Econometric Modeling of Mall Transactions Prices
A Preliminary Investigation

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1. Introduction

We analyze and model Real Capital Analytics (RCA) data for mall transactions, 2000Q3-2006Q2. Our objective is to estimate property values (that is, to predict transactions prices), conditional on the covariates. Alternatively and nearly equivalently, the objective is to produce a quality-adjusted transactions price index, that is, a price index that controls for attributes of the properties transacted.

Hedonic modeling, which reflects a "fundamental" approach to valuation, is an appropriate and appealing method in this context. Indeed it is likely the only workable method, as comparison to comparable properties, which represents a complementary "technical" approach to valuation, is likely infeasible in the present context due to a paucity of credible comparables.

We proceed as follows. In section 2, we provide some preliminary statistical analysis of the price data in isolation. In section 3 we introduce covariates and specify a hedonic model. In section 4 we discuss the construction of quality-adjusted price indexes in the context of our hedonic model. In section 5 we present the estimation results for our hedonic model, and in section 6 we present the corresponding hedonic price indexes. We include additional demand variables and interest rates in section 7, and we conclude in section 8.

2. Preliminary Statistical Analysis of Transactions Price Data

To help guide subsequent analysis, we examine the transactions price data before specifying and estimating a hedonic model. We have data on 577 transactions with comparable prices (i.e., closed transactions).

In the time series dimension, annual averages indicate relatively small changes in (log) prices during the period under investigation (Table 1). A notable exception is the relatively big drop in 2001, followed by small drops in 2002, 2003, and 2004. A small

gain in 2005 was also followed by a small drop in the first half of 2006. Similar patterns appear in quarterly averages (Table 2).

In the cross-sectional dimension, the key observation is the large variation in prices, including several outliers, as seen in the box-whisker plots of Figures 1 (annual) and Figure 2 (quarterly). Digging deeper reveals that much of the variation is across rather than within metro areas (Table 3, Figure 3); hence it appears that a good hedonic model should include location measures such as metro dummies. A caveat is in order, however: some areas have very few transactions during our six-year sample period (and in some cases, such as Albuquerque, only one transaction).

Looking ahead to construction of hedonic transactions price indexes, an important issue is an index's frequency, e.g., monthly, quarterly or annual. A tradeoff arises. In principle, high-frequency indexes such as monthly would be most useful for tracking real-time developments. But in practice, data sparseness increases sharply with frequency. Hence, for example, monthly indexes are infeasible. Conversely, annual indexes are feasible but not timely enough to be of great use.

All told, it seems that the quarterly frequency is optimal (frequent enough to be useful, yet not so frequent as to be infeasible). Hence we construct a quarterly index. Even there, however, some caveats are in order: there are low numbers of transactions in 2000Q3, in all quarters of 2001, and in 2006Q2 (Table 2).

3. Hedonic Model Specification

We have RCA data on transactions price and covariates such as units (square footage), year built, year renovated, occupancy rate, number of floors, number of buildings, tenants, location (metro areas or markets), and transaction date. However, missing data for some of these variables renders their use impossible. Four key variables are available for all transactions: units, year built, location (metro area), and transaction date (grouped by quarter). We convert year built into age by taking the difference between the year of transaction and the year built.

Our benchmark hedonic model, which may be used to establish the "fair value" of a property based on its characteristics, is:

$$\log (P_i) = \beta_0 + \beta_1 \log (UNITS_i) + \beta_2 AGE_i + \beta_3 (AGE_i)^2 + \Sigma\alpha_j M_j + \Sigma\delta_t T_t + \varepsilon_i$$

where:

P_i - closing price of the transaction i property, i = 1, 2, …, 577

$UNITS_i$ - square footage of the transaction i property, i = 1, 2, …, 577

AGE_i - age (in years) of the transaction i property, i = 1, 2, …, 577

M_j - "location dummy" variable equal to one if the property is in the j'th metro area, and zero otherwise, j = 2, 3, …, 77

T_t - "time dummy" variable equal to 1 if the property transacted at time (quarter) t, and zero otherwise, t = 4, 5, …., 26 (2000Q1=1, 2000Q2=2, 2000Q3=3, …, 2006Q2=26)

ε_i - stochastic disturbance term.

There are 77 metro locations, so we use 76 location dummies. There are 24 quarters between 2000Q3 and 2006Q2, so we use 23 time dummies.

4. Construction of Quality-Adjusted Price Indexes From a Hedonic Model

A hedonic model may also be used to construct a quality-adjusted price index, as follows. First set a base period, say 2000Q3, in which the index is equal to exp(0)=1. Then the index value for 2000Q4 is the exponential of the coefficient associated with the time dummy for that period, i.e. $\exp(\delta_4)$, and so on. In addition, the percentage change from the base period to any subsequent period is simply the difference between the exponential of the coefficient associated with the period dummy and one; e.g., $\exp(\delta_4)$-1.

It may be interesting to construct a price index for comparisons over space rather than time (e.g., across metro areas). First define a base metro, for which the index is one in the base period (exp(0)=1). Then the index value for another metro is the exponential of the coefficient associated with that metro's dummy for that period; e.g., $\exp(\alpha_2)$. If one is interested in the percentage change in prices from the base metro, the difference

between the exponential of the coefficient associated with the relevant metro dummy and one yields the result; e.g., $\exp(\alpha_2)$-1.

Finally, time and location dummies may be used jointly to construct indexes over space and time, by adding the time and location components. For example, the price index value for the second metro area in time period 4 would be $\exp(\delta_4)+\exp(\alpha_2)$, and the percentage difference would be $\exp(\delta_4)+\exp(\alpha_2)$-1.

5. Empirical Results I: Hedonic Model Estimates

The first estimated equation includes units, age and age squared as covariates (Table 4). All variables are significant at the one percent level. The R^2 is above forty percent. The elasticity of price with respect to units is 0.95, and it is not statistically different from one at the five percent level. Price tends to vary negatively with age; other things equal, the percent change in price as a result of an increase in age (at the average value of age) is -0.0133 (-0.04215 + 2*0.000544*26.5). White's test indicates possible heteroskedasticity, and Ramsey's RESET test indicates possible misspecification (Table 4).

Adding time dummies (and nothing else) does not significantly improve the equation, as shown in Table 5. (We include 23 quarterly time dummies. We exclude the 2002Q2 time dummy (T10) to avoid the dummy variable trap, as we have already included an intercept in the regression. We chose 2002Q2 as the base because it has the most observations, 57.) The R^2 is unchanged.

Adding metro dummies (and nothing else) improves the equation significantly, however, as shown in Table 6. (We include 76 location dummies. We exclude the LA metro dummy, which we take as the base because it has the most observations, 33.) The R^2 increases from 0.41 to 0.51. The elasticity with respect to units is 0.98; and it is not statistically different from one at the one percent level. Other things the same, the percent change in prices as a result of an increase in age (at average value of age) is -0.016 (-0.03226 + 2*0.000301*26.5). As in previous equations, White's test indicates possible heteroskedasticity, and Ramsey's RESET test indicates possible misspecification.

Finally, the full benchmark model with both time and location dummies has an adjusted R^2 of 0.5354 (Table 7). Both the metro dummies and the time dummies are

jointly statistically significant. The elasticity with respect to units is 0.94; and it is not statistically different from one at the ninety five percent level of confidence. Other things equal, the percent change in prices as a result of an increase in age (at the average value of age) is negative 0.014 (-0.02619 + 2*0.000228*26.5). As in previous equations, White's test indicates possible heteroskedasticity, and Ramsey's RESET test indicates possible misspecification.

6. Empirical Results II: Quality-Adjusted Price Indexes

We use the estimated benchmark equation with time and location dummies to calculate quality adjusted price indexes. We use the LA Metro in 2002Q2 as the base location and period; hence we exclude the LA metro dummy and the 2002Q2 dummy and the price index for the LA Metro in 2002Q2 equals one. Results appear in Table 8 and Figure 4. Holding other factors (units, age) constant, a change from the price in the base location at base period can be calculated using coefficients associated with dummy variables. For example, the Philadelphia metro has an index of 1.24 ($e^{0.2133} + e^{0}$) for 2002Q2, and 1.91 ($e^{0.2133} + e^{0.4361}$) for 2006Q2.

7. Including Other Covariates

Several macro variables, namely personal income, per capita personal income, population, employment, and mortgage rate, are used in addition to units, age, location dummies and time dummies. The modified model is

$$\log (P_i) = \beta_0 + \beta_1 \log (UNITS_i) + \beta_2 AGE_i + \beta_3 (AGE_i)^2 + \Sigma\alpha_j M_j + \Sigma\delta_t T_t + \Sigma\phi_k X_k + \varepsilon_i,$$

where the Xs are various demand indicators and a mortgage interest rate, including:

- Personal income, per capita personal income, and population data for the metropolitan statistical areas (MSAs), obtained from the Bureau of Economic Analysis. We calculate the figures for 2005 and 2006 using the national figures and 2000-2004 average shares of the various MSA's.
- Monthly MSA employment figures obtained from the Bureau of Labor Statistics. We calculate figures for the second quarter of 2006 using the shares of 2006Q1.
- Three year moving averages of personal income, per capita personal income, population, and employment, and moving averages of growth rates for those variables.

- The 30-year mortgage rate data, obtained from the Federal Reserve Bank of St. Louis.

We add the new variables one-by-one to the base model (units, age, location dummies and time dummies), and we keep them in the model if they are statistically significant. There is no need to retain all demand indicators; one variable, such as per capita personal income, is sufficient to use (Table 9), and including additional demand indicators adds little. Indeed, not only does including per capita personal income improve the equation, but also it produces much-improved White statistics for heteroskedasticity and Ramsey statistics for functional form. This equation may be used to calculate the hedonic price index. Finally, the mortgage interest rate is not significant.

8. Future Work

Although it is possible to derive price indexes for specific metro areas, the increase in these indexes is the same as the index for the base (LA_Metro). It is possible to calculate indexes for metro areas that do not follow the same pattern as the base, which is more appealing, if there are enough observations to include the product of location and time dummies in the equation. The data requirement is clear; there should be more than 77*25 (N*T) observations.

Table1. Annual Averages of Transactions Prices

Descriptive Statistics for LOG(PRICE)
Categorized by values of YEAR
Date: 06/05/06 Time: 13:00
Sample: 1 590 IF STATUS_TX="closed" AND
ORDER>0
Included observations: 577

YEAR	Mean	Std. Dev.	Obs.
2000	17.17101	0.869551	38
2001	16.85369	0.990796	34
2002	17.81274	1.126000	126
2003	17.51510	1.111093	119
2004	17.23346	1.021371	121
2005	17.31604	1.282114	126
2006	17.12226	1.011907	13
All	17.40708	1.139473	577

Table 2. Quarterly Averages of Transactions Prices
Descriptive Statistics for LOG(PRICE)
Categorized by values of PERIODQUARTER
Date: 06/05/06 Time: 13:46
Sample: 1 590 IF STATUS_TX="closed" AND ORDER>0
Included observations: 577

PERIODQUARTER	Mean	Std. Dev.	Obs.	
3	17.14411	0.717694	6	2000.3
4	17.17606	0.905108	32	2000.4
5	16.65777	1.078585	12	2001.1
6	16.89553	0.922899	7	2001.2
7	17.07716	0.941655	10	2001.3
8	16.81836	1.175704	5	2001.4
9	17.09517	0.813807	13	2002.1
10	18.37597	0.965545	57	2002.2
11	17.32682	1.031363	26	2002.3
12	17.47466	1.135526	30	2002.4
13	17.46666	1.046700	26	2003.1
14	17.29674	1.155197	29	2003.2
15	17.74237	1.250092	27	2003.3
16	17.55445	1.019162	37	2003.4
17	17.34357	1.038046	29	2004.1
18	17.21830	1.191245	28	2004.2
19	17.23597	0.839681	18	2004.3
20	17.17229	0.990864	46	2004.4
21	17.09603	1.283550	33	2005.1
22	17.44878	1.560586	27	2005.2
23	17.32135	1.187356	27	2005.3
24	17.40664	1.151504	39	2005.4
25	17.01041	1.062279	11	2006.1
26	17.73743	0.329575	2	2006.2
All	17.40708	1.139473	577	

Table 3. Prices by Metro
Descriptive Statistics for LOG(PRICE)
Categorized by values of RCA_METROS_TX
Date: 06/05/06 Time: 14:32
Sample: 1 590 IF STATUS_TX="closed" AND
ORDER>0
Included observations: 577

RCA_METROS_TX	Mean	Std. Dev.	Obs.
Albuquerque	18.98031	NA	1
AllOthers_AR_MS_LA_AL	17.13680	1.188967	23
AllOthers_CA	17.63528	0.814207	7
AllOthers_DE_MD_VA_WV	17.46586	0.729883	6
AllOthers_FL	17.20468	1.166553	5
AllOthers_IL_IN_OH	16.98034	1.085696	24
AllOthers_MI_WI	16.64737	1.144176	11
AllOthers_NewEngland	17.41876	1.141759	7
AllOthers_Northwest	16.78960	0.803699	14
AllOthers_NY	17.25223	0.936476	4
AllOthers_OK_TX	17.48892	0.879563	19
AllOthers_PA	17.00788	0.720677	11
AllOthers_PLainsStates	17.05453	0.793913	18
AllOthers_Southwest	17.12894	0.646669	13
AllOthers_GA_KY_NC_SC_TN	17.13459	0.859989	24
Atlanta	17.05039	1.255897	5
Boston	17.03928	1.241354	6
Buffalo	16.31325	0.789588	6
CentralCA	16.54620	0.943610	9
CentralFL	16.90385	1.324837	3
Charleston	17.38200	0.042019	2
Charlotte	17.01791	0.817100	11
Chicago	17.45512	1.611606	17
Cincinnati	17.52396	1.131926	12
Cleveland	17.19825	1.406959	9
Columbia	16.57915	0.728731	4
Columbus	16.83362	1.118124	4
Dallas	17.63652	1.033120	10
Dayton	15.42495	0.000000	2
DCMetro	17.59297	1.186326	15
Denver	16.62938	1.742033	3
Detroit	17.88209	0.754493	8
ElPaso	17.85856	NA	1
GrandRapids	16.84565	1.892456	3
Greensboro	16.73508	1.269705	4
Greenville	17.42643	NA	1
Hawaii	17.42348	1.209725	5
Houston	17.20607	1.083303	13

Indianapolis	15.78395	NA	1
Jacksonville	15.60727	NA	1
KansasCity	17.05412	1.367674	7
Knoxville	17.06381	1.838503	3
LAMetro	17.92587	1.091444	33
LasVegas	18.39964	1.581180	6
Lexington	17.10693	0.366100	2
LittleRock	18.16579	NA	1
Louisville	17.95659	0.949091	2
Memphis	16.54736	1.206858	5
Milwaukee	18.13487	0.648128	8
Minneapolis	17.56924	1.260148	9
Nashville	17.39934	0.992919	3
NewOrleans	17.66292	1.268438	2
Norfolk	18.35543	0.755838	4
NYCMetro	17.90748	1.302629	26
Oklahoma City	16.49008	1.212438	5
Orlando	17.19189	2.013739	5
PhillyMetro	17.95255	0.741953	15
Phoenix	18.26472	0.436237	11
Pittsburgh	17.70285	0.972819	3
Providence	17.68394	1.345456	5
RaleighDurham	17.18251	1.581463	3
Richmond	16.88502	1.783638	2
Rochester	18.63094	1.471553	5
Sacramento	17.25560	1.112203	5
SaltLakeCity	17.95728	1.326252	5
SanAntonio	17.37192	1.206061	8
SanDiego	17.02277	0.823911	2
Seattle	17.74228	0.673176	6
SFMetro	18.46530	0.867110	10
SoFla	17.62634	0.843213	12
StLouis	17.91759	1.714948	3
SWFlorida	17.74429	0.566783	4
Tallahassee	17.93349	NA	1
Tampa	18.13458	1.188757	6
Toledo	17.51776	1.396450	3
Tucson	18.40648	0.851337	2
Tulsa	17.90535	0.684558	3
All	17.40708	1.139473	577

Table 4. Determinants of Prices

Dependent Variable: LOG(PRICE)
Method: Least Squares
Date: 06/05/06 Time: 15:10
Sample: 1 590 IF STATUS_TX="closed" AND ORDER>0
Included observations: 562

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.703883	0.623486	9.148372	0.0000
LOG(UNITS)	0.946761	0.048321	19.59322	0.0000
AGE	-0.042154	0.010264	-4.107145	0.0000
AGE^2	0.000544	0.000177	3.077770	0.0022

R-squared	0.410775	Mean dependent var	17.41404
Adjusted R-squared	0.407607	S.D. dependent var	1.139960
S.E. of regression	0.877394	Akaike info criterion	2.583370
Sum squared resid	429.5596	Schwarz criterion	2.614200
Log likelihood	-721.9271	F-statistic	129.6688
Durbin-Watson stat	1.739970	Prob(F-statistic)	0.000000

White Heteroskedasticity Test:

F-statistic	13.17821	Prob. F(5,556)	0.000000
Obs*R-squared	59.54545	Prob. Chi-Square(5)	0.000000

Ramsey RESET Test:

F-statistic	18.63233	Prob. F(2,556)	0.000000
Log likelihood ratio	36.45823	Prob. Chi-Square(2)	0.000000

Table 5. Determinants of Prices (with time dummies)

Dependent Variable: LOG(PRICE)
Method: Least Squares
Date: 06/06/06 Time: 10:45
Sample: 1 590 IF STATUS_TX="closed" AND ORDER>0
Included observations: 562

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.434308	0.709551	9.068144	0.0000
LOG(UNITS)	0.913952	0.051983	17.58164	0.0000
AGE	-0.038603	0.010478	-3.684044	0.0003
AGE^2	0.000502	0.000180	2.779698	0.0056
T3	-0.652666	0.410700	-1.589156	0.1126
T4	-0.386630	0.204605	-1.889638	0.0593
T5	-0.420438	0.297267	-1.414344	0.1578
T6	-0.771642	0.354330	-2.177748	0.0299
T7	-0.890804	0.315869	-2.820167	0.0050
T8	-0.982333	0.410486	-2.393094	0.0171
T9	-0.676312	0.272513	-2.481761	0.0134
T11	-0.441374	0.211294	-2.088906	0.0372
T12	-0.368440	0.204017	-1.805929	0.0715
T13	-0.483564	0.210017	-2.302504	0.0217
T14	-0.529096	0.206757	-2.559029	0.0108
T15	-0.265790	0.207220	-1.282650	0.2002
T16	-0.311759	0.188362	-1.655103	0.0985
T17	-0.405484	0.204180	-1.985911	0.0476
T18	-0.430833	0.207735	-2.073954	0.0386
T19	-0.507178	0.240455	-2.109245	0.0354
T20	-0.451691	0.181456	-2.489258	0.0131
T21	-0.324392	0.203563	-1.593575	0.1116
T22	-0.258334	0.216806	-1.191543	0.2340
T23	-0.239607	0.210808	-1.136614	0.2562
T24	-0.214580	0.189040	-1.135100	0.2568
T25	-0.321213	0.298372	-1.076551	0.2822
T26	0.197064	0.632729	0.311450	0.7556

R-squared	0.436754	Mean dependent var	17.41404
Adjusted R-squared	0.409382	S.D. dependent var	1.139960
S.E. of regression	0.876079	Akaike info criterion	2.620128
Sum squared resid	410.6198	Schwarz criterion	2.828226
Log likelihood	-709.2561	F-statistic	15.95584
Durbin-Watson stat	1.770696	Prob(F-statistic)	0.000000

White Heteroskedasticity Test:

F-statistic	3.090303	Prob. F(28,533)	0.000000
Obs*R-squared	78.49358	Prob. Chi-Square(28)	0.000001

Ramsey RESET Test:

F-statistic	17.61080	Prob. F(2,533)	0.000000
Log likelihood ratio	35.96240	Prob. Chi-Square(2)	0.000000

Table 6. Determinants of Prices (with location dummies)

Dependent Variable: LOG(PRICE)
Method: Least Squares
Date: 06/06/06 Time: 10:56
Sample: 1 590 IF STATUS_TX="closed" AND ORDER>0
Included observations: 562

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.600143	0.644040	8.695329	0.0000
LOG(UNITS)	0.984225	0.048767	20.18219	0.0000
AGE	-0.032259	0.010037	-3.214013	0.0014
AGE^2	0.000301	0.000171	1.759169	0.0792
M_ALBUQUERQUE	0.403031	0.808654	0.498397	0.6184
M_ALLOTHERS_AR_MS_LA_AL	-0.614927	0.217580	-2.826211	0.0049
M_ALLOTHERS_CA	0.023755	0.332009	0.071550	0.9430
M_ALLOTHERS_DE_MD_VA_WV	-0.563073	0.353626	-1.592285	0.1120
M_ALLOTHERS_FL	-0.511032	0.383108	-1.333911	0.1829
M_ALLOTHERS_GA_KYNCSCTN	-0.612321	0.215385	-2.842912	0.0047
M_ALLOTHERS_IL_IN_OH	-0.843249	0.215274	-3.917090	0.0001
M_ALLOTHERS_MI_WI	-0.964407	0.301492	-3.198776	0.0015
M_ALLOTHERS_NEWENGLAND	-0.473511	0.331586	-1.428016	0.1539
M_ALLOTHERS_NORTHWEST	-0.677695	0.262644	-2.580279	0.0102
M_ALLOTHERS_NY	-0.575285	0.421506	-1.364832	0.1729
M_ALLOTHERS_OK_TX	-0.373635	0.234768	-1.591506	0.1122
M_ALLOTHERS_PA	-0.865561	0.288114	-3.004237	0.0028
M_ALLOTHERS_PLAINSSTATES	-0.808975	0.234799	-3.445390	0.0006
M_ALLOTHERS_SOUTHWEST	-0.361982	0.262869	-1.377042	0.1691
M_ATLANTA	-0.836898	0.382495	-2.187995	0.0291
M_BOSTON	-0.543324	0.382379	-1.420906	0.1560
M_BUFFALO	-1.617839	0.354210	-4.567453	0.0000
M_CENTRALCA	-0.567198	0.302787	-1.873256	0.0616
M_CENTRALFL	-0.646765	0.481266	-1.343881	0.1796
M_CHARLESTON	-0.054480	0.580039	-0.093925	0.9252
M_CHARLOTTE	-1.012823	0.277993	-3.643342	0.0003
M_CHICAGO	-0.051024	0.243937	-0.209168	0.8344
M_CINCINNATI	-0.503136	0.269089	-1.869774	0.0621
M_CLEVELAND	-1.344817	0.315144	-4.267313	0.0000
M_COLUMBIA	-1.352922	0.421848	-3.207130	0.0014
M_COLUMBUS	-1.226155	0.423003	-2.898694	0.0039
M_DALLAS	-0.396878	0.288302	-1.376607	0.1693
M_DAYTON	-2.341011	0.580005	-4.036189	0.0001
M_DCMETRO	-0.421277	0.249016	-1.691768	0.0913
M_DENVER	-0.828740	0.483947	-1.712459	0.0875
M_DETROIT	-0.311948	0.332788	-0.937377	0.3490
M_ELPASO	-0.017172	0.808496	-0.021239	0.9831
M_GRANDRAPIDS	-0.797519	0.481157	-1.657502	0.0981

M_GREENSBORO	-0.599160	0.422866	-1.416904	0.1572
M_GREENVILLE	-0.884163	0.807454	-1.095001	0.2741
M_HAWAII	1.289212	0.393191	3.278843	0.0011
M_HOUSTON	-0.759120	0.261605	-2.901774	0.0039
M_INDIANAPOLIS	-1.120991	0.809593	-1.384634	0.1668
M_JACKSONVILLE	-1.395664	0.808607	-1.726010	0.0850
M_KANSASCITY	-0.680401	0.332089	-2.048853	0.0410
M_KNOXVILLE	-1.327276	0.480676	-2.761272	0.0060
M_LASVEGAS	0.666059	0.357579	1.862687	0.0631
M_LEXINGTON	-0.323545	0.579967	-0.557867	0.5772
M_LITTLEROCK	0.403468	0.809944	0.498143	0.6186
M_LOUISVILLE	0.064452	0.579486	0.111223	0.9115
M_MEMPHIS	-1.338289	0.382242	-3.501156	0.0005
M_MILWAUKEE	0.123874	0.315906	0.392123	0.6951
M_MINNEAPOLIS	-0.106655	0.301164	-0.354143	0.7234
M_NASHVILLE	-0.320905	0.480581	-0.667743	0.5046
M_NEWORLEANS	-0.750823	0.580381	-1.293673	0.1964
M_NORFOLK	-0.157803	0.422753	-0.373275	0.7091
M_NYCMETRO	0.136102	0.216489	0.628679	0.5299
M_OKLAHOMACITY	-1.008058	0.383072	-2.631514	0.0088
M_ORLANDO	-0.581652	0.382650	-1.520060	0.1292
M_PHILLYMETRO	0.107715	0.250285	0.430368	0.6671
M_PHOENIX	0.088349	0.278017	0.317784	0.7508
M_PITTSBURGH	0.141473	0.480358	0.294517	0.7685
M_PROVIDENCE	-0.334489	0.382139	-0.875306	0.3818
M_RALEIGHDURHAM	-1.028959	0.481260	-2.138050	0.0330
M_RICHMOND	-1.417272	0.579500	-2.445682	0.0148
M_ROCHESTER	0.473974	0.423332	1.119627	0.2634
M_SACRAMENTO	-0.398834	0.382452	-1.042832	0.2975
M_SALTLAKECITY	-0.284753	0.382582	-0.744293	0.4571
M_SANANTONIO	-0.498980	0.314508	-1.586543	0.1133
M_SANDIEGO	0.144972	0.581993	0.249095	0.8034
M_SEATTLE	-0.617326	0.354231	-1.742719	0.0820
M_SFMETRO	0.314174	0.292285	1.074886	0.2830
M_SOFLA	-0.438345	0.277800	-1.577918	0.1152
M_STLOUIS	-0.578907	0.480853	-1.203918	0.2292
M_SWFLORIDA	-0.261075	0.421409	-0.619528	0.5359
M_TALLAHASSEE	-0.490642	0.807799	-0.607381	0.5439
M_TAMPA	-0.641438	0.358385	-1.789804	0.0741
M_TOLEDO	-0.788880	0.579524	-1.361256	0.1741
M_TUCSON	-0.078803	0.580351	-0.135785	0.8920
M_TULSA	-0.513584	0.481505	-1.066623	0.2867

R-squared	0.582583	Mean dependent var	17.41404
Adjusted R-squared	0.514168	S.D. dependent var	1.139960
S.E. of regression	0.794571	Akaike info criterion	2.509111
Sum squared resid	304.3074	Schwarz criterion	3.125695

Log likelihood	-625.0602	F-statistic	8.515440
Durbin-Watson stat	1.853581	Prob(F-statistic)	0.000000

White Heteroskedasticity Test:

F-statistic	1.774255	Prob. F(81,480)	0.000135
Obs*R-squared	129.4945	Prob. Chi-Square(81)	0.000503

Ramsey RESET Test:

F-statistic	7.454814	Prob. F(2,480)	0.000648
Log likelihood ratio	17.19106	Prob. Chi-Square(2)	0.000185

Table 7. Determinants of Prices (with location and time dummies)

Dependent Variable: LOG(PRICE)
Method: Least Squares
Date: 06/06/06 Time: 10:55
Sample: 2 590 IF STATUS_TX="closed" AND ORDER>0
Included observations: 561
White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.403816	0.809954	7.906396	0.0000
LOG(UNITS)	0.944265	0.058795	16.06033	0.0000
AGE	-0.026187	0.015169	-1.726399	0.0850
AGE^2	0.000228	0.000298	0.767506	0.4432
M_ALBUQUERQUE	0.698111	0.217405	3.211106	0.0014
M_ALLOTHERS_AR_MS_LA_AL	-0.615729	0.235429	-2.615352	0.0092
M_ALLOTHERS_CA	0.061675	0.251163	0.245556	0.8061
M_ALLOTHERS_DE_MD_VA_WV	-0.446703	0.223722	-1.996690	0.0465
M_ALLOTHERS_FL	-0.585673	0.248495	-2.356876	0.0188
M_ALLOTHERS_GA_KYNCSCTN	-0.655162	0.221409	-2.959053	0.0032
M_ALLOTHERS_IL_IN_OH	-0.932127	0.225963	-4.125125	0.0000
M_ALLOTHERS_MI_WI	-1.022168	0.383674	-2.664157	0.0080
M_ALLOTHERS_NEWENGLAND	-0.449688	0.338112	-1.329995	0.1842
M_ALLOTHERS_NORTHWEST	-0.648143	0.295955	-2.190004	0.0290
M_ALLOTHERS_NY	-0.579700	0.419019	-1.383470	0.1672
M_ALLOTHERS_OK_TX	-0.299796	0.200974	-1.491715	0.1365
M_ALLOTHERS_PA	-0.853229	0.259561	-3.287197	0.0011
M_ALLOTHERS_PLAINSSTATES	-0.758364	0.223984	-3.385794	0.0008
M_ALLOTHERS_SOUTHWEST	-0.364987	0.209899	-1.738875	0.0827
M_ATLANTA	-0.890477	0.347500	-2.562523	0.0107
M_BOSTON	-0.381236	0.344760	-1.105803	0.2694
M_BUFFALO	-1.660130	0.308568	-5.380109	0.0000
M_CENTRALCA	-0.498157	0.229598	-2.169689	0.0305
M_CENTRALFL	-0.637151	0.518679	-1.228410	0.2199
M_CHARLESTON	-0.209638	0.217115	-0.965559	0.3348
M_CHARLOTTE	-0.915208	0.217997	-4.198249	0.0000
M_CHICAGO	-0.123876	0.204963	-0.604381	0.5459
M_CINCINNATI	-0.380505	0.243706	-1.561328	0.1191
M_CLEVELAND	-1.385190	0.427744	-3.238363	0.0013
M_COLUMBIA	-1.411459	0.441752	-3.195141	0.0015
M_COLUMBUS	-1.063598	0.480765	-2.212305	0.0274
M_DALLAS	-0.538029	0.356772	-1.508045	0.1322
M_DAYTON	-2.553491	0.375617	-6.798116	0.0000
M_DCMETRO	-0.395557	0.294469	-1.343288	0.1798
M_DENVER	-0.886510	0.528480	-1.677472	0.0941
M_DETROIT	-0.382068	0.258857	-1.475977	0.1406

M_ELPASO	0.012454	0.216494	0.057527	0.9542
M_GRANDRAPIDS	-0.930709	0.575643	-1.616815	0.1066
M_GREENSBORO	-0.711008	0.454286	-1.565112	0.1182
M_GREENVILLE	-1.108815	0.195472	-5.672507	0.0000
M_HAWAII	1.089094	0.680918	1.599450	0.1104
M_HOUSTON	-0.816726	0.330243	-2.473107	0.0138
M_INDIANAPOLIS	-1.130316	0.207051	-5.459108	0.0000
M_JACKSONVILLE	-1.394709	0.218154	-6.393226	0.0000
M_KANSASCITY	-0.615038	0.344117	-1.787293	0.0746
M_KNOXVILLE	-1.348458	0.666848	-2.022138	0.0437
M_LASVEGAS	0.691787	0.528910	1.307949	0.1915
M_LEXINGTON	-0.349025	0.244186	-1.429343	0.1536
M_LITTLEROCK	0.472669	0.266728	1.772098	0.0770
M_LOUISVILLE	0.048326	0.280057	0.172559	0.8631
M_MEMPHIS	-1.367259	0.280524	-4.873951	0.0000
M_MILWAUKEE	0.244266	0.272943	0.894934	0.3713
M_MINNEAPOLIS	-0.171472	0.295776	-0.579738	0.5624
M_NASHVILLE	-0.345839	0.388962	-0.889133	0.3744
M_NEWORLEANS	-0.667643	0.569472	-1.172389	0.2417
M_NORFOLK	-0.209070	0.372209	-0.561700	0.5746
M_NYCMETRO	0.159000	0.195344	0.813947	0.4161
M_OKLAHOMACITY	-1.045083	0.273569	-3.820184	0.0002
M_ORLANDO	-0.598873	0.651259	-0.919562	0.3583
M_PHILLYMETRO	0.213296	0.229450	0.929596	0.3531
M_PHOENIX	0.192769	0.242296	0.795593	0.4267
M_PITTSBURGH	0.166019	0.251931	0.658987	0.5102
M_PROVIDENCE	-0.056739	0.384701	-0.147489	0.8828
M_RALEIGHDURHAM	-1.091069	0.305924	-3.566468	0.0004
M_RICHMOND	-1.314454	0.956124	-1.374773	0.1699
M_ROCHESTER	0.777904	0.270094	2.880125	0.0042
M_SACRAMENTO	-0.612946	0.312573	-1.960968	0.0505
M_SALTLAKECITY	-0.129608	0.380717	-0.340431	0.7337
M_SANANTONIO	-0.590591	0.384838	-1.534649	0.1256
M_SANDIEGO	0.423417	0.197836	2.140246	0.0329
M_SEATTLE	-0.491451	0.324857	-1.512826	0.1310
M_SFMETRO	0.427486	0.287010	1.489447	0.1371
M_SOFLA	-0.294694	0.247245	-1.191910	0.2339
M_STLOUIS	-0.493571	1.022637	-0.482645	0.6296
M_SWFLORIDA	-0.280425	0.286381	-0.979200	0.3280
M_TALLAHASSEE	-0.490475	0.257405	-1.905459	0.0573
M_TAMPA	-0.722362	0.337417	-2.140858	0.0328
M_TOLEDO	-0.881056	0.546115	-1.613316	0.1074
M_TUCSON	0.124382	0.585620	0.212394	0.8319
M_TULSA	-0.579483	0.255716	-2.266122	0.0239
T3	-1.051392	0.208585	-5.040584	0.0000
T4	-0.245177	0.201551	-1.216455	0.2244
T5	-0.131539	0.281324	-0.467571	0.6403

T6	-0.605052	0.386507	-1.565437	0.1182
T7	-1.099488	0.276596	-3.975068	0.0001
T8	-1.476523	0.510063	-2.894787	0.0040
T9	-0.836003	0.212702	-3.930397	0.0001
T11	-0.427924	0.210806	-2.029938	0.0429
T12	-0.414954	0.194658	-2.131712	0.0336
T13	-0.428830	0.186644	-2.297587	0.0220
T14	-0.665434	0.216110	-3.079150	0.0022
T15	-0.330465	0.183571	-1.800202	0.0725
T16	-0.428291	0.188531	-2.271728	0.0236
T17	-0.468311	0.195662	-2.393470	0.0171
T18	-0.470673	0.234915	-2.003594	0.0457
T19	-0.459340	0.222003	-2.069067	0.0391
T20	-0.498403	0.172473	-2.889744	0.0040
T21	-0.344360	0.199337	-1.727524	0.0847
T22	-0.374344	0.235560	-1.589169	0.1127
T23	-0.324285	0.220989	-1.467428	0.1429
T24	-0.147377	0.180234	-0.817700	0.4140
T25	-0.453175	0.243685	-1.859672	0.0636
T26	0.436118	0.269481	1.618362	0.1063

R-squared	0.620079	Mean dependent var	17.41712
Adjusted R-squared	0.535468	S.D. dependent var	1.138638
S.E. of regression	0.776057	Akaike info criterion	2.495167
Sum squared resid	275.8368	Schwarz criterion	3.290107
Log likelihood	-596.8943	F-statistic	7.328570
Durbin-Watson stat	1.919363	Prob(F-statistic)	0.000000

White Heteroskedasticity Test:

F-statistic	1.570309	Prob. F(104,456)	0.000962
Obs*R-squared	147.9353	Prob. Chi-Square(104)	0.003032

Ramsey RESET Test:

F-statistic	7.930383	Prob. F(2,456)	0.000412
Log likelihood ratio	19.18123	Prob. Chi-Square(2)	0.000068

Table 8.Quality Adjusted Price Indexes (LA Metro in 2002Q2=1)

	2000Q3	2000Q4	2001Q1	2001Q2	2001Q3	2001Q4
M_ALBUQUERQUE	0.70	1.57	1.76	1.10	0.67	0.46
M_ALLOTHERS_AR_MS_LA_AL	0.19	0.42	0.47	0.29	0.18	0.12
M_ALLOTHERS_CA	0.37	0.83	0.93	0.58	0.35	0.24
M_ALLOTHERS_DE_MD_VA_WV	0.22	0.50	0.56	0.35	0.21	0.15
M_ALLOTHERS_FL	0.19	0.44	0.49	0.30	0.19	0.13
M_ALLOTHERS_GA_KYNCSCTN	0.18	0.41	0.46	0.28	0.17	0.12
M_ALLOTHERS_IL_IN_OH	0.14	0.31	0.35	0.21	0.13	0.09
M_ALLOTHERS_MI_WI	0.13	0.28	0.32	0.20	0.12	0.08
M_ALLOTHERS_NEWENGLAND	0.22	0.50	0.56	0.35	0.21	0.15
M_ALLOTHERS_NORTHWEST	0.18	0.41	0.46	0.29	0.17	0.12
M_ALLOTHERS_NY	0.20	0.44	0.49	0.31	0.19	0.13
M_ALLOTHERS_OK_TX	0.26	0.58	0.65	0.40	0.25	0.17
M_ALLOTHERS_PA	0.15	0.33	0.37	0.23	0.14	0.10
M_ALLOTHERS_PLAINSSTATES	0.16	0.37	0.41	0.26	0.16	0.11
M_ALLOTHERS_SOUTHWEST	0.24	0.54	0.61	0.38	0.23	0.16
M_ATLANTA	0.14	0.32	0.36	0.22	0.14	0.09
M_BOSTON	0.24	0.53	0.60	0.37	0.23	0.16
M_BUFFALO	0.07	0.15	0.17	0.10	0.06	0.04
M_CENTRALCA	0.21	0.48	0.53	0.33	0.20	0.14
M_CENTRALFL	0.18	0.41	0.46	0.29	0.18	0.12
M_CHARLESTON	0.28	0.63	0.71	0.44	0.27	0.19
M_CHARLOTTE	0.14	0.31	0.35	0.22	0.13	0.09
M_CHICAGO	0.31	0.69	0.77	0.48	0.29	0.20
M_CINCINNATI	0.24	0.53	0.60	0.37	0.23	0.16
M_CLEVELAND	0.09	0.20	0.22	0.14	0.08	0.06
M_COLUMBIA	0.09	0.19	0.21	0.13	0.08	0.06
M_COLUMBUS	0.12	0.27	0.30	0.19	0.11	0.08
M_DALLAS	0.20	0.46	0.51	0.32	0.19	0.13
M_DAYTON	0.03	0.06	0.07	0.04	0.03	0.02
M_DCMETRO	0.24	0.53	0.59	0.37	0.22	0.15
M_DENVER	0.14	0.32	0.36	0.23	0.14	0.09
M_DETROIT	0.24	0.53	0.60	0.37	0.23	0.16
M_ELPASO	0.35	0.79	0.89	0.55	0.34	0.23
M_GRANDRAPIDS	0.14	0.31	0.35	0.22	0.13	0.09
M_GREENSBORO	0.17	0.38	0.43	0.27	0.16	0.11
M_GREENVILLE	0.12	0.26	0.29	0.18	0.11	0.08
M_HAWAII	1.04	2.33	2.61	1.62	0.99	0.68
M_HOUSTON	0.15	0.35	0.39	0.24	0.15	0.10
M_INDIANAPOLIS	0.11	0.25	0.28	0.18	0.11	0.07
M_JACKSONVILLE	0.09	0.19	0.22	0.14	0.08	0.06
M_KANSASCITY	0.19	0.42	0.47	0.30	0.18	0.12
M_KNOXVILLE	0.09	0.20	0.23	0.14	0.09	0.06
M_LAMETRO	0.35	0.78	0.88	0.55	0.33	0.23
M_LASVEGAS	0.70	1.56	1.75	1.09	0.67	0.46
M_LEXINGTON	0.25	0.55	0.62	0.39	0.23	0.16
M_LITTLEROCK	0.56	1.26	1.41	0.88	0.53	0.37
M_LOUISVILLE	0.37	0.82	0.92	0.57	0.35	0.24
M_MEMPHIS	0.09	0.20	0.22	0.14	0.08	0.06

M_MILWAUKEE	0.45	1.00	1.12	0.70	0.43	0.29
M_MINNEAPOLIS	0.29	0.66	0.74	0.46	0.28	0.19
M_NASHVILLE	0.25	0.55	0.62	0.39	0.24	0.16
M_NEWORLEANS	0.18	0.40	0.45	0.28	0.17	0.12
M_NORFOLK	0.28	0.63	0.71	0.44	0.27	0.19
M_NYCMETRO	0.41	0.92	1.03	0.64	0.39	0.27
M_OKLAHOMACITY	0.12	0.28	0.31	0.19	0.12	0.08
M_ORLANDO	0.19	0.43	0.48	0.30	0.18	0.13
M_PHILLYMETRO	0.43	0.97	1.09	0.68	0.41	0.28
M_PHOENIX	0.42	0.95	1.06	0.66	0.40	0.28
M_PITTSBURGH	0.41	0.92	1.04	0.64	0.39	0.27
M_PROVIDENCE	0.33	0.74	0.83	0.52	0.31	0.22
M_RALEIGHDURHAM	0.12	0.26	0.29	0.18	0.11	0.08
M_RICHMOND	0.09	0.21	0.24	0.15	0.09	0.06
M_ROCHESTER	0.76	1.70	1.91	1.19	0.72	0.50
M_SACRAMENTO	0.19	0.42	0.47	0.30	0.18	0.12
M_SALTLAKECITY	0.31	0.69	0.77	0.48	0.29	0.20
M_SANANTONIO	0.19	0.43	0.49	0.30	0.18	0.13
M_SANDIEGO	0.53	1.20	1.34	0.83	0.51	0.35
M_SEATTLE	0.21	0.48	0.54	0.33	0.20	0.14
M_SFMETRO	0.54	1.20	1.34	0.84	0.51	0.35
M_SOFLA	0.26	0.58	0.65	0.41	0.25	0.17
M_STLOUIS	0.21	0.48	0.54	0.33	0.20	0.14
M_SWFLORIDA	0.26	0.59	0.66	0.41	0.25	0.17
M_TALLAHASSEE	0.21	0.48	0.54	0.33	0.20	0.14
M_TAMPA	0.17	0.38	0.43	0.27	0.16	0.11
M_TOLEDO	0.14	0.32	0.36	0.23	0.14	0.09
M_TUCSON	0.40	0.89	0.99	0.62	0.38	0.26
M_TULSA	0.20	0.44	0.49	0.31	0.19	0.13

Table 8.Quality Adjusted Price Indexes (LA Metro in 2002Q2=1) (Continued)

	2002Q1	2002Q2	2002Q3	2002Q4	2003Q1	2003Q2
M_ALBUQUERQUE	0.87	2.01	1.31	1.33	1.31	1.03
M_ALLOTHERS_AR_MS_LA_AL	0.23	0.54	0.35	0.36	0.35	0.28
M_ALLOTHERS_CA	0.46	1.06	0.69	0.70	0.69	0.55
M_ALLOTHERS_DE_MD_VA_WV	0.28	0.64	0.42	0.42	0.42	0.33
M_ALLOTHERS_FL	0.24	0.56	0.36	0.37	0.36	0.29
M_ALLOTHERS_GA_KYNCSCTN	0.23	0.52	0.34	0.34	0.34	0.27
M_ALLOTHERS_IL_IN_OH	0.17	0.39	0.26	0.26	0.26	0.20
M_ALLOTHERS_MI_WI	0.16	0.36	0.23	0.24	0.23	0.18
M_ALLOTHERS_NEWENGLAND	0.28	0.64	0.42	0.42	0.42	0.33
M_ALLOTHERS_NORTHWEST	0.23	0.52	0.34	0.35	0.34	0.27
M_ALLOTHERS_NY	0.24	0.56	0.37	0.37	0.36	0.29
M_ALLOTHERS_OK_TX	0.32	0.74	0.48	0.49	0.48	0.38
M_ALLOTHERS_PA	0.18	0.43	0.28	0.28	0.28	0.22
M_ALLOTHERS_PLAINSSTATES	0.20	0.47	0.31	0.31	0.31	0.24
M_ALLOTHERS_SOUTHWEST	0.30	0.69	0.45	0.46	0.45	0.36
M_ATLANTA	0.18	0.41	0.27	0.27	0.27	0.21
M_BOSTON	0.30	0.68	0.45	0.45	0.44	0.35
M_BUFFALO	0.08	0.19	0.12	0.13	0.12	0.10
M_CENTRALCA	0.26	0.61	0.40	0.40	0.40	0.31
M_CENTRALFL	0.23	0.53	0.34	0.35	0.34	0.27
M_CHARLESTON	0.35	0.81	0.53	0.54	0.53	0.42
M_CHARLOTTE	0.17	0.40	0.26	0.26	0.26	0.21
M_CHICAGO	0.38	0.88	0.58	0.58	0.58	0.45
M_CINCINNATI	0.30	0.68	0.45	0.45	0.45	0.35
M_CLEVELAND	0.11	0.25	0.16	0.17	0.16	0.13
M_COLUMBIA	0.11	0.24	0.16	0.16	0.16	0.13
M_COLUMBUS	0.15	0.35	0.23	0.23	0.22	0.18
M_DALLAS	0.25	0.58	0.38	0.39	0.38	0.30
M_DAYTON	0.03	0.08	0.05	0.05	0.05	0.04
M_DCMETRO	0.29	0.67	0.44	0.44	0.44	0.35
M_DENVER	0.18	0.41	0.27	0.27	0.27	0.21
M_DETROIT	0.30	0.68	0.44	0.45	0.44	0.35
M_ELPASO	0.44	1.01	0.66	0.67	0.66	0.52
M_GRANDRAPIDS	0.17	0.39	0.26	0.26	0.26	0.20
M_GREENSBORO	0.21	0.49	0.32	0.32	0.32	0.25
M_GREENVILLE	0.14	0.33	0.22	0.22	0.21	0.17
M_HAWAII	1.29	2.97	1.94	1.96	1.94	1.53
M_HOUSTON	0.19	0.44	0.29	0.29	0.29	0.23
M_INDIANAPOLIS	0.14	0.32	0.21	0.21	0.21	0.17
M_JACKSONVILLE	0.11	0.25	0.16	0.16	0.16	0.13
M_KANSASCITY	0.23	0.54	0.35	0.36	0.35	0.28
M_KNOXVILLE	0.11	0.26	0.17	0.17	0.17	0.13
M_LAMETRO	0.43	1.00	0.65	0.66	0.65	0.51
M_LASVEGAS	0.87	2.00	1.30	1.32	1.30	1.03
M_LEXINGTON	0.31	0.71	0.46	0.47	0.46	0.36
M_LITTLEROCK	0.70	1.60	1.05	1.06	1.04	0.82
M_LOUISVILLE	0.45	1.05	0.68	0.69	0.68	0.54
M_MEMPHIS	0.11	0.25	0.17	0.17	0.17	0.13

M_MILWAUKEE	0.55	1.28	0.83	0.84	0.83	0.66
M_MINNEAPOLIS	0.37	0.84	0.55	0.56	0.55	0.43
M_NASHVILLE	0.31	0.71	0.46	0.47	0.46	0.36
M_NEWORLEANS	0.22	0.51	0.33	0.34	0.33	0.26
M_NORFOLK	0.35	0.81	0.53	0.54	0.53	0.42
M_NYCMETRO	0.51	1.17	0.76	0.77	0.76	0.60
M_OKLAHOMACITY	0.15	0.35	0.23	0.23	0.23	0.18
M_ORLANDO	0.24	0.55	0.36	0.36	0.36	0.28
M_PHILLYMETRO	0.54	1.24	0.81	0.82	0.81	0.64
M_PHOENIX	0.53	1.21	0.79	0.80	0.79	0.62
M_PITTSBURGH	0.51	1.18	0.77	0.78	0.77	0.61
M_PROVIDENCE	0.41	0.94	0.62	0.62	0.62	0.49
M_RALEIGHDURHAM	0.15	0.34	0.22	0.22	0.22	0.17
M_RICHMOND	0.12	0.27	0.18	0.18	0.17	0.14
M_ROCHESTER	0.94	2.18	1.42	1.44	1.42	1.12
M_SACRAMENTO	0.23	0.54	0.35	0.36	0.35	0.28
M_SALTLAKECITY	0.38	0.88	0.57	0.58	0.57	0.45
M_SANANTONIO	0.24	0.55	0.36	0.37	0.36	0.28
M_SANDIEGO	0.66	1.53	1.00	1.01	0.99	0.79
M_SEATTLE	0.27	0.61	0.40	0.40	0.40	0.31
M_SFMETRO	0.66	1.53	1.00	1.01	1.00	0.79
M_SOFLA	0.32	0.74	0.49	0.49	0.49	0.38
M_STLOUIS	0.26	0.61	0.40	0.40	0.40	0.31
M_SWFLORIDA	0.33	0.76	0.49	0.50	0.49	0.39
M_TALLAHASSEE	0.27	0.61	0.40	0.40	0.40	0.31
M_TAMPA	0.21	0.49	0.32	0.32	0.32	0.25
M_TOLEDO	0.18	0.41	0.27	0.27	0.27	0.21
M_TUCSON	0.49	1.13	0.74	0.75	0.74	0.58
M_TULSA	0.24	0.56	0.37	0.37	0.36	0.29

Table 8.Quality Adjusted Price Indexes (LA Metro in 2002Q2=1) (Continued)

	2003Q3	2003Q4	2004Q1	2004Q2	2004Q3	2004Q4
M_ALBUQUERQUE	1.44	1.31	1.26	1.26	1.27	1.22
M_ALLOTHERS_AR_MS_LA_AL	0.39	0.35	0.34	0.34	0.34	0.33
M_ALLOTHERS_CA	0.76	0.69	0.67	0.66	0.67	0.65
M_ALLOTHERS_DE_MD_VA_WV	0.46	0.42	0.40	0.40	0.40	0.39
M_ALLOTHERS_FL	0.40	0.36	0.35	0.35	0.35	0.34
M_ALLOTHERS_GA_KYNCSCTN	0.37	0.34	0.33	0.32	0.33	0.32
M_ALLOTHERS_IL_IN_OH	0.28	0.26	0.25	0.25	0.25	0.24
M_ALLOTHERS_MI_WI	0.26	0.23	0.23	0.22	0.23	0.22
M_ALLOTHERS_NEWENGLAND	0.46	0.42	0.40	0.40	0.40	0.39
M_ALLOTHERS_NORTHWEST	0.38	0.34	0.33	0.33	0.33	0.32
M_ALLOTHERS_NY	0.40	0.36	0.35	0.35	0.35	0.34
M_ALLOTHERS_OK_TX	0.53	0.48	0.46	0.46	0.47	0.45
M_ALLOTHERS_PA	0.31	0.28	0.27	0.27	0.27	0.26
M_ALLOTHERS_PLAINSSTATES	0.34	0.31	0.29	0.29	0.30	0.28
M_ALLOTHERS_SOUTHWEST	0.50	0.45	0.43	0.43	0.44	0.42
M_ATLANTA	0.29	0.27	0.26	0.26	0.26	0.25
M_BOSTON	0.49	0.45	0.43	0.43	0.43	0.41
M_BUFFALO	0.14	0.12	0.12	0.12	0.12	0.12
M_CENTRALCA	0.44	0.40	0.38	0.38	0.38	0.37
M_CENTRALFL	0.38	0.34	0.33	0.33	0.33	0.32
M_CHARLESTON	0.58	0.53	0.51	0.51	0.51	0.49
M_CHARLOTTE	0.29	0.26	0.25	0.25	0.25	0.24
M_CHICAGO	0.63	0.58	0.55	0.55	0.56	0.54
M_CINCINNATI	0.49	0.45	0.43	0.43	0.43	0.42
M_CLEVELAND	0.18	0.16	0.16	0.16	0.16	0.15
M_COLUMBIA	0.18	0.16	0.15	0.15	0.15	0.15
M_COLUMBUS	0.25	0.22	0.22	0.22	0.22	0.21
M_DALLAS	0.42	0.38	0.37	0.36	0.37	0.35
M_DAYTON	0.06	0.05	0.05	0.05	0.05	0.05
M_DCMETRO	0.48	0.44	0.42	0.42	0.43	0.41
M_DENVER	0.30	0.27	0.26	0.26	0.26	0.25
M_DETROIT	0.49	0.44	0.43	0.43	0.43	0.41
M_ELPASO	0.73	0.66	0.63	0.63	0.64	0.62
M_GRANDRAPIDS	0.28	0.26	0.25	0.25	0.25	0.24
M_GREENSBORO	0.35	0.32	0.31	0.31	0.31	0.30
M_GREENVILLE	0.24	0.22	0.21	0.21	0.21	0.20
M_HAWAII	2.14	1.94	1.86	1.86	1.88	1.81
M_HOUSTON	0.32	0.29	0.28	0.28	0.28	0.27
M_INDIANAPOLIS	0.23	0.21	0.20	0.20	0.20	0.20
M_JACKSONVILLE	0.18	0.16	0.16	0.15	0.16	0.15
M_KANSASCITY	0.39	0.35	0.34	0.34	0.34	0.33
M_KNOXVILLE	0.19	0.17	0.16	0.16	0.16	0.16
M_LAMETRO	0.72	0.65	0.63	0.62	0.63	0.61
M_LASVEGAS	1.44	1.30	1.25	1.25	1.26	1.21
M_LEXINGTON	0.51	0.46	0.44	0.44	0.45	0.43
M_LITTLEROCK	1.15	1.05	1.00	1.00	1.01	0.97
M_LOUISVILLE	0.75	0.68	0.66	0.66	0.66	0.64
M_MEMPHIS	0.18	0.17	0.16	0.16	0.16	0.15

M_MILWAUKEE	0.92	0.83	0.80	0.80	0.81	0.78
M_MINNEAPOLIS	0.61	0.55	0.53	0.53	0.53	0.51
M_NASHVILLE	0.51	0.46	0.44	0.44	0.45	0.43
M_NEWORLEANS	0.37	0.33	0.32	0.32	0.32	0.31
M_NORFOLK	0.58	0.53	0.51	0.51	0.51	0.49
M_NYCMETRO	0.84	0.76	0.73	0.73	0.74	0.71
M_OKLAHOMACITY	0.25	0.23	0.22	0.22	0.22	0.21
M_ORLANDO	0.39	0.36	0.34	0.34	0.35	0.33
M_PHILLYMETRO	0.89	0.81	0.77	0.77	0.78	0.75
M_PHOENIX	0.87	0.79	0.76	0.76	0.77	0.74
M_PITTSBURGH	0.85	0.77	0.74	0.74	0.75	0.72
M_PROVIDENCE	0.68	0.62	0.59	0.59	0.60	0.57
M_RALEIGHDURHAM	0.24	0.22	0.21	0.21	0.21	0.20
M_RICHMOND	0.19	0.18	0.17	0.17	0.17	0.16
M_ROCHESTER	1.56	1.42	1.36	1.36	1.38	1.32
M_SACRAMENTO	0.39	0.35	0.34	0.34	0.34	0.33
M_SALTLAKECITY	0.63	0.57	0.55	0.55	0.55	0.53
M_SANANTONIO	0.40	0.36	0.35	0.35	0.35	0.34
M_SANDIEGO	1.10	1.00	0.96	0.95	0.96	0.93
M_SEATTLE	0.44	0.40	0.38	0.38	0.39	0.37
M_SFMETRO	1.10	1.00	0.96	0.96	0.97	0.93
M_SOFLA	0.54	0.49	0.47	0.47	0.47	0.45
M_STLOUIS	0.44	0.40	0.38	0.38	0.39	0.37
M_SWFLORIDA	0.54	0.49	0.47	0.47	0.48	0.46
M_TALLAHASSEE	0.44	0.40	0.38	0.38	0.39	0.37
M_TAMPA	0.35	0.32	0.30	0.30	0.31	0.30
M_TOLEDO	0.30	0.27	0.26	0.26	0.26	0.25
M_TUCSON	0.81	0.74	0.71	0.71	0.72	0.69
M_TULSA	0.40	0.37	0.35	0.35	0.35	0.34

Table 8.Quality Adjusted Price Indexes (LA Metro in 2002Q2=1) (Continued)

	2005Q1	2005Q2	2005Q3	2005Q4	2006Q1	2006Q2
M_ALBUQUERQUE	1.42	1.38	1.45	1.73	1.28	3.11
M_ALLOTHERS_AR_MS_LA_AL	0.38	0.37	0.39	0.47	0.34	0.84
M_ALLOTHERS_CA	0.75	0.73	0.77	0.92	0.68	1.65
M_ALLOTHERS_DE_MD_VA_WV	0.45	0.44	0.46	0.55	0.41	0.99
M_ALLOTHERS_FL	0.39	0.38	0.40	0.48	0.35	0.86
M_ALLOTHERS_GA_KYNCSCTN	0.37	0.36	0.38	0.45	0.33	0.80
M_ALLOTHERS_IL_IN_OH	0.28	0.27	0.28	0.34	0.25	0.61
M_ALLOTHERS_MI_WI	0.25	0.25	0.26	0.31	0.23	0.56
M_ALLOTHERS_NEWENGLAND	0.45	0.44	0.46	0.55	0.41	0.99
M_ALLOTHERS_NORTHWEST	0.37	0.36	0.38	0.45	0.33	0.81
M_ALLOTHERS_NY	0.40	0.39	0.40	0.48	0.36	0.87
M_ALLOTHERS_OK_TX	0.53	0.51	0.54	0.64	0.47	1.15
M_ALLOTHERS_PA	0.30	0.29	0.31	0.37	0.27	0.66
M_ALLOTHERS_PLAINSSTATES	0.33	0.32	0.34	0.40	0.30	0.72
M_ALLOTHERS_SOUTHWEST	0.49	0.48	0.50	0.60	0.44	1.07
M_ATLANTA	0.29	0.28	0.30	0.35	0.26	0.63
M_BOSTON	0.48	0.47	0.49	0.59	0.43	1.06
M_BUFFALO	0.13	0.13	0.14	0.16	0.12	0.29
M_CENTRALCA	0.43	0.42	0.44	0.52	0.39	0.94
M_CENTRALFL	0.37	0.36	0.38	0.46	0.34	0.82
M_CHARLESTON	0.57	0.56	0.59	0.70	0.52	1.25
M_CHARLOTTE	0.28	0.28	0.29	0.35	0.25	0.62
M_CHICAGO	0.63	0.61	0.64	0.76	0.56	1.37
M_CINCINNATI	0.48	0.47	0.49	0.59	0.43	1.06
M_CLEVELAND	0.18	0.17	0.18	0.22	0.16	0.39
M_COLUMBIA	0.17	0.17	0.18	0.21	0.15	0.38
M_COLUMBUS	0.24	0.24	0.25	0.30	0.22	0.53
M_DALLAS	0.41	0.40	0.42	0.50	0.37	0.90
M_DAYTON	0.06	0.05	0.06	0.07	0.05	0.12
M_DCMETRO	0.48	0.46	0.49	0.58	0.43	1.04
M_DENVER	0.29	0.28	0.30	0.36	0.26	0.64
M_DETROIT	0.48	0.47	0.49	0.59	0.43	1.06
M_ELPASO	0.72	0.70	0.73	0.87	0.64	1.57
M_GRANDRAPIDS	0.28	0.27	0.29	0.34	0.25	0.61
M_GREENSBORO	0.35	0.34	0.36	0.42	0.31	0.76
M_GREENVILLE	0.23	0.23	0.24	0.28	0.21	0.51
M_HAWAII	2.11	2.04	2.15	2.56	1.89	4.60
M_HOUSTON	0.31	0.30	0.32	0.38	0.28	0.68
M_INDIANAPOLIS	0.23	0.22	0.23	0.28	0.21	0.50
M_JACKSONVILLE	0.18	0.17	0.18	0.21	0.16	0.38
M_KANSASCITY	0.38	0.37	0.39	0.47	0.34	0.84
M_KNOXVILLE	0.18	0.18	0.19	0.22	0.17	0.40
M_LAMETRO	0.71	0.69	0.72	0.86	0.64	1.55
M_LASVEGAS	1.42	1.37	1.44	1.72	1.27	3.09
M_LEXINGTON	0.50	0.49	0.51	0.61	0.45	1.09
M_LITTLEROCK	1.14	1.10	1.16	1.38	1.02	2.48
M_LOUISVILLE	0.74	0.72	0.76	0.91	0.67	1.62
M_MEMPHIS	0.18	0.18	0.18	0.22	0.16	0.39

M_MILWAUKEE	0.90	0.88	0.92	1.10	0.81	1.97
M_MINNEAPOLIS	0.60	0.58	0.61	0.73	0.54	1.30
M_NASHVILLE	0.50	0.49	0.51	0.61	0.45	1.09
M_NEWORLEANS	0.36	0.35	0.37	0.44	0.33	0.79
M_NORFOLK	0.57	0.56	0.59	0.70	0.52	1.25
M_NYCMETRO	0.83	0.81	0.85	1.01	0.75	1.81
M_OKLAHOMACITY	0.25	0.24	0.25	0.30	0.22	0.54
M_ORLANDO	0.39	0.38	0.40	0.47	0.35	0.85
M_PHILLYMETRO	0.88	0.85	0.89	1.07	0.79	1.91
M_PHOENIX	0.86	0.83	0.88	1.05	0.77	1.88
M_PITTSBURGH	0.84	0.81	0.85	1.02	0.75	1.83
M_PROVIDENCE	0.67	0.65	0.68	0.82	0.60	1.46
M_RALEIGHDURHAM	0.24	0.23	0.24	0.29	0.21	0.52
M_RICHMOND	0.19	0.18	0.19	0.23	0.17	0.42
M_ROCHESTER	1.54	1.50	1.57	1.88	1.38	3.37
M_SACRAMENTO	0.38	0.37	0.39	0.47	0.34	0.84
M_SALTLAKECITY	0.62	0.60	0.64	0.76	0.56	1.36
M_SANANTONIO	0.39	0.38	0.40	0.48	0.35	0.86
M_SANDIEGO	1.08	1.05	1.10	1.32	0.97	2.36
M_SEATTLE	0.43	0.42	0.44	0.53	0.39	0.95
M_SFMETRO	1.09	1.05	1.11	1.32	0.97	2.37
M_SOFLA	0.53	0.51	0.54	0.64	0.47	1.15
M_STLOUIS	0.43	0.42	0.44	0.53	0.39	0.94
M_SWFLORIDA	0.54	0.52	0.55	0.65	0.48	1.17
M_TALLAHASSEE	0.43	0.42	0.44	0.53	0.39	0.95
M_TAMPA	0.34	0.33	0.35	0.42	0.31	0.75
M_TOLEDO	0.29	0.28	0.30	0.36	0.26	0.64
M_TUCSON	0.80	0.78	0.82	0.98	0.72	1.75
M_TULSA	0.40	0.39	0.41	0.48	0.36	0.87

Table 9. Price Determinants (with location and time dummies and per capita income)

Dependent Variable: LOG(PRICE)

Method: Least Squares

Date: 06/18/06 Time: 20:56

Sample (adjusted): 1 585

Included observations: 507 after adjustments

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.608899	3.859529	-0.416864	0.6770
LOG(UNITS)	0.976751	0.050515	19.33568	0.0000
AGE	-0.027048	0.014221	-1.901937	0.0579
AGE^2	0.000211	0.000275	0.766465	0.4438
M_ALBUQUERQUE	0.736251	0.219453	3.354939	0.0009
M_ALLOTHERS_AR_MS_LA_AL	-0.425147	0.272744	-1.558777	0.1198
M_ALLOTHERS_CA	0.181347	0.230282	0.787498	0.4315
M_ALLOTHERS_DE_MD_VA_WV	-0.222806	0.222184	-1.002799	0.3166
M_ALLOTHERS_FL	-0.485707	0.235452	-2.062877	0.0398
M_ALLOTHERS_GA_KYNCSCTN	-0.547205	0.232359	-2.354999	0.0190
M_ALLOTHERS_IL_IN_OH	-0.934199	0.287128	-3.253598	0.0012
M_ALLOTHERS_MI_WI	-0.785614	0.440079	-1.785165	0.0750
M_ALLOTHERS_NEWENGLAND	-0.419725	0.375525	-1.117703	0.2644
M_ALLOTHERS_NORTHWEST	-0.562052	0.324037	-1.734530	0.0836
M_ALLOTHERS_NY	0.103682	0.226637	0.457483	0.6476
M_ALLOTHERS_OK_TX	0.122402	0.202094	0.605671	0.5451
M_ALLOTHERS_PA	-0.825698	0.278566	-2.964099	0.0032
M_ALLOTHERS_PLAINSSTATES	-0.736069	0.295442	-2.491418	0.0131
M_ALLOTHERS_SOUTHWEST	-0.065031	0.236646	-0.274803	0.7836
M_ATLANTA	-0.919954	0.343388	-2.679052	0.0077
M_BOSTON	-0.598663	0.353742	-1.692369	0.0913
M_BUFFALO	-1.657481	0.306146	-5.414022	0.0000
M_CENTRALCA	-0.323264	0.210303	-1.537136	0.1250
M_CENTRALFL	-0.525628	0.528766	-0.994066	0.3208
M_CHARLESTON	-0.008688	0.232274	-0.037404	0.9702
M_CHARLOTTE	-1.088298	0.250781	-4.339630	0.0000
M_CHICAGO	-0.205892	0.219987	-0.935926	0.3499
M_CINCINNATI	-0.391092	0.247121	-1.582591	0.1143

M_CLEVELAND	-1.401673	0.432383	-3.241737	0.0013
M_COLUMBIA	-1.366001	0.481200	-2.838738	0.0048
M_COLUMBUS	-1.143731	0.465040	-2.459424	0.0143
M_DALLAS	-0.579086	0.385029	-1.504007	0.1334
M_DAYTON	-2.523729	0.349443	-7.222154	0.0000
M_DCMETRO	-0.556141	0.299325	-1.857984	0.0639
M_DENVER	-0.998091	0.548423	-1.819929	0.0695
M_DETROIT	-0.420713	0.265009	-1.587546	0.1132
M_ELPASO	0.280453	0.238417	1.176312	0.2402
M_GRANDRAPIDS	-0.832000	0.531917	-1.564153	0.1186
M_GREENSBORO	-0.592324	0.448199	-1.321564	0.1871
M_GREENVILLE	-1.097168	0.194528	-5.640143	0.0000
M_HAWAII	0.074839	0.204569	0.365836	0.7147
M_HOUSTON	-0.924211	0.333549	-2.770844	0.0058
M_INDIANAPOLIS	-0.986774	0.225648	-4.373074	0.0000
M_JACKSONVILLE	-1.347646	0.213473	-6.312959	0.0000
M_KANSASCITY	-0.678283	0.346818	-1.955731	0.0512
M_KNOXVILLE	-1.341320	0.687927	-1.949799	0.0519
M_LASVEGAS	0.952979	0.522403	1.824221	0.0689
M_LEXINGTON	-0.048674	0.225731	-0.215630	0.8294
M_LITTLEROCK	0.553708	0.289611	1.911899	0.0566
M_LOUISVILLE	0.130795	0.278670	0.469354	0.6391
M_MEMPHIS	-1.365615	0.273241	-4.997838	0.0000
M_MILWAUKEE	0.226595	0.283734	0.798617	0.4250
M_MINNEAPOLIS	-0.337315	0.317278	-1.063155	0.2883
M_NASHVILLE	-0.381160	0.409321	-0.931201	0.3523
M_NEWORLEANS	-0.676015	0.593505	-1.139021	0.2554
M_NORFOLK	-0.200412	0.345152	-0.580649	0.5618
M_NYCMETRO	-0.058630	0.244655	-0.239644	0.8107
M_OKLAHOMACITY	-0.927505	0.306325	-3.027842	0.0026
M_ORLANDO	-0.502777	0.673346	-0.746684	0.4557
M_PHILLYMETRO	0.104466	0.234208	0.446037	0.6558
M_PHOENIX	0.280239	0.251379	1.114806	0.2656
M_PITTSBURGH	0.153476	0.249629	0.614817	0.5390
M_PROVIDENCE	-0.086939	0.356254	-0.244038	0.8073
M_RALEIGHDURHAM	-1.142070	0.318966	-3.580536	0.0004
M_RICHMOND	-1.365333	0.909321	-1.501487	0.1340
M_ROCHESTER	0.806380	0.270334	2.982904	0.0030

M_SACRAMENTO	-0.678474	0.326695	-2.076782	0.0385
M_SALTLAKECITY	-0.069776	0.368264	-0.189472	0.8498
M_SANANTONIO	-0.459818	0.385567	-1.192575	0.2337
M_SANDIEGO	0.367757	0.214047	1.718117	0.0865
M_SEATTLE	-0.659899	0.355719	-1.855112	0.0643
M_SFMETRO	0.085195	0.341297	0.249622	0.8030
M_SOFLA	-0.363066	0.253130	-1.434305	0.1523
M_STLOUIS	-0.588465	1.035389	-0.568352	0.5701
M_SWFLORIDA	-0.458853	0.327800	-1.399796	0.1623
M_TALLAHASSEE	-0.329178	0.262748	-1.252827	0.2110
M_TAMPA	-0.761933	0.326551	-2.333276	0.0201
M_TOLEDO	-0.875795	0.564257	-1.552123	0.1214
M_TUCSON	0.188087	0.545427	0.344844	0.7304
M_TULSA	-0.620157	0.266621	-2.325987	0.0205
T3	-1.039117	0.213195	-4.874024	0.0000
T4	-0.294972	0.216702	-1.361184	0.1742
T5	-0.029755	0.356443	-0.083478	0.9335
T6	-0.619763	0.439548	-1.410000	0.1593
T7	-0.981831	0.306780	-3.200439	0.0015
T8	-1.475971	0.504981	-2.922822	0.0037
T9	-0.879618	0.211961	-4.149908	0.0000
T11	-0.526044	0.211926	-2.482209	0.0135
T12	-0.423405	0.195655	-2.164042	0.0310
T13	-0.444575	0.214966	-2.068117	0.0393
T14	-0.650799	0.227610	-2.859267	0.0045
T15	-0.225698	0.183239	-1.231718	0.2188
T16	-0.389626	0.190158	-2.048957	0.0411
T17	-0.437344	0.206537	-2.117508	0.0348
T18	-0.532443	0.263797	-2.018381	0.0442
T19	-0.462646	0.242073	-1.911186	0.0567
T20	-0.638810	0.184299	-3.466158	0.0006
T21	-0.444951	0.203271	-2.188956	0.0292
T22	-0.516172	0.244822	-2.108354	0.0356
T23	-0.340268	0.234187	-1.452977	0.1470
T24	-0.146734	0.186247	-0.787849	0.4312
T25	-0.499606	0.261081	-1.913607	0.0564
T26	0.162560	0.399722	0.406684	0.6845
LOG(PERCAPITA)	0.737920	0.373131	1.977645	0.0486

R-squared	0.644611	Mean dependent var	17.47643
Adjusted R-squared	0.553780	S.D. dependent var	1.157924
S.E. of regression	0.773490	Akaike info criterion	2.504875
Sum squared resid	241.1097	Schwarz criterion	3.372261
Log likelihood	-530.9857	F-statistic	7.096784
Durbin-Watson stat	1.778756	Prob(F-statistic)	0.000000

White Heteroskedasticity Test:

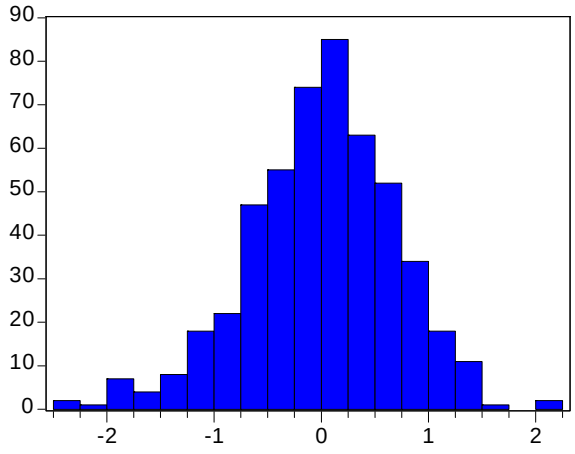
F-statistic	1.202031	Prob. F(106,397)	0.107599
Obs*R-squared	122.4551	Prob. Chi-Square(106)	0.130998

Ramsey RESET Test:

F-statistic	2.387340	Prob. F(2,398)	0.093188
Log likelihood ratio	6.010347	Prob. Chi-Square(2)	0.049530

Ramsey RESET Test:

F-statistic	1.613722	Prob. F(3,397)	0.185625
Log likelihood ratio	6.108793	Prob. Chi-Square(3)	0.106436



Series: Residuals
Sample 1 593 IF STATUS_TX="closed" AND ORDER>0
Observations 504

Mean	5.49e-15
Median	0.027249
Maximum	2.147295
Minimum	-2.337355
Std. Dev.	0.691331
Skewness	-0.363759
Kurtosis	3.580832
Jarque-Bera	18.19963
Probability	0.000112

Figure1. Box-Whisker Plots of Annual Prices

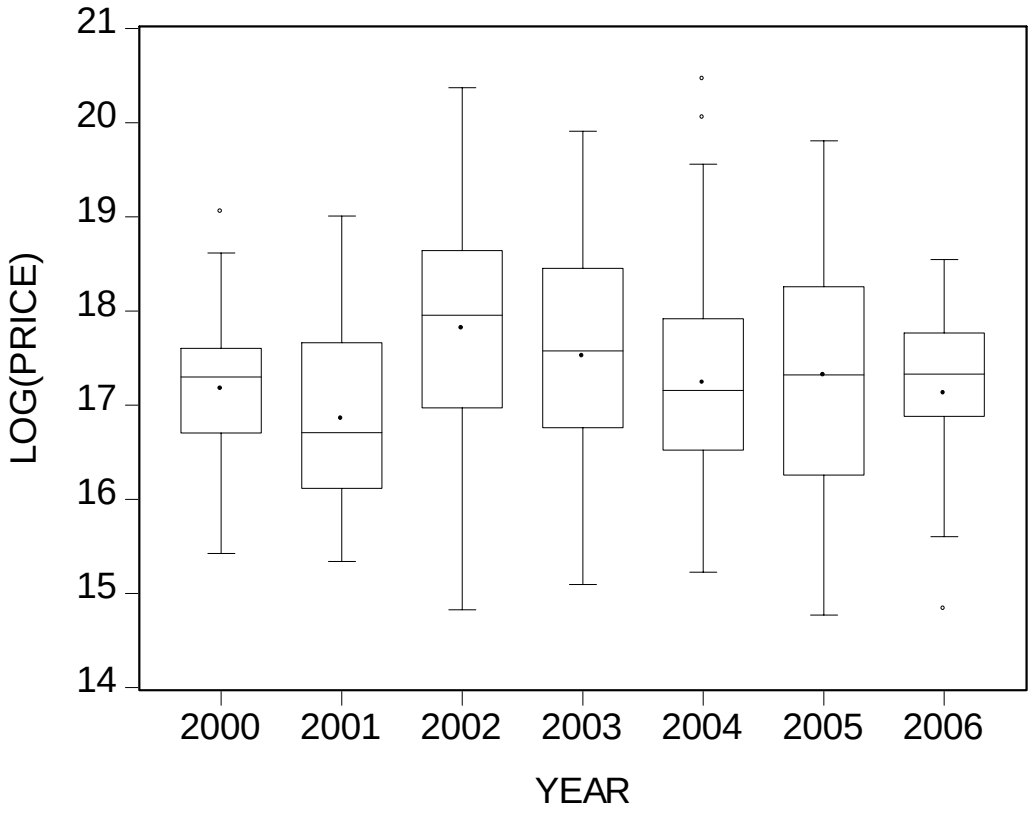


Figure 2. Box-Whisker Plots of Quarterly Prices

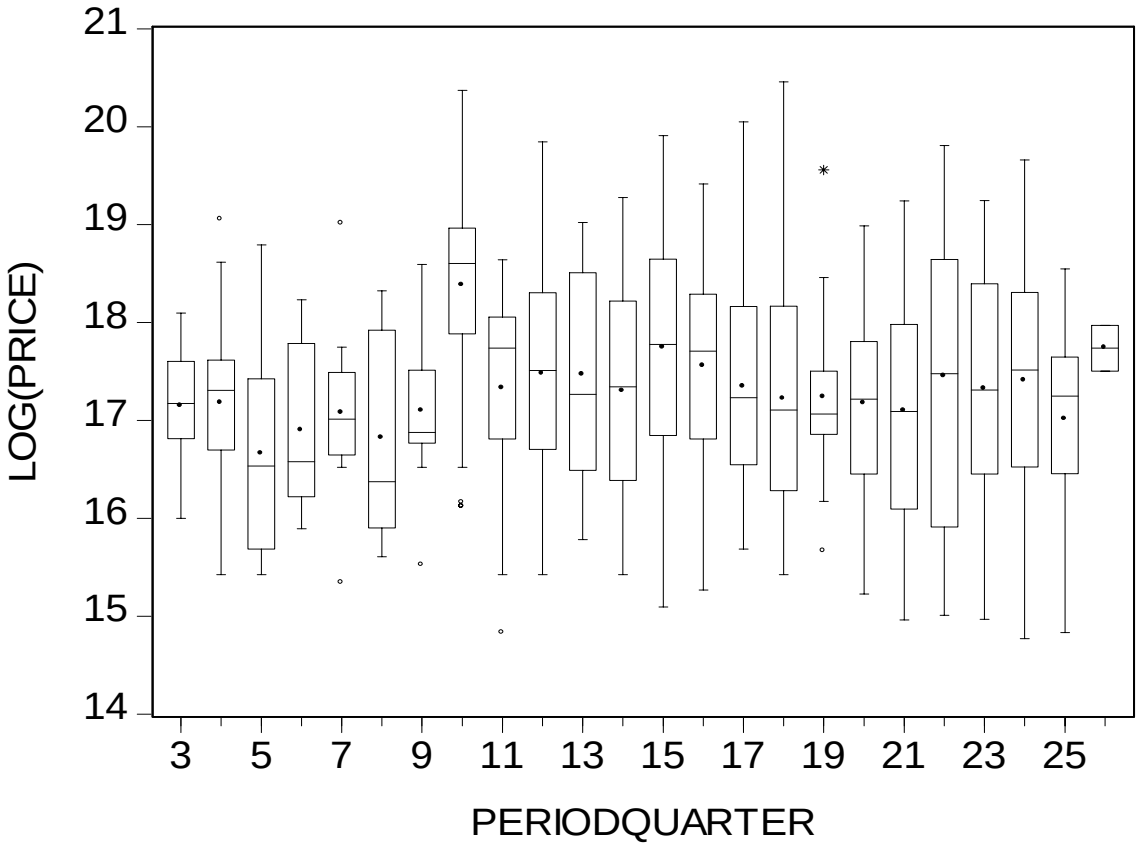


Figure 3. Box-Whisker Plot of Prices by Metro

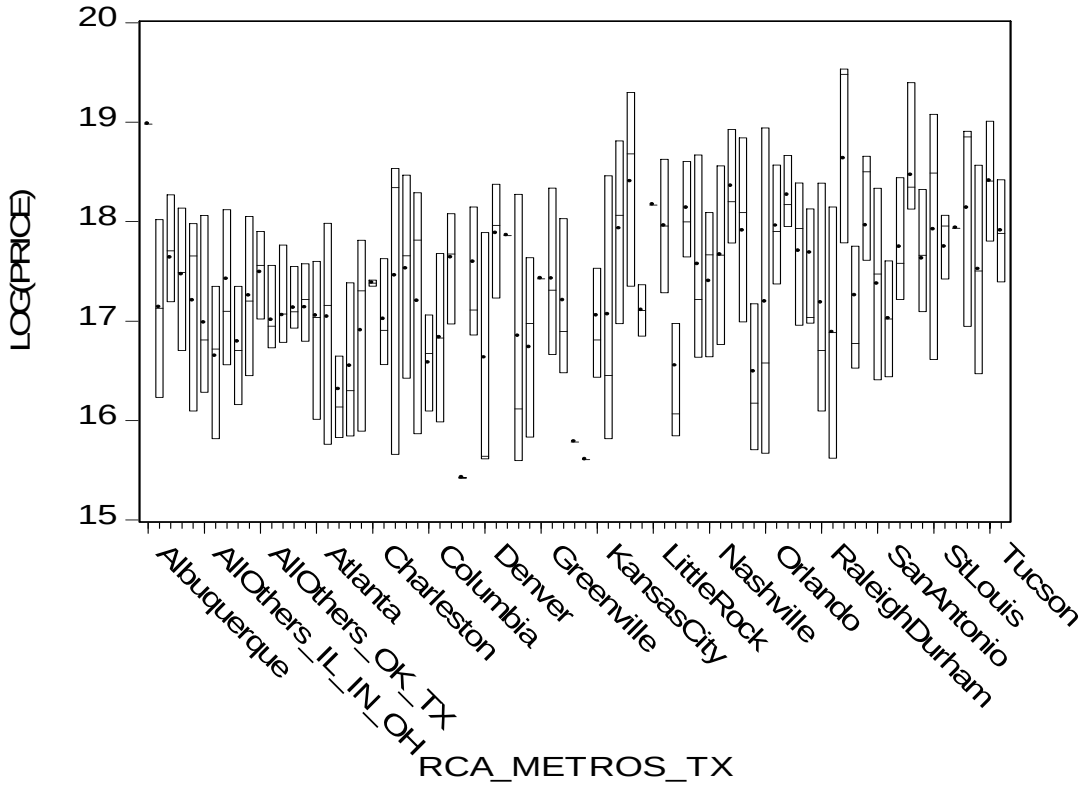


Figure 4. Price Indexes (LA Metro in 2002Q2=1)