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ABSTRACT

Research has produced mixed results regarding the presence of economies of scale in the US casino industry. This study replicated and extended two previous studies (Gu, 2001: Marfels, 1995) that examined economies of scale among Atlantic City casinos. Results were mixed. Depending on how size was operationalized there either was or wasn't evidence supporting scale economies in Atlantic City. These results have implications for future development in Atlantic City suggesting that management processes may be more important in achieving economies of scale than is the simple physical size of the casino floor.

Key Words: casino management, economies of scale, financial analysis, replication research.

INTRODUCTION

Current conditions present numerous challenges to the casino industry, both in the United States and internationally. Demand is soft and year-to-year performance figures have declined in many casino jurisdictions. Employees have been laid off. The lack of available credit has put many expansion plans on hiatus. Among the casino jurisdictions struggling during these current conditions is Atlantic City, NJ. In many ways Atlantic City's history as a resort has been a rollercoaster of alternating periods of popularity and economic decline (Stansfield, 1978). Since legalizing gaming in 1976 and opening its first casino hotel in 1978 Atlantic City has become the second largest casino gaming destination in the United States. There are currently eleven casino hotels operating in the coastal community. Developers in Atlantic City are in the process of adding or renovating at least four new casino hotel properties. The developers of those properties have important decisions to make regarding the allocation of a very scarce Atlantic City resource: space. New Jersey gaming regulations place constraints on the use of space, so decisions allocating space among hotel rooms, conference space, restaurants, entertainment and most importantly the casino itself are critical. The purpose of this study is to investigate the role of economies of scale in the Atlantic City casino industry. This will be done by replicating and extending two previous studies of economies of scale in Atlantic City casinos (Gu, 2001; Marfels, 1995).

The Regulatory Environment in Atlantic City

From the outset of legalized gaming in Atlantic City in the 1970s the State of New Jersey planned the industry as an oligopoly, meaning that there would be few casino operators in the market (Eadington, 1999). In order to gain licensure and build a casino in Atlantic City, properties have to meet certain benchmarks for size and scope. For instance, new Atlantic City casino construction has to include at least 500 hotel rooms and casino floor space of 60,000 square feet or less. If casinos built more than 500 hotel guest rooms and suites, they could increase the casino floor size by 10,000 square feet for each additional 100 rooms above the prerequisite 500 rooms. While no cap was placed on the total size of Atlantic City hotels, the maximum casino floor size was set at 200,000 square feet (New Jersey Casino Control Commission (NJ CCC), 1976). These regulations limited the types of investors who could afford to do business in Atlantic City and set up the oligopolistic nature of the industry present in Atlantic City.

21st Century Challenges Facing Atlantic City

In the early 2000's, Atlantic City began yet another resurgence. Atlantic City casino market revenues grew every year (Rutherford, 2008). Borgata Hotel Casino & Spa opened in the summer of 2003; it was the first new casino property to open since the Trump Taj Mahal thirteen years prior. Borgata, an upscale, Las Vegas-style mega casino, was the first of its kind to open in Atlantic City. Borgata was an immediate success and it showed that Atlantic City had capacity for growth. On the heels of a successful half-decade of operations for Borgata, plans were on the table to bring several additional Las Vegas-style properties to Atlantic City.

But in early 2009, Atlantic City is again at a crossroads. Atlantic City casinos were hit hard from two directions in 2008: global macroeconomic decline caused by the US banking collapse and an increase in regional gaming competition. The economic downturn in the United States had a definite impact on the Atlantic City casino market. However, had the Atlantic City casino market not faced the increased competition from the new racinos in Pennsylvania, it may well have fared much better (Rutherford, 2008). These economic impacts reach well beyond the direct stakeholders in the Atlantic City casinos; the 9.25% tax on total casino revenue is a major funding source for the State of New Jersey (Parmley, 2006; Rutherford, 2008).

Economies of Scale in the Casino Industry

Quoting Cullen (1997, p. 140) "economies of scale exist when the long-run average cost falls as the rate of output increases." Furthermore, economies of scale can exist at various levels of aggregation: there can be economies of scale at play for an industry as a whole, for a firm, and/or for a production unit. Thus economies of scale can be external to the firm but internal to the industry—as the industry grows all units in the area benefit from reduced costs. Or economies of scale can be internal to the firm or the production unit. In that case the benefits of decreased cost per unit of output are only enjoyed by the firm or production unit that has some advantage from, typically, size or scope of operations. Cullen goes on to argue that long-term trends away from small independent economic units in hospitality and towards multi-unit operations reflects the achievement of, and benefits from, economies of scale.

In contrast Vogel (2001) is more agnostic regarding the presence of economies of scale in travel and hospitality industries. He argues that in these industries, including casinos, constant return to scale are dominant. He noted that while economies of scale can be achieved in administrative functions or purchasing, for example, (p. 183) "the people-service nature of these businesses suggests that most returns on investment do not improve as the scale of the operation increases."

Empirical Evidence for Casino Economies of Scale

Eadington (1976) used a Cobb-Douglas production function to model casino output as a function of capital, labor, and raw material inputs. Specifically he modeled gross casino revenue as a function of the number of various denomination slot machines, the number of table games of different types, and the number of employees. His units of analysis were seven Nevada gaming regions (Las Vegas Strip, Downtown Las Vegas, Reno, South Shore of Lake Tahoe, Sparks, North Shore of Lake Tahoe, and Elko) across the three years 1971 to 1973. He then summed the estimated output elasticities from the regression results. If these had summed to substantially more than 1.0 that would have provided evidence for scale economies. Elasticities in his empirical results summed to 1.106 which was not significantly greater than 1.0. Eadington considered this evidence regarding scale economies inconclusive but suggested that other evidence supported the presence of scale economies in the casino industry. He argued that if diseconomies of scale were present one would not expect larger areas to grow at faster rates than smaller areas. Since the larger gaming regions were growing faster than the smaller regions during the period under consideration he took this as evidence of a spillover effect of aggregation—that is an industry level economy of scale.

A different approach to the study of economies of scale in the casino industry was taken by Marfels (1995). He used casino floor space in square feet as his measure of size and looked for relationships between size and several measures of casino efficiency among Atlantic City casinos. The four measures of efficiency were total cost of casino / hotel operations per square foot of casino floor space, casino department revenue per square foot of casino floor space, casino department expenses per square foot of casino floor space, and casino department income per square foot of casino floor space. He claimed that these were, respectively, measures of average total costs, average revenues, average expenses, and average income. The analysis used full year performance data covering the years 1980 to 1993. Results for all four regression equations were statistically significant. In each case there was a negative relationship between casino floor size and each measure of efficiency. Larger casinos had lower total costs

per square foot of casino floor space and lower casino department costs per square foot of casino floor space than did smaller casinos. At the same time larger properties had lower casino department revenue per square foot of casino floor space and lower casino department income per square foot of casino floor space than did smaller properties. Marfels concluded (1995, p. 10) "overall evaluation of the evidence from the regression analysis leads to the conclusion that the Atlantic City industry does not lend support to the notion that bigness is better in casino gaming when casino floor space is used as the benchmark for bigness."

Firm level economies of scale have also been investigated. Upneja, Kim, and Singh (2000) examined a number of financial performance measures for 50 publicly traded casino firms listed on the New York Stock Exchange, the American Stock Exchange, and NASDAQ. Data was retrieved from COMPUSTAT for the fiscal year 1995. Eleven performance ratios measuring liquidity, solvency, efficiency, and profitability were used. Size was operationalized using the firms' asset value. A median split was used to dived the 50 firms into two groups—large firms and small firms. Differences in the 11 financial ratios between large and small firms were evaluated with the Wilcox Rank Sum Test. Three of these tests indicated statistically significant differences between large and small firms. All the observed statistically significant relationships involved solvency ratios. Upneja and colleagues found that smaller firms had a higher short-term debt ratio and lower long-term debt than did larger firms. Larger firms had a greater proportion of total debt than did smaller firms. These statistically significant relationships were all in the directions hypothesized from the literature. Failing to find any statistically significant differences in efficiency ratios (asset turnover and fixed asset turnover) lead the authors to note that (p. 33) "large casino firms do not appear to enjoy economies of scale."

A fourth approach to economies of scale in the casino industry was provided by Gu (2001; also 1999). He used vertical analysis of casino income statements to compare the performance of larger and smaller casinos. In this approach line items on an income statement are divided by total revenue—if costs and expenses are proportional between different firms or across different size classes then they will show similar percentage values. On the other hand, economies of scale would be suggested if larger firms have lower percentages for cost items and/or higher percentages for income items when compared to smaller firms. Diseconomies of scale would be suggested if larger firms have higher cost percentages and/or lower income percentages than smaller firms. Gu had access to aggregate data for small and large casinos on the Las Vegas Strip, where $72 million in revenue was the cut point between small and large casinos. He had access to individual property level data for Atlantic City. Given the regulatory requirements regarding size of casinos in Atlantic City he used an ad hoc cut point of $400 million in revenues to identify larger from smaller properties. Results from the vertical analysis of aggregated Las Vegas Strip casino income data illustrated a number of cost advantages enjoyed by large casinos over small casinos. Given the availability of property-level data for Atlantic City he was able to do both a vertical analysis of large versus small properties as well as a correlation analysis of the relationship between total revenue and each of the cost and income ratios from the casino income statements. These results also suggested that the benefits of economies of scale were present for larger properties compared to smaller properties in Atlantic City. For example, properties with higher total revenues tended to have lower cost-of-goods-and-services ratios, lower cost-of-selling, general, and administrative ratios, higher gross operating income ratios, and higher income from operations ratios than did smaller properties. Gu concluded that casinos in these two jurisdictions did experience economies of scale. Specifically larger casinos, as measured by total revenue, achieved savings in costs areas such as sales, payroll, administration, and marketing when compared to smaller casinos.

These empirical results reflect the divergent theoretical positions regarding economies of scale in the casino industry advanced by Cullen (1997) and Vogel (2001). Some evidence was found in some situations for economies of scale; however other studies that operationalized size differently, or used different methods, or focused on different jurisdictions, or used data at a different level of aggregation (i.e., property versus geographical aggregation) reached different conclusions. Thus it may be too early to generalize from this literature. Given the nature of these results this study will attempt to replicate and extend the two studies that focused on Atlantic City (Gu, 2001; Marfels, 1995) in order to try to answer whether or not economies of scale are currently extent in the Atlantic City casino industry.

Replication Research

Replication research was defined by Hubbard and Armstrong (1994) as "a duplication of a previously published empirical study that is concerned with assessing whether similar findings can be obtained upon repeating the study." But in hospitality researchers (as in many fields) it may be impossible to fully "duplicate" a study; more

often researchers are *approximating* the original work (Madden et al., 1995). For example, this study can replicate Marfels study and either support or contest his findings as he reported them using the same Atlantic City data that appeared in his original study. However, when looking at the casino data generated after 1993, the last year Marfels studied, this study can only approximate Marfels' research methods because of the introduction of factors such as changing economic cycles, regulatory changes (including the cessation of reporting casino department expenses and income to the NJ CCC), changes in local, regional and national competition, customer demographics, etc.

Replication research has long been a respected form of research in the natural sciences due to its ability to support or challenge, and therefore validate, previous work (Madden et al., 1995). However, replication research in hospitality studies has been less common. This is an unfortunate fact since replication is integral to establishing reliability, validity and generalizability to research findings.

METHODS

Data was collected from New Jersey Casino Control Commission annual reports spanning 1980, the first year to have full year data available for more than one property, through 2007. Marfels (1995) also used 1980 as the initial year in his data series. The annual reports provided data for casino revenues, costs, income, and casino floor size for each of the Atlantic City casinos each year they were in operation. As a further extension to Marfels (1995) a second set of data was analyzed. This second data set included only observations that qualified as multiple unit operators, such as Trump, Harrah's, Caesars and Bally's in years when the companies operated at least two casinos in the Atlantic City market. These 38 aggregated observations were then analyzed with the same methods previously described to measure the impacts of size on total revenue, cost and income. Unaudited property level income statements available from the NJ CCC for the year ending December 31, 2007 were used to replicate and extend Gu's (2001) analysis of economies of scale in Atlantic City. Data was manipulated to replicate the analysis appearing in Tables 6 and 7 of his paper.

RESULTS

Prior to carrying out the regression analysis to measure the impacts of casino floor size on costs, revenues and income, general descriptive statistics were generated for the data in the study. Some key observations about the Atlantic City casino industry from 1980 through 2007 include the following (recall that all dollar values are reported in 2007 dollars): the average casino floor size in Atlantic City between 1980 and 2007 was 97,174 square feet; the average Atlantic City casino generated $622 million in total revenues annually, which is equal to $7,010.63 per square foot; Atlantic City casinos, on average, had annual total costs of $414 million, which is equal to $4,853.15 per square foot; and average total income (or loss) amongst Atlantic City casinos was $8.7 million, which is equal to $88.20 per square foot.

Atlantic City: Casino Floor Size and Economies of Scale

Following Marfels (1995) three simple regression equations were used to understand the impacts of casino floor size on total revenues, total costs and total income. Understanding the value of these three independent variables is important when seeking to identify whether economies of scale exist in Atlantic City casino hotels.

The linear regression method used in this section is a loose replication of Marfels' method. Where Marfels measured data on casino department-specific revenues, expenses and income, this study looks at total property revenues (TR), costs (TC) and income (TI). Changes in New Jersey Casino Control Commission reporting eliminated the reporting requirement that generated the department-specific expense and income data. In addition to analyzing total revenue, total costs and total income, this study extends Marfels' work by generating statistics on approximately twice the number of data points available to Marfels in 1995.

To allow for comparability amongst casinos of different sizes, new variables were created in which Total Cost, Total Revenue and Total Income observations were divided by the square footage of a given casino's gaming floor. To determine whether economies of scale exist within Atlantic City casino hotels, this study looks at the impacts of Casino Floor Size on Total Costs per Square Foot, Total Revenue per Square Foot and Total Income per Square Foot. Additionally, all data measurements were adjusted for inflation using the Consumer Pricing Index (CPI) multiplier. Having inflation-adjusted, 2007 dollars provides for comparable measurements over the twenty-seven years of the study. Results are illustrated in Table 1.

Table 1. Regression Outcome: Casino Floor Size and Three Measures of Performance

Dependent Variable	Intercept	Coefficient B_1	R^2	F	Level of Significance
Total Cost per Square Foot	3491.232	.677	.459	251.06	.000
Total Revenue per Square Foot	1425.392	.465	.216	81.47	.000
Total Income per Square Foot	247.638	.136	.018	5.54	.019

First, the impact of casino floor size on total costs per square foot was examined. With an R-square of .459, a little less than half of the variation in total costs per square foot in this study can be explained by casino floor size. Using adjusted means, total costs per square foot equal $69,277.99 given the mean casino floor size of 97173.94 square feet. The slope of the regression line indicates that for each additional square foot of casino floor space, total costs per square foot increased by $0.68. Next, the impact of casino floor size on total revenue per square foot was analyzed. This time the R-square statistic indicates that 21.6% of the variation in the observations of total revenue per square foot can be attributed to the measurements of casino floor size. With a casino floor equal to the average of 97173.94 square feet, the data suggests that a property's total revenue per square foot would be $46,611.27. There is a positive relationship between the independent and dependent variables. So for each additional one square foot of casino floor space, total revenue per square foot increases by $0.47. Finally, this section looks at the impact of casino floor size on total income per square foot. With an R-square statistic of .018, roughly 2% of the variation of total income per square foot can be predicted by casino floor size. While this is a relatively weak coefficient of determination, the findings are statistically significant. With a casino floor equal to the average of 97173.94 square feet, the data suggests that a property's total income per square foot would be $13,463.29. With a slope of .136, there is a positive relationship between the independent and dependent variables. So for each additional square foot of casino floor space, total income per square foot increases by $0.14.

While the analysis of the impact of casino floor size on total income per square only accounts for a small amount of the variation in total income, the statistics related to casino floor size and total costs per square foot and total revenue per square foot do provide useful information about the relationship of the variables. The statistics for the impact of size on revenue per square foot and costs per square foot both explains less than half of the variation in the variables, however, the data does indicate that, all else being equal, total costs per square foot increase at a faster pace than do total revenues per square foot with each additional square foot of casino floor space. This indicates that bigger is not better and economies of scale with respect to casino floor size do not exist in Atlantic City casinos. However, the analysis of casino size and its impact on total income per square foot indicates that larger properties see slight increases, but that other variables beyond the scope of this study may have more of an impact on total income than casino floor size does.

Results of the Multiple Property Operator Analysis

Similar to the empirical analysis of the entire Atlantic City casino market, descriptive statistics were generated for three multiple property operators: Trump Entertainment Resorts, Harrah's Entertainment and Caesars/Bally's. Some key observations about the three brands with multiple Atlantic City properties include: the average combined casino floor size amongst the three brands in Atlantic City between 1980 and 2007 was 261,902 square feet; the average combined total annual revenues amongst the three brands' properties were $1.5 billion, which is equal to $6,131.53 per square foot (this is about $879 per square foot less than the city average revenue per square foot); Trump, Harrah's and Caesars/Bally's, on average, had combined property annual total costs of $786 million, which is equal to $4,041.78 per square foot (which is about $811 per square foot less than the city average cost per square foot); and average total income (or loss) amongst the three multi-property operators in Atlantic City was $11.5 million, which is equal to $62.75 per square foot (this is $25 less per square foot than the city average income per square foot).

Table 2. Regression Outcome: Casino Floor Size and Three Measures of Performance, Multi-unit Operations

Dependent Variable	Intercept	Coefficient B_1	R^2	F	Level of Significance
Total Cost per Square Foot	-.006616	-.589	.347	19.13	.000
Total Revenue per Square Foot	.005895	-.492	.242	11.52	.002
Total Income per Square Foot	-.000482	-.123	.015	0.55	.463

Summarizing the results in Table 2 both total cost per square foot and total revenue per square foot decrease as casino floor space increases for multi-unit operators in Atlantic City. There is no statistically significant relationship between size and total income per square foot of casino floor space. For the Trump, Harrah's and

Caesars/Bally's multiple property portfolios, casino floor size explains roughly 35% of the variation in the observations of the three brands' total costs per square foot. The negative t-value and slope is an indication of the nature of the relationship between the variables. For the three multiple casino operators that have operated in Atlantic City, their total cost per square foot decreases by $0.59 for every additional square foot of casino space. This statistic provides evidence of economies of scale that exist for Trump, Harrah's and Caesars/Bally's that did not exist for the Atlantic City casino industry in general. So while bigger may not necessarily be better at the property-level, bigger in terms of number of properties operated may indeed be the key to generating economies of scale, with respect to controlling costs, in Atlantic City. In contrast for the Trump, Harrah's and Caesars' casinos in Atlantic City, the data shows that for every additional square foot of casino floor space, total revenue per square foot decreases by $0.49. The negative slope indicates the lack of ability of the three brands to use their combined capacity to generate greater revenues per square foot. Finally, casino floor size is not useful in predicting total income per square foot amongst the multiple unit operators. The findings indicate that the variation in the observations of total income per square foot at the three multiple property operators in Atlantic City cannot be reliably explained by the observations of their casino floor sizes.

Atlantic City: Vertical Analysis of Income Statements and Economies of Scale

Extending Gu's (2001) work the most recent year-end casino income statements were analyzed using vertical analysis of cost and income ratios. Table 3 shows Gu's (2001) results as a benchmark and makes two comparisons with the available data—a comparison of small versus large casinos using the same size criteria as used by Gu and a comparison of single unit casinos versus multi-unit casinos (where single and multi-unit refer only to activities in the Atlantic City market). Comparing the 2000 results reported by Gu with the performance in 2007 (2008 data will be used once it becomes available) shows some of the impacts of economic trends and increased competition on Atlantic City. Ratios of income before taxes and extraordinary items (IBTEI) to total revenue declined for both small and large casinos between 2000 and 2007. None-the-less, larger properties appeared to outperform their smaller counterparts in that key cost ratios were lower and income ratios were higher. Similarly the data suggest some advantages for multi-unit operators over single unit operators in Atlantic City. Perhaps most noteworthy is that the ratio of IBTEI to total revenue was positive for multi-unit operators while it was negative for single unit operators. This happened even though what is arguably Atlantic City's most successful property, the Borgota, appears as part of the single unit operator data.

Table 3. Vertical Analysis of Atlantic City Casinos' Aggregated Income Statements; 2000 and 2007

	2000[1]		2007[2]		2007	
	small casinos[3]	large casinos	small casinos[4]	large casinos	single unit operators[5]	multiple unit operators
Total Revenue	100%	100%	100%	100%	100%	100%
Promotional allowances	10.9	10.9	26.0	21.6	22.2	23.4
Net Revenue	89.1	89.1	74.0	76.4	77.8	76.6
Costs of goods & services	49.3	44.1	47.6	45.2	47.7	44.9
Selling, general, and administrative	23.8	18.8	12.3	10.0	11.3	10.3
Provision for doubtful accounts	0.7	0.6	0.5	0.4	0.5	0.4
Gross Operating Income	15.3	25.6	13.5	22.7	18.2	21.0
Depreciation & amortization	4.8	5.4	6.0	7.4	7.4	6.7
Management fees	0.9	2.4	0.2	0	0.2	0
Other operating costs	2.0	1.3	2.6	1.8	0.3	3.0
Income from Operations	7.6	16.4	4.7	13.5	10.3	11.2
Interest income	9.1	9.5	9.1	7.3	8.0	7.7
Other non-operating expenses	1.0	0	7.1	0.8	4.6	-0.5
Income Before Taxes & Extraordinary Items	-2.5	7.0	-16.8	5.4	-5.8	1.4

[1] Gu, Z. (2001). Economies of scale in the gaming industry: An analysis of casino operations on the Las Vegas Strip and in Atlantic City. *The Journal of Hospitality Financial Management*, 9(1), 1-15.
[2] All analyses for 2007 by authors using data from the New Jersey Casino Control Commission unaudited income statements.
[3] Gu (2001) identified Hilton, Claridge, Resorts, Sands, Showboat, Trump Marina, and Trump Plaza as small properties and Bally's, Caesars, Harrah's, Tropicana, and Trump Taj Mahal as large properties.
[4] Following Gu and adjusting for changes in the industry Hilton, Resorts, Showboat, Trump Marina, and Trump Plaza were categorized as small properties and Ballys, Borgota, Caesars, Harrah's, Tropicana, and Trump Taj Mahal as large properties.
[5] Single unit operators in Atlantic City included Hilton, Borgota, Resorts, and Tropicana. Operators with multiple units in Atlantic City included Bally's, Caesars, Harrah's, Showboat, Trump Marina, Trump Plaza, and Trump Taj Mahal.

Recognizing that the vertical analysis data in Table 3 is aggregated across properties a correlation analysis was conducted using data at the level of the individual property (Table 4). Again this replicates and extends Gu's (2001) presentation. Generally the results parallel his findings. Size, as measured by total revenue is negatively related the ratio of selling, general, and administrative costs in both Gu's work and the current analysis. Similarly, there are positive relationships between size and gross operating income and income from operations ratios at both time periods. The current work finds a positive relationship between size and IBTEI ratio in 2007. These relationships seem consistent with the presence of economies of scale in the Atlantic City casino industry—at least when scale is measured by total revenue.

Table 4: Kendall's tau-b Correlation Coefficients and Significance Levels between Total Revenue and Cost/Income Percentages from Vertical Analysis

	2000[1]	2007[2]
Promotional allowances	0.147 (0.382)	-0.455 (.052)
Costs of goods & services	**-0.846 (0.000)**[3]	-0.345 (.139)
Selling, general, and administrative	**-0.783 (0.001)**	**-0.527 (0.024)**
Provision for doubtful accounts	-0.021(0.474)	-0.055 (0.815)
Gross Operating Income	**0.818 (0.001)**	**0.564 (0.016)**
Depreciation & amortization	0.378 (0.113)	0.200 (0.392)
Management fees	0.284 (0.186)	-0.341 (0.206)
Other operating costs	-0.036 (0.455)	0.110 (0.639)
Income from Operations	**0.671 (0.008)**	**0.782 (0.001)**
Interest income	0.434 (0.080)	-0.382 (.102)
Other non-operating expenses	-0.427 (0.083)	0.091 (0.607)
Income Before Taxes & Extraordinary Items	0.387 (0.103)	**0.600 (0.010)**

[1] Gu, Z. (2001). Economies of scale in the gaming industry: An analysis of casino operations on the Las Vegas Strip and in Atlantic City. *The Journal of Hospitality Financial Management*, 9(1), 1-15.
[2] All analyses for 2007 by authors using data from the New Jersey Casino Control Commission unaudited income statements.
[3] Results statistically significant at the $\alpha \leq 0.05$ level are printed in bold type.

CONCLUSIONS

This study looked at the issue of economies of scale in the Atlantic City casino industry by replicating and extending two previous studies. When size was operationalized using a measure of casino floor square footage industry-wide impacts were mixed. While revenue and income per square foot were positively related to casino floor size, so were costs—and costs appeared to increase at a higher rate than revenue. In contrast multi-unit operators saw costs decline as casino floor size increased. Unfortunately, so did revenue per square foot. When size was operationalized as total revenue more evidence was seen supporting both economies of scale and economies of scope for multi-unit operations.

New Jersey gaming regulations have shaped the industry in Atlantic City to include a relatively small number of relatively large properties. Yet even within this restricted range of business models there is some evidence that size matters. However, these results suggest that success is due to more than just the size of the casino floor. Rather successful high revenue casinos achieve cost savings compared to their less successful competitors. But this is a problematic finding since it suggests that mere physical size is not enough to achieve the benefits of scale economies in the Atlantic City market. Designing a property to optimize casino floor space is one thing; designing operational processes that reduce costs and generate high levels of profit may well be a more daunting task.

These results also emphasize some of the benefits from replication research. Similar results, produced by two different sets of researchers, separated, in one case, by almost 15 years, argues rather strongly for the validity of the results.

Opportunities for future research include testing hypotheses related to casinos' revenue and income in environments not as strictly regulated as Atlantic City. In addition, the there are opportunities to research impacts of the 2008 economic decline in the United States on casino markets across the country. Comparing the vertical analysis results for 2000 to those for operations in 2007 illustrated some of the areas hardest hit by economic conditions and indicated some ways that casinos are attempting to cope with these more challenging conditions (e.g., higher promotional allowances and tighter control on administrative costs). Replicating this study across other jurisdictions may help to identify best practice and may help to quantify the role that the different regulatory regimes play in shaping casino performance.

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