CHAPTER 8 -- LOGISTIC REGRESSION

UNIVARIATE LOGISTIC REGRESSION
ESTIMATE FOR EACH INDEPENDENT VARIABLE

UNIVARIATE LOGISTIC REGRESSION
X6

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	60	100.0
	Missing Cases	0	.0
	Total	60	100.0
Unselected Cases		0	.0
Total		60	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
USA/North America	0
Outside North America	1

Block 0: Beginning Block

Classification Table[a,b]

			Predicted		
			X4 - Region		
	Observed		USA/North America	Outside North America	Percentage Correct
Step 0	X4 - Region	USA/North America	0	26	.0
		Outside North America	0	34	100.0
	Overall Percentage				56.7

a. Constant is included in the model.

b. The cut value is .500

UNIVARIATE LOGISTIC REGRESSION
X6

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.268	.261	1.060	1	.303	1.308

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	X6 - Product Quality	11.925	1	.001
	Overall Statistics		11.925	1	.001

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	12.996	1	.000
	Block	12.996	1	.000
	Model	12.996	1	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	69.112[a]	.195	.261

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

UNIVARIATE LOGISTIC REGRESSION

X6

Classification Table[a]

			Predicted		
			X4 - Region		
Observed			USA/North America	Outside North America	Percentage Correct
Step 1	X4 - Region	USA/North America	17	9	65.4
		Outside North America	9	25	73.5
	Overall Percentage				70.0

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	X6 - Product Quality	-.782	.245	10.214	1	.001	.457
	Constant	6.486	1.997	10.548	1	.001	656.191

a. Variable(s) entered on step 1: X6 - Product Quality.

STEPWISE LOGISTIC REGRESSION

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	60	60.0
	Missing Cases	0	.0
	Total	60	60.0
Unselected Cases		40	40.0
Total		100	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
USA/North America	0
Outside North America	1

Block 0: Beginning Block

Iteration History[a,b,c]

Iteration		-2 Log likelihood	Coefficients
			Constant
Step 0	1	82.108	.267
	2	82.108	.268
	3	82.108	.268

a. Constant is included in the model.

b. Initial -2 Log Likelihood: 82.108

c. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

STEPWISE LOGISTIC REGRESSION

Classification Table[a,b]

Observed			Predicted: Selected Cases[c] X4 - Region: USA/North America	Predicted: Selected Cases[c] X4 - Region: Outside North America	Percentage Correct
Step 0	X4 - Region	USA/North America	0	26	.0
		Outside North America	0	34	100.0
	Overall Percentage				56.7

Classification Table[a,b]

Observed			Predicted: Unselected Cases[d] X4 - Region: USA/North America	Predicted: Unselected Cases[d] X4 - Region: Outside North America	Percentage Correct
Step 0	X4 - Region	USA/North America	0	13	.0
		Outside North America	0	27	100.0
	Overall Percentage				67.5

a. Constant is included in the model.

b. The cut value is .500

c. Selected cases Sample Split -- 60/40 EQ 0

d. Unselected cases Sample Split -- 60/40 NE 0

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.268	.261	1.060	1	.303	1.308

STEPWISE LOGISTIC REGRESSION

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	X6 - Product Quality	11.925	1	.001
		X7 - E-Commerce Activities	2.052	1	.152
		X8 - Technical Support	1.609	1	.205
		X9 - Complaint Resolution	.866	1	.352
		X10 - Advertising	.791	1	.374
		X11 - Product Line	18.323	1	.000
		X12 - Salesforce Image	8.622	1	.003
		X13 - Competitive Pricing	21.330	1	.000
		X14 - Warranty & Claims	.465	1	.495
		X15 - New Products	.614	1	.433
		X16 - Order & Billing	.090	1	.764
		X17 - Price Flexibility	21.204	1	.000
		X18 - Delivery Speed	.157	1	.692
	Overall Statistics		42.350	13	.000

Block 1: Method = Forward Stepwise (Wald)

STEPWISE LOGISTIC REGRESSION

Iteration History[a,b,c,d,e]

Iteration		-2 Log likelihood	Coefficients		
			Constant	X13 - Competitive Pricing	X17 - Price Flexibility
Step 1	1	58.793	-4.920	.782	
	2	57.040	-6.589	1.058	
	3	56.972	-6.988	1.125	
	4	56.971	-7.008	1.129	
	5	56.971	-7.008	1.129	
Step 2	1	46.868	-7.047	.577	.798
	2	41.251	-10.722	.848	1.302
	3	40.073	-13.089	1.009	1.664
	4	39.962	-14.058	1.071	1.822
	5	39.960	-14.190	1.079	1.844
	6	39.960	-14.192	1.079	1.844
	7	39.960	-14.192	1.079	1.844

a. Method: Forward Stepwise (Wald)

b. Constant is included in the model.

c. Initial -2 Log Likelihood: 82.108

d. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

e. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	25.136	1	.000
	Block	25.136	1	.000
	Model	25.136	1	.000
Step 2	Step	17.011	1	.000
	Block	42.148	2	.000
	Model	42.148	2	.000

STEPWISE LOGISTIC REGRESSION

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	56.971[a]	.342	.459
2	39.960[b]	.505	.677

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

b. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	17.329	8	.027
2	5.326	8	.722

Contingency Table for Hosmer and Lemeshow Test

		X4 - Region = USA/North America		X4 - Region = Outside North America		
		Observed	Expected	Observed	Expected	Total
Step 1	1	4	5.263	2	.737	6
	2	6	4.900	0	1.100	6
	3	5	4.458	1	1.542	6
	4	4	3.675	2	2.325	6
	5	0	2.876	6	3.124	6
	6	3	2.010	3	3.990	6
	7	4	1.479	3	5.521	7
	8	0	.742	6	5.258	6
	9	0	.483	7	6.517	7
	10	0	.113	4	3.887	4
Step 2	1	6	5.752	0	.248	6
	2	4	5.251	2	.749	6
	3	5	4.927	1	1.073	6
	4	5	4.634	2	2.366	7

STEPWISE LOGISTIC REGRESSION

Contingency Table for Hosmer and Lemeshow Test

	X4 - Region = USA/North America		X4 - Region = Outside North America		
	Observed	Expected	Observed	Expected	Total
5	5	3.372	1	2.628	6
6	1	1.554	5	4.446	6
7	0	.291	6	5.709	6
8	0	.131	6	5.869	6
9	0	.084	7	6.916	7
10	0	.006	4	3.994	4

Classification Table[a]

			Predicted		
			Selected Cases[b]		
			X4 - Region		
Observed			USA/North America	Outside North America	Percentage Correct
Step 1	X4 - Region	USA/North America	19	7	73.1
		Outside North America	9	25	73.5
	Overall Percentage				73.3
Step 2	X4 - Region	USA/North America	25	1	96.2
		Outside North America	6	28	82.4
	Overall Percentage				88.3

Classification Table[a]

			Predicted		
			Unselected Cases[c]		
			X4 - Region		
Observed			USA/North America	Outside North America	Percentage Correct
Step 1	X4 - Region	USA/North America	4	9	30.8
		Outside North America	1	26	96.3
	Overall Percentage				75.0
Step 2	X4 - Region	USA/North America	9	4	69.2
		Outside North America	2	25	92.6
	Overall Percentage				85.0

STEPWISE LOGISTIC REGRESSION

a. The cut value is .500

b. Selected cases Sample Split -- 60/40 EQ 0

c. Unselected cases Sample Split -- 60/40 NE 0

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	X13 - Competitive Pricing	1.129	.287	15.471	1	.000	3.092
	Constant	-7.008	1.836	14.570	1	.000	.001
Step 2[b]	X13 - Competitive Pricing	1.079	.357	9.115	1	.003	2.942
	X17 - Price Flexibility	1.844	.639	8.331	1	.004	6.321
	Constant	-14.192	3.712	14.614	1	.000	.000

Variables in the Equation

		95% C.I.for EXP(B)	
		Lower	Upper
Step 1[a]	X13 - Competitive Pricing	1.762	5.426
	Constant		
Step 2[b]	X13 - Competitive Pricing	1.460	5.928
	X17 - Price Flexibility	1.807	22.110
	Constant		

a. Variable(s) entered on step 1: X13 - Competitive Pricing.

b. Variable(s) entered on step 2: X17 - Price Flexibility.

Correlation Matrix

		Constant	X13 - Competitive Pricing	X17 - Price Flexibility
Step 1	Constant	1.000	-.984	
	X13 - Competitive Pricing	-.984	1.000	
Step 2	Constant	1.000	-.750	-.808
	X13 - Competitive Pricing	-.750	1.000	.231
	X17 - Price Flexibility	-.808	.231	1.000

STEPWISE LOGISTIC REGRESSION

Variables not in the Equation

			Score	df	Sig.
Step 1	Variables	X6 - Product Quality	4.859	1	.028
		X7 - E-Commerce Activities	.132	1	.716
		X8 - Technical Support	.007	1	.931
		X9 - Complaint Resolution	1.379	1	.240
		X10 - Advertising	.129	1	.719
		X11 - Product Line	6.154	1	.013
		X12 - Salesforce Image	2.745	1	.098
		X14 - Warranty & Claims	.640	1	.424
		X15 - New Products	.344	1	.557
		X16 - Order & Billing	2.528	1	.112
		X17 - Price Flexibility	13.723	1	.000
		X18 - Delivery Speed	1.206	1	.272
	Overall Statistics		27.315	12	.007
Step 2	Variables	X6 - Product Quality	.656	1	.418
		X7 - E-Commerce Activities	3.501	1	.061
		X8 - Technical Support	.006	1	.937
		X9 - Complaint Resolution	.693	1	.405
		X10 - Advertising	.091	1	.762
		X11 - Product Line	3.409	1	.065
		X12 - Salesforce Image	.849	1	.357
		X14 - Warranty & Claims	2.327	1	.127
		X15 - New Products	.026	1	.873
		X16 - Order & Billing	.010	1	.919
		X18 - Delivery Speed	2.907	1	.088
	Overall Statistics		20.216	11	.042

```
Step number: 1
```

STEPWISE LOGISTIC REGRESSION

Observed Groups and Predicted Probabilities

```
       8 +
                                +
         I
                                I
         I
                                I
F        I
                                I
R      6 +
                                +
E        I
                                I
Q        I                                                                  O
                        O       I
U        I                                                                  O
                        O       I
E      4 +                                                 O                O
                        O       +
N        I                                                 O                O
                        O       I
C        I                  U     U                        O                U
           U          O O       I
Y        I                  U     U                        O                U
           U          O O       I
       2 +             O  U U     U U      U       O       O                U
           U  O O     O O O   O +
         I             O  U U     U U      U       O       O                U
           U  O O     O O O   O I
         I      U    UOU UU U U   U U O    U    U  U  O    O  O       O     U
O    U O   U  O OO    O O OOO O I
         I      U    UOU UU U U   U U O    U    U  U  O    O  O       O     U
O    U O   U  O OO    O O OOO O I
Predicted ---------+---------+---------+---------+---------+---------+--------
-+---------+---------+----------
  Prob:   0        .1        .2        .3        .4        .5        .6
.7        .8        .9         1
```

STEPWISE LOGISTIC REGRESSION

```
  Group:  UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUOOOOOOOOOOOOOOOOOO
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO

          Predicted Probability is of Membership for Outside North America
          The Cut Value is .50
          Symbols: U - USA/North America
                   O - Outside North America
          Each Symbol Represents .5 Cases.



             Step number: 2

             Observed Groups and Predicted Probabilities

       8 +
                                   +
         I
                                   I
         I
                                  OI
F        I
                                  OI
R      6 +
                                 OO+
E        I
                                 OOI
Q        I
                                OOOI
U        I
                                OOOI
E      4 +              O
                                OOO+
N        I              O
                                OOOI
C        I              U
                                OOOI
```

STEPWISE LOGISTIC REGRESSION

```
Y        I               U
                             OOOI
       2 +   U  U     U  OU                  OU   U U
                          OO OOO+
         I   U  U     U  OU                  OU   U U
                          OO OOOI
         I UU   UU  U UO UU    U   U  U  U   UOU  U U    OU     O        O O
      O              U OOOO OOOI
         I UU   UU  U UO UU    U   U  U  U   UOU  U U    OU     O        O O
      O              U OOOO OOOI
Predicted ---------+---------+---------+---------+---------+---------+--------
-+---------+---------+----------
  Prob:   0       .1        .2        .3        .4        .5        .6
.7        .8        .9          1
  Group:  UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUOOOOOOOOOOOOOOOOOOO
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO

          Predicted Probability is of Membership for Outside North America
          The Cut Value is .50
          Symbols: U - USA/North America
                   O - Outside North America
          Each Symbol Represents .5 Cases.
```

Casewise List[b]

Case	Selected Status[a]	Observed X4 - Region	Predicted	Predicted Group	Temporary Variable Resid	ZResid	SResid
3	S	O**	.123	U	.877	2.664	2.104
43	S	U**	.907	O	-.907	-3.120	-2.240
64	S	O**	.144	U	.856	2.441	2.022

a. S = Selected, U = Unselected cases, and ** = Misclassified cases.

b. Cases with studentized residuals greater than 2.000 are listed.

ESTIMATION OF MULTIPLE CUTOFF VALUES

ESTIMATION OF MULTIPLE CUTOFF VALUES
CUTOFF VALUE -- 0.0

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	60	100.0
	Missing Cases	0	.0
	Total	60	100.0
Unselected Cases		0	.0
Total		60	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
USA/North America	0
Outside North America	1

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted: X4 - Region: USA/North America	Predicted: X4 - Region: Outside North America	Predicted: Percentage Correct
Step 0	X4 - Region	USA/North America	0	26	.0
		Outside North America	0	34	100.0
	Overall Percentage				56.7

a. Constant is included in the model.

b. The cut value is .000

ESTIMATION OF MULTIPLE CUTOFF VALUES
CUTOFF VALUE -- 0.0

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.268	.261	1.060	1	.303	1.308

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	X13 - Competitive Pricing	21.330	1	.000
		X17 - Price Flexibility	21.204	1	.000
	Overall Statistics		31.323	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	42.148	2	.000
	Block	42.148	2	.000
	Model	42.148	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	39.960[a]	.505	.677

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

ESTIMATION OF MULTIPLE CUTOFF VALUES
CUTOFF VALUE -- 0.0

Classification Table[a]

Observed			Predicted X4 - Region: USA/North America	Predicted X4 - Region: Outside North America	Percentage Correct
Step 1	X4 - Region	USA/North America	0	26	.0
		Outside North America	0	34	100.0
	Overall Percentage				56.7

a. The cut value is .000

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	X13 - Competitive Pricing	1.079	.357	9.115	1	.003	2.942
	X17 - Price Flexibility	1.844	.639	8.331	1	.004	6.321
	Constant	-14.192	3.712	14.614	1	.000	.000

a. Variable(s) entered on step 1: X13 - Competitive Pricing, X17 - Price Flexibility.

ESTIMATION OF MULTIPLE CUTOFF VALUES
CUTOFF VALUE -- 0.1

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	60	100.0
	Missing Cases	0	.0
	Total	60	100.0
Unselected Cases		0	.0
Total		60	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
USA/North America	0
Outside North America	1

Block 0: Beginning Block

Classification Table[a,b]

			Predicted		
			X4 - Region		
Observed			USA/North America	Outside North America	Percentage Correct
Step 0	X4 - Region	USA/North America	0	26	.0
		Outside North America	0	34	100.0
	Overall Percentage				56.7

a. Constant is included in the model.

b. The cut value is .100

ESTIMATION OF MULTIPLE CUTOFF VALUES
CUTOFF VALUE -- 0.1

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.268	.261	1.060	1	.303	1.308

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	X13 - Competitive Pricing	21.330	1	.000
		X17 - Price Flexibility	21.204	1	.000
	Overall Statistics		31.323	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	42.148	2	.000
	Block	42.148	2	.000
	Model	42.148	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	39.960[a]	.505	.677

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

ESTIMATION OF MULTIPLE CUTOFF VALUES
CUTOFF VALUE -- 0.1

Classification Table[a]

Observed			Predicted: X4 - Region: USA/North America	Predicted: X4 - Region: Outside North America	Percentage Correct
Step 1	X4 - Region	USA/North America	7	19	26.9
		Outside North America	0	34	100.0
	Overall Percentage				68.3

a. The cut value is .100

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	X13 - Competitive Pricing	1.079	.357	9.115	1	.003	2.942
	X17 - Price Flexibility	1.844	.639	8.331	1	.004	6.321
	Constant	-14.192	3.712	14.614	1	.000	.000

a. Variable(s) entered on step 1: X13 - Competitive Pricing, X17 - Price Flexibility.

ROC CURVE

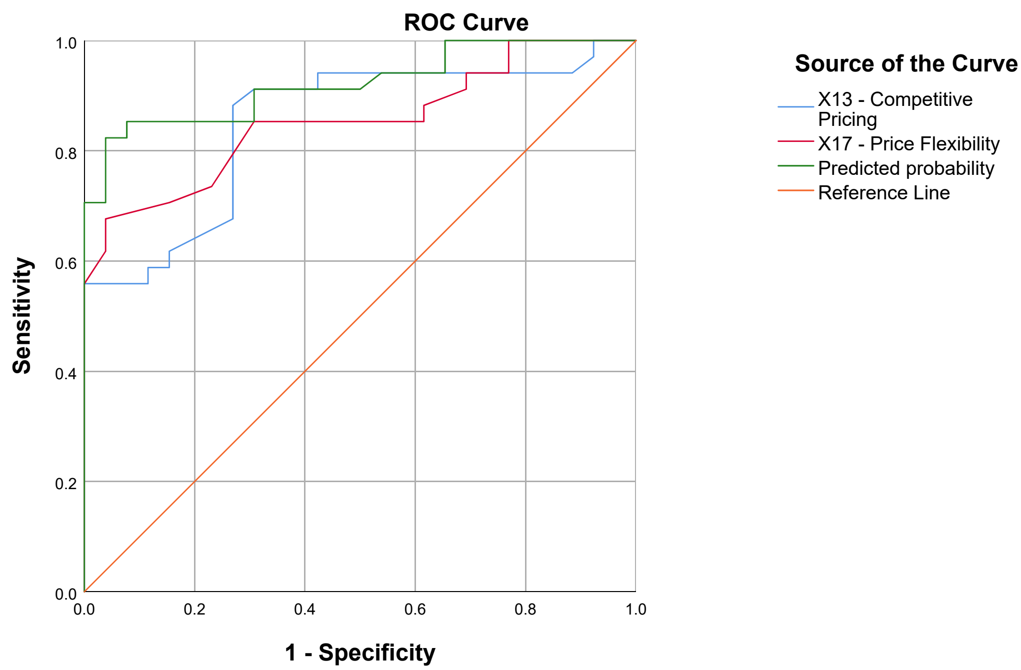
ROC Curve

Case Processing Summary

X4 - Region	Valid N (listwise)
Positive[a]	34
Negative	26

Larger values of the test result variable(s) indicate stronger evidence for a positive actual state.

a. The positive actual state is Outside North America.



Diagonal segments are produced by ties.

ROC CURVE

Area Under the Curve

Test Result Variable(s)	Area
X13 - Competitive Pricing	.850
X17 - Price Flexibility	.854
Predicted probability	.921

The test result variable(s): X13 - Competitive Pricing, X17 - Price Flexibility, Predicted probability has at least one tie between the positive actual state group and the negative actual state group. Statistics may be biased.

Coordinates of the Curve

Test Result Variable(s)	Positive if Greater Than or Equal To[a]	Sensitivity	1 - Specificity
X13 - Competitive Pricing	2.800	1.000	1.000
	4.100	1.000	.962
	4.450	1.000	.923
	4.550	.971	.923
	4.650	.941	.885
	4.750	.941	.846
	4.850	.941	.769
	4.950	.941	.654
	5.100	.941	.615
	5.250	.941	.500
	5.350	.941	.423
	5.500	.912	.423
	5.700	.912	.346
	5.850	.912	.308
	5.950	.882	.269
	6.100	.853	.269
	6.250	.735	.269
	6.450	.706	.269
	6.700	.676	.269

ROC CURVE

Coordinates of the Curve

Test Result Variable(s)	Positive if Greater Than or Equal To[a]	Sensitivity	1 - Specificity
	6.850	.618	.154
	7.000	.588	.154
	7.150	.588	.115
	7.300	.559	.115
	7.500	.559	.000
	7.650	.500	.000
	7.750	.441	.000
	8.000	.412	.000
	8.300	.324	.000
	8.450	.206	.000
	8.650	.176	.000
	8.850	.118	.000
	9.050	.088	.000
	9.450	.059	.000
	9.800	.029	.000
	10.900	.000	.000
X17 - Price Flexibility	1.600	1.000	1.000
	2.650	1.000	.923
	2.800	1.000	.846
	3.000	1.000	.769
	3.150	.941	.769
	3.300	.941	.692
	3.450	.912	.692
	3.550	.882	.615
	3.650	.853	.615
	3.750	.853	.538
	3.850	.853	.462
	3.950	.853	.308
	4.050	.794	.269
	4.150	.735	.231

ROC CURVE

Coordinates of the Curve

Test Result Variable(s)	Positive if Greater Than or Equal To[a]	Sensitivity	1 - Specificity
	4.250	.706	.154
	4.350	.676	.038
	4.450	.647	.038
	4.550	.618	.038
	4.650	.559	.000
	4.750	.529	.000
	4.850	.500	.000
	5.000	.441	.000
	5.250	.412	.000
	5.450	.324	.000
	5.650	.294	.000
	5.850	.235	.000
	6.000	.206	.000
	6.150	.176	.000
	6.250	.088	.000
	6.800	.029	.000
	8.300	.000	.000
Predicted probability	.0000000	1.000	1.000
	.0222516	1.000	.962
	.0419022	1.000	.885
	.0596622	1.000	.808
	.0786107	1.000	.769
	.1069110	1.000	.731
	.1210689	1.000	.654
	.1335720	.971	.654
	.1467599	.941	.654
	.1513238	.941	.615
	.1557680	.941	.538
	.1802392	.912	.500
	.2247767	.912	.462

ROC CURVE

Coordinates of the Curve

Test Result Variable(s)	Positive if Greater Than or Equal To[a]	Sensitivity	1 - Specificity
	.2608264	.912	.423
	.2881286	.912	.385
	.3245459	.912	.346
	.3487035	.912	.308
	.3543198	.882	.308
	.3626390	.853	.308
	.3843338	.853	.231
	.4127285	.853	.154
	.4547658	.853	.077
	.4887841	.824	.077
	.5229904	.824	.038
	.6010994	.794	.038
	.6550364	.765	.038
	.7049052	.735	.038
	.8274971	.706	.038
	.9172203	.706	.000
	.9292100	.676	.000
	.9367978	.647	.000
	.9444162	.618	.000
	.9526215	.588	.000
	.9592807	.559	.000
	.9651468	.529	.000
	.9727536	.500	.000
	.9751433	.471	.000
	.9768158	.441	.000
	.9787266	.412	.000
	.9801335	.382	.000
	.9810863	.324	.000
	.9820085	.265	.000
	.9843308	.235	.000

ROC CURVE

Coordinates of the Curve

Test Result Variable(s)	Positive if Greater Than or Equal To[a]	Sensitivity	1 - Specificity
	.9892264	.206	.000
	.9942933	.176	.000
	.9970014	.118	.000
	.9979240	.088	.000
	.9984275	.059	.000
	.9992584	.029	.000
	1.0000000	.000	.000

The test result variable(s): X13 - Competitive Pricing, X17 - Price Flexibility, Predicted probability has at least one tie between the positive actual state group and the negative actual state group.

a. The smallest cutoff value is the minimum observed test value minus 1, and the largest cutoff value is the maximum observed test value plus 1. All the other cutoff values are the averages of two consecutive ordered observed test values.

TESTING FOR NONLINEAR EFFECTS

TESTING FOR NONLINEAR EFFECTS
X6 -- TESTING UNIVARIATE MODEL WITH INTERACTION

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	60	100.0
	Missing Cases	0	.0
	Total	60	100.0
Unselected Cases		0	.0
Total		60	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
USA/North America	0
Outside North America	1

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted: X4 - Region: USA/North America	Predicted: X4 - Region: Outside North America	Predicted: Percentage Correct
Step 0	X4 - Region	USA/North America	0	26	.0
		Outside North America	0	34	100.0
	Overall Percentage				56.7

a. Constant is included in the model.

b. The cut value is .500

TESTING FOR NONLINEAR EFFECTS
X6 -- TESTING UNIVARIATE MODEL WITH INTERACTION

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.268	.261	1.060	1	.303	1.308

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	X6 - Product Quality	11.925	1	.001
	Overall Statistics		11.925	1	.001

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	12.996	1	.000
	Block	12.996	1	.000
	Model	12.996	1	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	69.112[a]	.195	.261

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

TESTING FOR NONLINEAR EFFECTS
X6 -- TESTING UNIVARIATE MODEL WITH INTERACTION

Classification Table[a]

			Predicted		
			X4 - Region		
Observed			USA/North America	Outside North America	Percentage Correct
Step 1	X4 - Region	USA/North America	17	9	65.4
		Outside North America	9	25	73.5
	Overall Percentage				70.0

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	X6 - Product Quality	-.782	.245	10.214	1	.001	.457
	Constant	6.486	1.997	10.548	1	.001	656.191

a. Variable(s) entered on step 1: X6 - Product Quality.

Block 2: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	8.095	1	.004
	Block	8.095	1	.004
	Model	21.091	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	61.017[a]	.296	.398

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

TESTING FOR NONLINEAR EFFECTS

X6 -- TESTING UNIVARIATE MODEL WITH INTERACTION

Classification Table[a]

Observed			Predicted: X4 - Region: USA/North America	Predicted: X4 - Region: Outside North America	Predicted: Percentage Correct
Step 1	X4 - Region	USA/North America	21	5	80.8
		Outside North America	13	21	61.8
	Overall Percentage				70.0

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	X6 - Product Quality	-37.689	15.493	5.918	1	.015	.000
	X6_INT	11.979	4.992	5.759	1	.016	159352.993
	Constant	101.552	40.649	6.241	1	.012	1.269E+44

a. Variable(s) entered on step 1: X6_INT.

TESTING FOR NONLINEAR EFFECTS
X6 -- ADDING INTERACTION TERM TO FINAL MODEL

Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	60	100.0
	Missing Cases	0	.0
	Total	60	100.0
Unselected Cases		0	.0
Total		60	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
USA/North America	0
Outside North America	1

Block 0: Beginning Block

Classification Table[a,b]

Observed			Predicted: X4 - Region: USA/North America	Predicted: X4 - Region: Outside North America	Predicted: Percentage Correct
Step 0	X4 - Region	USA/North America	0	26	.0
		Outside North America	0	34	100.0
	Overall Percentage				56.7

a. Constant is included in the model.

b. The cut value is .500

TESTING FOR NONLINEAR EFFECTS
X6 -- ADDING INTERACTION TERM TO FINAL MODEL

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.268	.261	1.060	1	.303	1.308

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	X13 - Competitive Pricing	21.330	1	.000
		X17 - Price Flexibility	21.204	1	.000
	Overall Statistics		31.323	2	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	42.148	2	.000
	Block	42.148	2	.000
	Model	42.148	2	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	39.960[a]	.505	.677

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

TESTING FOR NONLINEAR EFFECTS
X6 -- ADDING INTERACTION TERM TO FINAL MODEL

Classification Table[a]

			Predicted		
			X4 - Region		
Observed			USA/North America	Outside North America	Percentage Correct
Step 1	X4 - Region	USA/North America	25	1	96.2
		Outside North America	6	28	82.4
	Overall Percentage				88.3

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	X13 - Competitive Pricing	1.079	.357	9.115	1	.003	2.942
	X17 - Price Flexibility	1.844	.639	8.331	1	.004	6.321
	Constant	-14.192	3.712	14.614	1	.000	.000

a. Variable(s) entered on step 1: X13 - Competitive Pricing, X17 - Price Flexibility.

Block 2: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	4.622	2	.099
	Block	4.622	2	.099
	Model	46.770	4	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	35.338[a]	.541	.726

a. Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.

TESTING FOR NONLINEAR EFFECTS
X6 -- ADDING INTERACTION TERM TO FINAL MODEL

Classification Table[a]

Observed			Predicted: X4 - Region: USA/North America	Predicted: X4 - Region: Outside North America	Predicted: Percentage Correct
Step 1	X4 - Region	USA/North America	25	1	96.2
		Outside North America	4	30	88.2
	Overall Percentage				91.7

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.
Step 1[a]	X13 - Competitive Pricing	.916	.388	5.570	1	.018
	X17 - Price Flexibility	1.862	.753	6.109	1	.013
	X6 - Product Quality	-47.599	25.640	3.446	1	.063
	X6_INT	15.141	8.188	3.419	1	.064
	Constant	115.100	67.596	2.899	1	.089

Variables in the Equation

		Exp(B)
Step 1[a]	X13 - Competitive Pricing	2.499
	X17 - Price Flexibility	6.434
	X6 - Product Quality	.000
	X6_INT	3762762.339
	Constant	9.708E+49

a. Variable(s) entered on step 1: X6 - Product Quality, X6_INT.