

Voting on Stadium and Arena Subsidies

Dennis Coates*

University of Maryland Baltimore County
Department of Economics

Brad R. Humphreys

University of Maryland Baltimore County
Department of Economics

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Abstract

We analyze voting on subsidies for professional sports in Harris County (Houston), Texas and Brown County (Green Bay), Wisconsin to learn more about voter preferences for these subsidies. Where whites, the poor, and males comprise a larger share of the population, support for subsidies will be weak. Where large numbers of individuals work in recreation services, support for subsidies will be relatively strong. Voters in close proximity to existing facilities are more likely to favor subsidies than are voters living farther from the facilities. Different values of consumption benefits, stemming from differences in preferences, may explain these voting patterns.

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*Department of Economics, University of Maryland Baltimore County, 1000 Hilltop Circle, Baltimore, MD 21250.
Internet: coates@umbc.edu

Introduction and Motivation

What factors induce voters to support or oppose public subsidies for the construction or renovation of professional sports facilities? In this paper we aim to increase our understanding of the factors that determine voting on subsidies for professional sports. We undertake an empirical analysis of recent referenda 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 differed, providing us with considerable variation in the referenda. But 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.

These referenda 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.

The issues in the referenda themselves are 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.

¹Of 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.

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 sparse literature on the public support for stadium and arena subsidies includes chapters in Noll and Zimbalist's (1997) volume *Sports, Jobs and Taxes* by Agostino, Quigley, and Smolensky (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 Agostino, Quigley, and Smolensky (1997) chapter in *Sports, Jobs and Taxes* estimates an empirical model of voting behavior on stadium referendums.

Fort (1997) surveyed the referendums on sports subsidies up until about 1996. He argues that one can infer from the referendums whether median voter or agenda setter models better describe what was happening. 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. The agenda setter will choose 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 stadium situation, the alternatives may be for the community to pay up, building the franchise the palace it so richly deserves or requires to remain competitive, or to lose the 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 proponents generally also 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 the \$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, about \$435,000 was spent on advertising on TV and radio and

on the market research that helped the Packers focus their campaign message. Opponents of the plan spent an estimated total of \$34,996.

Agostino, et al. (1997) analyzed two referenda on proposals to subsidize a new baseball stadium for the San Francisco Giants in 1989 and 1996. This research estimated vote share equations for the two referenda. The results for these two vote share equations are very 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 who are college graduates. 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 shares of the population that are male 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 two questions. First, they confirmed that the coefficients were stable over time; the effect of income, education, race, etc. on the vote for a stadium subsidy was the same in both 1989 and 1996. The 1996 referendum passed but the 1989 referendum did not. Second, they examined why the outcome of the votes differed. The difference appears to be that the cost to taxpayers was reduced from 1989 to 1996. In fact, the dummy variable for the 1996 election indicates that the pro-stadium vote increased by about 15% over what it would have been in 1986. Agostino, Quigley, and Smolensky (1997) conclude that this additional 15% of the vote is the result of lowering the taxpayers' cost of the stadium subsidy.

We use an approach similar to the one used by Agostino, Quigley, and Smolensky (1997), although it differs in at least two important respects. First, in Green Bay the proposal was to renovate an existing stadium and in Houston the site of the proposed new stadium had already been identified. 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. We estimate a SUR logit model of voting on sports referenda.

Like Agostino, Quigley, and Smolensky (1997), we match census tract data with voting precinct data for Harris County, Texas (Houston) and Brown County, Wisconsin (Green Bay) where referenda related to professional sports subsidies were on the ballot in the Fall of 2000. The underlying issues differed in the two jurisdictions, so 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

²Fort (1997) made such a suggestion.

using local tax monies 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. We describe the circumstances in detail below. However, because the circumstances are different it is possible to take advantage of the different circumstances to aid in understanding the influences on voters.

Background

Brown County, Wisconsin and Harris County, Texas each held referenda in November of 2000 relating to public financing of stadium or arena projects. How they arrived at these referenda, and the issues that were placed on the ballots, differ substantially. In this section we describe the circumstances leading up to the votes in each jurisdiction.

Brown County

Brown County, Wisconsin is the jurisdiction containing Green Bay, home of the National Football League 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, which was renamed Lambeau Field in 1965, opened as the Packers home. 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. Packers profits neared \$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.

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

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 percent add on to the state sales tax which applies 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.

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 National Football League. The Oilers left Houston after the 1996 season for Nashville, Tennessee to become the Tennessee Titans, leaving Houston without a professional football team. 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 paper 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 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 that 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.

In the 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 all 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 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 went to the polls to vote 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 an individual voter with his or her vote nor his or her personal characteristics. We can match the voting outcome in a precinct with descriptive characteristics of the residents of that precinct and then make inferences about how college graduates vote, say, by noting that as the proportion of the precinct's population that is college graduates rises, the precinct's share of the vote in favor of the stadium referendum rises (or falls).

We estimate a logit model because the data available to us describes 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 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 random shock which has mean 0, and is uncorrelated across precincts. However, 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, and the two arena votes in consecutive years, along with the Olympic vote in Harris County, to further

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

$$lorv1_{i1} = \beta x_{i1} + \mu_{i1} \quad (2)$$

$$lorv2_{i2} = \alpha x_{i2} + \mu_{i2} \quad (3)$$

$$lorv3_{i3} = \gamma x_{i3} + \mu_{i3}. \quad (4)$$

The equation errors, μ_{ij} $j=1, 2, 3$, have mean zero and constant, but different, variance and are correlated one with another. Formally, $E[\mu_{ij}\mu_{ik}] \neq 0, j \neq k$.

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. The voting results from all voting precincts were gathered from county government web sites for both Harris County and Brown County. The locations of each voting station were used to determine the census tract for each polling place. Once this was known, data from the U. S. Census for 1990, the most recent available at this writing, 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 have been mapped into the same census tract. In these cases, the explanatory variables from the census data are identical, though the vote share on the referendum and the presidential election voting differ. For example, in those tracts containing multiple precincts, the spread in the share of the vote for the sales tax increase ranges from only a few tenths of a percentage point to tens of percentage points.

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; Table 2 has this information for Harris County-Houston.⁴ We also use variables that reflect the distance from the existing or proposed facility to each census tract as regressors. These variables embody the idea that people living close to an existing facility, or in the area where the new facility will be constructed, may have stronger preferences or more

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

information about what it means to live near a stadium or arena. Census tracts were separated into four categories in terms of distance from an existing or proposed facility:

1. “Very close” Tracts: contain the facility or are contiguous to the tract with the facility
2. “Close” Tracts: Contiguous to “Very Close” tracts
3. “Somewhat close” Tracts: Contiguous to “Close” tracts
4. All Other 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.

Results and Discussion

Separate SUR logit models were estimated for each jurisdiction. Table 3 contains the results from estimating a seemingly unrelated logit regression model on the three votes held in Brown County, Wisconsin. On the question of whether or not the sales tax should be raised to finance renovation to Lambeau Field, the evidence suggests that as the proportion of the district’s population that is white rises the likelihood of a yes vote falls. Similarly, as the share of the district population that voted for Al Gore for President rises and as the share of the district population that lives in poverty rises, the likelihood of a vote to raise the property tax falls. However, individuals whose occupation is in recreation are more likely to vote for the sales tax increase as are those whose property is close by Lambeau Field, those with higher incomes, and those living in districts that are relatively more urbanized. Interestingly, people who live close to the stadium but on the opposite side of the Fox River are less likely to vote favorably on the sales tax increase, though this variable is only significant at the 10% level.

The equation explaining voting on whether to use any surplus funds generated by the sales tax increase to reduce local property taxes has only one statistically significant variable. If the district is relatively more urban, then voters there were more likely to vote favorably on the property tax relief.

The vote share for Al Gore is not statistically significant in the property tax cut equation, but it does have a p-value of 0.107. It is closer to passing muster as statistically significant than any other variable in the property tax equation. Its positive sign indicates that Gore voters were more

likely to favor cutting the property tax if the sales tax increase generated surplus funds. Combined with the evidence from the sales tax equation that Gore voters were more likely to oppose the sales tax increase, these results turn on its head the popular notion that Democrats are the party of tax increases and Republicans the party of tax cuts. Given that the Republican candidate for President, George W. Bush, was the beneficiary of enormous state financed subsidies for stadium construction as owner of the Major League Baseball Texas Rangers, this may simply indicate a Republican tendency to favor pro-business and pro-economic development policies.

In the last referendum studied, voters were asked to consider the sale of the naming rights to the renovated field. Districts with greater proportions of males were more likely to vote to sell naming rights (significant at the 10% level), but those with higher incomes, those in the retail sector and those living very near Lambeau Field all were more likely to vote against selling the naming rights.

Finally, one might argue that the analysis includes an enormous number of irrelevant variables. Very few of the profession variables are statistically significant, and most have p-values well above 0.5. Nonetheless, an F-test easily rejects the null hypothesis that all of these variables in all three equations have coefficients of zero, suggesting that these variables belong in the empirical model.

Table 4 contains 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.

Turning to the Harris County, Texas voting on whether to raise taxes on hotel rooms and rental cars to fund the construction of a new basketball arena, one finds results that are quite different from those reported above. Table 5 reports the results for a SUR logit model of the 1999 and in 2000 votes on funding a new basketball facility. The results show that males, those who would vote for Al Gore, those who work in technical jobs, and those who live near to the existing facility or the proposed site for the new arena were more likely to vote in favor of the tax increase to fund the stadium in 1999. The elderly, whites, urbanites, and those with bachelors degrees, production and machine operators, and those in retail are less likely to vote in favor of the plan. When the vote is held in 2000, with the removal of the ticket tax, the same behavioral effects as in 1999 are found along with several new results. Renters, professionals and those employed in entertainment and recreation services are less likely to vote for the arena plan in 2000.

Note that a large number of the occupation variables are statistically significant in this model. It is also true that the null hypothesis of joint insignificance is easily rejected for this case. What is, perhaps, surprising is that all of these occupation variables reduce the likelihood of supporting the arena funding plan.

Table 7 presents the results of simultaneously estimating the voting equations for 1999 and 2000 along with an equation for the referendum to support the bid for the 2012 Summer Olympics. As this last vote was only held in Houston, as opposed to the entirety of Harris County, these results

depend only on precincts from the city. The results are, however, basically identical to those for the county regressions reported above. As before, support for the arena plans comes from males and those who voted for Al Gore for President, rises as income rises, and is greater among those living near to either the existing facility or the site of the proposed new arena. Opposition comes from the elderly, whites, the relatively more educated, and several of the occupation classes. Support for the Olympic bid follows these same patterns.

Tables 9 and 10 report 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. Being near to Lambeau Field raises the odds of a pro-stadium vote by between 19 and 23%. Interestingly, being equally close, but being separated from the stadium by the Fox River, has the effect of reducing the odds of a favorable vote by about 10%. Proximity to the Compaq Center in Houston does raise the odds of a favorable vote on the arena referendums, but the effect is only between 3 and 10%. However, being very near to the site for the new arena results in an increase in the odds of a favorable vote of between 10 and 20%.

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.

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, because these consumption benefits may be large for some groups of voters. So, for example, in a referendum on funding local schools, voter's would not take into account consumption benefits associated with attending primary or secondary school when deciding on how to vote. If the expected economic costs of a project are similar for most voters in a jurisdiction, then 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 when viewed solely as a local investment decision. We look for evidence that voters who might have greater consumption benefits were more likely to vote for the 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 demographic group who may derive significant consumption value from professional sports, and would thus be more likely to support subsidies for professional sports. The

empirical results bear this out. *pctmale*, the fraction of males in a precinct, is positive and statistically significant in three of the five votes (if a less stringent significance level is used for the smaller Brown County sample). Precincts with larger fractions of white voters tended to vote against sports subsidies in both jurisdictions. This could reflect that whites derive lower consumption benefits from professional sports. But this variable could capture more than just preferences for professional sports.

We included both median family income and per capita income in the empirical model in order to capture both the relative affluence of the voters and the skew of the income distribution. The signs on these variables differ across the jurisdictions. Both are positive, and generally statistically significant, in Harris County, while both are generally negative, and generally statistically significant in Brown County.⁵ These signs imply that more affluent districts were more likely to vote for sports subsidies in Houston and more likely to vote against 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 these particular sports are one group who would get 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.

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. This could reflect the two different 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.

Voter's proximity to the facilities is also an important factor in the outcome of the vote 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. 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

⁵Again this is true if a less stringent significance level is used for the smaller sample in Brown County. Several of the income variables have P-values in the neighborhood of .20 in Brown County.

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.

Finally, the more precise estimates from Houston reveal several other patterns in voting that do not appear in voting on the referenda in Green Bay. In Houston elderly voters and more educated voters were more likely to vote against sports subsidies and voters in precincts that voted for Gore in the 2000 presidential election were more likely to vote against sports subsidies.

Conclusions

We analyze the determinants of votes cast in referenda on economic subsidies for professional sports facilities 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 which allows us to improve on the efficiency of our empirical 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, 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 Agostino 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.

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Table 1: Variable Definitions, Descriptive Statistics: Brown County

Variable	Definition	Number	Mean	Std. Dev.	Minimum	Maximum
tvshare	% voting yes on sales tax	91	0.509	0.094	0.166	0.685
snshare	% voting yes on naming rights	98	0.529	0.039	0.449	0.665
xsshare	% voting yes on tax cut	91	0.444	0.053	0.262	0.559
goreshar	% voting for Gore	98	0.470	0.075	0.296	0.650
rentshar	% renters	98	0.325	0.177	0.069	0.965
pcturb	% urban	98	81.332	38.146	0.000	100.00
pcthsp	% high school or more	98	81.453	7.584	55.40	95.100
pctbch	% with bachelor's degree	98	16.377	8.495	1.700	38.400
popvct	% living in poverty	98	9.602	8.368	1.600	39.600
exec	% executive jobs	98	0.104	0.039	0.038	0.217
prof	% professional jobs	98	0.116	0.047	0.020	0.232
tech	% technical jobs	98	0.032	0.010	0.000	0.051
sales	% sales jobs	98	0.123	0.027	0.074	0.175
clerical	% clerical jobs	98	0.158	0.028	0.102	0.252
houserv	% in household services	98	0.003	0.004	0.000	0.022
protect	% in protective services	98	0.015	0.010	0.000	0.042
service	% in other services	98	0.122	0.039	0.069	0.280
ag	% agriculture	98	0.025	0.046	0.000	0.199
product	% production	98	0.117	0.032	0.000	0.166
machine	% machine operators	98	0.090	0.028	0.035	0.151
transpor	% transportation	98	0.047	0.014	0.021	0.080
handlers	% handlers	98	0.048	0.019	0.013	0.106
retail	% retail	98	0.204	0.038	0.123	0.305
recserve	% recreation services	98	0.011	0.008	0.000	0.043
whitepct	% white	98	0.963	0.045	0.802	1.000
near1	Closest to facility	98	0.133	0.341	0.000	1.000
near2	Second closest to facility	98	0.173	0.381	0.000	1.000
near3	Third closest to facility	98	0.214	0.412	0.000	1.000
nearriver	Across river from facility	98	0.153	0.362	0.000	1.000
shar65up	% 65 years old or more	98	0.105	0.053	0.022	0.416
medfamin	Median Family Income	98	36288	8109	13182	52118
percapin	Per Capita Income	98	13585	2651	7370	20571

Table 2: Variable Definitions, Descriptive Statistics: Harris County

Variable	Definition	Number	Mean	Std. Dev.	Minimum	Maximum
yes99pct	% in favor of subsidy in 1999	1790	0.475	0.176	0.000	1.000
yes00pct	% in favor of subsidy in 2000	1830	0.668	0.125	0.000	1.000
yesoly	% in favor of subsidy to Olympics	1572	0.757	0.084	0.250	0.972
goreshar	% voting for Gore	1834	0.502	0.258	0.000	1.000
rentshar	% renters	2108	0.371	0.175	0.000	0.929
pcturb	% urban	2134	94.86	19.804	0.000	100.0
pcthsp	% high school or more	2134	69.79	21.917	0.000	100.0
pctbch	% with bachelor's degree	2134	22.39	19.222	0.000	78.3
povpct	% living in poverty	2134	17.29	13.943	0.000	100.0
exec	% executive jobs	2108	0.124	0.076	0.000	0.372
prof	% professional jobs	2108	0.134	0.092	0.000	0.449
tech	% technical jobs	2108	0.039	0.021	0.000	0.138
sales	% sales jobs	2108	0.122	0.041	0.000	0.262
clerical	% clerical jobs	2108	0.159	0.043	0.000	0.313
housesrv	% in household services	2108	0.010	0.012	0.000	0.136
protect	% in protective services	2108	0.017	0.026	0.000	0.789
service	% in other services	2108	0.114	0.065	0.000	0.538
ag	% agriculture	2108	0.011	0.013	0.000	0.150
product	% production	2108	0.124	0.073	0.000	1.000
machine	% machine operators	2108	0.050	0.039	0.000	0.462
transpor	% transportation	2108	0.045	0.032	0.000	0.172
handlers	% handlers	2108	0.050	0.048	0.000	1.000
retail	% retail	2108	0.166	0.046	0.000	0.538
recserve	% recreation services	2108	0.012	0.008	0.000	0.054
whitepct	% white	2112	0.628	0.292	0.000	1.000
near1	Closest to existing facility	2136	0.018	0.132	0.000	1.000
near2	Second closest to existing facility	2136	0.018	0.132	0.000	1.000
near3	Third closest to existing facility	2136	0.027	0.163	0.000	1.000
shar65up	% 65 years old or more	2112	0.079	0.049	0.000	0.296
medfamin	Median Family Income	2134	36977	21083	0	150001
percapin	Per Capita Personal Income	2134	14861	10670	0	106934
newsite1	Closest to proposed facility	2136	0.036	0.185	0.000	1.000
newsite2	Second closest to proposed facility	2136	0.031	0.173	0.000	1.000
newsite3	Third closest to proposed facility	2136	0.036	0.185	0.000	1.000

Table 3: Regression Results: Brown County

Variable	Sales tax			Property tax cut			Sell naming rights		
	Coefficient	St. Dev.	p-value	Coefficient	St. Dev.	p-value	Coefficient	St. Dev.	p-value
Constant	3.701	5.537	0.504	0.688	5.851	0.906	0.756	4.512	0.867
goreshar	-0.566	0.313	0.071	0.535	0.332	0.107			
shar65up	0.165	0.596	0.782	0.21	0.630	0.739	-0.378	0.492	0.443
pctmale	-0.001	0.004	0.724	-0.003	0.004	0.476	0.006	0.003	0.064
whitepct	-1.565 [†]	0.738	0.034	-0.66	0.786	0.401	-0.648	0.608	0.287
pctpov	-0.024 [†]	0.011	0.021	-0.009	0.011	0.402	-0.005	0.009	0.573
pcturb	0.022 [†]	0.010	0.036	0.025 [†]	0.010	0.020	-0.002	0.009	0.831
pcthsp	0.008	0.007	0.252	0.003	0.007	0.700	-0.001	0.006	0.882
pctbch	0.015	0.012	0.236	0.002	0.013	0.879	0.001	0.010	0.888
percaphin	-0.003	0.003	0.193	-0.001	0.003	0.596	-0.005 [†]	0.002	0.043
medfamin	-0.182 [†]	0.085	0.032	-0.094	0.090	0.299	0.094	0.075	0.205
rentshar	-0.029	0.215	0.892	-0.05	0.229	0.826	0.098	0.186	0.597
exec	-0.674	5.528	0.903	0.842	5.851	0.886	1.412	4.554	0.757
prof	-0.321	5.971	0.957	1.028	6.323	0.871	-0.018	4.833	0.997
tech	0.667	5.908	0.910	1.440	6.252	0.818	0.127	4.856	0.979
sales	-2.549	5.573	0.647	-1.466	5.900	0.804	1.656	4.527	0.715
clerical	-2.274	5.542	0.682	-1.604	5.855	0.784	0.274	4.546	0.952
protect	-7.296	6.918	0.292	-4.724	7.329	0.519	4.429	5.648	0.433
service	-0.963	5.400	0.858	0.527	5.712	0.926	0.934	4.390	0.831
ag	-5.491	5.565	0.324	-0.700	5.889	0.905	0.986	4.517	0.827
product	-2.628	5.344	0.623	-1.866	5.654	0.741	0.185	4.315	0.966
machine	-1.730	5.483	0.752	-0.377	5.792	0.948	0.297	4.511	0.948
transpor	3.261	4.656	0.484	4.016	4.923	0.415	0.890	3.930	0.821
handlers	-3.14	5.339	0.557	-1.398	5.635	0.804	-0.612	4.396	0.889
retail	-0.279	0.798	0.727	-0.073	0.849	0.931	-1.572	0.793	0.047
recserve	6.335	3.781	0.094	2.770	4.013	0.490	-2.498	3.349	0.456
near1	0.208 [†]	0.052	0.000	0.066	0.056	0.237	-0.214 [†]	0.046	0.000
near2	0.175 [†]	0.051	0.001	0.060	0.054	0.265	-0.040	0.045	0.375
near3	-0.009	0.062	0.883	-0.013	0.066	0.846	-0.069	0.056	0.222
nearriver	-0.101	0.055	0.065	-0.087	0.057	0.130	-0.025	0.044	0.570
R^2/N	0.88	91		0.81	91		0.74	91	

Table 4: Correlation matrix of residuals: Brown County

Equation	Sales tax	Property tax cut	Sell naming rights
Sales Tax	1.0000		
Property Tax Cut	0.6062	1.0000	
Sell naming rights	-0.1401	-0.0694	1.0000

Breusch-Pagan test of independence: $\chi^2(3) = 35.669$, $Pr = 0.0000$

Table 5: Regression Results: Harris County

Variable	1999 Vote			2000 Vote		
	Coefficient	St. Dev.	p-value	Coefficient	St. Dev.	p-value
Constant	0.138	0.800	0.863	1.319	0.712	0.064
goeshar	2.198 [†]	0.058	0.000	1.552 [†]	0.047	0.000
shar65up	-1.451 [†]	0.177	0.000	-1.422 [†]	0.146	0.000
pctmale (a)	0.147 [†]	0.033	0.000	0.086 [†]	0.024	0.000
whitepct	-0.340 [†]	0.064	0.000	-0.220 [†]	0.053	0.000
pctpov	-0.001	0.002	0.382	0.000	0.001	0.905
pcturb	-0.002 [†]	0.000	0.000	-0.001 [†]	0.000	0.000
pcthsp	-0.001	0.001	0.375	0.001	0.001	0.211
pctbch	-0.004 [†]	0.002	0.010	-0.005 [†]	0.001	0.000
percaphin (a)	0.018	0.021	0.397	0.038 [†]	0.017	0.029
medfam (a)	0.043 [†]	0.013	0.001	0.024 [†]	0.011	0.027
rentshar	-0.016	0.057	0.779	-0.104 [†]	0.046	0.023
exec	-0.313	0.816	0.701	-0.558	0.720	0.438
prof	-1.021	0.808	0.207	-1.437 [†]	0.714	0.044
tech	-2.264 [†]	0.885	0.010	-2.458 [†]	0.765	0.001
sales	0.693	0.833	0.405	0.342	0.733	0.641
clerical	-0.473	0.808	0.559	-0.639	0.721	0.375
protect	-0.285	1.069	0.790	-0.814	0.893	0.363
service	-0.001	0.871	0.999	-0.242	0.767	0.752
ag	-0.176	1.097	0.873	-0.502	0.939	0.593
product	-1.878 [†]	0.819	0.022	-1.842 [†]	0.725	0.011
machine	-2.471 [†]	0.830	0.003	-2.392 [†]	0.730	0.001
transpor	-0.795	0.846	0.347	-0.718	0.745	0.335
handlers	-0.045	0.873	0.959	-0.248	0.767	0.747
retail	-1.614 [†]	0.224	0.000	-1.401 [†]	0.184	0.000
recserve	-0.219	0.785	0.781	-1.630 [†]	0.648	0.012
near1	0.060	0.038	0.109	0.084 [†]	0.032	0.009
near2	-0.007	0.042	0.871	0.031	0.034	0.362
near3	0.079 [†]	0.031	0.010	0.069 [†]	0.026	0.009
new1	0.182 [†]	0.046	0.000	0.110 [†]	0.039	0.005
new2	0.004	0.039	0.910	-0.120 [†]	0.035	0.001
new3	0.077 [†]	0.031	0.012	0.023	0.028	0.414
R^2/N	0.88	1736		0.94	1736	

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

Table 6: Correlation matrix of residuals: Harris County

Equation	1999 Vote	2000 Vote
1999 Vote	1.0000	
2000 Vote	0.7694	1.0000

Breusch-Pagan test of independence: $\chi^2(1) = 1027.8$, Pr = 0.0000

Table 7: Regression Results: Houston - Olympics

Variable	1999 Vote			2000 Vote			Olympic Bid		
	Coefficient	St. Dev.	p-value	Coefficient	St. Dev.	p-value	Coefficient	St. Dev.	p-value
Constant	0.587	0.799	0.462	2.229	0.733	0.002	2.323	0.712	0.001
goreshar	2.335 [†]	0.059	0.000	1.649	0.048	0.000	1.376	0.048	0.000
shar65up	-1.252 [†]	0.188	0.000	-1.255	0.162	0.000	-1.074	0.156	0.000
pctmale (a)	0.060 [†]	0.040	0.131	0.040	0.030	0.140	0.082	0.036	0.023
whitepct	-0.327	0.065	0.000	-0.219	0.055	0.000	-0.186	0.055	0.001
pctpov	-0.002	0.001	0.259	-0.001	0.001	0.519	-0.001	0.001	0.284
pcturb	-0.003	0.000	0.000	-0.002	0.000	0.000	-0.002	0.001	0.007
pcthsp	-0.001	0.001	0.389	0.000	0.001	0.835	0.002	0.001	0.126
pctbch	-0.004	0.002	0.007	-0.005	0.001	0.000	-0.004	0.001	0.003
percaphin (a)	0.054	0.022	0.014	0.062	0.018	0.001	0.034	0.017	0.043
medfamin (a)	0.020	0.014	0.146	0.006	0.011	0.580	0.007	0.010	0.462
rentshar	0.013	0.061	0.828	-0.049	0.049	0.316	0.020	0.046	0.660
exec	-0.279	0.809	0.730	-0.853	0.730	0.242	-0.862	0.703	0.220
prof	-1.405	0.799	0.078	-2.125	0.726	0.003	-1.808	0.698	0.010
tech	-1.890	0.895	0.035	-2.941	0.798	0.000	-1.828	0.775	0.018
sales	-0.193	0.836	0.817	-0.954	0.761	0.210	-1.015	0.726	0.162
clerical	-1.022	0.801	0.202	-1.446	0.734	0.049	-1.127	0.708	0.111
protect	-1.576	1.080	0.145	-1.976	0.930	0.034	-2.096	0.967	0.030
service	-0.561	0.873	0.521	-1.306	0.796	0.101	-0.795	0.775	0.305
ag	0.098	1.129	0.931	-0.606	0.997	0.543	-1.409	0.984	0.152
product	-2.149	0.820	0.009	-2.805	0.748	0.000	-2.441	0.725	0.001
machine	-2.903	0.821	0.000	-3.414	0.745	0.000	-2.595	0.721	0.000
transpor	-0.891	0.842	0.290	-1.244	0.767	0.105	-1.063	0.750	0.156
handlers	-0.553	0.873	0.526	-1.086	0.793	0.171	-0.337	0.774	0.663
retail	-1.288	0.231	0.000	-1.034	0.197	0.000	-1.151	0.193	0.000
recserve	-2.366	0.842	0.005	-3.598	0.709	0.000	-3.299	0.684	0.000
near1	0.053	0.037	0.154	0.096	0.027	0.000			
near2	-0.008	0.041	0.837	0.019	0.029	0.506			
near3	0.061	0.029	0.038	0.043	0.021	0.044			
new1	0.183	0.039	0.000	0.096	0.029	0.001			
new2	0.083	0.032	0.010	-0.024	0.025	0.326			
new3	0.111	0.026	0.000	0.050	0.020	0.014			
R^2/N	0.90	1280		0.95	1280		0.97	1280	

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

Table 8: Correlation matrix of residuals: Houston

Equation	1999 Vote	2000 Vote	Olympic Vote
1999 Vote	1.0000		
2000 Vote	0.7545	1.0000	
Olympic Vote	0.5195	0.6870	1.0000

Breusch-Pagan test of independence: $\chi^2(3) = 1678.3$, $\Pr = 0.0000$

Table 9: Changes in Odds Ratios: Brown County

Variable	Sales Tax	Property Tax	Naming rights
near1	1.231		0.807
near2	1.191		
near3			
near river	0.904		

Table 10: Changes in Odds Ratios: Harris County (Houston)

Variable	1999 Vote	2000 Vote
near1		1.088 (1.101)
near2		
near3	1.082 (1.063)	1.031 (1.044)
new site 1	1.200 (1.201)	1.116(1.101)
new site 2	(1.087)	0.887 (0.976)
new site 3	1.080 (1.117)	(1.051)