USPS LR-J-66 / Docket No. R2001-1

Description and Program Documentation of Cube-Weight Relationship Estimation

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Introduction

The purpose of this Library Reference is to describe and document the regression analysis used to estimate the cubic feet per piece for Inter-BMC, Intra-BMC and Parcel Select Parcel Post. This library reference is an update of the combination of LR-I-104 and USPS-T-26, Appendix I, filed in Docket No. R2000-1.

Witness Eggleston (USPS-T-25) is sponsoring this Category 2 library reference. Witness Eggleston and Witness Kiefer (USPS-T-33) use the results from this analysis.

Section A
Description of the Cube-Weight Relationship Estimation

I. Description

The purpose of Section A of this library references is to describe how the estimated cubic feet per piece by weight increment (cube-weight relationships) are calculated for Inter-BMC, Intra-BMC and Parcel Select. Using data from USPS LR-I-67 the cubic feet per piece by weight increment for each rate category were estimated using the weighted least squares method of estimation. The econometric methods used to estimate the cube-weight relationships in this docket are identical to those employed in Docket No. R2000-1.

II. Inputs

The only input data necessary to estimate the cube-weight relationship for each rate category are the total cubic feet and total volume by each weight increment for each rate category of Parcel Post. Again, the input data was obtained from USPS LR-I-67. A complete listing of the input data can be found on pages 14-16. Using these data, several calculations are made to develop the variables that are used in the estimation. Table 1 describes each of the variables in the input data set and its source:

TABLE 1
CUBE-WEIGHT RELATIONSHIP INPUT VARIABLES

Variable Name	**Description**	**Source**
RATECAG	Rate category within Parcel Post.	N/A.
LBS	Weight increment.	N/A.
CF	Total cubic feet in the given weight increment.	All data are from USPS LR-I-67
PCS	Total volume in the given weight increment.	All data are from USPS LR-I-67
CFPERPC	Cubic feet per piece in the given weight increment.	CF / PCS.
LNLBS	The natural log of the weight increment.	LN(LBS).
LNLBS2	The natural log of the weight increment, squared.	$LN(LBS)^2$.
LNCFPPC	The natural log of cubic feet per piece.	LN(CFPERPC).

All of the above data serve as inputs into the estimation of the cube-weight relationships and are shown on pages 18 and 19 (inter-BMC), pages 25 and 26 (intra-BMC), and pages 32 and 33 (Parcel Select).

III. Estimation

Three separate cube-weight relationships are estimated: Inter-BMC, Intra-BMC and Parcel Select.[1] The model used to estimate each relationship is the same as the model recommended by the Commission in Docket No. R94-1.[2] The model is a translog model with the dependent variable being LNCFPPC and the independent variables being LNLBS and LNLBS2. Thus the model has the form:

$$\ln\left(cf \,/\, pc_i\right) = a + b\left[\ln\left(lbs_i\right)\right] + c\left[\ln\left(lbs_i\right)\right]^2 \qquad (1)$$

Where the "*i*" subscript represents the weight increment (2 through 70). Because the dependent variable represents the average cubic feet per piece for a given weight increment, "cf/pc_i" can be written as:

$$cf \,/\, pc_i = \frac{\sum_{j=1}^{j=pcs_i} cf_j}{pcs_i} \qquad (2)$$

Where "pcs_i" is the total number of pieces in weight increment "*i*", "cf_j" is the number of cubic feet for the "j^{th}" parcel in weight increment "*i*". Therefore, the average cubic feet per piece in weight increment "*i*" is the sum of the cubic feet of all the parcels in weight increment "*i*" divided by the number of pieces in weight increment "*i*".

When estimating a relationship where each observation of the dependent variable represents an average of data (in this case pieces in each weight increment), the proper estimation technique is a form of weighted least squares using volume (pcs_i) as the weighting variable.[3] For example, the average cubic feet per piece for a parcel in

[1] Currently there is no data available to estimate a cube-weight relationship for each of the three Parcel Select rate categories (DBMC, DSCF and DDU).
[2] PRC Op., Docket No. R94-1, page V-116.
[3] For a discussion of why weighted least squares is appropriate when dealing with pooled data, please see J. Johnston, *Econometric Methods* 293-296 (McGraw-Hill 1984).

the two-pound weight increment is determined by taking the average of millions of parcels. The average cubic feet per piece for a parcel in the 70-pound weight increment is the average of only thousands of parcels; the relative number of pieces from which each average is calculated needs to be accounted for in the model.

Using weighted least squares is relatively straightforward. First, the regression equation must be weighted using the appropriate variable. Then, ordinary least squares (OLS) can be used to estimate the weighted model. In estimating the cube-weight relationship in Parcel Post using weighted least squares, Equation 1 is transformed to the following:

$$\ln\left(cf \;/\; pc_i\right)\sqrt{pcs_i} = a\sqrt{pcs_i} + b\left[\ln\left(lbs_i\right)\right]\sqrt{pcs_i} + c\left[\ln\left(lbs_i\right)\right]^2\sqrt{pcs_i} \qquad (3)$$

The parameter estimates and analysis of variance for the inter-BMC, intra-BMC, and Parcel Select regressions are shown on pages 20, 27, and 34, respectively. The parameter estimates are used in the Parcel Post analysis on page 1 Attachment B. The statistics associated with the results are summarized in the following table:

	Inter-BMC	**Intra-BMC**	**DBMC**
Intercept t-stat	-85396	-76.74	-63.03
LNLBS t-stat	38.69	33.76	27.23
LNLBS2 t-stat	-13.25	-12.98	-6.32
R-square	.9950	.9913	.9917
Adjusted R-square	.9949	.9910	.9915

In all three relationships, all of the dependent variables, including the intercepts, were significant at the 99 percent level. In addition, in all three relationships, the equation itself is significant at the 99 percent level.

Pages 21 and 22, 28 and 29, and 35 and 36 show the results of the inter-BMC, intra-BMC, and Parcel Select regressions for all observations respectively. Pages 24, 31, and 38 show a plot of the actual values of cubic feet per piece by weight increment

and the predicted values of cubic feet per piece by weight increment for inter-BMC, intra-BMC and Parcel Select respectively.

Finally, page 39 shows a summary of the estimated cubic feet per piece for all three categories. The SAS program code and log file that were used to produce the estimates of the cube-weight relationships for each rate category are included in pages 40-46. All input data, programs, and output are available on diskette included in this library reference.

Section B

I. Requirements of Statistical Studies

I. Requirements of Statistical Studies

A. For each econometric study:

1. A presentation of the economic theory underlying the study:

The purpose of this econometric analysis is to estimate the relationship between the volume (cubic feet) and the weight of parcels in each rate category of Parcel Post. The results of this regression are used in the development of unit transportation costs for Parcel Post. Because this relationship is only relevant within the narrow scope of Parcel Post, there is no general economic theory that would apply.

2. A complete description of:

a. the econometric model(s):

See Section A.

b. the reasons for each major assumption and specification:

See Section A

3. The definition of the variables selected and the justification for their selection:

See Section A

4. For any alternative model whose computed econometric results influenced the choice of the preferred model:

No alternative models were used.

5. A reference to a detailed description in a text, manual, or technical journal:

See Section A (footnote 3).

6. For all input data:

a. Summary descriptions and source citations:

See Table 1 in Section A

b. *A complete listing of the data:*

See pages 14-16 in this section of this library reference for a listing of the raw input data.

c. Complete descriptions of any alterations or transformations made to the data as received from the original sources:

See Table 1 in Section A for a description of the transformations made to the input variables.

7. A complete report of the econometric results, including, where applicable,

a. Coefficient estimates:

See page 20 (inter-BMC), page 27 (intra-BMC), and page 34 (Parcel Select).

b. *Standard errors and t-values:*

See page 20 (inter-BMC), page 27 (intra-BMC), and page 34 (Parcel Select).

c. *Goodness-of-fit statistics:*

See page 20 (inter-BMC), page 27 (intra-BMC), and page 34 (Parcel Select).

d. *Other appropriate test statistics:*

See page 20 (inter-BMC), page 27 (intra-BMC), and page 34 (Parcel Select).

e. *The variance/covariance matrix of the estimates:*

See page 23 (inter-BMC), page 30 (intra-BMC), and page 37 (Parcel Select).

f. Computed residuals for results:

See pages 21 and 22 (inter-BMC), pages 28 and 29 (intra-BMC), and pages 35 and 36 (Parcel Select).

8. Descriptions of all statistical tests of hypotheses and the results of such tests:

See Section A

Section B
II. Requirements of Computer Analysis Relied Upon

Program Name: CF_LBS.SAS

A. *A general description of the program that includes:*

1. *Objective of the program:*

   The objective of this program is to estimate the relationship between volume (cubic feet) and weight within the three rate categories of Parcel Post. The relationships are estimated using regression analysis.

2. *Processing tasks performed:*

   This program performs the following processing tasks:
   - read in raw data for each rate category,
   - create necessary regression variables,
   - regress the specified regression model,
   - format and print the results.

3. *Methods and procedures employed:*

   See Section V, pages 40-46 for a listing of the source code for this program.

4. *A listing of the input and output data:*

   See Section III, pages 14-16 for a listing of the input data.

   See Section IV, pages 18-39 for a listing of the output data.

5. *A listing of the source codes:*

   See Section V, pages 40-46 for a listing of the source code for this program.

B. *For all input data:*

1. *Designation of the sources of such data:*

   See Table 1 in Section A

2. *Explanation of any modifications to such data made for use in the program:*

   The input data were transformed so that the appropriate regression model could be used. All transformations are described in Table 1 in Section A.

C. *Definitions of all input and output variables or sets of variables:*

See Table 1 in Section A.

D. *A description of input and output data file organization:*

Input data sets are fixed width ASCII text columns. Record formats can be seen in the program listing on pages 40-46. The output data for this program are all printed SAS output. The output data can be found in pages 18-39.

All input and output data, as well as the SAS program file are available on the enclosed diskette. The filenames are as follows:

- SAS program file: CF_LBS.SAS
- SAS log file: CF_LBS.LOG
- Input file: CF_LBS.PRN
- Output file: CF_LBS.LST

E. *A machine readable copy of all data bases:*

All final edited databases are available on the enclosed diskette. The only database used by this program is the input data file, CF_LBS.PRN.

F. *For all source codes, documentation sufficiently comprehensive and detailed to satisfy generally accepted software documentation standards.*

Referring to the attached program listing (pages 40-46), the following is a description of the specific functions performed by the program by line number:

Line #'s	Functions Performed
1-10:	Set system options and define input file names
11-22:	Read in all volume and cubic foot data
23-32:	Set Intra, Inter and Parcel Select data sets
33-36:	Define regression macro
37-46:	Create variables necessary for regression model
47-53:	Print the input data and data used in the regression
54-67:	Regress the log of cubic feet per piece on the log of weight and the log of weight squared using weighted least squares
68-74:	Calculate the estimated cubic feet per piece using regression results
75-81:	Print the regression results and estimated cubic feet per piece
82-89:	Create the variance/covariance matrix using the regression results
90-96:	Print the variance/covariance matrix
97-104:	Plot actual versus predicted values for cubic feet per piece
105-122:	Calculate the estimated cubic feet per piece for each weight increment
123-126:	End the regression macro
127-133:	Run the regression macro for the data from each rate category
134-145:	Merge the estimated cubic feet per piece in each rate category together to form one dataset
146-151:	Print the estimated cubic feet per piece for each rate category

G. *The source program in machine-readable form:*

The source program is available on the enclosed diskette as CF_LBS.SAS.

H. *All pertinent operating system and programming language manuals:*

SAS User's Guide: Basics. See Docket No. R94-1, USPS LR-G-135.

I. *Statistical Packages:*

PC-SAS Version 6.12

III. Listing of Input Data File “CF_LBS.PRN”

INTRA	2	2358164	10510989
INTRA	3	2211863	6167522
INTRA	4	1758706	3800536
INTRA	5	1316649	2359809
INTRA	6	1063717	1577698
INTRA	7	859419	1135668
INTRA	8	665818	791592
INTRA	9	674851	592362
INTRA	10	412176	416929
INTRA	11	292538	321331
INTRA	12	306012	288188
INTRA	13	233028	199585
INTRA	14	186106	167747
INTRA	15	233933	180349
INTRA	16	181611	144964
INTRA	17	214922	160095
INTRA	18	148627	93186
INTRA	19	138801	109093
INTRA	20	141678	100963
INTRA	21	85458	55110
INTRA	22	138816	108524
INTRA	23	128210	61183
INTRA	24	90392	57182
INTRA	25	109159	62027
INTRA	26	83319	57994
INTRA	27	86142	52445
INTRA	28	121145	46561
INTRA	29	95631	49339
INTRA	30	47340	27615
INTRA	31	62840	41755
INTRA	32	159885	59589
INTRA	33	42757	27179
INTRA	34	41478	21617
INTRA	35	53065	21989
INTRA	36	36153	22650
INTRA	37	24399	15054
INTRA	38	26359	14473
INTRA	39	37931	17122
INTRA	40	39301	17610
INTRA	41	14188	5735
INTRA	42	38150	19070
INTRA	43	17492	10246
INTRA	44	25894	11309
INTRA	45	9974	6000
INTRA	46	8241	3652
INTRA	47	20051	8725
INTRA	48	25129	9132
INTRA	49	13838	5973
INTRA	50	9688	5096
INTRA	51	8395	5767
INTRA	52	32726	10708
INTRA	53	22752	13423
INTRA	54	10575	8534
INTRA	55	14303	5358
INTRA	56	3033	3836
INTRA	57	4875	1753
INTRA	58	1167	397
INTRA	59	1810	735
INTRA	60	3051	1848
INTRA	61	822	348
INTRA	62	7684	2339
INTRA	63	2974	933
INTRA	64	12515	4408
INTRA	65	624	295
INTRA	66	3422	967
INTRA	67	1510	969
INTRA	68	806	377
INTRA	69	0	0
INTRA	70	3178	1112
INTER	2	3316983	12712489
INTER	3	3236205	8444244
INTER	4	3102373	5977151
INTER	5	2714888	4036697
INTER	6	1795962	2512204
INTER	7	1387892	1666511

INTER	8	1149815	1308002
INTER	9	1025877	1072243
INTER	10	959215	885443
INTER	11	941299	865565
INTER	12	757900	702592
INTER	13	683593	568043
INTER	14	658376	534240
INTER	15	535770	413706
INTER	16	686944	484336
INTER	17	485093	333033
INTER	18	433631	283123
INTER	19	438752	251115
INTER	20	398445	223927
INTER	21	340980	200636
INTER	22	337579	202454
INTER	23	438321	245317
INTER	24	333848	186246
INTER	25	252715	135946
INTER	26	320878	166223
INTER	27	168765	94310
INTER	28	187307	89224
INTER	29	176531	93613
INTER	30	132390	78382
INTER	31	136420	88771
INTER	32	152041	71605
INTER	33	112924	61674
INTER	34	105614	44299
INTER	35	85191	34071
INTER	36	62559	27765
INTER	37	55398	21662
INTER	38	81226	26630
INTER	39	57869	23450
INTER	40	28336	10974
INTER	41	34149	13184
INTER	42	28723	12596
INTER	43	27261	9281
INTER	44	25123	12564
INTER	45	35176	10034
INTER	46	13964	3977
INTER	47	23891	8624
INTER	48	17015	5827
INTER	49	16642	5511
INTER	50	10639	3513
INTER	51	15209	5138
INTER	52	13483	4346
INTER	53	11518	6518
INTER	54	16853	7361
INTER	55	9817	3308
INTER	56	11251	3302
INTER	57	23733	5545
INTER	58	4718	1473
INTER	59	5233	1249
INTER	60	19649	4710
INTER	61	11654	2675
INTER	62	9224	2544
INTER	63	4713	1218
INTER	64	12209	2675
INTER	65	2827	941
INTER	66	3800	1131
INTER	67	4144	1015
INTER	68	1851	512
INTER	69	2444	520
INTER	70	8338	1773
DBMC	2	21581207	70258105
DBMC	3	22575286	53984788
DBMC	4	18137805	30314371
DBMC	5	15322309	21145670
DBMC	6	12992830	14853300
DBMC	7	10541765	10971657
DBMC	8	8834155	8135180
DBMC	9	6026808	5177015
DBMC	10	5013489	3838790
DBMC	11	4325068	3328331
DBMC	12	4215388	3321381
DBMC	13	3091445	2073436

DBMC	14	2062291	1399641
DBMC	15	3068470	1625667
DBMC	16	2623540	1424564
DBMC	17	2248284	1082578
DBMC	18	1757686	850476
DBMC	19	1568594	740358
DBMC	20	1440336	679410
DBMC	21	1600064	664685
DBMC	22	1245736	603006
DBMC	23	1263670	532096
DBMC	24	1382679	507347
DBMC	25	688222	292934
DBMC	26	1257530	457645
DBMC	27	725803	240491
DBMC	28	767341	249273
DBMC	29	595191	203131
DBMC	30	573601	211616
DBMC	31	298677	104501
DBMC	32	285765	128075
DBMC	33	405609	147270
DBMC	34	217285	99383
DBMC	35	406293	123523
DBMC	36	234094	80584
DBMC	37	125254	42943
DBMC	38	132886	42604
DBMC	39	234877	106089
DBMC	40	72761	26718
DBMC	41	84756	28711
DBMC	42	162025	53726
DBMC	43	160711	57743
DBMC	44	162619	80278
DBMC	45	170708	74586
DBMC	46	91889	32935
DBMC	47	96356	34553
DBMC	48	39372	18111
DBMC	49	26882	9437
DBMC	50	99957	27427
DBMC	51	143928	45094
DBMC	52	4372	2288
DBMC	53	24866	20817
DBMC	54	14065	5570
DBMC	55	13799	8012
DBMC	56	10134	1936
DBMC	57	6955	2285
DBMC	58	38489	14140
DBMC	59	57537	11448
DBMC	60	30268	12954
DBMC	61	75765	26823
DBMC	62	17410	5793
DBMC	63	4359	2343
DBMC	64	2926	3902
DBMC	65	2932	938
DBMC	66	880	200
DBMC	67	8858	3057
DBMC	68	2835	1657
DBMC	69	1192	488
DBMC	70	0	0

IV. Listing of Program Output

InterBMC Cubic Feet and Volumes by Weight Increment

Obs	lbs	cf	pcs	cfperpc	lnlbs	lnlbs2	lncfppc
1	2	3316983	12712489	0.26092	0.69315	0.4805	-1.34353
2	3	3236205	8444244	0.38324	1.09861	1.2069	-0.95908
3	4	3102373	5977151	0.51904	1.38629	1.9218	-0.65578
4	5	2714888	4036697	0.67255	1.60944	2.5903	-0.39668
5	6	1795962	2512204	0.71489	1.79176	3.2104	-0.33562
6	7	1387892	1666511	0.83281	1.94591	3.7866	-0.18295
7	8	1149815	1308002	0.87906	2.07944	4.3241	-0.12890
8	9	1025877	1072243	0.95676	2.19722	4.8278	-0.04420
9	10	959215	885443	1.08332	2.30259	5.3019	0.08003
10	11	941299	865565	1.08750	2.39790	5.7499	0.08388
11	12	757900	702592	1.07872	2.48491	6.1748	0.07578
12	13	683593	568043	1.20342	2.56495	6.5790	0.18517
13	14	658376	534240	1.23236	2.63906	6.9646	0.20893
14	15	535770	413706	1.29505	2.70805	7.3335	0.25855
15	16	686944	484336	1.41832	2.77259	7.6872	0.34947
16	17	485093	333033	1.45659	2.83321	8.0271	0.37610
17	18	433631	283123	1.53160	2.89037	8.3542	0.42631
18	19	438752	251115	1.74722	2.94444	8.6697	0.55802
19	20	398445	223927	1.77935	2.99573	8.9744	0.57625
20	21	340980	200636	1.69950	3.04452	9.2691	0.53033
21	22	337579	202454	1.66744	3.09104	9.5545	0.51129
22	23	438321	245317	1.78675	3.13549	9.8313	0.58040
23	24	333848	186246	1.79251	3.17805	10.1000	0.58362
24	25	252715	135946	1.85894	3.21888	10.3612	0.62000
25	26	320878	166223	1.93041	3.25810	10.6152	0.65773
26	27	168765	94310	1.78947	3.29584	10.8625	0.58192
27	28	187307	89224	2.09929	3.33220	11.1036	0.74160
28	29	176531	93613	1.88575	3.36730	11.3387	0.63433
29	30	132390	78382	1.68904	3.40120	11.5681	0.52416
30	31	136420	88771	1.53676	3.43399	11.7923	0.42968
31	32	152041	71605	2.12333	3.46574	12.0113	0.75299
32	33	112924	61674	1.83098	3.49651	12.2256	0.60485
33	34	105614	44299	2.38412	3.52636	12.4352	0.86883
34	35	85191	34071	2.50040	3.55535	12.6405	0.91645
35	36	62559	27765	2.25316	3.58352	12.8416	0.81233
36	37	55398	21662	2.55738	3.61092	13.0387	0.93898
37	38	81226	26630	3.05017	3.63759	13.2320	1.11520
38	39	57869	23450	2.46776	3.66356	13.4217	0.90331
39	40	28336	10974	2.58210	3.68888	13.6078	0.94860
40	41	34149	13184	2.59019	3.71357	13.7906	0.95173
41	42	28723	12596	2.28033	3.73767	13.9702	0.82432
42	43	27261	9281	2.93729	3.76120	14.1466	1.07749
43	44	25123	12564	1.99960	3.78419	14.3201	0.69295
44	45	35176	10034	3.50568	3.80666	14.4907	1.25438
45	46	13964	3977	3.51119	3.82864	14.6585	1.25595
46	47	23891	8624	2.77029	3.85015	14.8236	1.01895
47	48	17015	5827	2.92003	3.87120	14.9862	1.07159

InterBMC Cubic Feet and Volumes by Weight Increment

Obs	lbs	cf	pcs	cfperpc	lnlbs	lnlbs2	lncfppc
48	49	16642	5511	3.01978	3.89182	15.1463	1.10518
49	50	10639	3513	3.02847	3.91202	15.3039	1.10806
50	51	15209	5138	2.96010	3.93183	15.4593	1.08522
51	52	13483	4346	3.10239	3.95124	15.6123	1.13217
52	53	11518	6518	1.76711	3.97029	15.7632	0.56934
53	54	16853	7361	2.28950	3.98898	15.9120	0.82833
54	55	9817	3308	2.96765	4.00733	16.0587	1.08777
55	56	11251	3302	3.40733	4.02535	16.2035	1.22593
56	57	23733	5545	4.28007	4.04305	16.3463	1.45397
57	58	4718	1473	3.20299	4.06044	16.4872	1.16408
58	59	5233	1249	4.18975	4.07754	16.6263	1.43264
59	60	19649	4710	4.17176	4.09434	16.7637	1.42834
60	61	11654	2675	4.35664	4.11087	16.8993	1.47170
61	62	9224	2544	3.62579	4.12713	17.0332	1.28807
62	63	4713	1218	3.86946	4.14313	17.1656	1.35311
63	64	12209	2675	4.56411	4.15888	17.2963	1.51822
64	65	2827	941	3.00425	4.17439	17.4255	1.10003
65	66	3800	1131	3.35986	4.18965	17.5532	1.21190
66	67	4144	1015	4.08276	4.20469	17.6794	1.40677
67	68	1851	512	3.61523	4.21951	17.8042	1.28516
68	69	2444	520	4.70000	4.23411	17.9277	1.54756
69	70	8338	1773	4.70276	4.24850	18.0497	1.54815

InterBMC Cube-Weight Relationship Regression

The REG Procedure
Model: InterBMC
Dependent Variable: lncfppc

Weight: pcs

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	16289666	8144833	6588.74	<.0001
Error	66	81587	1236.17412		
Corrected Total	68	16371253			

Root MSE	35.15927	R-Square	0.9950
Dependent Mean	-0.65152	Adj R-Sq	0.9949
Coeff Var	-5396.48052		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	-2.12581	0.02473	-85.96	<.0001
lnlbs	1	1.20624	0.03118	38.69	<.0001
lnlbs2	1	-0.11174	0.00843	-13.25	<.0001

InterBMC Cube-Weight Relationship Regression Results

Obs	cfperpc	lncfppc	predlncf	predcf	resid	l95m	u95m
1	0.26092	-1.34353	-1.34340	0.26096	-0.00013	-1.36135	-1.32544
2	0.38324	-0.95908	-0.93549	0.39239	-0.02359	-0.94750	-0.92348
3	0.51904	-0.65578	-0.66836	0.51255	0.01258	-0.68164	-0.65507
4	0.67255	-0.39668	-0.47389	0.62258	0.07721	-0.48875	-0.45903
5	0.71489	-0.33562	-0.32326	0.72379	-0.01236	-0.33909	-0.30743
6	0.83281	-0.18295	-0.20170	0.81734	0.01875	-0.21804	-0.18536
7	0.87906	-0.12890	-0.10069	0.90421	-0.02821	-0.11730	-0.08407
8	0.95676	-0.04420	-0.01490	0.98521	-0.02930	-0.03172	0.00191
9	1.08332	0.08003	0.05921	1.06100	0.02081	0.04216	0.07627
10	1.08750	0.08388	0.12412	1.13215	-0.04024	0.10671	0.14153
11	1.07872	0.07578	0.18160	1.19913	-0.10583	0.16368	0.19952
12	1.20342	0.18517	0.23298	1.26236	-0.04782	0.21439	0.25158
13	1.23236	0.20893	0.27928	1.32218	-0.07035	0.25984	0.29872
14	1.29505	0.25855	0.32128	1.37889	-0.06273	0.30084	0.34172
15	1.41832	0.34947	0.35961	1.43276	-0.01013	0.33802	0.38119
16	1.45659	0.37610	0.39476	1.48403	-0.01866	0.37192	0.41760
17	1.53160	0.42631	0.42715	1.53288	-0.00084	0.40295	0.45134
18	1.74722	0.55802	0.45711	1.57951	0.10091	0.43149	0.48274
19	1.77935	0.57625	0.48494	1.62408	0.09131	0.45782	0.51206
20	1.69950	0.53033	0.51086	1.66673	0.01947	0.48220	0.53952
21	1.66744	0.51129	0.53508	1.70759	-0.02380	0.50485	0.56531
22	1.78675	0.58040	0.55777	1.74678	0.02263	0.52594	0.58961
23	1.79251	0.58362	0.57909	1.78441	0.00453	0.54563	0.61254
24	1.85894	0.62000	0.59915	1.82056	0.02086	0.56407	0.63423
25	1.93041	0.65773	0.61807	1.85534	0.03966	0.58135	0.65479
26	1.78947	0.58192	0.63595	1.88883	-0.05403	0.59760	0.67431
27	2.09929	0.74160	0.65289	1.92108	0.08871	0.61289	0.69288
28	1.88575	0.63433	0.66895	1.95218	-0.03462	0.62732	0.71057
29	1.68904	0.52416	0.68420	1.98218	-0.16004	0.64094	0.72746
30	1.53676	0.42968	0.69871	2.01115	-0.26903	0.65383	0.74358
31	2.12333	0.75299	0.71253	2.03914	0.04046	0.66604	0.75901
32	1.83098	0.60485	0.72570	2.06619	-0.12085	0.67762	0.77379
33	2.38412	0.86883	0.73829	2.09235	0.13054	0.68861	0.78796
34	2.50040	0.91645	0.75032	2.11767	0.16613	0.69906	0.80157
35	2.25316	0.81233	0.76182	2.14218	0.05051	0.70900	0.81464
36	2.55738	0.93898	0.77285	2.16592	0.16614	0.71848	0.82722
37	3.05017	1.11520	0.78341	2.18893	0.33178	0.72751	0.83932
38	2.46776	0.90331	0.79356	2.21124	0.10976	0.73612	0.85099
39	2.58210	0.94860	0.80329	2.23288	0.14531	0.74435	0.86224
40	2.59019	0.95173	0.81265	2.25388	0.13907	0.75221	0.87310
41	2.28033	0.82432	0.82166	2.27427	0.00266	0.75973	0.88359
42	2.93729	1.07749	0.83032	2.29406	0.24716	0.76692	0.89372
43	1.99960	0.69295	0.83867	2.31329	-0.14572	0.77381	0.90353
44	3.50568	1.25438	0.84672	2.33198	0.40767	0.78042	0.91302
45	3.51119	1.25595	0.85448	2.35015	0.40148	0.78675	0.92221
46	2.77029	1.01895	0.86197	2.36781	0.15699	0.79282	0.93111
47	2.92003	1.07159	0.86920	2.38499	0.20240	0.79864	0.93975

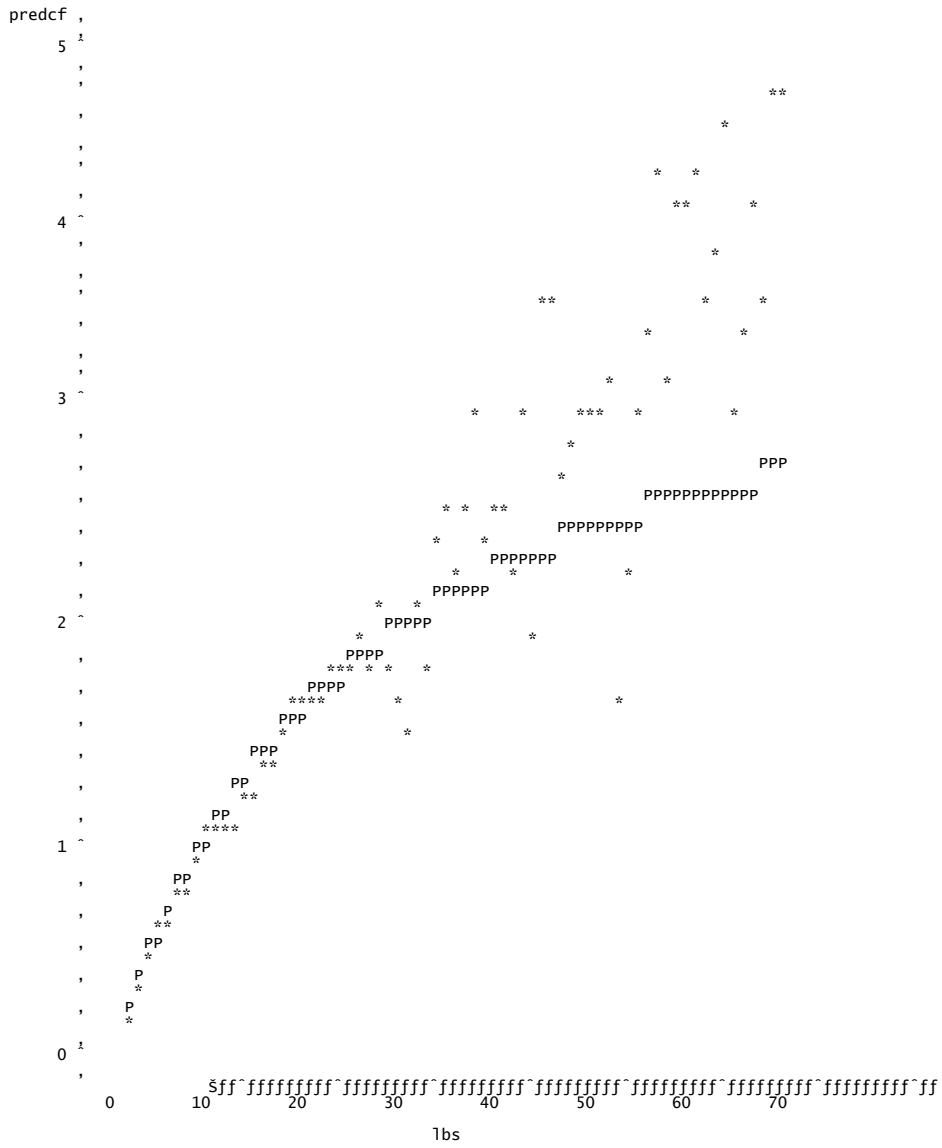
InterBMC Cube-Weight Relationship Regression Results

Obs	cfperpc	lncfppc	predlncf	predcf	resid	l95m	u95m
48	3.01978	1.10518	0.87618	2.40171	0.22900	0.80424	0.94812
49	3.02847	1.10806	0.88293	2.41798	0.22512	0.80961	0.95625
50	2.96010	1.08522	0.88946	2.43383	0.19576	0.81478	0.96415
51	3.10239	1.13217	0.89578	2.44925	0.23639	0.81974	0.97182
52	1.76711	0.56934	0.90190	2.46428	-0.33255	0.82452	0.97928
53	2.28950	0.82833	0.90782	2.47892	-0.07949	0.82911	0.98653
54	2.96765	1.08777	0.91356	2.49318	0.17421	0.83354	0.99358
55	3.40733	1.22593	0.91912	2.50708	0.30681	0.83779	1.00045
56	4.28007	1.45397	0.92451	2.52064	0.52946	0.84189	1.00713
57	3.20299	1.16408	0.92974	2.53386	0.23434	0.84584	1.01364
58	4.18975	1.43264	0.93482	2.54675	0.49782	0.84965	1.01999
59	4.17176	1.42834	0.93974	2.55933	0.48859	0.85332	1.02617
60	4.35664	1.47170	0.94453	2.57160	0.52717	0.85685	1.03220
61	3.62579	1.28807	0.94917	2.58357	0.33890	0.86026	1.03809
62	3.86946	1.35311	0.95369	2.59526	0.39943	0.86355	1.04383
63	4.56411	1.51822	0.95807	2.60667	0.56015	0.86672	1.04943
64	3.00425	1.10003	0.96234	2.61781	0.13769	0.86978	1.05490
65	3.35986	1.21190	0.96649	2.62869	0.24541	0.87273	1.06025
66	4.08276	1.40677	0.97052	2.63932	0.43625	0.87557	1.06547
67	3.61523	1.28516	0.97444	2.64969	0.31071	0.87832	1.07057
68	4.70000	1.54756	0.97826	2.65983	0.56930	0.88097	1.07555
69	4.70276	1.54815	0.98198	2.66974	0.56617	0.88353	1.08043

InterBMC Variance/Covariance Matrix

Obs	_NAME_	Intercept	lnlbs	lnlbs2
1	Intercept	0.000611638	-.000736160	0.000184012
2	lnlbs	-.000736160	0.000972202	-.000256077
3	lnlbs2	0.000184012	-.000256077	0.000071083

InterBMC Cube-Weight Relationship
Actual Versus Predicted Values of CF/Piece



IntraBMC Cubic Feet and Volumes by Weight Increment

Obs	lbs	cf	pcs	cfperpc	lnlbs	lnlbs2	lncfppc
1	2	2358164	10510989	0.22435	0.69315	0.4805	-1.49454
2	3	2211863	6167522	0.35863	1.09861	1.2069	-1.02546
3	4	1758706	3800536	0.46275	1.38629	1.9218	-0.77056
4	5	1316649	2359809	0.55795	1.60944	2.5903	-0.58349
5	6	1063717	1577698	0.67422	1.79176	3.2104	-0.39420
6	7	859419	1135668	0.75675	1.94591	3.7866	-0.27872
7	8	665818	791592	0.84111	2.07944	4.3241	-0.17303
8	9	674851	592362	1.13925	2.19722	4.8278	0.13037
9	10	412176	416929	0.98860	2.30259	5.3019	-0.01147
10	11	292538	321331	0.91039	2.39790	5.7499	-0.09388
11	12	306012	288188	1.06185	2.48491	6.1748	0.06001
12	13	233028	199585	1.16756	2.56495	6.5790	0.15492
13	14	186106	167747	1.10944	2.63906	6.9646	0.10386
14	15	233933	180349	1.29711	2.70805	7.3335	0.26014
15	16	181611	144964	1.25280	2.77259	7.6872	0.22538
16	17	214922	160095	1.34247	2.83321	8.0271	0.29451
17	18	148627	93186	1.59495	2.89037	8.3542	0.46684
18	19	138801	109093	1.27232	2.94444	8.6697	0.24084
19	20	141678	100963	1.40327	2.99573	8.9744	0.33880
20	21	85458	55110	1.55068	3.04452	9.2691	0.43869
21	22	138816	108524	1.27913	3.09104	9.5545	0.24618
22	23	128210	61183	2.09552	3.13549	9.8313	0.73980
23	24	90392	57182	1.58078	3.17805	10.1000	0.45792
24	25	109159	62027	1.75986	3.21888	10.3612	0.56524
25	26	83319	57994	1.43668	3.25810	10.6152	0.36234
26	27	86142	52445	1.64252	3.29584	10.8625	0.49623
27	28	121145	46561	2.60186	3.33220	11.1036	0.95622
28	29	95631	49339	1.93824	3.36730	11.3387	0.66178
29	30	47340	27615	1.71429	3.40120	11.5681	0.53900
30	31	62840	41755	1.50497	3.43399	11.7923	0.40877
31	32	159885	59589	2.68313	3.46574	12.0113	0.98698
32	33	42757	27179	1.57316	3.49651	12.2256	0.45309
33	34	41478	21617	1.91877	3.52636	12.4352	0.65168
34	35	53065	21989	2.41325	3.55535	12.6405	0.88098
35	36	36153	22650	1.59616	3.58352	12.8416	0.46760
36	37	24399	15054	1.62077	3.61092	13.0387	0.48290
37	38	26359	14473	1.82125	3.63759	13.2320	0.59952
38	39	37931	17122	2.21534	3.66356	13.4217	0.79540
39	40	39301	17610	2.23174	3.68888	13.6078	0.80278
40	41	14188	5735	2.47393	3.71357	13.7906	0.90581
41	42	38150	19070	2.00052	3.73767	13.9702	0.69341
42	43	17492	10246	1.70720	3.76120	14.1466	0.53486
43	44	25894	11309	2.28968	3.78419	14.3201	0.82841
44	45	9974	6000	1.66233	3.80666	14.4907	0.50822
45	46	8241	3652	2.25657	3.82864	14.6585	0.81385
46	47	20051	8725	2.29811	3.85015	14.8236	0.83209
47	48	25129	9132	2.75175	3.87120	14.9862	1.01224

IntraBMC Cubic Feet and Volumes by Weight Increment

Obs	lbs	cf	pcs	cfperpc	lnlbs	lnlbs2	lncfppc
48	49	13838	5973	2.31676	3.89182	15.1463	0.84017
49	50	9688	5096	1.90110	3.91202	15.3039	0.64243
50	51	8395	5767	1.45570	3.93183	15.4593	0.37548
51	52	32726	10708	3.05622	3.95124	15.6123	1.11718
52	53	22752	13423	1.69500	3.97029	15.7632	0.52768
53	54	10575	8534	1.23916	3.98898	15.9120	0.21443
54	55	14303	5358	2.66947	4.00733	16.0587	0.98188
55	56	3033	3836	0.79067	4.02535	16.2035	-0.23488
56	57	4875	1753	2.78095	4.04305	16.3463	1.02279
57	58	1167	397	2.93955	4.06044	16.4872	1.07826
58	59	1810	735	2.46259	4.07754	16.6263	0.90121
59	60	3051	1848	1.65097	4.09434	16.7637	0.50137
60	61	822	348	2.36207	4.11087	16.8993	0.85954
61	62	7684	2339	3.28516	4.12713	17.0332	1.18942
62	63	2974	933	3.18757	4.14313	17.1656	1.15926
63	64	12515	4408	2.83916	4.15888	17.2963	1.04351
64	65	624	295	2.11525	4.17439	17.4255	0.74918
65	66	3422	967	3.53878	4.18965	17.5532	1.26378
66	67	1510	969	1.55831	4.20469	17.6794	0.44360
67	68	806	377	2.13793	4.21951	17.8042	0.75984
68	70	3178	1112	2.85791	4.24850	18.0497	1.05009

IntraBMC Cube-Weight Relationship Regression

The REG Procedure
Model: IntraBMC
Dependent Variable: lncfppc

Weight: pcs

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	10458706	5229353	3684.51	<.0001
Error	65	92253	1419.28222		
Corrected Total	67	10550959			

Root MSE	37.67336	R-Square	0.9913
Dependent Mean	-0.88013	Adj R-Sq	0.9910
Coeff Var	-4280.42405		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	-2.35563	0.03070	-76.74	<.0001
lnlbs	1	1.34863	0.03995	33.76	<.0001
lnlbs2	1	-0.14274	0.01099	-12.98	<.0001

IntraBMC Cube-Weight Relationship Regression Results

Obs	cfperpc	lncfppc	predlncf	predcf	resid	l95m	u95m
1	0.22435	-1.49454	-1.48940	0.22551	-0.00513	-1.51088	-1.46793
2	0.35863	-1.02546	-1.04628	0.35124	0.02082	-1.06154	-1.03102
3	0.46275	-0.77056	-0.76034	0.46751	-0.01022	-0.77818	-0.74251
4	0.55795	-0.58349	-0.55482	0.57417	-0.02867	-0.57513	-0.53452
5	0.67422	-0.39420	-0.39745	0.67203	0.00326	-0.41934	-0.37557
6	0.75675	-0.27872	-0.27180	0.76200	-0.00692	-0.29469	-0.24892
7	0.84111	-0.17303	-0.16844	0.84498	-0.00459	-0.19206	-0.14483
8	1.13925	0.13037	-0.08150	0.92173	0.21187	-0.10577	-0.05723
9	0.98860	-0.01147	-0.00708	0.99294	-0.00438	-0.03208	0.01791
10	0.91039	-0.09388	0.05751	1.05920	-0.15139	0.03165	0.08337
11	1.06185	0.06001	0.11421	1.12099	-0.05420	0.08731	0.14111
12	1.16756	0.15492	0.16446	1.17876	-0.00954	0.13633	0.19259
13	1.10944	0.10386	0.20936	1.23289	-0.10550	0.17982	0.23890
14	1.29711	0.26014	0.24974	1.28370	0.01040	0.21863	0.28086
15	1.25280	0.22538	0.28629	1.33148	-0.06091	0.25346	0.31912
16	1.34247	0.29451	0.31954	1.37650	-0.02504	0.28488	0.35421
17	1.59495	0.46684	0.34993	1.41897	0.11691	0.31334	0.38652
18	1.27232	0.24084	0.37782	1.45910	-0.13698	0.33922	0.41642
19	1.40327	0.33880	0.40350	1.49706	-0.06470	0.36284	0.44417
20	1.55068	0.43869	0.42723	1.53301	0.01146	0.38446	0.47001
21	1.27913	0.24618	0.44923	1.56711	-0.20305	0.40431	0.49415
22	2.09552	0.73980	0.46967	1.59947	0.27013	0.42258	0.51676
23	1.58078	0.45792	0.48871	1.63022	-0.03080	0.43944	0.53799
24	1.75986	0.56524	0.50649	1.65946	0.05874	0.45503	0.55796
25	1.43668	0.36234	0.52313	1.68730	-0.16079	0.46947	0.57679
26	1.64252	0.49623	0.53872	1.71381	-0.04249	0.48286	0.59457
27	2.60186	0.95622	0.55336	1.73908	0.40287	0.49531	0.61140
28	1.93824	0.66178	0.56713	1.76319	0.09466	0.50690	0.62735
29	1.71429	0.53900	0.58009	1.78620	-0.04110	0.51770	0.64249
30	1.50497	0.40877	0.59232	1.80818	-0.18355	0.52777	0.65687
31	2.68313	0.98698	0.60387	1.82919	0.38311	0.53718	0.67056
32	1.57316	0.45309	0.61479	1.84927	-0.16170	0.54597	0.68361
33	1.91877	0.65168	0.62512	1.86848	0.02656	0.55419	0.69606
34	2.41325	0.88098	0.63492	1.88686	0.24606	0.56189	0.70794
35	1.59616	0.46760	0.64420	1.90446	-0.17660	0.56910	0.71931
36	1.62077	0.48290	0.65302	1.92132	-0.17012	0.57585	0.73018
37	1.82125	0.59952	0.66139	1.93748	-0.06186	0.58218	0.74059
38	2.21534	0.79540	0.66935	1.95296	0.12606	0.58812	0.75058
39	2.23174	0.80278	0.67692	1.96781	0.12586	0.59369	0.76016
40	2.47393	0.90581	0.68413	1.98205	0.22168	0.59891	0.76935
41	2.00052	0.69341	0.69100	1.99571	0.00241	0.60381	0.77819
42	1.70720	0.53486	0.69755	2.00882	-0.16269	0.60841	0.78668
43	2.28968	0.82841	0.70379	2.02140	0.12462	0.61273	0.79486
44	1.66233	0.50822	0.70975	2.03348	-0.20153	0.61677	0.80273
45	2.25657	0.81385	0.71544	2.04508	0.09841	0.62057	0.81031
46	2.29811	0.83209	0.72087	2.05622	0.11122	0.62412	0.81761
47	2.75175	1.01224	0.72606	2.06691	0.28618	0.62745	0.82466

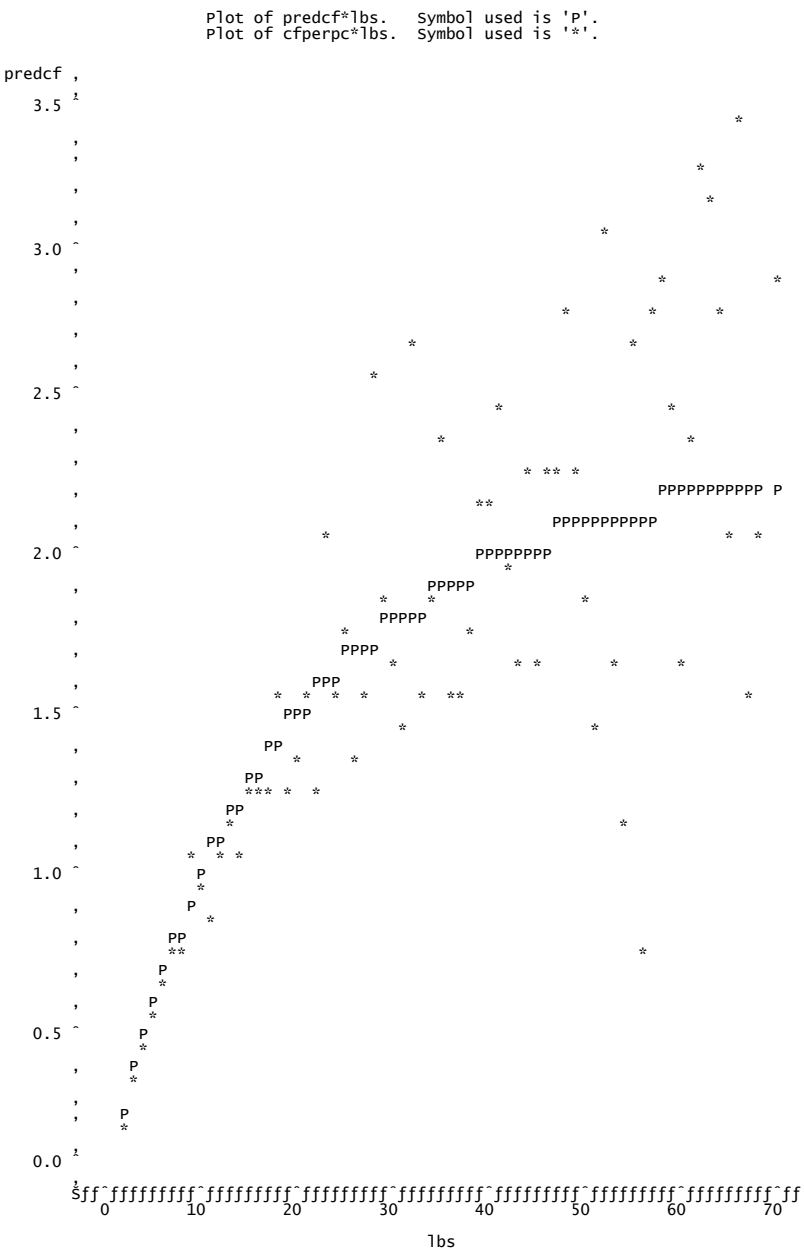
IntraBMC Cube-Weight Relationship Regression Results

Obs	cfperpc	lncfppc	predlncf	predcf	resid	l95m	u95m
48	2.31676	0.84017	0.73102	2.07719	0.10915	0.63057	0.83146
49	1.90110	0.64243	0.73576	2.08706	-0.09333	0.63349	0.83803
50	1.45570	0.37548	0.74029	2.09655	-0.36481	0.63622	0.84437
51	3.05622	1.11718	0.74463	2.10566	0.37255	0.63876	0.85050
52	1.69500	0.52768	0.74878	2.11442	-0.22110	0.64114	0.85642
53	1.23916	0.21443	0.75275	2.12284	-0.53832	0.64336	0.86215
54	2.66947	0.98188	0.75656	2.13092	0.22532	0.64542	0.86769
55	0.79067	-0.23488	0.76020	2.13870	-0.99507	0.64733	0.87306
56	2.78095	1.02279	0.76368	2.14616	0.25911	0.64911	0.87825
57	2.93955	1.07826	0.76702	2.15334	0.31124	0.65075	0.88329
58	2.46259	0.90121	0.77022	2.16023	0.13099	0.65227	0.88816
59	1.65097	0.50137	0.77328	2.16686	-0.27191	0.65367	0.89289
60	2.36207	0.85954	0.77621	2.17322	0.08333	0.65495	0.89747
61	3.28516	1.18942	0.77902	2.17934	0.41040	0.65612	0.90192
62	3.18757	1.15926	0.78171	2.18521	0.37755	0.65719	0.90623
63	2.83916	1.04351	0.78429	2.19084	0.25922	0.65816	0.91041
64	2.11525	0.74918	0.78675	2.19625	-0.03758	0.65903	0.91448
65	3.53878	1.26378	0.78912	2.20145	0.47467	0.65981	0.91842
66	1.55831	0.44360	0.79138	2.20643	-0.34778	0.66051	0.92225
67	2.13793	0.75984	0.79354	2.21122	-0.03370	0.66112	0.92597
68	2.85791	1.05009	0.79760	2.22020	0.25249	0.66210	0.93310

IntraBMC Variance/Covariance Matrix

Obs	_NAME_	Intercept	lnlbs	lnlbs2
1	Intercept	0.000942346	-.001169483	0.000294722
2	lnlbs	-.001169483	0.001595693	-.000425247
3	lnlbs2	0.000294722	-.000425247	0.000120863

IntraBMC Cube-Weight Relationship
Actual Versus Predicted Values of CF/Piece



DBMC Cubic Feet and Volumes by Weight Increment

Obs	lbs	cf	pcs	cfperpc	lnlbs	lnlbs2	lncfppc
1	2	21581207	70258105	0.30717	0.69315	0.4805	-1.18035
2	3	22575286	53984788	0.41818	1.09861	1.2069	-0.87185
3	4	18137805	30314371	0.59832	1.38629	1.9218	-0.51362
4	5	15322309	21145670	0.72461	1.60944	2.5903	-0.32213
5	6	12992830	14853300	0.87474	1.79176	3.2104	-0.13382
6	7	10541765	10971657	0.96082	1.94591	3.7866	-0.03997
7	8	8834155	8135180	1.08592	2.07944	4.3241	0.08243
8	9	6026808	5177015	1.16415	2.19722	4.8278	0.15199
9	10	5013489	3838790	1.30601	2.30259	5.3019	0.26697
10	11	4325068	3328331	1.29947	2.39790	5.7499	0.26196
11	12	4215388	3321381	1.26917	2.48491	6.1748	0.23836
12	13	3091445	2073436	1.49098	2.56495	6.5790	0.39943
13	14	2062291	1399641	1.47344	2.63906	6.9646	0.38760
14	15	3068470	1625667	1.88751	2.70805	7.3335	0.63526
15	16	2623540	1424564	1.84164	2.77259	7.6872	0.61066
16	17	2248284	1082578	2.07679	2.83321	8.0271	0.73082
17	18	1757686	850476	2.06671	2.89037	8.3542	0.72596
18	19	1568594	740358	2.11870	2.94444	8.6697	0.75080
19	20	1440336	679410	2.11998	2.99573	8.9744	0.75141
20	21	1600064	664685	2.40725	3.04452	9.2691	0.87849
21	22	1245736	603006	2.06588	3.09104	9.5545	0.72555
22	23	1263670	532096	2.37489	3.13549	9.8313	0.86495
23	24	1382679	507347	2.72531	3.17805	10.1000	1.00258
24	25	688222	292934	2.34941	3.21888	10.3612	0.85416
25	26	1257530	457645	2.74783	3.25810	10.6152	1.01081
26	27	725803	240491	3.01800	3.29584	10.8625	1.10460
27	28	767341	249273	3.07832	3.33220	11.1036	1.12438
28	29	595191	203131	2.93008	3.36730	11.3387	1.07503
29	30	573601	211616	2.71057	3.40120	11.5681	0.99716
30	31	298677	104501	2.85813	3.43399	11.7923	1.05017
31	32	285765	128075	2.23123	3.46574	12.0113	0.80255
32	33	405609	147270	2.75419	3.49651	12.2256	1.01312
33	34	217285	99383	2.18634	3.52636	12.4352	0.78223
34	35	406293	123523	3.28921	3.55535	12.6405	1.19065
35	36	234094	80584	2.90497	3.58352	12.8416	1.06642
36	37	125254	42943	2.91675	3.61092	13.0387	1.07047
37	38	132886	42604	3.11910	3.63759	13.2320	1.13754
38	39	234877	106089	2.21396	3.66356	13.4217	0.79478
39	40	72761	26718	2.72330	3.68888	13.6078	1.00184
40	41	84756	28711	2.95204	3.71357	13.7906	1.08250
41	42	162025	53726	3.01577	3.73767	13.9702	1.10385
42	43	160711	57743	2.78321	3.76120	14.1466	1.02361
43	44	162619	80278	2.02570	3.78419	14.3201	0.70591
44	45	170708	74586	2.28874	3.80666	14.4907	0.82800
45	46	91889	32935	2.79001	3.82864	14.6585	1.02605
46	47	96356	34553	2.78864	3.85015	14.8236	1.02556
47	48	39372	18111	2.17393	3.87120	14.9862	0.77654

DBMC Cubic Feet and Volumes by Weight Increment

Obs	lbs	cf	pcs	cfperpc	lnlbs	lnlbs2	lncfppc
48	49	26882	9437	2.84857	3.89182	15.1463	1.04682
49	50	99957	27427	3.64447	3.91202	15.3039	1.29321
50	51	143928	45094	3.19173	3.93183	15.4593	1.16056
51	52	4372	2288	1.91084	3.95124	15.6123	0.64754
52	53	24866	20817	1.19450	3.97029	15.7632	0.17773
53	54	14065	5570	2.52513	3.98898	15.9120	0.92629
54	55	13799	8012	1.72229	4.00733	16.0587	0.54366
55	56	10134	1936	5.23450	4.02535	16.2035	1.65527
56	57	6955	2285	3.04376	4.04305	16.3463	1.11309
57	58	38489	14140	2.72199	4.06044	16.4872	1.00136
58	59	57537	11448	5.02594	4.07754	16.6263	1.61461
59	60	30268	12954	2.33658	4.09434	16.7637	0.84869
60	61	75765	26823	2.82463	4.11087	16.8993	1.03838
61	62	17410	5793	3.00535	4.12713	17.0332	1.10039
62	63	4359	2343	1.86044	4.14313	17.1656	0.62081
63	64	2926	3902	0.74987	4.15888	17.2963	-0.28785
64	65	2932	938	3.12580	4.17439	17.4255	1.13969
65	66	880	200	4.40000	4.18965	17.5532	1.48160
66	67	8858	3057	2.89761	4.20469	17.6794	1.06389
67	68	2835	1657	1.71092	4.21951	17.8042	0.53703
68	69	1192	488	2.44262	4.23411	17.9277	0.89307

DBMC Cube-Weight Relationship Regression

The REG Procedure
Model: DBMC
Dependent Variable: lncfppc

Weight: pcs

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	76875790	38437895	3898.01	<.0001
Error	65	640959	9860.91272		
Corrected Total	67	77516749			

Root MSE	99.30213	R-Square	0.9917
Dependent Mean	-0.58091	Adj R-Sq	0.9915
Coeff Var	-17094		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	-1.94356	0.03133	-62.03	<.0001
lnlbs	1	1.11700	0.04101	27.23	<.0001
lnlbs2	1	-0.07431	0.01175	-6.32	<.0001

DBMC Cube-Weight Relationship Regression Results

Obs	cfperpc	lncfppc	predlncf	predcf	resid	l95m	u95m
1	0.30717	-1.18035	-1.20502	0.29969	0.02467	-1.22661	-1.18343
2	0.41818	-0.87185	-0.80610	0.44660	-0.06575	-0.82055	-0.79165
3	0.59832	-0.51362	-0.53788	0.58398	0.02426	-0.55421	-0.52156
4	0.72461	-0.32213	-0.33830	0.71298	0.01618	-0.35658	-0.32003
5	0.87474	-0.13382	-0.18073	0.83466	0.04691	-0.20019	-0.16127
6	0.96082	-0.03997	-0.05136	0.94994	0.01139	-0.07156	-0.03115
7	1.08592	0.08243	0.05785	1.05956	0.02457	0.03701	0.07870
8	1.16415	0.15199	0.15199	1.16414	0.00000	0.13040	0.17358
9	1.30601	0.26697	0.23444	1.26421	0.03253	0.21188	0.25701
10	1.29947	0.26196	0.30761	1.36018	-0.04566	0.28379	0.33144
11	1.26917	0.23836	0.37324	1.45243	-0.13487	0.34786	0.39861
12	1.49098	0.39943	0.43261	1.54127	-0.03318	0.40543	0.45979
13	1.47344	0.38760	0.48673	1.62698	-0.09913	0.45752	0.51593
14	1.88751	0.63526	0.53638	1.70980	0.09888	0.50498	0.56778
15	1.84164	0.61066	0.58218	1.78994	0.02848	0.54845	0.61592
16	2.07679	0.73082	0.62465	1.86759	0.10617	0.58847	0.66082
17	2.06671	0.72596	0.66418	1.94290	0.06177	0.62549	0.70287
18	2.11870	0.75080	0.70113	2.01604	0.04967	0.65987	0.74239
19	2.11998	0.75141	0.73579	2.08712	0.01562	0.69193	0.77965
20	2.40725	0.87849	0.76839	2.15628	0.11010	0.72190	0.81487
21	2.06588	0.72555	0.79914	2.22362	-0.07358	0.75002	0.84826
22	2.37489	0.86495	0.82822	2.28925	0.03673	0.77647	0.87998
23	2.72531	1.00258	0.85580	2.35325	0.14679	0.80141	0.91018
24	2.34941	0.85416	0.88199	2.41570	-0.02782	0.82498	0.93899
25	2.74783	1.01081	0.90692	2.47669	0.10389	0.84731	0.96653
26	3.01800	1.10460	0.93070	2.53628	0.17390	0.86850	0.99290
27	3.07832	1.12438	0.95341	2.59454	0.17097	0.88864	1.01817
28	2.93008	1.07503	0.97513	2.65152	0.09990	0.90782	1.04245
29	2.71057	0.99716	0.99595	2.70730	0.00121	0.92612	1.06579
30	2.85813	1.05017	1.01592	2.76191	0.03424	0.94359	1.08826
31	2.23123	0.80255	1.03511	2.81541	-0.23255	0.96030	1.10992
32	2.75419	1.01312	1.05356	2.86784	-0.04044	0.97630	1.13082
33	2.18634	0.78223	1.07133	2.91925	-0.28910	0.99164	1.15101
34	3.28921	1.19065	1.08845	2.96967	0.10220	1.00637	1.17053
35	2.90497	1.06642	1.10497	3.01915	-0.03855	1.02052	1.18943
36	2.91675	1.07047	1.12093	3.06771	-0.05046	1.03413	1.20773
37	3.11910	1.13754	1.13635	3.11539	0.00119	1.04723	1.22548
38	2.21396	0.79478	1.15128	3.16223	-0.35649	1.05986	1.24270
39	2.72330	1.00184	1.16572	3.20824	-0.16388	1.07203	1.25942
40	2.95204	1.08250	1.17972	3.25347	-0.09723	1.08378	1.27566
41	3.01577	1.10385	1.19330	3.29794	-0.08944	1.09514	1.29146
42	2.78321	1.02361	1.20647	3.34166	-0.18286	1.10611	1.30683
43	2.02570	0.70591	1.21926	3.38467	-0.51334	1.11672	1.32179
44	2.28874	0.82800	1.23168	3.42699	-0.40368	1.12700	1.33637
45	2.79001	1.02605	1.24376	3.46864	-0.21772	1.13695	1.35058
46	2.78864	1.02556	1.25551	3.50964	-0.22996	1.14659	1.36444
47	2.17393	0.77654	1.26695	3.55001	-0.49042	1.15594	1.37796

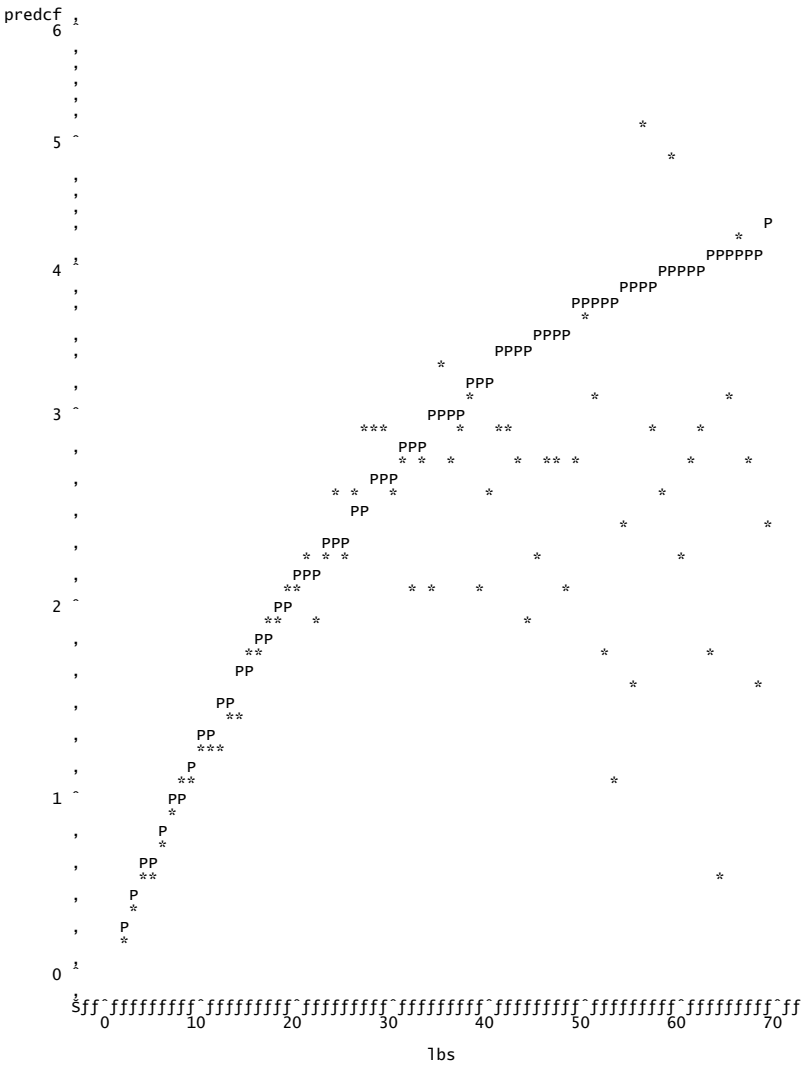
DBMC Cube-Weight Relationship Regression Results

Obs	cfperpc	lncfppc	predlncf	predcf	resid	l95m	u95m
48	2.84857	1.04682	1.27809	3.58977	-0.23127	1.16502	1.39116
49	3.64447	1.29321	1.28894	3.62893	0.00427	1.17383	1.40405
50	3.19173	1.16056	1.29952	3.66752	-0.13895	1.18238	1.41665
51	1.91084	0.64754	1.30983	3.70555	-0.66229	1.19070	1.42897
52	1.19450	0.17773	1.31990	3.74303	-1.14216	1.19878	1.44101
53	2.52513	0.92629	1.32972	3.77998	-0.40342	1.20664	1.45280
54	1.72229	0.54366	1.33931	3.81642	-0.79566	1.21429	1.46433
55	5.23450	1.65527	1.34868	3.85235	0.30659	1.22174	1.47563
56	3.04376	1.11309	1.35784	3.88779	-0.24475	1.22899	1.48669
57	2.72199	1.00136	1.36680	3.92276	-0.36543	1.23606	1.49753
58	5.02594	1.61461	1.37555	3.95726	0.23906	1.24295	1.50816
59	2.33658	0.84869	1.38412	3.99131	-0.53543	1.24966	1.51858
60	2.82463	1.03838	1.39250	4.02492	-0.35413	1.25621	1.52880
61	3.00535	1.10039	1.40071	4.05810	-0.30032	1.26260	1.53882
62	1.86044	0.62081	1.40875	4.09085	-0.78794	1.26884	1.54867
63	0.74987	-0.28785	1.41663	4.12320	-1.70448	1.27493	1.55833
64	3.12580	1.13969	1.42435	4.15514	-0.28466	1.28088	1.56781
65	4.40000	1.48160	1.43191	4.18669	0.04969	1.28669	1.57713
66	2.89761	1.06389	1.43933	4.21786	-0.37544	1.29237	1.58629
67	1.71092	0.53703	1.44660	4.24865	-0.90957	1.29792	1.59529
68	2.44262	0.89307	1.45374	4.27908	-0.56067	1.30334	1.60413

DBMC Variance/Covariance Matrix

Obs	_NAME_	Intercept	lnlbs	lnlbs2
1	Intercept	0.000981615	-.001229276	0.000323586
2	lnlbs	-.001229276	0.001682158	-.000467851
3	lnlbs2	0.000323586	-.000467851	0.000138041

DBMC Cube-Weight Relationship
Actual Versus Predicted Values of CF/Piece



Estimated Cube-Weight Relationship for Each Rate Category

LBS	Inter BMC	Intra BMC	DBMC
2	0.26096	0.22551	0.29969
3	0.39239	0.35124	0.44660
4	0.51255	0.46751	0.58398
5	0.62258	0.57417	0.71298
6	0.72379	0.67203	0.83466
7	0.81734	0.76200	0.94994
8	0.90421	0.84498	1.05956
9	0.98521	0.92173	1.16414
10	1.06100	0.99294	1.26421
11	1.13215	1.05920	1.36018
12	1.19913	1.12099	1.45243
13	1.26236	1.17876	1.54127
14	1.32218	1.23289	1.62698
15	1.37889	1.28370	1.70980
16	1.43276	1.33148	1.78994
17	1.48403	1.37650	1.86759
18	1.53288	1.41897	1.94290
19	1.57951	1.45910	2.01604
20	1.62408	1.49706	2.08712
21	1.66673	1.53301	2.15628
22	1.70759	1.56711	2.22362
23	1.74678	1.59947	2.28925
24	1.78441	1.63022	2.35325
25	1.82056	1.65946	2.41570
26	1.85534	1.68730	2.47669
27	1.88883	1.71381	2.53628
28	1.92108	1.73908	2.59454
29	1.95218	1.76319	2.65152
30	1.98218	1.78620	2.70730
31	2.01115	1.80818	2.76191
32	2.03914	1.82919	2.81541
33	2.06619	1.84927	2.86784
34	2.09235	1.86848	2.91925
35	2.11767	1.88686	2.96967
36	2.14218	1.90446	3.01915
37	2.16592	1.92132	3.06771
38	2.18893	1.93748	3.11539
39	2.21124	1.95296	3.16223
40	2.23288	1.96781	3.20824
41	2.25388	1.98205	3.25347
42	2.27427	1.99571	3.29794
43	2.29406	2.00882	3.34166
44	2.31329	2.02140	3.38467
45	2.33198	2.03348	3.42699
46	2.35015	2.04508	3.46864
47	2.36781	2.05622	3.50964
48	2.38499	2.06691	3.55001
49	2.40171	2.07719	3.58977
50	2.41798	2.08706	3.62893
51	2.43383	2.09655	3.66752
52	2.44925	2.10566	3.70555
53	2.46428	2.11442	3.74303
54	2.47892	2.12284	3.77998
55	2.49318	2.13092	3.81642
56	2.50708	2.13870	3.85235
57	2.52064	2.14616	3.88779
58	2.53386	2.15334	3.92276
59	2.54675	2.16023	3.95726
60	2.55933	2.16686	3.99131
61	2.57160	2.17322	4.02492
62	2.58357	2.17934	4.05810
63	2.59526	2.18521	4.09085
64	2.60667	2.19084	4.12320
65	2.61781	2.19625	4.15514
66	2.62869	2.20145	4.18669
67	2.63932	2.20643	4.21786
68	2.64969	2.21122	4.24865
69	2.65983	2.21580	4.27908
70	2.66974	2.22020	4.30915

V. Listing of SAS Log File

```
1                                          The SAS System          11:06 Wednesday, March
7, 2001

NOTE: Copyright (c) 1999-2000 by SAS Institute Inc., Cary, NC, USA.
NOTE: SAS (r) Proprietary Software Release 8.1 (TS1M0)
      Licensed to US POSTAL SERVICE, Site 0034757225.
NOTE: This session is executing on the WIN_95  platform.
NOTE: SAS initialization used:
      real time           0.93 seconds

1
*******************************************************************************;
2
*******************************************************************************;
3          ****  CUBE-WEIGHT RELATIONSHIP ESTIMATION PROGRAMS
****;
4          ****
5
6
*******************************************************************************;
7
8          options nocenter ls=93 ps=51 nodate nonumber;
9          filename in1  'a:\cf_lbs.prn';
10
11         ****  READ IN CUBIC FOOT AND VOLUME DATA BY RATE CATEGORY AND WEIGHT;
12
13         data PPost;
14            infile in1;
15            input
16               @1  ratecag $5.
17               @15 lbs      2.
18               @18 cf      8.
19               @27 pcs     8.;
20            if pcs = 0 then delete;
21         run;

NOTE: The infile IN1 is:
      File Name=a:\cf_lbs.prn,
      RECFM=V,LRECL=256

NOTE: 207 records were read from the infile IN1.
      The minimum record length was 34.
      The maximum record length was 35.
NOTE: The data set WORK.PPOST has 205 observations and 4 variables.
NOTE: DATA statement used:
      real time           0.05 seconds

22
23         ****  CREATE 3 CATAGORIES;
24
25         data intraBMC interBMC DBMC problem;
26            set PPost;
27            if ratecag = "INTRA" then output intraBMC;
28            else if ratecag = "INTER" then output interBMC;
29            else if ratecag = "DBMC " then output DBMC;
30            drop ratecag;
31         run;

NOTE: There were 205 observations read from the data set WORK.PPOST.
NOTE: The data set WORK.INTRABMC has 68 observations and 3 variables.
NOTE: The data set WORK.INTERBMC has 69 observations and 3 variables.
NOTE: The data set WORK.DBMC has 68 observations and 3 variables.
NOTE: The data set WORK.PROBLEM has 0 observations and 3 variables.
NOTE: DATA statement used:
      real time           0.04 seconds


32
33         ****  DEFINE REGRESSION MACRO;
34
35         %macro regress(mod,in,out,tst);
36
37         ****  CREATE VARIABLES NECESSARY FOR REGRESSION MODEL;
```

```
38
39          data CF_LBS;
40             set &in;
41             cfperpc  = cf/pcs;
42             lnlbs    = log(lbs);
43             lnlbs2   = log(lbs)**2;
44             lncfppc  = log(cfperpc);
45          run;
46
47          **** PRINT RAW DATA AND DATA USED IN REGRESSION MODEL;
48
49          proc print data=CF_LBS;
50             title "&mod Cubic Feet and Volumes by Weight Increment";
51             var lbs cf pcs cfperpc lnlbs lnlbs2 lncfppc;
52          run;
53
54          **** REGRESS THE LOG OF CUBIC FEET PER PIECE ON THE LOG OF WEIGHT;
55          **** AND THE LOG OF WEIGHT SQUARED USING WEIGHTED LEAST SQUARES;
56
57          proc reg data=CF_LBS outest = &tst covout;
58             title "&mod Cube-Weight Relationship Regression";
59             &mod: model lncfppc = lnlbs lnlbs2;
60             output out=&out
61                predicted = predlncf
62                residual  = resid
63                l95m      = l95m
64                u95m      = u95m;
65             weight pcs;
66          run;
67
68          **** CALCULATE THE ESTIMATED CUBIC FEET PER PIECE BASED ON RESULTS;
69
70          data &out;
71             set &out;
72             predcf = exp(predlncf);
73          run;
74
75          **** PRINT THE REGRESSION RESULTS;
76
77          proc print data=&out;
78             title "&mod Cube-Weight Relationship Regression Results";
79             var cfperpc lncfppc predlncf predcf resid l95m u95m;
80          run;
81
82          **** CREATE THE VARIANCE/COVARIANCE MATRIX;
83
84          data &tst matrix;
85             set &tst;
86             if _type_ = "COV  " then output matrix;
87             else output &tst;
88          run;
89
90          **** PRINT THE VARIANCE/COVARIANCE MATRIX;
91
92          proc print data=matrix;
93             title "&mod Variance/Covariance Matrix";
94             var _name_ intercept lnlbs lnlbs2;
95          run;
96
97          **** PLOT ACTUAL VERSUS ESTIMATED VALUES FROM THE REGRESSION;
98
99          proc plot data=&out;
100            title "&mod Cube-Weight Relationship";
101            title2 'Actual Versus Predicted Values of CF/Piece';
102            plot predcf*lbs='P' cfperpc*lbs='*' / overlay;
103         run;
104
105         **** CALCULATE THE ESTIAMTED VALUES FOR EACH WEIGHT INCREMENT;
106
107         data &tst(keep=LBS &mod intercept lnlbs lnlbs2);
108            set &tst;
109            do LBS = 2 to 70;
110               &mod = EXP(intercept + lnlbs*log(LBS) + lnlbs2*log(LBS)**2);
```

```
111             output;
112          end;
113       run;
114
115       data &tst(keep=LBS &mod);
116          set &tst;
117       run;
118
119       proc sort data=&tst;
120          by LBS;
121       run;
122
123       **** END OF REGRESSION MACRO;
124
125       %mend regress;
126
127       **** RUN REGRESSION MACRO FOR EACH RATE CATEGORY;
128
129       %regress(InterBMC,interBMC,INTERout,INTERtst);

NOTE: There were 69 observations read from the data set WORK.INTERBMC.
NOTE: The data set WORK.CF_LBS has 69 observations and 7 variables.
NOTE: DATA statement used:
      real time           0.05 seconds

NOTE: There were 69 observations read from the data set WORK.CF_LBS.
NOTE: The PROCEDURE PRINT printed pages 1-2.
NOTE: PROCEDURE PRINT used:
      real time           0.50 seconds

NOTE: 69 observations read.
NOTE: 69 observations used in computations.

NOTE: There were 69 observations read from the data set WORK.CF_LBS.
NOTE: The data set WORK.INTERTST has 4 observations and 9 variables.
NOTE: The data set WORK.INTEROUT has 69 observations and 11 variables.
NOTE: The PROCEDURE REG printed page 3.
NOTE: PROCEDURE REG used:
      real time           0.10 seconds

NOTE: There were 69 observations read from the data set WORK.INTEROUT.
NOTE: The data set WORK.INTEROUT has 69 observations and 12 variables.
NOTE: DATA statement used:
      real time           0.00 seconds

NOTE: There were 69 observations read from the data set WORK.INTEROUT.
NOTE: The PROCEDURE PRINT printed pages 4-5.
NOTE: PROCEDURE PRINT used:
      real time           0.00 seconds

NOTE: There were 4 observations read from the data set WORK.INTERTST.
NOTE: The data set WORK.INTERTST has 1 observations and 9 variables.
NOTE: The data set WORK.MATRIX has 3 observations and 9 variables.
NOTE: DATA statement used:
      real time           0.00 seconds

NOTE: There were 3 observations read from the data set WORK.MATRIX.
NOTE: The PROCEDURE PRINT printed page 6.
NOTE: PROCEDURE PRINT used:
      real time           0.04 seconds


NOTE: There were 69 observations read from the data set WORK.INTEROUT.
NOTE: The PROCEDURE PLOT printed page 7.
NOTE: PROCEDURE PLOT used:
      real time           0.00 seconds

NOTE: There were 1 observations read from the data set WORK.INTERTST.
NOTE: The data set WORK.INTERTST has 69 observations and 5 variables.
NOTE: DATA statement used:
      real time           0.00 seconds

NOTE: There were 69 observations read from the data set WORK.INTERTST.
```

```
NOTE: The data set WORK.INTERTST has 69 observations and 2 variables.
NOTE: DATA statement used:
      real time           0.00 seconds

NOTE: There were 69 observations read from the data set WORK.INTERTST.
NOTE: The data set WORK.INTERTST has 69 observations and 2 variables.
NOTE: PROCEDURE SORT used:
      real time           0.06 seconds

130        %regress(IntraBMC,intraBMC,INTRAout,INTRAtst);

NOTE: There were 68 observations read from the data set WORK.INTRABMC.
NOTE: The data set WORK.CF_LBS has 68 observations and 7 variables.
NOTE: DATA statement used:
      real time           0.04 seconds

NOTE: There were 68 observations read from the data set WORK.CF_LBS.
NOTE: The PROCEDURE PRINT printed pages 8-9.
NOTE: PROCEDURE PRINT used:
      real time           0.00 seconds

NOTE: 68 observations read.
NOTE: 68 observations used in computations.

NOTE: There were 68 observations read from the data set WORK.CF_LBS.
NOTE: The data set WORK.INTRATST has 4 observations and 9 variables.
NOTE: The data set WORK.INTRAOUT has 68 observations and 11 variables.
NOTE: The PROCEDURE REG printed page 10.
NOTE: PROCEDURE REG used:
      real time           0.04 seconds

NOTE: There were 68 observations read from the data set WORK.INTRAOUT.
NOTE: The data set WORK.INTRAOUT has 68 observations and 12 variables.
NOTE: DATA statement used:
      real time           0.00 seconds

NOTE: There were 68 observations read from the data set WORK.INTRAOUT.
NOTE: The PROCEDURE PRINT printed pages 11-12.
NOTE: PROCEDURE PRINT used:
      real time           0.00 seconds

NOTE: There were 4 observations read from the data set WORK.INTRATST.
NOTE: The data set WORK.INTRATST has 1 observations and 9 variables.
NOTE: The data set WORK.MATRIX has 3 observations and 9 variables.
NOTE: DATA statement used:
      real time           0.00 seconds

NOTE: There were 3 observations read from the data set WORK.MATRIX.
NOTE: The PROCEDURE PRINT printed page 13.
NOTE: PROCEDURE PRINT used:
      real time           0.00 seconds

NOTE: There were 68 observations read from the data set WORK.INTRAOUT.
NOTE: The PROCEDURE PLOT printed page 14.
NOTE: PROCEDURE PLOT used:
      real time           0.00 seconds

NOTE: There were 1 observations read from the data set WORK.INTRATST.
NOTE: The data set WORK.INTRATST has 69 observations and 5 variables.
NOTE: DATA statement used:
      real time           0.00 seconds

NOTE: There were 69 observations read from the data set WORK.INTRATST.
NOTE: The data set WORK.INTRATST has 69 observations and 2 variables.
NOTE: DATA statement used:
      real time           0.04 seconds

NOTE: There were 69 observations read from the data set WORK.INTRATST.
NOTE: The data set WORK.INTRATST has 69 observations and 2 variables.
NOTE: PROCEDURE SORT used:
      real time           0.06 seconds

131        %regress(DBMC,DBMC,DBMCout,DBMCtst);
```

```
NOTE: There were 68 observations read from the data set WORK.DBMC.
NOTE: The data set WORK.CF_LBS has 68 observations and 7 variables.
NOTE: DATA statement used:
      real time           0.00 seconds


NOTE: There were 68 observations read from the data set WORK.CF_LBS.
NOTE: The PROCEDURE PRINT printed pages 15-16.
NOTE: PROCEDURE PRINT used:

real time           0.00 seconds

NOTE: 68 observations read.
NOTE: 68 observations used in computations.

NOTE: There were 68 observations read from the data set WORK.CF_LBS.
NOTE: The data set WORK.DBMCTST has 4 observations and 9 variables.
NOTE: The data set WORK.DBMCOUT has 68 observations and 11 variables.
NOTE: The PROCEDURE REG printed page 17.
NOTE: PROCEDURE REG used:
      real time           0.00 seconds

NOTE: There were 68 observations read from the data set WORK.DBMCOUT.
NOTE: The data set WORK.DBMCOUT has 68 observations and 12 variables.
NOTE: DATA statement used:
      real time           0.00 seconds

NOTE: There were 68 observations read from the data set WORK.DBMCOUT.
NOTE: The PROCEDURE PRINT printed pages 18-19.
NOTE: PROCEDURE PRINT used:
      real time           0.00 seconds

NOTE: There were 4 observations read from the data set WORK.DBMCTST.
NOTE: The data set WORK.DBMCTST has 1 observations and 9 variables.
NOTE: The data set WORK.MATRIX has 3 observations and 9 variables.
NOTE: DATA statement used:
      real time           0.05 seconds

NOTE: There were 3 observations read from the data set WORK.MATRIX.
NOTE: The PROCEDURE PRINT printed page 20.
NOTE: PROCEDURE PRINT used:
      real time           0.00 seconds


NOTE: There were 68 observations read from the data set WORK.DBMCOUT.
NOTE: The PROCEDURE PLOT printed page 21.
NOTE: PROCEDURE PLOT used:

      real time           0.00 seconds

NOTE: There were 1 observations read from the data set WORK.DBMCTST.
NOTE: The data set WORK.DBMCTST has 69 observations and 5 variables.
NOTE: DATA statement used:
      real time           0.00 seconds

NOTE: There were 69 observations read from the data set WORK.DBMCTST.
NOTE: The data set WORK.DBMCTST has 69 observations and 2 variables.
NOTE: DATA statement used:
      real time           0.04 seconds

NOTE: There were 69 observations read from the data set WORK.DBMCTST.
NOTE: The data set WORK.DBMCTST has 69 observations and 2 variables.
NOTE: PROCEDURE SORT used:
      real time           0.00 seconds


132        run;
133
134        **** MERGE RESULTS FROM THE THREE REGRESSIONS INTO ONE DATASET;
135
136        data results;
137           merge INTERtst INTRAtst;
```

```
138          by LBS;
139       run;

NOTE: There were 69 observations read from the data set WORK.INTERTST.
NOTE: There were 69 observations read from the data set WORK.INTRATST.
NOTE: The data set WORK.RESULTS has 69 observations and 3 variables.
NOTE: DATA statement used:
      real time           0.00 seconds


140
141       data results;
142          merge results DBMCtst;
143          by LBS;
144       run;

NOTE: There were 69 observations read from the data set WORK.RESULTS.
NOTE: There were 69 observations read from the data set WORK.DBMCTST.
NOTE: The data set WORK.RESULTS has 69 observations and 4 variables.
NOTE: DATA statement used:
      real time           0.04 seconds

145
146       **** PRINT THE ESTIMATED VALUES FOR ALL THREE RATE CATEGORIES;
147
148       proc print data=results noobs;
149          title 'Estimated Cube-Weight Relationship for Each Rate Category';
150          var LBS InterBMC IntraBMC DBMC;
151       run;

NOTE: There were 69 observations read from the data set WORK.RESULTS.
NOTE: The PROCEDURE PRINT printed pages 22-23.
NOTE: PROCEDURE PRINT used:
      real time           0.00 seconds


NOTE: SAS Institute Inc., SAS Campus Drive, Cary, NC USA 27513-2414
NOTE: The SAS System used:
      real time           36.08 seconds
```