Voting on Stadium and Arena Subsidies

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Abstract

We analyze voting on subsidies for professional sports facilities in Harris County (Houston), Texas and Brown County (Green Bay), Wisconsin to learn more about voter preferences for these subsidies. The results differ somewhat between the two jurisdictions, as do the nature of the supports being proposed and the communities. One consistent result is that voting precincts that have a relatively high degree of poverty tend to oppose subsidies for professional sports. Another consistent result is that voters in close proximity to existing facilities are more likely to favor subsidies than are voters living farther from the facilities. In Harris County, the results consistently indicate that those over 65 years of age, whites, and those with Bachelors degrees statistically significantly oppose subsidies while those with higher incomes and blacks favor the subsidies. Different values of consumption benefits, stemming from differences in preferences, may explain these voting patterns.

JEL Codes: R58, J30, H71
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Introduction and Motivation

What factors induce voters to support or oppose public subsidies for the construction or renovation of professional sports facilities? Referenda on subsidies for sports facilities occur frequently. Fort (1997) identified 29 stadium or arena referendums between 1974 and 1996.[1] Many more stadium subsidy referendums have been on the ballot since then. In the fall of 2000 alone, Green Bay, Wisconsin, Phoenix, Arizona, and Houston, Texas each had referenda on public support of professional sports. Seattle, Cleveland, Pittsburgh, the state of Wisconsin (rejected creation of a lottery to pay for a new stadium for the Brewers in spring 1995, legislature raised taxes to fund it), Houston (in 1999 and 2000), Columbus, Ohio, San Antonio, St. Paul, Minnesota, Greensboro, North Carolina, Scottsdale, Arizona, and Omaha, Nebraska have held referenda on stadium or arena subsidies since 1996. Often times the battles over these referenda have been protracted affairs, sometimes involving whether or not a referendum should be held at all, and, if so, when it should occur.

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[1] Of these 29 referenda, 12 passed and 17 failed to pass, making it seem that stadium proponents are generally unsuccessful at getting voters to support them. This appearance may be misleading.

The issues in these referenda are often complex. The size of the subsidies, and the large revenue streams generated by new or renovated sports facilities, provide teams with strong incentives to sway public opinion toward their side in these votes. Local politicians also stand to benefit, in terms of political capital and visible accomplishments in the community, from the granting of these subsidies. Public campaigning often complicates voters decisions on these matters. Proponents of public subsidies for sports facilities often commission consultants to produce "economic impact studies" that purport to measure the (inevitably large and unambiguously positive) economic benefits generated by new sports facilities. Academic studies of the economic impact of professional sports facilities, on the other hand, have generally found either no evidence of positive economic benefits, or evidence of a negative economic impact. Depending on how informed the voting public is, the cost-benefit calculation on such a proposal may be far from clear.

In this paper we aim to increase our understanding of the factors that affect voting on subsidies for sports facility construction and renovation by empirically analyzing several recent referenda on subsidies for the construction and renovation of professional sports facilities held in Green Bay, Wisconsin and Houston, Texas. The circumstances surrounding the votes in each jurisdiction, the details of the subsidies, the socio-economic and demographic characteristics of the jurisdictions, and the outcomes all differed, providing us with considerable variation in the referenda. In each case we exploit the results from votes on similar questions in these jurisdictions to increase the efficiency of our empirical analysis, an important consideration for the relatively small sample sizes involved.

We selected these two cities because they held multiple referenda on sport-related subsidies in a short period of time, creating a richer and more interesting setting than in other cities that held single, isolated referenda. Additionally, the data on voting in these referenda were available on the web, reducing the time and effort required for data collection. Finally, matching voting data to other data sources containing demographic and economic control variables is difficult and time consuming. This limits the number of referenda that can be analyzed in a reasonable amount of time.

Public subsidies for professional sports must be viewed somewhat differently than a cost-benefit analysis of a public investment project, like funding for education, highway construction, or trash collection, because of the consumption benefits that voters derive from the existence of a local professional sports team. These consumption benefits are likely to be an important component of the total economic benefits of a proposed project. But because they are idiosyncratic to the voters and because they do not pass through the market, placing a simple, convenient summary value on these benefits is extremely difficult.

Given the lack of evidence for any positive economic impact on local economies from professional sports, these consumption benefits are likely to be what motivates people to vote in favor of public subsidies for professional sports. The relatively spare literature on the public support for stadium and arena subsidies includes chapters in Noll and Zimbalist's (1997) volume *Sports, Jobs and Taxes* by Agostini, Quigley, and Smolenskey (1997), Blair and Swindell (1997), Fort (1997), and Baade and Sanderson (1997), a law review article by Fort (1999), and a case study on Cincinnati by Brown and Paul (1999). Only the Agostini, Quigley, and Smolensky (1997) chapter in *Sports, Jobs and Taxes* estimates an empirical model of voting behavior on stadium referendums.

Fort (1997) surveyed referenda on sports subsidies up until about 1996. He argues that one can infer from the outcomes whether median voter or agenda setter models better describe the process. In the median voter model, the voter whose most preferred outcome exactly splits the ranking of most favored alternatives will carry the day. Note however that this preference may bear little or no relation to the Pareto efficient outcome. In agenda setter models, the agenda setter chooses the alternatives to be voted on in such a way as to get an outcome closer to his or her own most

preferred alternative. In the context of referenda on stadium subsidies, the alternatives might be for the community to subsidize the construction of the palace the local team so richly deserves or requires to remain competitive, or to lose the local team to some other city. If the public believes the threat of departure is credible, it is likely to vote for a larger subsidy than it would prefer. Fort argues that close votes are support for the agenda setter model, and he shows that 64% of the referendums carried a favorable vote share between 40% and 60%. He is not, therefore, impressed with the argument that democracy has given the people the right to decide, and they have chosen to support stadiums.

Manipulation of the process of the sort that Fort describes undoubtedly occurs. Stadium subsidy proponents also generally expend vast sums of money campaigning for their proposals. For example, the Milwaukee *Journal Sentinel* reported in its November 1, 2000 edition that the campaign finance arm of the Green Bay Packers spent $858,000 to win voter approval for the redevelopment of Lambeau Field. Added to $568,000 in lobbying expenses at the state level spent to get the sales tax referendum before the Brown County voters, the Packers spent more than $1.42 million on the referendum. Of this amount, $435,000 was spent on advertising on TV and radio, and on market research to help the Packers focus their campaign message. Opponents of the plan spent $34,996.

Agostini, et al. (1997) estimated vote share equations for two referenda on proposals to subsidize a new baseball stadium for the San Francisco Giants in 1989 and 1996. The results from these two vote share equations are similar; the fraction of voters supporting each proposal rose with income, with the share of people in executive and managerial jobs, and with the share of voters with college degrees. Precincts with large Hispanic populations voted against the proposals, while precincts with larger Asian populations voted for the stadium subsidies, at least in some models. Interestingly, precincts with larger male population shares tended to vote against the stadium proposals.

Pooling the data for the two referendums and including a dummy variable for the 1996 vote, which passed, the authors focused on parameter stability and outcome differences in the two votes. They confirmed that the coefficients were stable over the referenda; the effect of income, education, race, etc. on the vote for a stadium subsidy was the same in both 1989 and 1996. They also examined why the outcome of the successful 1996 referendum and the unsuccessful 1989 referendum differed. The difference appears to be that the cost to taxpayers was reduced from 1989 to 1996. In fact, a dummy variable for the 1996 election in a pooled regression indicates that the pro-stadium vote increased by about 15% over what it would have been in 1989. The authors conclude that this additional 15% of the vote came from lowering the taxpayers' cost of the stadium subsidy.

We adopt the basic approach used by Agostini, Quigley, and Smolensky (1997). We match census tract data with voting precinct data for Harris County (Houston), Texas and Brown County (Green Bay), Wisconsin, where referenda related to professional sports subsidies were on the ballot in the Fall of 2000. Because the underlying issues differed in the two jurisdictions, the voting results cannot be pooled. Harris County had a single vote that occurred simultaneously with presidential balloting. However, Harris County voted on a similar measure in 1999 and also cast ballots on a non-binding measure to gauge interest in using local tax revenues to support a bid for the 2012 Summer Olympics. Brown County held three votes, two on the same day in September 2000 and a third simultaneously with the presidential election in November 2000.

Our empirical analysis differs from Agostini, Quigley, and Smolensky (1997) in two ways. Because of differences in the circumstances surrounding these two referenda, we estimate a SUR logit model of voting on sports referenda. We describe the circumstances in detail below. Also, the Green Bay proposal included renovation of an existing stadium and the Houston proposal identified the specific site of the proposed new stadium had. This allows us to construct measures of the

distance from the facility to each precinct for use as explanatory variables in our analysis.[2] Second, we have data from several different sports related votes that occurred in a short period of time in each jurisdiction. Data from these referenda enable us to estimate a system of vote equations that improves the efficiency of our estimates.

Two Sports Subsidy Referenda

Brown County (Green Bay), Wisconsin and Harris County (Houston), Texas each held referenda relating to public financing of stadium or arena projects in November 2000. How they arrived at these referenda, and the issues that were placed on the ballots, differ substantially. These differences play an important role in shaping our empirical analysis, so a thorough understanding of the details of the referenda in each jurisdiction is important. In this section we describe the circumstances leading up to the votes in each jurisdiction.

Brown County

Brown County, Wisconsin contains Green Bay, home of the National Football League (NFL) Packers, a storied franchise rooted in the earliest days of the NFL. The team was organized in 1919 and J. E. Clair of the Acme Packing Company was granted an NFL franchise in 1921.[3] E. L. "Curly" Lambeau purchased the franchise in 1922 for $250 of which $50 was his own. In 1934, after losing a lawsuit concerning a fall by a spectator inside the stadium, the local business community raised $15,000 to rescue the club from bankruptcy. Despite winning numerous championships, the club needed $50,000 in loans in 1949 to stave off bankruptcy. In 1950 the club raised $118,000 through a stock offering, putting them in sound financial footing.

In 1957, City Stadium, opened as the Packers home; the stadium was renamed Lambeau Field in 1965. Seventy-two private boxes were added in 1985, and in 1986 the Packers reported an annual profit of over $2 million for the first time. Profit passed $3 million in 1987 and in 1989 the Packers announced plans to add more private boxes and to construct 1,920 club seats at a cost of over $8 million. Profits approached $5 million in 1993, and in 1994 plans were announced for construction of additional private boxes. These boxes were completed in 1995 and profits edged over the $5 million mark in 1996 and 1997. Improvements to Lambeau Field continued with new scoreboards added in 1996 and a new playing surface installed in 1997. The Packers also issued 400,000 shares of stock, at a price of $200 per share, in 1997, the first public offering of stock since 1950. In 1998 the Packers' profits exceed $6 million and they announced that the stock sale increased shareholders by 106,000, raising $24 million.

In 2000, the Packers reported an operating loss of $419,000 but also announced plans for a $295 million redevelopment project for Lambeau Field. Financing for the project was to come from a 0.5% add-on to the state sales tax to apply only in Brown County. The tax was passed by referendum in September by a vote of 48,788 in favor to 42,580 opposed. Also on the ballot at the same time was a proposal that any excess revenues raised by the sales tax would be used to lower local property taxes. This proposal failed with the opposition taking 56% of the vote. After the community agreed to tax itself to pay for renovations to Lambeau Field, a third proposal came up which would use funds generated by sale of the naming rights to the field to reduce the burden on the local tax payers of paying for the stadium renovation. This proposal passed on general election day in November after debate that was described by the Milwaukee *Journal* as subdued.

[2] Fort (1997) suggests that these factors might be important.

[3] Information in this section is taken http://www.packers.com/history/chronology/index.html, the Packers' official web site.

Harris County

Harris County, Texas includes the city of Houston, which is the home to the Houston Astros of Major League Baseball, the Houston Rockets of the National Basketball Association, and, through 1996 the Houston Oilers of the NFL. The Oilers left Houston after the 1996 season for Nashville, Tennessee to become the Tennessee Titans, leaving Houston without a professional football team.[4] Typically, one point of contention between the Oilers and Houston was dissatisfaction with their home, the Astrodome. The Oilers were not alone in feeling dissatisfied with the Astrodome which also was home to the Astros.

The Oilers move to Tennessee prompted local politicians to push for construction of a new stadium to attract a new football franchise to Houston and, at the same time, to avert the loss of the Astros. In June of 1996, city officials made plans to hold a referendum on spending more than $625 million on new facilities for the baseball and football franchises. The possibility of a referendum on building a new arena for the Rockets in Houston was also raised at this time. On November 5, 1996 voters passed a referendum to support facilities for baseball and football. Houston Mayor Bob Lanier proclaimed the deal inherent in the referendum "a good play" as it would not raise either property or general sales taxes and would require both teams to sign a thirty year lease. The final outcome of voting was a victory for stadium proponents; 51% of the vote supported stadium construction.

A key for this research was the omission of funding for an arena for the Houston Rockets in 1996. The Texas state legislature debated and passed a bill in 1997 that would allow local jurisdictions to impose taxes to construct or repair sports facilities. However, the bill required a local referendum before new taxes could be imposed on car rentals, parking, and tickets to sports events. Because Houston and Harris County had held a referendum on the baseball and football stadium issue, but had not done so for construction of a new basketball facility, the legislation required Houston to hold one.

In April of 1998, the Houston Chronicle reported that, based on a poll of Harris County residents, 73% supported building a new facility for the Houston Rockets so long as no new taxes were required. Armed with this information, the Rockets pushed for an August referendum. Also, 87% of those polled believed it was important or very important that the Rockets remain in Houston, and 85% believed it was important or very important that the Rockets remain competitive and make the playoffs every year.

A deal to include a ticket tax in the financing mix, along with increases in hotel and rental car taxes, resulted in an agreement between Houston Mayor Lee Brown and Rockets owner Les Alexander to place a referendum for a new arena before the voters. The ticket tax was a sticking point because football and rodeo interests were afraid that, without revenues from the ticket tax, the city would be unable to afford both a new arena and a new football stadium. The Mayor expressed confidence that the referendum would pass.

Under the proposed arena deal, the Rockets received a $160 million facility for which they would bear half the cost. The facility was to be ready for the 2003 seasons of the Houston Comets of the WNBA and the Houston Rockets of the NBA. In addition, the team would control the revenues from all arena events. This meant that all ticket revenues, merchandising and naming rights would belong to the team. Additionally, the team would have exclusive control over advertising rights during both Rockets games and all other events.

The referendum was defeated on November 2, 1999 by a vote of 55% to 45%. Team owner Les Alexander told the Houston *Chronicle* (November 4, 1999), "We never thought we would lose." Interestingly, across the state in San Antonio at the same time, voters in Bexar County passed a

[4]Houston was awarded an expansion NFL franchise, the Texans, who began play in 2002 in a new stadium.

referendum 60% to 40% in favor of raising hotel and rental car taxes to help fund a $175 million arena for the San Antonio Spurs who were then playing in the 6-year old AlamoDome.

One year later, voters in Houston and Harris County faced another referendum on using hotel and rental car taxes to fund construction of an arena for the Houston Rockets. This proposal did not include provision for a tax on ticket sales. In addition, the opposition in 2000 sought to block the arena entirely, whereas in 1999, according to the Houston *Chronicle* (October 4, 2000, section A, page 19), opponents of the plan simply wanted a better funding deal for the taxpayers. The absence of the ticket tax meant that many opponents from 1999, including some of the most prominent, had become supporters in 2000. Moreover, the Houston *Chronicle* also reported that the opponents in 1999 spent nearly $700,000 on their campaign, but the 2000 opponents had far less resources to devote to the fight. Proponents reportedly spent over $2.5 million, much of it coming from Rockets owner Les Alexander. The referendum passed with over 60% of the vote.

At the same time that Houston voters were considering the arena issue in 2000, they also voted on a referendum designed to measure interest in a bid to host the 2012 Olympics. The referendum, if passed, would allow hotel taxes to be diverted into a trust fund which would, if Houston landed the 2012 Olympics, provide up to $100 million to cover losses if the event lost money. If hosting the Olympics turned a profit, then the trust funds would be released to the city and state which would normally have received them. Little opposition to the measure arose, and both major political parties endorsed it. Still, the measure received only about 60% of the vote.

Empirical Model

We focus on identifying the factors that induce voters to support or oppose plans for public funding of the construction or renovation of sports facilities. Ideally, information on individual voters, including income, tax price, and socio-demographic characteristics, would be matched with that person's vote allowing estimation of a logit or probit model using maximum likelihood methods. The estimated parameters would, in this case, be interpretable as coming from the indirect utility function of the voter.

Unfortunately, the data available to us come in the form of precinct or census tract level aggregates. We cannot match individual voters with their votes nor with their personal characteristics. We can match voting outcomes in precincts with descriptive characteristics of the residents of the precincts. This allows us to make inferences about, for example, how college graduates vote, by noting that as the proportion of the precinct's population that has a college degree rises, the precinct's share of the vote in favor of the stadium referendum rises (or falls).

We estimate a logit model because the available data describe the socio-demographic characteristics of the voting precinct and the vote totals for and against the referendum. The dependent variable, lor_i, is the log of the ratio of the share of yes votes to the share of no votes in precinct i. The determinants of this variable are the economic and demographic characteristics of the voters in precinct i at the time of the ballot and measures of the proximity of precinct i to the existing or proposed facility (X_i).

$$lor_i = \beta X_i + \mu_i \tag{1}$$

where β is a vector of parameters to be estimated and μ_i is a mean 0 random shock which is uncorrelated across precincts. μ_i is heteroscedastic as a consequence of the logit specification. We address this problem by using weighted least squares because the nature of the heteroscedasticity is precisely known for logit models.

We also exploit the multiple votes regarding the stadium financing in Brown County, along with the two arena votes in consecutive years and the Olympic vote in Harris County, to further improve

the efficiency of our estimates. In particular, because of the three votes in each location, we can estimate a system of logit models using seemingly unrelated regression techniques for each vote

$$lor_{i1} = \beta_1 X_{i1} + \mu_{i1} \tag{2}$$
$$lor_{i2} = \beta_2 X_{i2} + \mu_{i2} \tag{3}$$
$$lor_{i3} = \beta_3 X_{i3} + \mu_{i3}. \tag{4}$$

The equation errors, μ_{ij} j=1, 2, 3, have mean zero and constant, but possibly unequal, variance and are correlated. Formally, we assume that $E[\mu_{ij}\mu_{ik}] \neq 0, j \neq k$.

The correlation in the error terms arises because there are unobserved influences on the voting behavior of residents in precinct i that affect the votes on each of the separate ballot items. Using the correlation among the error terms enables us to get finer estimates of their variance, improving the efficiency of the coefficient estimates.

Data

The data for this analysis comes from two sources. Voting results from all precincts were gathered from county government web sites for both Harris County and Brown County. The addresses of voting stations were used to determine the census tract containing each station. Once matched, data from the 1990 Decennial Census, the most recent census available at the time of the data collection, were merged with the precinct-level voting results.

Voting precincts tend to be smaller than census tracts, so in some cases two or more precincts were mapped into the same census tract. In these cases, the explanatory variables from the census data are identical for each voting precinct, but the vote share on each referendum differs. For example, in those tracts containing multiple precincts, the spread in the share of the vote for the sales tax increase for Brown County ranges from only a few tenths of a percentage point to tens of percentage points, but the explanatory variables for these precincts are the same.

Note also that the percent voting in favor of the tax increase or stadium construction ranges from 47.5% in the 1999 vote in Harris County to 66.8%, also in Harris County. The vote share in Brown County was 50.9% in favor of the sales tax increase. The Brown County vote and the 1999 vote in Harris County both are in the range that Fort (1997) argues provides evidence in favor of an agenda setter model. The 66.8% vote in the 2000 referendum in Harris County is not consistent with the Fort's setter model.[5]

The explanatory variables include socio-demographic and economic characteristics of each census tract. Table 1 contains variable definitions and descriptive statistics for all the variables in the analysis of Brown County-Green Bay and Harris County-Houston.[6] We also include variables that reflect the distance from the existing or proposed facility to the geographic center of each census tract as regressors. These variables capture the idea that people living close to an existing sports facility, or in the area where the new facility will be constructed, may have stronger preferences or more information about the costs and benefits associated with living near a stadium or arena.

Census tracts were separated into four categories in terms of distance from an existing or proposed facility:

[5]The wide disparity in spending on advertising and promotions in favor of the pro-stadium or arena groups is also consistent with the agenda setter model.

[6]The Census data were taken from the CensusCD, version 4, produced by GeoLytics, Incorporated using the 1990 United States Census.

Table 1: Variable Definitions and Descriptive Statistics

Variable	Definition	Precincts	Mean	Std. Dev.	Minimum	Maximum
	Brown County-Green Bay, Wisconsin					
YTAX	% voting yes on sales tax	91	50.9	9.4	16.6	68.5
YSELL	% voting yes on naming rights	98	52.9	3.9	44.9	66.5
YCUT	% voting yes on tax cut	91	44.4	5.3	26.2	55.9
Gore	% voting for Gore	98	47.0	7.5	29.6	65.0
Rent	% renters in tract	98	32.5	17.7	6.9	96.5
Urban	% urban	98	81.332	38.146	0.000	100.00
College	% With bachelor's degree	98	16.377	8.495	1.700	38.400
Poverty	% Living in poverty in tract	98	9.602	8.368	1.600	39.600
Exec	% Executive jobs in tract	98	10.4	3.9	3.8	21.7
White	% White	98	96.3	4.5	80.2	100.0
N1	Closest tracts to facility	98	0.143	0.352	0.000	1.000
N2	Second closest tracts to facility	98	0.184	0.389	0.000	1.000
N3	Third closest tracts to facility	98	0.031	0.173	0.000	1.000
River	Across river from facility	98	0.071	0.259	0.000	1.000
P65	% 65 years old or more in tract	98	10.5	5.3	2.2	41.6
Inc	Median Family Income	98	36288	8109	13182	52118
	Harris County-Houston, Texas					
Y99	% in favor of subsidy in 1999 vote	1790	47.5	17.6	0.000	100.0
Y00	% in favor of subsidy in 2000 vote	1830	66.8	12.5	0.000	100.0
YOLY	% in favor of subsidy to Olympics	1572	75.7	8.4	25.0	97.2
Gore	% voting for Gore	1834	50.2	25.8	0.000	1.000
Rent	% renters in tract	2108	37.1	17.5	0.000	92.9
Urban	% urban	2134	94.86	19.804	0.000	100.0
College	% with bachelor's degree in tract	2134	22.39	19.222	0.000	78.3
Poverty	% living in poverty	2134	17.29	13.943	0.000	100.0
Exec	% executive jobs	2108	12.4	7.6	0.000	37.2
White	% white	2112	62.8	29.2	0.000	100.0
Black	% black	2112	21.5	29.1	0.000	99.6
Spanish	% speak Spanish	2112	18.5	16.9	0.000	100.0
Near1	Closest tracts to facility	2136	0.018	0.132	0.000	1.000
Near2	Second closest tracts to facility	2136	0.018	0.132	0.000	1.000
Near3	Third closest tracts to facility	2136	0.027	0.163	0.000	1.000
P65	% 65 years old or more in tract	2112	7.9	4.9	0.000	29.6
Inc	Median Family Income	2134	36977	21083	0	150001
New1	Closest tracts to proposed facility	2136	0.036	0.185	0.000	1.000
New2	Second closest tracts to proposed facility	2136	0.031	0.173	0.000	1.000
New3	Third closest to tracts proposed facility	2136	0.036	0.185	0.000	1.000

1. "Very Close" Tracts: contain Lambeau Field or the Compaq Center or are contiguous to the tract containing the existing facilities (Near1) or contain or are contiguous to the proposed new arena in Houston (New1)

2. "Close" Tracts: Contiguous to "Very Close" tracts (Near2, New2)

3. "Somewhat Close" Tracts: Contiguous to "Close" tracts (Near3, New3)

4. All Other Tracts

We constructed dummy variables, shown in parentheses, to identify these voting precincts and tracts. This taxonomy makes the classification of distance from a facility sound far more definite and straightforward than it really was. Because tracts vary in size and shape, some tracts that would be in the "somewhat close" category under strict adherence to the rules described above were, nonetheless, placed in the close or even the very close groups. Consequently, placement of many tracts was subject to rough judgements of distances.

Harris County differs from Brown County in one important respect regarding the distance variables. Harris County has an existing facility and the proposals refer to construction of a new facility in a different location, while in Brown County the proposal is about refurbishment or renovation of the existing facility. Consequently, in the Harris County analysis are two sets of variables, one indicating distance from the Compaq Center (Near1, Near2, Near3) and another indicating distance from the proposed new facility (New1, New2, New3).

These two locations are near enough to each other that some census tracts are "Somewhat close" to the proposed location and "Somewhat close," "Close," and even "Very Close" to the existing facility. To identify these tracts, we created a third set of proximity dummy variables (Over13, Over23, Over33) that identify tracts "Very Close" to one facility and "Somewhat close to the other (Over13), tracts "Close" to one facility and "Somewhat Close" to the other facility (Over23), and tracts "Somewhat Close" to both facilities (Over33).

Brown County also has a unique feature that we include in our empirical analysis. Some voting precincts are fairly close to Lambeau Field but on the opposite side of the Fox River. These tracts are spatially close to the stadium but the driving distance from these tracts to the stadium is relatively long due to the absence of bridges over the river near the stadium. We indicate these areas with a variable that takes on the value 1 for those districts across the river from Lambeau field, and takes on the value 0 for all other precincts.

Figure 1 shows the census tracts that fall into each category for the existing facility in Harris County, the Compaq Center. On this figure, the lines show the census tract boarders. The darkest shaded tracts are those identified by the variable Near1, the lightest shaded tracts are those identified by variable Near2, and the middle shade are tracts identified by variable Near3.

Figure 2 shows the census tracts that fall into each category for the proposed facility in Harris County, the the Houston Arena. Again, the lines show the census tract boarders in Harris County. The darkest shaded tracts are those identified by the variable New1, the lightest shaded tracts are those identified by variable New2, and the middle shade are tracts identified by variable New3.

Figure 3 shows the census tracts near Lambeau Field in Brown County. On this figure, the lightest shaded tracts are those identified by the variable Near1, the next lightest shaded tracts are those identified by variable Near2, and the darkest shaded tracts are tracts identified by variable Near3 and tracts across the river from the stadium.

Empirical Results

Separate SUR logit models were estimated for each county. Table 2 contains the results from estimating a seemingly unrelated logit regression voting model for the three votes held in Brown County (Green Bay). The three voting equations explain a large fraction of the observed variation in vote shares, indicated by the relatively large values of R^2 for each equation. On the question of whether or not the sales tax should be raised to finance renovation of Lambeau Field, the evidence suggests that three characteristics of the population are statistically significant determinants of voting behavior: the percent of the population in a voting precinct living in poverty, the voting precincts located in urban areas of Brown County, and the percent of the population in a voting precinct employed as executives, here interpreted as "white collar" occupations. Additionally, the percent of the population in a voting precinct holding a college degree was nearly significant, with a p-value of 0.104.

Poor precincts voted against the sales tax increase, a regressive tax in most instances, to finance the renovation of Lambeau Field. Urban and white collar precincts voted for the sales tax increase.

The equation explaining voting on use of any surplus funds generated by the sales tax increase to reduce local property taxes has only one statistically significant variable. Voters in relatively

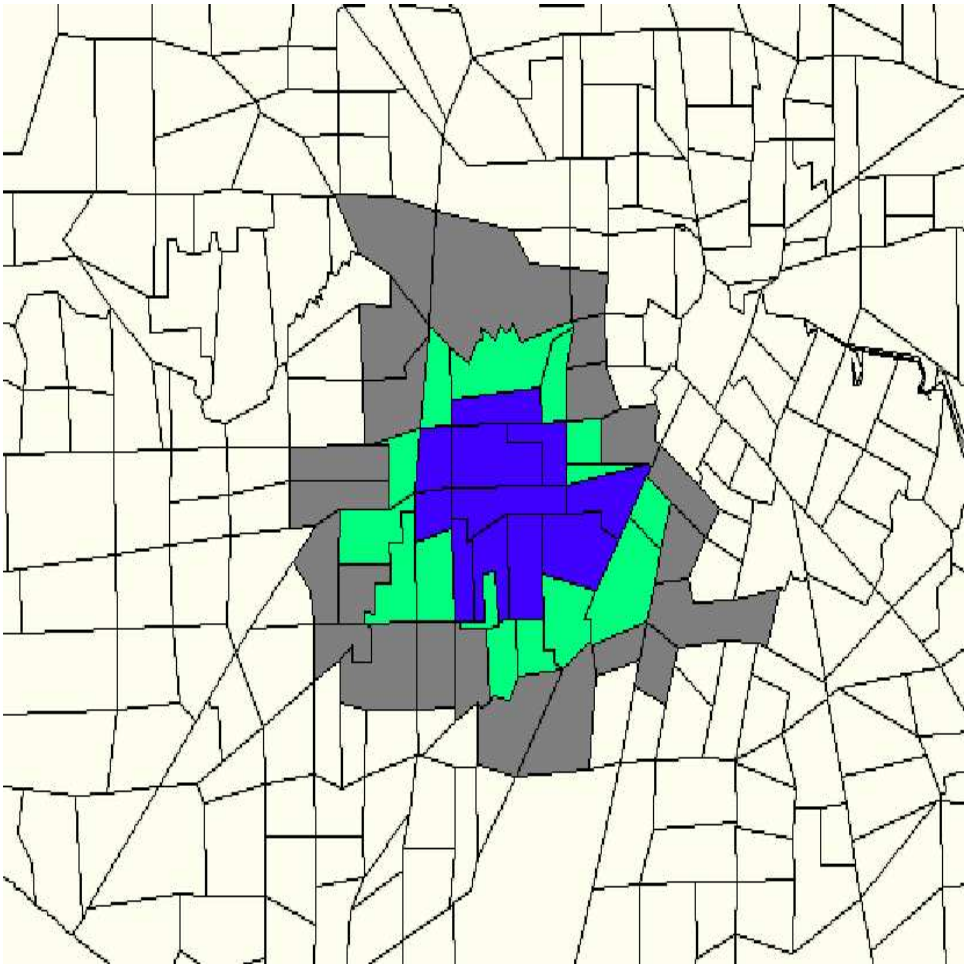

Figure 1: Compaq Center Proximity

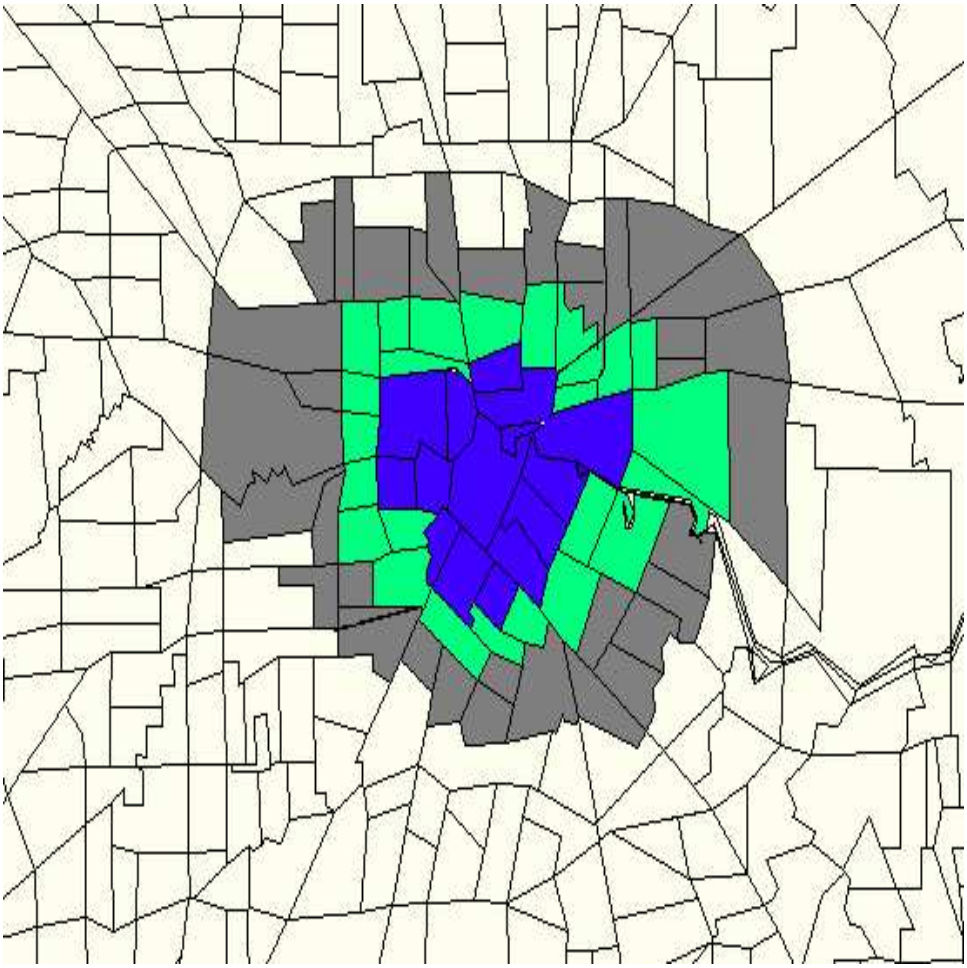

Figure 2: Houston Arena Proximity

Figure 3: Lambeau Field Proximity

Table 2: Regression Results: Brown County

Variable	Sales Tax Vote		Property Tax Cut Vote		Naming Rights Vote	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Constant	0.363	0.636	-0.783	0.230	0.799	0.095
P65	-0.567	0.285	0.350	0.433	-0.512	-0.122
Male	0.000	0.699	0.000	0.446	0.000	0.164
White	-0.917	0.174	0.167	0.771	-0.457	0.277
Poverty	-0.011	0.035	0.002	0.620	-0.002	0.522
Urban	0.004	0.000	0.002	0.002	0.000	0.465
College	0.007	0.104	0.001	0.829	0.003	0.288
Inc	0.000	0.794	0.000	0.914	0.000	0.453
Rent	0.221	0.221	0.120	0.430	-0.154	0.189
Exec	1.875	0.029	1.295	0.073	-0.158	0.781
Near1	0.198	0.001	0.073	0.141	-0.192	0.000
Near2	0.103	0.048	0.023	0.594	-0.113	0.001
Near3	0.004	0.978	-0.011	0.925	-0.125	0.133
River	0.102	0.189	0.098	0.130	-0.053	0.278
R^2/N	0.76	91	0.76	91	0.70	91

more urban precincts were more likely to vote favorably on the property tax relief. The percent of the population in the district that is employed as an executive is also significant at the 10% level in this equation. In the third referendum, voters were asked to consider the sale of the naming rights to the renovated field. No socio-demographic variables were statistically significant in this equation.

The estimated parameters on the proximity variables in the system of voting equations for Brown County contain several interesting patterns. In both the sales tax and naming rights equations, precincts identified by Near1 and Near2 voted differently than other precincts. Proximity to the facility influenced voters casting ballots on stadium or arena subsidies as Fort (1997) suggested. Those closest to Lambeau Field voted strongly in favor of raising the sales tax rate to subsidize renovation of the stadium and about equally strongly in opposition to selling the naming rights to the stadium. This result suggests that voters living near the facility valued Lambeau Field more than voters living farther from the facility. The result also suggests that the non-pecuniary benefits generated by Lambeau Field may be distributed unequally across the Green Bay metropolitan area. The result for the naming rights issue suggests that voters living near the facility valued the current name of the facility, relative to a name reflecting corporate sponsorship of the team. This results hints at another important non-pecuniary benefit from a professional sports team - residents of cities appear to value the name of the facility where the local team plays.

Table 3 shows the results of tests of the appropriateness of the SUR framework. The results of these tests show that the errors from the three equations are not independent. Recall that the SUR estimation approach assumes that the equation errors from the system of three voting equations estimated are correlated, and exploits this correlation to improve the efficiency of the point estimates. The evidence on Table 3 suggests that the equation terms for these three equations are correlated. The unobservable factors that affect the outcomes of each of the three votes are statistically related.

Table 4 reports the estimates of a SUR logit voting model for the 1999 and 2000 votes on funding a new basketball facility. In general, the parameters on the demographic and economic control variables in the system of Harris County voting equations are significant, perhaps because of the larger number of voting precincts, and correspondingly larger sample size, in this jurisdiction. Note that because of the relatively large latino population in Houston, we use variables indicating

Table 3: Correlation matrix of residuals: Brown County

Equation	Sales Tax	Property Tax Cut	Naming Rights
Sales Tax	1.0000		
Property Tax Cut	0.5317	1.0000	
Sell naming rights	-0.0917	-0.1305	1.0000

Breusch-Pagan test of independence: chi2(3) = 28.037, Pr = 0.0000

both the number of blacks and whites living in each precinct in these regressions. We also include a variable for the number of Spanish speaking residents in each precinct in the Houston voting model.

The first referendum analyzed, the 1999 vote on raising taxes on hotel rooms, rental cars, and sports event tickets to fund the construction of a new basketball arena, was unsuccessful. The results for this referendum, shown in columns two and three, show that precincts with large populations of the elderly, whites, persons living in poverty, and persons with college degrees, were more likely to oppose the subsidy, while voting precincts with higher family incomes and containing more black voters were more likely to favor the subsidy than are other voters. These results differ from the voting results from Brown County, where few demographic and economic variables were statistically significant.

The second referendum analyzed, the 2000 vote on raising taxes on hotel rooms and rental cars, was successful. The results for the second referendum, shown in columns three and four, are very similar to those from the earlier vote. Again, precincts with large populations of the elderly, whites, persons living in poverty, and persons with college degrees, were more likely to oppose the subsidy, while voting precincts with higher family incomes and containing more black voters were more likely to favor the subsidy than are other voters. In the second referendum, precincts with a larger proportion of white collar employees and precincts with large proportions of the population speaking Spanish were also more likely to vote for the tax financed sports subsidy.

Like Green Bay, the proximity variables are strongly significant in Houston. Interestingly, both close proximity to the existing facility and close proximity to the proposed new facility significantly increase the likelihood of a vote in favor of the subsidy for the new arena. Also, the coefficient on Near1 is twice that on Near3, suggesting that those most closely located around the existing facility vote most heavily in favor of subsidizing construction of a new facility. At the same time, those closest to the site of the proposed new facility are less favorably inclined than those that are "close" but not too close to the proposed site. In other words, experience with nearness convinces one that proximity is a net cost, while promises of net benefits may entice locals to support construction of a new arena in their neighborhood.

Finally, those precincts identified by the proximity interaction variables - that is, that are in a ring for both the existing and the proposed sites - are less likely to support the subsidy for the new facility than are either precincts not near the facilities under any of the three classifications or those precincts in proximity to only one of the sites. In other words, those precincts close to the existing facility prefer to have the new facility constructed unless they are close enough to the new site, in which case they prefer no new facility be subsidized. The extent of this preference grows dramatically as precincts get farther from the existing facility without growing closer to the proposed new one. The implication is that people who have experienced proximity to the arena are willing to give up that nearness for greater distance from the facility, but they appear unwilling to subsidize a new facility without it being constructed farther from them than the existing arena.

Table 4: Regression Results: Harris County

Variable	1999 Vote		2000 Vote	
	Coefficient	p-value	Coefficient	p-value
Constant	0.027	0.871	0.846	0.000
P65	-0.391	0.045	-0.515	0.001
Male (a)	0.005	0.194	0.003	0.302
White	-.903	0.000	-0.594	0.000
Poverty	-0.004	0.006	-0.003	0.020
Urban (b)	-0.146	0.780	-0.427	0.181
College	-0.003	0.005	-0.005	0.000
Inc (a)	0.041	0.000	0.037	0.000
Rent	0.063	0.242	0.053	0.192
Exec	0.249	0.322	0.587	0.002
Spanish (a)	0.436	0.002	0.224	0.047
Black	0.012	0.000	0.009	0.000
Near1	0.212	0.000	0.157	0.000
Near2	0.139	0.031	0.114	0.019
Near3	0.097	0.009	0.072	0.017
New1	0.133	0.063	0.087	0.131
New2	0.235	0.000	0.043	0.263
New3	0.250	0.000	0.152	0.000
Over13	-0.258	0.008	-0.207	0.011
Over23	-0.295	0.010	-0.227	0.015
Over33	-0.307	0.004	-0.175	0.063
R^2/N	0.78	1736	0.90	1736

(a): Coefficients and standard errors multiplied by 10000.
(b): Coefficients and standard errors multiplied by 1000.

Table 5 shows the correlation between the residuals from the two voting equations estimated using data from Houston. Again, the residuals from these two equations are correlated and the null hypothesis of statistical independence is strongly rejected. These results support the use of a SUR logit model to simultaneously estimate both voting equations.

Table 5: Correlation matrix of residuals: Harris County

Equation	1999 Vote	2000 Vote
1999 Vote	1.0000	
2000 Vote	0.8611	1.0000

Breusch-Pagan test of independence:
chi2(1) = 1287.4, Pr = 0.0000

Table 6 contains the results of simultaneously estimating the voting equations for the 1999 and 2000 referenda on tax financed sports subsidies along with an equation for the referendum to support the bid for the 2012 Summer Olympics. As this last vote was only held in the city of Houston, as opposed to the entirety of Harris County, these results are based only on data from voting precincts in the city. The Olympic vote model contains no proximity variables because no specific Olympic venues were identified in that vote.

The results from this three equation system are virtually identical to those for the 1999 and 2000 referenda reported above. As before, support for the arena plans comes from precincts with higher median income and greater proportions of black voters and is greater among those living near to either the existing facility or the site of the proposed new arena. Opposition comes from

the precincts with higher proportions of whites, the relatively more educated, more urbanized and poorer populations. Renters were more likely to vote in favor of the subsidy in 2000, though not in 1999. Support for the Olympic bid follows these same patterns.

Table 6: Regression Results: Houston - Olympics

Variable	1999 Vote		2000 Vote		Olympic Bid	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Constant	0.199	0.261	0.969	0.000	1.440	0.000
P65	-0.312	0.154	-0.285	0.091	-0.325	0.037
Male (a)	-1.220	0.001	-0.009	0.015	-0.004	0.913
White	-0.902	0.016	-0.664	0.000	-0.566	0.000
Poverty	-0.005	0.001	-0.004	0.003	-0.004	0.002
Urban	-0.001	0.041	-0.001	0.000	-0.002	0.075
College	-0.003	0.003	-0.005	0.000	-0.002	0.001
Inc (a)	0.035	0.000	0.032	0.000	0.017	0.009
Renters	0.090	0.131	0.107	0.016	0.127	0.001
Exec	0.238	0.408	0.791	0.000	0.276	0.152
Speak Spanish (a)	0.498	0.001	0.285	0.017	0.214	0.048
Black	0.011	0.000	0.008	0.000	0.007	0.000
Near1	0.084	0.102	0.096	0.005		
Near2	0.093	0.111	0.050	0.168		
Near3	0.098	0.001	0.058	0.005		
New 1	0.089	0.101	0.039	0.305		
New 2	0.239	0.000	0.056	0.020		
New 3	0.164	0.000	0.071	0.004		
Over 1 3	0.048	0.541	-0.002	0.972		
Over 2 3	-0.113	0.202	-0.042	0.482		
Over 3 3	-0.079	0.349	0.021	0.727		
R^2/N	0.78	1280	0.90	1280	0.96	1280

(a): Coefficients and standard errors have been multiplied by 10000.

Interestingly, when only the Houston precincts are analyzed the precincts that fall near to both the existing and the proposed facility - the proximity interaction variables - are not statistically significant and the coefficients on the variables indicating proximity to the existing and proposed new arenas also much smaller in size and less precisely estimated.

Table 7 shows the correlation between the residuals from the three equation SUR system and a test of statistical independence for these residuals. Once again, the residuals are correlated and the null hypothesis of statistical independence is rejected, supporting the SUR logit approach for analyzing the vosting on these three referenda.

Table 7: Correlation matrix of residuals: Houston

Equation	1999 Vote	2000 Vote	Olympic Vote
1999 Vote	1.0000		
2000 Vote	0.8734	1.0000	
Olympic Vote	0.7377	0.8119	1.0000

Breusch-Pagan test of independence:
chi2(3) = 2516.7, Pr =0.0000

A Closer Look at Proximity

Because proximity to the sports facilities plays an important role in the empirical results presented above, we further analyze the effects of proximity on voting in favor of a subsidy by calculating the effects of proximity on the odds ratio from the empirical models. Table 8 reports the change in the odds of a vote in favor of a stadium subsidy, based on proximity to either the existing facility or the site of the proposed facility, for the statistically significant parameters on the location variables in the three SUR logit systems estimated above. On this table, changes in odds ratios greater than one can be interpreted as increasing the likelihood of voting yes in the referendum and changes in odds ratios less than one can be interpreted as decreasing the likelihood of voting yes in the referendum. The first row of the table shows that voters the the precinct containing Lambeau Field, and the precincts contiguous to this precinct were 21.9% more likely to vote for the sales tax increase than voters in other precincts and that voters in these precincts were 17.5% less likely to vote for selling the naming rights to Lambeau Field. The voters in the next tier of voting precincts were 10.8% morelikely to vote for the sales tax and 10.7% less likely to vote for selling the naming rights.

For the Harris County votes, the numbers in parentheses are the changes in the odds ratios for the three equation SUR logit system that included the vote on the 2012 Olympic bid; the other numbers are for the two equation SUR logit system. Proximity to the Compaq Center in Houston raised the odds of a favorable vote on the arena referendums by between 7% and 24%. The range falls to 6% to 10% when only the Houston precincts are analyzed. Being very near to the site for the new arena results in an increase in the odds of a favorable vote of between 14% and 28%, when all of Harris County is included in the analysis, and by from 5% to 27% when only the Houston precincts are examined. Precincts that fall within close proximity to both venues show reductions in the odds ratio of as little as 19% and as much as 27%.

Table 8: Changes in Odds Ratios and Proximity

Brown County (Green Bay)		
Variable	Sales Tax	Naming rights
Near1	1.219	0.825
Near2	1.108	0.893
Harris County (Houston)		
Variable	1999 Vote	2000 Vote
Near1	1.236	1.170 (1.101)
Near2	1.149	1.121
Near3	1.102 (1.103)	1.075 (1.060)
New1	1.142	
New2	1.265 (1.270)	(1.058)
New3	1.284 (1.103)	1.164 (1.074)
Over13	0.773	0.813
Over23	0.745	0.797
Over33	0.736	0.839

Again, we interpret these strong proximity effects on voting as evidence that the non-pecuniary benefits associated with sports facilities are not equally distributed across all areas of cities. Either those voters who live close to sports facilities voted for these referenda because they derive greater non-pecuniary benefits from these facilities, or they have more information about the nature and size of the relative benefits and costs. Previous research on the economic impact of sports facilities have not contained evidence of an unequal spatial distribution of these benefits.

Note that the sample sizes differ significantly for the two jurisdictions. Houston contains roughly

an order of magnitude more precincts than Green Bay. This has a clear effect on the efficiency of the parameter estimates; the standard errors are much smaller for Houston. Sample size differences make comparing the results across the two jurisdictions somewhat difficult. In the discussion below, we apply a less stringent significance level to the results from Green Bay, due to the effect of the smaller sample size on the efficiency of the parameter estimates for those votes.

Discussion

What do these results tell us about the determinants of votes for or against referenda on sports subsidies? Unlike votes on subsidies for trash collection, highways, or education, the consumption value of sports may be an important factor in referenda on sports subsidies and these consumption benefits may vary significantly across different groups of voters. For example, voters would not take into account consumption benefits associated with attending primary or secondary school when deciding on how to vote on a local school funding referendum. If the expected economic costs of a project are perceived as similar by most voters in a jurisdiction, then consumption benefits may be an important determinant of voting. It may be possible that consumption benefits are large enough to induce some voters to support a proposed sports subsidy that makes no economic sense solely as a local investment decision.

Do our results contain evidence that voters who derive greater consumption benefits were more likely to vote for these sports subsidies? This requires identification of groups that might derive different consumption benefits from professional sports. Unfortunately, economic theory provides no guidance on this point, as these differences stem from differing preferences.

Males are one identifiable group who might derive significant consumption benefits from professional sports, and would thus be more likely to support subsidies for professional sports. The empirical results do not, however, bear this out. The fraction of males in a precinct is not positive and statistically significant in any of the referenda studied. Black voters, on the other hand, tend to support the referenda while white voters do not. This could reflect that whites derive lower consumption benefits, and blacks higher consumption benefits, from professional sports. But these race variables could capture more than just preferences for professional sports.

Median family income was a significant and positive determinant of voting for sports subsidies in Harris County but insignificant in Brown County. Affluent districts were more likely than other districts to vote for sports subsidies in Houston, but not more likely to vote for the sports subsidies in Green Bay. One reason for this difference in voting patterns could be the sport being subsidized. In Houston, the proposed subsidy was for professional basketball while in Green Bay the proposed subsidy was for professional football. Clearly, fans of a particular sport are one group who would derive large consumption benefits from the sport in question. If professional basketball fans tend to be more affluent and professional football fans tend to be less affluent, then differences in consumption benefits could explain this difference in voting. This difference does not appear to extend throughout the income distribution, because the percent of a precinct's population living in poverty is a negative and statistically significant determinant of voting in favor of sports facility subsidies in both Brown and Harris Counties, suggesting that the poorest citizens oppose subsidies for professional sports in general.

A similar pattern emerges in the patterns of voting in urban precincts in Houston and Green Bay. Urban voters in Green Bay tended to vote for the proposed sports subsidies while those in Houston tended to vote against the proposed sports subsidies.[7] This difference could reflect the two different

[7]When all of Harris County is analyzed the percent urban is not statistically significant at any reasonable probability level.

sports being subsidized, and thus also reflect differences in consumption values. Alternatively, the demographic composition of the city and suburbs may differ in these two jurisdictions.

Perhaps the most interesting evidence of differences in consumption benefits emerges from the signs and statistical significance of the proximity variables. Voter's proximity to the facilities was an important factor in the outcomes in both jurisdictions. In Houston, voters living close to the existing basketball arena, and those living close to the proposed site of a new arena were more likely to vote for sports subsidies. In Green Bay, voters living close to Lambeau Field were more likely to vote for sports subsidies, although they were less likely to vote for allowing the sale of the naming rights to the stadium. Proximity to the sports facility can capture many different phenomena. Sports facilities may increase property values in the immediate area.[8] In this case, voters living near the facilities would benefit directly from renovation or construction of a facility. In a model of perfect mobility households would sort themselves into different areas of a city based on the characteristics of the areas and the preferences of the households. In this context, households that derive positive consumption benefits from professional sports might prefer areas closer to the sports facility. Households with these strong preferences would also be more likely to vote for sports subsidies.

Note that in Houston voters living near the proposed new facility tended to vote in favor of sports subsidies. This supports the idea that these voters perceived a direct economic benefit from the new facility. However, it is very unlikely that this reflects consumption benefits, as this refers to a proposed location, not a long time existing location of a sports facility, because individuals with strong preferences for access to sporting events would not yet have moved to these precincts.

Conclusions

We empirically investigate the determinants of votes cast in referenda on economic subsidies for professional sport facility construction and renovation in Green Bay, Wisconsin and Houston, Texas. The votes in these two jurisdictions were interesting because several sports related referenda took place in a relatively short period of time in each area, allowing us to improve on the efficiency of the estimates by estimating systems of vote share equations for each area.

Our analysis of voting on these referenda reveals several interesting patterns. We find striking differences in the voting patterns of several groups of voters. Males were more likely to vote in favor of sports subsidies and white, elderly, and more educated voters were more likely to vote against sports subsidies in Houston. Whites and the poor are more likely to vote against subsidies in Green Bay. One explanation for these patterns could be differences in the value of the consumption benefits associated with professional sports across groups of voters, a phenomena identified by Agostini et al (1997) in referenda on sports subsidies in San Francisco.

New insight into the importance and nature of consumption benefits from professional sports is relevant, because it helps to explain why cities continue to attempt to attract new sports teams and prevent existing teams from leaving by increasing the size of the subsidies given to these teams. The retrospective evidence about the economic impact of professional sports teams and facilities on local economies suggests that at best they have no economic impact and, as much recent evidence shows, at worst they have a negative economic impact. This evidence suggests that, when viewed simply as a public investment project, sports subsidies do not pass a cost-benefit test. Significant consumption benefits are one possible explanation for the continued economic support cities give to professional sports team owners and players.

[8] Coates and Humphreys (2002) find evidence of somewhat higher property values within a quarter mile radius of a sports facility.

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