Report On

Development of Pilot Valuation Models

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For

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Contents

1. STUDY OVERVIEW

This project was designed to evaluate the ability to develop workable market models from data on the Department's current NAL files for use in in-depth studies and market value estimates. The Department provided NAL files for five pilot counties. The consultant developed ten models for these counties for a variety of property types that with one exception (stratum 4 in County 4) accounted for at least 5% of total just value on the 2007 roll. In many cases, residential property constituted over 50% of just value.

Despite a limited number of property characteristic attributes, the results are very encouraging and demonstrate that effective models can be developed when adequate sales and well-defined market areas and neighborhoods exist. Of course, the addition of other property attributes (such as location amenities, garages, and pools) would further improve model performance. A significant side benefit to the development of models is the need to track time trends and develop time adjustment factors, which can be used to quantify market changes and update sales to a common point in time for valuation, sales ratio, and other analytical purposes. Somewhat unfortunately given recent changes in market conditions, the most recently available NAL files at the initiation of the project only included sales (at best) through June 2007. A follow-up to the present study would help quantify market changes since that time.

Section 2 below describes the methodology followed in the project. Section 3 summarizes the study results. Section 4 presents the conclusions and recommendations. The appendices contain the final models and ratio study statistics for each of the ten pilot areas.

2. METHODOLOGY

Using data from the most recently available NAL files, the project developed pilot multiple regression (MRA) models for the following 10 property groups:

- County 1 single family residential properties (use code 1)
- County 1 condominiums (use code 4)
- County 1 multi-family properties (stratum 2)
- County 1 commercial properties (stratum 6)
- County 2 single family residential properties (use code 1)
- County 3 single family and mobile home properties (use codes 1 and 2)
- County 4 single family residential properties (use code 1)
- County 4 vacant land (stratum 4)
- County 5 single family properties (use code 1)
- County 5 acreage parcels (stratum 5)

The statistical package, SPSS (Statistical Package for the Social Sciences), version 15 was used to develop the models. SPSS is the most popular statistical package among assessors and has the strong advantage for this project that it allows the user to develop and save pseudo-English program ("syntax") files that document the process and can be used to recreate or update the analyses. The appendix contains the final models. The accompanying syntax files (which are simple text files that can also be opened with any word processing program) were provided separately.

All ten models following the following process:

- Initial filters
- Preliminary time trend analysis
- Exploratory data analysis
- Determination of candidate variables
- Development of exploratory additive models
- Determination of final additive model and ratios
- Development of comparison multiplicative model

Each of the steps is explained below and illustrated using County 4 data.

2.1 Initial Filters

Filters were set to select candidate properties for inclusion in each model. For example, the following filters were used for single family residential properties in County 4:

- Stratum = 1
- Use code = 2 (single family residential)
- Roll year = 2007
- Roll type = "R" (real)

- Public land = blank (no)
- Sale disqualification code = 0 (qualified sale)
- Vacant/improved code = "I" (improved at time of sale)
- New construction code = 0
- Number of buildings = 1
- Sale year = 2003 or later (used for all 10 models)
- Effective construction year < sale year
- Sale price > $1,000
- Just value > $500
- Land/total value ratio < .80
- Improvement quality = 2-5 (there was only one quality 1 sales and no quality 6 sales)
- Assessment/sale ratio (just value ÷ sale price) between 0.50 and 2.00

The final filter based on assessment-to-sales ratios helped eliminate sales with extreme prices or other anomalies. This edit removed 13 sales (3.0%) in County 4 stratum 1. In some cases these cut points for exclusion were modified depending on the distribution of the ratios (a wider range of ratios was accepted for vacant land models).

2.2 Preliminary Time Trend Analysis

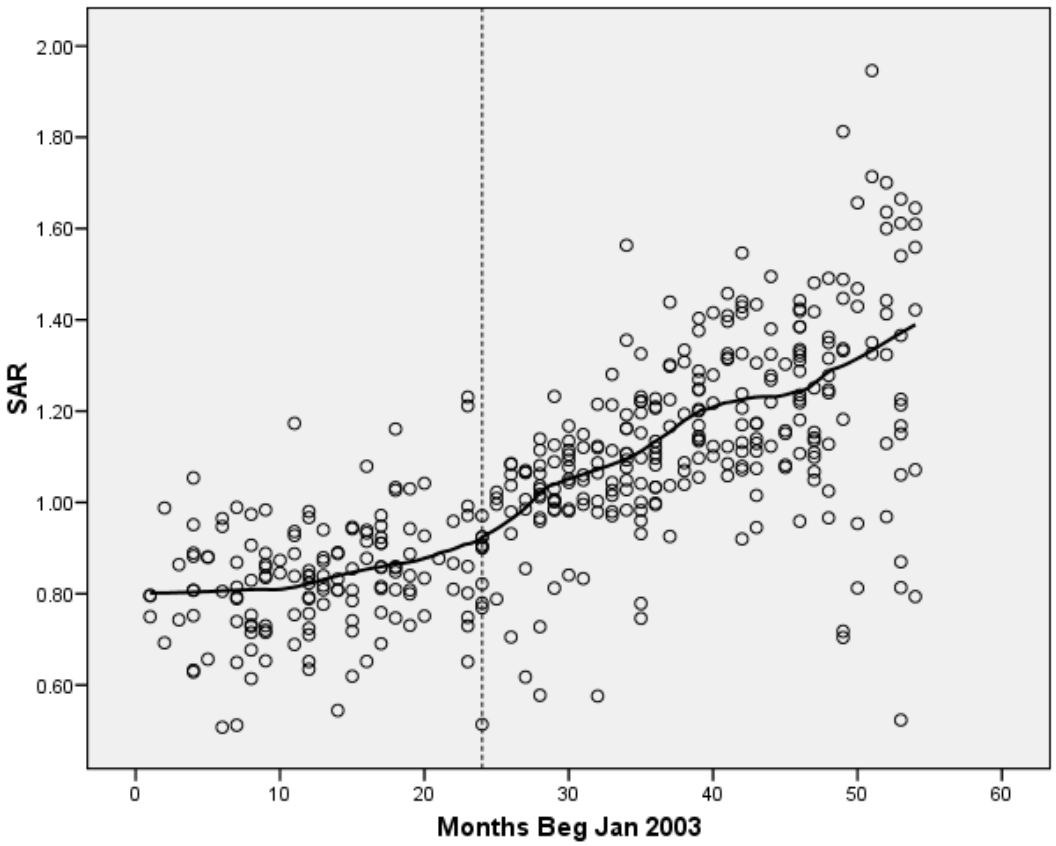
To facilitate analysis sales were numbered sequentially based on month sold: Jan 2003 = 1, Feb 2003 = 2, etc. In most cases the resulting variable (MONTHS) ranged from 1 to 54 (Jun 2007).

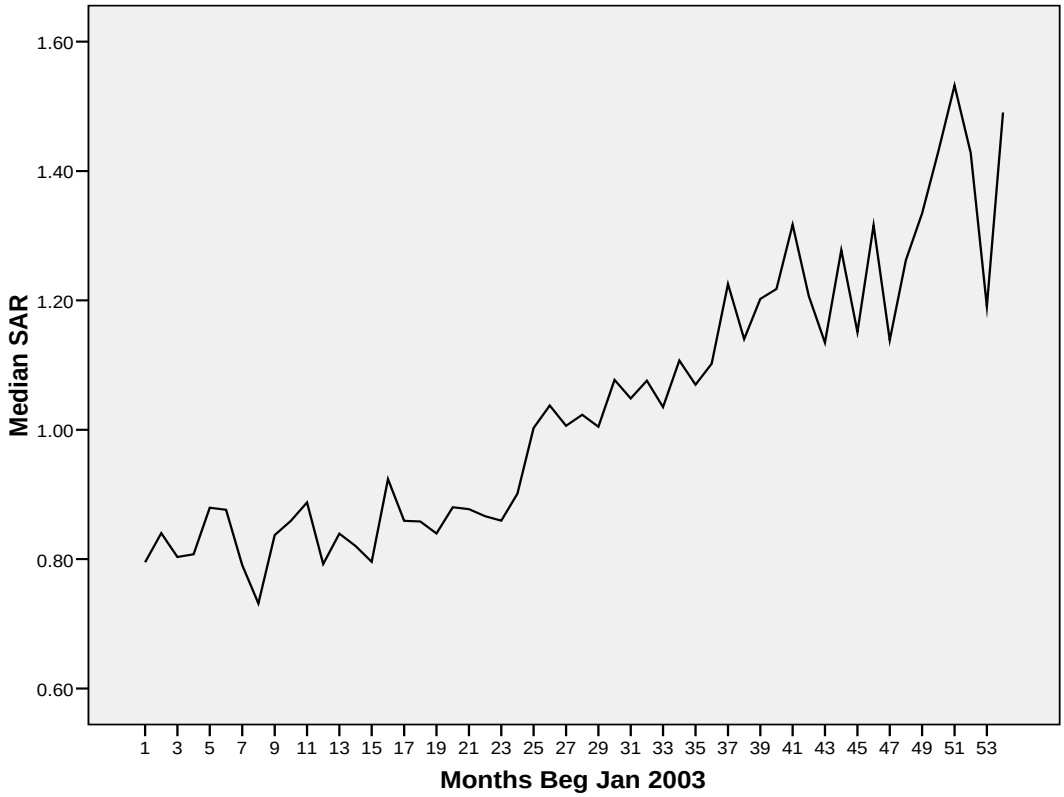
Using the sales ratio trend method of time analysis[1], sales prices were divided by the 2007 just value to form sale-to-assessment (SAR) ratios and plotting against time using both a scatter graph and line chart as shown below for County 4 stratum 1. In this case both charts increase a modest but steady increase in prices during 2003 and 2004 followed by stronger increases beginning in 2005. The indicated overall increase in prices is at least 75% (compare average ending SAR ratios of 1.80 versus beginning SAR ratios of 0.80).

Based on this analysis two time trend were identified: one for the first 24 months (2003 and 2004) and one for the remainder of the sales period (Jan 2003 through Jun 2007) and two time variables (the first coded 1 to 24 and the second coded 1 to 30) were created. SAR ratios were regressed on these two time variables which, in this case, indicated an increase in value of 0.95% per month for the first 24 months and 1.25% per months for the subsequent 30 months. The overall (compounded) increase in value over the 54 month period was 80 percent.

Prices were adjusted at these rates to the ending month of Jun 2007 and prices reexamined. In this case, one atypically low time-adjusted price (less than $25,000) was excluded.

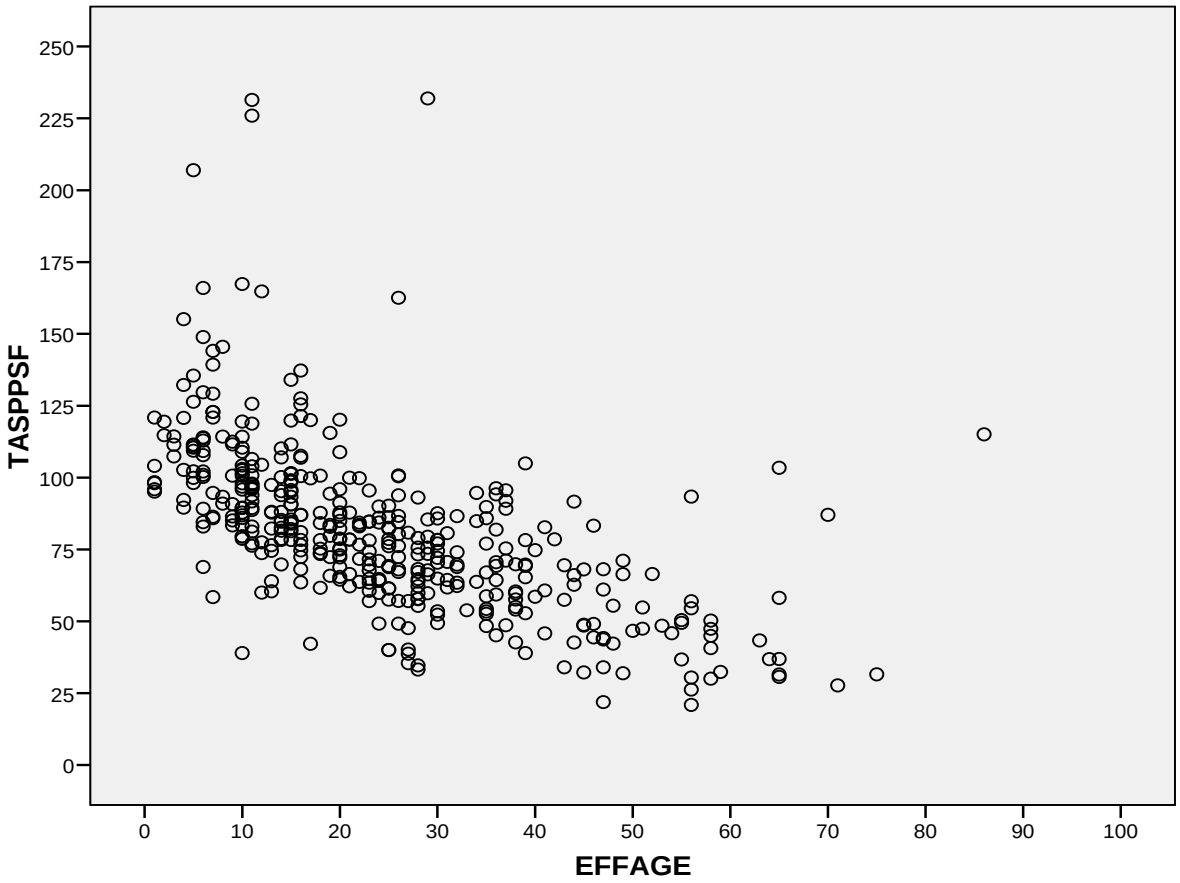
[1] See Robert J. Gloudemans, *Mass Appraisal or Real Property* (IAAO, 1999), pages 265-268.

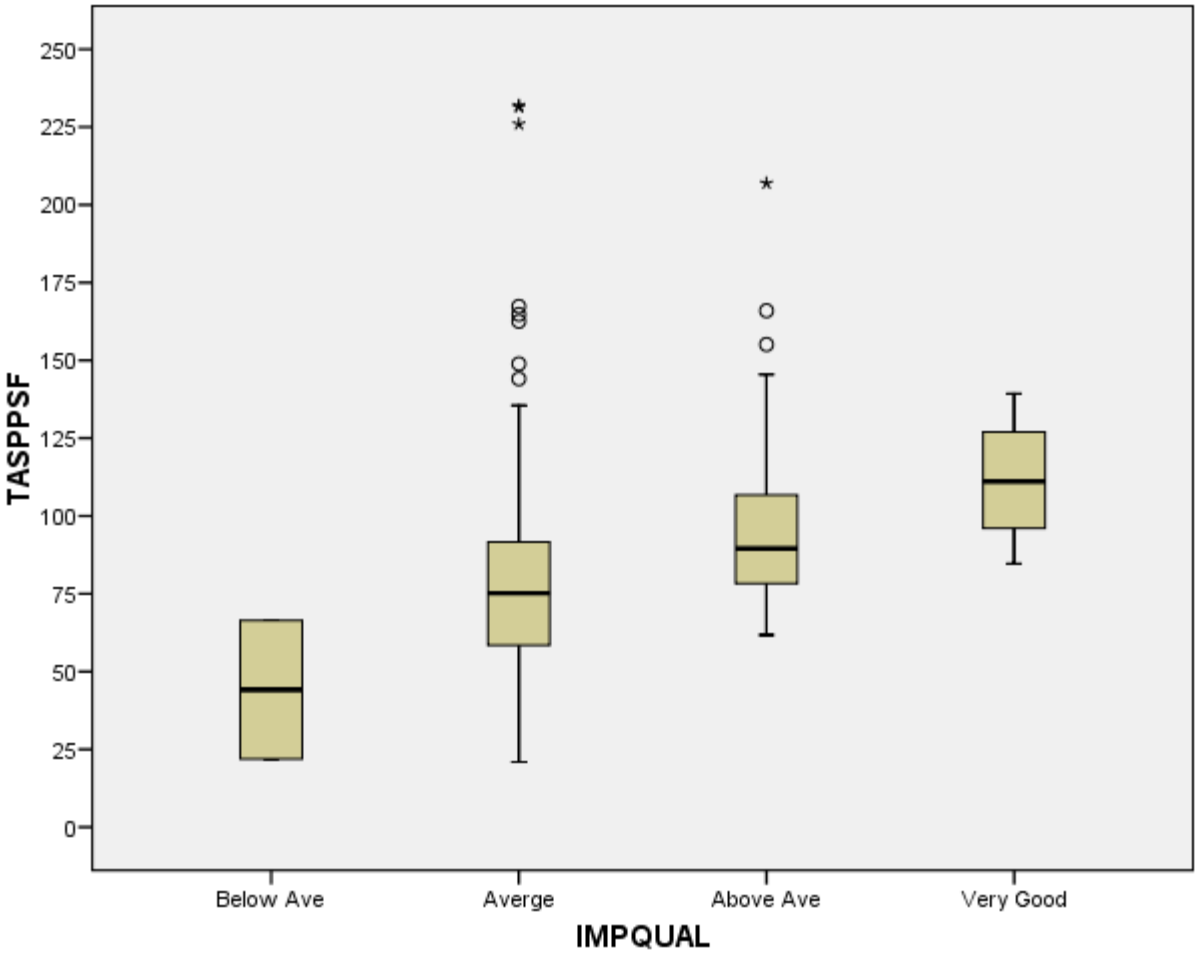

SAR
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0
10
20
30
40
50
60
Months Beg Jan 2003


Median SAR
1.60
1.40
1.20
1.00
0.80
0.60
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53
Months Beg Jan 2003

2.3 Exploratory Data Analysis

With sales prices adjusted to a common date (June 2007), analyses were conducted to explore the distribution of relevant variables and their relationships to price. These analyses took the form of statistics and graphs with scatter graphs used for continuous variables such as lot size and living area and box plots used for categorical variables such as improvement class and market area (see examples below). In box plots, the shaded boxes represent the middle 50% of the data (time adjusted sale price per square foot), the horizontal dark lines toward the center of the boxes represent the median, circles represent outliers, and asterisks indicate extremes. Extremes were checked to determine whether other variables explained their behavior and in some cases deleted. In this case, the three extremes all represent large acreage parcels and the sales were retained
.





2.4 Determination of Candidate Variables

Exploratory data analysis helped to identify candidate variables for regression modeling. For market areas and neighborhoods, the most common area was generally adopted as the "base" area and binary variables were created for the other categories. Scatter and plots also helped identify appropriate transformations for variables. In County 4 stratum 1, for example, the effective age variable was capped at 60 years as depreciation appears to level out at that point.

The following variables were created for testing in the County 4 single family residential model:

- Lot size. In addition to lot size, variables were tested for lot size raised to the .25, .50, and .75 powers. In this case the .50 power (square root function) provided the best fit. In each case, the variables were centered on the typical lot size (12,500 square feet in this case), so that the constant in the model would include the base lot value.

- Living area (TOTLARA). Separate variables were constructed for each quality class (2, 3, 4, and 5) so that the rate per square foot could vary by class.

- Improvement quality. Binary variables (coded 0 or 1) were created for each of the four quality classes and multiplied against TOTLARA as explained above to yield four "pseudo" binary variables (0 or TOTLAREA). Thus for each sale, one of the four variables applied and the other three were coded "0". This enabled the model to develop a separate market-derived rate per square foot for each class. When an improvement class had few sales, it was sometimes combined with another class (e.g., classes 2 and 3 or classes 5 and 6), although unless the market indicated otherwise a premium was still applied for the higher class.

- Effective age. Effective age was capped at 60 and multiplied by TOTLAREA, enabling the model develop a depreciation rate per square foot.

- Market area and neighborhood. County 4 has delineated four market areas, all with at least 30 usable sales. Area 2 with typical prices and over 100 sales was chosen as the base area and binary variables were created for the other three areas. Neighborhoods generally had too few sales to be considered in the initial analysis. Instead sales ratios from the initial model were evaluated by neighborhood and supplemental neighborhood binary variables were created where sales were adequate and/or ratios out-of-line.

- Sale date. The same time variables used in the preliminary time trend analysis were tested in the models. The final time trends were based on this analysis.

Variables were not available for secondary areas such as porches and garages, building style, or land attributes such as traffic, golf course, or waterfront. Undoubtedly these would have improved model performance.

2.5 Exploratory Models

The above variables (except for neighborhoods) were tested in exploratory models and the ratios saved and analyzed for the approximately 50 neighborhoods in the County with available sales. Additional binary variables were created for four neighborhoods with out-of-line sales ratios and the model rerun with these supplemental variables. A review of sales ratios from this model identified 13 outliers (3.1 percent), which were removed and the model again rerun. Ratios were reviewed with respect to the variables listed in 2.4 above and, when there appeared to be no opportunity for additional improvements, final time adjustments were determined. This was done by comparing indicated price increases per month with the average sale price in the corresponding time period. In this case, for example, the model indicated that properties were increasing $1,015 per month during 2003 and 2004 and $1,719 in the subsequent time period. These dollar increases were divided by the average sale price for the same two time periods to yield percentage increases of 1.15% and 1.55% per month, respectively.

With time trends determined, time adjustment factors were constructed and multiplied by sales prices to provide time-adjusted prices for development of the final model. Adjusting sales prices for time in this manner served to yield model rates and factors contemporary with the end of the sales period (as recent as possible).

Table 1 below lists the time adjustment developed for the various pilot models.

Table 1 – Summary of Time Trends

Model Group	Monthly Time Trends
County 1 Single-family	1.14% thru July 06 and -0.33 thereafter
County 1 Condos	1.6% thru March 06 and 0.1% thereafter
County 1 Multi-family	1.9% thru March 06; no change thereafter
County 1 Commerical	1.24% thru June 07
County 2 Single-family	1.5% from Jan 04 thru June 07
County 3 Residential	1.3% from Jan 04 thru June 07
County 4 Single-family	1.15% thru 2004 and 1.55% thereafter
County 4 Vacant Land	1.7% thru June 07
County 5 Single-famil	1.3% from Jan 04 thru June 07
County 5 Acreage	1.9% from Jan 04 thru June 07

2.6 Final Additive Model

With final time adjustments were applied, the time variables were removed and the final additive model developed. Of course, the dependent variable was changed from sale price to time-adjusted sale price. With the exception of the removal of the time variables, other independent variables remained the same.

Below is the final additive model for County 4 stratum 1. The model begins with a constant of $37,179, which includes the base lot value, applies a rate per square foot of living area depending on improvement class (classes 2 and 3 were weighted together with a lesser weight for class 2 than for class 3), makes a downward adjustment per square foot per year of age (capped at 60), makes an adjustment for lot size, and applies adjustments for market areas and for neighborhood 95000. The other three neighborhoods proved statistically insignificant (likely due to few sales). As indicated by the R-Square value, the model is able to explain an impressive 92% of variation in (time-adjusted) sales prices. The median ratio is 0.997 and the COD is 12.5.

The appendices contain the final models and sales ratio statistics for all 10 pilot models.

Final Additive Model – County 4 Single Family Properties

Model: 4

R	R Square	Adjusted R Square	Std. Error of the Estimate
.959	.920	.918	22693.34942

Model: 10

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	30921.576	2105.516		14.686	.000
LSIZE_.75	9.640	.415	.905	23.250	.000
MKTAREA1	5874.280	2643.892	.067	2.222	.028
MKTAREA2	14181.893	2755.446	.174	5.147	.000
NB_538500	-20040.692	9859.606	-.065	-2.033	.044
NB_2400X	-11962.339	5205.697	-.066	-2.298	.023
NB_4300X	-21020.439	10002.633	-.060	-2.101	.037
NB_7000X	-32487.367	10071.512	-.092	-3.226	.002
NB_9400	-32440.862	12043.909	-.075	-2.694	.008
NB_17000X	-31615.254	12200.544	-.073	-2.591	.010
NB_56500X	-18490.222	12043.675	-.043	-1.535	.127
NB_73500X	35527.274	12300.234	.082	2.888	.004
NB_77400	-50828.969	12192.650	-.118	-4.169	.000
NB_80300	34036.083	5215.958	.214	6.525	.000
NB_91000	-19121.024	7978.412	-.070	-2.397	.018
NB_128800X	16683.588	10057.777	.047	1.659	.099
NB_699500	-43242.182	6933.202	-.185	-6.237	.000
NB_709000X	-29785.535	5623.505	-.158	-5.297	.000

Excluded Variables[d]

Model: 4

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
NB_458500	.005	.327	.744	.016	.955
NB_1500	.010	.675	.500	.034	.917
NB_538500	.011	.732	.465	.037	.915

d. Dependent Variable: TASP

Ratio Statistics for ESP / TASP

Sales	405
Median	.997
Weighted Mean	1.000
Minimum	.671
Maximum	1.939
Price Related Differential	1.028
Coefficient of Dispersion	.125

2.7 Comparative Multiplicative Model

Multiplicative models make percentage adjustments and are optimal for calibrating curves, such as the relationship between lot size and value. They also minimize the impact of outliers. On the other hand, they require logarithms (which develop percentage adjustments) and variables must be re-expressed in a manner that makes sense as multipliers. Multiplicative models often produce significantly better results for vacant land but only marginally better results for improved properties. For comparison purposes, a multiplicative model was developed for each of the 10 pilot models using the same sales and data as used in the additive model.

Below is the comparison multiplicative model for County 4 stratum 1. The coefficients for variables for which logarithms were computed (SizeFactor, PctGood, and LRatio) are exponents that calibrate the curvilinear relationship of a variable with price. For example, the exponent of 0.700 for SizeFactor indicates economies of scale: as living area increases, value increases but not in direct proportion. The other coefficients represent logarithms of the corresponding multipliers. For example, the coefficient for Qual4 of .119 implies a multiplier of 1.126 (antilog of .119) or a premium of 12.6% over average quality construction. Note that the same data attributes appear in both the additive and multiplicative models but sometimes in different formats. Binary variables remain the same (0 or 1), although additive models calibrate dollar adjustments for them and multiplicative models calibrate percentage adjustments. Percentage adjustments can be advantageous when a model is developed for a wide range of properties, such as for an entire county.

In this case the multiplicative model produces a median ratio of 0.995 and a COD of 13.3% (not as good as in the additive model). In seven of the ten areas, however, the multiplicative models produced the better COD with the improvement most pronounced in the vacant land models in County 4. This improvement is in spite of the factor that outliers were reviewed based on the additive model (no additional outliers were excluded in the multiplicative models).

Final Multiplicative Model – County 4 Single Family Properties

Model: 4

R	R Square	Adjusted R Square	Std. Error of the Estimate
.947	.896	.894	.17242

Model: 4

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	11.945	.021		560.592	.000
LN_SIZEFACTOR	.700	.028	.521	25.008	.000
QUAL4	.119	.025	.098	4.710	.000
QUAL5	.322	.091	.060	3.556	.000
LN_PCTGOOD	1.003	.043	.403	23.238	.000
LN_LRATIO	.161	.010	.313	16.140	.000
MKTAREA1	-.121	.027	-.082	-4.532	.000
MKTAREA3	-.102	.034	-.053	-3.008	.003
MKTAREA4	-.069	.023	-.064	-2.936	.004
NB_95000	-.790	.079	-.165	-10.049	.000

Excluded Variables[d]

Model: 4

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
NB_1500	-.008	-.459	.646	-.023	.910
NB_458500	.009	.526	.599	.026	.962
NB_538500	.023	1.354	.176	.068	.911

d. Dependent Variable: LN_TASP

Ratio Statistics for ESP / TASP

Sales	405
Median	.995
Weighted Mean	.990
Minimum	.563
Maximum	1.942
Price Related Differential	1.026
Coefficient of Dispersion	.133

Finally, to facilitate interpretation logarithms developed in multiplicative models were converted back to real number. The final multiplicative model for County 4 stratum 1 then appears as shown below. The syntax files contain similar conversions for the other model areas.

```
VALUE = 154013
* (TOTLAREA/1400) ^ 0.700
* (1=EffAge60/100) ^ 1.003
* (LandSqft/12500) ^ 0.161
*  1.127 ^ QUAL4
*  1.380 ^ QUAL5
*  0.886 ^ MKTAREA1
*  0.903 ^ MKTAREA3
*  0.934 ^ MKTAREA4
*  0.454 ^ NB_95000
```

3. MODEL RESULTS

Table 2 below summarizes model results for all 10 pilot areas. The results are highly encouraging. They indicate that workable models can be produced for at least single family residential properties in most counties, as well as other property types when adequate sales exist and market areas or neighborhoods are well-defined.

County 3 residential, which included mobile homes (in fact, mobile homes were the majority of sales) and the two vacant land models (stratum 4 in County 4 and stratum 5 in County 5) produced the least satisfactory results. If vacant land models are pursued, multiplicative models are clearly preferred. The multiplicative model also produced a 2.0 point improvement in the COD for commercial properties in County 1, undoubtedly due to the ability to better capture nonlinear relationships and to develop percentage adjustments that better adapt to a large range in property values. Additive models are entirely adequate for residential properties.

Table 2 – Summary of Model Performance

	Sales	R-Square	Median	COD	R-Square	Median	COD
County 1 Single-family	10,459	0.916	1.001	10.7	0.913	0.995	10.5
County 1 Condos	2,835	0.916	1.003	6.9	0.929	1.000	6.5
County 1 Multi-family	219	0.875	1.006	12.1	0.898	1.009	10.6
County 1 Commerical	225	0.680	1.023	17.9	0.905	1.010	15.9
County 2 Single-family	169	0.833	1.020	17.7	0.821	1.014	18.9
County 3 Residential	532	0.805	1.032	27.9	0.750	1.001	26.2
County 4 Single-family	405	0.918	0.997	12.5	0.894	0.995	13.3
County 4 Vacant Land	182	0.861	1.008	26.1	0.866	1.000	21.6
County 5 Single-famil	204	0.847	1.000	17.1	0.836	0.982	16.5
County 5 Acreage	222	0.461	0.560	47.0	0.687	0.953	37.7

4. CONCLUSIONS AND RECOMMENDATIONS

This project demonstrates that satisfactory valuation models can be developed for at least single family residential properties (and condominiums) in counties with adequate sales and well-defined market areas and neighborhoods. There are at least four payoffs from such models. First, they can be used to produce market values estimates for in-depth studies and school aid distribution purposes. To a considerable extent, models developed for such purposes need only be accurate in the aggregate and clearly MRA models produce values centered on the market as indicated by the median ratios in Table 2 all cluster about 1.00. Second, model coefficients can inform attribute adjustments made in traditional appraisal models and the models could provide reference values for comparison and support purposes. Third, models will help determine time trends and related value changes. Fourth, counties stand to benefit from adoption of similar methods in their valuation programs.

Although highly encouraging given the limited property attribute data on current NAL files, future models would clearly benefit from the inclusion of other important attributes such as building style, garages and carports, and site amenities such as location on water, golf course frontage, and major streets (a negative influence for residential properties but a positive one for retail-oriented properties). Equally important, models would benefit significantly from improvements in market area and neighborhood delineations. Some counties clearly have given little thought to defining meaningful market areas and neighborhoods with adequate market data, while others have done an adequate or good job.

Regarding additive versus multiplicative models, additive models are fine for single family properties and condominiums and can also produce adequate results for multi-family and commercial properties. In any case, modelers should develop proficiency with additive models first before venturing into other model structures. That said, multiplicative models can often substantial improve performance increase for vacant land.

The following steps are recommended:

- Work with counties to improve market area and neighborhood definitions
- Add additional property attributes to the NAL file
- Continue to monitor the screening for sales to ensure that sales are properly coded for both sales ratio and valuation/modeling purposes
- Develop a core proficiency in MRA modeling and related statistical analysis
- Pursue a follow-up to the present study using more recent sales that will reflect the downturn that many markets have experienced over the past year or more.

Appendix 1
County 1 Single Family Residential Models

Additive Model

Model: 15

R	R Square	Adjusted R Square	Std. Error of the Estimate
.957	.917	.916	36989.19751

Model: 15

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	32858.091	1611.119		20.395	.000
BAV_SF	77.321	5.337	.043	14.487	.000
AVG_SF	107.852	1.030	.733	104.710	.000
AAV_SF	120.049	.755	1.094	159.061	.000
EXC_SF	153.744	.750	.831	204.918	.000
SUP_SF	183.844	1.550	.360	118.591	.000
EFFAGE60SF	-.658	.020	-.131	-32.924	.000
LANDSF_.75	4.963	.203	.081	24.428	.000
MKTAREA2	-21305.805	1288.382	-.061	-16.537	.000
MKTAREA3	-23262.883	1683.097	-.070	-13.821	.000
NB_11431003X	-26108.058	3587.064	-.021	-7.278	.000
NB_11431501	14724.407	5273.721	.008	2.792	.005
NB_11431503	44471.668	9296.062	.014	4.784	.000
NB_11432212	58022.316	16593.275	.010	3.497	.000
NB_11432802	-30108.412	11185.694	-.008	-2.692	.007
NB_11432901X	-29950.664	7290.737	-.012	-4.108	.000
NB_11433101X	-22399.023	3618.572	-.018	-6.190	.000
NB_11433203	-35515.250	4357.115	-.024	-8.151	.000
NB_11433204	-32802.819	7310.400	-.013	-4.487	.000
NB_11433408	-58413.553	11325.098	-.015	-5.158	.000
NB_11433411X	-19337.224	8524.719	-.006	-2.268	.023
NB_11433501	22709.361	9014.740	.007	2.519	.012
NB_11433505	24948.583	6498.443	.011	3.839	.000
NB_11433531	-21628.097	9288.394	-.007	-2.329	.020
NB_11433602X	-13839.155	7670.343	-.005	-1.804	.071
NB_12530433X	-39601.788	5143.447	-.022	-7.699	.000
NB_12530505	-28267.710	5785.338	-.014	-4.886	.000
NB_12530601X	-18933.924	6037.804	-.009	-3.136	.002
NB_12530703	51758.456	6210.317	.024	8.334	.000
NB_12538804	-17146.628	6896.118	-.007	-2.486	.013

Model: 15

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
NB_12530813	16786.779	5745.759	.008	2.922	.003
NB_12530908X	-57522.809	4473.523	-.037	-12.859	.000
NB_12531401X	40304.829	16571.920	.007	2.432	.015
NB_12531702	34432.142	7190.434	.014	4.789	.000
NB_12531703X	55825.425	10809.524	.015	5.164	.000
NB_12531803	32161.986	4793.920	.019	6.709	.000
NB_12531806	95418.033	13152.428	.021	7.255	.000
NB_12531815	34089.557	12389.916	.008	2.751	.006
NB_12531903X	13518.476	4267.722	.009	3.168	.002
NB_12531909	66491.083	8556.589	.022	7.771	.000
NB_12531912	42653.476	7602.934	.016	5.610	.000
NB_12531917X	91119.486	8565.432	.030	10.638	.000
NB_12531922X	19095.923	6223.923	.009	3.068	.002
NB_12531926X	95804.635	7221.516	.040	13.267	.000
NB_12532002X	13726.535	3767.577	.010	3.643	.000
NB_12532009	14854.445	5806.798	.007	2.558	.011
NB_12532010	-55779.908	7652.554	-.021	-7.289	.000
NB_12532011	22577.208	8740.837	.007	2.583	.010
NB_12532013	33229.968	9928.570	.010	3.347	.001
NB_12532018	-35194.044	4450.670	-.023	-7.908	.000
NB_12532019X	40326.072	9299.652	.012	4.336	.000
NB_12532101X	-28184.125	3025.813	-.027	-9.315	.000
NB_12532201X	-35718.754	9954.619	-.010	-3.588	.000
NB_12532902X	40146.279	9914.549	.012	4.049	.000
NB_12533002	201468.315	26377.815	.022	7.638	.000
NB_13422502	-25941.797	4591.621	-.016	-5.650	.000
NB_13423601X	37839.379	12379.506	.009	3.057	.002
NB_13432420	-28795.731	7470.234	-.011	-3.855	.000
NB_13432423	-19625.091	11198.067	-.005	-1.753	.080
NB_13432504X	-339069.813	19424.272	-.052	-17.456	.000
NB_14530101	107141.895	8793.550	.035	12.184	.000
NB_14530102	61089.210	4579.514	.038	13.340	.000
NB_14530104X	79326.156	6575.012	.034	12.065	.000
NB_14530201	9257.330	4071.304	.007	2.274	.023
NB_14540402	30807.938	6924.000	.013	4.449	.000
NB_14540403	73788.939	7454.185	.028	9.899	.000
NB_14540405	-27798.437	8361.288	-.010	-3.325	.001
NB_14540501X	-49664.322	10283.969	-.014	-4.829	.000
NB_14540503	-93841.353	14000.764	-.019	-6.703	.000
NB_14540507	-39354.453	14006.671	-.008	-2.810	.005

Model: 15

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
NB_14540602X	106796.268	4187.752	.074	25.502	.000
NB_14540604X	61728.845	10290.648	.017	5.999	.000
NB_14540901X	-42447.931	6217.402	-.020	-6.827	.000
NB_14541601	-50098.548	9285.545	-.015	-5.395	.000
NB_14820001X	-22885.517	9287.076	-.007	-2.464	.014
NB_14830001X	-53835.795	16587.302	-.009	-3.246	.001
NB_14840001X	-21708.076	6914.940	-.009	-3.139	.002
NB_15432403X	-17740.169	5387.412	-.009	-3.293	.001
NB_15432410	9264.515	3163.377	.009	2.929	.003
NB_16431402	-24747.111	8746.350	-.008	-2.829	.005
NB_16431408X	-28127.190	5244.602	-.015	-5.363	.000
NB_17430050X	-36510.585	4946.426	-.021	-7.381	.000
NB_17432301	-23942.336	7030.901	-.010	-3.405	.001
NB_17432317X	-37362.494	3360.935	-.032	-11.117	.000
NB_21520101X	89871.866	10846.214	.024	8.286	.000
NB_21520202X	60578.451	3783.609	.049	16.011	.000
NB_21521202	108743.633	16631.379	.019	6.538	.000
NB_21521401	57074.636	8604.260	.019	6.633	.000
NB_21621601X	-14620.690	7097.636	-.006	-2.060	.039
NB_22210000X	-35084.643	11749.133	-.009	-2.986	.003
NB_22310002X	-11378.633	3894.660	-.009	-2.922	.003
NB_22310008X	-24934.398	8166.893	-.009	-3.053	.002
NB_22310011X	-55236.174	14029.469	-.011	-3.937	.000
NB_22310042X	-25767.493	9192.951	-.008	-2.803	.005
NB_22311701	-86711.270	21429.832	-.012	-4.046	.000
NB_22312401X	-40319.676	16585.867	-.007	-2.431	.015
NB_23320801	-18909.697	11232.710	-.005	-1.683	.092
NB_23321402X	-25369.942	8159.884	-.009	-3.109	.002
NB_23321404X	-81275.200	21386.568	-.011	-3.800	.000
NB_23321429	-31194.155	15150.097	-.006	-2.059	.040
NB_31352301	-45688.561	11265.624	-.012	-4.056	.000
NB_31363331	69437.048	15194.284	.013	4.570	.000
NB_31450040X	-64651.761	14132.955	-.013	-4.575	.000
NB_31453003X	-37077.564	21422.791	-.005	-1.731	.084
NB_31540000X	-18419.051	9376.340	-.006	-1.964	.050
NB_31540101	-22483.480	4627.499	-.015	-4.859	.000
NB_31540301	-34890.052	9384.139	-.011	-3.718	.000
NB_31540302X	-28464.812	8630.068	-.010	-3.298	.001
NB_31541000X	-16469.769	5731.111	-.008	-2.874	.004
NB_31541102X	-20287.130	5141.691	-.012	-3.946	.000

Model: 15

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
NB_31541104X	-44988.391	9118.792	-.014	-4.934	.000
NB_31541200X	-21936.974	7163.151	-.009	-3.062	.002
NB_31541403X	-19562.606	10005.422	-.006	-1.955	.051
NB_31550040	-46109.060	16638.027	-.008	-2.771	.006
NB_31550601X	-22072.371	8857.015	-.007	-2.492	.013
NB_31560040X	-98626.218	11931.941	-.024	-8.266	.000
NB_31562601	-44631.633	10373.764	-.012	-4.302	.000
NB_31562603X	-27908.704	7579.494	-.011	-3.682	.000
NB_31562626	-40339.490	11258.387	-.010	-3.583	.000
NB_32240000	-49078.934	26245.126	-.005	-1.870	.062
NB_32340000X	-52524.609	11946.233	-.013	-4.397	.000
NB_32441904	30555.896	4840.576	.019	6.312	.000
NB_32441906X	18453.902	7042.391	.008	2.620	.009
NB_32442003	15472.646	8054.787	.006	1.921	.055
NB_32442802	-7652.968	4156.411	-.006	-1.841	.066
NB_32442901X	21294.831	5464.181	.012	3.897	.000
NB_32442904X	24506.452	5424.359	.013	4.518	.000
NB_32443001X	17574.323	3916.242	.014	4.488	.000
NB_32443100X	90606.474	4383.786	.063	20.669	.000
NB_32443104X	39838.139	4819.993	.025	8.265	.000
NB_32443201X	23967.025	6360.929	.011	3.768	.000
NB_32443203X	50682.830	5314.248	.028	9.537	.000
NB_32443205X	30761.809	7158.402	.012	4.297	.000
NB_32443303	104961.622	6006.492	.052	17.475	.000
NB_32443304	38173.952	5421.935	.021	7.041	.000
NB_32443305	17990.296	4921.687	.011	3.655	.000
NB_32443405	-24821.911	6126.928	-.012	-4.051	.000

Excluded Variables[o]

Model: 15

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
NB_12530332	.002	.641	.522	.006	.993
NB_11432701	.002	.718	.473	.007	.992
NB_11432708	.002	.753	.452	.007	.977
NB_13432412X	.002	.769	.442	.008	.986
NB_11432803	-.002	-.810	.418	-.008	.991
NB_31363301	-.003	-.988	.323	-.010	.978
NB_12531808	-.003	-1.057	.290	-.010	.953
NB_11431502	-.003	-1.047	.295	-.010	.984
NB_12530302	.003	1.112	.266	.011	.972
NB_31550042	-.003	-1.174	.240	-.012	.986
NB_22310401	-.004	-1.343	.179	-.013	.993
NB_11433507	-.004	-1.444	.149	-.014	.993
NB_32440000	-.005	-1.594	.111	-.016	.996
NB_16431401	.005	1.629	.103	.016	.996

o. Dependent Variable: TASP

Ratio Statistics for ESP / TASP

Sales	10459
Median	1.001
Weighted Mean	1.000
Minimum	.112
Maximum	2.065
Price Related Differential	1.016
Coefficient of Dispersion	.107

Multiplicative Model

Model: 14

R	R Square	Adjusted R Square	Std. Error of the Estimate
.956	.914	.913	.14088

Model: 14

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	12.314	.004		3119.630	.000
LN_SIZEFACTOR	.837	.006	.645	144.740	.000
QUAL_BAV	-.285	.030	-.028	-9.421	.000
QUAL_AAV	.104	.005	.098	23.064	.000
QUAL_EXC	.372	.010	.136	36.131	.000
QUAL_SUP	.634	.046	.041	13.666	.000
LN_PCTGOOD	.421	.012	.149	36.404	.000
LN_LRATIO	.049	.002	.070	20.766	.000
MKTAREA2	-.102	.005	-.077	-20.367	.000
MKTAREA3	-.137	.007	-.110	-21.058	.000
NB_11431003X	-.123	.014	-.026	-8.953	.000
NB_11431501	.070	.020	.010	3.477	.001
NB_11431503	.147	.035	.012	4.151	.000
NB_11432212	.166	.063	.008	2.635	.008
NB_11432708	.058	.020	.009	2.953	.003
...	...	...	...	...	...
NB_32443304	.291	.021	.043	13.998	.000
NB_32443305	.116	.019	.019	6.161	.000
NB_32443405	-.201	.023	-.026	-8.622	.000

Excluded Variables[n]

Model: 14

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
NB_31363301	.000	-.138	.890	-.001	.977
NB_11431502	.000	-.132	.895	-.001	.988
NB_12531808	.001	.278	.781	.003	.946
NB_31550042	.001	.409	.683	.004	.984
NB_22310042X	-.003	-.952	.341	-.009	.960
NB_11433602X	-.003	-.946	.344	-.009	.980
NB_11433507	-.003	-.982	.326	-.010	.995
NB_11432803	-.003	-1.203	.229	-.012	.992
NB_11432701	.004	1.303	.193	.013	.991
NB_12530332	.004	1.323	.186	.013	.992
NB_31453003X	-.004	-1.348	.178	-.013	.994
NB_14830001X	-.004	-1.398	.162	-.014	.997
NB_13432412X	.005	1.643	.100	.016	.984

n. Dependent Variable: LN_TASP

Ratio Statistics for ESP / TASP

Sales	10459
Median	.995
Weighted Mean	.990
Minimum	.522
Maximum	1.962
Price Related Differential	1.020
Coefficient of Dispersion	.105

Appendix 2
County 1 Condominium Models

Additive Model

Model: 1

R	R Square	Adjusted R Square	Std. Error of the Estimate
.958	.918	.916	14401.12248

Model: 1

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	37932.325	1741.121		21.786	.000
TOTLAREA	131.440	1.644	.714	79.960	.000
EFFAGE20SF	-1.803	.064	-.313	-28.159	.000
MKTAREA2	-16629.347	3189.826	-.047	-5.213	.000
MKTAREA3	15555.501	1452.570	.085	10.709	.000
NB_11430041	-18869.855	1725.244	-.075	-10.937	.000
NB_11433407	-20097.509	7301.262	-.015	-2.753	.006
NB_12530331	21048.799	2445.340	.049	8.608	.000
NB_12530430	-59489.511	5192.594	-.064	-11.457	.000
NB_12530431	-49868.341	1983.503	-.152	-25.142	.000
NB_12530432	-22727.034	1968.787	-.069	-11.544	.000
NB_12530434	-24805.519	1589.171	-.101	-15.609	.000
NB_12530435	-16755.824	1771.363	-.064	-9.459	.000
NB_12531002	8835.338	1432.560	.040	6.168	.000
NB_12531104	-32150.254	1526.100	-.147	-21.067	.000
NB_12531151	-14803.677	7256.353	-.011	-2.040	.041
NB_12531179	-26533.221	7261.524	-.020	-3.654	.000
NB_12531901	25238.429	1418.429	.114	17.793	.000
NB_12532015	22803.139	7318.331	.017	3.116	.002
NB_13603033	71832.930	1730.211	.245	41.517	.000
NB_14531260	11936.964	2416.627	.028	4.940	.000
NB_14531269	28528.480	1776.475	.098	16.059	.000
NB_14531270	-43167.227	6538.450	-.036	-6.602	.000
NB_14531331	-54245.375	1544.744	-.226	-35.116	.000
NB_14540401	-27103.274	5517.837	-.027	-4.912	.000
NB_14540406	53719.923	8370.797	.035	6.418	.000
NB_14540407	61557.515	4142.050	.093	14.862	.000
NB_14540505	34477.566	5516.228	.034	6.250	.000
NB_14540531	93968.247	2769.435	.200	33.930	.000
NB_14540602	39032.133	10222.464	.021	3.818	.000

Model: 1

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
NB_14540730	-5889.982	1882.926	-.020	-3.128	.002
NB_14540731	13539.500	3342.521	.023	4.051	.000
NB_14540830	-22039.253	4143.585	-.030	-5.319	.000
NB_14540831	21175.585	2770.464	.044	7.643	.000
NB_14540832	39301.690	2755.499	.081	14.263	.000
NB_14581004	-22552.838	2289.251	-.059	-9.852	.000
NB_14580030	3324.118	2010.647	.010	1.653	.098
NB_14580031	6348.854	2463.861	.015	2.577	.010
NB_14580032	17174.641	2777.313	.035	6.184	.000
NB_14580033	19536.355	4068.624	.028	4.802	.000
NB_14580035	23005.537	1785.677	.080	12.883	.000
NB_14580038	-11344.731	5199.103	-.012	-2.182	.029
NB_14810051X	-36952.833	1946.597	-.116	-18.983	.000
NB_14580074	-38284.504	3953.415	-.054	-9.684	.000
NB_14540032	-16606.480	2425.003	-.040	-6.848	.000
NB_14840035	-19475.000	4097.950	-.026	-4.752	.000
NB_14840036	-13825.687	2524.172	-.033	-5.477	.000
NB_14860031	-23634.415	1697.206	-.083	-13.925	.000
NB_14860070	-41188.368	7297.857	-.031	-5.644	.000
NB_14860071	-18387.411	5185.774	-.020	-3.546	.000
NB_21520049	-24782.790	5005.652	-.034	-4.951	.000
NB_23333202	10531.326	4601.658	.018	2.289	.022
NB_32441830	-82225.285	8394.997	-.054	-9.795	.000
NB_32443000X	-38524.455	3804.015	-.058	-10.127	.000
NB_32443034	-30443.083	4046.213	-.043	-7.524	.000
NB_32443109	-10634.230	5741.776	-.011	-1.852	.064
NB_32443204X	-38908.311	6649.219	-.033	-5.852	.000
NB_32443249	17436.624	8393.723	.011	2.077	.038
NB_32443269	-26297.286	10251.432	-.014	-2.565	.010
NB_32443407	-50332.162	3385.262	-.089	-14.868	.000

Ratio Statistics for ESP / TASP

Sales	2835
Median	1.003
Weighted Mean	1.000
Minimum	.695
Maximum	1.826
Price Related Differential	1.008
Coefficient of Dispersion	.069

Multiplicative Model

Model: 3

R	R Square	Adjusted R Square	Std. Error of the Estimate
.965	.931	.929	.08847

Model: 3

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	12.106	.007		1729.619	.000
LN_SIZEFACTOR	.753	.009	.596	83.148	.000
LN_PCTGOOD	1.029	.039	.253	26.655	.000
MKTAREA2	-.057	.014	-.024	-4.038	.000
MKTAREA3	.107	.009	.087	12.273	.000
NB_11430041	-.087	.010	-.052	-8.439	.000
NB_11433407	-.083	.045	-.009	-1.865	.062
NB_12530331	.118	.015	.041	7.955	.000
...	...	...	...	...	...
NB_32443249	.108	.052	.011	2.103	.036
NB_32443269	-.197	.063	-.016	-3.135	.002
NB_32443407	-.361	.021	-.095	-17.221	.000

Excluded Variables[c]

Model: 3

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
NB_23333202	.002	.353	.724	.007	.500
NB_14580030	.007	1.333	.183	.025	.811

c. Dependent Variable: LN_TASP

Ratio Statistics for ESP / TASP

Sales	2835
Median	1.000
Weighted Mean	.997
Minimum	.700
Maximum	1.741
Price Related Differential	1.007
Coefficient of Dispersion	.065

Appendix 3
County 1 Multi-Family Models (Stratum 2)

Additive Model

Model: 9

R	R Square	Adjusted R Square	Std. Error of the Estimate
.941	.886	.875	33645.96933

Coefficients[a]

Model: 9

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	85872.741	9966.104		8.616	.000
TOTLAREA	79.404	5.143	1.080	15.441	.000
QUAL_BAV	-88622.769	20302.808	-.109	-4.365	.000
EFFAGE25SF	-.898	.223	-.279	-4.028	.000
MKTAREA2	-65928.100	17999.378	-.093	-3.663	.000
MKTAREA3	-32142.072	9061.362	-.136	-3.547	.000
NB_12530481	-148693.288	9090.271	-.481	-16.357	.000
NB_12530902	-108132.418	9548.975	-.321	-11.324	.000
NB_12530907	-95990.824	13976.368	-.178	-6.868	.000
NB_12532103	-72012.840	10833.857	-.179	-6.647	.000
NB_13603031X	71736.854	13441.390	.142	5.337	.000
NB_14540481	-64621.680	20564.362	-.079	-3.142	.002
NB_14581072	-88151.393	7844.470	-.384	-11.237	.000
NB_14580073	-55507.962	24448.138	-.056	-2.270	.024
NB_14840008	-31750.070	17728.268	-.045	-1.791	.075
NB_17431370	-134126.501	16048.380	-.211	-8.358	.000
NB_31540080X	-50086.418	24690.381	-.050	-2.029	.044
NB_32441840X	-47198.708	14550.858	-.088	-3.244	.001
NB_32442071	-60343.062	16419.097	-.095	-3.675	.000
NB_32443470	-41083.243	24672.391	-.041	-1.665	.097

a. Dependent Variable: TASP

Excluded Variables[i]

Model: 9

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
LANDSF_.25	-.002	-.061	.952	-.004	.424
NB_31540380	.027	.642	.522	.046	.319
NB_32442970X	.017	.687	.493	.049	.895
NB_14540482X	-.016	-.571	.569	-.041	.746
NB_21620000	-.021	-.618	.537	-.044	.503
NB_32442070	-.014	-.520	.604	-.037	.793
NB_31541204	-.024	-.965	.336	-.068	.929
QUAL_AAV	.027	1.079	.282	.076	.926

i. Dependent Variable: TASP

Ratio Statistics for ESP / TASP

Sales	219
Median	1.006
Weighted Mean	1.000
Minimum	.635
Maximum	1.696
Price Related Differential	1.020
Coefficient of Dispersion	.121

Multiplicative Model

Model: 11

R	R Square	Adjusted R Square	Std. Error of the Estimate
.952	.906	.898	.15500

Model: 11

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	12.665	.090		140.672	.000
LN_SIZEFACTOR	.879	.031	.771	28.100	.000
QUAL_BAV	-.978	.096	-.234	-10.185	.000
LN_PCTGOOD	1.130	.333	.077	3.388	.001
MKTAREA2	-.236	.080	-.065	-2.943	.004
NB_12530481	-.587	.040	-.371	-14.661	.000
NB_12530902	-.512	.040	-.297	-12.697	.000
NB_12530907	-.424	.062	-.154	-6.878	.000
NB_12532103	-.261	.048	-.127	-5.409	.000
NB_13603031X	.414	.059	.160	7.048	.000
NB_14540481	-.248	.093	-.059	-2.678	.008
NB_14581072	-.431	.030	-.367	-14.310	.000
NB_14580073	-.194	.112	-.038	-1.730	.085
NB_17431370	-.664	.072	-.204	-9.235	.000
NB_31540080X	-.403	.112	-.079	-3.588	.000
NB_32441840X	-.299	.062	-.108	-4.835	.000
NB_32442071	-.455	.073	-.140	-6.199	.000
NB_32443470	-.355	.111	-.070	-3.185	.002

Excluded Variables[k]

Model: 11

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
NB_32442970X	-.001	-.044	.965	-.003	.962
NB_14540482X	.005	.206	.837	.015	.866
MKTAREA3	-.045	-1.309	.192	-.092	.393
NB_31540380	.020	.545	.586	.039	.335
NB_14840008	-.023	-1.026	.306	-.072	.937
QUAL_AAV	.020	.898	.370	.063	.950
NB_21620000	-.035	-1.152	.251	-.081	.498
NB_31541204	-.023	-1.053	.294	-.074	.945
LN_LRATIO	.032	.944	.346	.067	.416
NB_32442070	-.029	-1.287	.200	-.091	.927

k. Dependent Variable: LN_TASP

Ratio Statistics for ESP / TASP

Sales	219
Median	1.009
Weighted Mean	.990
Minimum	.521
Maximum	1.729
Price Related Differential	1.021
Coefficient of Dispersion	.106

Appendix 4
County 1 Commercial Models (Stratum 6)

Additive Model

Model: 7

R	R Square	Adjusted R Square	Std. Error of the Estimate
.838	.702	.680	29.02621

Model: 7

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	191.995	6.049		31.741	.000
QUAL_BAV	-28.637	11.236	-.104	-2.549	.012
QUAL_GOOD	15.684	6.216	.134	2.523	.012
EFFAGE45	-1.750	.213	-.410	-8.225	.000
MKTAREA2	-12.134	6.638	-.088	-1.828	.069
MKTAREA3	-26.002	5.935	-.223	-4.381	.000
OFFICE_MULTISTORY	-23.316	12.284	-.073	-1.898	.059
AUTO_REPAIR	-57.625	9.051	-.281	-6.367	.000
WH_INDUSTRIAL	-69.558	6.930	-.455	-10.037	.000
NB_11430055X	-19.655	7.781	-.112	-2.526	.012
NB_12531050	-36.192	17.457	-.081	-2.073	.039
NB_14540450X	-24.311	14.151	-.070	-1.718	.087
NB_14540552X	-26.503	10.402	-.101	-2.548	.012
NB_25740078	-36.171	13.815	-.123	-2.618	.009
NB_32440052X	-18.754	10.640	-.079	-1.763	.079
NB_32443350X	41.777	12.941	.131	3.228	.001

Excluded Variables[g]

Model: 7

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
OFFICE_PROF	.026	.582	.561	.040	.728
LANDSF_.25	-.014	-.350	.727	-.024	.878
STORE	-.031	-.681	.497	-.047	.673
NB_13610020	-.037	-.927	.355	-.064	.885
NB_25710081	-.049	-1.169	.244	-.081	.820
SHOPPING_CTR	-.058	-1.441	.151	-.099	.867

g. Dependent Variable: TASPPSF

Ratio Statistics for ESP / TASP

Sales	225
Median	1.023
Weighted Mean	1.077
Minimum	.504
Maximum	1.770
Price Related Differential	.976
Coefficient of Dispersion	.179

Multiplicative Model

Model: 10

R	R Square	Adjusted R Square	Std. Error of the Estimate
.951	.905	.898	.21261

Model: 10

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	13.124	.042		315.462	.000
LN_SIZEFACTOR	.820	.023	.934	35.958	.000
LN_PCTGOOD	1.110	.118	.262	9.440	.000
LN_LRATIO	.040	.013	.080	3.193	.002
QUAL_BAV	-.262	.081	-.073	-3.246	.001
QUAL_GOOD	.046	.042	.030	1.086	.279
SHOPPING_CTR	-.113	.056	-.045	-2.023	.044
OFFICE_MULTISTORY	-.153	.090	-.037	-1.699	.091
AUTO_REPAIR	-.523	.067	-.196	-7.782	.000
WH_INDUSTRIAL	-.595	.052	-.300	-11.465	.000
MKTAREA2	-.087	.048	-.049	-1.808	.072
MKTAREA3	-.197	.042	-.130	-4.651	.000
NB_14540450X	-.304	.103	-.067	-2.946	.004
NB_25740078	-.403	.101	-.105	-3.979	.000
NB_32440052X	-.169	.078	-.055	-2.156	.032
NB_32443350X	.325	.097	.079	3.365	.001

Excluded Variables[j]

Model: 10

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
NB_13610020	.005	.231	.817	.016	.885
OFFICE_PROF	.020	.769	.442	.053	.664
STORE	-.020	-.748	.455	-.052	.641
NB_12531050	-.011	-.509	.611	-.035	.908
NB_25710081	-.019	-.783	.434	-.054	.803
NB_11430055X	-.031	-1.199	.232	-.083	.667
NB_14540552X	-.034	-1.487	.138	-.103	.870

[j] Dependent Variable: LN_TASP

Ratio Statistics for ESP / TASP

Sales	225
Median	1.010
Weighted Mean	.969
Minimum	.493
Maximum	1.673
Price Related Differential	1.053
Coefficient of Dispersion	.159

Appendix 5
County 2 Residential Models

Additive Model

Model: 4

R	R Square	Adjusted R Square	Std. Error of the Estimate
.918	.842	.833	23431.04305

Model: 4

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	11594.562	5832.042		1.988	.049
QUAL1SF	23.701	16.328	.050	1.452	.149
QUAL2SF	44.603	7.844	.245	5.686	.000
QUAL3SF	58.020	4.848	.820	11.968	.000
QUAL4SF	81.493	3.824	1.278	21.312	.000
EFFAGE60SF	-.412	.089	-.191	-4.651	.000
SQRT_LANDSF	103.674	15.274	.229	6.788	.000
NB_300	-23249.097	7483.586	-.100	-3.107	.002
NB_900	63616.425	17027.490	.120	3.736	.000
NB_10000000	-24665.269	6636.919	-.126	-3.716	.000

Excluded Variables[d]

Model: 4

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
NB_11000000	-.004	-.101	.920	-.008	.811
NB_9000000	-.022	-.660	.510	-.052	.879
NB_400	.024	.753	.453	.060	.947

d. Dependent Variable: TASP

Ratio Statistics for ESP / TASP

Group	Sales	Median	Weighted Mean	Minimum	Maximum	PRD	COD
1 Single Family	169	1.020	1.000	.496	1.856	1.047	.177
Overall	169	1.020	1.000	.496	1.856	1.047	.177

Multiplicative Model

Model: 3

R	R Square	Adjusted R Square	Std. Error of the Estimate
.912	.831	.821	.22939

Model: 3

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	11.468	.045		252.587	.000
LN_SIZEFACTOR	.782	.058	.494	13.399	.000
QUAL1	-.827	.172	-.166	-4.816	.000
QUAL2	-.463	.093	-.171	-4.974	.000
QUAL4	.332	.046	.277	7.131	.000
LN_PCTGOOD	.527	.092	.213	5.747	.000
LN_LRATIO	.128	.020	.246	6.533	.000
NB_300	-.302	.073	-.138	-4.134	.000
NB_900	.426	.166	.085	2.571	.011
NB_10000000	-.307	.068	-.167	-4.531	.000
NB_11000000	.170	.119	.053	1.427	.156

Excluded Variables[c]

Model: 3

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
NB_9000000	-.027	-.754	.452	-.060	.829
NB_400	.039	1.159	.248	.092	.932

c. Dependent Variable: LN_TASP

Ratio Statistics for ESP / TASP

Group	Sales	Median	Weighted Mean	Minimum	Maximum	PRD	COD
1 Single Family	169	1.014	.978	.478	1.786	1.048	.169
Overall	169	1.014	.978	.478	1.786	1.048	.169

Appendix 6
County 3 Residential Models

Additive Model

Model: 2

R	R Square	Adjusted R Square	Std. Error of the Estimate
.900	.809	.805	42831.81283

Model: 2

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	58279.460	7831.752		7.441	.000
QUAL2SF	51.214	7.759	.152	6.600	.000
QUAL3SF	78.776	3.945	.581	19.968	.000
QUAL4SF	105.718	4.262	.736	24.806	.000
QUAL5SF	239.344	10.508	.552	22.777	.000
EFFAGE	-1150.630	198.646	-.133	-5.792	.000
SQRT_LANDSF	191.067	26.438	.157	7.227	.000
NB_10000000	27236.149	4589.481	.133	5.934	.000
NB_30000000	-18088.940	4898.548	-.081	-3.693	.000
NB_40000000	32169.553	9343.061	.069	3.443	.001
NB_70000000	38306.858	20630.268	.045	1.857	.064
MOBILEHOME_SF	-40.412	3.080	-.276	-13.123	.000

Excluded Variables[b]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	NB_50000000	-.021	-.910	.363	-.040	.711

b. Dependent Variable: TASP

Ratio Statistics for ESP / TASP

Group	Sales	Median	Weighted Mean	Minimum	Maximum	PRD	COD
1 Single Family	184	1.026	.999	.460	2.173	1.099	.240
2 Mobile Home	348	1.041	1.001	.015	3.077	1.113	.298
Overall	532	1.032	1.000	.015	3.077	1.109	.279

Multiplicative Model

Model: 3

R	R Square	Adjusted R Square	Std. Error of the Estimate
.869	.754	.750	.32451

Model: 3

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	12.037	.050		240.146	.000
LN_SIZEFACTOR	.744	.042	.452	17.917	.000
QUAL2	-.342	.061	-.129	-5.589	.000
QUAL4	.238	.038	.150	6.194	.000
QUAL5	.614	.243	.058	2.530	.012
LN_PCTGOOD	.991	.114	.233	8.727	.000
LN_LRATIO	.128	.021	.154	5.991	.000
NB_10000000	.209	.036	.153	5.777	.000
NB_30000000	-.308	.038	-.206	-8.045	.000
NB_50000000	-.120	.052	-.057	-2.326	.020
MOBILEHOME	-.461	.034	-.339	-13.603	.000

Excluded Variables[c]

Model: 3

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
NB_70000000	-.017	-.647	.518	-.028	.648
NB_40000000	.027	1.165	.244	.051	.873

c. Dependent Variable: LN_TASP

Ratio Statistics for ESP / TASP

Group	Sales	Median	Weighted Mean	Minimum	Maximum	PRD	COD
1 Single Family	184	.991	.973	.384	2.018	1.080	.264
2 Mobile Home	348	1.008	.949	.330	2.584	1.109	.260
Overall	532	1.001	.961	.330	2.584	1.095	.262

Appendix 7
County 4 Single Family Residential Models

Additive Model

Model: 4

R	R Square	Adjusted R Square	Std. Error of the Estimate
.959	.920	.918	22693.34942

Model: 4

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	37179.319	3713.548		10.012	.000
QUAL23SF	81.131	2.931	.760	27.682	.000
QUAL4SF	93.171	2.119	1.222	43.965	.000
QUAL5SF	111.229	3.894	.432	28.566	.000
EFFAGE60SF	-1.066	.052	-.353	-20.407	.000
SQRT_LANDSF	231.864	9.874	.379	23.482	.000
MKTAREA1	-9732.928	3521.317	-.044	-2.764	.006
MKTAREA3	-9825.228	4435.552	-.034	-2.215	.027
MKTAREA4	-6774.981	2989.520	-.042	-2.266	.024
NB_95000	-52270.920	10347.539	-.073	-5.052	.000

Excluded Variables[d]

Model: 4

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
NB_458500	.005	.327	.744	.016	.955
NB_1500	.010	.675	.500	.034	.917
NB_538500	.011	.732	.465	.037	.915

d. Dependent Variable: TASP

Ratio Statistics for ESP / TASP

Sales	405
Median	.997
Weighted Mean	1.000
Minimum	.671
Maximum	1.939
Price Related Differential	1.028
Coefficient of Dispersion	.125

Multiplicative Model

Model: 4

R	R Square	Adjusted R Square	Std. Error of the Estimate
.947	.896	.894	.17242

Model: 4

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	11.945	.021		560.592	.000
LN_SIZEFACTOR	.700	.028	.521	25.008	.000
QUAL4	.119	.025	.098	4.710	.000
QUAL5	.322	.091	.060	3.556	.000
LN_PCTGOOD	1.003	.043	.403	23.238	.000
LN_LRATIO	.161	.010	.313	16.140	.000
MKTAREA1	-.121	.027	-.082	-4.532	.000
MKTAREA3	-.102	.034	-.053	-3.008	.003
MKTAREA4	-.069	.023	-.064	-2.936	.004
NB_95000	-.790	.079	-.165	-10.049	.000

Excluded Variables[d]

Model: 4

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
NB_1500	-.008	-.459	.646	-.023	.910
NB_458500	.009	.526	.599	.026	.962
NB_538500	.023	1.354	.176	.068	.911

d. Dependent Variable: LN_TASP

Ratio Statistics for ESP / TASP

Sales	405
Median	.995
Weighted Mean	.990
Minimum	.563
Maximum	1.942
Price Related Differential	1.026
Coefficient of Dispersion	.133

Appendix 8
County 4 Vacant Land Models (Stratum 4)

Additive Model

Model: 10

R	R Square	Adjusted R Square	Std. Error of the Estimate
.935	.874	.861	16833.06820

Model: 10

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	30921.576	2105.516		14.686	.000
LSIZE_.75	9.640	.415	.905	23.250	.000
MKTAREA1	5874.280	2643.892	.067	2.222	.028
MKTAREA2	14181.893	2755.446	.174	5.147	.000
NB_538500	-20040.692	9859.606	-.065	-2.033	.044
NB_2400X	-11962.339	5205.697	-.066	-2.298	.023
NB_4300X	-21020.439	10002.633	-.060	-2.101	.037
NB_7000X	-32487.367	10071.512	-.092	-3.226	.002
NB_9400	-32440.862	12043.909	-.075	-2.694	.008
NB_17000X	-31615.254	12200.544	-.073	-2.591	.010
NB_56500X	-18490.222	12043.675	-.043	-1.535	.127
NB_73500X	35527.274	12300.234	.082	2.888	.004
NB_77400	-50828.969	12192.650	-.118	-4.169	.000
NB_80300	34036.083	5215.958	.214	6.525	.000
NB_91000	-19121.024	7978.412	-.070	-2.397	.018
NB_128800X	16683.588	10057.777	.047	1.659	.099
NB_699500	-43242.182	6933.202	-.185	-6.237	.000
NB_709000X	-29785.535	5623.505	-.158	-5.297	.000

Excluded Variables[j]

Model: 10

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
MKTAREA3	.003	.096	.923	.008	.923
NB_19700	-.006	-.188	.851	-.015	.865
NB_948500	.014	.516	.607	.040	.983
NB_229000	.023	.521	.603	.041	.402
NB_12800	-.015	-.516	.606	-.040	.966
NB_139900	.035	.765	.445	.060	.368
NB_239500X	-.023	-.821	.413	-.064	.953
NB_69400X	-.029	-1.025	.307	-.080	.991
NB_77800	.035	1.255	.211	.098	.987

[j]. Dependent Variable: TASP

Ratio Statistics for ESP / TASP

Sales	182
Median	1.008
Weighted Mean	1.000
Minimum	.313
Maximum	3.317
Price Related Differential	1.087
Coefficient of Dispersion	.261

Multiplicative Model

Model: 8

R	R Square	Adjusted R Square	Std. Error of the Estimate
.939	.881	.866	.29139

Model: 8

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	10.416	.035		300.411	.000
LN_SIZEFACTOR	.696	.026	1.054	27.061	.000
MKTAREA1	.164	.069	.107	2.366	.019
MKTAREA2	.237	.056	.164	4.219	.000
NB_229000	.292	.166	.075	1.758	.081
NB_139900	.697	.151	.169	4.607	.000
NB_948500	.447	.296	.042	1.509	.133
NB_2400X	-.133	.090	-.042	-1.476	.142
NB_7000X	-.274	.173	-.044	-1.581	.116
NB_9400	-.829	.209	-.109	-3.977	.000
NB_17000X	-.284	.210	-.037	-1.349	.179
NB_56500X	-.416	.209	-.055	-1.993	.048
NB_69400X	-.419	.293	-.039	-1.430	.155
NB_73500X	.398	.211	.052	1.887	.061
NB_77400	-.642	.210	-.084	-3.052	.003
NB_77800	.293	.208	.039	1.407	.161
NB_80300	.246	.085	.088	2.881	.005
NB_128800X	.934	.178	.150	5.239	.000
NB_239500X	-.546	.175	-.088	-3.121	.002
NB_699500	-.576	.118	-.139	-4.878	.000
NB_709000X	-.338	.096	-.101	-3.511	.001

Excluded Variables[h]

Model: 8

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
MONTHS	-.004	-.132	.895	-.010	.661
NB_12800	-.004	-.158	.875	-.012	.972
NB_538500	-.024	-.602	.548	-.048	.484
NB_19700	-.020	-.618	.538	-.049	.728
MKTAREA3	-.020	-.645	.520	-.051	.742
NB_91000	-.027	-.958	.339	-.076	.923
NB_4300X	-.030	-1.102	.272	-.087	.967

h. Dependent Variable: LN_TASP

Ratio Statistics for ESP / TASP

Sales	182
Median	1.000
Weighted Mean	.969
Minimum	.428
Maximum	2.846
Price Related Differential	1.074
Coefficient of Dispersion	.216

Appendix 9
County 5 Residential Models

Additive Model

Model: 2

R	R Square	Adjusted R Square	Std. Error of the Estimate
.923	.853	.847	40900.23436

Model: 2

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	16071.112	8750.373		1.837	.068
QUAL2SF	58.092	25.742	.067	2.257	.025
QUAL3SF	91.186	6.679	.833	13.652	.000
QUAL4SF	105.645	5.399	1.040	19.568	.000
QUAL6SF	126.611	5.369	.903	23.582	.000
EFFAGE30SF	-1.072	.206	-.206	-5.216	.000
SQRT_LANDSF	120.599	18.443	.213	6.539	.000
MKTAREA3	10130.524	3968.712	.080	2.553	.011

Excluded Variables[b]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	MKTAREA2	.040	.968	.334	.069	.432

b. Dependent Variable: TASP

Ratio Statistics for ESP / TASP

Sales	204
Median	1.000
Weighted Mean	1.000
Minimum	.629
Maximum	1.817
Price Related Differential	1.045
Coefficient of Dispersion	.171

Multiplicative Model

Model: 2

R	R Square	Adjusted R Square	Std. Error of the Estimate
.914	.836	.830	.20845

Model: 2

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	12.164	.042		288.125	.000
LN_SIZEFACTOR	.882	.046	.647	19.103	.000
QUAL2	-.196	.124	-.047	-1.579	.116
QUAL4	.086	.040	.075	2.131	.034
QUAL6	.174	.082	.071	2.126	.035
LN_PCTGOOD	1.457	.176	.273	8.297	.000
LN_LRATIO	.081	.012	.231	6.641	.000
MKTAREA3	.035	.020	.057	1.698	.091

Excluded Variables[b]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	MKTAREA2	.057	1.120	.264	.080	.325

b. Dependent Variable: LN_TASP

Ratio Statistics for ESP / TASP

Sales	204
Median	.982
Weighted Mean	.985
Minimum	.525
Maximum	1.745
Price Related Differential	1.037
Coefficient of Dispersion	.165

Appendix 10
County 5 Acreage Model (Stratum 5)

Additive Model

Model: 1

R	R Square	Adjusted R Square	Std. Error of the Estimate
.684	.468	.461	6593.89136

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14759.928	631.726		23.364	.000
	ACRES_.25	-6226.223	1232.596	-.252	-5.051	.000
	MKTAREA2	8278.313	2356.748	.175	3.513	.001
	MKTAREA3	5417.375	455.970	.593	11.881	.000

Ratio Statistics for ESP / TASP

Sales	222
Median	1.026
Weighted Mean	1.033
Minimum	.438
Maximum	3.021
Price Related Differential	1.135
Coefficient of Dispersion	.369

Multiplicative Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.829	.687	.683	.41859

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.965	.040		272.668	.000
	LN_SIZEFACTOR	.764	.038	.776	20.264	.000
	MKTAREA2	.430	.150	.110	2.871	.004
	MKTAREA3	.309	.029	.408	10.658	.000

Ratio Statistics for ESP / TASP

Sales	222
Median	.953
Weighted Mean	.971
Minimum	.394
Maximum	3.007
Price Related Differential	1.127
Coefficient of Dispersion	.377