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Economic impact of the **Super Bowl in Indianapolis**

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Community efforts to attract the National Football League Championship Game are motivated by a number of issues. The Super Bowl is an internationally known, heavily watched event that typically provides a friendly showcase for a city. Pre and post game shows and several days of news events will likely depict a community's many assets and attractions. These are valuable advertising events. A Super Bowl is an excellent opportunity to focus attention on a community's sporting venues, often a desired amenity to businesses and residents. Sporting events like the Super Bowl with their concomitant festival atmosphere are just plain fun, and more welcomed to a community than the highly sought after annual meeting of the American Economic Association. And, of course, the Super Bowl attracts visitors, players, performers, revelers and the media to a community, often for lengthy periods – weeks or months before the game. This has an economic impact on a community in terms of wages, the value of goods and services sold and in tax receipts and expenditures.

This report outlines the economic and fiscal impacts that can be anticipated in Indianapolis, should the Super Bowl come to the city. This is accomplished by briefly reviewing other studies of the Super Bowl's impacts, constructing and testing a model of the Super Bowl's impact using history from actual Super Bowls from 1969 through 2005 and then applying the estimated impact to Indianapolis and the surrounding regions' economy.

Earlier Studies

Estimates of the Super Bowl's impact are typically performed using one of two separate techniques, the regional impact model or econometric models. Perhaps the most common method is the use of regional impact models. These models rely on an estimate of visitor expenditures, which are then used to estimate the local impact. These models have a long vintage, and are easy to explain to both the public and policymakers, making them an attractive tool. These models are familiar, and use visitor expenditures to estimate direct impacts, which are then adjusted to local conditions to reflect the 'recirculation' of these dollars in the local economy. The additional economic activity they generate are subject to the 'multiplier' effect as the dollars are spent by local firms and workers in the region.

Despite their ease of use these models are frequently criticized. These models cannot capture labor supply constraints effectively, so may overstate impacts in local employment. Also, they do not permit prices to adjust, and so miss an important element in the impact of a single event like the Super Bowl. Optimistic estimates of visitor expenditures are commonly criticized in the application of these models. Also, failure to account for local visitors (whose spending might simply be redirected from other local venues, and as such do not add to the local economy) are a common problem in these studies.[1]

The benefits of the regional impact model is that it does a very good job of connecting local supply chain linkages, and so permits a

1. For critiques of the use of these regional impact models in general see Hicks (2007) and with application to sporting events see Seaman (2006).

About the Bureau:

The Bureau of Business Research is a premier economic policy and forecasting research center housed within the Miller College of Business at Ball State University. The Bureau publishes the American Journal of Business—a peer-reviewed scholarly journal—and the Indiana Business Bulletin—a Web site with weekly commentary, analysis and data on economic, business and demographic trends in Indiana. Research in the Bureau encompasses health care, public finance, regional economics, transportation and energy sector studies. In addition to research, the Bureau hosts the Executive Economic Exchange in Indianapolis four times a year, and also serves as the forecasting element in the Muncie area—hosting five state and federal economic forecasting roundtables.

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Table 1, Estimates of Super Bowl Impacts

year	Super Bowl	City	Stadium	Economic Impact (in millions of 2007 inflation adjusted Dollars)
1989	XXIII	Miami	Joe Robbie Stadium	$269 (a)
1990	XXIV	New Orleans	Louisiana Superdome	404 (a)
1991	XXV	Tampa	Tampa Stadium	183 (a)
1992	XXVI	Minneapolis	Hubert Humphrey Metrodome	176 (a)
1993	XXVII	Pasadena	Rose Bowl Stadium	253 (b)
1994	XXVIII	Atlanta	Georgia Dome	183 (a)
1995	XXIX	Miami	Miami Orange Bowl	456 (a)
1996	XXX	Tempe	Sun Devil Stadium	360 (a)
1997	XXXI	New Orleans	Louisiana Superdome	250 (a)
1998	XXXII	San Diego	Qualcomm Stadium	363 (c) *
1999	XXXIII	Miami	Miami Orange Bowl	440 (d)
2000	XXXIV	Atlanta	Georgia Dome	341 (d)
2001	XXXV	Tampa	Raymond James Stadium	306 (d)
2002	XXXVI	New Orleans	Louisiana Superdome	346 (d)
2003	XXXVII	San Diego	Qualcomm Stadium	347 (g) *
2004	XXXVIII	Houston	Reliant Stadium	357 (d)
2005	XXXIX	Jacksonville	AllTel Stadium	317 (d)
2006	XL	Detroit	Ford Field	279 (e)
2007	XLI	Miami	Miami Orange Bowl	463 (f)
2008	XLII	Glendale	University of Pheonix Stadium	350 (f)

**direct impacts only, Sources: (a) Coates and Humphreys; (b) UCLA/LA Sports Council; (c) Pricewaterhousecoopers), (d) Depken and Wilson, (e) Rishe; (f) Miami Convention and Visitors Bureau; (g) San Diego Citizen's Task Force*

researcher to disaggregate the impact across different industries. This is important both for firms interested in responding to the visitors to the Super Bowl by adding capacity and for local policymakers who must understand the tax implications of the event, which will vary dramatically by the type of industry affected.

The second method of estimating the Super Bowl's impact is econometric modeling. These models employ historical data to statistically estimate the impact of an event (a Super Bowl in this case) on some measure of economic activity such as personal income. These types of models have a very long pedigree, are much more sophisticated than the input-output models and are typically used in scholarly research. These models are more difficult to employ and interpret, and are sensitive to some statistical considerations. The benefits are that they rely on estimating the contribution of a Super Bowl to a region's economy after the effect has occurred. However, this is often a difficult proposition because so many factors, such as recessions, city specific conditions, weather and events such as the Persian Gulf War that are highly idiosyncratic must be disentangled from a Super Bowl's effects. Of course extrapolating these estimates to future events introduces some additional uncertainty that is in common with the first type of modeling.

Economists have criticized estimates of the scale of Super Bowl impact. Their criticism echoes the weaknesses of the regional impact models. Criticism of Super Bowl impact estimates are also extended to a failure to account for local public sector expenditures such as upgrading facilities and providing police protection and other local services.

Table 1 illustrates the most recent 20 Super Bowls along with the published estimates of their economic impacts.

It is worth restating that criticism of the types of estimates displayed in Table 1 have been levied by some economists. These are not idle fears. An overstatement of impacts might lead businesses to over invest in preparation for the Super Bowl, or it might prompt governments to misallocate public resources in anticipation of future tax receipts.

The range of estimates of impacts in other scholarly studies range from zero impacts to roughly $200 million in the city during a Super Bowl year. In terms of gross impacts, the lower of these estimates would be exceeded simply by accommodations (less meals) for about two thirds of the visitors (perhaps $30 million).[2] The higher estimated impacts are roughly those estimated as direct expenditures by out of state visitors to the game (not including the extensive media and NFL staff visitation in the host city).

In the end, we take these concerns seriously. In order to provide conservative estimate, we employ econometric methods of the type used by the critics. However, we employ only cities with a Super Bowl history, since we are concerned that inclusion of additional cities in the sample introduces some statistical problems in the model, which we address in the next section.

Our Model

In order to examine the impact of the Super Bowl, we believe it is best to rely on the experience of other cities, in an econometric model. To do this we collected data on all the Super Bowls since 1969. These data included the total personal income in each city in which the game was played. These data were then adjusted for inflation and placed into the following statistical relationship:

d(PI) = f(Super Bowl, X, Z)

Where the change in inflation adjusted personal income, d(PI), in each of the cities was a function of a whether or not a Super Bowl was played in the city that year, a variable X that accounted for city specific conditions that did not vary across the years (such as weather and location), and Z, a variable that accounted for conditions that were specific to each city in each year (say a presidental election, bad weather or recession). This type of model uses the value of personal income in each city in each year from 1969-2006 to measure the 'average' impact the Super Bowl contributes to personal income the year it is played in a specific city. We would have used earlier data, but the personal income data is not available through the Bureau of Economic Analysis prior to 1969.

This approach is attractive because it does not require us to project potential visitation to the game or other future events. Instead, it gives us the "average" effect of the game in each city, and it permits us to calculate whether or not the impact enjoys statistical regularity across time.[3]

By constructing our model in this way, we also sidestep two potential concerns with earlier studies. First, we are worried that

2. These concerns have been levied in scholarly papers authored by Baade and Matheson, Depken and Wilson, Coates and Humphreys, Baade and Humphreys, Matheson and Badde and a sole authored paper by Matheson.

3. The full model is a known as a cross sectional, time series model, with panel corrected standard errors, with an autoregressive (order one) element. The model itself takes the following explicit specification. $\frac{d(\log(Y_{i,t}))}{dt} = c_i + c + \beta(Superbowl_{i,t}) + \delta\phi_{i,t-n} + \gamma T_{1969+n} + \tilde{e}_{i,t}$ *, where the dependent variable (log in change of personal income Y, for county i, in year t, is a function of fixed effects and a common intercept, the Super Bowl binary variable, the nth order autoregressive element, a trend and a PCSE error term, whitewashed with degrees of freedom adjustment. The data are stationary, following the appropriate tests, and are expressed in 2005 dollars. The goodness of fit measure is a 0.52, and the panel Durbin-Watson is a 1.89. The model is insensitive to the inclusion of a recession variable and cross sectional specific trends.*

Table 2, The Super Bowl's Impact on Indianapolis

	Employment	Wages & Compensation	Total Output
Agriculture	2	31,000	128,000
Mining	0	5,000	31,000
Utilities	7	864,000	3,380,000
Construction	12	576,000	1,270,000
Manufacturing	26	1,862,000	9,442,000
Wholesale	32	2,155,000	5,136,000
Transportation	38	1,708,000	3,298,000
Retail	272	6,750,000	15,105,000
Information	17	956,000	3,788,000
Finance and Insurance	64	3,804,000	10,896,000
Real Estate	70	1,777,000	9,934,000
Professional Services	68	3,030,000	6,263,000
Management	7	701,000	1,346,000
Adminsitration	68	1,873,000	3,525,000
Educational	40	1,096,000	1,887,000
Healthcare	228	10,922,000	18,544,000
Arts & Sporting Events	3,816	159,034,000	242,614,000
Accomodation	148	2,530,000	6,861,000
Other Services	108	2,520,000	4,868,000
Government	9	458,000	16,359,000
Total	5,032	202,652,000	364,686,000

Note: total values may not sum due to rounding

there is a clear selectivity in the cities that host a Super Bowl. If we include other cities in the sample (as others have) then we introduce a type of statistical bias that may not be mathematically possible to correct.[4] Further, if we were to isolate our sample to cities that have had a Super Bowl then we avoid the local "crowding out" effect. As any convention traveler will notice from Table 1, many of the cities that have hosted a Super Bowl are well known convention destinations. A Super Bowl obviously displaces another potential convention (as so famously occurred after the NFL game was postponed after the 9/11 attacks, post-poning the Super Bowl by a week). If the Super Bowl is simply representative of another convention activity, our statistical model will reveal this only if we restrict our sample to destination cities. There are other concerns with some previous models that are best reserved for more technical reports.

Subsequent to our calculations and the performance of a standard battery of statistical tests, we estimate that the Super Bowl game will boost total personal income in the average city by roughly 0.35 percent in the year it is played. This estimate enjoys statistical significance at the 5 percent level, suggesting a great deal of confidence in this estimate.

Applying these results to Indianapolis predicts a one time jump in personal income of $202.9 million in the year of the Super Bowl (using 2006 data). However, this estimate only accounts for the impact on wages.

4. The problem I refer to is endogeneity bias, that could mis-predict the impacts. This type of bias requires a multiple equation approach that requires that factors that distinguish a community's ability to lure a Super Bowl, but are unrelated to its overall economic growth be found.

To extrapolate this to both total output and employment we use a regional impact model. In essence, we have circumvented the weaknesses the input-output model, by not relying on visitor expenditure estimates. But, we exploit its strength in estimating supply chain linkages between industries in the region. Table 2 details the impact of the Super Bowl, expressed in 2006 dollars across the nine county Indianapolis Metropolitan Statistical Area.

Thus, we estimate that if the Super Bowl comes to Indianapolis, the resulting economic impact will be roughly 5,000 full time equivalent jobs paying roughly $40,000 in total compensation. The total economic impact would be roughly $364 million in 2006 dollars. This estimate is approximately 5 percent higher than the average of the estimated impacts of the past five Super Bowls. Four of these five estimates were made using similar econometric models.

We offer some caution. We have modeled the effects as happening primarily within the sporting related activities. This was done to accommodate the large influx of NFL and media employees to the region. Some of the impact will undoubtably be felt more heavily in accomodations than in arts and sporting events. This would not affect the overall numbers or overall compensation, but might influence the share of activity across sectors.

Under Indiana's current tax system, this economic activity would result in roughly $32 million in total tax receipts to state and local activities.[5]

Summary

This report offers an estimate of the impact of the Super Bowl in Indianapolis. Using the most conservative approach, I find the impact of the Super Bowl to be a significant, one time increase of $365 million in total economic activity, resulting in $202 million dollars in labor compensation and roughly 5,000 employees. State and local tax revenues would top $32 million under the current tax structure. This estimate is highly consistent with other estimates, and relies on historical data of actual Super Bowl impacts dating back to the 1960s. It is within 5 percent of the average impact estimates for the past five Super Bowls (which is important, since the impacts are apparently increasing with time).

Some caveats remain. This study does not take into account local public sector expenditures, and is thus not a benefit cost analysis of the Super Bowl. It is however, a study that employs the most sophisticated modeling techniques, and which acknowledges the earlier critiques of these types of studies. In the end, this study suggests, as the vast majority that have preceded it, that the Super Bowl would be a significant contribution to the economy of the host city.

5. We anticipate that roughly $2.5 million will be tax exempted through licensing agreements.

References

Baade, R. and Matheson, V. "An Assessment of the Economic Impact of the American Football Championship, the Super Bowl, on Host Communities." Reflets et Perspectives, 39(2-3), 2000, 35-46.

Hicks, Michael J. "A Quasi-Experimental Test of Large Retail Stores Impacts on Regional Labor Markets: The Case of Cabela's Retail Outlets" The Journal of Regional Analysis and Policy, XXVI 2007.

Humphreys, Jeffrey M, et al. 1993. "The Economic Impact of Hosting the 1994 Super Bowl in Atlanta." Georgia Business and Economic Conditions. November-December 1993.

Matheson, Victor and Robert Baade "Padding Required: Assessing the Economic Impact of the Super Bowl" College of the Holy Cross, Working Paper NO. 04-03, September, 2004.

Matheson, Victor "Research Note: Contrary Evidence on the Economic Impact of the Super Bowl on the Victorious City" mimeo

National Football League. "Super Bowl XXXII Generates $396 Million for South Florida." NFL Report, 58(7), 1999(b).

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