The Effect of a College on Housing Prices and the Tax Base

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Abstract: This paper investigates whether the presence of college increases house prices and the tax base. Colleges provide cultural and recreational amenities to the surrounding area but lifestyle choices of students may create negative externalities that depress property prices. In addition, colleges are exempt from property taxes. While the property tax exemption reduces the tax base, the amenity value of the college may cause more development on the remaining land. Previous literature considers the impact of a wide range of amenities including open space, however, none try to capture the effect from a college in a given area. I find evidence that private four-year colleges have a positive effect on housing prices and housing price increases from the years 1995 to 2000. I also find evidence that the presence of a college increases the higher tax base regardless of whether the college is public or private.

Introduction

Colleges provide culture, high technology, recreational facilities, open space, and fun. If an entrepreneur is looking for talent and technology, college towns can often provide them. This is because some college towns have significant private research and technology industries nearby to take advantage of university facilities. Colleges also hold cultural and sporting events and offer first-rate recreational facilities including swimming pools and tennis courts. Often, the architecture on the campus is a significant source of community pride. Not surprisingly then, Gopal (2008) reports that property values in college towns have appreciated immensely. Openshaw (2006) notes that in college towns housing demand is steadier than the average real estate market.

On the other hand, college students create nuisances that residents near colleges must endure. Some of these include noise and drinking at student housing, as well as traffic congestion and parking problems. Loud parties are also often associated with vandalism. This can potentially offset the value of the existing and future cultural facilities of these towns that attract visitors. Consequently, a series of municipalities have passed ordinances to reduce the nuisances that students cause. For instance, in Ewing New Jersey, where The College of New Jersey is located, the township council approved a revised noise and nuisance ordinance on February 1st, 2009. The ordinance raised fines to $3,000 for township residents who violate the noise ordinance.

A parallel debate focuses on the impact of a college on the tax base. On one hand, colleges are tax exempt. Because of this, property that the college owns is removed from the local tax rolls. This in turn, lowers the tax base for the municipality, which potentially raises property tax rates. Municipalities often complain that the presence of the college causes an

additional burden for services as roads that lead to the campus get more use and students use off-campus facilities. Of course, the presence of the college may attract more development because the amenities noted above offset any negative impact from the tax exemption.

This paper aims to measure the net effect of a college on house prices and the tax base using municipal-level data for the state of New Jersey. Our analysis uses a dummy variable for the presence of a four-year college or university in a given municipality. In addition we interact the dummy with a dummy that indicates whether the college is public or private. Two main questions will be investigated. First, does the presence of a college raise or lower the tax base? That is, does the increase in development and the associated tax base induced by the presence of the college offset the loss of tax base caused by the tax exemption? Second, do colleges increase house prices? That is, does the amenity value of the college from cultural activities and athletic facilities outweigh disamenities from nuisances such as loud parties?

We find no significant effect for the presence of a public college on house prices. However, we do find that private colleges have a significant positive impact on house prices. This result holds regardless of whether we analyze the level of house prices or the change in house prices over the period 1995-2000. For the tax base, we find that the presence of a college has a significant positive effect on tax base levels (for the year 2000). However, the presence of a college has a negative effect on the change in the tax base over the period 1995-2000. This suggests that while municipalities with colleges had larger tax bases than municipalities without tax bases, the difference is decreasing.

Literature Review

Although no studies explicitly examine the impact of a college on house prices, a large body of literature considers the impact of a wide range of amenities, including open space, on the price of real estate in a given area. In addition, a series of papers consider the impact of primary and secondary school quality on house prices (Hayes 1996; Boarnet and Chalermpong 2001). Hayes (1996) finds that school expenditures, commute to a central business district, neighboring parks and dumps explain house prices. Her findings suggest that the premium for school quality can be among the most important determinants of housing prices. However, the likely causes of a link between primary and secondary school quality and house prices if far different than the causes of the link between the presence of a college and house prices. Purchase of a house in a particular municipality confers the right to enroll all school-age children in the household in the local primary or secondary school. By law, all municipalities must provide all residents access to a primary and secondary school. All that differs across municipalities is the quality of the schools. In addition, the schools are often financed primarily through local property taxes and higher property taxes reduce house prices.

By contrast, purchasing a house in the same municipality as a four-year college confers no right to attend the college. The funding sources for colleges are also different. Rather than local property taxes, colleges rely on tuition, endowments, and state and federal funds. Because colleges produce geographic concentrations of college-age men and women they may cause the increase in disamenties described above (e.g., loud parties).

One additional characteristic of colleges is the college campus. A college campus is often the focal point of a municipality. Green areas, water bodies, and open space are all common on

college campuses. Thus, the campus itself may raise house prices. Luttik (2000) finds that an aesthetically pleasing environment is increases house prices. Houses that overlook water have, on average, prices that are 8-10% higher and houses that have a pleasant view overlooking open space have, on average, prices that are 6-12% higher. Restoration has also been a source of valuing environmental amenities at residential locations as Dietrich Earnhart (2001) has found. Earnhart finds that water-based and land-based features generate higher utility than no natural feature. Among the category of land-based features, forests generated the highest utility. Water-based features such as marshes generate relatively high utilities when they are restored. Restored marshes generated roughly $40,578 in benefits, while disturbed marshes generated negative benefits of $32,412, representing 16.6% and 13.2% of the median house price, respectively.

More generally, a long series of papers examine the impact of open space on house prices using hedonics (Geoghegan et al. 1997; Bolitzer and Netusil 2000; Espey and Owusu-Edusei 2001; Lutzenheiser and Netusil 2001; Shultz and King 2001; Irwin 2002; Geoghegan 2002; Geoghegan et al. 2003; Wu 2003; Anderson and West 2006). Hedonic pricing relies on the assumption that the value of environmental amenities will be capitalized into house prices. In essence, a residential property is viewed as a bundle of attributes. Each attribute affects the sales price of the final good.

For instance, Bolitzer and Netusil (2000) consider the impact of open space on property values in Portland, Oregon. Properties located near open spaces such as public parks, natural areas, and golf courses may experience higher prices but the net effect of this proximity is undetermined since traffic congestion and noise may negate the benefits received from these amenities. However, they find that open space within 1500 feet of a home has a positive and significant effect on house prices. They also find that the open space type has an important

effect on property values. Golf courses had the highest positive effect on housing price, while public parks were second. Wu (2003) found that amenity features had mixed effects. While proximity to a business district did not have a significant effect on property values, the elevation coefficient showed that with an increase of elevation of 100 feet, housing prices increase by $2.12 per square foot. For a 5% increase in open space, housing values would approximately increase by $1,000.

Finally, Bolitzer and Netusil find that open space had the largest impact on property values when the open space was 401-700 feet from the property. Espey and Owusu-Edusei (2001) also find that the value of parks varies with park size and proximity. Homes located within 1500 feet exhibited a 6.5% increase in their home price relative to homes located more than 1500 feet away. Coefficient estimates for a small, attractive park produced the largest magnitude of results. Holding everything else constant, small attractive parks produce an 11% increase of housing prices if they are located within 600 feet of the property in question. This empirical evidence further supports homebuyer's demand for an attractive landscape. As with colleges, multiple acres of green bodies within suburban and rural landscapes may also be seen as amenity worth of higher value than average.

In addition to open space, colleges also provide access to recreation facilities and the arts. Haurin and Brasington (1996) employ a hedonic price model that includes an accessibility index, arts index, population growth index, and recreation index among several other house characteristic variables. Distance to a central business district was positive, but not statistically significant. The four indices used were all statistically significant except the population growth rate index. This suggests that housing prices within towns that provide arts and recreation increase due an amenity value present. Since college towns are notorious for providing that

value without enrolling, it is hypothesized that housing prices in college towns will increase due to recreation and arts being provided.

Data and Methods

The New Jersey Department of the Treasury supplied the data on mean house sale price by municipality in the year 2000 and 1995 in the state of New Jersey. Open space observations such as total open space expenditures and state open state expenditures are from the New Jersey Department of Environmental Protection. This department also provided data on travel distance to New York City and Philadelphia. Municipality population, school age population, median rooms per housing unit, median family income, seasonal housing units, and the proportion of housing units built before 1960 are from the U.S. Census Bureau. Land use/land cover data is a composite of 1995/97 land use/land cover analysis developed by NJDEP and updated for 2000 using information developed by Richard Lathrop at The Center for Remote Sensing and Spatial Analysis at Rutgers University using satellite images. Data on tax bases, tax rates, commercial and residential land values, and the ratios of assessed property values to market values are from the New Jersey Department of Community Affairs. We do not include housing characteristics in the tax base specifications because high value land may contain a large number of smaller housing units or a small number of large (and expensive) housing units.

Lastly, the college related variables presence of a college dummy, and public private dummy were collected from the State of New Jersey's Commission on Higher Education for the year 2000. For the enrollment variable, Fall 2000 total enrollment was used for each college.

Because the tax rate and tax base are determined simultaneously, we need instruments to identify the tax rate. We use the ratio of residential to commercial land values, because as the

ratio of residential to commercial land values rises, the tax rates should rise because residents are more intensive users. Also, we use percentage of population that is of school age and population as instruments as well. Likewise, increases in the population that is of school age should also cause higher tax rates. Lastly, population may affect tax rates because economies of scale in the provision of services. This is the following model:

(1) $R_i = f(N_i, K_i, A_i)$

(2) $B_i = g(N_i, K_i, \hat{R}_i)$

where A_i are instruments used to identify the tax rate (or the change in the tax rate), B_i is the tax base per acre of land for municipality i (or the percentage change in the tax base over the period 1995-2000). R_i is the equalized tax rate per $100 of property value (or the percentage change in the tax rate over the period 1995-2000), and $\hat{R}_i$ is the fitted value for R_i. Also using Lutzenhiser and Netusil's hedonic pricing model gives us a new logical estimation of the model:

(4) $R_i = j(S_i, N_i, K_i, A_i)$

(5) $P_i = k(S_i, N_i, K_i, \hat{R}_i)$

where S_i is a vector of housing characteristics for municipality i, N_i is a vector of neighborhood - locational characteristics for municipality i, and K_i is a vector of land use variables for municipality *i*. The dependent variable (P_i) is house sale price. Because many of the independent variables take on zero values, the log-log linear specification causes a large number of lost observations; therefore, we report only semi-log linear specifications here.

Results

House Price and Colleges

Table 1 shows the means and standard deviations for the dependent variable (House Price, Tax Base) and the independent variables. The variation in average house prices across the

state was large. Out of the 566 municipalities, only six reported no house sale data for the year 2000. Since bigger houses on larger lots should ceteris paribus raise house prices, we expect that house prices will increase with average residential parcel size per housing unit (Average Parcel) and the median number of rooms per house (Rooms).

The expected sign for the college present dummy variable is indeterminate. As noted above, colleges provide both amenities and disamenities. To check for a differential impact between private and public colleges, we create an interaction term. This term equals one when a private college is present and zero otherwise.

Statewide, about 7.5% of municipalities have a college within their bounadaries. About 2.5% of municipalities have a private college within their boundaries. Table 3 reports regressions on the log of average house price and the tax rate by municipality. Column 2 of Table 3 reports the results on log house sale prices assuming that the tax rate is exogenous, column 3 reports the results on the tax rate, and column 4 reports the results on the log house sale price assuming that the tax rate is endogenous. College Presence does not show a significant effect in either of the house price specifications. However, the private college interaction term shows a consistent, positive and significant effect on house prices across both specifications. From column 4 in Table 3, we see that with a private college being present in a municipality, house prices are 22.01 percent greater. Using the mean value for house price, this implies that with the presence of a private college raises the average house price by about $46,394.

The tax rate has a significant negative effect on house prices in both specifications. If higher house prices depressed the tax rate, then the estimates of the tax rate coefficient based on the fitted value of the tax rate (column 4) should have be lower than the estimates using the actual tax rate (column 2). However, the estimates based on the fitted value (β= -0.239) are

slightly higher than the estimates that use the actual value (β= -0.238). This suggests that higher house prices do not reduce the tax rate. Finally, estimates in column 3 suggest that with a private institution present, the equalized tax rate is falls by about $0.37 per $100 of assessed value (or about 15%)

The Tax Base and Colleges

The average tax base per acre across New Jersey municipalities in 2000 is $367,860 (Table 1). Like house prices, tax bases per acre vary dramatically across New Jersey municipalities. From a theoretical perspective, the effect of a college present on the tax base is indeterminate. We do not know whether the potential increases in development brought about by the presence of a college make up for the lost tax base due to the college's tax-exempt status. With higher densities or house prices, the tax base is also higher. On the other hand, colleges remove land from the tax rolls and lower the tax base. Table 4 reports regressions on the log of the tax base and the tax rate by municipality. Column 2 of Table 4 reports the results on log tax base assuming it is exogenous, column 3 reports the results on the tax rate, and column 4 reports the results on the log tax base assuming that the tax rate is endogenous.

The presence of a college produces a significant positive effect on the tax base per acre. When a college is present within a municipality, a tax base per acre is about 25% higher (about $90,000). The results also suggest that there is no differential effect on the tax base depending on whether the college is public or private. The equalized property tax rate shows a significant negative effect on the tax base across both specifications. From column 4 of Table 4, we see that a $1 per $100 of value tax increase is associated with a tax base per acre that is about 60 percent lower (about $220,000). If we instead treat the tax rate as exogenous, we get a smaller effect. The estimate of the effect of an exogenous tax rate on the tax base shows a $1 per $100 of value

tax increase is associated with a tax base that is 12 percent lower (about $44,000). The corrected estimate shows an impact of $176,000 greater because it removes the effect of the tax base on the tax rate. This suggests that a larger tax base depresses tax rates.

Changes in House Prices and Colleges

To check the robustness of our results, we examine the impact of the presence of a college on house price appreciation over the period 1995-2000. During the period 1995-2000, house prices increased an average of 19.4 percent (Table 1). Table 5 reports regressions on the log ratio of average house price, and the tax rate ratio. The log ratio of house prices is defined as the log of the ratio of average house sale price for 2000 to average house sale price for 1995 (by municipality). The tax rate ratio is the ratio of the equalized property tax rate in 2000 to the equalized property tax rate in 1995 (by municipality). Column 2 of Table 5 reports the results on log house price ratio assuming the tax rate ratio is exogenous, column 3 reports the results on the tax rate ratio, and column 4 reports the results on the log house sale price ratio assuming that the tax rate ratio is endogenous.

Once again, College Presence does not show a significant effect in either of the house price specifications. That is, we are unable to find evidence that the presence of a college caused a change in house price appreciation over the period 1995-2000. However, the private college interaction term shows a consistent, positive and significant effect on house price appreciation across both specifications. From column 4 in Table 5, we see that with a private college being present in a municipality, house prices appreciated another 8% over the period. In both specifications, the ratio of the equalized property tax rate (equalized tax rate 2000/equalized tax rate 1995) shows a significant negative effect on the log ratio of the house prices. The estimates in column 4 show that a 0.1 increase in the tax rate ratio is associated with a 3.3 percent decrease

in house prices over the period. If we instead treat the tax rate of exogenous, we get a smaller effect. The estimate of the effect of an exogenous tax rate ratio on the house price ratio shows a 0.1 increase in the tax rate ratio is associated with a 1 percent reduction in the house price ratio. The corrected estimate thus shows an impact that is about 2.3 percentage points greater because it removes the effect of the house prices on the tax rate. This suggests that a higher house price depresses tax rates.

Changes in Tax Base and Colleges

During the period 1995-2000, the average percentage increase in the tax base per acre was 20.84 for the state (Table 1). Table 6 reports regressions on the log ratio of the tax base and the tax rate ratio. The log ratio of the tax base is defined as the log of the ratio of the market value of the tax base for 2000 to the market value of the tax base for 1995 (by municipality). The tax rate ratio is defined as above (equalized property tax rate in 2000 to equalized property tax rate in 1995). Column 2 of Table 6 reports the results on log tax base ratio assuming that the tax rate ratio is exogenous, column 3 reports the results on the tax rate ratio, and column 4 reports the results on the log tax base ratio assuming that the tax rate ratio is endogenous.

Despite finding a positive effect from the presence of a college on the tax base level, we find a negative effect from a college on the change in the tax base over the period 1995-2000. The presence of a college shows a consistent, significant, negative effect on the change in the tax base of 3.3% in both specifications. Using the mean value of the tax base per acre of $367,860, this implies the reduction in the tax base over the period was about $11,000. Taken together, the results on the tax base level and the tax base imply that while municipalities with colleges have a higher tax base per acre than municipalities without colleges, the difference is shrinking.

In both specifications, the ratio of equalized property tax rate (tax rate 2000/tax rate 1995) shows a significant negative effect on the log ratio of the tax base over the period. The estimates in column 4 show that a 0.1 increase in the tax rate ratio is associated with a 3.3 percent decrease in the tax base over the period. If we instead treat the tax rate as exogenous, we get a smaller effect. The estimate of the effect of a purportedly exogenous tax rate on the tax base shows a 0.1 increase in the tax rate ratio is associated with a 2.6 percent reduction in the tax base. The corrected estimate thus shows an impact that is about 0.7 percentage points greater because it removes the effect of the tax base on the tax rate. This suggests, once again, that a larger tax base does depress tax rates.

Conclusion

While colleges and their surrounding local governments have argued for decades over disruptions caused by noisy students and the economic impact of the college on the surrounding community, there is no economic literature that attempts to measure the net amenity value of the college and its impact on the tax base. I find that private colleges have a significant positive effect on housing prices in 2000, and housing price increases from 1995-2000. This suggests that private schools are providing positive amenity values that are causing house prices to rise. However, I am unable to find any effect on house prices for public colleges. It is possible that eminent domain considerations account for this result. Because public colleges have the right to eminent domain, the reduce property values relative to private colleges that have no such right.

I also find evidence that the presence of a college in a given municipality raises the tax base regardless of whether it is public or private college. However, over the 1995-2000 period, colleges had a negative effect on the tax base suggesting the gap between municipalities who had

colleges and those without, decreased. Our estimates suggest that the difference in tax base per acre for municipalities that had a college and those that did not was about $90,000 while over the period 1995-2000 the difference in tax base per acre between municipalities with a college and municipalities without was about $11,000.

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Table 1. Means and Standard Deviations

Variable	N	Mean	Standard Deviation
House Price	560	210,786	139,732
Rooms	566	6.09	1.02
Average Parcel	566	0.448	0.414
Pre-1960	566	49	21.1
Pct Seasonal	566	4.51	12.84
Nyc Dist	566	48.05	31
NycPhl	566	81.28	17.53
Undeveloped	566	28.5	23.4
Open Space Exp	566	451.86	2244.7
Tax Base	566	367,860	434,501
Tax Rate	566	2.52	0.792
Assessed to Market	566	85.6	16.4
%Δ House Price	556	19.43	20.26
%Δ Tax Base	565	19.64	50.72
Tax Rate Ratio	566	1.076	0.2539
Residential/Commercial Ratio	565	7.44	12.72
Pct School Age	566	25.28	4.42
Population	566	14,866	22,789
CollegePresent	566	0.075	0.265

Public_Private	566	0.024	0.155

House Price$_i$ = average price per housing unit in dollars for municipality i in 2000.
Rooms$_i$ = median number of rooms per housing unit for municipality i in 2000.
Average Parcel$_i$ = average residential lot size in acres for municipality i in 2000.
Pre-1960$_i$ = percentage of total housing units that were built prior to 1960 for municipality i in 2000.
Pct Seasonal$_i$ = percentage of total housing units that are seasonal units for municipality i in 2000.
Nyc Dist$_i$ = distance (in miles) between the municipality and New York City.
NycPhl = $[(\text{Distance to NYC})^2 + (\text{Distance to Philadelphia})^2]^{1/2}$
Undeveloped$_i$ = Undeveloped land (less acreage acquired as open space) as a percentage of total acreage as of 2000 for municipality i.
Open Space Exp$_i$ = total real open space expenditures (in 2000 dollars) as of 2000 per housing unit for municipality i.
Tax Base$_i$ = total assessed tax base (land and improvements) in dollars per acre for municipality i in 2000 multiplied by the market to assessed ratio.
Tax Rate$_i$ = general property tax rate per $100 of assessed value for municipality i in 2000 multiplied by the assessed to market ratio.
Assessed to Market$_i$ = ratio of total market value to assessed value expressed as a percentage for municipality i in 2000.
%Δ House Price$_i$ = percentage change in average price per housing unit by municipality for 1995-2000.
%Δ Tax Base$_i$ = percentage change in the total equalized tax base per acre by municipality for 1995-2000.
Tax Rate Ratio$_i$ = equalized property tax rate per $100 of value by municipality for 2000 divided by the equalized property tax rate per $100 of value by municipality for 1995.
Residential/Commercial Ratio$_i$ = ratio of residential land values to commercial land values for municipality i in 2000.
Pct School Age$_i$ = percentage of the total population that is between the ages of 3 and 18 years of age for municipality i in 2000.
Population$_i$ = total population for municipality i in 2000.
CollegePresent = dummy variable denoting the presence of a college in a municipality
Public_Private = dummy variable denoting the presence of a public college (0), or a private college (1)

Table 3. Regressions on the Natural Log of House Prices and Tax Rates

Dependent Variable:	Ln_House Price	Tax Rate	Ln_House Price
Constant	11.52***	2.58***	11.52***
	(0.214)	(0.36)	(0.306)
Op Space Exp	0.000014**	-0.000018***	0.0000139
	(0.0000052)	(0.0000058)	(0.0000055)
Nyc Dist	-0.0175***	0.00717	-0.017***
	(0.002)	(0.00461)	(0.0019)
Nyc Dist Squared	0.00007***	-0.000011	0.0000708***
	(0.000018)	(0.000042)	(0.000017)
NycPhl	0.0069	0.01	0.0068
	(0.0045)	(0.0095)	(-0.0047)
NycPhl Squared	-0.000041	-0.000091	-0.000041
	(0.000028)	(0.000059)	(-0.000028)
Pct Seasonal	0.0104***	-0.017***	0.010***
	(0.0012)	(0.0025)	(0.002)
Pre-1960	0.00039	0.0051***	0.00043
	(0.00057)	(0.001)	(0.00062)
Undeveloped	0.0002	-0.0037***	0.00018
	(0.0005)	(0.001)	(0.00061)
Rooms	0.233***	-0.304***	0.234***
	(0.015)	(0.033)	(0.022)
Average Parcel [a]	0.18***	-0.25**	0.180***
	(0.051)	(0.088)	(0.052)
Tax Rate [b]	-0.238**		-0.239***
	(0.0238)		(0.071)
Residential/Commercial Ratio		0.0042**	
		(0.0013)	
Pct School Age		0.0473***	
		(0.0098)	
CollegePresent	-0.018	0.0127	-0.0180277
	(0.038)	(0.0861)	(0.0386482)
Public_Private	0.22**	-0.3734*	0.2201458***
	(0.078)	(0.2104)	(0.0859125)
R^2	0.84	0.55	0.85
N	560	559	559

[a] = residual
[b] = fitted value in col. 4
* = significant at 0.1 level, ** = significant at 0.05 level, *** = significant at 0.01 level.

Table 4. Regressions on the Natural Log of the Tax Base and Tax Rates

Dependent Variable:	Ln_Tax Base	Tax Rate	Ln_Tax Base
Constant	13.7***	0.97*	14.46***
	(0.66)	(0.518)	(0.786)
Op Space Exp	-0.000033**	0.000052***	-0.000059***
	(0.000014)	(0.000012)	(0.000022)
Nyc Dist	-0.241***	-0.0077	-0.0276***
	(0.0072)	(0.0072)	(0.0074)
Nyc Dist Squared	0.000067	0.00014**	0.00001*
	(0.00007)	(0.000067)	(0.00007)
NycPhl	0.0188	0.026**	0.019
	(0.017)	(0.012)	(-0.017)
NycPhl Squared	-0.00012	-0.0002**	-0.00013
	(0.00011)	(0.00008)	(-0.00011)
Pct Seasonal	0.0132**	-0.0094**	0.006
	(0.0055)	(0.0047)	(0.005)
Pre-1960	0.002	0.0088***	0.006
	(0.0026)	(0.0023)	(0.004)
Undeveloped	-0.0442***	-0.0036**	-0.0459***
	(0.0026)	(0.0016)	(0.0025)
Tax Rate [b]	-0.12**		-0.607**
	(0.053)		(0.298)
Residential/Commercial Ratio		-0.0062**	
		(0.0026)	
Pct School Age		0.027***	
		(0.008)	
CollegePresent	0.136	0.138	0.249**
	(0.087)	(0.0898)	(0.119)
Public_Private	0.111	-0.327	-0.0202
	(0.133)	(0.201)	(0.1575)
R^2	0.76	0.27	0.72
N	566	565	565

[a] = residual
[b] = fitted value in col. 4
* = significant at 0.1 level, ** = significant at 0.05 level, *** = significant at 0.01 level.

Table 5. Regressions on the Change in House Prices and Tax Rates 1995-2000

Dependent Variable:	ln(House Price Ratio)	Tax Rate Ratio	ln(House Price Ratio)
Constant	0.164	2***	0.652*
	(0.132)	(0.188)	(0.386)
House Price 1995#	-0.000000418**	-0.00000101***	-0.00000063***
	(0.000000151)	(0.000000214)	(0.000000222)
Change in Open Space Exp	0.0000354*	-0.00000022	0.0000354*
	(0.0000191)	(0.000011)	(0.0000186)
Open Space Exp	2.56E-09	-4.2E-09	1.7E-09
	(2.9E-09)	(3.39E-09)	(3.07E-09)
Nyc Dist	-0.002**	-0.00009	-0.002**
	(0.001)	(0.0015)	(0.001)
Nyc Dist Squared	0.00001	0.00000624	0.00001
	(0.0000102)	(0.0000142)	(0.00001)
NycPhl	0.0035	0.002	0.0037
	(0.0026)	(0.0035)	(0.0025)
NycPhl Squared	-0.000019	-0.000024	-0.000023
	(0.00001)	(0.000021)	(0.000016)
Pct Seasonal	0.004***	-0.0052***	0.00266*
	(0.0007)	(0.0012)	(0.00137)
Pre-1960	0.00042	0.0005	0.00047
	(0.0003)	(0.0004)	(0.00033)
Undeveloped	0.00019	-0.0008**	0.000018
	(0.00034)	(0.0003)	(0.000362)
Rooms	0.0373***	-0.0585***	0.027**
	(0.0091)	(0.014)	(0.012)
Average Parcel [a]	0.0688*	-0.0195	0.0679*
	(0.0415)	(0.043)	(0.0422)
Tax Rate Ratio [b]	-0.107**		-0.3313**
	(0.036)		(0.1633)
Tax Rate 1995	-0.061***	-0.285***	-0.12***
	(0.013)	(0.031)	(0.04)
Residential/Commercial Ratio		0.0018**	
		(0.0007)	
Pct School Age		0.011***	
		(0.0034)	
CollegePresent	-0.026	-0.022	-0.0253
	(0.016)	(0.027)	(0.0179)

Public_Private	0.082**	-0.017	0.0864**
	(0.035)	(0.059)	(0.0382)
R^2	0.33	0.46	0.25
N	556	555	555

[a] = residual
[b] = fitted value in col. 4
* = significant at 0.1 level, ** = significant at 0.05 level, *** = significant at 0.01 level.

Table 6. Regressions on the Change in Tax Base and Tax Rates 1995-2000

Dep Var:	ln(Tax Base Ratio)	Tax Rate Ratio	ln(Tax Base Ratio)
Constant	0.746***	1.27***	0.839***
	(0.164)	(0.164)	(0.31)
Tax Base 1995#	-0.000000198	-0.000000112	-0.000000205
	(0.000000161)	(4.43E-08)	(0.000000147)
Change in Open Space Exp	-0.00000867	-0.0000167	-0.0000103
	(0.0000125)	(0.0000116)	(0.0000112)
Open Space Exp	7.63E-10	-5.06E-09	5.57E-10
	(4.56E-09)	(4.16E-09)	(4.43E-09)
Nyc Dist	-0.0052**	-0.00095	-0.0054**
	(0.0025)	(0.0024)	(-0.0023)
Nyc Dist Squared	0.000034	0.000024	0.000037
	(0.000025)	(0.000022)	(0.000024)
NycPhl	0.0032	0.0046	0.0037
	(0.005)	(0.0043)	(0.0044)
NycPhl Squared	-0.0000264	-0.000041	-0.0000306
	(0.0000305)	(0.000027)	(0.0000265)
Pct Seasonal	0.00204	-0.0027*	0.0018
	(0.0015)	(0.0014)	(0.0018)
Pre-1960	-0.0022**	0.001	-0.00223**
	(0.0008)	(0.0008)	(0.00088)
Undeveloped	-0.0005	-0.00029	-0.00054
	(0.002)	(0.00065)	(0.00197)
Tax Rate Ratio [b]	-0.261***		-0.3335
	(0.056)		(0.2147)
Tax Rate 1995	-0.036**	-0.129***	-0.0456*
	(0.013)	(0.039)	(0.02757)
Residential/Commercial Ratio		-0.0019**	
		(0.00098)	
Population#		0.00000146**	
		(0.000000649)	
CollegePresent	-0.033*	-0.07418**	-0.0335*
	(0.0191)	(0.0309)	(0.0188)
Public_Private	0.096	0.11	0.1009
	(0.081)	(0.069)	(0.0781)

R^2	0.12	0.21	0.11
N	565	564	564

[a] = residual
[b] = fitted value in col. 4
* = significant at 0.1 level, ** = significant at 0.05 level, *** = significant at 0.01 level.