Summary Report

Main points

A) For the regression model, the natural logarithm was taken for the VALUE because LN(VALUE) followed a bell-shaped cureve.

B) The regression model taken was takesn with an alpha value of 0.05 and 15 independent variables.

Interpretation of coefficients

β_0 : No managerial interpretation. The intercept has no meaning when all X variables are zero.

β_1 : The value of the housing unit is less than 15 percent in the central part of the city compared to other parts of the city.

β_2 : The value of the housing unit is less than 15 percent in the Northeast compared to the West.

β_3 : The value of the housing unit is less than 27 percent in the Midwest compared to the West.

β_4 : The value of the housing unit is less than 20 percent in the South compared to the West.

β_5 : When the Area Median income increases by 1 percent, the value of the unit increases by 0.06 percent.

β_6 : When the Fair Market Rent increases by 1 percent, the value of the housing unit increases by 0.75 percent.

β_7 : When the Poverty Income Threshold increases by 1 percent, the value of the unit decreases by 1.09 percent.

β_8 : When the number of people in the home increases by 1, the value of the unit increases by 16 percent.

β_9 : When the Annual Household Income increases by 1 percent, the value of the unit increases by 0.12 percent. β_{10} : When the Monthly Housing Costs increases by 1 percent, the value of the unit increases by 0.37 percent

β_{11} : When the utility costs increases by 1 percent, the value of the housing unit increases by 0.02 percent.

β_{12} : When total other montly costs increases by a dollar, the value of the housing unit increases by 0.1 percent.

β_{13} : When the age increases by one, the value of the housing unit increases by 0.3 percent.

β_{14} : When Monthly mortgage payments assuming median interest increases by one, the value of the housing unit increases by 0.02 percent.

β_{15} : When number of rooms in the unit increases by one , the value of the housing unit increases by 4 percent.

Interpretation of R-square

The regression model was able to explain 72.5% of variations in the data

LN(VALUE) = β0 + β1*CENTRALCITY + β2*NORTHEAST + β3*MIDWEST + β4*SOUTH + β5*LN(MED) + β6LN(FMR) + β7*LN(IPOV) + β8*PER + β9*LN(ZINC2) + β10*LN(ZSHC) + β11*LN(UTILITY) + β12*OTHERCOST + β13*AGE1 + β14*COSTMED + β15*ROOMS

REGRESSION MODEL

SUMMARY OUTPUT

Regression Statistics	*Column1*
Multiple R	0.851841682
R Square	0.725634252
Adjusted R Square	0.725502678
Standard Error	0.424703643
Observations	31295

ANOVA

Column1	*df*	*SS*	*MS*	*F*	*Significance F*
Regression	15	14921.5079	994.7671931	5515.050351	0
Residual	31279	5641.89283	0.180373184		
Total	31294	20563.40073			

	Column1	*Coefficients*	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
β0	Intercept	7.628607455	0.481525771	15.84257357	2.62101E-56	6.684797764	8.572417145	6.684797764	8.572417145
β1	CENTRALCITY	-0.099985075	0.005902467	-16.93954052	4.44241E-64	-0.111554145	-0.088416005	-0.111554145	-0.088416005
β2	NORTHEAST	-0.061668436	0.008840586	-6.975604879	3.10609E-12	-0.078996337	-0.044340535	-0.078996337	-0.044340535
β3	MIDWEST	-0.202104303	0.009039216	-22.35860866	7.2425E-110	-0.219821527	-0.184387078	-0.219821527	-0.184387078
β4	SOUTH	-0.107710817	0.008204623	-13.12806337	2.8887E-39	-0.123792206	-0.091629428	-0.123792206	-0.091629428
β5	LN(LMED)	0.143649025	0.022877575	6.279032047	3.45158E-10	0.098808067	0.188489983	0.098808067	0.188489983
β6	LN(FMR)	0.255518928	0.014956888	17.08369639	3.87908E-65	0.226202833	0.284835024	0.226202833	0.284835024
β7	LN(IPOV)	-0.167145843	0.047078354	-3.550375676	0.000385246	-0.259421292	-0.074870394	-0.259421292	-0.074870394
β8	PER	0.01880181	0.00950287	1.978540232	0.047876553	0.000175807	0.037427814	0.000175807	0.037427814
β9	LN(ZINC2)	0.077910959	0.002734245	28.49450964	2.4648E-176	0.072551731	0.083270187	0.072551731	0.083270187
β10	LN(ZSHC)	0.253057711	0.004697805	53.8672207	0	0.243849826	0.262265597	0.243849826	0.262265597
β11	LN(UTILITY)	-0.149084114	0.0062871	-23.71270118	3.2686E-123	-0.161407079	-0.136761148	-0.161407079	-0.136761148
β12	OTHERCOST	-0.000212795	2.67904E-05	-7.942969203	2.03974E-15	-0.000265306	-0.000160285	-0.000265306	-0.000160285
β13	AGE1	0.003659708	0.000205198	17.834993	8.48479E-71	0.003257511	0.004061904	0.003257511	0.004061904
β14	COSTMED	0.000272616	1.88644E-06	144.5134162	0	0.000268919	0.000276314	0.000268919	0.000276314
β15	ROOMS	0.044640042	0.00182074	24.51752367	1.6792E-131	0.041071318	0.048208765	0.041071318	0.048208765

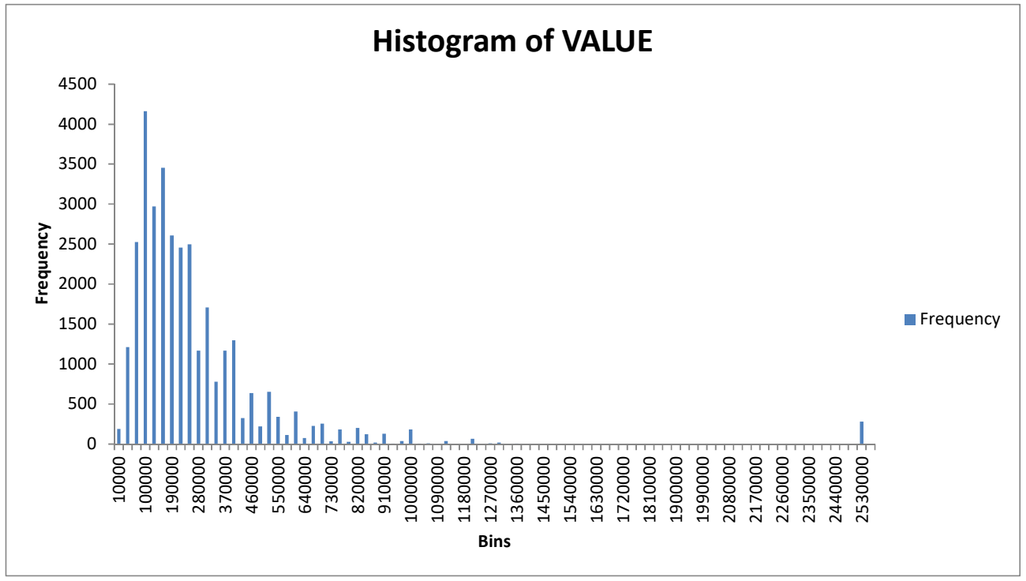
Data Descriptors

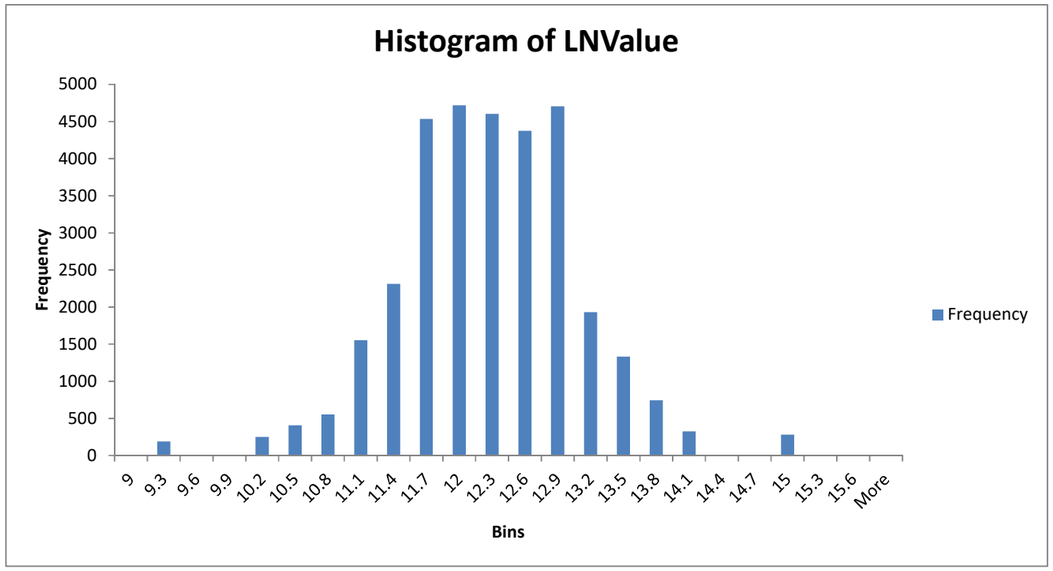
STATISTICS FOR VARIABLES USED IN REGRESSION MODEL

Statistics	CENTRALCITY	NORTHEAST	MIDWEST	SOUTH	LN(LMED)	LN(FMR)	LN(IPOV)	PER	LN(ZINC2)	LN(ZSHC)	LN(UTILITY)	OTHERCOST	AGE1	COSTMED	ROOMS	LN(VALUE)
Mean	0.217382969	0.242115354	0.295925867	0.301038505	11.11460909	7.11088953	9.736354059	2.648474197	10.98360067	6.93921941	5.423552647	95.9683549	55.70365873	1849.859367	6.75711775	12.12826085
Standard Error	0.002331615	0.002421487	0.0025803	0.002593027	0.00098889	0.001660525	0.001732624	0.008116056	0.005917983	0.004315617	0.002607067	0.590563892	0.087723561	9.680255675	0.009305446	0.004582257
Median	0	0	0	0	11.07921519	7.093404626	9.648079041	2	11.12040126	7.001245622	5.424950017	70.83333333	55	1407.700224	7	12.15477935
Mode	0	0	0	0	11.27973158	7.239932591	9.645493724	2	11.51266543	6.276643489	5.257495372	100	55	795.0167788	6	11.91839057
Standard Deviation	0.412471878	0.428370602	0.45646512	0.45871674	0.174938463	0.293753405	0.306507907	1.435762236	1.046914509	0.763449658	0.461200451	104.4730727	15.5186425	1712.47526	1.646170028	0.810619283
Sample Variance	0.17013305	0.183501373	0.208360406	0.210421047	0.030603466	0.086291063	0.093947097	2.061413199	1.09602999	0.58285538	0.212705856	10914.62292	240.8282652	2932571.516	2.70987576	0.657103621
Kurtosis	-0.121887195	-0.55017153	-1.200470384	-1.247479408	0.20905176	-0.00105063	-0.392020977	2.615458411	7.661051168	-0.232226855	1.686469264	63.08171062	-0.573923229	31.44802913	1.063917519	0.875898431
Skewness	1.370445402	1.204102834	0.894207101	0.8675254	0.457047541	0.247334768	0.576916133	1.178849558	-1.587365851	-0.18183026	-0.286425062	5.661252883	0.154262572	4.65124305	0.764510071	-0.098232592
Range	1	1	1	1	1.096879186	1.987788906	1.541136026	19	13.87559009	7.077685565	5.338339041	2020.916667	79	17049.02115	13	5.529429088
Minimum	0	0	0	0	10.55841352	6.17586727	9.310818991	1	0	2.197224577	1.791759469	0	14	106.2683446	2	9.210340372
Maximum	1	1	1	1	11.65529271	8.163656176	10.85195502	20	13.87559009	9.274910143	7.13009851	2020.916667	93	17155.28949	15	14.73976946
Sum	6803	7577	9261	9421	347831.6916	222535.2878	304699.2003	82884	343731.783	217162.8714	169730.0801	3003329.667	1743246	57891348.9	211464	379553.9233
Count	31295	31295	31295	31295	31295	31295	31295	31295	31295	31295	31295	31295	31295	31295	31295	31295

Graphs and Charts

THE LN(VALUE) FOLLOWS A MORE NORMAL DISTRIBUTION AND HENCE WE USE LOG-LOG AND SEMI-LOG MODEL





Statistical Tests

REGRESSION MODEL

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.851841682
R Square	0.725634252
Adjusted R Square	0.725502678
Standard Error	0.424703643
Observations	31295

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	14921.5079	994.7671931	5515.050351	0
Residual	31279	5641.89283	0.180373184		
Total	31294	20563.40073			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	7.628607455	0.481525771	15.84257357	2.62101E-56	6.684797764	8.572417145	6.684797764	8.572417145
CENTRALCITY	-0.099985075	0.005902467	-16.93954052	4.44241E-64	-0.111554145	-0.088416005	-0.111554145	-0.088416005
NORTHEAST	-0.061668436	0.008840586	-6.975604879	3.10609E-12	-0.078996337	-0.044340535	-0.078996337	-0.044340535
MIDWEST	-0.202104303	0.009039216	-22.35860866	7.2425E-110	-0.219821527	-0.184387078	-0.219821527	-0.184387078
SOUTH	-0.107710817	0.008204623	-13.12806337	2.8887E-39	-0.123792206	-0.091629428	-0.123792206	-0.091629428
LN(LMED)	0.143649025	0.022877575	6.279032047	3.45158E-10	0.098808067	0.188489983	0.098808067	0.188489983
LN(FMR)	0.255518928	0.014956888	17.08369639	3.87908E-65	0.226202833	0.284835024	0.226202833	0.284835024
LN(IPOV)	-0.167145843	0.047078354	-3.550375676	0.000385246	-0.259421292	-0.074870394	-0.259421292	-0.074870394
PER	0.01880181	0.00950287	1.978540232	0.047876553	0.000175807	0.037427814	0.000175807	0.037427814
LN(ZINC2)	0.077910959	0.002734245	28.49450964	2.4648E-176	0.072551731	0.083270187	0.072551731	0.083270187
LN(ZSHC)	0.253057711	0.004697805	53.8672207	0	0.243849826	0.262265597	0.243849826	0.262265597
LN(UTILITY)	-0.149084114	0.0062871	-23.71270118	3.2686E-123	-0.161407079	-0.136761148	-0.161407079	-0.136761148
OTHERCOST	-0.000212795	2.67904E-05	-7.942969203	2.03974E-15	-0.000265306	-0.000160285	-0.000265306	-0.000160285
AGE1	0.003659708	0.000205198	17.834993	8.48479E-71	0.003257511	0.004061904	0.003257511	0.004061904
COSTMED	0.000272616	1.88644E-06	144.5134162	0	0.000268919	0.000276314	0.000268919	0.000276314
ROOMS	0.044640042	0.00182074	24.51752367	1.6792E-131	0.041071318	0.048208765	0.041071318	0.048208765

CORRELATION MODEL

	CENTRALCITY	*NORTHEAST*	*MIDWEST*	*SOUTH*	*LN(LMED)*	*LN(FMR)*	*LN(IPOV)*	*PER*	*LN(ZINC2)*	*LN(ZSHC)*	*LN(UTILITY)*	*OTHERCOST*	*AGE1*	*COSTMED*	*ROOMS*	*LN(VALUE)*
CENTRALCITY	1															
NORTHEAST	-0.056807768	1														
MIDWEST	-0.012251124	-0.366430724	1													
SOUTH	-0.002865184	-0.370931751	-0.425467771	1												
LN(LMED)	0.007675805	0.539241865	-0.112022543	-0.413077309	1											
LN(FMR)	0.061328151	0.342532402	-0.379900203	-0.196456428	0.663101751	1										
LN(IPOV)	0.00037452	0.033636983	-0.013949562	-0.041640969	0.078937674	0.234040719	1									
PER	0.001695926	0.032966732	-0.013872697	-0.04363194	0.076037205	0.230596705	0.980573512	1								
LN(ZINC2)	-0.04971229	0.065150999	-0.023695815	-0.077219184	0.161708945	0.242713363	0.352263885	0.309029291	1							
LN(ZSHC)	-0.018729968	0.194495583	-0.090051611	-0.162629241	0.357720377	0.4647286	0.364608583	0.325228041	0.460137633	1						
LN(UTILITY)	0.025684788	0.207170649	-0.128225883	-0.047531874	0.198965432	0.32792389	0.313304821	0.30754664	0.246240804	0.444575572	1					
OTHERCOST	-0.018396092	0.018807143	-0.094438193	0.046008523	0.110621984	0.200386224	0.023988485	0.023297804	0.173327681	0.352825494	0.133955108	1				
AGE1	-0.019060122	0.019710126	-0.017703991	0.00390908	-0.01561322	-0.05619671	-0.481992188	-0.40140749	-0.295600345	-0.349190115	-0.069185931	0.018600498	1			
COSTMED	-0.01791701	0.145742059	-0.178957869	-0.108529078	0.305556474	0.455770468	0.112162385	0.108130359	0.299616431	0.498162517	0.325411047	0.460334425	0.008230717	1		
ROOMS	-0.051376212	0.042384224	-0.015167715	-0.027963649	0.135349174	0.389803973	0.267895353	0.266361303	0.314048036	0.383499322	0.371581607	0.183977563	-0.048838142	0.375411983	1	
LN(VALUE)	-0.068958017	0.205998751	-0.229598983	-0.138639551	0.378675443	0.542723197	0.146805831	0.13829504	0.388285168	0.59113085	0.294891252	0.375348576	-0.02372293	0.790505259	0.426766272	1