

UNIVERSITY OF MASSACHUSETTS SCHOOL OF PUBLIC HEALTH AND HEALTH SCIENCES

MGM Springfield First Year of Operation: Economic Impacts Report

Prepared by the UMass Donahue Institute's Economic & Public Policy Research Group

September 2020

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Table of Contents

Acknowledgementsii
Figures and Tablesiii
Executive Summaryv
Introduction1
Methodology5
Direct Impacts of Casino Operations
Public Sector Impacts from Gross Gaming Revenue18
Changes in Consumer Spending: Patrons and their Spending Patterns
REMI Results
Comparison to Plainridge Park Casino
Conclusion
Appendix 1: The PI ⁺ Model
Appendix 2: Detailed Methodology for Data Preparation41
Appendix 3: Glossary for Economic Impacts45
Appendix 4: The Concepts of Output and Value-Added46
Appendix 5: Patron Survey Tables

Acknowledgements

Support for this study came from the Massachusetts Gaming Commission under ISA MGC10500003UMS15A establishing the Social and Economic Impacts of Gambling in Massachusetts study. This multi-year project was competitively bid via the Massachusetts Gaming Commission Request for Response (MGC-RA-2012) for Research Services and awarded to the University of Massachusetts Amherst in April 2013. In June 2019 the Massachusetts Gaming Commission issued a subsequent Request for Response (BD-19-1068-1700-1-40973) for Research Services and the University of Massachusetts Amherst was awarded the contract effective January 2020.

We would like to thank Mark Vander Linden, Director of Research and Responsible Gaming, whose leadership and research insights have contributed to our work. We would also like to thank MGM Springfield Casino and Jose Delgado, Director of Government Affairs, Daniel Miller, Compliance Director, and Seth Stratton, Vice President & Legal Counsel, for their assistance, which allowed for the creation of this report.

SUGGESTED CITATION:

Peake, T., Breest, K., Aron, E. (2020). *MGM Springfield First Year of Operation: Economic Impact Report*. Hadley, MA: University of Massachusetts Donahue Institute, Economic and Public Policy Research Group.

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Figures and Tables

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Table 1. MGM Springfield Employment, Hours Worked, and Wages Paid by Region, First Year of
Operation
Table 2. MGM Springfield Hires, Hours Worked, and Wages Paid by Organizational Group, First Year of Operation
Table 3 MGM Springfield Hires Hours Worked and Wages Daid by Full-Time/Part-Time Status First
Year of Operation
Table 4. Hires by Place of Residence. First Year of Operation
Table 5. Payments Made by MGM Springfield. First Year of Operation
Table 6. Top 10 Industries by Vendor Spending. First Year of Operation
Table 7. Distribution of Local Aid from MGM Springfield Gross Gaming Revenue by REMI Region. First
Year of Operation
Table 8: Share of On-Site Spending by Spending Type and MGM Springfield. First Year of Operation 25
Table 9. Share of On-Site Gambling Spending by Spending Type at MGM Springfield, First Year of
Operation
Table 10. Share of On-Site Non-Gambling Spending by Patron Type at MGM Springfield, First Year of
Operation
Table 11. Off-Site Spending by MGM Springfield Patrons by Non-Gambling Activity, First Year of
Operation
Table 12. Share of Off-Site Non-Gambling Spending by MGM Springfield Patron Type, First Year of
Operation
Table 13. Summary of Primary REMI Inputs, First Year of Operation 28
Table 14. Sources of Patron Spending at MGM Springfield, First Year of Operation 29
Table 15. Economic Impacts of MGM Springfield by Region, First Year of Operation 30
Table 16. Employment Impacts of MGM Springfield from Public and Private Sector Activity, First Year of
Operation
Table 17. Average Casino Employment and Total Employment Impact, Plainridge Park Casino and MGM
Springfield, First Year of Operation
Table 18. On-Site Spending, Plainridge Park Casino and MGM Springfield, First Year of Operation
Table 19. Revenue and Taxes, Plainridge Park Casino and MGM Springfield, First Year of Operation34
Table 20. Off-Site Spending and Visitation, Plainridge Park Casino and MGM Springfield, First Year of
Operation
Table 21. Patron Type Definitions
Table 22. Share of On-Site Gambling Spending by Patron Type from MGM Springfield
Table 23. Share of On-Site Non-Gambling Spending by Patron Type from MGM Springfield
Table 24. Share of Recaptured Patron Gambling Spending by REMI Region from MGM Springfield
Table 25. Share of Recaptured Patron On-Site Non-Gambling Spending by REMI Region from MGM
Springfield
Table 26. Share of Reallocated In-State Patron Gambling Spending by REMI Region from MGM
Springfield
Table 27. Share of Reallocated In-State Patron On-Site Non-Gambling Spending by REMI Region from
MGM Springfield
Table 28. Share of Reallocated In-State Incidental Patron Gambling Spending by REMI Region from MGM
Springfield
Table 29. Share of Reallocated In-State Incidental Patron On-Site Non-Gambling Spending by REMI
Region from MGM Springfield

Table 30. Share of off-site gambling spending by visitor type from MGM Springfield50Table 31. Reallocated In-State Patron Off-Site Spending by REMI Region from MGM Springfield51

Figures

Figure 1. Massachusetts Gaming Commission Regions1
Figure 2. Host and Surrounding Communities2
Figure 3. REMI Regions7
Figure 4. Average Bi-Weekly Employment at MGM Springfield, August 2018 – November 2019
Figure 5. Map of MGM Springfield Hires, August 2018-January 201912
Figure 6. MGM Springfield Vendor and Government Spending by Region, First Year of Operation14
Figure 7. In-State and Out-of-State Spending by MGM Springfield by Industry, First Year of Operation 15
Figure 8. Map of MGM Springfield Private Vendor Spending by State, First Year of Operation16
Figure 9. Map of MGM Springfield Private Vendor Spending within Massachusetts by City/Town, First
Year of Operation17
Figure 10. Monthly Admissions at MGM Springfield, First Year of Operation
Figure 11. MGM Springfield Casino Monthly Gross Gaming Revenue, August 2018-February 2020 19
Figure 12. Disbursement of Taxes on MGM Springfield's Gross Gaming Revenue
Figure 13. New Local Aid Money from MGM Springfield Gross Gaming Revenue by City/Town, First Year
of Operation21
Figure 14. Map of Survey Respondents by MGM Springfield Patron Type, First Year of Operation23
Figure 15. REMI Model Linkages
Figure 16. Economic Geography Linkages
Figure 17. Trade and Commuter Flow Linkages

Executive Summary

The purpose of the MGM Springfield Operating Report is to estimate the full economic impact of the casino on the Massachusetts economy during its first year of operation. To assess total economic impacts, the UMass Donahue Institute's Economics and Public Policy Research unit (UMDI) assessed two key areas creating operational effects: casino operations (spending on vendors, employees and government entities) and patron spending (spending within the casino as well as in Springfield and the surrounding region). To conduct the analysis, UMDI collected data on MGM Springfield's operations, including employment, payroll, and purchasing data directly from MGM Springfield, as well as revenue data from the Massachusetts Gaming Commission and data on patron spending from a survey of casino patrons conducted by the SEIGMA team. From there, UMDI employed the PI⁺ model from Amherst, MA-based Regional Economic Models Inc. (REMI) to measure direct and spin-off effects in the Massachusetts economy.

An analysis of payroll data from MGM Springfield found that, upon opening, MGM Springfield employed just over 3,000 employees. That number fell by just over 30 percent over the course of MGM Springfield's first year of operation. The majority of MGM Springfield's employees lived in the Pioneer Valley region of Massachusetts, with the remainder of workers mostly located out of state, primarily in Northern Connecticut. MGM Springfield employees living in the Pioneer Valley had a lower average hourly wage than employees living in other places, which might be explained by a concentration of lower-wage workers close to the casino and in Springfield in particular. Three quarters of MGM Springfield workers held full-time positions at the casino.

UMDI also analyzed data on spending by MGM Springfield to outside entities such as private sector vendors, government entities, and other organizations. About three quarters of that spending was to private sector vendors, while most of the remainder went to government entities. The majority of the spending (58.1 percent) occurred within Massachusetts, with 31.2 percent of the spending occurring in the Pioneer Valley. Just over half of the payments to entities in Massachusetts but outside of the Pioneer Valley were payments to various government entities in Boston. Excluding payments to government entities, MGM Springfield spent more on goods and services from outside of Massachusetts than inside Massachusetts.

Payroll employment, visitation, and gaming revenue have fallen since the opening of the casino, although this is to be expected as the novelty of a new gaming facility wears off. Since the beginning of 2019 through the end of the study period, revenue has remained mostly level, as have the taxes collected by the state. The 25 percent tax levied on gross gaming revenue is distributed to a number of state funds, the largest one being local aid, which receives 20 percent of the taxes collected, or five percent of gross gaming revenue.

One goal of the SEIGMA team's survey of patrons at MGM Springfield was to understand how shifts in patron spending have affected the Massachusetts economy outside of the casino. Most of the patrons surveyed reported that they were either Massachusetts residents who would have otherwise spent their money gambling at an out-of-state casino, or out-of-state residents who specifically visited Massachusetts to gamble at MGM Springfield. Therefore, the survey indicates that most casino patrons did not shift their spending towards the casino and away from other businesses in Massachusetts – the spending is new to the Commonwealth. Finally, the survey allowed SEIGMA to estimate that visitors to MGM Springfield spent an estimated \$83.6 million in off-site spending in the Springfield area while visiting the casino. While some of that spending would have occurred in Springfield regardless, an

estimated \$66.3 million of this is money which would have been spent elsewhere if MGM Springfield had not opened.

To summarize our findings, the \$365.2 million dollars spent in and around MGM Springfield by casino patrons supported an average of 2,538 positions at the casino, paid \$85.2 million in compensation, and created demand for \$110.1 million of intermediate goods and services purchased from vendors by MGM Springfield. The casino also paid \$101.5 million in payments to government entities. These findings served as inputs which we used to inform our economic impact model, which estimates the secondary and tertiary "spin off" effects of an economic event. In addition to the 2,538 jobs directly supported by the casino, new spending from vendors, government entities, and new employees, along with shifts in spending from casino patrons led to another 3,740 jobs on net, for a total of 6,287 jobs supported by the casino. The majority of those jobs are located in the Pioneer Valley. MGM Springfield also supported \$356.9 million in new personal income and \$974.2 million in new output within the Massachusetts economy, of which \$640.1 million was value added (i.e., net new economic activity or gross state product).

Introduction

Background to the Research Project

In November of 2011, Governor Deval Patrick signed the Expanded Gaming Act into law, an act tasked with establishing the grounds for gambling legalization in the Commonwealth. Through the expansion of the casino industry in Massachusetts, lawmakers provided avenues for the creation of new jobs, revenue, and economic growth in the state. To ensure these needs are met, the Massachusetts Gaming Commission (MGC)–established to oversee the implementation of the Expanded Gaming Act–organizes protective measures for communities threatened by potential social and economic impacts of gaming establishments. The UMass Donahue Institute (UMDI), as a part of the Social and Economic Impacts of Gambling in Massachusetts (SEIGMA) Research Team, is tasked with producing various analyses of economic and fiscal impacts in fulfillment of the MGC's research agenda and mandates.

The gaming legislation allows for the creation of up to three commercial resort-style casinos in the state and one slots parlor. To reduce internal competition among casinos, the Commonwealth was divided into three licensing regions, shown in Figure 1, with each region able to attract no more than one full resort-style casino license. Slots-parlor licenses are not geographically limited. To date, two full resortstyle licenses and one slots-parlor license have been awarded. In Region A, Plainridge Park Casino–the state's singular slots-parlor–launched the casino industry with its opening in Plainville, Massachusetts in July of 2015. MGM Springfield, located in Springfield, Massachusetts, started as the first resort-style casino in the state, having taken residence in Region B in August of 2018. Encore Boston Harbor opened in Everett, Massachusetts, in June of 2019, joining Plainridge Park Casino as the second casino in Region A and joining MGM Springfield as the second resort casino in the Commonwealth.



Figure 1. Massachusetts Gaming Commission Regions

Regional Context: Springfield and Its Surrounding Communities

MGM Springfield is one of many gaming establishments owned by MGM Resorts International, a global gaming entertainment company with 30 properties worldwide, employing 83,000 people globally. MGM Springfield is normally open 24 hours a day and for all days during the week, including holidays and weekends. MGM Springfield features 2,500 slot machines, 93 gaming tables, and 23 poker tables. Located off of East Columbus Avenue in the heart of the city of Springfield's downtown, this facility offers non-gambling recreational activities and a variety of non-gambling services and amenities, including a 251-room hotel, spa, several restaurants, bars, and shops, convention space, movie theater, bowling alley, seasonal ice-skating rink, farmers market, and live entertainment. Valet parking and free self-parking are available at the casino's multi-level parking garage on MGM Way.

The city of Springfield is located in Hampden County, which is in the southern part of the Pioneer Valley in Western Massachusetts. Bordering the city are municipalities with Surrounding Community designations from the MGC, namely: Agawam, Chicopee, East Longmeadow, Holyoke, Longmeadow, Ludlow, West Springfield, Wilbraham, seen in Figure 2.



Figure 2. Host and Surrounding Communities

The 2018 population of the city is estimated at 155,032 residents, which makes Springfield the largest city in Western Massachusetts, and the third largest city in the Commonwealth. As the most populous city in the area, Springfield is an important hub in the economy of Western Massachusetts and Northern

Connecticut. Sixty percent of the jobs in Springfield are held by residents from other towns.¹ Over half of workers who reside in Springfield also work there, while most other residents commute to municipalities adjacent to Springfield.²

Springfield is recognized by the state as a Gateway City, a designation given to cities experiencing economic hardships from the decline in industries that used to be "a 'gateway' to the American Dream."³ Poverty rates are higher than the state and a lack of employment opportunities for its residents are among ongoing modern challenges in the city.⁴ Typically trending higher than the state, unemployment rates in Springfield were 13.7 percent in 2010, 5.1 percent higher than the state during the midst of the 2008 financial crisis.⁵ The median household income in Springfield is much lower than for Massachusetts as a whole–\$36,730 in the city compared to \$77,378 for Massachusetts between 2014 and 2018.

A high school diploma is the most common education level among Springfield residents compared to the state as a whole; and 18.6 percent of Springfield residents over 25 have a Bachelor's degree or higher whereas that share is 42.9 percent at the state level. In addition to lower education levels, there is a stark difference in the language profile of Springfield residents compared to the state. Among Springfield residents, 38.9 percent speak a language other than English at home while 23.6 percent of Massachusetts residents speak another language at home. Thirty-three percent of Springfield residents report speaking Spanish at home. Not only does Springfield have a high Hispanic population but it also has a larger population of Black residents when compared to the state. Black (alone, no other race) residents make up 20.9 percent of the population in Springfield while Black (alone) residents make up a mere 9.0 percent of the state's population.⁶

The location of Springfield for the Commonwealth's first resort casino is part of a recent wave of publicand private-sector investment in the city. According to a recent report by MassDevelopment,⁷ projects such as the \$95 million renovation of Springfield Union Station, the Springfield Innovation Center, and MGM Springfield are illustrative of this investment and are contributing to the revitalization of the city by drawing economic activity back into the region. MGM Springfield itself represents the largest privatesector investment in Springfield's history. The casino project itself was established with a range of conditions to support the city and the surrounding region including hiring and contracting goals to support diverse, local workers and businesses, and the inclusion of various community development projects and priorities to help revitalize downtown Springfield and its neighborhoods. Some of the commitments approved by Springfield's Mayor Dominic Sarno include MGM Springfield's agreement to hire no fewer than 3,000 employees of which 2,200 were full-time. Additionally MGM Springfield

https://www.masshousing.com/portal/server.pt/community/home/217/supporting_gateway_cities/4495 ⁴ Quick facts on Springfield compared to Massachusetts as a whole can be found here: https://www.census.gov/quickfacts/fact/table/MA,springfieldcitymassachusetts/INC910218

¹ U.S. Census Bureau, 2011-2015 5-Year American Community Survey Commuting Flows, Table 3 (Residence MCD/County to Workplace MCD/County Flows for the United States and Puerto Rico Sorted by Residence Geography: 5-Year ACS, 2011-2015)

² Ibid.

³ The Massachusetts Gateway City Program description can be found here:

⁵ Massachusetts Executive Office of Labor and Workforce Development, Local Area Unemployment Statistics ⁶ <u>https://www.census.gov/quickfacts/fact/table/MA,springfieldcitymassachusetts/EDU685218#EDU685218</u>, https://data.census.gov/cedsci/profile?g=1600000US2567000

⁷ https://www.massdevelopment.com/assets/pdfs/annual-reports/TDI report 2018.pdf

pledged to pay an annual rate of over \$25 million in property tax payments, community impact payments, community development payments, and Riverfront Park improvements payments.⁸

⁸ Springfield Casino Host Community Agreement, MassLive, April 30 2013.

Methodology

Overview

The process of assessing economic impacts began with collecting primary data on any economic variable which was likely to change as a result of the casino's operations. Many of these measures were provided directly by MGM Springfield, including employment counts, wages, and detailed vendor spending data. Other data, such as information on the collection and disbursement of taxes on MGM Springfield's gross gaming revenue, was provided to UMDI from state government sources. Finally, data on patron expenditure, origin, and consumption response to MGM Springfield was collected by the SEIGMA team, which administered an on-site patron survey at MGM Springfield.

Patron Survey Methodology

SEIGMA members from both the social and economic teams collaborated closely on the MGM Springfield Patron Survey, working together to create and implement the survey, and later to analyze the data and report on the findings. One of the important and unique aspects of this survey was the great lengths the team went to in order to capture a representative sample of patrons. This involved (a) waiting 6-12 months after the casino opened to allow patronage volume and demographic characteristics to settle; (b) splitting the data collection between the winter and the summer to take account of potential seasonal differences in patronage; (c) spreading each data collection period over a two week time span; and (d) sampling during both peak and non-peak days as well as during peak and non-peak hours. The survey was conducted over the following eight days, dates, and times: Saturday, 2/23/2019, 11 am-5 pm; Monday, 2/25/2019, 6 pm-12 am; Saturday, 3/2/2019, 6 pm-12 am, Monday, 3/4/2019, 11 am-5 pm; Saturday, 7/27/2019, 11 am-5 pm; Monday, 7/29/2019, 6 pm-12 am; Saturday, 8/3/2019, 6 pm-12 am, and Monday, 8/5/2019, 11 am-5 pm.

The unique approach was also reflected in the recruitment of patrons. Teams of surveyors, wearing UMass attire, were stationed at each of the three exits from MGM Springfield. The surveyors had three distinct roles, which they switched off every hour. **The counter** counted and kept a tally of all exiting patrons. When the sixth exiting patron was reach, **the solicitor** approached that patron and asked if they had 5-10 minutes to complete an anonymous, self-administered survey and receive a \$5 Starbucks gift card as compensation. If the patron indicated they were not exiting the facility (i.e., just going outside to smoke or use the ATM) the solicitor recorded a "non-exit." Importantly, if the patron declined to participate, the solicitor recorded, to the best of their ability, the gender, race, and age range of that patron.

If the patron agreed to participate, the solicitor escorted the patron to the table where **the table monitor** provided more information about the survey and offered the patron the survey electronically (via SurveyGizmo) or on paper, depending on the patron's preference. The purpose of the selfadministered format was to maximize the validity of responses to potentially sensitive questions (e.g., gambling expenditure, income).

The surveyors approached a total of 4,686 patrons exiting the casino and invited them to complete the survey. Of those, 417 people were not eligible to complete the survey⁹. Of the remaining 4,137 eligible

⁹ Ineligible people consisted of three groups: a) 312 individuals who were not permanently leaving (this was the largest group, and included a large number who were temporarily going outside to smoke), b) 59 patrons who had already completed the survey, and c) 46 people who were not actually MGM Springfield patrons (i.e., people who were just utilizing the free parking and non-uniformed MGM Springfield employees).

patrons invited to take the, survey, a total of 878 patrons agreed, which represents a response rate of 21.2 percent. Response rates for individual questions were above 80 percent for all but two of the questions (year of birth and having used a GameSense kiosk).

The patron survey data were weighted to correct for sampling biases based on: (1) seasonality and period of the week and (2) certain types of people being more or less likely to answer the questionnaire. Weighting was done to make the sample more representative of the population of MGM Springfield patrons in the calendar year of 2019. The first step of the weighting procedure accounted for differences in patron volume based on season and weekday/weekend. This step in the weighting process was based on entry count data provided to the SEIGMA team by MGM Springfield. The entry counts track entries into the casino, but do not distinguish unique patrons, since persons exiting and reentering the casino (i.e. for smoking, etc.) are counted each time they enter the casino. The entry counts also do not distinguish between patrons and MGM Springfield employees. The next step in the weighting process was done to establish the population characteristics during the sampling periods. This involved combining the age category, race/ethnicity category, and gender of people who completed the survey (and reported these demographic characteristics in their survey) with the age, race/ethnicity, and gender of people who declined to complete the survey (as recorded by the survey team). The demographics of people who completed the survey were then weighted to match the gender, race/ethnicity, and age range of the total population of casino patrons during the survey periods.

The reliability and validity of this step in the weighting procedure depends on the accuracy of the survey team in correctly identifying the age, gender, and race/ethnicity of refusals; this was examined using a rater accuracy test given to student surveyors, with an overall average of 89.1 percent correct identification. Based on the test performance of the raters, we concluded that it was reasonable to combine the demographic characteristics of people who completed the survey with the assessed demographic characteristics of people who refused to do the survey in order to establish the demographic characteristics of the total population of casino patrons during the survey periods. This allowed us to then create weights for the completed surveys so that their demographic profile (gender, race/ethnicity, and age range) matched the gender, race/ethnicity, and age range profile of the population of casino patrons.

More information about the MGM Springfield Patron Survey, including methodology and weighting, the questionnaire, results, and summary findings, as well as the concurrent License Plate Survey, can be found in a separate report which will be available on the SEIGMA website (https://www.umass.edu/seigma/reports).

Economic Modeling Methodology

For this analysis as well as past and future economic analyses, the SEIGMA team has chosen the PI⁺ model from Massachusetts-based Regional Economic Models, Inc. (REMI). PI⁺ generates realistic yearby-year estimates of the total regional effects of specific initiatives. Model simulations using PI⁺ allow users to estimate comprehensive economic and demographic effects created by economic events such as the development and operation of a casino within a region. PI⁺ allows economists to assess a variety of effects including economic impact analysis; changes in policies and infrastructure; and state and local taxes. REMI allows for dynamic, multi-year modeling as compared to other, more simplistic modeling systems. REMI thus has significant advantages for analysis of major complex initiatives that: (a) have time-series based impacts that are likely to vary over time; (b) require the use and interpretation of multiple economic variables; and (c) emphasize economic interactions between regions within the state that add up to a true state-level impact. The REMI model purchased by SEIGMA is a six region, 70 sector model. Each of the six regions in the model is built from Massachusetts counties, and the 70 REMI industry sectors roughly correspond to the 3-digit codes of the North American Industry Classification System (NAICS) (Figure 3). For the purposes of this study, PI⁺ used information on the economic concepts described above, all by region, to produce economic impact estimates. These inputs allow for the appropriate allocation of economic activity across the regions of the Commonwealth so that the model can calculate the total economic impacts for the state and show how activity in one region impacts others.



Figure 3. REMI Regions

The detail and specificity of the data provided to UMDI allowed the modelers to replace some of the default assumptions of the model with project-specific information. For example, PI⁺ includes average wages by industry and region and the typical flows of goods and services among regions. The operations spending data from MGM Springfield included specific information on each of these areas and therefore allowed the use of actual reported data rather than the averages built into the model which are needed in the absence of precise inputs. Appendices 1 and 2 provide detailed methodologies of the PI⁺ model and the data preparation. Appendix 4 provides a glossary of economic impact terminology.

Direct Impacts of Casino Operations

This section discusses direct impacts, the immediate economic impacts generated during MGM Springfield's first year of operations. As discussed in the Methodology, UMDI obtained data to measure and analyze primary spending at the casino, which serves as the basis for secondary economic effects as vendors, government entities, and employees spend the money they received from the operations of the casino. Major aspects of MGM Springfield's operations that have an immediate effect on the Massachusetts economy include hiring staff, paying wages, purchasing intermediate goods and services, and paying government taxes, fees, and community agreement payments. Direct spending in these ways triggers additional impacts in the economy. For example, MGM Springfield's spending on its own staff initiates secondary effects by creating new demand in Massachusetts as these employees spend their new paychecks. MGM Springfield's spending on intermediate goods and services—such as food, slot machines, and performers—supports employment and business expansion in other establishments. This section provides detail on this 'first-round' spending – discussing the ways MGM Springfield's primary spending and operations had a direct impact on the Massachusetts economy.

Employment and Wages

MGM Springfield's hiring of workers and paying wages and benefits represents one of its biggest economic contributions to the immediate region as well as to the broader economy. Payroll data is utilized for the analysis of employment and wages. On average, from September 2018 to August 2019, 2,538 workers were employed at MGM Springfield on any given day. Collectively, employees worked just over 4 million hours over this period, which earned them about \$85 million collectively. Full-time workers account for approximately three-quarters of MGM Springfield's employees.

The majority of employees live in close proximity to the casino, including municipalities just over the border in Connecticut. Table 1 shows the regional distribution of MGM Springfield's average annual employment counts, as well as the associated totals for hours worked, and wages paid. Average annual employment counts show that employees from the surrounding Pioneer Valley represent most of MGM Springfield's workers. Employees living outside of Massachusetts represent the second largest group by region, with 80% of these employees coming from Connecticut. This is unsurprising as the casino is located less than 10 miles from the Connecticut border. When examining the total hours worked and the total wages paid together, a regional difference emerges. Workers in the Pioneer Valley only made an average of \$19.24 per hour, while out-of-state workers made an average hourly wage of \$26.36 per hour. This discrepancy is likely the result of clustering of lower-wage workers in close proximity to the casino itself, while higher-paid workers are more geographically distributed. The average annual wage for MGM Springfield employees living in the Pioneer Valley is heavily influenced by the wages in places like Springfield, Chicopee, West Springfield, and Holyoke, where large numbers of MGM Springfield employees live and where average wages are lower than the average for all employees. There are also some communities within the Pioneer Valley, such as East Longmeadow, Longmeadow, and Wilbraham, where average wages for MGM Springfield employees are considerably higher than the average for all employees, however these discrepancies appear to mirror broader discrepancies in income across all workers in the area.

	Average Annual Payroll	Total Hours	Total Wages	Average Hourly
Region	Employment	Worked	Paid	Wage
Metro Boston	48	84,808	\$2,067,283	\$24.38
Southeast	2	3,123	\$66,933	\$21.43
Central	37	60,114	\$1,464,036	\$24.35
Pioneer Valley	1,834	2,820,395	\$54,261,649	\$19.24
Berkshires	6	9,055	\$185,954	\$20.54
Cape and Islands	0	55	\$666	\$12.00
Rest of Nation / World	612	1,031,472	\$27,184,645	\$26.36
Total	2,538	4,009,021	\$85,231,167	\$21.26

Table 1. MGM Springfield Employment, Hours Worked, and Wages Paid by Region, First Year of Operation

Source: MGM Springfield

Figure 4 shows the count of people employed at MGM Springfield for each biweekly payroll date. As was the case at Plainridge Park Casino, employment at MGM Springfield was highest in the first months of operation and gradually tapered off. This figure illustrates counts of employees from the first day of operation (August 23, 2018) until the most recent data collected (December 2019). MGM Springfield began operations with 3,072 employees which gradually declined over most of the rest of the study period. MGM Springfield completed its first year of operation with 2,122 employees representing a 30.9 percent decline over the course of the first year. In statements made prior to the start of the COVID-19 pandemic, MGM Springfield stated that they had struggled to find candidates for available jobs and that this, rather than a lack of interest in hiring, accounted for the lower-than-projected employment at the casino¹⁰.



Figure 4. Average Bi-Weekly Employment at MGM Springfield, August 2018 – November 2019

¹⁰ <u>https://www.masslive.com/mgmspringfield/2020/02/with-2004-workers-mgm-springfield-employment-stands-at-23-of-original-estimate.html</u>

As shown in Table 2, most of the employees hired at MGM Springfield worked in Gaming & Recreation (the casino portion of the resort), averaging 988 workers the first year of operation. The second and third largest work areas are the Food & Beverage and General & Administrative departments with 718 and 532 employees on average, respectively. Gaming & Recreation employees tend to earn higher wages, at \$23.92 per hour, while the second largest department, Food & Beverage, earned lower wages than most departments at \$17.39 per hour. These hourly wage levels include tips.

Department	Average Annual Payroll Employment	Total Hours Worked	Total Wages Paid	Average Hourly Wage
Entertainment	186	134,523	\$2,542,803	\$18.90
Food & Beverage	718	1,068,896	\$18,588,099	\$17.39
Gaming & Recreation	988	1,675,933	\$39,355,727	\$23.48
General & Administrative	532	939,328	\$21,531,429	\$22.92
Hotel	102	172,161	\$2,923,412	\$16.98
Retail	13	18,180	\$289,698	\$15.93
Total	2,538	4,009,021	\$85,231,167	\$21.26

Table 2. MGM Springfield Hires, Hours Worked, and Wages Paid by Organizational Group, First Year ofOperation

Source: MGM Springfield

Table 3 highlights some of the differences between part-time/on-call and full-time workers at MGM Springfield. Of all the employees working at MGM Springfield throughout its first year of operation, nearly 76 percent were full-time employees. It should also be noted that among these two groups exist workers who work multiple part-time positions, a combination of full- and part-time, and even on-call shifts. Full-time employees worked more hours overall than their part-time counterparts, making up 3.5 million of the 4 million hours worked (86.6 percent) that year. On average, full-time positions have higher base pay, and full-time employees earned nearly 90 percent of total wages paid.

Table 3. MGM Springfield Hires, Hours Worked, and Wages Paid by Full-Time/Part-Time Status, First Year of Operation

Part-Time/Full- Time Status	Average Annual Payroll Employment	Total Hours Worked	Total Wages Paid	Average Hourly Wage
Full-Time	1,927	3,472,960	\$76,441,805	\$22.01
Part-Time/On-Call	611	536,061	\$8,789,362	\$16.40

Source: MGM Springfield

Table 4 and Figure 5 detail the geographic distribution of employees hired by MGM Springfield in its first year of operation. Springfield residents represented 39 percent of all hires in the first year suggesting the casino is hiring heavily from its host and surrounding communities. The casino hired roughly 60 percent of its workers from host and surrounding communities and all but Ludlow and Wilbraham of the casino's surrounding communities appear in the top ten towns for hires. All the top Massachusetts locations for hiring are found in the lower Pioneer Valley, and the cities of Enfield and Norwich in Northern Connecticut.

City/Town	REMI Region	Average Annual Payroll Employment	Share of Employees
Springfield, MA	Pioneer Valley	990	39.0%
Chicopee, MA	Pioneer Valley	168	6.6%
West Springfield, MA	Pioneer Valley	98	3.9%
Agawam, MA	Pioneer Valley	87	3.4%
Holyoke, MA	Pioneer Valley	87	3.4%
Enfield, CT	Rest of Nation / World	87	3.4%
Westfield, MA	Pioneer Valley	62	2.4%
Norwich, CT	Rest of Nation / World	59	2.3%
East Longmeadow, MA	Pioneer Valley	43	1.7%
Longmeadow, MA	Pioneer Valley	42	1.7%
All Other Places		816	32.1%
Total		2,538	100.0%

Table 4. Hires by Place of Residence, First Year of Operation

Source: MGM Springfield

Figure 5, which uses randomly generated dots based on the zip codes of workers, illustrates that most of the individuals hired to work at MGM Springfield are clustered relatively close to the casino itself, specifically within the borders of Springfield. Some employees, however, are distributed as far away as Southern Connecticut, Southern New Hampshire, Cape Cod, the suburbs of southern Worcester County, and Boston or its immediate suburbs.



Figure 5. Map of MGM Springfield Hires, August 2018-January 2019

Source: MGM Springfield data

Note: Each dot represents one hire at MGM Springfield from August 2018 to January 2019. The total number of hires (3,827) differs from the average total employment because it includes all individuals who held a job at MGM Springfield at any point during the first year, including people may have quit or been terminated at any point during that period. The dots in Massachusetts and Connecticut represent 93.2 percent of all people hired by MGM Springfield in this period. A small number of employees who live in other states are not shown.

Vendor Spending and Taxes

In addition to wages paid to employees, MGM Springfield made millions of dollars in payments to various third parties in the first year of operation. MGM Springfield relies on the business of different entities to provide the casino with various essential services. These payments include purchases of goods from vendors, such as food and alcohol, payments to utility companies and third party service providers, and other payments made to various government entities, along with payments made on behalf of employees to various unions and membership organizations. Taken together, these payments amount to \$145.5 million in MGM Springfield's first year of operation, with \$84.5 million, or 58.1 percent of the total spent in-state.

With \$109.7 million of the spending, which is 75.4 percent of total vendor payments, payments to private sector vendors make up a strong majority of payments made to vendors by MGM Springfield. Payments to government entities makes up 24.3 percent. The remaining less than one percent can be attributed to payments to unions or membership organizations, payments to charitable organizations, or miscellaneous payments to individuals. Of the payments made to government entities, the Commonwealth of Massachusetts is the largest beneficiary with 13.9 percent of the money spent by MGM Springfield. Other State governments amount to less than one percent of the payments. However, local government entities within Massachusetts amount for 9.8 percent of the payments made by MGM Springfield. Table 5 summarizes the source of payments from outside entities.

Type of Payment Amount Share \$109,747,804 75.4% Payments to Private Sector Vendors \$35,422,476 24.3% Payments to Government Entities \$900,745 0.6% Federal Government Entities \$20,297,326 13.9% Massachusetts State Government Entities \$1,200 0.0% Government Entities in Other States \$14,223,205 9.8% Local Government Entities \$322,007 0.2% Payments to Unions and Other Membership Organizations \$34,200 0.0% Payments to Charitable Organizations \$0 0.0% Payments to Individuals \$145,526,487 100.0% Total

Table 5. Payments Made by MGM Springfield, First Year of Operation

Source: MGM Springfield

Table 6 shows the top private industry sectors to receive payments form MGM Springfield. The largest single industry in terms of spending by MGM Springfield was wholesale trade with 14.2 percent of the payments. This is somewhat intuitive since casinos need to purchase almost all of their food, alcohol, cleaning supplies, uniforms, printed materials, etc. from wholesalers. Not far behind is the second largest industry spending category, payments to miscellaneous manufacturing, at 12.7 percent. These payments are primarily made to the manufacturers of slot machines and other gaming equipment. Other additional expenditures made by MGM Springfield in its first year of operation were on standard business services (such as utilities, professional, scientific, and technical services, and administrative and support services). Payments to other industries, such as performing arts and spectator sports, and motion picture and sound recording industries, defining MGM Springfield as a resort-style casino.

Industry	Amount	Share
Wholesale trade	\$20,634,027	14.2%
Miscellaneous manufacturing	\$18,437,544	12.7%
Professional, scientific, and technical services	\$16,621,396	11.4%
Administrative and support services	\$7,512,811	5.2%
Ambulatory health care services	\$4,688,982	3.2%
Retail trade	\$3,551,815	2.4%
Broadcasting, except Internet	\$3,472,293	2.4%
Real estate	\$3,453,662	2.4%
Insurance carriers and related activities	\$3,252,025	2.2%
Personal and laundry services	\$2,601,641	1.8%
All Other Industries	\$61,300,291	42.1%
Total	\$145,526,487	100.0%

Table 6. Top 10 Industries by Vendor Spending, First Year of Operation

Source: MGM Springfield

As shown in Figure 6, the Pioneer Valley region of Massachusetts was the largest beneficiary of MGM Springfield's payments to vendors and governments within the state. In its first fiscal year of operation, 31.2 percent of these payments were made to businesses and government entities in the Pioneer Valley. The Metro Boston region is the second largest beneficiary of MGM Springfield within the state, with 23.3 percent of payments. One reason for the large share of payments going to the Metro Boston region is due to payments to state government entities in Boston, which represent 58.6 percent of the spending going to Metro Boston. Excluding payments to government entities, MGM Springfield spent more on goods and services from outside of Massachusetts than inside Massachusetts.



Figure 6. MGM Springfield Vendor and Government Spending by Region, First Year of Operation

Source: MGM Springfield

Figure 7 provides more information on this out-of-state spending, showing MGM Springfield's vendor spending by industry for in-state and out-of-state vendors. The single largest recipient of spending from the casino was the wholesale trade sector, with most of that spending occurring in Massachusetts. The second largest category includes miscellaneous manufacturing which includes manufacturers of gaming

equipment. In the United States, many of these manufacturers are based around cities such as Los Angeles and Las Vegas, supporting the finding that most of these funds were spent on out-of-state vendors.



Figure 7. In-State and Out-of-State Spending by MGM Springfield by Industry, First Year of Operation

Figure 8 shows private vendor spending by state. While MGM Springfield spent more on private sector goods and services from outside of Massachusetts, Massachusetts as a state receives the highest levels of spending to private sector vendors. The states receiving the next highest levels of vendor spending are California and Nevada, from which MGM Springfield purchased most of its gaming equipment. As illustrated in the map, MGM Springfield made payments to private vendors in 40 out of the 50 U.S. States. Its business spending to vendors from outside the U.S. was limited to a few purchases from three Canadian vendors and a single vendor from the United Kingdom.

Source: MGM Springfield



Figure 8. Map of MGM Springfield Private Vendor Spending by State, First Year of Operation

Source: MGM Springfield

Figure 9 shows private, non-farm vendor spending by city or town within Massachusetts. Private sector vendor spending within Massachusetts, in MGM Springfield's first year, was largely focused in the Pioneer Valley and the Metro Boston Regions. Additional, lower levels of spending went to vendors in the Southeast and Central regions.

Figure 9. Map of MGM Springfield Private Vendor Spending within Massachusetts by City/Town, First Year of Operation



Source: MGM Springfield

Public Sector Impacts from Gross Gaming Revenue

As primary sources of state gaming revenue, resort-casino revenues are important to track and assess over the years. Our analysis of revenue at PPC includes a discussion of revenue trends and taxes that are paid from this gross gaming revenue. Gross gaming revenue (GGR) at MGM Springfield is sourced from the bets that patrons place while gambling both on slot machines and on table games. For revenue sources from slots, total amount of bets placed are referred to as "coin-in", and the casino sets a hold percentage on these bets, which indicates the amount of coin-in to be retained as revenue. The remainder of coin-in is then returned to bettors in the form of a "payout." Table games generate revenue in the same fashion, although bets and payouts differ from game to game. Overall, the percentage of bets that MGM Springfield keeps is considered its gross gaming revenue. From this GGR, a resort-style casino like MGM Springfield is subject to a 25 percent state tax in Massachusetts. The total collected is then divided among 12 different public funds in the state, with the majority (20 percent) going to Local Aid.

Figure 10 shows visitation at MGM Springfield over its first year of operation. In its first year, MGM Springfield experienced an initial surge in visitation upon opening, with visitation largely leveling off after the first few months of operations. While visitation rose and fell over the course of 2019, it did not experience a clear positive or negative trend over the course of that calendar year.



Figure 10. Monthly Admissions at MGM Springfield, First Year of Operation

Source: MGM Springfield

The same trend observed in visitation can be seen in gaming revenue and, by extension, taxes paid on that revenue. MGM Springfield paid \$66 million in GGR taxes on \$264 million in gross gaming revenue generated by their slot machines and table games. As shown in Figure 11, after an initial spike in revenue in the first month of operation, GGR did not follow a consistent upward or downward trend. Instead, revenues stayed within a steady range throughout the period, rising and falling between just

under \$18 million to just under \$26 million, but staying in the \$20-\$22 million range for most months. This meant that revenue to the Commonwealth remained roughly level as well.¹¹



Figure 11. MGM Springfield Casino Monthly Gross Gaming Revenue, August 2018-February 2020

Taxes on MGM Springfield's gross gaming revenue are allocated according to a formula set in place by the Expanded Gaming Act. This is in contrast to most of the taxes paid by MGM Springfield, which are not earmarked for a specific purpose by the local, state, or federal government entities collecting them. Of the \$66 million in tax revenues collected from MGM Springfield during its first fiscal year of operation, 20 percent (\$13.2 million) went to local aid for Massachusetts cities and towns, while the remaining 80 percent was allocated to various state funds using the formula pictured in Figure 12.

It should be noted that many of the funds which receive revenue from taxes on MGM Springfield's gross gaming revenue also receive funds from other sources, such as budget appropriations from the state legislature. There is no way to know precisely how resources would have been allocated to these funds if the Commonwealth did not receive revenue from MGM Springfield and the other casinos. It is possible that an increase in funds from taxes on MGM Springfield's gross gaming revenue allowed the legislature to decrease their appropriation to a fund while preserving its operating budget. Because of the fungible nature of government funds, UMDI did not thoroughly model the exact economic impact of each fund, but rather chose to model the new funds to state and local government as new general state and local government spending.

Source: Massachusetts Gaming Commission

¹¹ In addition to these payments, MGM Springfield, as well as the other license awardees, paid licensing fees which were distributed according to a different formula. Since this report seeks to study the impacts of MGM Springfield in its first year of operation, these payments are not modeled, but they may be addressed in a future report.



Figure 12. Disbursement of Taxes on MGM Springfield's Gross Gaming Revenue

Source: Massachusetts Gaming Commission

Local Aid

The Commonwealth has an existing mechanism for making direct payments to cities and towns using the state's General Fund and proceeds from the state lottery. By statute, 20 percent of the taxes on MGM Springfield's gross gaming revenue is allocated to local aid and thus added to these existing sources of funding. This newly enlarged pot of money is then allocated using the same distribution formula which had previously been used, resulting in each city and town continuing to receive its expected share of now-greater local aid funds.¹² The formula currently set by the Massachusetts legislature distributes local aid funds based on a city or town's population, income, and property values. Indeed, large and economically distressed communities received the largest share of new local aid funds from MGM Springfield. Figure 13 and Table 7 show how local aid funds were distributed across Massachusetts.

¹² For more information on local aid distribution, see <u>https://budget.digital.mass.gov/bb/h1/fy18h1/os_18/h3.htm</u>

Figure 13. New Local Aid Money from MGM Springfield Gross Gaming Revenue by City/Town, First Year of Operation



Source: Massachusetts State Legislature, UMDI calculations

When aggregated into the regions that we used for our PI⁺ model, the majority of local aid funds are distributed to the Metro Boston region. This may be attributed to the high population density of the region and that many of the Commonwealth's more economically distressed cities and towns are within this region. As discussed earlier, contributions to the public sector, which generate spending in many areas, is the reason for a net positive economic impact in most regions of Massachusetts, which did benefit heavily from employment or vendor spending from MGM Springfield, but which did lose some local consumption as patrons reallocated their spending towards the casinos. This local aid funding is one the largest single sources of that spending.

Table 7. Distribution of Local Aid from MGM Springfield Gross Gaming Revenue by REMI Region, First Year of Operation

Fund/Source	Amount (Millions of Dollars)
Gross Gaming Revenue (GGR)	\$264
Taxes Collected from GGR	\$66
Total New Local Aid	\$13.2
Region	New Local Aid (Millions of Dollars)
Metro Boston	\$7.9
Southeast	\$1.9
Central	\$1.5
Pioneer Valley	\$1.5
Cape and Islands	\$0.1
Berkshires	\$0.3

Source: Massachusetts State Legislature

Changes in Consumer Spending: Patrons and their Spending Patterns

MGM Springfield's revenue is obtained through consumer spending via participation in the gambling opportunities offered or other on-site amenities. However, the money spent by visitors at MGM Springfield may have been spent elsewhere, had the casino not been there.¹³ The data on employment, wages, vendor spending, and revenue only describes part of MGM Springfield's economic impact. In order to fully capture the impact of MGM Springfield's opening, the amounts of spending diverted from other Massachusetts businesses needed to be established. The following section describes our process for forming those estimates.

Figure 14 shows the approximate location of survey respondents, based on zip code. Patrons of the casino are heavily clustered in the lower Pioneer Valley and along the I-91 corridor in Connecticut. Patrons are coded by patron type. The methodology classifying patrons by type is described briefly below and in more detail in Appendix 2.



Figure 14. Map of Survey Respondents by MGM Springfield Patron Type, First Year of Operation

Source: MGM Springfield Patron Survey

¹³ In order to model the economic impacts of MGM Springfield, UMDI had to model the amount of money spent at MGM Springfield which would otherwise have been spent on other goods and services within Massachusetts. UDMI used the patron survey to identify patrons who likely would not have spent their money in Massachusetts were it not for the casino, and then reduced consumer spending from the remaining patrons based on the geographic origins of the patrons surveyed. While this assumption simplifies how patrons finance their visits to MGM Springfield (some patrons may spend out of savings or take on debt), UMDI believes that this assumption adequately captures the flows of regional spending in the long run, as diminished savings or greater debt will likely lead to a decrease in consumer spending at some point.

Patron Spending

Using the patron survey data, patron spending assumptions can be made and used in our economic impact model.¹⁴ The UMDI team collected data on-site from patrons at MGM Springfield by surveying participants on topics regarding their reasons for coming to the casino, their origin, and the amount of money that they spend in the area during their visit. Using real data based on patron origins, shares of patron spending by patron type can be calculated. These calculations are applied to known spending (Gross Gaming Revenue) at the casinos to come up with spending estimates for each patron type.

As can be seen in Figure 11, MGM Springfield patrons spent \$264.3 million dollars on gambling in MGM's first year of operation. UMDI estimates that this amounts to almost three dollars spent on gambling for every dollar they spent on expenses other than gambling. Patrons also reported spending over \$83 million in off-site spending in the city in the course of their visits to the casino, although some of that spending would have occurred in Springfield regardless of whether or not the casino had opened.

One of the greatest challenges facing researchers conducting economic impact studies is conceiving of a counterfactual for consumer behavior. ¹⁵ To determine how changes in patron behavior affect the economy, it is critical to understand how money spent at the casino would have been spent if Massachusetts had not expanded in-state gaming. To do this, SEIGMA's MGM Springfield patron survey gathers information from patrons about where they live, whether they would have come to Springfield without the casino, and whether they would have gambled in another state were it not for the existence of the MGM Springfield.¹⁶ Based on the patrons' answers, they are categorized into one of six patron types created by UMDI. Descriptions of the six patron types and how they were derived are given in Appendix 2. Patron types are then used to determine how patrons' spending is treated within our economic model.

All patron spending at or around MGM Springfield is classified into three spending types. **New spending** is spending which would not have occurred within Massachusetts if not for the casino. This includes spending by recaptured patrons (patrons who indicated that they would have travelled out-of-state to gamble if an in-state option was not available) and out-of-state patrons who indicated that they would not have made their visit to Massachusetts if the casino had not opened. **Reallocated spending** is spending from patrons whose survey responses indicate that they would have spent their money in Massachusetts whether or not the casino opened. This group is important to track because a key concern from some groups leading up to the opening of the casinos was that consumers would shift their spending away from other local businesses and towards the casino. This study helps UMDI to capture the magnitude of that activity. Finally, **incidental spending** is spending at the casino cannot be incidental, but off-site spending can be, as many casino patrons would have been in the Springfield area, and would have spent money in area establishments, regardless of whether the casino opened. On-site and off-site patron spending is modeled differently in our economic modeling exercise depending on whether it is classified as new, reallocated, or incidental.

¹⁴ <u>https://www.umass.edu/seigma/reports</u>

¹⁵ In the parlance of economic modeling, a counterfactual is a statement of what would be different if something which is currently true were not true. So in this case, finding a counterfactual for consumer behavior would mean finding an estimate for how MGM Springfield patrons would have spent their money if MGM Springfield had never opened.

¹⁶ For detailed information on the patron survey, including a copy of the survey instrument, see *Patron and License Plate Report: MGM Springfield 2019*. SEIGMA. June 2020 available here: umass.edu/seigma/reports.

Patron Spending at MGM Springfield

The findings of SEIGMA's patron survey during MGM's first year of operation show that approximately two out of every three patrons indicated that they would have spent their money outside Massachusetts if the casinos had never opened. These patrons could be recaptured patrons who live instate but would have travelled out-of-state to gamble if the casino had never opened, or they could be out-of-state patrons who indicated that they would not have made the trip to Massachusetts if not for the casino. In either case, the economic impact is the same; the spending of these patrons would not have occurred in the Commonwealth had it not been for the casino. These patrons also account for a disproportionate share of total spending, with just over three quarters of all spending attributed to new patrons (Table 8). The remaining patrons are individuals whose survey responses led UMDI to conclude that the money they spent at MGM Springfield would have otherwise been spent elsewhere in the Commonwealth. Their spending, amounting to \$85.6 million, represents UMDI's estimate of the total spending reallocated away from other types of spending in Massachusetts and toward MGM Springfield.

Spending Type	Share of Respondents	Spending	Share of Spending
New	66.1%	\$270,670,864	76.0%
Reallocated	33.9%	\$85,574,115	24.0%
Total	100.0%	\$356,244,980	100.0%

Table 8: Share of On-Site Spending by Spending Type and MGM Springfield, First Year of Operation

As shown in Table 9, the majority of respondents who indicated that they had gambled at MGM Springfield were either Massachusetts residents who would have gambled out-of-state or new out-ofstate patrons. Taken together, this leads to an estimate that 79.2 percent of gambling spending was new spending to Massachusetts. According to our method as described above, the remaining 20.8 percent of spending, would likely have been spent on other types of goods and services within Massachusetts.

Table 9. Share of On-Site Gambling Spending by Spending Type at MGM Springfield, First Year of Operation

Spending Type	Share of Respondents	Share of Spending	
New	68.7%	79.2%	
Reallocated	31.3%	20.8%	
Total	100.0%	100.0%	

Source: SEIGMA MGM Springfield Patron Survey

As discussed earlier in the report, the MGM Springfield site includes a number of recreational activities, as well as dining and shopping areas, which do not involve gambling. As with gambling spending, the majority of non-gambling spending at MGM Springfield is considered new, with 66.9 percent of non-gambling spending, being considered new to Massachusetts. However, when compared to gambling spending, a higher share of non-gambling spending (33.1 percent) is considered to be reallocated. This may suggest that these amenities are a more important draw for patrons who would not have otherwise spent their money in another state, and who may not prioritize gambling in the same way. Table 10 shows the breakdown of on-site non-gambling spending.

Spending Type	Share of Respondents	Share of Spending
New	63.0%	66.9%
Reallocated	37.0%	33.1%
Total	100.0%	100.0%

Table 10. Share of On-Site Non-Gambling Spending by Patron Type at MGM Springfield, First Year of Operation

Source: SEIGMA MGM Springfield Patron Survey

Patron Spending Off-Site

Nearly half of patrons surveyed indicated that they spent money off-site during their trip to MGM Springfield. Among those patrons who reported some off-site spending, the most reported expenditures were food or beverages in a restaurant or fast food court, with 22.8 percent of patrons reporting expenditures. Other common types of off-site spending on visitor trips included attending an event, show, or exhibit in Springfield, visiting a local bar, pub, or nightclub, and buying fuel or other goods at a gas station. Very few survey respondents reported staying at a hotel or attending other types of entertainment outside of MGM Springfield. UMDI examined patron survey data for patrons whose trips to Springfield were prompted solely by MGM Springfield against patrons who had other plans in Springfield, in order to determine differences in the spending patterns of these two different types. However, the spending pattern across the two types of patrons (patrons who planned to visit MGM Springfield and incidental visitors) is not dramatically different. While the patron survey did help inform UMDI as to what types of things patrons were spending money on, it did not give a sense of how much was spent. In order to model new or reallocated off-site spending, UMDI utilized translator variables within the REMI model, which provide estimates of how visitors might spend their money during their visits.¹⁷ Table 11 details reported off-site spending by MGM Springfield parons.

¹⁷ Translator variables inside the REMI model represent a basket of goods and services purchased by a certain type of tourist, based on data provided by the US Bureau of Economic Analysis. For recaptured in-state patrons and new out-of-state patrons, their off-site spending is modeled using the translator variable for resident households, or day trippers, since most of those patrons do live within driving distance. When considering reallocated spending from out-of-state patrons who would have visited Massachusetts regardless of whether or not MGM Springfield opened, the translator variable for nonresidents is used. See Appendix 2.

Non-gambling activities off-	Patrons Prompt MGM Spr	ed to Visit by ingfield	Patrons Not Prompted to Visit by MGM Springfield		
site	Estimated Patrons	Share of Patrons	Estimated Patrons	Share of Patrons	
Attended an event, show, or exhibit in Springfield	98,441	12.5%	95,437	13.3%	
Went to a live entertainment show outside of Springfield, but in Massachusetts	73,344	9.3%	52,271	7.3%	
Bought food or beverage in a restaurant or fast food court	195,484	24.8%	146,461	20.4%	
Visited a local bar, pub, or nightclub	81,884	10.4%	85,504	11.9%	
Retail Shopping	50,622	6.4%	58,531	8.1%	
Stayed at a hotel outside the casino	31,930	4.1%	23,005	3.2%	
Bought fuel or other goods at a gas station	79,665	10.1%	62,101	8.6%	
Spent money on other entertainment (amusement park, golf course, etc.)	37,767	4.8%	69,683	9.7%	
Nothing	397,787	50.5%	361,366	50.2%	

Table 11. Off-Site Spending by MGM Springfield Patrons by Non-Gambling Activity, First Year of Operation

Source: SEIGMA MGM Springfield Patron Survey; SEIGMA estimates

As mentioned earlier, not all the reported off-site spending at MGM Springfield is new spending to the region. Based on patron survey responses, UMDI estimates that \$17 million, or 20.7 percent of all the reported off-site spending by MGM Springfield patrons, would have occurred regardless of whether the casino ever opened. Of the remaining spending, UMDI estimates that \$51.6 million, or 61.7 percent, is new spending which would not have occurred in Massachusetts if MGM Springfield had not opened, while the remaining \$14.7 million, or 17.6 percent, is reallocated spending that would have occurred elsewhere in the Massachusetts economy. Table 12 shows the breakdown of onsite spending at MGM Springfield by spending type.

Table 12. Share of Off-Site Non-Gambling Spending by MGM Springfield Patron Type, First Year of Operation

Spending Type	Share of Respondents	Spending	Share of Spending
New	52.1%	\$51,629,415	61.7%
Reallocated	21.0%	\$14,699,170	17.6%
Incidental	27.0%	\$17,320,897	20.7%
Total	100.0%	\$83,649,483	100.0%

REMI Results

The study involved collecting data from MGM Springfield to determine the economic footprint of its operations, including employment, wages, vendor spending, and fiscal impacts from taxes and other assessments paid to the state. These activities, known as primary activities, are used both for informative analysis as well as inputs for a REMI PI⁺ economic model, to calculate the total economic impacts of this new activity. A second part of the analysis involved patron spending data. Survey data from patrons at the casino highlighted shifts of patron spending patterns and doubled as inputs for a REMI PI⁺ economic model. The resulting model of economic impact on Massachusetts details effects in the private sector, such as the shift in private sector activity (i.e., employment and wages, vendor spending and reallocation of patron spending) as a result of the casino, and in the public sector, such as the economic activity resulting from new state and local government spending made possible by taxes and other government revenue from MGM Springfield.

Casino Operations

Daily casino operation involves spending in a number of ways, each of which generates economic impacts locally, regionally and across the state. Casino operations generated new job openings in the state, yielding paychecks for Massachusetts households. Operational spending resulted in revenue for Massachusetts' firms and taxes and fees paid to government. Revenue generated by the casino, described in Table 13 below, enabled MGM Springfield to employ an average of 2,538 employees and pay \$85.2 million in wages in their first 12 full months of operation. During the same period, MGM Springfield spent \$110.1 million on vendors, membership organizations, and charitable causes. Additional large-scale spending went to state and local government, including, as specified by Massachusetts' Expanded Gaming Act, the 25 percent of MGM Springfield's gross gaming revenue levied by the state for taxes. These are assessments paid in addition to normal federal, state, and local taxes. Furthermore, MGM Springfield has entered into various agreements with the host community of Springfield and the surrounding communities of Agawam, Chicopee, Holyoke, East Longmeadow, Longmeadow, Ludlow, West Springfield, and Wilbraham. Some of these agreements include payments to the communities. In total, MGM Springfield spent \$101.5 million in payments to various Massachusetts government entities in their first year of operation. Finally, visitors to MGM Springfield spent an estimated \$83.6 million in off-site spending in the Springfield area while visiting the casino. While some of that spending would have occurred in Springfield regardless, an estimated \$66.3 million of this is money which would have been spent elsewhere if MGM Springfield had not opened.

Measure	Units	Value
Average Employment	Jobs	2,538
Total Wages	Millions of Dollars	\$85.2
Intermediate (e.g. B2B) Spending	Millions of Dollars	\$110.1
Government Revenue ¹⁸	Millions of Dollars	\$101.5
Consumer Spending (Estimated New Off-Site Spending)	Millions of Dollars	\$66.3

Table 13. Summary of Primary REMI Inputs, First Year of Operation

Source: MGM Springfield; SEIGMA MGM Springfield Patron survey NOTE: Inputs based on operator data and government reports.

¹⁸ Government Revenue encompasses taxes on gross gaming revenue set by the Massachusetts Gaming Commission as well as other taxes paid as a part of Host Community agreements.

Patron Spending at MGM Springfield

Patron survey data was used in the REMI modeling exercise to estimate where money may not have been spent as casino patrons shifted their spending away from their usual activities and towards the casino. While on-site patron spending drives MGM Springfield's revenues, patron spending at MGM Springfield is not an economic impact in and of itself. Instead, the impacts of patron spending on the local economy are seen when the casino uses those revenues to pay employees and purchase goods and services from other firms. Since questions about the origin and behavior of MGM Springfield's patrons have broader public policy implications beyond direct economic impacts, the SEIGMA Research Team conducted a survey on MGM Springfield patrons. The economic implications of those survey findings are explored in the Patron Spending section of this report, and the results are described in further detail in SEIGMA's MGM Springfield Patron Survey report.¹⁹

During MGM Springfield's first 12 full months of operation (September 2018 through August 2019), patrons spent approximately \$356.2 million dollars on gambling and non-gambling activities at the facility. In order to understand how that spending impacts the economy of the Commonwealth, it is critical to understand how these patrons would have interacted with the Massachusetts economy had MGM Springfield never opened. Table 14 details the sources of spending by patrons at MGM Springfield. Based on a survey of patrons administered on-site, UMDI estimates that over a third of spending at MGM Springfield–\$131.2 million dollars–was spent by Massachusetts residents who would have spent their money gambling at an out-of-state casino in the absence of MGM Springfield.²⁰ From a policy standpoint, these "recaptured" patrons are essentially bringing "new" money to the Commonwealth since these patrons would have otherwise spent their money in another state.²¹ Another \$78.3 million in spending, just under a quarter of total on-site spending, was spent by Massachusetts residents who otherwise would have spent their money elsewhere in Massachusetts. This spending is referred to as reallocated spending because some or all of the money spent by these patrons at MGM Springfield would have likely been spent elsewhere in the Massachusetts economy if MGM Springfield never opened. Details on these figures and the data used to derive them can be found in the full patron survey report entitled Patron and License Plate Survey Report: MGM Springfield 2019.

Source of On-Site Spending	Estimated Spending (Millions of Dollars)	Share of Spending
Recaptured Spending by In-State Patrons	\$131.2	36.8%
Reallocated Spending by In-State Patrons	\$78.3	22.0%
Spending by Out-of-State Patrons	\$146.7	41.2%
Total	\$356.2	100.0%

Table 14. Sources of Patron Spending at MGM Springfield, First Year of Operation

¹⁹ This report and other reports from the SEIGMA research team can be found at umass.edu/seigma/reports
²⁰ This result is one indicator among several and needs to be aligned with results from the MGM Patron Survey, the Springfield Follow-up Targeted Survey, and actual revenues at CT and RI casinos. We intend to examine and integrate all of these data sources with the present finding in our next integrative report.

²¹ For the purposes of this report, "new" economic activity means economic activity new to the Commonwealth of Massachusetts. While Massachusetts residents choosing to spend their money in a Massachusetts casino rather than an out-of-state facility might be considered a simple reallocation of funds from one business to another from a national perspective, it is new to the state. Given the scope of our work, this report considers this money new.

The remaining \$146.7 million dollars were spent on-site by out-of-state residents. The extent to which their spending is new to Massachusetts is largely a function of whether they would have visited Massachusetts in the absence of MGM Springfield. Using patron survey information, we estimate that \$139.4 million, or 95 percent of this total, was new spending brought into the state due to the casino.

Total Economic Impacts

The employment and spending impacts of the casino discussed in detail above, form the basis of inputs to the REMI model. Modeling these direct employment and spending impacts shows how MGM Springfield generated waves of additional business activity in the economy, known as secondary impacts. In its first year of operation, the direct employment, wages, vendor spending, and fiscal activity associated with MGM Springfield generated a total of 6,599 jobs, with 5,226 of those jobs existing in the private sector. The remainder were government positions supported by the revenue generated by MGM Springfield. Just over three fifths of that employment impact occurred in the three-county Pioneer Valley region, which includes Hampden County and the City of Springfield. This new economic activity was partially paid for by a decline in existing spending on other goods and services in Massachusetts as casino patrons shifted their spending away from activities in other areas and towards MGM Springfield, leading to a loss of support for an estimated 313 jobs elsewhere in the state. After adjusting for reallocation, on net, MGM Springfield created or supported 6,287 jobs in the Commonwealth, 4,929 of which were in the private sector. As seen in Table 15, MGM Springfield also supported \$356.9 million in new personal income and \$974.2 million in new output within the Massachusetts economy, of which \$640.1 million was value added (i.e. net new economic activity or gross state product).

		Private Non-		Value	Personal
	Total	Farm	Output	Added	Income
Region	Employment	Employment	(\$M)	(\$M)	(\$M)
Regional Operating Impacts:					
Metro Boston	1,612	1,009	\$308.0	\$198.4	\$124.8
Southeast	375	259	\$50.5	\$32.3	\$29.6
Pioneer Valley	4,067	3,596	\$589.2	\$393.8	\$178.8
Central	380	239	\$52.8	\$33.6	\$30.9
Berkshires	71	51	\$12.0	\$7.3	\$5.2
Cape and Islands	95	72	\$12.6	\$8.0	\$7.2
Total	6,599	5,226	\$1,025.1	\$673.2	\$376.5
Statewide Impacts from Change	es in Consumer	Spending:			
Total	-313	-296	-\$50.9	-\$33.1	-\$19.6
Statewide Net Impacts:					
Total	6,287	4,929	\$974.2	\$640.1	\$356.9

Table 15. Economic Impacts of MGM Springfield by Region, First Year of Operation

Source: Regional Economic Models, Inc., UMDI Calculations

While the private sector activity at MGM Springfield had both positive and negative impacts on each region of the Commonwealth, and in the Pioneer Valley region in particular, the majority of new employment outside of the Pioneer Valley was the result of new tax revenue from MGM Springfield being spent across the state. Table 16 shows the shares of employment impacts associated with private sector activity and government spending.

Region	Total Employment Impacts	Employment Impacts from Private Sector Activity	Employment Impacts from Government Spending
Metro Boston	1,566	207	1,359
Southeast	368	59	309
Pioneer Valley	3,847	3,322	526
Central	361	44	317
Berkshires	60	24	36
Cape and Islands	84	17	67
Total	6,287	3,672	2,614

Table 16. Employment Impacts of MGM Springfield from Public and Private Sector Activity, First Year of Operation

Source: Regional Economic Models, Inc., UMDI Calculation

Overall, the \$365.2 million dollars spent in and around MGM Springfield by casino patrons supported an average of 2,538 positions at the casino, paying \$85.2 million in compensation, and created demand for \$110.1 million of intermediate goods and services purchased from vendors by MGM Springfield. The casino also paid \$101.5 million in payments to government entities. This new economic activity led to an estimated 6,287 jobs in Massachusetts, including the 2,538 at the casino, the majority of which are within the Pioneer Valley.

Comparison to Plainridge Park Casino

MGM Springfield is the second casino to have opened in Massachusetts, and as a large, resort-style casino, it is interesting to see what similarities and differences it has to its predecessor, Plainridge Park Casino, a smaller venue focused on slots gaming activities. Plainridge Park Casino opened in the summer of 2015 in Plainville, MA, close to the Rhode Island border. From then until the opening of MGM Springfield, it was the only gambling establishment in Massachusetts. Located on the site of a pre-existing harness racing track, Plainridge Park Casino was different from MGM Springfield in that, while it did continue to host harness races, it did not feature table games or a hotel. The slots-only license was unique from those awarded to the other casinos in Massachusetts in that its location was not restricted to a particular region of Massachusetts, but did include a much higher tax on gross gaming revenue (49 percent for the slots facility versus 25 percent at the resort-style casinos, with 82 percent of that revenue going directly to local aid and the rest allocated towards a Race Horse Development Fund)

While MGM Springfield employed over four times as many people as Plainridge Park Casino, in both cases direct casino employment accounted for less than half of the job creation attributed to the casinos' first year of operation, with the rest being attributed to jobs generated through secondary effects including vendor spending, new revenue collected by various state and local government entities, and new consumer expenditure by MGM Springfield's new employees. All told, MGM Springfield's total employment impact is estimated at 6,287 jobs. While this is far more than the 2,354 jobs that were estimated to be supported by the first year of operation at Plainridge Park Casino, it is not proportional to the much larger size of the actual operation. While Plainridge Park Casino was estimated to support 3.2 jobs outside the casino for every job at the casino in its first year of operation, MGM Springfield was estimated to support 1.5 jobs outside the casino for every job at the casino. Much of this discrepancy is likely due to the different tax rates paid by the two properties. Table 17 compares the non-casino to casino job ratios of the two casinos.

	Plainridge Park	MGM
Measure	Casino	Springfield
Average Casino Employment	556	2,538
Total Employment Impact	2,354	6,287
Non-Casino Employment Impact	1,798	3,749
Non-Casino to Casino Job Ratio	4.2:1	2.5:1

Table 17. Average Casino Employment and Total Employment Impact, Plainridge Park Casino and MGM Springfield, First Year of Operation

Source: Plainridge Park Casino, MGM Springfield, UMDI REMI Calculation

Although the jobs at MGM Springfield are presented as an average over the first year of operation in much of this report, the number of people employed at MGM Springfield fell over the course of the first year of operation, from 3,072 employees at the opening to 2,122 a year later, a decline of 30.9 percent. The SEIGMA team noted a similar trend in Plainridge Park Casino's first year of operation with employment falling from 570 jobs to 506 jobs over the first year, a decline of 11.2 percent. At Plainridge Park Casino, employment largely leveled off after that first year. Future operating reports will document whether this trend is also observed for MGM Springfield.

One way in which the two casinos diverge in more than scale is in the origins and behaviors of their patrons in their first year. The share of gambling spending by recaptured patrons is significantly lower at

MGM Springfield than it was in Plainridge Park Casino's first year of operation (38.5 percent at MGM Springfield versus 58.3 percent at Plainridge Park Casino) – meaning that a smaller share of MGM Springfield's patrons identified as in-state residents who would have travelled out of state to gamble if the casino had not opened. However, the much higher share of new out-of-state patrons (35.4 percent at MGM Springfield versus 13.9 percent at Plainridge Park Casino) means that a roughly equivalent share of gambling spending came from patrons who had stated in the survey that they would have spent their money gambling at a casino outside of the Commonwealth had Massachusetts not expanded gambling. A comparison of the two casinos is complicated by the fact that the two casinos opened approximately three years apart and started in different competitive environments. In particular, Plainridge Park Casino was the only casino located in Massachusetts in it's first year of operation while MGM Springfield has always had in-state competition.

The methodology developed for this study does not differentiate between the economic impact of instate or out-of-state residents, provided that they identified themselves as individuals who otherwise would not have spent their money out of state. Part of this discrepancy might be explained by location. While Plainville and its surrounding communities are not densely populated by the standards of Eastern Massachusetts, Plainridge Park Casino is strategically located between Boston and Rhode Island. Rhode Island casinos had been the nearest to Boston prior to the opening of Plainridge Park Casino so it is possibly attracting patrons who would have normally driven to Rhode Island to gamble. These patrons, who otherwise would have continued into Rhode Island or even Connecticut to gamble, would count as recaptured patrons, may explain the relatively higher share of recaptured patronsat Plainridge Park Casino. Likewise, while Springfield does not stand in between any larger metropolitan area and the nearest out-of-state casinos, much of Northern Connecticut is actually closer to MGM Springfield than to either of the casinos located in Southeastern Connecticut, which might make MGM Springfield a more attractive location for out-of-state visitors. These patrons, many of whom may have otherwise gambled at Connecticut's casinos, may account for the relatively higher share of new out-of-state patrons at MGM Springfield. Table 18 compares the shares of spending at each casino by patron type.

Patron Type	Share of Spending (Plainridge Park Casino)	Share of Spending (MGM Springfield)
Recaptured In-State	38.5%	57.7%
Reallocated In-State	9.3%	18.2%
Reallocated In-State Incidental	9.6%	5.9%
New Out-of-State	35.4%	11.8%
Captured Out-of-state Incidental	5.2%	5.9%
Reallocated Out-of-State Incidental	1.9%	0.4%
Total	100.0%	100.0%

Table 18. On-Site Spending, Plainridge Park Casino and MGM Springfield, First Year of Operation

Source: SEIGMA MGM Springfield Patron Survey

Also noteworthy is the scale of gambling spending by casino patrons, as well as non-gambling spending both on- and off-site. These different spending profiles, among other factors, lead to differing economic impacts across the two facilities. MGM Springfield brought in 10.8 percent more gross gaming revenue from slots during its first year of operation than PPC (\$184 million at MGM Springfield on approximately 2,600 machines versus \$166 million at Plainridge Park Casino on approximately 1,250 machines).²²

²² <u>https://massgaming.com/regulations/revenue/</u>

However, the presence of table games brought in an additional \$80 million for MGM Springfield in its first year. The structure of taxes and assessments for MGM Springfield also created noticeable differences from Plainridge Park Casino. While patrons spent more money on both gambling and non-gambling expenditures at MGM Springfield in its first year of operation than they did at Plainridge Park Casino in its first year of operation, the Commonwealth actually received more money from Plainridge Park Casino (\$78.4 million versus \$66.1 million at MGM Springfield), in part due to the higher taxes and assessments levied on Plainridge Park Casino. New government revenue, and its subsequent expenditure, is one of the major drivers of economic impact at both facilities. Table 19 compares gaming revenue and tax rates at the two casinos.

Measure	Plainridge Park Casino	MGM Springfield
Slot Machine Revenue (millions)	\$159.9	\$184.0
Table Games Revenue (millions)	\$0.0	\$80.3
Tax Rate	49%	25%
Taxes on Gross Gaming Revenue (millions)	\$78.4	\$66.1

Table 19. Revenue and Taxes, Plainridge Park Casino and MGM Springfield, First Year of Operation

Source: Massachusetts Gaming Commission

MGM Springfield patrons also reported spending much more money off-site over the course of their visit as well (\$51.6 million outside of MGM Springfield versus \$4.0 million outside of Plainridge Park Casino). Based on visitation data from the two casinos,²³ this represents \$14.37 per visit in off-site spending by MGM Springfield patrons versus \$2.26 per visit for PPC patrons. Part of this discrepancy in off-site spending may be explained by the physical locations of the two properties. MGM Springfield is located in downtown Springfield, while Plainridge Park Casino is located at the edge of town. The presence of a hotel at MGM Springfield may also have encouraged guests to stay longer and spend more money in the area.

While shifts in consumer spending away from existing businesses are observed in both cases, patrons of MGM Springfield also shifted some of their spending towards local businesses in a much more pronounced way than at Plainridge Park Casino, cancelling out some of the economic losses in the area. In the case of MGM Springfield, new business brought to the state outweighed losses due to reallocated spending by Massachusetts residents. These differences ultimately affect the net economic impact that shifts in patron spending had on the Commonwealth, with fewer net jobs lost due to MGM Springfield operations than Plainridge Park operations, despite the larger size of MGM Springfield. Table 20 compares off-site spending per casino visitor at the two casinos.

²³ This visitation data may double-count visitors who leave and then re-enter the casino. Off-site spending from recaptured patrons and new out-of-state casino visitors is modeled as spending from resident tourists in the Pioneer Valley, since Patron Survey data suggests most live within driving distance of the casino and few are staying overnight outside of the casino itself. Reallocated spending from out-of-state patrons whose visit was not prompted by the casino (reallocated out-of-state patrons) is modeled as lost tourism spending to other businesses in the Pioneer Valley.

Table 20. Off-Site Spending and Visitation, Plainridge Park Casino and MGM Springfield, First Year of Operation

Measure	Plainridge Park Casino	MGM Springfield
Off-Site Spending (Millions)	\$6.5	\$91.9
Number of Visits	2,873,420	6,393,294
Off-Site Spend per Visit	\$2.26	\$14.37

Source: SEIGMA MGM Springfield Patron Survey, Plainridge Park Casino, MGM Springfield

Conclusion

MGM Springfield, and the rest of Massachusetts' casinos, are still young establishments in a new and tumultuous market. As that market evolves, there will continue to be opportunities to explore the casinos' operational data. Further exploration will include both ongoing monitoring of the data that informed this analysis and deeper exploration into topics that were not covered in this report. The research mandate, a component of the Expanded Gaming Act, has allowed the SEIGMA team to access data that would not always be available to researchers studying an emerging industry, and we look forward for continuing to use these rich datasets to help inform stakeholders in Massachusetts.

Another opportunity for further study may come when the SEIGMA team is able to conduct a follow-up patron survey at properties that have already been surveyed once. At the time that the patron survey was conducted at MGM Springfield, there was still a certain level of novelty to the casino, and there may be changes in who visits the casino and how they spend money there as time passes. One key question there will be whether shares of recaptured spending in the first year of operation hold going forward, or whether patrons who had previously been travelling out of state to gamble return to that behavior as time goes on and the novelty of a local casino wears off. Ongoing research from the SEIGMA team will also continue to shed light on the behavior of casino patrons, and may provide opportunities for future economic research based on those findings.

For most of its first year of operation, MGM Springfield was the only resort-style casino in Massachusetts, but that changed when Encore Boston Harbor opened its doors in June of 2019. The impact that Encore Boston Harbor, as well as out-of-state casinos, online gambling, and other major changes in the competitive landscape, will have on MGM Springfield, Plainridge Park Casino, and the Commonwealth as a whole, is the subject of further study.

Appendix 1: The PI⁺ Model

PI⁺ is a structural economic forecasting and policy analysis model. It integrates input-output, computable general equilibrium, econometric, and economic geography methodologies. The model is dynamic, with forecasts and simulations generated on an annual basis and behavioral responses to compensation, price, and other economic factors.

The model consists of thousands of simultaneous equations with a structure that is relatively straightforward. The exact number of equations used varies depending on the extent of industry, demographic, demand, and other detail in the specific model being used. The overall structure of the model can be summarized in five major blocks: (1) Output and Demand, (2) Labor and Capital Demand, (3) Population and Labor Supply, (4) Compensation, Prices, and Costs, and (5) Market Shares. The blocks and their key interactions are shown in Figure 15 and Figure 16.

Figure 15. REMI Model Linkages

REMI Model Linkages (Excluding Economic Geography Linkages)





Figure 16. Economic Geography Linkages



Economic Geography Linkages



The Output and Demand block consists of output, demand, consumption, investment, government spending, exports, and imports, as well as feedback from output change due to the change in the productivity of intermediate inputs. The Labor and Capital Demand block includes labor intensity and productivity as well as demand for labor and capital. Labor force participation rate and migration equations are in the Population and Labor Supply block. The Compensation, Prices, and Costs block includes composite prices, determinants of production costs, the consumption price deflator, housing prices, and the compensation equations. The proportion of local, inter-regional, and export markets captured by each region is included in the Market Shares block.

Models can be built as single region, multi-region, or multi-region national models. A region is defined broadly as a sub-national area, and could consist of a state, province, county, or city, or any combination of sub-national areas.

Single-region models consist of an individual region, called the home region. The rest of the nation is also represented in the model. However, since the home region is only a small part of the total nation, changes in the home region do not have an endogenous effect on the variables in the rest of the nation.

Multi-regional models have interactions among regions, such as trade and commuting flows. These interactions include trade flows from each region to each of the other regions. These flows are illustrated for a three-region model in Figure 17.



Trade and Commuter Flow Linkages

Multiregional national models also include a central bank monetary response that constrains labor markets. Models that only encompass a relatively small portion of a nation are not endogenously constrained by changes in exchange rates or monetary responses.

Block 1. Output and Demand

This block includes output, demand, consumption, investment, government spending, import, commodity access, and export concepts. Output for each industry in the home region is determined by industry demand in all regions in the nation, the home region's share of each market, and international exports from the region.

For each industry, demand is determined by the amount of output, consumption, investment, and capital demand on that industry. Consumption depends on real disposable income per capita, relative prices, differential income elasticities, and population. Input productivity depends on access to inputs because a larger choice set of inputs means it is more likely that the input with the specific characteristics required for the job will be found. In the capital stock adjustment process, investment occurs to fill the difference between optimal and actual capital stock for residential, non-residential, and equipment investment. Government spending changes are determined by changes in the population.

Block 2. Labor and Capital Demand

The Labor and Capital Demand block includes the determination of labor productivity, labor intensity, and the optimal capital stocks. Industry-specific labor productivity depends on the availability of workers

with differentiated skills for the occupations used in each industry. The occupational labor supply and commuting costs determine firms' access to a specialized labor force.

Labor intensity is determined by the cost of labor relative to the other factor inputs, capital, and fuel. Demand for capital is driven by the optimal capital stock equation for both non-residential capital and equipment. Optimal capital stock for each industry depends on the relative cost of labor and capital, and the employment weighted by capital use for each industry. Employment in private industries is determined by the value added and employment per unit of value added in each industry.

Block 3. Population and Labor Supply

The Population and Labor Supply block includes detailed demographic information about the region. Population data is given for age, gender, and race, with birth and survival rates for each group. The size and labor force participation rate of each group determines the labor supply. These participation rates respond to changes in employment relative to the potential labor force and to changes in the real aftertax compensation rate. Migration includes retirement, military, international, and economic migration. Economic migration is determined by the relative real after-tax compensation rate, relative employment opportunity, and consumer access to variety.

Block 4. Compensation, Prices and Costs

This block includes delivered prices, production costs, equipment cost, the consumption deflator, consumer prices, the price of housing, and the compensation equation. Economic geography concepts account for the productivity and price effects of access to specialized labor, goods, and services.

These prices measure the price of the industry output, considering the access to production locations. This access is important due to the specialization of production that takes place within each industry, and because transportation and transaction costs of distance are significant. Composite prices for each industry are then calculated based on the production costs of supplying regions, the effective distance to these regions, and the index of access to the variety of outputs in the industry relative to the access by other uses of the product.

The cost of production for each industry is determined by the cost of labor, capital, fuel, and intermediate inputs. Labor costs reflect a productivity adjustment to account for access to specialized labor, as well as underlying compensation rates. Capital costs include costs of non-residential structures and equipment, while fuel costs incorporate electricity, natural gas, and residual fuels. The consumption deflator converts industry prices to prices for consumption commodities. For potential migrants, the consumer price is additionally calculated to include housing prices. Housing prices change from their initial level depending on changes in income and population density.

Compensation changes are due to changes in labor demand and supply conditions and changes in the national compensation rate. Changes in employment opportunities relative to the labor force and occupational demand change determine compensation rates by industry.

Block 5. Market Shares

The market shares equations measure the proportion of local and export markets that are captured by each industry. These depend on relative production costs, the estimated price elasticity of demand, and the effective distance between the home region and each of the other regions. The change in share of a specific area in any region depends on changes in its delivered price and the quantity it produces compared with the same factors for competitors in that market. The share of local and external markets then drives the exports from and imports to the home economy.

Appendix 2: Detailed Methodology for Data Preparation

Employment, Wages, Value Added, and Output

Employment data was provided to UMDI directly from MGM. Since not all employees worked the full year, and since employees were a mixture of full-time and part-time, an employment number for the PI⁺ model was calculated by dividing the total number of hours worked by MGM Springfield employees by the average yearly hours worked for an employee of a non-hotel casino in 2016. Average annual hours were calculated using the average weekly hours worked for workers in a casino without a hotel from the Bureau of Labor Statistics and multiplying it by 52.

The PI⁺ model makes certain assumptions about the expected wages, value-added, output, and intermediate inputs based on employment numbers, region, and industry. Because UMDI had more precise data for all of these values based on actual wages, sales, and vendor spending data, the policy variables for wages, value added, and output were adjusted to reflect known values rather than expected averages. Intermediate inputs were modified as described below.

Intermediate Inputs

MGM provided UMDI with quarterly records of vendor spending, including the vendor name, amount spent, and the zip code of the vendor. The data did not contain information about the industry of the vendor, so UMDI manually assigned NAICS codes to each vendor, making educated guesses when detailed information on the vendor was not available online. These records were then combined and used to populate a list of policy variables for intermediate demand by industry and region, replacing the intermediate demand which would be assumed by the model. Since UMDI was using a PI⁺ model that only included regions of Massachusetts, spending on vendors located outside of the state was not modeled. This may slightly underestimate the actual economic impact of MGM Springfield, as new business in other states may have "downstream" effects which positively impact Massachusetts. These effects would likely be very small and are impossible to estimate the within limitations of UMDI's current model.

Commuter Adjustment

A higher share of MGM Springfield employees reside out of state (particularly in Connecticut) than what would be assumed by the model based on historic commuting patterns. UMDI took the difference between the model's assumptions of wage leakages from the Pioneer Valley region and the actual wage leakages and used the Commuter Earnings policy variable within the PI⁺ model to adjust them.

Government Spending

As is typical in economic-impact modeling exercises, the assumption was made that any new state or local government revenue would be spent in the same year. Therefore, the amount of government spending imputed into the model is equal to the amount of new government revenue calculated. UMDI also chose to adhere to the best practice of not modeling the fiscal impacts of MGM's federal tax revenue, as federal fiscal policy is considerably more complex and difficult to estimate.

State government spending was calculated by adding up all of the state taxes paid by UMDI in its first year of operation (except for taxes on gross gaming revenue) and spreading them across the model's six regions based on their previous shares of state government spending.

Local government spending was taken by adding up all of the taxes and host and surrounding community payments paid by MGM Springfield to local governments, by region, and adding to it each region's share of new local aid funds coming from taxes on MGM Springfield's gross gaming revenue.

Consumer Spending

While it may seem counterintuitive, no attempt was made to model the patron spending at MGM Springfield. The reason for this is that the impacts of that spending – MGM Springfield's employment, wages, vendor spending, and tax payments – are already known, so modeling this spending would create a problem of "double-counting". Instead, SEIGMA's patron survey was used to capture the spending which did not directly occur at MGM Springfield, that is, the new off-site spending by MGM Springfield visitors, and spending reallocated by Massachusetts residents and visitors from other Massachusetts businesses to MGM Springfield.

For the purposes of this analysis, UMDI used MGM Springfield's gross gaming revenue as reported by the MGC to capture the total amount of patron gambling spending at MGM. MGM provided non-gaming revenue numbers for September through December of 2018 and calendar year 2019. Non-gaming revenues for January-August 2019 were estimated using that period's share of annual visitation. Off-site patron spending was estimated by taking a ratio of reported off-site non-gambling spending to reported on-site spending and applying it to the figure for on-site non-gambling spending.

UMDI estimated the total amount of off-site spending by MGM Springfield visitors by taking the ratio of reported off-site spending to the reported on-site non-gambling spending and applying it to the actual on-site non-gambling spending of \$91.9 million. The resulting \$83.6 million was then allocated across regions and patron types based on shares of reported off-site spending. The off-site spending of patrons who indicated that they would have been in the area regardless of whether MGM Springfield had opened or not (reallocated in-state incidental patrons and captured out-of-state incidental patrons) was excluded since it cannot be attributed to MGM Springfield. This money was then allocated as new consumer spending on a basket of goods and services estimating the spending behavior of tourists on daytrips. Their consumption was modeled using a translator variable within the REMI model.

In order to calculate the reallocated spending of in-state patrons, UMDI added up the total amount of reallocated spending (all spending by reallocated in-state patrons and all on-site spending by reallocated in-state incidental patrons) and assigned it to a consumption reallocation variable, based on the home region of the patrons. This variable assumes that the patrons spend less on a general basket of goods and services as they spend more at MGM Springfield, with a built in elasticity assumption which designates some consumption items as easier to consume less of than others (for example, it is easier to spend less at restaurants and bars than it is to spend less on rent).

For reallocated out-of-state incidental patrons (out-of-state patrons whose visit to Massachusetts was not prompted by MGM Springfield and who would not have otherwise spent their money at an out-of-state casino), reduced using a tourism translator variable which represents a basket of typical goods and services purchased by nonresident tourists. In our analysis of Plainridge Park Casino, this spending was then spread across the 6 regions in the model based on each model's share of consumption of each good or service, but given the Pioneer Valley's relative distance from the commercial and population centers in Massachusetts, UMDI determined that it would be best to concentrate that reallocated spending within the Pioneer Valley.

Patron Types

Patron Type Definitions

The six patron types are defined by a combination of attributes. A **captured** or **recaptured** patron is someone who indicated that, had Massachusetts never expanded in-state gaming, they would have spent the money that they spent at MGM Springfield at an out-of-state casino. A **reallocated** patron is someone who indicated that, had MGM Springfield never opened, they would have spent the money they spent at MGM Springfield on other goods and services within Massachusetts. A **new** patron is an out-of-state patron who would not have visited Massachusetts were it not for MGM Springfield. An **incidental** patron is someone whose visit to Springfield (if from Massachusetts) or to Massachusetts (if from out-of-state), was not prompted by MGM Springfield.

Recaptured in-state patrons are people who live in Massachusetts but who would have gambled out-ofstate if not for the in-state option. For modeling purposes, UMDI treats all spending reported by recaptured in-state patrons as new to the state. This includes their off-site spending, as UMDI assumes that, if MGM Springfield did not exist, recaptured in-state patrons would be spending money on similar off-site expenditures in another state. Technically speaking, the on-site spending of recaptured in-state patrons is not used as an input in the model because the casino's revenues, which go to hire and pay employees, purchase intermediate goods and services, and pay state and local governments, are already captured in greater detail elsewhere in the modeling process.

Reallocated in-state patrons are people from Massachusetts who would not have visited Springfield were it not for the casino, but who also would not have gambled out-of-state. In other words, these are patrons who, were it not for the casino, would have likely spent their money on goods and services other than gambling. Therefore, the decision to visit MGM Springfield implies a movement (or reallocation) of spending from an activity in one region to a different activity in another. For simplicity, this is represented in the model as a decrease in consumption of a general basket of goods and services in the region where the patron lives, equal to the on-site and off-site expenditures of the patron. It is offset by an increase in off-site spending in the region that hosts the casino. On-site spending is already captured in the modeling of casino revenues.

Reallocated in-state incidental patrons are like reallocated in-state casino visitors, except that they indicated that MGM Springfield did not prompt their visit to Springfield. For example, they may live in Springfield itself, or they may have been running errands or visiting family in Springfield. In any case, they would have been in the area regardless of the presence of a casino. The primary way that this affects the economic modeling is that UMDI cannot assume that their spending outside of the casino would not have occurred if not for the existence of MGM Springfield. Therefore, it is neither added to the model as new spending nor reallocated from another region.

New out-of-state patrons are visitors from other states who would not have visited Massachusetts were it not for MGM Springfield. While these residents live outside of Massachusetts, for modeling purposes, they are exactly the same as recaptured in-state patrons, as their expenditures during that visit would not have occurred within the Commonwealth if not for MGM Springfield.

Captured out-of-state incidental patrons are people who would have visited Massachusetts regardless of whether MGM Springfield existed, but who chose to gamble here rather than in their home state now that it does exist. These are patrons who live out of state, who reported that MGM Springfield did not prompt their visit to Massachusetts, but also reported they would have spent the money that they spent at MGM Springfield on gambling at an out-of-state casino if MGM Springfield did not exist.

reallocated in-state incidental patrons, these patrons are drawn to Springfield by a purpose unrelated to the existence of the casino, but their stay would probably have been shorter and less expensive were it not for MGM Springfield. These survey responses of these patrons do not have any effect on the economic model because their spending at MGM Springfield is already captured through employment, payroll, vendor spending, and fiscal data. Any spending these patrons do off-site is also assumed to be part of the regular course of their visit to Massachusetts, which would have occurred without the casino.

Reallocated out-of-state incidental patrons are patrons whose visit to Massachusetts was not prompted by MGM Springfield, and who would not have otherwise spent the money they spent at MGM Springfield on gambling out-of-state. In other words, they are out-of-state visitors who would have come to Massachusetts without the casino and instead chose to spend their time and money at MGM Springfield rather than elsewhere in Massachusetts. Our economic model treats these patrons in a similar way to the reallocated in-state casino visitors. The one exception is that instead of having their spending reallocated from a regional consumption basket to casino revenues, it is reallocated from a basket of goods and services frequently consumed by tourists in Massachusetts.

Patron Type	Q1 Origin	Q20 Would have gambled elsewhere	Q5 Casino prompted visit (from MA)	Q6 Casino prompted visit (not from MA)	On Site	Off Site
Recaptured In- State	In- State	Yes	N/A	N/A	Not Modeled	Modeled, New
Reallocated In- State	In- State	No	Yes	N/A	Modeled, Reallocated	Modeled, Reallocated
Reallocated In- State Incidental	In- State	No	No	N/A	Modeled, Reallocated	Not Modeled
New Out-of- State	Out-of- State	N/A	N/A	Yes	Not Modeled	Modeled, New
Captured Out- of-State Incidental	Out-of- State	Yes	N/A	No	Not Modeled	Not Modeled
Reallocated Out-of-State Incidental	Out-of- State	No	N/A	No	Modeled, Reallocated	Modeled, Reallocated

Table 21. Patron Type Definitions

Appendix 3: Glossary for Economic Impacts

In this section, UMDI defines terms common to economic modeling and analysis that are used in this report. They are as follows:

Employment: Employment is a count of jobs, not people, by place of work. It counts all jobs with the same weight regardless of whether the position is full- or part-time or the labor of a self-employed proprietor. Additionally, jobs are counted as job-years, which are equivalent to one job lasting for one year. This is a similar concept to "person-hours." Jobs often carry over from year to year and therefore the jobs in one year include many of the same jobs as in the previous year. For example, if a new business opens with 10 employees then the host community of that business will have 10 more jobs than it would have had in every future year that the company maintains its workforce. For example, over 5 years, the business will have created 50 job-years (10 jobs at the company x 5 years = 50 job-years) though it is possible that it is not the same 10 people who are working there over time. When reviewing changes in employment across multiple years, knowledge of the concept of job-years is vital to proper interpretation.

Output: Output is the total economic value of production, sales, or business revenues, whether final (i.e., purchased by the end user) or intermediate (used by another business to produce its own output). It includes the value of inputs to production, wages paid to employees, capital expenses, taxes, and profit. It is useful as an indicator of business activity, but it should not be construed as net new economic activity.

Personal Income: Personal income is income and benefits from all sources earned by all persons living in an area. It excludes the income earned by non-resident workers who commute into an area but includes the income of residents who commute out.

Value Added: Value added is the value of all final goods and services created in an economy. It represents new economic activity and is also known as gross product or net economic impact. It differs from output by the value of inputs to production. Value added provides a useful summary of the economy which is why all nations and U.S. states report their economic growth in this way, calling it either gross domestic product or gross state product as appropriate. Its usefulness derives from the elimination of the double-counting inherent in output, which stems from the inclusion of inputs. An example of the double-counting of inputs can be found and simplified in the process of making and selling a loaf of bread. A farmer sells wheat to a mill, which then sells flour to a baker, who then sells bread to the final customer. The sale price of the bread includes the cost of all necessary inputs including growing the wheat, milling the flour, and baking the bread. Value added only counts the sale price of the bread to the final consumer which is the net new value created in the economy. On the other hand, output counts the revenues earned by every business in the supply chain which means that the value of the wheat and flour are counted more than once.

Appendix 4: The Concepts of Output and Value-Added

This appendix serves to clarify the distinctions between two related economic concepts discussed in this report – output and value added.

For any firm to produce goods and services to be sold on the market, it needs to pay for the things required to produce them. It needs to compensate workers for their labor and invest in the capital goods (machinery, for example) which those workers will use. It also needs to purchase intermediate goods and services from other firms. Workers then use the firm's capital goods to turn the intermediate goods and services purchased from other firms into final goods and services. These final goods and services are the output of the firm, and are equivalent to the value of its sales or revenue.

The concept of **value added** captures only the portion of the output which is directly created by the firm's capital goods and labor. In other words, value added is the value of the final goods and services produced minus the cost of the intermediate goods and services which were purchased to produce them. This can be interesting when examining an individual firm, since two firms can have similar outputs but very different value added, depending on the cost of their intermediate inputs.



Consider the example of two different t-shirt manufacturers whose economic impact on a region is being evaluated. Both of the manufacturers ultimately sell \$100 million in t-shirts, and in order to produce them, both manufacturers use \$50 million in cotton. However, the structure of their supply chains is different. One of the firms takes the cotton and performs every step required to turn the cotton into t-shirts at their facility. For this firm, value added is \$50 million (\$100 million in t-shirts minus \$50 million in cotton) and output is \$100 million. The other manufacturer instead opts to purchase fabric from a third-party fabric manufacturer, which has taken the \$50 million in cotton and turned it

into \$70 million in fabric. When considering the economic impact of this operation, both firms will need to be considered. The fabric manufacturer has a value added of \$20 million (\$70 million in fabric minus \$50 million in cotton) and an output of \$70 million. The t-shirt manufacturer has a value added of \$30 million (\$100 million in t-shirts minus \$70 million in fabric) and an output of \$100 million, the same as the original factory. Considered together, this second operation has a combined value added of \$50 million, the same as the first example, but a combined output of \$170 million, much higher than the initial example. The lesson from this is that while output is a useful economic metric in many cases, it has the potential to double count the production of some goods and services and is best presented alongside value added for context.



Example: How change in supply chains can change output without changing value added

Appendix 5: Patron Survey Tables

	Share of		Share of
Patron Type	Respondents	Spending	Spending
Recaptured In-State	30.9%	\$101,887,444	38.5%
Reallocated In-State	13.8%	\$24,689,831	9.3%
Reallocated In-State Incidental	12.8%	\$25,459,194	9.6%
New Out-of-State*	31.6%	\$93,493,284	35.4%
Captured Out-of-state Incidental	6.3%	\$13,840,196	5.2%
Reallocated Out-of-State Incidental**	4.7%	\$4,962,034	1.9%
Total	100.0%	\$264,331,983	100.0%

Table 22. Share of On-Site Gambling Spending by Patron Type from MGM Springfield

Source: SEIGMA MGM Springfield Patron Survey

Note: An asterisk indicates estimates are unreliable, relative standard error > 30%, while two asterisks indicate that the cell size is less than 6.

Table 23. Share of On-Site Non-Gambling Spending by Patron Type from MGM Springfield

	Share of		Share of
Patron Type	Respondents	Spending	Spending
Recaptured In-State	27.5%	\$29,347,558	31.9%
Reallocated In-State	12.2%	\$7,560,062	8.2%
Reallocated In-State Incidental	18.5%	\$20,552,317	22.4%
New Out-of-State*	29.4%	\$29,132,575	31.7%
Captured Out-of-state Incidental	6.1%	\$2,969,807	3.2%
Reallocated Out-of-State Incidental**	6.3%	\$2,350,679	2.6%
Total	100.0%	\$91,912,997	100.0%

Source: SEIGMA MGM Springfield Patron Survey

Note: An asterisk indicates estimates are unreliable, relative standard error > 30%, while two asterisks indicate that the cell size is less than 6.

Table 24. Share of Recaptured Patron Gambling Spending by REMI Region from MGM Springfield

REMI Region	Share of Respondents	Spending	Share of Spending
Berkshires	4.9%	\$2,221,971	2.2%
Pioneer Valley	78.0%	\$90,066,178	88.4%
Central	8.9%	\$4,236,688	4.2%
Greater Boston	6.9%	\$3,689,994	3.6%
Southeast	1.0%	\$1,478,757	1.5%
Cape and Islands	0.3%	\$193,856	0.2%
Total	100.0%	\$101,887,444	100.0%

Table 25. Share of Recaptured Patron On-Site Non-Gambling Spending by REMI Region from MGM Springfield

	Share of		Share of
REMI Region	Respondents	Spending	Spending
Berkshires	5.0%	\$1,983,703	6.8%
Pioneer Valley	79.9%	\$23,659,364	80.6%
Central	6.4%	\$975,703	3.3%
Greater Boston	7.3%	\$2,388,970	8.1%
Southeast	1.3%	\$338,304	1.2%
Cape and Islands	0.3%	\$3,363	0.0%
Total	100.2%	\$29,349,407	100.0%

Source: SEIGMA MGM Springfield Patron Survey

Table 26. Share of Reallocated In-State Patron Gambling Spending by REMI Region from MGM Springfield

REMI Region	Share of Respondents	Spending	Share of Spending
Berkshires	4.9%	\$736,242	3.0%
Pioneer Valley	86.9%	\$22,968,179	93.0%
Central	4.9%	\$326,653	1.3%
Greater Boston	2.1%	\$602,904	2.4%
Southeast	0.5%	\$16,747	0.1%
Cape and Islands	0.7%	\$39,105	0.2%
Total	100.0%	\$24,689,831	100.0%

Source: SEIGMA MGM Springfield Patron Survey

Table 27. Share of Reallocated In-State Patron On-Site Non-Gambling Spending by REMI Region from MGM Springfield

REMI Region	Share of Respondents	Spending	Share of Spending
Berkshires	5.3%	\$29,805	0.4%
Pioneer Valley	87.6%	\$7,131,917	94.3%
Central	2.4%	\$78,896	1.0%
Greater Boston	3.3%	\$308,743	4.1%
Southeast	0.7%	\$7,339	0.1%
Cape and Islands	0.7%	\$3,362	0.0%
Total	100.0%	\$7,560,062	100.0%

Table 28. Share of Reallocated In-State Incidental Patron Gambling Spending by REMI Region from MGM Springfield

REMI Region	Share of Respondents	Spending	Share of Spending
Berkshires	2.1%	\$620,080	2.4%
Pioneer Valley	93.9%	\$23,618,538	92.8%
Central	0.9%	\$186,958	0.7%
Greater Boston	2.1%	\$28,810	0.1%
Cape and Islands	1.1%	\$1,004,809	3.9%
Total	100.0%	\$25,459,194	100.0%

Source: SEIGMA MGM Springfield Patron Survey

Table 29. Share of Reallocated In-State Incidental Patron On-Site Non-Gambling Spending by REMI Region from MGM Springfield

REMI Region	Share of Respondents	Spending	Share of Spending
Berkshires	0.7%	\$274,070	1.3%
Pioneer Valley	92.9%	\$20,138,893	98.0%
Central	0.0%	\$0	0.0%
Greater Boston	5.7%	\$112,045	0.5%
Cape and Islands	0.7%	\$27,309	0.1%
Total	100.0%	\$20,552,317	100.0%

Source: SEIGMA MGM Springfield Patron Survey

Table 30. Share of off-site gambling spending by visitor type from MGM Springfield

	Share of		Share of
Patron Type	Respondents	Spending	Spending
Recaptured	27.7%	\$38,323,236	45.8%
Reallocated In-State	12.9%	\$11,114,580	13.3%
Reallocated In-State Incidental	19.0%	\$11,517,320	13.8%
New Out-of-State	24.4%	\$13,306,179	15.9%
Captured Out-of-state Incidental	7.9%	\$5,803,577	6.9%
Reallocated Out-of-State Incidental	8.1%	\$3,584,591	4.3%
Total	100.0%	\$83,649,483	100.0%

Table 31. Reallocated In-State Patron Off-Site Spending by REMI Region from MGM Springfield

	Share of		Share of
Patron Type	Respondents	Spending	Spending
Berkshires	0.0%	\$0	0.0%
Pioneer Valley	88.9%	\$5,648,420	97.3%
Central	5.7%	\$96,251	0.8%
Greater Boston	3.5%	\$210,476	1.6%
Southeast	1.0%	\$7,661	0.1%
Cape and Islands	0.9%	\$4,444	0.1%
Total	100.0%	\$11,114,580	100.0%