Estimating the Effect of Poker Room Promotions on Player Traffic

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Abstract

This paper examines the impact of poker room promotions on player traffic in casino-based poker rooms. Casinos regularly spend significant portions of their marketing budget on promotions, including free-play, item-based offers, complementary hotel rooms, and travel reimbursements (among others), in an effort to drive casino traffic. Poker room promotions, by contrast, are unique within the context of casino promotions because they are both player-funded and paid in cash. Despite these significant differences between poker room and other casino promotions, prior research has not provided empirical evidence on the effectiveness of poker room promotions. Using collected data on casino-based poker games and poker room promotions over an eight-month period, we present an analysis investigating the impact of common types of poker room promotions on player traffic. Our research demonstrates a consistently strong positive effect of poker room promotions on player traffic. This research offers a number of important insights not only for the gaming industry, but also for other industries which make use of a variety of promotion types (e.g. retail, hospitality and tourism, etc.).

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This paper is dedicated to the memory of our colleague and coauthor B.D. McCullough. Bruce was a Professor of Decision Sciences at Drexel University in Philadelphia for more than 20 years, a prominent researcher and author of several highly acclaimed textbooks on statistical analysis and predictive analytics. Bruce was a renowned educator, esteemed colleague, loyal friend, and a loving husband and father. He will be deeply missed by everyone who was fortunate enough to know him.

Introduction

This paper examines the impact of poker room promotions on player traffic in casino-based poker rooms. Poker games have enjoyed a surge in popularity over the last two decades thanks to the rise of televised poker tournaments and expanded access to games (via growth in local and online poker rooms) (Raskin, 2014). Local access to live games continues to expand along with the approval of brick-and-mortar casino gambling throughout the United States (Jones, 2018). The portrayal of poker as a social, skill-based gambling activity (compared to other casino activities such as playing slot machines) has significant implications for the type of players it attracts to the casino. These players tend to be younger (under 35) and have higher levels of disposable income (Ruddock, 2017). Given these demographics, numerous casinos have chosen to open new poker rooms to drive traffic to the casino (Burris, 2021; Pajich, 2021; Sofen, 2021). Poker rooms, in a similar effort to attract players, often offer promotions in the form of cash giveaways awarded throughout the day.

Poker promotions differ from other casino promotions in at least two ways. First, poker promotions are typically funded by players (rather than the casino) using additional pot raking known colloquially as "promotional rake." Every pot that reaches a specified size threshold is raked an additional one or two dollars beyond the normal rake exclusively to fund promotions. Second, poker room promotions are typically paid in cash rather than in complementary play or non-cash items. Cash promotions include various payouts for periodic high hands (i.e., the best hand dealt to a player during a specific period), "bad beats" (i.e., players who lose while holding very strong hands), and other giveaways.

Despite the general view that promotions are an effective way for businesses to drive customer traffic,[1] it is *a priori* unclear whether player-funded poker room promotions are effective at driving player traffic. Several factors suggest that poker players may be reluctant to participate in poker promotions. In addition to the use of pot raking to pay for these promotions, poker room promotions also tend to rely on chance rather than player skill, with players awarded for being dealt the highest ranked hand or sitting in a random seat during a promotional period (Woolley, 2016). The combination of these two factors may deter players who view poker as the only casino game where their skill can translate directly into regular winnings (Woolley, 2015). By contrast, promotional prizes tend to be relatively large and paid in cash (Woolley, 2016). Additionally, poker rooms tend to be relatively small, making the odds of winning a prize higher than most other types of casino promotions (which tend to be open to a larger pool of players) (Wooley 2016). Players, even those focused on exploiting their skill advantage against lower skilled players, may view promotional winnings as a sufficiently attractive return on their promotional rake to participate. Thus, whether player-funded poker promotions drive player traffic remains an important empirical and practical question. Addressing this question can yield important insights into the optimal design of casino promotions for maximizing both gaming revenue and overall spend.

We conduct our analysis using individual casino data from three geographic clusters in the Northeastern United States. Casinos in these regional clusters tend to structure their promotions to avoid competing directly with each other, thereby maximizing the effectiveness of their promotional efforts. We use several statistical methods to analyze our casino data. Our primary analysis is conducted using cross-sectional multivariate regression analysis. These regressions account for hour, day, and month fixed effects and are estimated at the individual-casino level. We supplement these tests by calculating confidence intervals and conducting t-tests on more limited samples of our data.

[1] See literature reviews/syntheses by Blattberg, Briesch, and Fox (1995) and Chandon (1995) for more general discussions of how various forms of marketing promotions yield increased customer traffic.

Literature Review

An Overview of Poker Rooms and Poker Room Promotions

Poker is unique within the casino in that its revenues are generally predictable and strictly related to player traffic (Suh & Tsai, 2013). Casinos typically earn a percentage of each pot, known as the rake, as a fee for organizing and managing poker games. This rake is expressed as a percentage of the pot, typically between 5% and 10% of the pot up to a pre-specified threshold (Phillips, 2010). Because the casino has no stake in the actual poker game being played aside from the rake, poker room revenues are strictly positive. This is in sharp contrast to other casino games where revenue can fluctuate widely, even being net negative, in the short-term due to variance. Each poker table runs one hand at a time, meaning that the amount of rake collected is driven by the number of tables running rather than the number of players. The costs of running these games include dedicated floor space, equipment (tables, chairs, etc.), and personnel. Personnel consist of dealers, who are typically paid primarily through gratuities, and supervisory staff. Driving traffic to the poker room is critical, therefore, to boost the number of games that are running at any one time and to spread the fixed costs of the poker room (equipment and supervisory staff) over a larger number of games.

Poker room promotions typically consist of so-called "High Hand" promotions (Woolley, 2015; 2016). These promotions involve tracking the player who showed the highest value poker hand during the promotion period and awarding them a cash prize. A recent "High Hand" promotion at a Philadelphia-area casino, for example, awarded a $300 prize to the player who showed down the high hand during each half-hour period over a 10-hour period from noon until 10 P.M. Another popular type of promotion is a "Hot Seat" promotion when a random seat gets drawn among all active players in the poker room with the winner receiving a prespecified payoff amount. While the two types of promotions are equal in terms of the levels of payout, "High Hand" promotions are generally preferred by the majority of the poker rooms as these promotions encourage greater action, since players actually need to be involved in the hands to have a chance to win (Mudrik, 2017). These promotions may sound expensive, but casinos typically make them self-sustaining through additional rake. So long as traffic is adequate, poker promotions pay for themselves. Designing an attractive promotion which drives traffic to the poker room, therefore, is a critical concern for casinos.

Academic Research on Casino Promotions

Prior research has provided numerous insights into the role of casino promotions at driving general player traffic. Lucas and Bowen (2002) find that the magnitude of promotional prize money influences slot volume, though they conclude that the costs of those promotions lead to an insignificant economic impact of promotions. Lucas and Nemati (2020) confirm the latter observation by dividing casino customers into 6 tiers and noting that free-play offers neither paid for themselves nor yielded increased wagering of players' own money across all tiers. Lucas, Dunn, and Singh (2005) highlight significant negative cash flow from commonly used complementary slot dollar promotions due to the increased traffic without commensurate increases in overall player spend. Match play promotions have similarly insignificant effects on gaming revenues (Lucas 2005). By contrast, McGowan and Brown (2009) find that comp-based casino promotions are effective at driving gaming volume and, to a lesser extent, profitability. Lee and Jang (2014) similarly find that certain forms of item-based offers, including travel reimbursement, free parking, and bus programs, are successful at attracting new players. Kim and Kang (2018) highlight the role of hotel room promotions at driving gaming revenues, with hotel room promotions having a direct positive effect, as well as an indirect effect when paired with promotions for non-food and beverage businesses within the property, on gaming revenues. These findings highlight the increasing importance of overall spend to casino profitability (in contrast with the more traditional focus on gaming revenues alone). Suh, Dang, and Alhaery (2014) also find that promotions are effective at driving slot traffic, with larger promotions being

more effective at driving traffic. Lucas and Spilde (2017) provide further insight into slot machine play offers by studying the effectiveness of player loyalty programs and related promotions at yielding more-than-minimum play from slot players.

Theoretical Development and Hypothesis

While these studies are informative as to the general conditions under which promotions should be expected to drive player traffic and gaming revenue, they focus exclusively on promotions geared toward slot and table games rather than poker room players. As previously discussed, poker room promotions differ substantively from other forms of casino promotions. Each of these factors can be expected to influence the extent to which players will be motivated by poker room promotions. Expectancy theory (Vroom 1964) contains three elements which influence how promotions influence player motivation: (1) expectancy, or the belief that one can meet the requirements of the promotion, (2) instrumentality, or the belief that meeting the requirements of the promotion will yield the reward, and (3) valence, or the player's value for the offered reward.

Promotional Expectancy: Two factors should influence promotional expectancy: number of players and probability of winning. Compared to other forms of casino promotions, fewer players are eligible to win poker room promotions (since poker rooms are small relative to the overall casino). Thus, promotional expectancy should be both higher for poker room promotions relative to other casino promotions and related to player traffic during the promotional period (i.e., more people, lower expectancy). The distribution of hands during any given period is random such that players should have an expectation that their probability of winning a promotional prize is reliably non-zero.

Promotional Instrumentality: Casinos operate in a highly regulated environment, with casinos required to receive regulatory approval over all cash poker room promotions and to maintain sufficient cash reserves to pay out promotions immediately during the promotional period (PA Gaming Control Board, 2021). Thus, we expect players will have a high level of instrumentality related to poker room promotions. We have found no reported examples of poker room promotions which were not paid out by casino poker rooms.

Promotional Valence: We expect that promotional expectancy will vary substantially among players based on several factors. The use of cash payouts and overall "larger" payouts (compared to other kinds of casino promotions) should both increase reward valence. Player funding of poker room promotions should decrease the valence of the promotional prizes by reducing the net expected value of the promotional payout (i.e., Expected payout minus expected contributions through rake). Valence should also be impacted by the extent to which winning promotional prizes relies on chance rather than skill. Some subsets of players (e.g., lower skill and/or recreational players) may be attracted by the opportunity to win promotional prizes while playing poker, while others (e.g., higher skill and/or professional players) may find that promotional prizes are insufficient to offset the additional outcome variance introduced to poker games by players chasing promotional prizes (Woolley, 2021).

These conflicting effects make it difficult to determine the general effect of these promotions at stimulating player traffic. As such, we state our hypothesis in the null form (with corresponding alternative form provided):

H_0: Poker room promotions will have no impact on player traffic in casino-based poker rooms.

H_1: Poker room promotions will have an impact on player traffic in casino-based poker rooms.

Methodology

Sample

"Bravo Poker Live" is a website (https://www.bravopokerlive.com) with an associated mobile app functionality where, among other things, poker players can see the number

of tables of each type and limit of poker game being run at their local casino. This data is updated in real time by the casinos as tables are opened and closed. We created a bot to scrape this website every ten minutes and collected data for the period from 17 July 2017 through 26 February 2018. In an average month, we collected table and game data for 4,400 10-minute sample periods for each casino in our sample, resulting in more than 25,000 total samples for each of the properties. Sampling every ten minutes yields six observations per hour: date, time to the second, game (e.g., 1-2 NL Holdem), number of tables for that game, and the venue (e.g., Parx Casino). Time was truncated to the minute. Occasional server disruptions led to a relatively small number of missing observations (represented as NA in our sample). These data appear to be missing at random. The most prevalent causes of such disruptions include localized internet failure, system glitches, and other connection issues. The total number of observations is given in Table 1.

Data was collected for three regional clusters of casino-based poker rooms. The first of these clusters is in Philadelphia and consists of three casinos: Harrah's Philadelphia, Rivers Philadelphia (formerly known as SugarHouse during our sample period), and Parx. These casinos are all located within a half hour of Center City Philadelphia and compete for the same group of Philadelphia metropolitan area poker players. The second cluster is in Connecticut and consists of two casinos: Foxwoods and Mohegan Sun. These two casinos are within 10 miles of each other and represent the two oldest and most established casino poker rooms in the New England region. The third cluster is in the mid-Atlantic region and consists of three casinos: Maryland Live, Horseshoe Baltimore and MGM National Harbor. These mid-Atlantic casinos all relatively new poker rooms that attract poker players from Maryland, Virginia, and metropolitan Washington DC area. While the geographic areas were selected arbitrarily, we gathered data for all casino-based poker rooms which operated within the area during the sample period.

During the sample period, the casinos offered players choice among several different poker games. The games are primarily characterized by type of game (Texas Holdem being the most prevalent with others, such as Omaha and 7-Card Stud, being available regionally), betting structure (limit or no limit) and stakes (buy-in limits and blind bet sizes). As shown in Table 2, most games offered in the Philadelphia region (Region 1) are no-limit Holdem. The distribution of games available in other regions is similar to that of the Philadelphia region.

Table 1
Sample observations by casino

Casino	*n*	# of NAs	Total Usable Observations	Total Hourly Observations (Average)
Region 1				
Harrah's Philadelphia	76,383	3,054	73,329	5,339
Parx	196,446	113	196,333	5,339
Rivers	87,668	111	87,557	5,086
Region 2				
Foxwoods	194,372	0	194,372	4,114
Mohegan Sun	80,158	0	80,158	4,114
Region 3				
Maryland Live	132,480	78	132,402	5,362
MGM National Harbor	207,794	87	207,707	5,362
Horseshoe Baltimore	75,979	142	75,837	5,362

Each month, for each casino, we visited the casino website and recorded data for that month's poker promotions. Table 3 shows a representative promotion, this one from the Rivers Philadelphia Casino for February 2018. That month, Rivers Philadelphia had 70 hours of promotions per week.

Data Analysis

Our primary dependent variable is the "average number of "tables per hour." Our data extends from midnight (00:00) 17 July 2017 through 13:10 on 26 February 2018 which is roughly 224 days, at 24 hours per day yields 5376 + 13 = 5389 continuous hours, some of which we lose due to the above-mentioned NAs. In general, our collection of data in 10-minute intervals yields six observations per hour for the number of tables observed; we take the average of these six observations and use that as our measurement of the average number of tables during that hour (*AvgTables*).

Since promotions always begin and end on the hour, we construct our primary independent variable of interest for promotions (*Promo*) and code each hourly observation as "N" (for periods with no promotion) or "P" (for periods with promotions). Our average tables per hour variable includes all tables regardless of the type of game being spread as there are relatively small differences in table rake across the various types of games offered.

Table 2
Distributions of Games for Region 1

Game	Harrah's Philadelphia	%	Parx	%	Rivers Philadelphia	%
1-2 NLH	26,585	36.25	31,256	15.92	31,040	35.37
1-3 NLH	20,423	27.85	23,765	12.10	24,420	27.83
2-X NLH	13,480	18.38	29,428	14.99	25,772	29.37
5-X Omaha	2,477	3.38	20,274	10.33	3,584	4.08
10-10 NLH	0	0.00	7,087	3.61	88	0.10
15-30 LH	0	0.00	9,877	5.03	0	0.00
40-80 LH	0	0.00	6,583	3.35	0	0.00
Sub-total	62,965	85.87	128,270	65.33	84,904	96.75
Other	10,364	14.13	68,063	34.67	2,853	3.25
Total	73,329	100.00	196,333	100.00	87,757	100.00

Table 3
Poker Room Promotions for Rivers Philadelphia Casino, February 2018

Thursday	$200 High Hand, every 30 minutes	12 PM–10 PM
Friday	$300 High Hand, every 30 minutes	12 PM–10 PM
Saturday	$300 High Hand, every 30 minutes	2 PM–12 AM
Sunday	$200 High Hand, every 30 minutes	12 PM–10 PM
Monday	$200 High Hand, every 30 minutes	12 PM–10 PM
Tuesday	$200 High Hand, every 30 minutes	12 PM–10 PM
Wednesday	$200 High Hand, every 30 minutes	12 PM–10 PM

We conduct our primary analysis using multivariate OLS regression analysis at the property level. We estimate Equation (1), shown below, for each casino to examine effect

of poker promotions on player traffic:

$$\boldsymbol{AveTables}_{it} = \beta_0 + \boldsymbol{\beta}_1 \boldsymbol{Promo}_{it} + \sum \gamma_{1-23} HourFE_{it} + \sum \gamma_{1-6} DayFE_{it} + \sum \gamma_{1-7} MonthFE_{it} + \varepsilon. \quad (1)$$

Given our use of time-series data, we are concerned with issues related to serial correlation and stationarity in our data and analysis. We assess the presence of serial correlation by calculating the Durbin-Watson D statistic (Durbin & Watson 1951) for each property-level regression. The calculated statistics range from 0.1148 to 0.3281. These statistics suggest our analyses may be impacted by serial correlation in our dependent variable. We subsequently include the lagged value of *AvgTables* in our model to account for potential serial correlation issues following prior research on poker rooms (Suh & Tsai 2013). We further assess potential stationarity issues using the Augmented Dickey Fuller (ADF) unit root test to test the stationarity of our dependent variable as suggested Dickey and Fuller (1979). We observe test statistic values of between -7.984 and -10.681, indicating significant issues with non-stationarity in our dependent variable. We therefore supplement our primary model with a linear trend variable, following prior literature by Lucas (2013) and Suh and Tsai (2013) on poker rooms, to account for potential issues of stationarity in our dependent variable. Our inclusion of binary fixed effects for the hour of the day (*Hour*), day of the week (*Day*), and month of the year (*Month*) also help address stationarity concerns by identifying and controlling for potential seasonality issues which might underlie our stationarity concerns.[2] Additionally, we run multicollinearity diagnostics for each of our property-level estimations. We observe no VIF factors above four across all eight property-level models, providing confidence that our models do not suffer from issues of multicollinearity.

Results

Property-level estimations for Equation (1) are reported in Table 4. These results provide strong support for the notion that poker room promotions have a significant positive ($p < 0.001$) influence on player traffic in poker rooms. We observe this positive and statistically significant relationship in 7 of the 8 casinos for which we estimate the relationship. The 8th casino, the MGM Resort at National Harbor, exhibits a slightly negative (relative to the coefficients estimated in our analysis of the other casinos) but statistically insignificant relationship between poker room promotions and player traffic. Upon further examination, we noted that the MGM poker room was relatively new at the time we collected data and held their promotions during periods where traffic should be expected to be relatively low. The combination of non-standard promotion periods and the relatively new room may be responsible for the statistically insignificant relationship noted in our analysis.

We further examine our results to determine whether there are any significant differences in poker traffic trends among the analyzed poker rooms. On an hourly basis, we note similar patterns of traffic growth and decline throughout the day. On a daily basis, most casinos have their largest traffic days on the weekends. The only deviation from this pattern is for Foxwoods, which has higher traffic on Sunday, Monday, and Thursday relative to Fridays and Saturdays. Later in this paper, we provide further examination of traffic patterns and promotions at Foxwoods which may help explain this discrepancy in overall traffic trends.

[2] Estimating our fixed effect regressions requires that we exclude one fixed effect each for hour, day, and month. Thus, we exclude 12:00 (noon), Wednesday, and October as each of these represents central points in the days, weeks, and months in our sample.

Table 4

Property-Level Regressions (Dependent Variable: AvgTables).

	(1) Harrahs	(2) Parx	(3) Rivers	(4) Baltimore	(5) Maryland	(6) Resort	(7) Foxwoods	(8) Mohegan
Promo	0.549***	0.869***	0.113**	−0.004	0.362***	0.657***	2.482***	0.949***
	(12.91)	(11.16)	(1.97)	(−0.09)	(7.33)	(8.52)	(12.08)	(10.34)
Day of Week Indicators								
Monday	−0.141***	0.404***	0.115***	0.002	−0.089	−0.105*	0.269**	−0.030
	(−3.32)	(5.86)	(3.25)	(0.05)	(−1.47)	(−1.73)	(2.08)	(−0.46)
Tuesday	−0.038	1.207***	−0.117***	0.165***	0.115**	−0.041	−0.682***	−0.110***
	(−0.96)	(19.19)	(−3.27)	(4.60)	(2.07)	(−0.69)	(−5.90)	(−2.18)
Thursday	−0.099**	0.471***	0.177***	0.080**	0.148***	0.098	0.121	−0.018
	(−2.46)	(7.17)	(4.64)	(2.35)	(2.82)	(1.62)	(1.52)	(−0.35)
Friday	0.673***	1.386***	0.299***	0.329***	0.736***	1.147***	−0.114	0.775***
	(15.18)	(19.05)	(6.96)	(7.82)	(9.50)	(7.37)	(−1.03)	(11.20)
Saturday	0.386***	0.882***	0.182***	0.095**	1.064***	1.223***	−0.318**	0.186**
	(7.20)	(10.68)	(3.91)	(2.32)	(8.81)	(7.05)	(−2.38)	(2.21)
Sunday	−0.059	−0.211***	−0.220***	−0.121***	−0.536***	0.275**	−0.628***	−0.504***
	(−1.32)	(−2.71)	(−5.44)	(−3.35)	(−8.02)	(2.43)	(−6.28)	(−7.56)
Hour Indicators								
0:00	−1.671***	−5.593***	−1.887***	−1.190***	−6.091***	−3.120***	−6.959***	−3.004***
	(-19.25)	(-33.44)	(-17.82)	(-14.40)	(-35.25)	(-14.26)	(-29.17)	(-21.06)
1:00	−1.807***	−6.451***	−2.157***	−1.472***	−6.537***	−4.119***	−7.646***	−3.810***
	(-22.78)	(-44.79)	(-22.72)	(-18.04)	(-39.92)	(-19.68)	(-33.30)	(-24.04)
2:00	−1.691***	−6.968***	−2.330***	−1.715***	−6.823***	−5.205***	−8.102***	−4.400***
	(-22.86)	(-46.85)	(-26.91)	(-22.80)	(-43.12)	(-27.66)	(-35.81)	(-26.92)
3:00	−1.776***	−6.964***	−2.478***	−1.718***	−6.544***	−6.349***	−8.439***	−4.553***
	(-23.59)	(-47.41)	(-30.16)	(-23.55)	(-45.75)	(-42.98)	(-39.31)	(-28.82)
4:00	−1.683***	−6.548***	−2.551***	−1.754***	−6.192***	−6.431***	−7.759***	−4.355***
	(-23.08)	(-51.01)	(-33.44)	(-24.20)	(-44.20)	(-45.26)	(-39.66)	(-30.43)
5:00	−1.602***	−6.082***	−2.589***	−1.832***	−5.980***	−6.495***	−7.069***	−3.643***
	(-22.44)	(-52.41)	(-38.03)	(-26.90)	(-44.10)	(-52.41)	(-37.04)	(-29.32)
6:00	−1.555***	−5.537***	−2.521***	−1.741***	−5.717***	−5.957***	−6.383***	−3.221***
	(-21.47)	(-52.11)	(-40.09)	(-26.70)	(-42.53)	(-44.14)	(-33.78)	(-26.49)
7:00	−1.417***	−4.793***	−2.177***	−1.502***	−5.155***	−5.013***	−5.901***	−2.900***
	(-20.94)	(-46.75)	(-38.07)	(-25.40)	(-38.91)	(-34.97)	(-31.33)	(-24.29)
8:00	−1.256***	−3.935*****	−1.917***	−1.275***	−4.704***	−4.034***	−4.373***	−2.337***
	(-19.96)	(-39.97)	(-34.01)	(-22.64)	(-36.25)	(-25.99)	(-20.29)	(-16.86)
9:00	−1.193***	−2.662*****	−1.584***	−1.028***	−3.588***	−1.452***	−2.312***	−1.376***
	(-18.40)	(-26.04)	(-29.48)	(-19.03)	(-25.75)	(-6.15)	(-7.34)	(-9.33)
10:00	−0.703***	−1.481*****	−1.135***	−0.724***	−1.486***	0.023	−0.985***	−0.656***
	(-8.61)	(-11.95)	(-21.18)	(-13.08)	(-8.74)	(0.13)	(-2.67)	(-4.89)
11:00	−0.293***	−0.254***	−0.655***	−0.314***	0.431**	0.129	0.187	−0.100
	(-4.44)	(-1.74)	(-11.94)	(-5.07)	(2.05)	(1.05)	(0.67)	(-0.66)
13:00	0.151**	−0.156	0.222***	0.198***	−0.650***	0.094	−0.674***	−0.065
	(2.19)	(-1.28)	(3.17)	(3.11)	(-4.49)	(0.79)	(-2.85)	(-0.48)
14:00	0.087	−0.463*****	0.296***	0.114*	−1.153***	0.118	−1.389***	−0.295*
	(1.15)	(-3.51)	(4.33)	(1.71)	(-7.70)	(0.81)	(-5.55)	(-1.96)
15:00	0.192**	−1.031*****	0.161**	−0.100	−1.637***	−0.367**	−2.597***	−1.150***
	(2.22)	(-6.56)	(2.16)	(-1.50)	(-10.13)	(-2.26)	(-9.80)	(-7.93)
16:00	−0.086	−1.694*****	0.273***	−0.174***	−2.047***	−0.587***	−3.751***	−1.320***
	(-0.95)	(-12.27)	(3.39)	(-2.65)	(-12.07)	(-3.18)	(-13.55)	(-9.15)
17:00	−0.436***	−1.962*****	0.486***	−0.246***	−2.447***	−1.135***	−4.809***	−1.692***
	(-4.90)	(-11.79)	(5.46)	(-3.62)	(-15.10)	(-5.91)	(-16.79)	(-12.07)
18:00	−0.772***	−2.663*****	0.735***	−0.174**	−2.897***	−1.641***	−5.913***	−1.988***
	(-9.22)	(-17.40)	(6.52)	(-2.38)	(-17.81)	(-8.13)	(-21.29)	(-14.67)
19:00	−0.793***	−2.293*****	0.685***	−0.143*	−3.343***	−2.090***	−6.246***	−2.045***
	(-9.99)	(-15.64)	(5.58)	(-1.78)	(-20.20)	(-9.97)	(-24.37)	(-14.51)
20:00	−0.731***	−1.929*****	0.027	−0.070	−3.451***	−2.08[0]***	−5.532***	−1.878***
	(-9.10)	(-11.75)	(0.23)	(-0.86)	(-21.11)	(-9.80)	(-22.57)	(-13.78)
21:00	−0.681***	−2.229*****	−0.283**	−0.200**	−2.997***	−1.858***	−4.842***	−1.731***
	(-9.27)	(-14.44)	(-2.43)	(-2.43)	(-18.22)	(-8.77)	(-19.94)	(-11.88)

Table 4
Property-Level Regressions (Dependent Variable: AvgTables), continued.

	(1) Harrahs	(2) Parx	(3) Rivers	(4) Baltimore	(5) Maryland	(6) Resort	(7) Foxwoods	(8) Mohegan
22:00	−0.927***	−3.062*****	−0.625***	−0.299***	−3.437***	−1.989***	−5.690***	−1.721***
	(-12.31)	(-19.16)	(-6.00)	(-3.66)	(-21.63)	(-9.22)	(-20.36)	(-11.43)
23:00	−1.148***	−4.233***	−1.273***	−0.615***	−4.706***	−2.236***	−6.303***	−2.072***
	(-14.86)	(-27.27)	(-12.08)	(-5.99)	(-21.01)	(-6.81)	(-22.72)	(-15.43)
Month Indicators								
January	0.023	−0.014	−0.065	0.274**	0.366	0.294	−0.151	0.050
	(0.18)	(−0.06)	(−0.49)	(2.25)	(1.34)	(1.10)	(−0.59)	(0.30)
February	0.068	−0.202	−0.077	0.372**	0.620*	0.332	−0.260	−0.210
	(0.40)	(−0.65)	(−0.45)	(2.49)	(1.87)	(1.06)	(−0.63)	(−0.74)
July	0.131	−0.072	−0.018	−0.280**	−0.138	−0.023	−0.017	−0.218
	(1.05)	(−0.31)	(−0.15)	(−2.48)	(−0.60)	(−0.10)	(−0.05)	(−0.96)
August	0.084	0.083	−0.041	−0.200**	−0.098	−0.020	−0.088	0.021
	(0.94)	(0.49)	(−0.45)	(−2.48)	(−0.56)	(−0.13)	(−0.36)	(0.13)
September	0.053	−0.285***	−0.086	−0.126**	0.168	−0.069	−0.060	−0.060
	(0.90)	(−2.63)	(−1.53)	(−2.39)	(1.58)	(−0.68)	(−0.39)	(−0.65)
November	0.068	−0.030	−0.010	0.097*	0.097	0.133	−0.013	0.005
	(1.12)	(−0.24)	(−0.16)	(1.89)	(0.87)	(1.23)	(−0.09)	(0.05)
December	0.008	−0.294*	−0.049	0.200**	0.415**	0.169	–	–
	(0.08)	(−1.73)	(−0.52)	(2.27)	(2.22)	(1.00)	–	–
Linear Trend and Lagged Dependent								
Trend	0.000	0.000	0.000	−0.000**	−0.000	−0.000	−0.000	−0.000
	(0.50)	(0.40)	(0.20)	(−2.39)	(−0.99)	(−0.63)	(−0.59)	(−0.19)
Lagged	0.879***	0.956***	0.907***	0.949***	0.938***	0.924***	0.918***	0.936***
AveTables	(126.17)	(186.01)	(128.29)	(138.99)	(139.04)	(72.25)	(91.53)	(137.67)
cons	1.043***	3.352***	1.651***	1.232***	4.298***	3.547***	6.169***	2.690***
	(7.65)	(13.65)	(12.38)	(9.67)	(15.52)	(10.21)	(12.95)	(8.46)
N	4458	5236	4988	5216	5246	5237	4047	3998
adj. R^2	0.9543	0.9806	0.9708	0.9615	0.9787	0.9793	0.9799	0.9763

t statistics in parentheses
* $p < 0.10$. ** $p < 0.05$. *** $p < 0.01$.

Robustness Check: Examining Shifts from Promotions to No Promotions

We note an important confound which we must consider in interpreting our results. The overwhelming majority of promotions in our sample occur either after 08:00 or before 23:00. A quick examination of the coefficients for our hour fixed effects shows that these hours are generally periods with increasing numbers of tables. Thus, the effect of promotions is confounded with the increasing time trend of the average number of tables during standard promotional periods.

To minimize the aforementioned confound related to the interaction between traffic time trends and promotional periods, we compare the hour before a promotion begins to the first hour of a promotional period for all three regions. For example, if a promotion begins at 18:00, we compare the average number of tables at 17:00 to the average number of tables at 18:00. We supplement this analysis by splitting our promotions into two types based on the average value of promotions for each casino. Below average promotions are labeled low (L) and above average promotions are labeled high (H). Formally, this is a two-sample test of means. The 95% confidence interval for each casino is reported in Table 5.

These results show that larger promotions are almost uniformly effective at stimulating higher player traffic, with the change from no promotion to high promotions yielding an increase of between 1.4 and 8.7 tables depending on the casino. The 95% confidence intervals for all but the Horseshoe Baltimore exclude zero, suggesting a statistically significant difference in the number of tables. Results for the shift from no promotion to low promotions, by contrast, provide mixed evidence on the effectiveness of promotions. For casinos in region 1, the shift from no promotions to low promotions yields between approximately one and four additional tables of player traffic. The same is true for casinos

in region 3, where Mohegan Sun's smaller promotions yield between one and two tables of additional player traffic. By contrast, casinos in region 2 not only shows no increase in tables when smaller promotions are introduced, but MGM National Harbor and Horseshoe Baltimore exhibit declines in player traffic. As previously discussed, there are several potential reasons for this effect. An additional reason beyond what was mentioned before is the relatively high variance between low and high promotions at the MGM National Harbor compared to other casinos. It is therefore possible that players avoid smaller promotions, instead waiting for the relatively lucrative large promotions.

Table 5
95% Confidence Interval for Changes in Promotional Levels

Casino	N to L	L to H	N to H
Region 1			
Harrah's Philadelphia	[1.0, 1.2] (142)	[0.9, 1.7] (11)	[1.4, 1.9] (99)
Parx	[3.2, 3.9] (50)	[−0.3, 0.6] (34)	[2.0, 3.0] (37)
Rivers Philadelphia	[1.2, 1.6] (132)	-NA-	[2.1, 2.6] (90)
Region 2			
Maryland Live	[−0.2 ,0.7] (116)	[4.9, 6.7] (55)	[2.6, 6.6] (31)
MGM National Harbor	[−4.0, −3.5] (322)	[4.1, 4.7] (297)	[3.3, 4.6] (124)
Horseshoe Baltimore	[−1.3, −1.1] (322)	[0.5, 0.7] (295)	[−0.1, 0.2] (124)
Region 3			
Foxwoods	-NA-	-NA-	[6.5, 8.7] (80)
Mohegan Sun	[1.4, 2.4] (18)	[0.9,2.5] (11)	[2.0, 3.0] (95)

Supplemental Analysis: Monday Madness at Foxwoods Casino

We also take advantage of a unique promotional feature at Foxwoods in order to better identify the effect of promotions. Foxwoods has a monthly promotion known as Monday Madness. While all other Mondays do not feature promotions, Monday Madness features a collection of high hand and random giveaways totaling well above the average level of hourly promotions. By comparing a Monday Madness day to a nearby non-promotional Monday, we can account for the time trend using a simple comparative approach with Foxwoods' normal player traffic patterns as its own control.

The average number of tables per hour on July 24th, 2018, a Monday Madness day, was 77.6. By contrast, the number of tables per hour on July 31st, 2018, a non-Monday Madness day, was 15.77. The 95% confidence interval between the average tables per hour between the two days was [53.10, 70.59] with an average difference of 61.85. The pattern of differences across all hours of the promotion, as displayed in Figure 1, suggests that promotions are effective at driving player traffic.

Discussion and Conclusion

This paper examines the impact of poker room promotions on player traffic in casino-based poker rooms. Using a combination of multivariate regression analysis and univariate sample testing, we find evidence to support the general effectiveness of poker promotions at increasing poker player traffic.

Theoretical Discussion

Our analyses provide support for a subset of our suppositions related to expectancy theory (Vroom, 1964). The general effect of poker room promotions and player traffic noted in our main analysis suggests that promotion expectancy influences player traffic,

with the mere presence of a promotion being associated with higher levels of poker room traffic. Our supplemental analyses related to promotional size also support the idea that higher valence (i.e., more valuable) promotions have an incremental positive impact on player traffic. Additional data on promotional size and an expanded sample could allow for future research to both confirm the valence effect and identify optimal levels/sizes of promotions. While we were unable to identify instances where poker rooms failed to pay out promotional prizes (i.e., variation in promotion instrumentality), future research might look at variation across jurisdictions in regulatory strength to better understand how instrumentality impacts poker players responses to promotions (e.g., Is player traffic less responsive to promotions offered in places like Texas card rooms, where the regulatory status and legality of poker rooms is murkier than in Las Vegas or other locales). Finally, an expanded sample of games at varying stakes could help us better understand how player expectancies surrounding their returns to skilled play impact their responses to poker room promotions. In particular, how do higher limit (i.e., more skilled) players respond to promotions as compared to lower limit (i.e., less skilled) players?

Managerial Implications

The results of our analysis provide several important insights as to how casino marketing professionals can make their poker room promotions more effective. Our evidence suggests that higher dollar value promotions are more effective at driving player traffic as compared to relatively smaller promotions. This is intuitive from a theoretical standpoint, as higher dollar value promotions are likely to increase the player's valence for the promotion at the same level of individual jackpot dollar contribution (Vroom, 1964). While this might be a problematic suggestion to make in the context of broader casino promotions, the use of player funded promotions in poker rooms makes it much easier for poker room managers and casino marketers to adjust the size of their poker room promotions upward without significant increases in marketing expenses. Switching to higher dollar value promotions may require poker rooms to be more selective in when they choose to run promotions, as promotional rake contributions are relatively static as a proportion of overall poker room revenues (Suh & Tsai, 2013; Woolley, 2015). Poker rooms should therefore focus on setting promotions during periods when players are available to play (typically evening hours) to generate the greatest increase in player traffic (McGowan, 2010). Finally, our data provides some qualitative evidence that regularly scheduled promotions may be more effective at generating player traffic. Results from our analysis of the two Connecticut casinos, for example, demonstrate similarly large effects of promotions (compared to other casinos) relative to their baseline levels of player traffic. A cursory review of the promotions for these casinos shows that they are much more consistent from month to month compared to the casinos in other regions. Anecdotal evidence provided by several discussions with recreational poker players suggests that being able to set a regular playing schedule helps with fitting poker into their leisure time routine while also balancing other personal obligations (e.g., family, work, etc.). Confirming this insight quantitively through additional data collection and analysis could provide a useful direction for future research.

Limitations and Conclusions

This study is subject to several limitations. While we can observe the total number of tables being run, we cannot directly calculate the exact number of players at those tables. Even though this reduces the granularity of our results, we nonetheless believe that table-level analysis is meaningful in examining general player traffic trends. We also cannot claim causation in our results given our use of secondary data. Conducting a true natural experiment with the cooperation of a casino-based poker room could help address these limitations. Additionally, we cannot entirely address the confound which exists in various time trends (day and hour effects) given the nature of our data and the sporadic promotional periods. Our efforts at accounting for the hour during which promotions go from

inactive to active are our attempt to address these concerns, but the lack of a true control sample of non-promotional periods at competing casinos prevents us from utilizing a more robust difference-in-differences methodology to analyze our data. Finally, we cannot rule out an alternative explanation whereby players adjust their playing times to coincide with announced promotional periods such that promotions become a form of necessary business expense in more saturated markets.

Nevertheless, we believe our results highlight an important consideration for casinos to boost overall player traffic in a cost-effective manner (given that players essentially fund their own promotions). Future research will dive deeper into network effects among clusters of casinos to determine how players flow from one casino to another based on the promotions being run. In particular, we believe more granular data on player typology could yield more useful insights into how poker rooms may structure their promotional activities in ways which maximize overall poker room and casino gaming revenues.

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