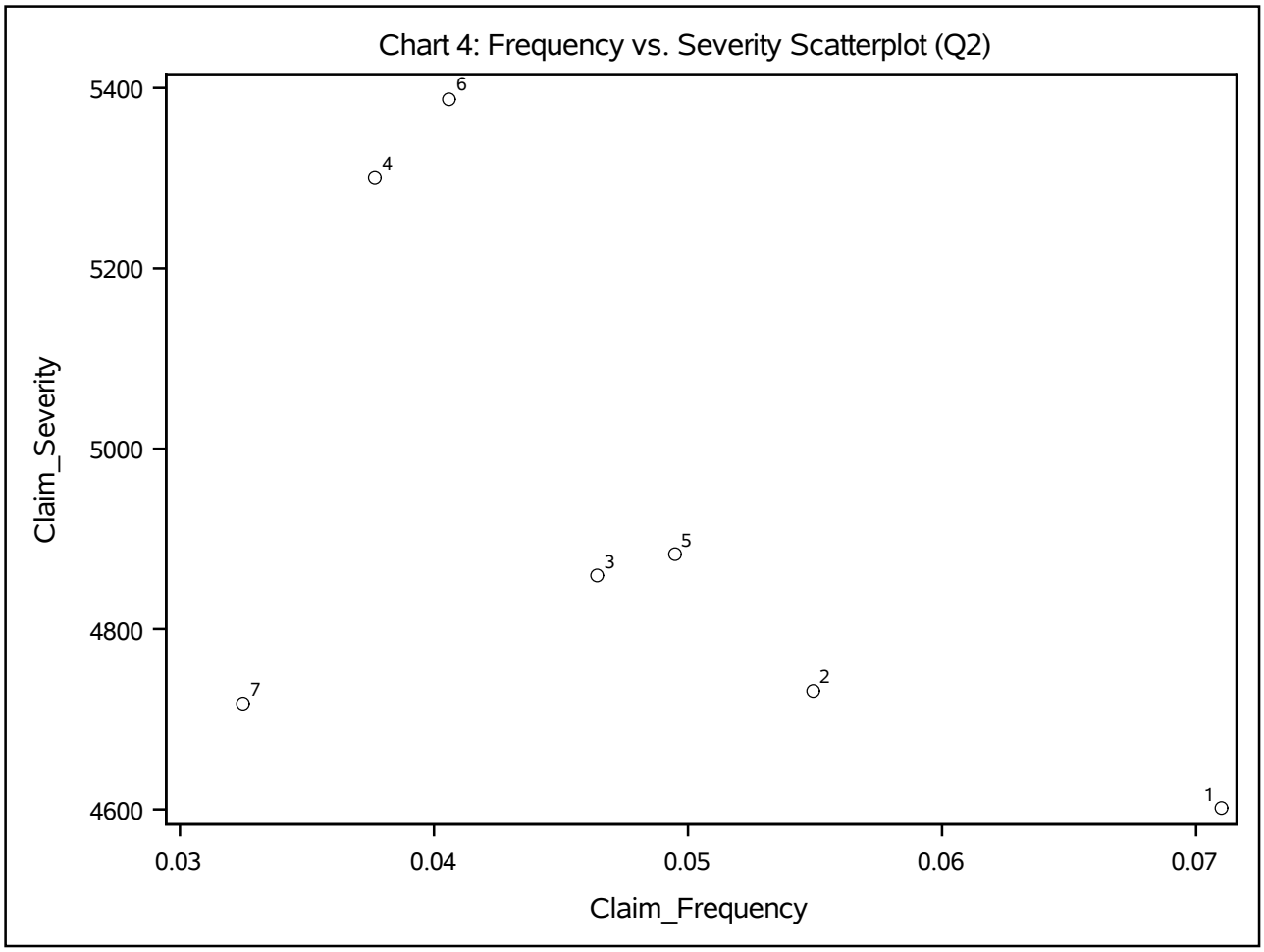


Chart 4: Frequency vs. Severity Scatterplot (Q2)
Claim_Severity
5400
5200
5000
4800
4600
0.03
0.04
0.05
0.06
0.07
Claim_Frequency
1
2
3
4
5
6
7

Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment

Number of Observations Read	2182
Number of Observations Used	2182

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	1.985791E15	3.971581E14	3186.08	<.0001
Error	2176	2.712476E14	1.246542E11		
Corrected Total	2181	2.257038E15			

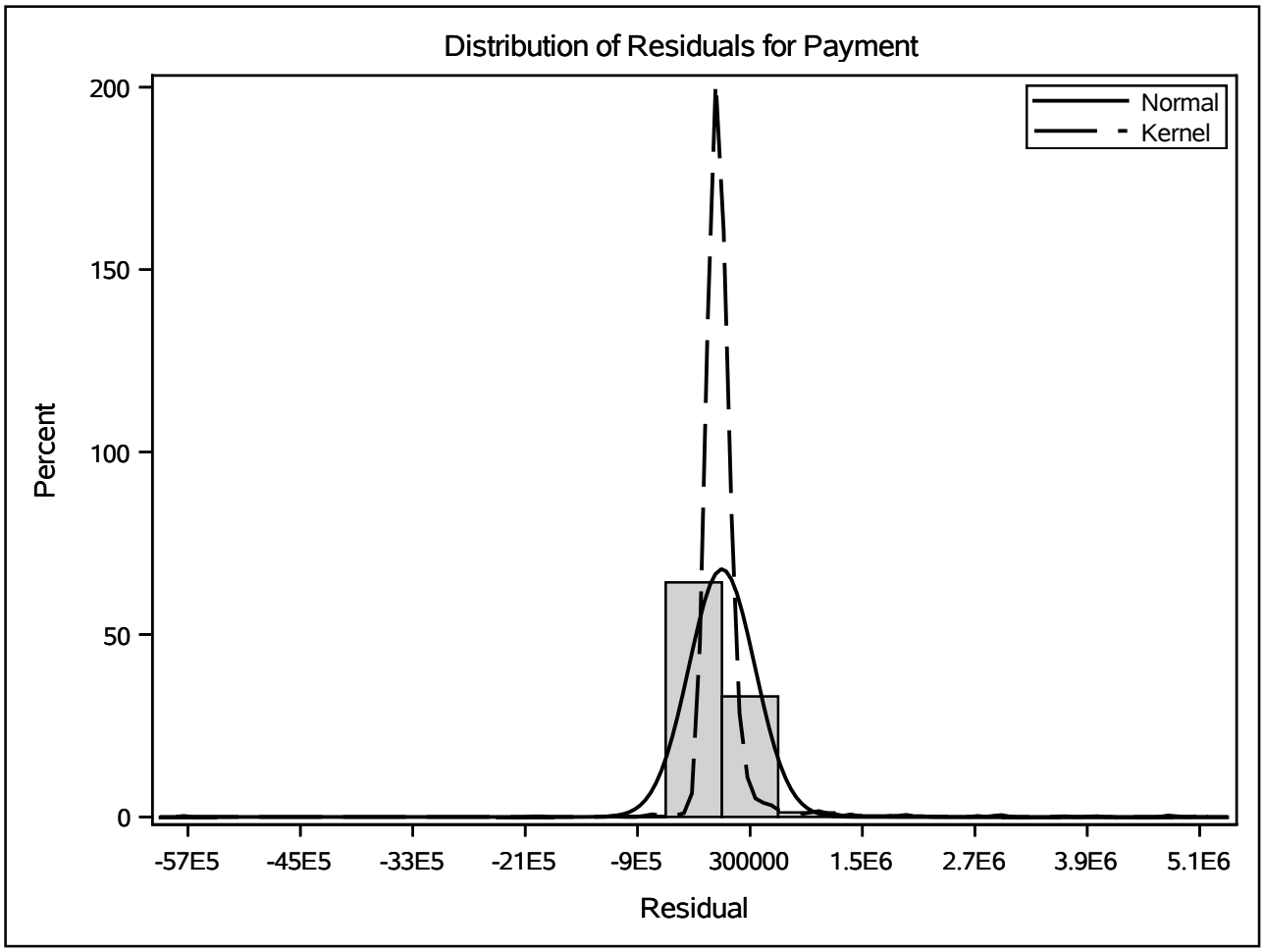
Root MSE	353064	R-Square	0.8798
Dependent Mean	257008	Adj R-Sq	0.8795
Coeff Var	137.37491		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	138485	31398	4.41	<.0001
Kilometres	1	-12343	5398.91138	-2.29	0.0223
Zone	1	-24834	3809.52874	-6.52	<.0001
Bonus	1	-17146	3835.88685	-4.47	<.0001
Make	1	28475	2976.02028	9.57	<.0001
Insured	1	165.42578	1.39101	118.92	<.0001

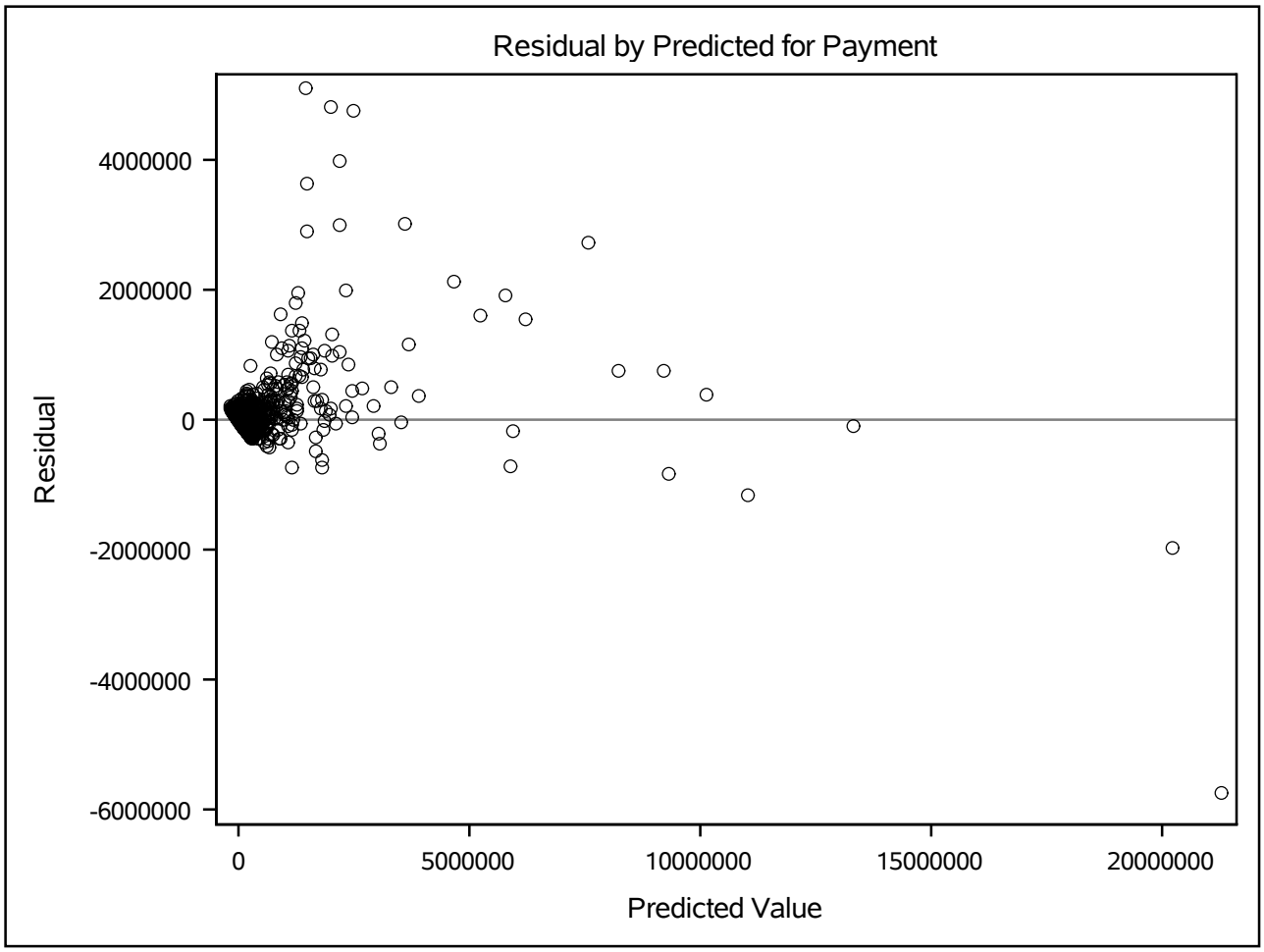
Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



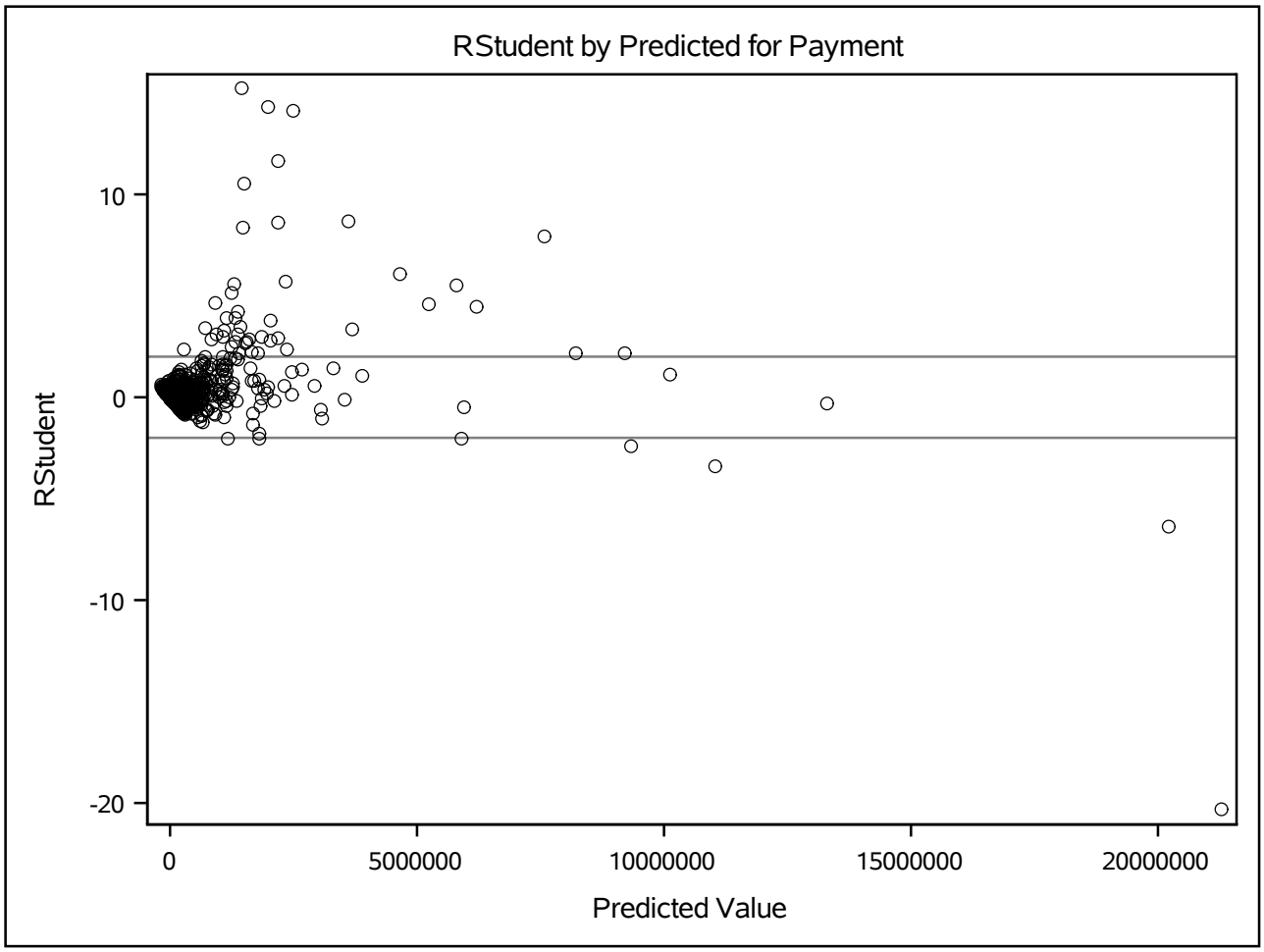
Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



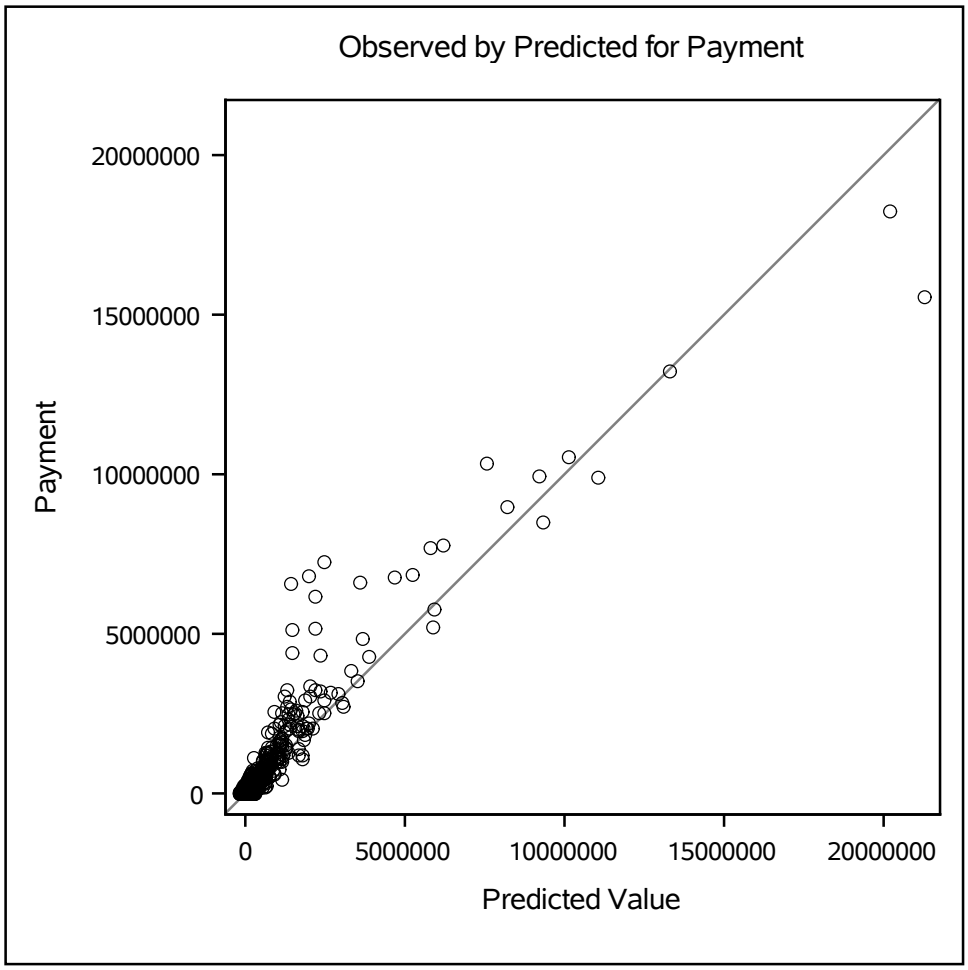
Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



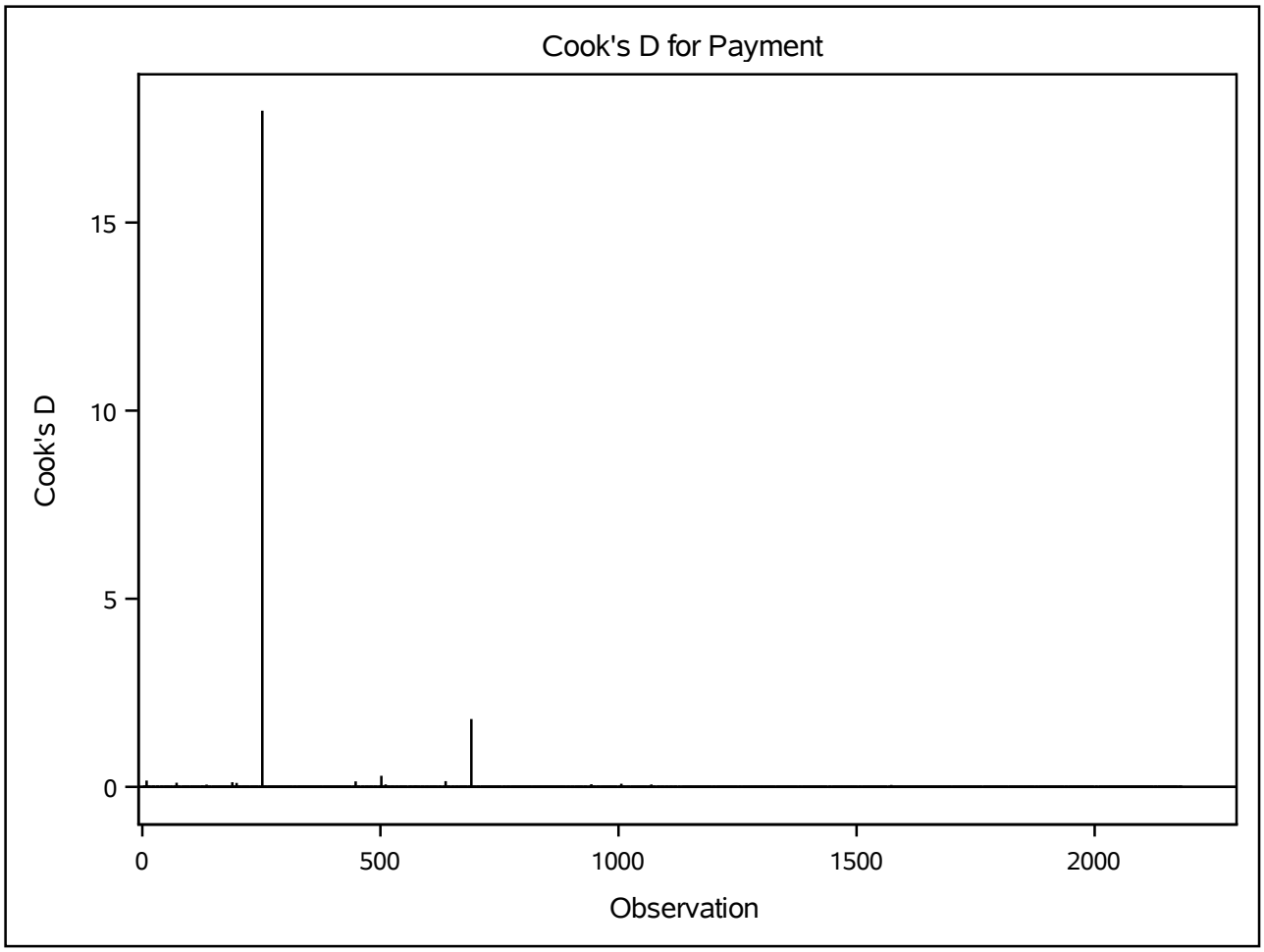
Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



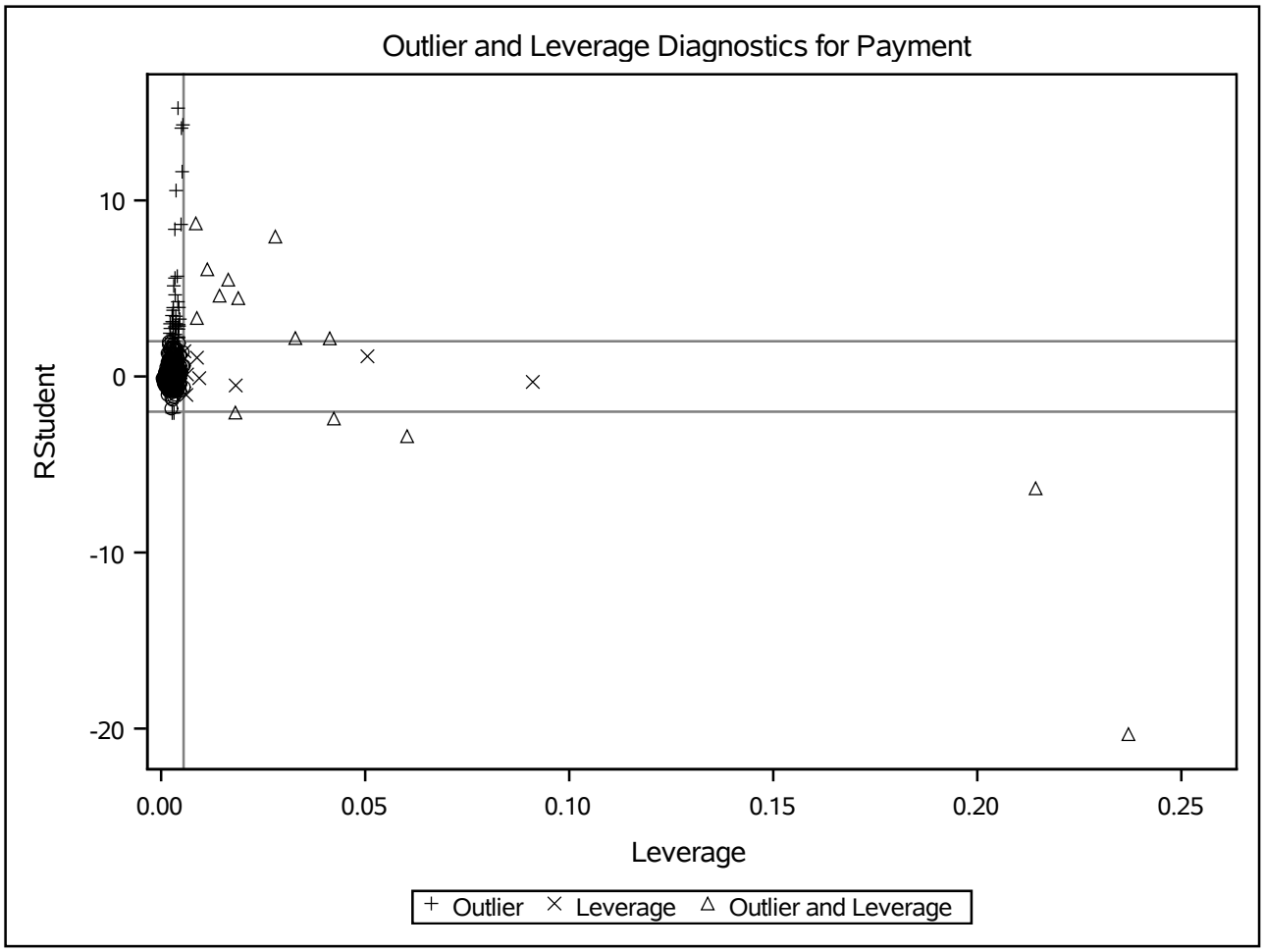
Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



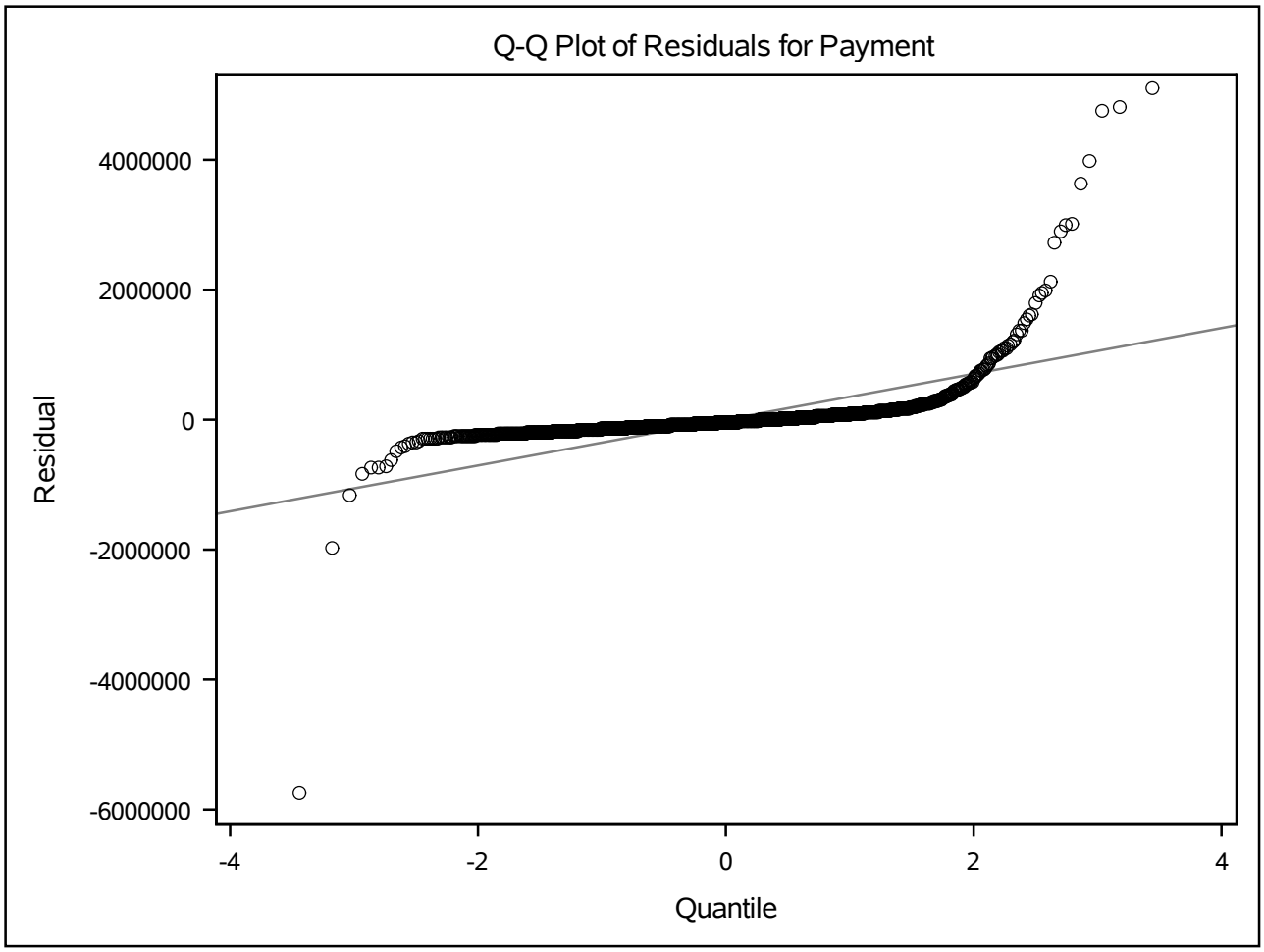
Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



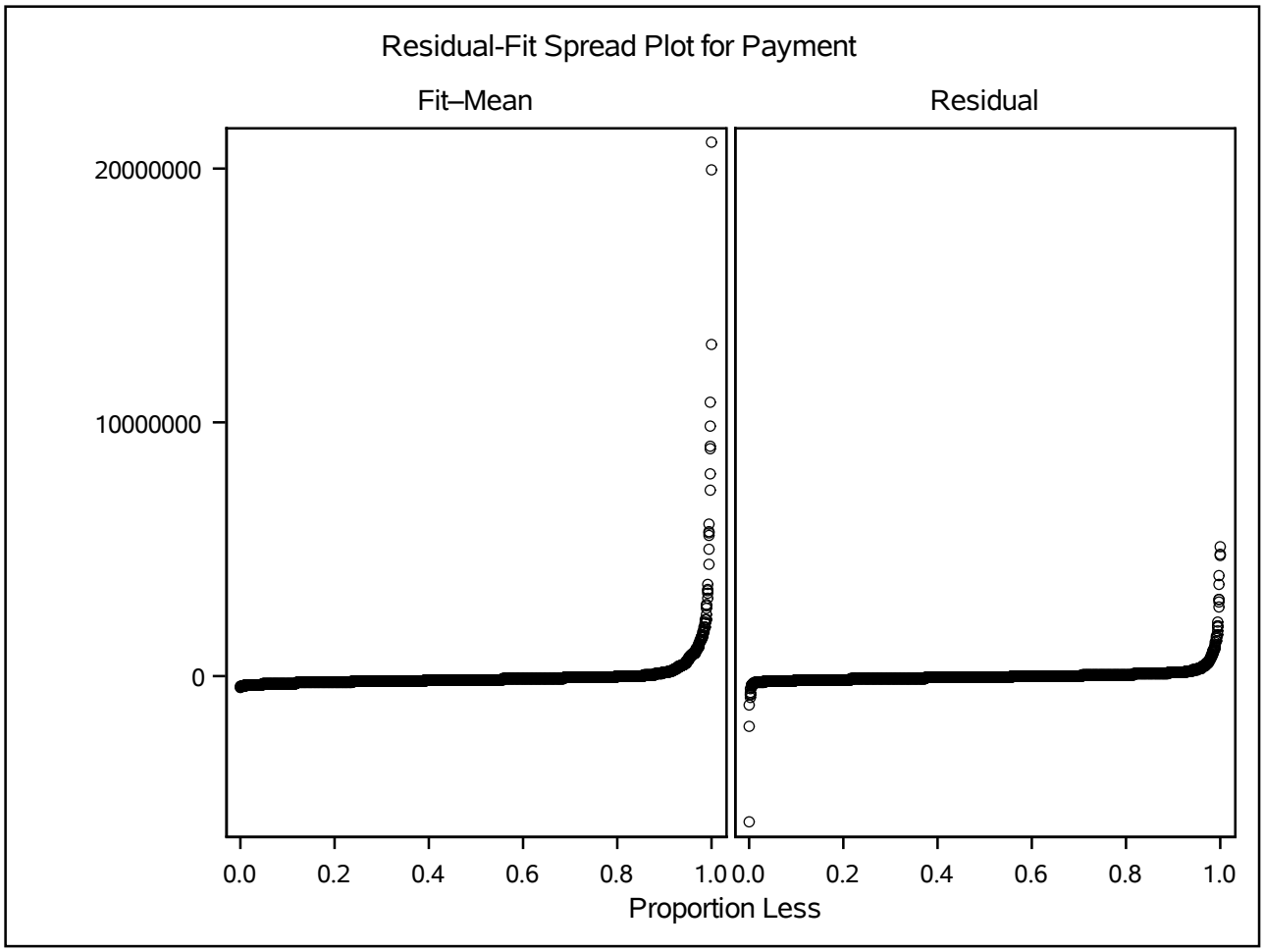
Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



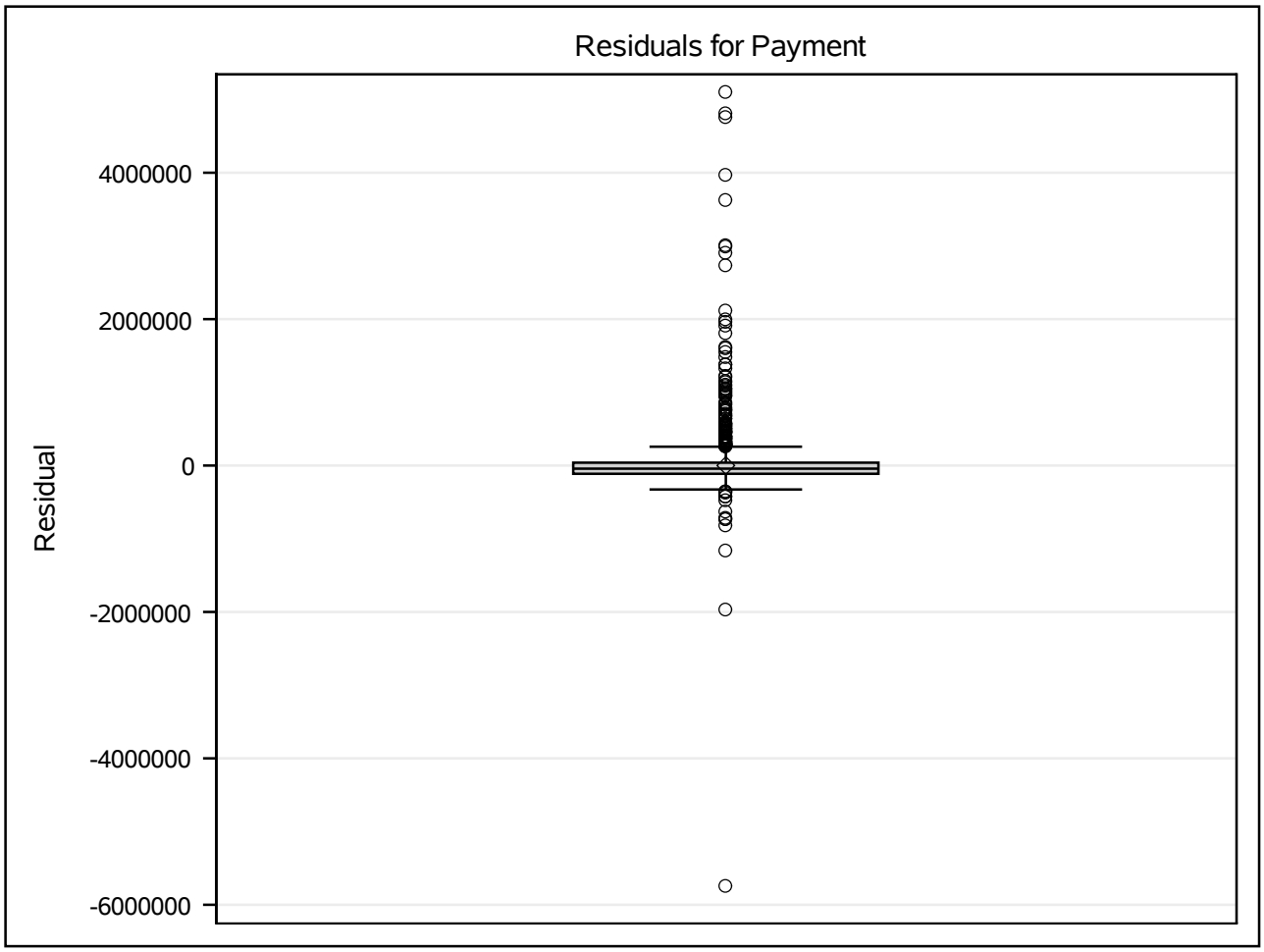
Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



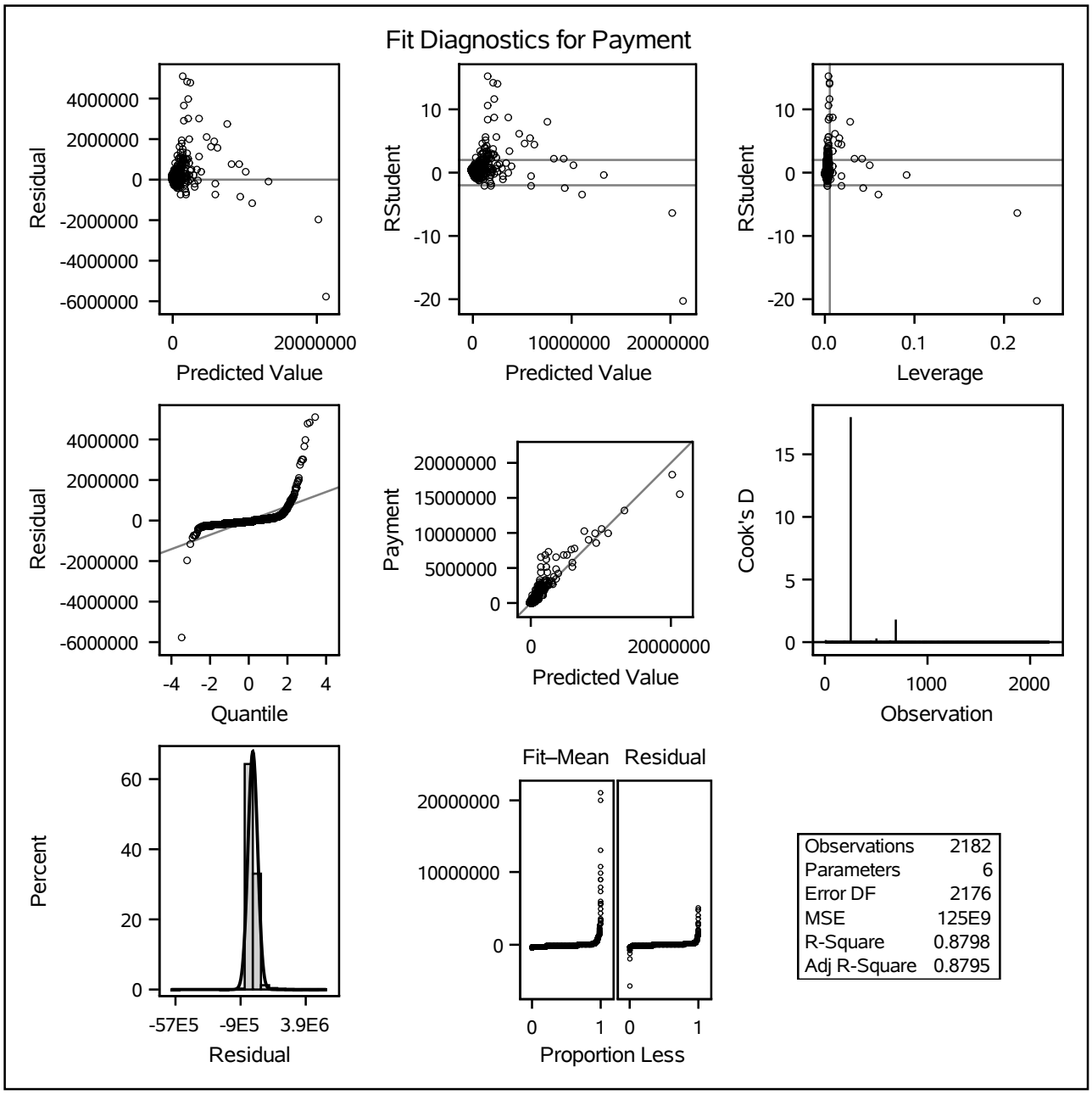
Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



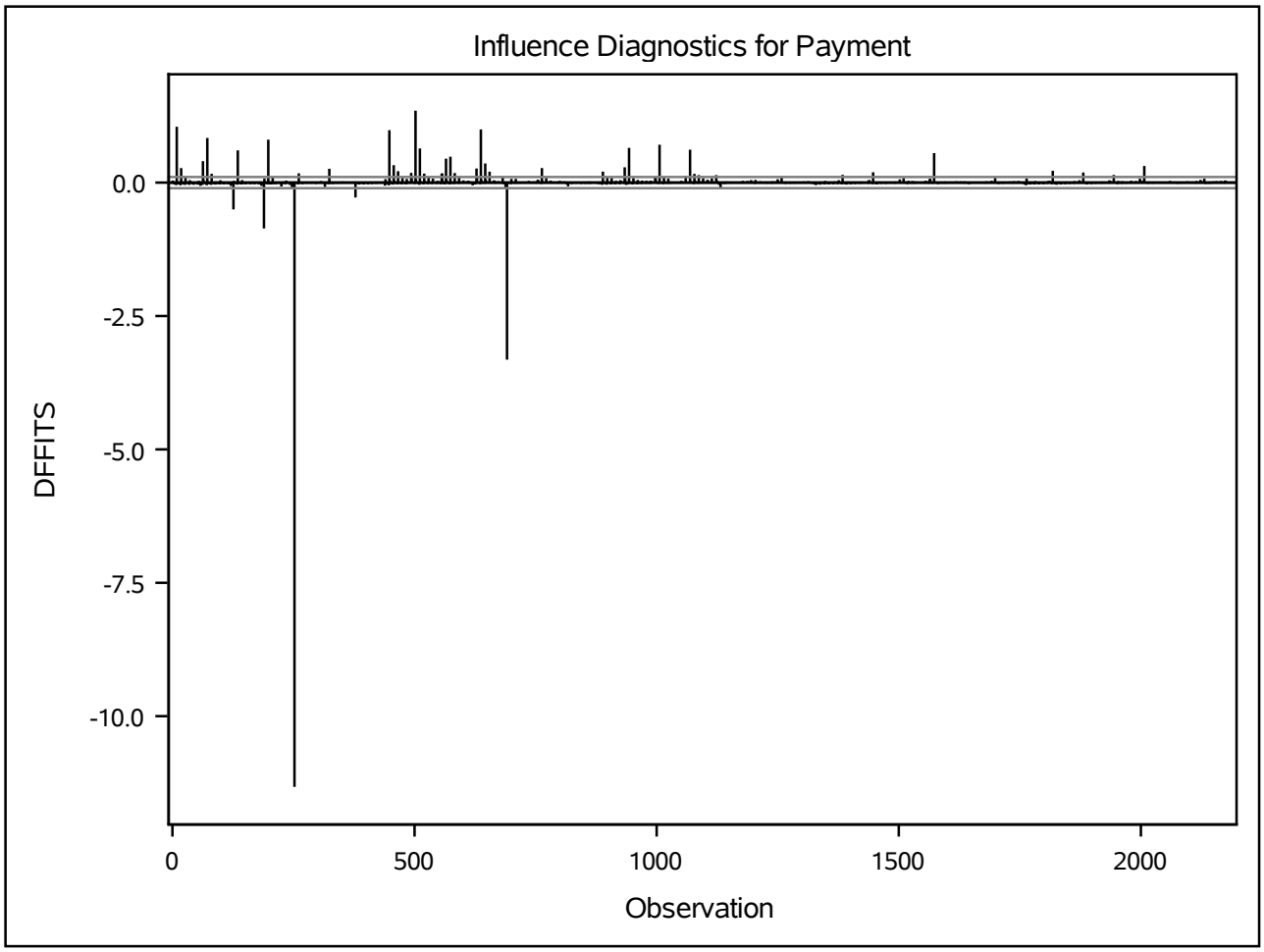
Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



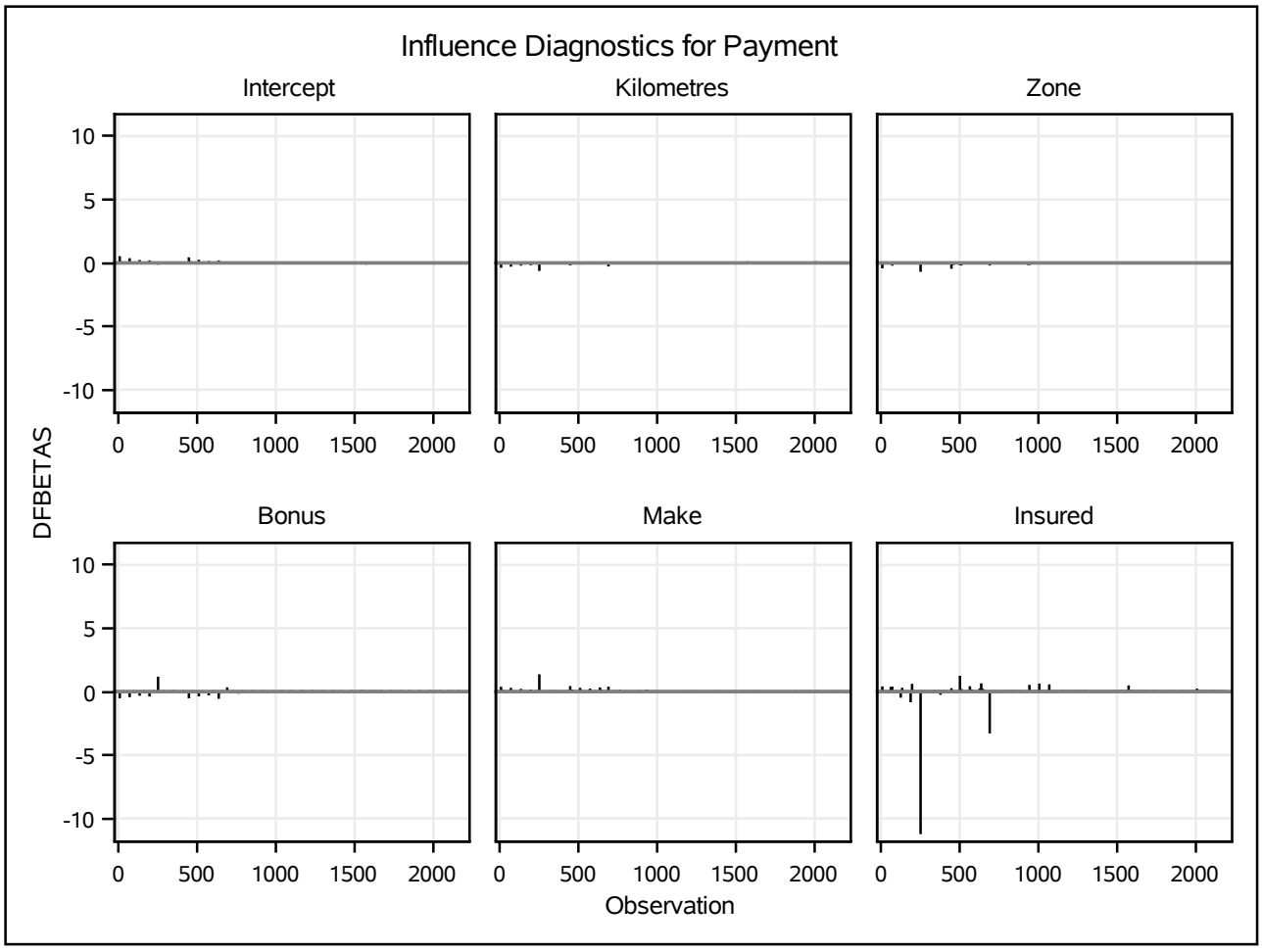
Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



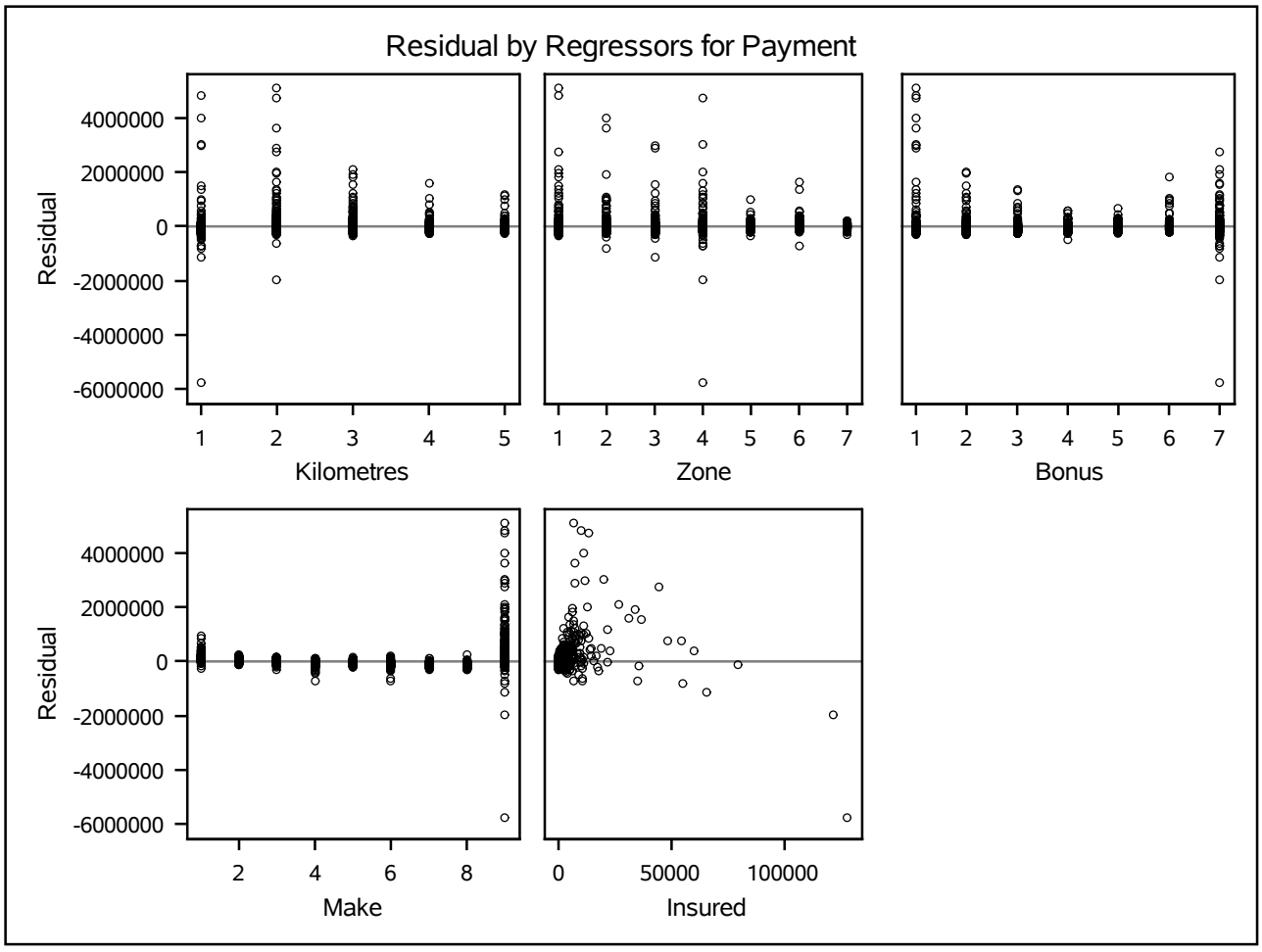
Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



Regression Model: Predicting Payment (Q3)

The REG Procedure
Model: MODEL1
Dependent Variable: Payment



Zone Classification by Risk Type (Q4)

Obs	Zone	Total_Insured	Total_Claims	Total_Payment	Claim_Frequency	Claim_Severity	Loss_Cost	Risk_Type
1	1	326394.10	23174	106633468	0.071000	4601.43	326.702	Low Risk
2	2	387916.78	21302	100775278	0.054914	4730.79	259.786	Low Risk
3	3	429331.99	19938	96878519	0.046440	4858.99	225.649	Low Risk
4	4	847154.83	31913	169177603	0.037671	5301.21	199.701	High Severity
5	5	120442.99	5962	29109577	0.049501	4882.52	241.688	Low Risk
6	6	252845.64	10262	55291468	0.040586	5387.98	218.677	High Severity
7	7	19083.75	620	2924768	0.032488	4717.37	153.260	Low Risk

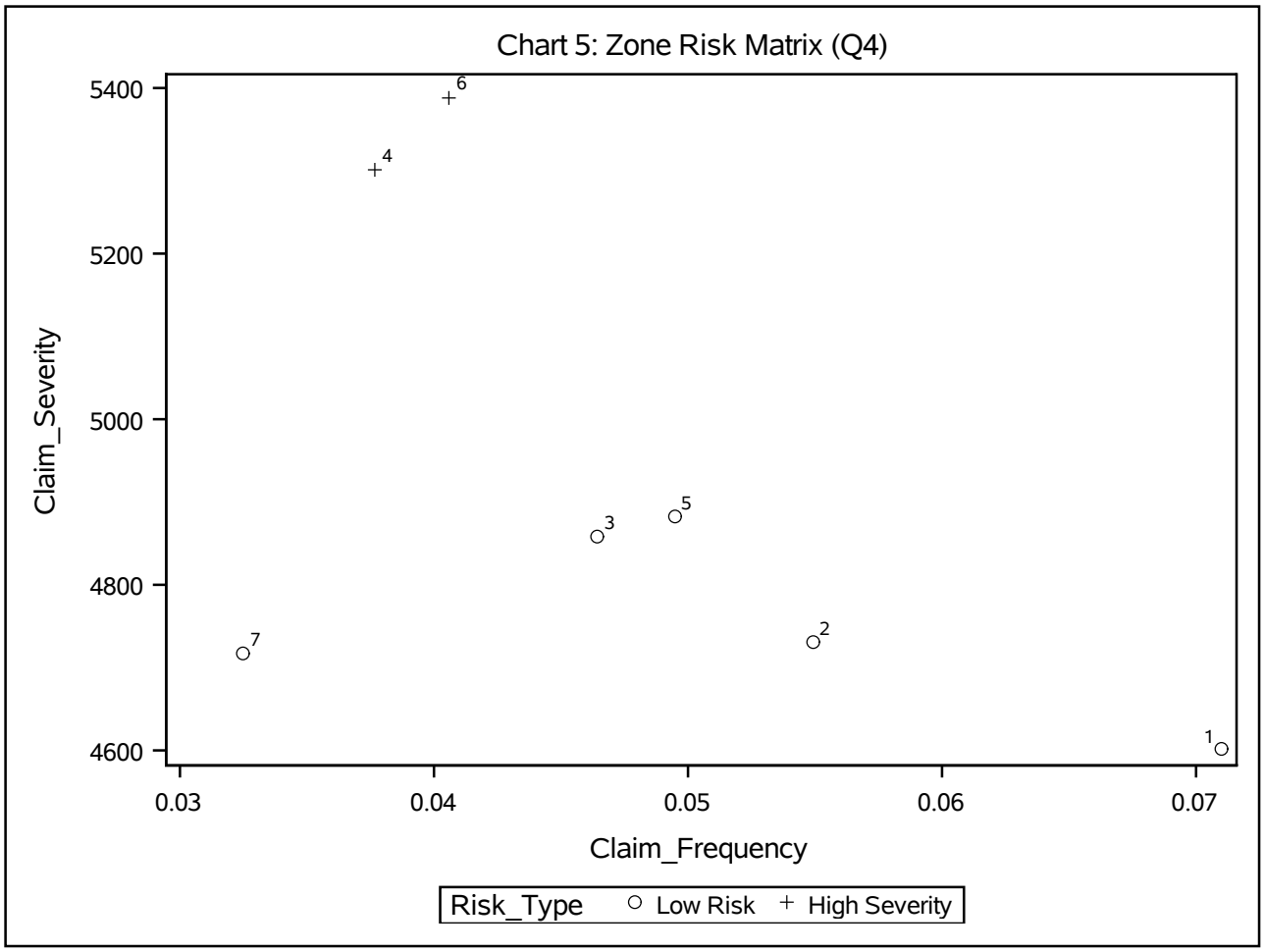


Chart 5: Zone Risk Matrix (Q4)
Claim_Severity
5400
5200
5000
4800
4600
0.03
0.04
0.05
0.06
0.07
Claim_Frequency
Risk_Type
Low Risk
High Severity
1
2
3
4
5
6
7

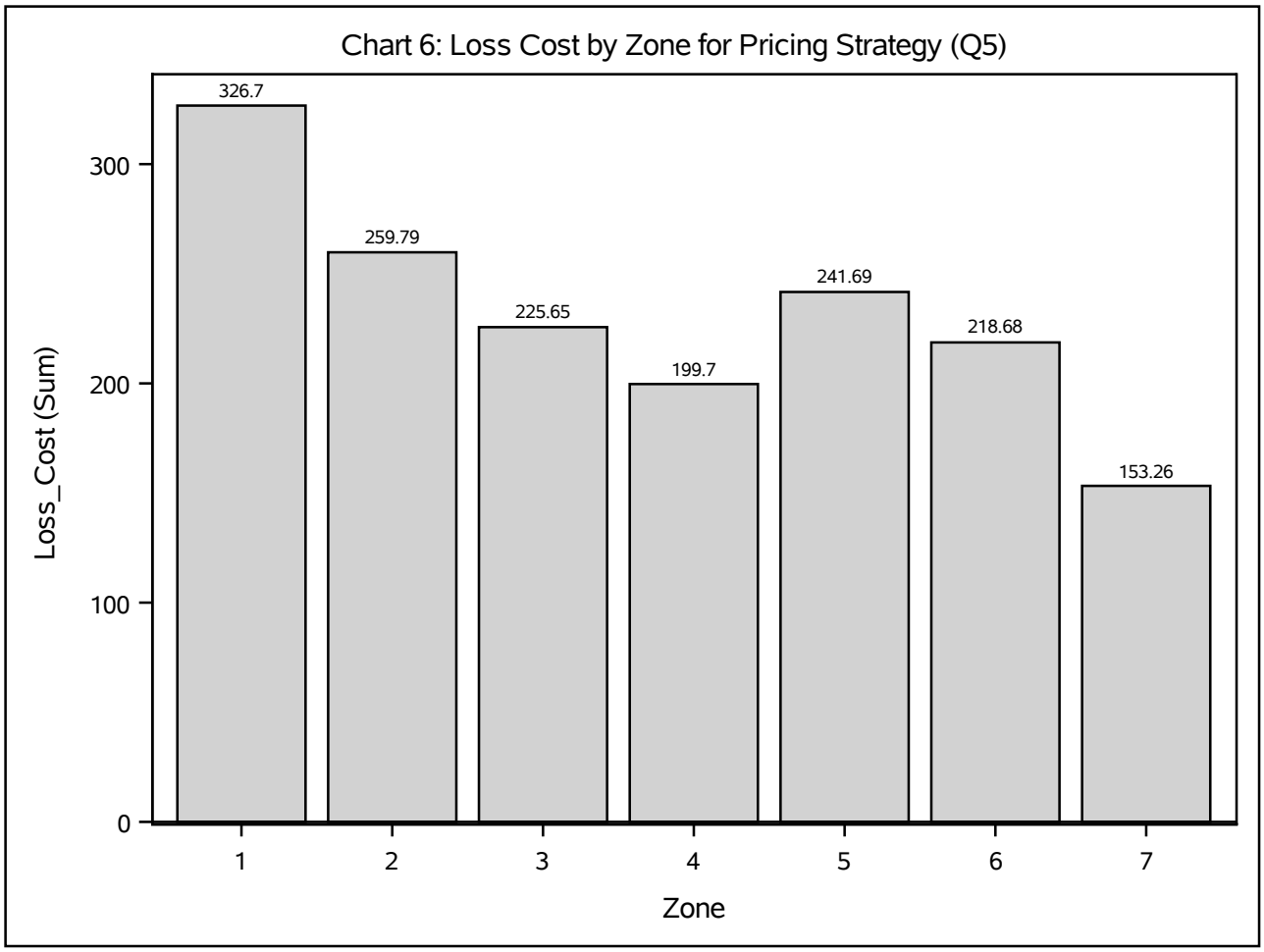


Chart 6: Loss Cost by Zone for Pricing Strategy (Q5)
Loss_Cost (Sum)
Zone
326.7
259.79
225.65
199.7
241.69
218.68
153.26
0
100
200
300
1
2
3
4
5
6
7