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April 2008

COLLEGE OF THE HOLY CROSS, DEPARTMENT OF ECONOMICS
FACULTY RESEARCH SERIES, PAPER NO. 08-04

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Abstract

This paper provides an empirical examination of the economic impact of spectator sports on local economies. Confirming the results of other ex post analyses of sports in general, this paper finds no statistically significant evidence that college football games in particular contribute positively to a host's economy. Our analysis from 1970-2004 of 63 metropolitan areas that play host to big-time college football programs finds that neither the number of home games played, the winning percentage of the local team, nor winning a national championship has a discernable impact on either employment or personal income in the cities where the teams play. While successful college football teams may bring fame to their alma mater, fortune appears to be a bit more elusive.

JEL Classification Codes: O18, R53

Keywords: conventions, impact analysis, mega-event

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1. Introduction

Convention tourism is big business in the United States. According to the Convention Industry Council, in 2004 the meetings, conventions, exhibitions, and incentive travel industry generated over $122.3 billion in direct spending and 1.7 million jobs. These figures are "more than the pharmaceutical and medicine manufacturing industry and only slightly less than the nursing and residential care facilities industry." (CIC, 2005) In hopes of gaining of piece of this lucrative business, cities compete vigorously to host meetings and conventions, and billions of dollars of taxpayer money has been directed towards the construction of ever larger and more elaborate convention centers in cities all across the country.

Perhaps the most sought-after jewels of the convention industry nationwide are the quadrennial National Democratic and Republican Conventions at which each party's presidential candidate is nominated. City and party officials suggest that these events generate significant economic windfalls for host cities and also serve to focus national and even international attention on the host city. For example, city officials of New York City and Boston claimed net economic impacts of $255 million and $156 million, respectively, for the 2004 Republican and Democratic National Conventions. These economic impact numbers figured prominently in press releases promoting the 2008 Republican Convention in St. Paul/Minneapolis.

Economists, however, tend to be more skeptical of the large economic impact numbers touted by event organizers. Our examination of 18 national political conventions from 1972-2004 suggests that the promoters' rosy economic projections are overstated, and these events have a negligible impact on local economies.

Background

Economic impact analyses are divided into two main categories: *ex ante* studies and *ex post* studies. *Ex ante* studies predict the economic effect of an event by estimating the number of visitors to the event as well as their average expenditures. A multiplier is typically also applied to these direct economic impact figures resulting in a total impact number that is often at least twice as large as the direct economic impact. As noted previously, *ex ante* studies of national political conventions routinely ascribe large benefits to these major events.

Critics of *ex ante* economic analysis, however, point out that these studies often suffer from three major shortcomings that lead to an overestimation of the total net impact of these events. First, *ex ante* reports often fail to account for the substitution effect which occurs when local residents spend their money on convention-related activities rather than on other goods and services in the local economy. As the Democratic and Republican national conventions primarily draw delegates from across the country rather than from local areas, the substitution effect in these cases is likely to be relatively small compared with, for example, a county or state political convention.

The second concern in *ex ante* studies is the crowding out effect. The large crowds and congestion associated with "mega-events" like the national conventions may deter people not associated with the convention from engaging in economic activities in the host city. While hotels, bars and restaurants, may do well during the convention, other retailers and service providers may not benefit from the event and potentially could lose sales. This issue is of particular concern during a national political convention which necessitates a high degree of security and also may generate large crowds of protesters both of which will serve to dissuade casual shoppers and diners and result in major disruptions for local residents. During the week of the 2004 Republican National Convention in New York City, for example, attendance at Broadway shows fell more than 20 percent compared with the same week a year earlier despite the presence of tens of thousands of visiting conventioneers and journalists.

Many economists are also skeptical of the multipliers used in *ex ante* studies to generate indirect economic benefits. Often the multipliers used are absurdly high, but even more careful estimates of multipliers may be viewed with suspicion. Multipliers are calculated using complex input-output tables for specific industries grounded in inter-industry relationships within regions based upon an economic area's normal production patterns. During mega-events, however, the economy within may be anything but normal, and therefore, these same inter-industry relationships may not hold. Since there is no reason to believe the usual economic multipliers apply during major events, any economic analyses based upon these multipliers may, therefore, be highly inaccurate (Matheson, 2004).

In particular, national conventions may result in large windfalls to national restaurant and hotel chains and provide employment opportunities for hospitality workers and journalists from across the country but may not result in significant wage gains for local employees. In this situation, the economic gain from the event does not accrue to the host city but rather benefits the bottom line back at corporate headquarters. It is local taxpayers, however, who are often asked to foot the fill for convention center expansions and who suffer from the disruptions associated with the event.

Finally, convention promoters often suggest that prominent events such as the Republican and Democratic National Conventions give cities immeasurable benefits in terms of national and international exposure by being placed in an intense media spotlight. While this contention may be true, it must be realized that the attention a city receives may not portray the city in a positive light. In the realm of sporting events, the Summer Olympic Games in 1972 in Munich and in 1996 in Atlanta were marred by terrorist incidents, and Salt Lake City's reputation suffered after the bribery scandal surrounding its bid for the 2002 Winter Olympics. Host cities for political conventions are similarly not immune from bad publicity. For example, the chaos and protests surrounding the 1968 Democratic Convention in Chicago is still noteworthy even 40 years later. It is hard to imagine that the city of Chicago benefited from its ill-fated moment in the sun.

Due to the difficulties associated with *ex ante* estimation, numerous scholars estimate the effects of mega-events on local economies by *ex post* estimation which examines the actual economic performance of local areas that host large events. While few *ex post* studies of conventions are found in the existing literature, many authors have examined of major sporting events such as the Olympics (Baade and Matheson, 2002; Jasmand and Maennig, 2007) or World Cup (Baade and Matheson, 2004; Hagn and Maennig, 2007a; 2007b), the Super Bowl (Porter, 1999; Baade and Matheson, 2006; Coates, 2006), All-Star Games (Baade and Matheson, 2001; Coates, 2006), and post season play in general (Coates and Humphreys, 2002; Coates and Depken, 2006; Baade, Baumann, and Matheson, 2008). The overwhelming majority of *ex ante* studies of mega-sporting events find little to no significant positive economic impact from hosting these events. If the Republican and Democratic National Conventions are truly the "Super Bowl" of the convention business, then based on the evidence of the actual economic impact of the Super Bowl, cities hosting national political conventions have every reason to be concerned about the real magnitude of the economic windfall they can expect.

The paper by Coates and Depken (2006) is of particular interest to our study. The authors use taxable sales data from individual cities in Texas to measure the economic gains from hosting a variety of sporting events including the Super Bowl and the World Series. Houston also hosted the 1992 Republican National Convention, and Coates and Depken include a control variable for this event. They find that "the political convention reduced taxable sales by $19 million and reduced sales tax revenues by approximately $1.4 million."

The Model

Two types of data have been used most frequently in the existing *ex post* studies for professional sports. Coates and Humphreys (1999; 2002; 2003), Baade and Matheson (2001; 2004; 2006), Hagn and Maennig (2007b), and Jasmand and Maennig (2007) use annual data on employment, personal income, or personal income per capita over a wide number of cities and years to estimate the economic impact of sporting events. Clearly annual data is not ideal when examining events with a relatively small duration such as a political convention. To this end, other studies such as Porter (1999), Baade and Matheson (2001), Coates (2006), Coates and Depken (2006), and Baade, Baumann, and Matheson (2008) have used taxable sales data that are available at a monthly or quarterly basis. Taxable sales data, however, cannot be used in nationwide panels of political conventions because of cross-state differences in data availability and taxation laws. This leaves two options: examining any political conventions that have taken place in a single state using high frequency data or examining a large panel of conventions using annual data. This paper uses the panel approach to look at multiple conventions over the period 1972-2004.

As noted by Baade, Baumann, and Matheson (2008), there are several approaches to estimate the impact of an event on a city. Mills and McDonald (1992) provide an extensive summary of these models, which seek to identify changes in economic activity through changes in key economic variables in the short-run or the identification of long-term developments that enhance the capacity for growth. Our task is not to replicate explanations of metropolitan economic growth, but to use past work to help identify any effects of political conventions on economic indicators. To this end we have selected explanatory variables from existing models to predict economic activity in the absence of the convention. Estimating the economic impact of a convention involves accounting for normal activity and determining whether the presence of an event of such national prominence increases economic activity. Thus, this approach depends on our ability to identify variables that account for the variation in growth in economic activity in host cities.

Our model estimates the changes in the growth rates of real personal income, employment, and real per capita income attributable to political conventions in host cities between 1969 and 2005. We use a sample of 50 metropolitan standardized areas (MSAs) that have at least one million residents in 2005. This sample includes the 14 MSAs that hosted a political convention (see Table 1) and a control group of MSAs that have not hosted a political convention. Most of the host cities are relatively large compared to the rest of the sample. The smallest MSA is Kansas City, which had a population of just under two million in 2005. For this reason, we use growth rates to compare cities of different sizes and also present estimations. Table 2 presents the summary statistics of real personal income, employment, real per capita income, and population.

The following is our baseline model for the estimations:

$$Y_{it} = \beta_0 + \beta_1 POP_{it} + \beta_2 OTHER_{it} + \beta_3 CON_{it} + \gamma_t + \alpha_i + \varepsilon_{it} \qquad (1)$$

There are three different dependent variables (Y_{it}): the growth rates of real personal income, employment, and real per capita income in year *t* and MSA *i*. POP_{it} is the log population of city *i* in time *t*. This variable is removed from the real per capita income model since the dependent variable is already scaled by the population size. $OTHER_{it}$ is a vector of dummy variables that represents other important economic events specific to an area that would not be captured in the national economic business cycle or overall city growth rate. Examples of such deviations include the tech boom in Silicon Valley during 1999 and 2000, the oil boom and bust cycles in the 70s and 80s in oil-producing cities, and Hurricane Katrina in New Orleans during 2005. For example, New Orleans in 2005 produces the minimum of each dependent variable in Table 2. The specific variables, cities, and years included in $OTHER_{it}$ is available from the authors upon request. CON_{it} equals one if the MSA hosted a political convention that year and zero otherwise. Finally, to account for the panel nature of our data, we include controls for each year (γ_t) and MSA (α_i). Ideally, this specification allows MSAs to have different intercepts and also purges national trends. In other versions of this model, we also included controls for city-specific trends as well, but this addition added little explanatory power and did not impact our main results.

We use several tests to ensure the dependent variables do not exhibit a unit root. First, we perform Dickey-Fuller and Phillips-Perron tests for each city and each dependent variable. For all three dependent variables, 48 of the 50 cities pass both tests at five percent. Of the other two cities, one passes both tests at ten percent (Washington, D.C.), and one fails both tests (New Orleans). We also perform unit root tests on the entire panel using tests from Levin, Lin, and Chu (2002) and Im, Pesaran, and Shin (2003), which allow for panel-specific attributes such as differing time trends and autoregressive paths. Both tests reject the existence of a unit root in all three dependent variables.

Given the time-series nature of the data, the error term in equation (1) is likely to be autocorrelated. While ordinary least squares regressions will produce consistent estimates, the standard errors will be incorrect. We use a test suggested by Wooldridge (2002) for autocorrelation within each panel, which estimates $\hat{\varepsilon}_{it} = \rho\hat{\varepsilon}_{i,t-1} + u_{it}$. Under the null hypothesis no autocorrelation, $\rho = -0.5$, and all three dependent variables reject the null.

One method to account for the autocorrelation is to include an autoregressive component, which changes our estimation model to

$$Y_{it} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 POP_{it} + \beta_3 TECH_{it} + \beta_4 CFB_{it} + \gamma t_i + \alpha_i + \varepsilon_{it} \ . \qquad (2)$$

Introducing a lagged dependent variable requires the Arellano and Bond (1991) estimation technique, which is sometimes referred to as a "difference GMM" model. This model is described in several works, including Bond (2002) and Roodman (2006). This model begins by differencing equation (1), which purges α_i. Once the city-specific effect is removed, the model uses higher-order lags of Y_{it} to instrument for $\Delta Y_{i,t-1}$. Any other independent variables that are believed to be endogenous or predetermined (i.e., variables independent to the current error but not previous errors) can be handled in the same way.

Given T = 35, there are 34 observations of the differenced dependent variable (ΔY_{it}) for each city. Given the first lag of the differenced dependent variable is endogenous ($\Delta Y_{i,t-1}$), all of the remaining 32 higher-order lags can be used as instruments for ΔY_{it}. While the higher-order lags should create missing values in practice, Holtz-Eakin, Newey, and Rosen (1988) show that each instrument produces a useful moment condition. In other words, consider the moment condition $E[Z_{it}^{'}\Delta\varepsilon_{it}] = 0$, where $Z_{it}^{'}$ contains the instruments (i.e., the higher-order lags) and $\Delta\varepsilon_{it}$ is the differenced error term. For the second-order lag instrument, the moment condition is

$\sum_i y_{i,t-2}\Delta\varepsilon_{it} = 0$ if $t \geq 3$; for the third-order lag instrument, the moment condition is

$\sum_i y_{i,t-3}\Delta\varepsilon_{it} = 0$ if $t \geq 4$; and so on.

Consistency of this approach requires the error terms are independently and identically distributed, which is typically cannot be assumed in dynamic panel models. For example, it is plausible the variance of the error term (original or differenced) may differ across cities. A weighting matrix W asymptotically corrects the moment condition: $W = \frac{1}{N}\sum_i (\vec{Z}_i^{'}\Delta\vec{\varepsilon}_i\Delta\vec{\varepsilon}_i^{'}\vec{Z}_i)$, where $\vec{Z}_i$ and $\Delta\vec{\varepsilon}_i$ are city-specific $(T-2)$ vectors. Using this weighting matrix, GMM minimizes $\left(\frac{1}{N}\sum_i \Delta\vec{\varepsilon}_i^{'}\vec{Z}_i\right)W^{-1}\left(\frac{1}{N}\sum_i \vec{Z}_i^{'}\Delta\vec{\varepsilon}_i\right)$.

To obtain the weighting matrix, it is necessary to have consistent estimates of $\Delta\vec{\varepsilon}_i$, which can be obtained using a different weighting matrix $W_1 = \frac{1}{N}\sum_i (\vec{Z}_i^{'}H\vec{Z}_i)$, where H is a $(T-2)$ square matrix with 2 on the diagonal, -1 on all of the immediate off-diagonals, and zero elsewhere. Thus, the first-step estimates the model using W_1 to produce the estimates $\Delta\hat{\vec{\varepsilon}}_{it}$, which the second step uses in the weighting matrix W. While this correction produces the desirable asymptotic properties, several works (Arellano and Bond, 1991 and Blundell and Bond, 1998, to name only two) suggest the standard errors in the second step are downward biased. We use the Windmeijer (2005) finite-sample correction to adjust the standard errors. Finally, one concern with the Arellano and Bond (1991) technique is over-identifying restrictions, especially given the relatively long time period for each city in our data. We use a Hansen (1982) test to determine the number of over-identifying restrictions.

Table 3 presents the Arellano-Bond estimation results of equation (2) using each of the three dependent variables. For brevity, we omit the estimates for the year dummies and the $OTHER_{it}$ controls, but these are available upon request. The Arellano-Bond tests for autoregressive errors produce the expected result. These tests suggest autocorrelation exists in the first lag, which is expected and justifies the inclusion of the first difference of each dependent variable. In addition, the same test suggests a second lag term is not necessary for any of the dependent variables.

We find only the weakest evidence that political conventions increase economic activity above normal fluctuations. All of the estimated six coefficients (Democratic and Republican conventions for employment, personal income, and per capita income) are positive, but none of the political convention controls are even close to statistically significant. Because all three dependent variables are positively correlated, however, these results are really closer to two pieces of evidence of net positive economic activity rather than six.

Conclusions

This paper provides an empirical examination of the economic impact of the Democratic and Republican National Conventions on local economies. Confirming the results of other *ex post* analyses of mega-events, particularly sporting events, this paper finds no statistically significant evidence that these huge conventions contribute positively to a host city's economy. Our analysis from 1970-2005 of the 50 largest metropolitan areas in the country, including all cities that have hosted one of the national conventions during this time period, finds that neither the presence of the Republican nor the Democratic National Convention has a discernable impact on employment, personal income, or personal income per capita in the cities where the events were held.

While the conventional wisdom regarding national conventions is that they bring fame and fortune to host cities, our results suggest that any economic benefits are quite elusive. People should view promises of economic windfalls from hosting national political conventions in the same way they should view the campaign promises of the candidates at these very conventions – with skepticism.

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Table 1: Political Convention Hosts

	Democratic National Convention	Republican National Convention
1972	Miami, Convention Center	Miami, Convention Center
1976	Madison Square Garden, New York City	Kemper Arena, Kansas City
1980	Madison Square Garden, New York City	Joe Louis Arena, Detroit
1984	Moscone Center, San Francisco	Reunion Arena, Dallas
1988	The Omni, Atlanta	Superdome, New Orleans
1992	Madison Square Garden, New York City	Astrodome, Houston
1996	United Center, Chicago	San Diego Convention Center
2000	Staples Center, Los Angeles	First Union Center, Philadelphia
2004	FleetCenter, Boston	Madison Square Garden, New York City

Table 2: Summary statistics

Variable	mean	Standard deviation	minimum	maximum
Percent personal income growth	0.0306	0.0308	-0.3616	0.2083
Percent employment growth	0.0229	0.0253	-0.0774	0.1468
Percent personal income per capita growth	0.0157	0.0261	-0.3614	0.1960
Percent population growth	0.0146	0.0147	-0.0176	0.0936

Table 3: Arellano-Bond Estimation Results (standard errors in parentheses), all cities

Dependent Variable	Personal income growth	Employment growth	Personal income per capita growth
Dependent variable$_{t-1}$	0.5064*** (0.0999)	0.6059*** (0.0796)	0.2556* (0.1408)
Percent population growth	0.0598 (0.1213)	0.0674 (0.1358)	
Democratic National Convention	0.0010 (0.0027)	0.0022 (0.0034)	0.0016 (0.0024)
Republican National Convention	0.0049 (0.0045)	0.0005 (0.0078)	0.0026 (0.0046)
Arellano-Bond test for AR(1)	z = -4.62 p = 0.000	z = -5.03 p = 0.000	z = -2.32 p = 0.021
Arellano-Bond test for AR(2)	z = -0.92 p = 0.357	z = -1.32 p = 0.188	z = -0.96 p = 0.339
instruments (lags of differenced dep. var.)	2,3,4,5	2,3	2,3,4,5,6
Hansen test for over-identification	$\chi^2 = 0.43$ p = 0.933	$\chi^2 = 1.01$ p = 0.316	$\chi^2 = 1.47$ p = 0.832

For brevity, we omit the year dummies, city fixed effects, and the coefficients on the vector of $OTHER_{it}$ variables. Full results are available from the authors upon request.

***Statistically significant at the 1% significance level.
**Statistically significant at the 5% significance level.
*Statistically significant at the 10% significance level.