The Effect of Professional Sports on the Earnings of Individuals: Evidence from Microeconomic Data

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Abstract

This paper explores the impact of professional sports teams and stadiums on the wages of individuals employed in several narrowly defined occupational groups in cities in the United States. The occupational groups examined are among those that proponents of public funding of professional sports claim will benefit economically from these stadiums. Our analysis uses data from the March Supplement to the Current Population Survey (CPS) for the period 1977 to 1998 as well as sports variables previously utilized by Coates and Humphreys (1999), (2001). Previous research focused on aggregate measures of income whereas here the focus is on the wages of individual workers. The results of the study confirm conclusions of earlier research that the overall sports environment is frequently statistically significant as a determinant of earnings and that the predicted mean impact of sports on wages in a sample of individuals employed in occupations closely related to professional sports is an annual average decrease in real earnings of $47.95. The results also show that the effects of the sports environment on wages differ across job-types. Workers in retail occupations earn more on average each year due to the presence of professional sports while workers in other peripherally related occupations like food services and hotels earn less.

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Introduction and Motivation

The economic impact of professional sports on local economies has emerged as an important economic policy issue in recent years. The reason for this is the significant increase in the construction of publicly funded professional sports stadiums and arenas. Over forty five new stadiums and arenas have been built for professional football, basketball and baseball teams since the mid 1980s and many more are currently under construction, in the planning phase, or have been proposed. Most of these construction projects receive substantial government subsidies, and proponents of this subsidization claim increases in employment, income and other economic benefits justify these subsidies. Prospective "economic impact" studies, commissioned and paid for by proponents of public subsidization of sports construction projects, claim to quantify these economic benefits. Siegfried and Zimbalist (2000) recently surveyed this issue.

Opponents of stadium and arena construction counter that the spending and income generation effects of sports are quite limited. Spending on sports substitutes for spending on other types of entertainment, and on other goods and services more generally, so there is very little new income (or employment) generated.[1] Indeed, Coates and Humphreys (1999), (2001) provide evidence that professional sports reduce local incomes. Coates and Humphreys (2003) examine the impact of professional sports on earnings and employment in the retail and services sectors of local economies, including the eating and drinking establishments, hotels and other lodgings, and amusements and recreation sectors. This research uses relatively aggregated data from a single source, the Regional Economic Information System (REIS) collected and distributed by the Bureau of Economic Analysis.

Here we examine the effects of the professional sports environment in cities on the earnings of individuals employed in a number of specific occupational groups in the service and retail sectors: food service, hotel services, retail sales, and sports and recreation. Like typical human capital wage equations, our models include controls for individual characteristics and local labor market conditions. We augment a typical human capital wage equation with a vector of variables that describes the professional sports environment in each city in order to assess the effect of professional sports on the earnings of individuals. We focus on the ability of sports variables to explain wages of individual workers in those sectors of the economy most closely linked to the sports environment – eating and drinking establishments, hotels and other lodging, and retail sales and sports and recreation – in order to assess the economic impact of sports. If the pro-stadium/pro-sports-led-development argument is correct, then one should find higher wages in each of these occupations associated with a richer sports environment in a city. If the anti stadium led development argument is correct then one might find decreases in, or no effect on, wages of these workers.

The empirical evidence suggests that the sports environment affects the wages of individuals working in some of these sectors. However, the vector of sports environment variables often reduces wages rather than increasing them, depending on the sector and the city, suggesting that sports may be an unproductive amenity in these industries. Thus, the results of this individual level analysis confirms the findings of Coates and Humphreys (2003) on the data aggregated by sector as well as the overall negative impact reported by Coates and Humphreys (2001), (1999).

[1] See Baade and Dye (1988), (1990); Baade (1996); Baade and Sanderson (1997); Rosentraub, Swindell, Przybylski and Mullins (1994); Rosentraub (1997)

Empirical Models of Wage Determination

A large body of literature exists on the determinants of the wages of individual workers[2]. This literature uses human capital, proxied by experience and education, indicators for riskier activities, union membership and other variables to explain the wages of workers. Here, we posit a wage equation that depends upon the characteristics of the individual worker, local labor market conditions captured in city and year specific effects, and the professional sports environment in the city. In other words, our approach controls for the characteristics of individual workers and other factors and determines whether or not the professional sports environment has any ability to explain variation in wages not already explained by the other variables. This approach also allows us to compute the contribution of the sports environment to wages earned by workers whose livelihood is, according to stadium-led growth advocates, most likely to benefit from improvements to the sports environment.

This research is related to a large literature examining the effect of amenities on wages.[3] Following the research by Roback (1982), the common approach in this literature has been to estimate wage equations, controlling for observable factors like race, gender, age, experience and education, for separate occupational groups and also including proxy variables for various amenities like good weather or access to the ocean. Here, we look for evidence that professional sports explains variation in wages of individuals, but the underlying causal relationship is direct - professional sports may alter the pattern of entertainment spending in a city and thus the earnings of workers in occupations related to entertainment spending - rather than an indirect effect due to a compensating wage differential.

Examining the wages of workers in different occupational groups allows us to address an important area of debate in the literature on the public subsidization of professional sports. Advocates of sports led economic growth frequently claim that the beneficial economic impact of sports will be concentrated in specific sectors of the economy. New teams and stadiums will attract people to the area around the stadium where they will spend money on food and beverages, hotels, and consumer items such as souvenirs and team paraphernalia. This new consumer spending will drive up demand for waitresses and waiters, hotel staff, and sales clerks, resulting in higher wages by people employed in these jobs.

Opponents of using subsidies to professional sports as a tool of economic development suggest that the job and income creation effects of franchises and stadiums will be minimal.[4] Opponents argue that much of the sales of food and drink and retail merchandise that arises around the stadium will simply substitute for similar sales at establishments in the city that are relatively distant from the stadium. Moreover, consumers may substitute attendance at sporting events for other types of recreational activities, such as attending movies or the theater or going bowling. If this argument is correct then one would expect to find no effect of the sports environment on the wages of workers in the Eating and Drinking, Hotels, and Amusements sectors of the economy.

The dependent variable in the wage equation, w_{ict}, is the log of real average weekly wages of individual i employed in city c in year t. Following the general practice in the literature on the determination of wages, the determinants of this variable are a vector of variables describing the economic and business climate in city c during year t, as well as factors specific to individual i working in city c in year t, x_{ict}, and a vector of variables which capture the role of stadiums and

[2]See Topel (1986) and Murphy and Welch (1992) for examples of studies of the determinants of wages based on times series of cross-sections drawn from the Current Population Survey (CPS) March Supplements.

[3]Rent gradients for amenities have also been estimated. See, for example Ridker and Henning (1967) and Diamond and Gerety (1995). Here we focus on estimating wage gradients for sports due to limited data on property values and rents.

[4]See, for example, the volume edited by Noll and Zimbalist (1997b).

franchises in the determination of economic activity, z_{ct}.

$$w_{ict} = \beta x_{ict} + \gamma z_{ct} + \mu_{ict} \tag{1}$$

where β and γ are vectors of parameters to be estimated and μ_{it} is a disturbance term. By assumption, the disturbance term takes the form

$$\mu_{ict} = e_{it} + v_c + u_t \tag{2}$$

where v_c is a disturbance specific to MSA c which persists throughout the sample period, u_t is a time t specific disturbance which affects all areas in the same way, and e_{ict} is a random shock to the wages of individual i in MSA c at time t which is uncorrelated across individuals within and between MSAs and over time. Estimated this way, the regression purges the wage of the effect of national events on each jurisdiction in a given year and generates an MSA specific impact. In other words, the level of wages in the market for hotel workers, say, in an MSA at any point in time is determined by time- and location-specific events, the characteristics of hotel workers, and the circumstances regarding sports franchises and stadiums.

In equation (1), x_{ict} is a vector of variables that control for factors other than the professional sports environment that affect wages of individual workers. These variables are described in more detail below, but they include gender, race, age, and educational descriptors, and union membership and coverage by a union contract. We estimate the model both pooling all the individuals, including occupation-specific dummy variables as regressors, and separately for each occupational group. By including the occupation variables in the pooled regression we can control for various unmeasured characteristics, including different levels of risk, associated with the various jobs. Regressions for individual occupations implicitly hold these factors constant.

The vector of sports environment variables, z_{ct}, contains a variety of variables to capture the variation in the sports environment in each of the 37 cities that currently have or, at some time in the 22 years from 1977 through 1998, had a professional football, basketball or baseball franchise. This vector includes: dummy variables indicating the presence of a football, basketball or baseball franchise; dummy variables indicating the ten year periods following all football, basketball and baseball franchise entries and exits; variables indicating the ten year period following construction or renovation of a stadium or arena; variables indicating whether the stadium in each city is a single or multiple use structure. The vector of variables also includes the seating capacity of all football, basketball and baseball stadia and those capacities squared. These capacity variables are intended to capture the idiosyncratic nature of each individual professional sports venue, as well as to reflect the incremental effects of renovation. These sports environment variables have been used by Coates and Humphreys (1999, 2003) to explain variation in aggregate measures of economic activity in cities.

Data

Our analysis focuses on the effect of the professional sports environment in cities on labor market outcomes for workers in several specific occupations. These occupations include food service, such as waiters and waitresses, cooks, busboys, and restaurant managers, lodgings, such as hotel clerks, maids, and bellhops, retail sales, including cashiers and sales personnel and sales managers, and in amusements and recreation, including athletes, ushers, and radio and television announcers. Data on individuals reporting one of these occupations was extracted from the Current Population

Survey (CPS) March Supplements for the years from 1977 to 1998. [5]

The individual level data includes socio-demographic characteristics, such as race, gender, age, and education, earnings information, union membership, Metropolitan Statistical Area (MSA) descriptors, and the occupation and industry in which the individual works. Using the MSA data, and a variable created to identify the year the individual observation was collected, the CPS data was merged with sports environment variables indicating the presence of a professional franchise in football, baseball, or basketball, whether or not a franchise had entered or departed the MSA in the last ten years, the seating capacity of the stadiums and arenas in the MSA, whether or not a new arena or stadium had opened in the last ten years. Table 1 presents variable definitions and descriptive statistics for the full sample of 53,052 individuals.

We collected data on 53,052 individuals spread about equally over the 22 years from 1977 until 1998. As a percentage of the total number of observations, 1989 is the smallest with 4 percent, and 1991 is the largest with 5.05 percent. The mean real weekly wage for the full sample is $216 with a standard deviation of $242. There is a slight upward trend in these wages which started at about $183 per week in 1977 and ended at about $273 per week in 1998. This shows an average annual growth in real weekly wages of about 2.2 percent, though there was a decline after 1977 until 1983 during which time the wage was in the $160 to $170 range. In 1983 the wage hit $215 per week, then it rose to between $220 and $230 until 1995 after which it was over $235 and rising. Over this last four years, the average real weekly wage rose by 3.9 percent.

The CPS contains detailed occupational data, based on Census Occupational Codes, for the individuals in the sample. We used these detailed occupational codes to create four broad occupational groups in our sample. Our goal was to obtain a sample of individuals employed in occupations that are either directly of closely related to professional sports. The four occupational groups are: hotel employees, food service employees, retail employees, and sports related occupations. The hotel employees group is made up of maids, housemen, baggage porters, bellhops and hotel clerks. The food services group is made up of waiters and waitresses, cooks, bartenders, food counter, fountain and related occupations, kitchen workers, food preparation, miscellaneous food preparation occupations, and supervisors of food preparations. The retail employees group is made up of sales counter clerks, cashiers, and sales managers. From Table 1, hotel workers make up about 5% of the sample, food services about 46% and retail workers about 47% of the sample collected from the CPS.

We also collected data from a small group of occupations that we have called sports related occupations. This occupational group comprises only 2% of the sample. These individuals worked in occupations that would be employed in sports facilities or in closely related establishments: announcers, ushers, and athletes. The exact description of these occupational groups can be found in the appendix. We can only identify the broader occupations of announcer, athlete and usher over the entire sample period, not the more detailed classifications shown in the appendix. Note that the athletes occupation includes coaches, scouts, referees and competitors, and that even among the athletes we cannot distinguish individuals employed in the sports facilities from, say, a jockey at the local race track or a personal trainer living in the city.

Eighty-two percent of the individuals in the sample are white, 12 percent are black. About 1.4 percent are union members and an additional .1 percent in jobs covered by union contracts. Twenty seven percent did not graduate from high school, 12 percent have bachelor's degrees or higher. Twenty four percent of the sample has some college but did not graduate, and about 37 percent graduated high school but received no further education.

[5] CPS data are available as far back as 1969 but the regional descriptors are far less detailed in the early part of the sample and these observations were unusable.

Data on sports franchises and stadia came from information in Noll and Zimbalist (1997a), Quirk and Fort (1992) and the *Information Please Sports Almanac* (1996). Our sample includes 37 cities, the universe of MSAs that had either a professional football, basketball, or baseball franchise during the period 1977 through 1998.

The entry, exit and construction variables take on a value of 1 in each of ten years, the year a franchise moves, or the year a stadium or arena opens, and the nine subsequent years. One might question the choice of this metric as ad hoc. We defend it on the basis of the length of time it takes for the novelty of a new franchise or stadium to wear off, as has been reported in this literature [Baade (1996)], or for the despair from losing a team to subside.[6] The entry and departure variables (BBE, FBE, BAE, BBD FBD, BAD) combine multiple entries and departures into a single variable. For example, the departure variable would not distinguish between a city that loses one baseball franchise and a city that loses two or more baseball franchises in less than ten years. This approach implicitly forces an equal effect on wages of each event.

Our analysis allows for variable effects of franchises over time through inclusion of dummy variables indicating the presence of a franchise and the entrance or exit of a franchise in the last ten years. We also allow for both the existence and the entrance and exit of franchises in each of three major professional sports, thus allowing for the effects of a franchise in one sport to be net of the effects of goings on with other sports or other franchises in the same sport. Our specification does not, however, control for any symbiotic or mutually detrimental effects of franchises in more than one sport. We control for construction of new facilities with dummy variables and, combined with the presence of a franchise, which must have had an existing facility, we address the issue of whether a new stadium replaces an old stadium or a new stadium is constructed where none previously existed. Additionally, one of the construction variables controls for multiple-sport facilities, as was common in the 1970's. The wide variety of our explanatory variables controls for the gamut of sports environments experienced in the United States. Because we examine the effects of entrance and exit of franchises over a ten year period, few MSAs have no variation in these explanatory variables. For example, a city which obtained its first football franchise in 1965 has a value of 0 for FBE throughout the sample. However, if that city obtained its first football franchise in 1977, then FBE takes a value of 1 for each year 1977 through 1986, and zero from 1987 on.

Results and Discussion

Tables 2 and 3 show the results of estimating Equation (1) for the entire sample of individuals and for the four occupational groups. All of the variables in equation (1) with an i subscript vary by individuals, but the vector of sports environment variables and the variables that control for local and national labor market conditions only vary across cities, not across individuals. Moulton (1990) pointed out that this clustering of observations can lead to downward bias in the usual OLS standard errors. We correct the standard errors for clustering of the observations using the two-step correction suggested by Wooldridge (2003).

The empirical models also included city-specific dummy variables, city-specific time trends, and time dummy variables for each year in the sample to control for unobservable local labor market conditions and aggregate economic factors that affect earnings and employment in all cities in the sample. The pooled regression also included occupational group specific time trends to capture differences in productivity growth in these occupations over time. The results for these variables, as well as the full results for the other occupational groups, are available from the authors on request.

[6] Baade and Sanderson (1997) estimate the novelty effect for each of ten cities. They find effects in the range of from 7 to 10 years.

The parameters on the individual-specific controls in the full-sample model and the occupational groups are precisely estimated and generally the correct sign. The omitted category is a female belonging to a non-black minority group with a high school degree working in a non-union job and living in the suburbs. Age, our proxy for experience, increases average weekly wages suggesting positive returns to experience. The educational variables are also significant and of the predicted sign given that they measure the effect of education on wages relative to someone with a high school diploma.

A few individual elements of the vector of sports environment variables are individually significant, mostly in the full sample. This was generally true of the significance of individual sports environment variables in previous research using aggregate data [Coates and Humphreys (1999), (2001), (2003).] Because it is difficult to quantitatively measure the sports environment in a city, and past research suggests that simple indicator variables for the presence of franchises do not fully capture the overall effect of the sports environment on the economy, we rely on F-tests of the overall significance of the vector of sports variables rather than the significance of individual variables in this vector as the appropriate test of the impact of professional sports on average weekly earnings of workers in the sample.

Table 4 shows the F-statistics and P-values of the overall test of significance for the sports environment variables for each of the empirical models. The hypotheses for these F-tests are

$H_o: \gamma = 0$

$H_a:$ At least one $\gamma \neq 0$.

The null hypothesis is rejected in the full sample specification and for all of the occupational groups, suggesting that the vector of sports variables is jointly significant in all these empirical specifications. In order to get a qualitative sense of the overall impact of the vector of sports environment variables on wages, we calculated the forecasted impact of the vector of sports environment variables on the log of average weekly earnings. These mean predicted impacts are shown in the last column of Table 4. To arrive at this predicted impact, we multiplied the point estimate for each parameter in the vector of sports environment variables by the mean value of the variable associated with that parameter in the sample and then summed these terms.

The mean predicted value for the overall sample, -0.0418, converts to a \$0.959 decrease in average weekly earnings of workers in the sample, or an annual decrease of \$47.95 in before tax earnings based on a fifty week work year. The overall effect of the sports environment in a city is to reduce the wages of individuals employed in these occupational groups by about \$48 per year. Increases in the sports environment in a city are associated with decreases in wages earned by individuals employed in hotels, food services, retail, or sports related occupations. This result is quantitatively similar to the impact of this vector of sports variables on real per capita income reported in previous research.

This negative predicted impact of the sports environment on average weekly wages can be interpreted as an indirect impact of sports. Siegfried and Zimbalist (2000) describe two possible indirect channels through which professional sports might decrease earnings of workers in some occupational groups. The first is a "Substitution Effect" resulting from the budget constraint faced by consumers. Sports competes with other entertainment goods and services in the local economy. Each dollar spent at the ballpark is a dollar not spent on a meal in a local restaurant, bowling alley, etc. Reduced consumer spending at local bars and restaurants could lower earnings of employees at these establishments. The second possible channel is Siegfried and Zimbalist's "Leakages and Multipliers" effect. Simply put, spending on sports may have a much lower local multiplier than spending on other entertainment goods and services. Coupled with the Substitution Effect, this

effect implies that the dollars spent on sports do not recirculate through the larger community to the same extent as dollars spent on other types of entertainment. This would also reduce earnings of workers in occupational groups like Food Services.

The overall predicted impact of the vector of sports environment variables on average weekly wages in the individual occupational groups shows that the overall effect masks some differences at the less aggregated level. The sports environment reduces the average annual earnings of hotel employees by $42.29 and earnings of food service employees by $45.57 per year; the average annual earnings of retail employees rise by $55.70. This differential impact confirms the results in Coates and Humphreys (2003), who reported a differential impact of professional sports on annual earnings of employees in a similar group of industries using aggregate data.

Interestingly, the sports environment reduces average annual earnings of individuals employed in the sports related occupations by $42.12. This might seem counter-intuitive, because this occupational group includes the highly paid professional athletes performing for professional football, basketball, and baseball teams. However, there are very few professional football, basketball, and baseball players working in a city at any particular time and the sample may not include any of these individuals. This occupational group also includes ushers and ticket takers at movie theaters and symphony halls, professional jockeys at local racetracks, coaches for non-professional sports, and radio announcers that could be adversely affected by increases in competing entertainment enterprizes like professional sports. This occupational group contains employees in jobs that directly benefit from increases in the sports environment as well as employees in industries that compete with professional sports for the fixed entertainment budget of local residents and stand to lose revenues when the sports environment in a city expands.

The negative predicted impact of the vector of sports variables on annual average wages does not support the notion that professional sports are viable engines of economic development in cities. Professional sports reduces wages in three of the four occupational groups studied here, and the impact on the full sample of workers is negative. The positive effect of sports on the earnings of retail workers provides some support for the idea that the economic benefits from professional sports are concentrated in specific areas of the local economy. But the full sample results suggest that the earnings increases experienced by retail workers are more than offset by losses in wages experienced by employees in the other occupational groups in the sample.

These results do not argue against public subsidies for professional sports facilities and franchises. Economists have long recognized the important non-pecuniary consumption benefits associated with professional sports. Residents of cities clearly derive significant utility from access to professional sports, and these consumption benefits may justify hundreds of millions of dollars of public spending on new sports facilities. However, the results presented here reinforce the point that public subsidies for professional sports facilities and franchises are not justified by the claims of direct or indirect economic benefits in the form of higher wages frequently put forth by the proponents of these subsidies. Professional sports do not appear to increase the wages earned by a large sample of workers in cities that hosted professional sports teams over the past few decades.

The results in this paper represent a robustness check on previously reported results. Much of the retrospective evidence on the economic impact of sports on local economies, including the findings of a negative impact, are based on aggregated data. Mostly, this data is published by the Bureau of Economic Analysis as part of the Regional Economic Information System (REIS). These data are aggregated across individuals in specific geographical areas. Aggregation of this type can lead to a number of econometric problems, as was pointed out by Zellner (1966). Serial correlation is another common econometric problem associated with aggregate data. The similarity of the results in this paper and those obtained from aggregate data suggest that previously published results do not have serial correlation problems.

Further, results from aggregate data depend on the sampling methodology underlying the REIS. Obtaining quantitatively similar results from a different data set composed of observations at a different level of aggregation, and using a different empirical modelling approach, suggests that previously published results are robust to problems stemming from the data and the model specification.

In this paper we have examined the impact of professional sports on average weekly earnings of a sample of workers in narrow occupational groups drawn from the Current Population Survey March Supplement. These occupational groups are among those that proponents of public funding of professional sports claim will benefit economically from subsidies. The approach here contrasts with that in previous research which focused on aggregate measures of income. However, the results of this study confirm conclusions of earlier research that the overall sports environment is frequently statistically significant as a determinant of earnings and that the predicted mean impact of sports on wages is negative. In this study, the effect of sports is an annual average decrease in inflation adjusted earnings of $47.95 for workers in the sample. However, the results also show that the effects of the sports environment differ across job-types. For example, for workers employed in retail occupations, annual earnings rise on average due to the presence of professional sports.

Our results cast further doubt on the idea that professional sports can be an effective economic development tool in metropolitan areas. Although some specific occupational groups clearly benefit from the presence of professional sports franchises and facilities in our sample of 37 cities, it does not appear that workers in other related occupational groups benefit. Instead, workers in these other occupational groups have lower wages as a result of the wider impact of professional sports on the local economy.

Table 1: Variable Definitions, Means and Standard Deviations

Variable	Definition	Mean	Std. Dev.
wage	Real weekly wage (dollars)	216	242
age	age in years	32.9	14.2
male	1 if male, 0 otherwise	0.442	0.496
white	1 if white, 0 otherwise	0.820	0.383
black	1 if black, 0 otherwise	0.123	0.329
unioncov	1 if job covered by union contract, 0 otherwise	0.001	0.039
unionmem	1 if a union member, 0 otherwise	0.014	0.119
nohschl	1 if did not graduate high school	0.266	0.442
hschlgrd	1 if a high school graduate, but no college	0.375	0.484
somecoll	1 if attended some college	0.239	0.426
bachdgr	1 if earned a bachelors degree or more	0.120	0.492
	Occupation: Sports and Entertainment	0.02	
	Occupation: Hotel Employee	0.05	
	Occupation: Food Services Employee	0.46	
	Occupation: Retail Employee	0.47	
fbfr	1 if a professional football franchise in the city	0.802	0.398
bafr	1 if a professional basketball franchise in the city	0.749	0.433
bbfr	1 if a professional baseball franchise in the city	0.769	0.421
bae	1 if a basketball franchise entered city in last 10 years	0.154	0.361
bbe	1 if a baseball franchise entered city in last 10 years	0.028	0.166
fbe	1 if a football franchise entered city in last 10 years	0.086	0.281
bad	1 if a basketball franchise left city in last 10 years	0.067	0.249
bbd	1 if a baseball franchise left city in last 10 years	0.012	0.109
fbd	1 if a football franchise left city in last 10 years	0.092	0.289
bbcap	seating capacity of the basketball arena in the city	49.095	32.407
fbcap	seating capacity of the football stadium(s) in the city	61.817	38.473
bacap	seating capacity of the baseball stadium(s) in the city	15.501	11.158
bbco	baseball stadium construction in last 10 years	0.051	0.221
fbco	football stadium construction in last 10 years	0.104	0.306
bbfbc	joint football and baseball stadium construction in last 10 years	0.048	0.214
baco	basketball arena construction in last 10 years	0.268	0.443

Table 2: Regression Results: Full Sample and Sports Related Occupations

	Full Sample		Sports Related Occupations	
Variable	Coefficient	t-stat.	Coefficient	t-stat.
log(age)	0.654	85.28	0.802	6.99
Male	0.327	50.98	0.313	6.44
White	0.065	4.87	0.135	0.96
Black	0.062	3.96	0.138	0.81
Union Contract	0.202	2.62	0.737	1.49
Union Member	0.211	8.42	0.578	3.01
No HS Diploma	-0.225	-28.91	-0.407	-4.19
Bachelors Degree	0.265	25.58	0.455	4.68
Some College	0.077	9.70	0.128	1.69
Live in CBD	0.037	5.46	0.080	0.82
Baseball Stadium Capacity	0.024	1.20	-0.089	-0.52
Football Stadium Capacity	-0.001	-0.45	0.017	0.90
Basketball Stadium Capacity	0.004	0.57	-0.039	-0.71
Baseball Stadium Capacity^2	0.000	-1.06	0.001	0.51
Football Stadium Capacity^2	0.000	0.69	0.000	0.06
Basketball Stadium Capacity^2	0.000	-0.89	0.001	0.62
Baseball Construction	0.056	3.06	0.042	0.23
Football Construction	0.007	0.49	0.084	0.41
Multi-Use Construction	-0.047	-2.45	0.049	0.29
Basketball Construction	0.029	2.51	0.250	2.22
Football Franchise	0.009	0.08	-1.483	-1.95
Basketball Franchise	-0.010	-0.13	0.582	1.03
Baseball Franchise	-0.785	-1.39	2.380	0.46
Basketball Entry	-0.011	-0.67	-0.224	-2.29
Baseball Entry	0.050	1.53	0.436	1.31
Football Entry	0.016	0.83	0.302	2.55
Basketball Departure	0.014	0.81	-0.107	-0.65
Baseball Departure	-0.074	-2.06	-0.328	-2.11
Football Departure	-0.006	-0.29	-0.584	-4.42
N	53052		1213	
R^2	0.41		0.34	

Table 3: Regression Results: Other Occupational Groups

	Hotel Employees		Food Services Employees		Retail Employees	
Variable	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.
log(age)	0.397	10.35	0.702	37.79	0.777	35.15
Male	0.275	7.79	0.297	16.58	0.572	34.80
White	-0.082	-1.37	0.065	2.80	0.189	7.41
Black	-0.064	-1.08	0.048	1.72	0.116	3.78
Union Contract	0.137	1.45	0.140	2.01	0.164	1.37
Union Member	0.266	6.18	0.137	4.39	0.060	1.30
No HS Diploma	-0.067	-2.08	-0.220	-7.57	-0.368	-14.69
Bachelors Degree	0.109	1.64	0.206	9.10	0.460	24.40
Some College	0.127	3.74	0.106	6.03	0.109	8.86
Live in CBD	0.023	0.72	0.096	7.34	-0.041	-3.84
Baseball Stadium Capacity	0.097	1.21	0.039	2.00	-0.026	-0.97
Football Stadium Capacity	-0.004	-0.52	-0.005	-1.48	0.003	0.96
Basketball Stadium Capacity	-0.007	-0.28	-0.009	-1.04	0.012	0.80
Baseball Stadium Capacity^2	-0.001	-1.11	0.000	-1.93	0.000	1.10
Football Stadium Capacity^2	0.000	0.26	0.000	1.75	0.000	0.00
Basketball Stadium Capacity^2	0.000	0.25	0.000	0.86	0.000	-1.08
Baseball Construction	-0.057	-1.28	0.057	2.76	0.057	2.00
Football Construction	-0.153	-1.82	0.017	0.76	0.012	0.51
Multi-Use Construction	0.063	0.45	-0.036	-1.36	-0.060	-1.80
Basketball Construction	0.039	0.87	0.046	2.45	0.015	0.82
Football Franchise	0.257	0.67	0.190	1.31	-0.235	-1.69
Basketball Franchise	0.193	0.66	0.125	1.41	-0.098	-0.59
Baseball Franchise	-3.175	-1.39	-1.255	-2.18	0.736	0.94
Basketball Entry	-0.038	-0.59	-0.006	-0.33	-0.009	-0.45
Baseball Entry	0.056	0.64	0.043	1.49	0.023	1.02
Football Entry	0.035	0.54	0.007	0.30	-0.002	-0.07
Basketball Departure	0.051	0.65	0.003	0.09	0.035	1.03
Baseball Departure	-0.052	-0.46	-0.100	-3.38	0.017	0.60
Football Departure	0.079	0.90	0.014	0.90	-0.022	-0.52
N	2728		24438		24673	
R^2	0.14		0.23		0.40	

Table 4: F-Tests and Forecast Mean Impact on Earnings

Model	F-Statistic	P-Value	Overall Impact
Full Sample	2.09	0.00	-0.0418
Sports Related Occupations	17.27	0.00	-0.1708
Hotel Employees	2.96	0.00	-0.1674
Food Service Employees	15.98	0.00	-0.0928
Retail Employees	12.37	0.00	0.1079

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Appendix: Occupational Group Descriptions

The following are the Census Occupation Codes (SOC), titles and descriptions for the occupational groups that comprise the sports and recreation group in the sample.

Announcers

27-3011/280 *Radio and Television Announcers*

"Talk on radio or television. May interview guests, act as master of ceremonies, read news flashes, identify station by giving call letters, or announce song title and artist."

27-3012/280 *Public Address System and Other Announcers*

"Make announcements over loud speaker at sporting or other public events. May act as master of ceremonies or disc jockey at weddings, parties, clubs, or other gathering places."

Athletes

27-2021/272 *Athletes and Sports Competitors*

"Compete in athletic events."

27-2022/272 *Coaches and Scouts*

"Instruct or coach groups or individuals in the fundamentals of sports. Demonstrate techniques and methods of participation. May evaluate athletes' strengths and weaknesses as possible recruits or to improve the athletes' technique to prepare them for competition."

27-2023/272 *Umpires, Referees, and Other Sports Officials*

"Officiate at competitive athletic or sporting events. Detect infractions of rules and decide penalties according to established regulations. Include all sporting officials, referees, and competition judges."

Ushers

39-3031/442 *Ushers, Lobby Attendants, and Ticket Takers*

"Assist patrons at entertainment events by performing duties, such as collecting admission tickets and passes from patrons, assisting in finding seats, searching for lost articles, and locating such facilities as rest rooms and telephones."