SEIGMA

SOCIAL AND ECONOMIC IMPACTS OF GAMBLING IN MASSACHUSETTS

UNIVERSITY OF MASSACHUSETTS SCHOOL OF PUBLIC HEALTH AND HEALTH SCIENCES

Plainridge Park Casino First Year of Operation:

Economic Impacts Report

October 6, 2017

Thomas Peake and Rod Motamedi
University of Massachusetts Donahue Institute, Economic and Public Policy Research Group

Authorship

Thomas Peake, Research Analyst at the UMass Donahue Institute (UMDI) and member of the Social and Economic Impacts of Gambling in Massachusetts (SEIGMA) project team.

Rod Motamedi, Research Manager at the UMass Donahue Institute (UMDI) and member of the Social and Economic Impacts of Gambling in Massachusetts (SEIGMA) project team.

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.

We would like to thank Mark Vander Linden, Director of Research and Responsible Gaming, Jill Griffin, Director of Workforce, Supplier, and Diversity Development, Derrek Lennon, the Gaming Commission's Chief Finance and Accounting Officer, and David Borges, from the University of Massachusetts, Dartmouth, whose insight and careful review of draft versions of this report contributed to its clarity as well as utility to multiple audiences. Finally, we would like to thank Plainridge Park Casino and Lisa McKenney, Plainridge Park Casino's Compliance Officer, for their cooperation, which allowed for the creation of this report.

SUGGESTED CITATION:
Peake, T. & Motamedi, R. (2017). *Plainridge Park Casino First Year of Operation: Economic Impacts Report*. Amherst, MA: University of Massachusetts Donahue Institute, Economic and Public Policy Research Group.

A PDF OF THIS REPORT CAN BE DOWNLOADED AT: www.umass.edu/seigma

Table of Contents

List of Figures

List of Tables

Executive Summary

The purpose of the current Operating Report is to estimate the full economic impact of the first year of operations of the Plainridge Park Casino (PPC) on the Massachusetts economy. In order to do that, the UMass Donahue Institute's Economics and Public Policy Research unit (UMDI) looked at two key aspects of operational effects. First, we worked directly with PPC to determine the economic footprint of PPC's operations, including employment, wages, vendor spending, and fiscal impacts from taxes and other assessments paid to the state. Second, we analyzed the way that shifts in patron spending as a result of the expansion of gaming would affect the state. To do this analysis, UMDI employed the PI$^+$ model from Amherst, MA-based Regional Economic Models Inc. (REMI) to estimate the direct and spin-off effects in the Massachusetts economy associated with casino operations and patron spending.

In Plainridge Park Casino's first full 12 months of operation (July 2015 through June 2016), patrons spent approximately $172.5 million on gambling and non-gambling activities at the facility.[1] 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 Plainridge Park Casino never opened. Based on a survey administered on-site and described in some detail later in the report – and in greater detail in SEIGMA's *Patron and License Plate Survey Report: Plainridge Park Casino 2016* – UMDI was able to estimate that the majority of spending at PPC, $100 million, was spent by Massachusetts residents who, in the absence of PPC, would have spent their money gambling at an out-of-state casino. From a policy standpoint, the significance of these "recaptured" patrons is that it is essentially "new" money to the Commonwealth since these patrons would have otherwise spent their money in another state.[2] Another $36.6 million in spending, just over a fifth of total on-site spending, was spent by Massachusetts residents who otherwise would have spent their money elsewhere in Massachusetts. The economic impact of these patrons is more nuanced than with the recaptured patrons. Since their spending has been reallocated from other Massachusetts businesses to PPC, any positive economic impact which comes from an increase in revenue at PPC is accompanied by a negative impact elsewhere in the Commonwealth.

Table 1: Sources of Spending at Plainridge Park Casino

Source of Spending	Estimated Spending (Millions of Dollars)	Share of Spending
Recaptured Spending by In-State Patrons	$100.0	58.0%
Reallocated Spending by In-State Patrons	$36.6	21.2%
Spending by Out-of-State Patrons	$36.0	20.8%
Total	$172.5	100.0%

Source: SEIGMA Patron Survey

The remaining $36.0 million was spent by out-of-state residents. The extent to which UMDI considers their spending to be new to Massachusetts is largely a function of whether or not they would have visited Massachusetts in the absence of PPC. For more detail on patron spending behavior and its

[1] Table 15 on Page 22 and the description of data preparation on Page 35 provide more detail on this number.
[2] 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.

impact on Massachusetts, see the section of the report titled, *Changes in Consumer Spending: Patrons and Their Spending Patterns*.

Table 2 details the types of economic activity which informed UMDI's analysis. These data give a high-level summary of the basis for our economic modeling exercise. Using survey data and primary data from PPC, UMDI sought to capture any economic activity that would not have occurred in the Commonwealth if the casino had not opened. These economic activities were used as inputs into a REMI PI^{+} economic model, which calculated the total economic impacts of this new activity.

The revenue described above enabled PPC to employ an average of 556 employees over the course of the fiscal year and pay $17.8 million in wages in fiscal year 2016. During the same period, PPC also supported $19.1 million in spending on vendors, membership organizations, and charitable causes. As part of Massachusetts' Expanded Gaming Act, 49% of PPC's gross gaming revenue is levied by the state for taxes and support for horse racing. These assessments are in addition to normal federal, state, and local taxes. PPC has also entered into various agreements with the host community of Plainville, Massachusetts and the surrounding communities of Attleboro, North Attleborough, Foxborough, Mansfield, and Wrentham. Some of these agreements include payments to the communities. Taken together, Plainridge Park Casino spent $77.6 million in payments to various Massachusetts government entities in fiscal year 2016. Finally, visitors to PPC spent an estimated $3.2 million in the Plainville area in the course of visiting the casino. This is money which would have been spent elsewhere if PPC had not opened.

Table 2: Summary of Primary REMI Inputs

Measure	Units	Value
Average Employment	Jobs	556
Total Wages	Millions of Dollars	$17.8
Intermediate (e.g. B2B) Spending	Millions of Dollars	$19.1
Government Revenue	Millions of Dollars	$77.6
Estimated New Off-Site Spending	Millions of Dollars	$3.2

Source: Plainridge Park Casino

Table 3 shows how the economic impacts of PPC were distributed around the state. While the analysis which produced these estimates used sub-state inputs and produced sub-state outputs, data related to consumer spending are only reported at the statewide level due small sample sizes in some regions of different types of patrons.[3]

In its first year of operation, the direct employment, wages, vendor spending, and fiscal activity associated with Plainridge Park Casino generated a total of 2,758 jobs, with 1,964 of those jobs existing in the private sector. Just over two-thirds of that employment impact occurred in the four-county Metro Boston region, which includes Norfolk County and the Town of Plainville. This new economic activity was partially paid for by a decline in existing spending on other goods and services in Massachusetts as

[3] As an example, we are reasonably confident in the total amount of money spent on gambling at the casino which has been reallocated from activity elsewhere in Massachusetts ($36.6 million). While our model allows us to estimate where these patrons live, and by extension, where they would have spent their money if not for the expansion of gaming, these geographic estimates are considerably more unreliable than the total estimates. As a result, economic model outputs, which are significantly informed by these data, are presented at the state level.

casino patrons shifted their spending away from other activities and towards PPC, leading to a loss of support for an estimated 340 jobs. On net, PPC created or supported 2,417 jobs in the Commonwealth, 1,633 of which were in the private sector.[4] The remainder were government positions supported by the revenue generated by PPC. The casino also supported $143.7 million in new personal income and $505.5 million in new output within the Massachusetts economy, of which $362.4 million was value added (i.e., net new economic activity or gross state product).

Table 3: Economic Impacts of Plainridge Park Casino by Region

Region	Total Employment	Private Non-Farm Employment	Output ($M)	Value Added ($M)	Personal Income ($M)
Regional Operating Impacts:					
Metro Boston	1,896	1,466	$447.0	$326.3	$98.7
Southeast	376	247	$48.3	$29.9	$31.7
Pioneer Valley	189	80	$23.1	$14.5	$10.3
Central	231	131	$30.2	$18.7	$17.4
Berkshires	27	11	$3.2	$2.0	$1.4
Cape and Islands	38	29	$4.6	$2.9	$2.8
Total	2,758	1,964	$556.4	$394.4	$162.2
Statewide Impacts from Changes In Consumer Spending:					
Total	-340	-331	-$50.9	-$31.9	-$18.5
Statewide Net Impacts:					
Total	2,417	1,633	$505.5	$362.4	$143.7

Source: Regional Economic Models, Inc., UMDI Calculations

Broadly speaking, PPC's impact on Massachusetts can be split into two parts. One part is the private sector activity resulting from PPC, including new employment and wages, intermediate spending on vendors, and reallocation of patron spending, either from out-of-state casino spending or from in-state consumption of other goods and services. The other part is the economic activity resulting from new state and local government spending made possible by revenue from PPC. Ultimately, while the private sector activity at PPC had both positive and negative impacts on each region of the Commonwealth, the majority of new employment outside of the immediate host region was the result of new tax revenue from PPC being spent across the state.

Table 4 shows the shares of employment impacts associated with private sector activity and government spending.

[4] Certain aspects of PPC's operation were not modeled due to technical or data limitations. These include impacts resulting from new federal revenue or new sales for out-of-state vendors, as well as any impacts from the Massachusetts Gaming Commission's Race Horse Development Fund. As a result, the output presented in this report may slightly underestimate the true economic impact of PPC.

Table 4: Employment Impacts from Public and Private Sector Activity

Source of Employment Demand	Employment Impact	Share of Total Impact
Employment Impacts from Private Sector Activity	778	32%
Employment Impacts from Government Spending	1,639	68%
Total Employment Impacts[5]	2,417	100%

Source: Regional Economic Models, Inc., UMDI Calculation

The employment impacts from PPC were largest in PPC's own industry (Amusement, gambling, and recreation). This sector, however, did not see a substantial change beyond the direct employment at PPC. Other industries affected by the casino are a mixture of industries which are heavily represented in PPC's vendor spending (also see Table 11). These include professional, scientific, and technical services, administrative and support services, and wholesale trade. Industries which are associated with an increase in general consumer spending, such as construction, retail trade, food services and drinking places, and real estate, were also affected by PPC vendor spending.

Table 5: Top 10 Industries by Statewide Employment Impact

Employment Impact by Industry Sector (Top Ten Industries)	Employment
Amusement, gambling, and recreation	560
Construction	281
Retail trade	104
Professional, scientific, and technical services	100
Administrative and support services	81
Food services and drinking places	62
Ambulatory health care services	43
Real estate	40
Wholesale trade	40
Personal and laundry services	28
All other industries	294
Total Private Non-Farm Employment	1,633

Source: Regional Economic Models, Inc., UMDI Calculation

To recap, less than a quarter of the jobs created or supported by the opening of PPC were actually at the facility. The majority of the employment impact related to PPC is the result of new state and local government spending due to the revenue collected on PPC's gross gaming revenue. While an estimated 340 jobs were lost statewide as consumers shifted their spending towards PPC, that number was somewhat lower than expected, due to the majority of casino spending coming from "recaptured" patrons.

[5] The rows in Table 4 are the result of three distinct REMI simulations: 1) only private sector variables, 2) only public sector variables, and 3) all variables. Since the REMI PI+ model is a dynamic economic impact model where variables interact with one another in the course of calculating impacts, the first two rows should not be expected to add up to the last.

Introduction

The UMass Donahue Institute (UMDI) is a member of the Social and Economic Impacts of Gambling in Massachusetts (SEIGMA) project team that has been charged with carrying out aspects of the research agenda of the Massachusetts Gaming Commission (MGC). A remarkable aspect of the MGC's research agenda is the opportunity to measure the actual economic outcomes of the casino facilities as they are built and carry out operations in the state. This report describes the activities undertaken by Plainridge Park Casino (PPC) in Plainville, Massachusetts in its first 12 full months (July 2015 through June 2016) of operation and measures the economic impacts generated in this first year.

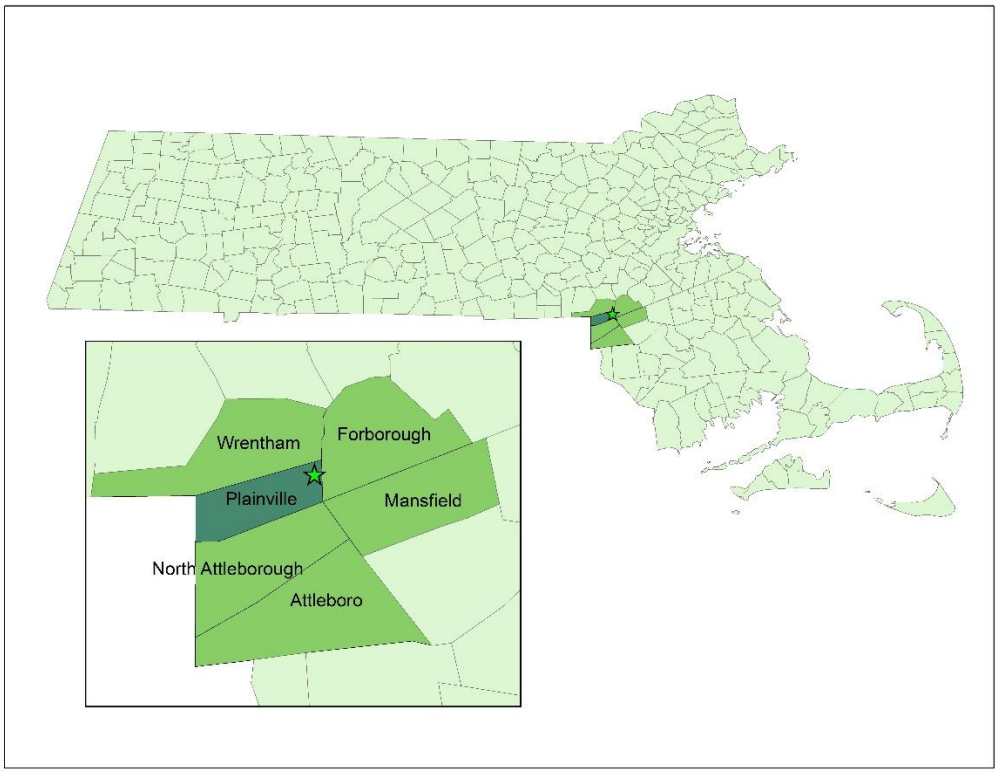
In November of 2011, Governor Deval Patrick signed the Expanded Gaming Act, which allows for the creation of up to three commercial resort-style casinos and one slot parlor.[6] To reduce internal competition among casinos and maximize their potential benefits, the Commonwealth was divided into three regions, shown in Figure 2, with each region able to attract only one full casino license. The slot parlor license was not geographically limited. To date, two full licenses in Regions A and B and the slots license have been awarded as shown in Figure 3. Plainridge Park Casino – the subject of this report – is the singular slot parlor and the only venue currently operating. The status of the Region C casino license is complicated by the MGC's decision to not award a license to the only commercial bidder, which hoped to open in Brockton.[7] The status of the Region C license is further complicated by a recent U.S. District Court ruling invalidating the land in trust granted to the Mashpee Wampanoag tribe for a casino in nearby Taunton.[8]

Recognizing that the introduction of casinos will create both positive and negative social and economic effects, Section 71 of the Expanded Gaming Act includes a mandate for the Massachusetts Gaming Commission to establish "an annual research agenda."[9] To facilitate this research, the MGC sought bids through a competitive process, which was won by SEIGMA, a team led by researchers at the UMass Amherst School of Public Health and Health Sciences.[10] The role of UMDI in the larger SEIGMA project is to collect data on and measure the economic impacts of the introduction of casinos in Massachusetts.

Plainridge Park Casino is located in the northeast corner of Plainville, Massachusetts near the intersection of Route 1 and Interstate 495. This site was formerly the home of Plainridge Racecourse, which has now been integrated into the casino facility. The final structures on the casino property include the racetrack used for harness racing, a grandstand and simulcast building, the casino, and a parking garage.

[6] <http://massgaming.com/about/expanded-gaming-act>
[7] http://massgaming.com/wp-content/uploads/16-025RegionC.pdf
[8] https://www.gpo.gov/fdsys/pkg/USCOURTS-mad-1_16-cv-10184/pdf/USCOURTS-mad-1_16-cv-10184-0.pdf
[9] <http://massgaming.com/about/research-agenda>
[10] An overview of the research plan can be found on the MGC's website: < http://massgaming.com/wp-content/uploads/SEIGMA-Research-Plan.pdf>

Figure 1: Location of Plainridge Park Casino, Plainville, and Surrounding Communities



This report seeks to inform stakeholders about Plainridge Park Casino's first year of operation and its economic contribution to the Commonwealth. Since Plainridge Park Casino began operations in June of 2015, UMDI has worked with PPC and the MGC to obtain data on employment, wages, spending, and government revenue related to the operation of PPC. UMDI also assisted in designing a survey of patrons, which other members of the SEIGMA team administered on-site at PPC on eight occasions during the first 12 months of operation. These data are presented in this report along with an estimate of the total economic impacts to the Commonwealth of Massachusetts resulting from PPC's first year of operation.

Figure 2: Massachusetts Gaming Regions[11]

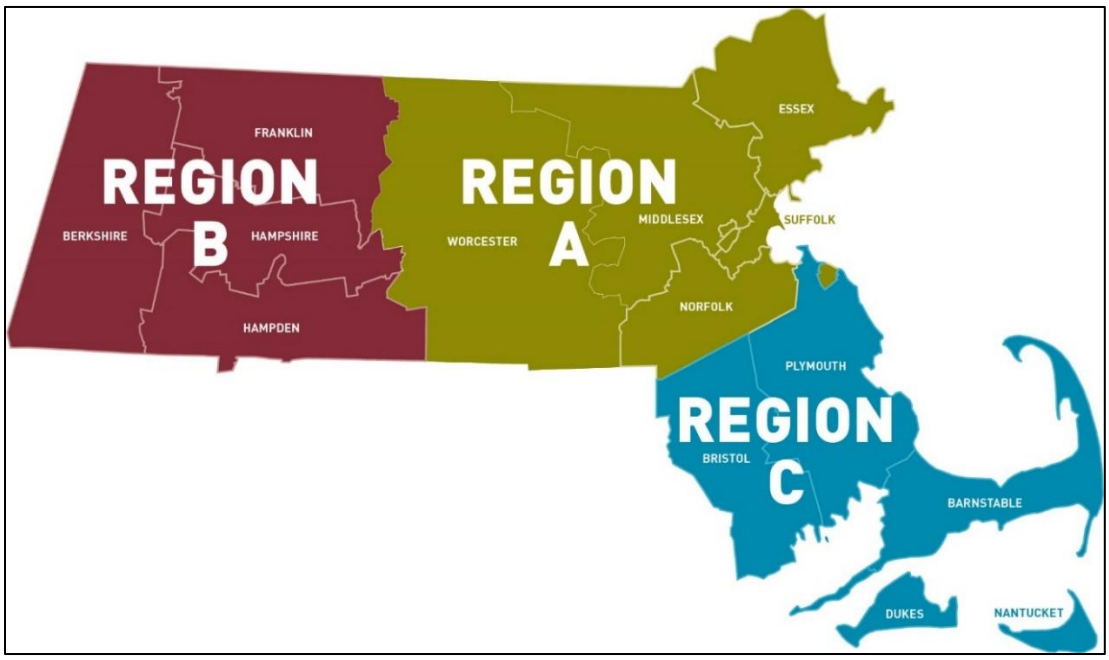
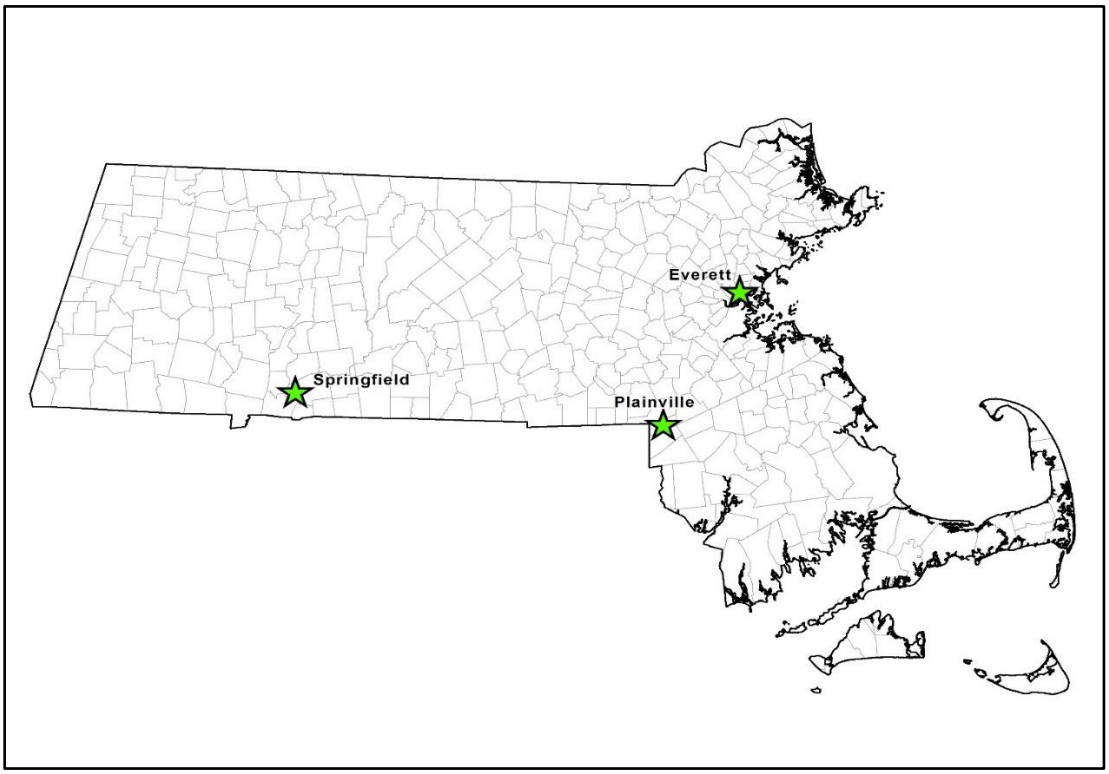


Figure 3: Locations of Approved Massachusetts Casinos



[11] <http://massgaming.com/about/expanded-gaming-act>

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. 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 (i.e., 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 US 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.

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 PPC, including employment counts, wages, and detailed vendor spending data. Other data, such as information on the collection and disbursement of taxes on PPC's gross gaming revenue, was provided to UMDI from state government sources. Finally, data on patron behavior had to be collected by the SEIGMA team, which administered an on-site patron survey at PPC.

Patron Survey Methodology

SEIGMA members from both the social and economic teams collaborated closely on the 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: (1) waiting 6-12 months after the casino opened to allow patronage volume and demographic characteristics to settle; (2) splitting the data collection between the winter and the summer to take account of potential seasonal differences in patronage; (3) spreading each data collection period over a two week time span; and (4) 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, 2/20/2016, 12-4 pm; Monday, 2/22/2016, 6-10 pm; Saturday 2/27/2016, 6-10 pm; Monday, 2/29/2016, 12-4 pm; Saturday, 7/30/2016, 12-4 pm; Monday, 8/1/2016, 6-10 pm; Saturday, 8/6/2016, 6-10 pm; and Monday, 8/8/2016, 12-4 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 PPC. 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 Dunkin Donuts 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 self-administered format was to maximize the validity of responses to potentially sensitive questions (e.g., gambling expenditure, income).

The surveyors approached a total of 2,136 patrons exiting the casino and invited them to complete the survey. A total of 479 patrons agreed, and all 479 completed the survey, which represents a response rate of 22.4%. Response rates for individual questions were all above 88.5%.

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 PPC patrons in the calendar year of 2016. 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 PPC. 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 PPC 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 86.1% 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 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, *Patron and License Plate Survey Report: Plainridge Park Casino 2016,* which will be available on the SEIGMA website in October of 2017.

Economic Modeling Methodology

For this and future economic analyses, the SEIGMA team has chosen the PI^{+} model from Massachusetts-based Regional Economic Models, Inc. (REMI). PI^{+} generates realistic year-by-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.

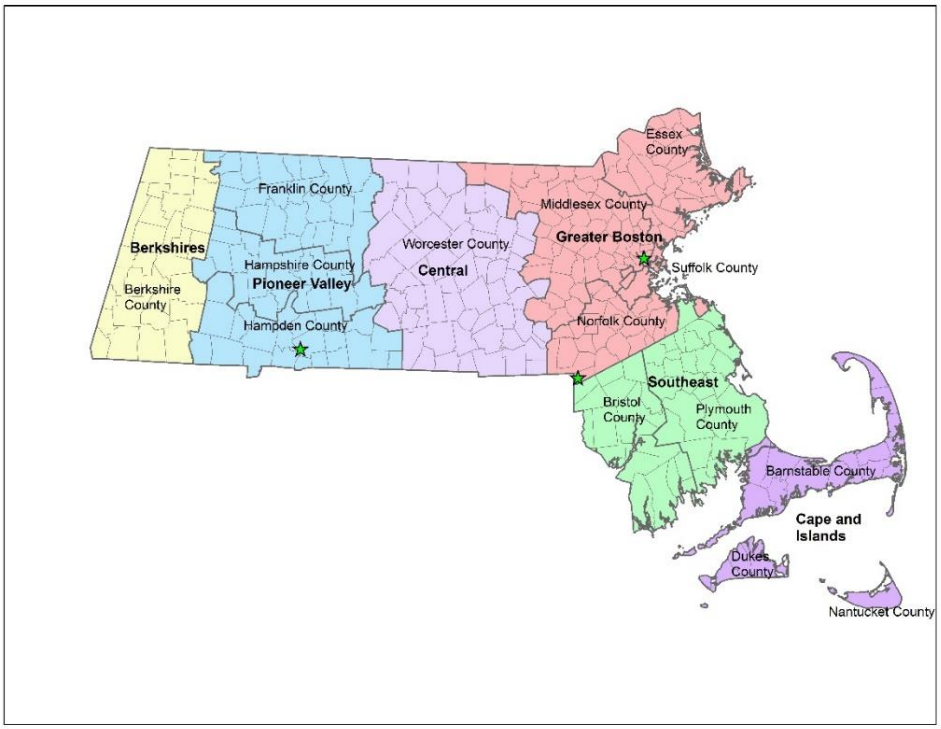
The REMI model purchased by SEIGMA is a 6 region, 70 sector model. Each of the 6 regions in the model is built from Massachusetts counties, and the 70 REMI industry sectors roughly correspond to the 3-digit codes of the North American Industry Classification System (NAICS). For the purposes of this study, 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.

Appendices 1 and 2 at the end of this report provide more information on the PI+ model and the methods used to prepare the data for the model.

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 on PPC included specific information on each of these areas and therefore allowed the use of actual reported data rather than industry and/or regional averages, which are needed in the absence of precise inputs. As previously noted, Appendices 1 and 2 provide detailed methodologies of the PI+ model and the data preparation.

For the purposes of this simulation, UMDI reconfigured the 6 REMI regions which would be used in the simulation.[12] The purpose of the reconfiguration was to describe Massachusetts using regional definitions which describe recognizable geographic and cultural regions of the Commonwealth, as well as to build regions which can be aggregated up to the MGC's designated gaming regions. One consequence of this is that Plainridge Park Casino now sits in the far southwestern corner of the Metro Boston Region, just to the north of the Southeast Region and just to the east of Rhode Island. Sitting on the border of such a large and economically diverse region could present some modeling problems in a less detailed study. Thanks to the richness and level of detail of our primary data, however, UMDI was able to overcome potential modeling problems associated with this regional layout.

Figure 4: REMI Regions



[12] Earlier analyses by UMDI used a different regional layout, which sought to center the approved casinos within each region.

Direct Impacts of Casino Operations

The most obvious way that Plainridge Park Casino changed the Massachusetts economy was by hiring staff, paying them wages, and purchasing intermediate goods and services. Casino operations refers to all of the economic activities that take place in the course of running the casino. PPC's spending on its own staff supports their positions and creates new demand in Massachusetts as these employees spend their new paychecks. Beyond the casino, PPC's spending on intermediate goods and services, such as food, slot machines, and performers, supports employment in other establishments, whose owners and employees then spend their earnings in turn. The following sections detail the ways in which PPC's operation had a direct impact on the Massachusetts economy.

Employment and Wages

Over the course of PPC's first year of operation, a total of 893 employees were hired. Of these employees, some worked full-time or even picked up overtime for the entirety of the year, while others worked for less than a week. Due to this discrepancy in tenure, the total number of hires is not an appropriate number for calculating employment. Instead, UMDI divided the total hours worked by employees by the average annual hours worked for a year-round employee based on data from the Bureau of Labor Statistics.[13]

Table 6 shows the regional distribution of PPC's hires, as well as the associated hours worked and wages paid. While Plainville and PPC sit in the far southwestern corner of the Metro Boston region, the majority of hires at PPC were not from the Metro Boston region. In fact, both the Southeast region and the rest of the nation provided more hires to PPC than the Metro Boston region. This is unsurprising, as the adjacent parts of both the Southeast Region and next-door Rhode Island are more densely populated than the fairly suburban communities of Western Norfolk County, where Plainville is located.

Table 6: Plainridge Park Casino Hires, Hours Worked, and Wages Paid by Region

Region	Hires	Hours Worked	Wages Paid
Metro Boston	229	254,019	$5,089,465
Southeast	364	401,127	$6,229,344
Central	40	42,003	$740,097
Pioneer Valley	1	2,200	$44,384
Cape and Islands	3	3,172	$64,862
Rest of Nation / World	256	292,428	$5,640,544
Total	893	994,949	$17,808,697

Source: Plainridge Park Casino

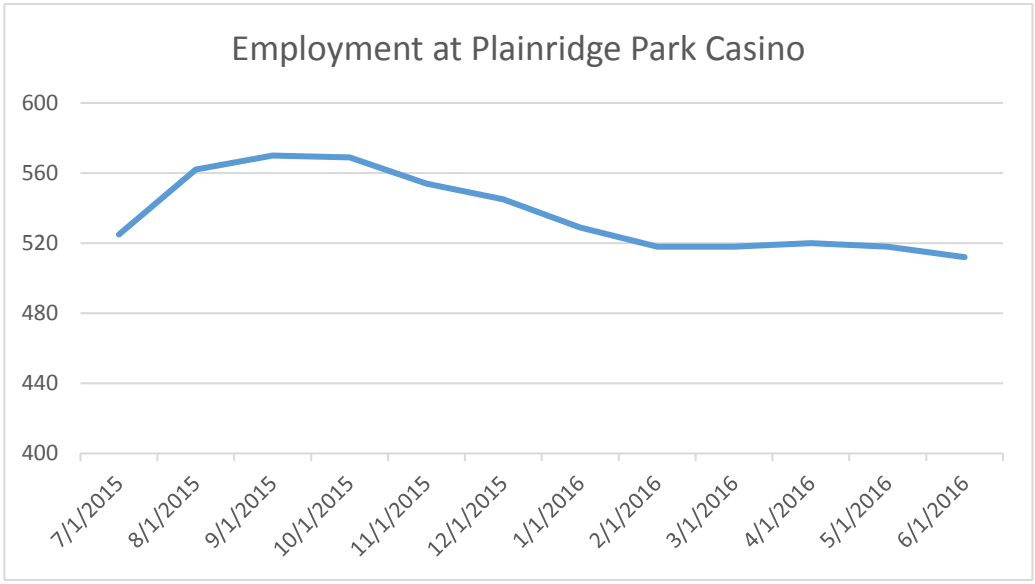
It should be noted that counts of hires, hours worked, and wages paid to employees from outside of Massachusetts are likely somewhat overstated, and as a result, the numbers for the regions of Massachusetts are likely somewhat understated. The reason is that the employment and payroll data

[13] According to the Bureau of Labor Statistics, the average employee in the casinos, except casino hotels industry worked 34.4 hours per week. The number used in UMDI's economic modeling exercise was calculated by dividing the 994,949 hours worked at PPC by 34.4 hours *52 weeks = 1,788.8 hours per year for a headcount of 556.2 annual employees.

used for this analysis relies upon employee self-reporting of home address. In the course of analyzing the data, UMDI found several employees whose home addresses were in states as far away as Florida or Nevada. While some of these workers may be seasonal workers (especially in the horse racing portion of the facility) with primary residences in other states, it is also likely that some employees hired from outside of Massachusetts simply forgot to update their addresses. While it is very unlikely that they still live so far away, UMDI determined that it cannot be assumed that they necessarily moved to Massachusetts, as a large number of employees do live in Rhode Island. Therefore, in the interest of a conservative estimate, these employees are assumed to live out-of-state for modeling purposes. When examining the total hours worked and the total wages paid together, it appears that there may be a regional difference in the number of higher-paying jobs. The average hourly wage for a worker in the Metro Boston region was $20.04/hour compared to $19.29/hour for out-of-state workers and $15.53/hour for workers from the Southeast region.

Figure 5 shows the count of people employed at PPC in each month of its first fiscal year of operation. PPC started the year with 525 employees, a number which rose to 569 by October 2015 and gradually declined to 518 employees by February 2016. Employment remained roughly level for the remainder of the fiscal year 2016. PPC finished the fiscal year with 512 employees.

Figure 5: Monthly Employment at Plainridge Park Casino, FY2016



Source: Plainridge Park Casino

As shown in Table 7, most of the employees hired at PPC worked in a customer-serving capacity, with the two largest organizational groups being food and beverage and casino operation. While food and beverage is the larger of the two groups in terms of hires, casino operations represents a greater share of both hours worked and wages paid. While the next largest group, finance and administration, is much smaller than either food and beverage or casino operation, it represents a disproportionate share of wages paid relative to its size.

Table 7: Plainridge Park Casino Hires, Hours Worked, and Wages Paid by Organizational Group

Organizational Group	Hires	Hours Worked	Wages Paid
Finance and Administration	110	170,164	$3,176,515
Sales and Marketing	27	43,402	$1,240,676
Food and Beverage	359	294,354	$4,536,710
Racing	71	61,918	$1,084,178
Casino Operation	283	346,426	$5,547,666
General and Administrative	5	7,296	$792,834
Support Operations	31	58,225	$1,080,251
Human Resources	7	13,164	$349,868
Total	893	994,949	$17,808,697

Source: Plainridge Park Casino

Table 8 highlights some of the differences between part-time and full-time workers at PPC. Of all the employees hired at PPC in its first year of operation, 573 of its 893 hires (64.2%) were full-time employees. Perhaps unsurprisingly, these employees worked longer hours than their part-time counterparts, making up 813,020 of the 994,949 hours worked (81.7%) that year. In what is likely the result of full-time positions having higher base pay, full-time employees made up an even more disproportionate share of wages paid, at $15,361,540 of $17,808,697 (86.3%).

Table 8: Plainridge Park Casino Hires, Hours Worked, and Wages Paid by Full-Time/Part-Time Status

Full-Time/Part-Time Status	Hires	Hours Worked	Wages Paid
Part-Time	320	181,928	$2,447,157
Full-Time	573	813,020	$15,361,540
Total	893	994,949	$17,808,697

Source: Plainridge Park Casino

Table 9 and Figure 6 detail the geographic distribution of employees hired by PPC in its first fiscal year of operation. The top 10 cities and towns by number of hires account for the narrow majority (52.5%) of all of PPC's hires. Five of the top 10 zip codes of residence, including the top two (Attleboro and North Attleborough) are in the Northern part of Bristol County, MA, in the Southeast REMI region. Another three, including Plainville, are in the Western part of Norfolk County, MA, in the Metro Boston REMI region. The remaining two, Pawtucket and Providence, are cities across the state border in Rhode Island.

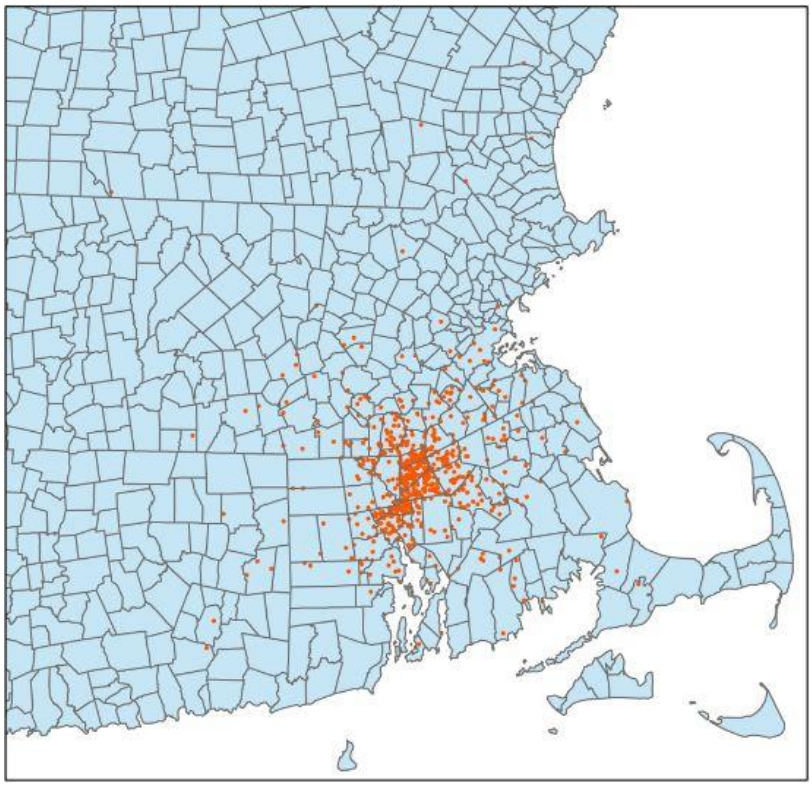
Table 9: Hires by Place of Residence

City/Town	REMI Region	Hires	Share of Hires
Attleboro, MA	Southeast	88	9.9%
North Attleborough, MA	Southeast	86	9.6%
Plainville, MA	Metro Boston	53	5.9%
Pawtucket, RI	Rest of Nation / World	53	5.9%
Providence, RI	Rest of Nation / World	39	4.4%
Mansfield, MA	Southeast	35	3.9%
Norton, MA	Southeast	30	3.4%
Taunton, MA	Southeast	29	3.2%
Franklin, MA	Metro Boston	28	3.1%
Wrentham, MA	Metro Boston	28	3.1%
All Other Places		424	47.5%
Total		893	100.0%

Source: Plainridge Park Casino

Most of the individuals hired to work at PPC are clustered relatively close to the casino itself. Some hires, however, are distributed as far away as Eastern Connecticut, Southern New Hampshire, Cape Cod, and the suburbs of southern Worcester County. Despite being by far the largest population center in the Commonwealth, only a few of PPC's employees listed Boston or its immediate suburbs as their place of residence.

Figure 6: Map of Plainridge Park Casino Hires, FY2016



Source: Plainridge Park Casino

Vendor Spending and Taxes

In addition to wages paid to employees, Plainridge Park Casino made millions of dollars in payments to various third parties in its first year of operation. These payments include purchases of goods from vendors, such as food and alcohol, payments to utility companies and third party service providers, taxes and other payments made to various government entities,[14] and payments made on behalf of employees to various unions and membership organizations. Taken together, these payments amount to $30.3 million in PPC's first year of operation, almost twice the amount paid in wages to employees. Table 10 gives a detailed breakdown of this spending.

Payments to private sector vendors account for $18.6 million of that spending, which is 61.3% of all third party payments made by PPC. Payments to government entities ($11.2 million or 36.9%) account for nearly all of the remaining spending. The remaining 1.7% of PPC's third party spending in its first year of operation 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 various local governments within Massachusetts accounting for the second largest share of spending. While PPC paid over $900,000 in federal taxes in its first year of operation, that sum is nowhere near the $4.4 million paid to Massachusetts local government or the $5.9 million paid to the Commonwealth. The remaining spending, only $23,245, is primarily payments made on behalf of employees to the governments of other states.

Table 10: Payments Made by Plainridge Park Casino, FY2016

Type of Payment	Amount	Share
Payments to Private Sector Vendors	$18,606,043	61.3%
Payments to Government Entities	$11,203,767	36.9%
Federal Government Entities	$921,451	3.0%
Massachusetts State Government Entities	$5,888,037	19.4%
Other State Government Entities	$23,245	0.1%
Local Government Entities	$4,371,035	14.4%
Payments to Unions and Other Membership Organizations	$400,644	1.3%
Payments to Charitable Organizations	$74,910	0.2%
Payments to Individuals	$58,927	0.2%
Total	$30,344,292	100.0%

Source: Plainridge Park Casino

Table 11 shows the top 10 private non-farm industry sectors to receive payments from PPC. The largest single industry in terms of spending by PPC was wholesale trade. This is somewhat intuitive since a firm as large as PPC would purchase almost all of its food, alcohol, cleaning supplies, uniforms, printed materials, etc. from wholesalers. The second largest industry, represented in REMI as miscellaneous manufacturing, is primarily payments to the manufacturers of slot machines and other gaming equipment. Many of PPC's expenditures in its first year of operation were on things that would be

[14] The spending data included in this chapter does not include taxes on PPC's gross gaming revenue, which are collected daily and automatically and distributed according to a formula described in the next chapter. It does include all payments to the federal government, all payments to local governments, and all other payments to the Commonwealth of Massachusetts and other state government entities.

required of any business (such as utilities, professional, scientific, and technical services, and administrative and support services) while other industries, such as "performing arts and spectator sports" and "motion picture and sound recording industries", more clearly differentiate PPC as a casino.

Table 11: Top 10 Industries by Vendor Spending

Industry	Amount	Share
Wholesale trade	$5,622,313	18.5%
Miscellaneous manufacturing	$2,950,975	9.7%
Utilities	$2,125,119	7.0%
Professional, scientific, and technical services	$1,795,481	5.9%
Retail trade	$765,392	2.5%
Performing arts and spectator sports	$634,976	2.1%
Administrative and support services	$616,625	2.0%
Membership associations and organizations	$480,069	1.6%
Broadcasting, except Internet	$473,781	1.6%
Motion picture and sound recording industries	$406,972	1.3%
All Other Industries	$14,472,590	47.7%
Total	$30,344,292	100.0%

Source: Plainridge Park Casino

As shown in Table 12, the Metro Boston region of Massachusetts was the largest beneficiary of PPC's spending in its first fiscal year of operation, although that is in part a result of large payments made to state government entities located in Boston, as well as payments to the town of Plainville, which is located on the periphery of the region. Excluding payments to government entities, PPC spent more on goods and services from outside of Massachusetts than inside Massachusetts.

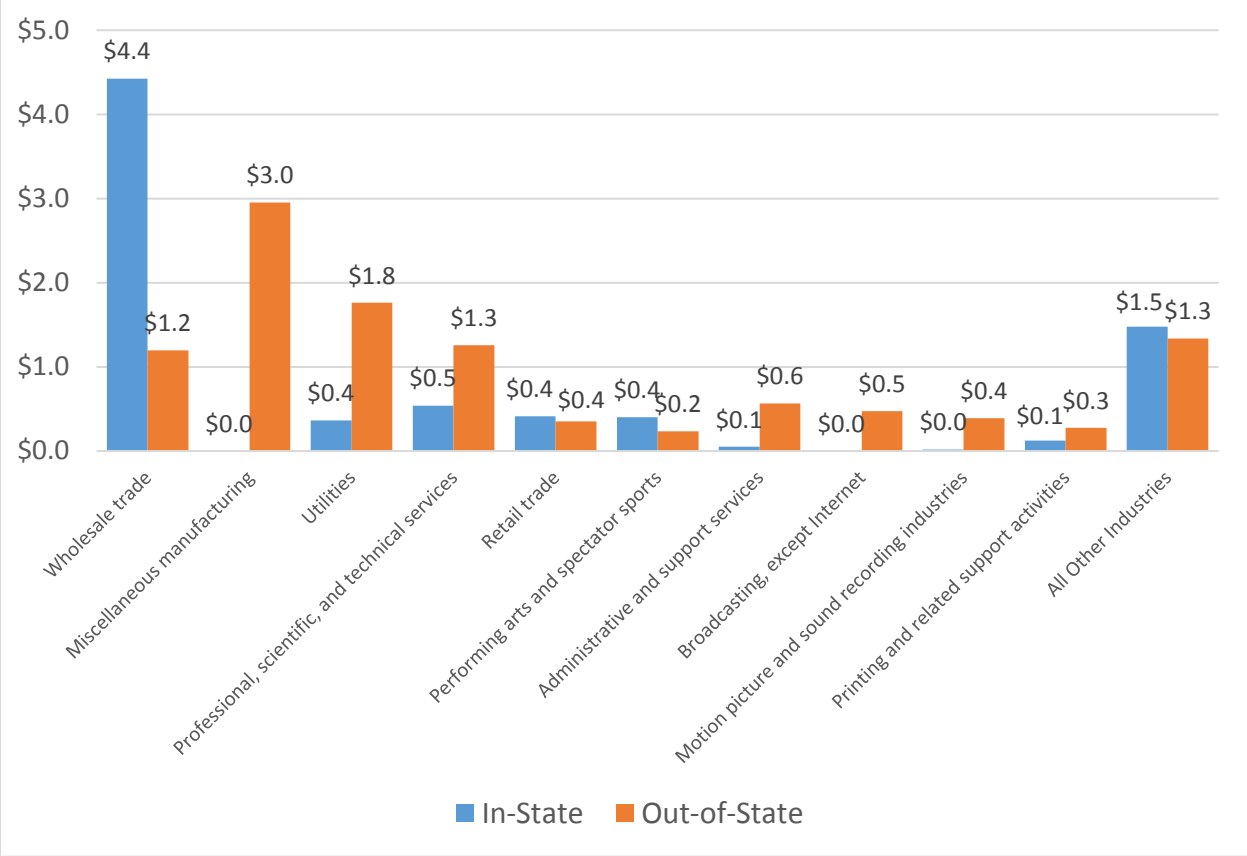
Table 12: Plainridge Park Casino Vendor Spending by Region

Region	Amount	Share
Metro Boston	$14,187,421	46.8%
Southeast	$4,482,510	14.8%
Central	$298,855	1.0%
Pioneer Valley	$124,808	0.4%
Cape and Islands	$80,822	0.3%
Rest of Nation / World	$11,169,878	36.8%
Total	$30,344,292	100.0%

Source: Plainridge Park Casino

Figure 7 shows PPC's vendor spending by industry for in-state and out-of-state vendors. The single largest recipient of spending from PPC was wholesale trade sector, with most of that spending occurring in Massachusetts. The second largest category, miscellaneous manufacturing, includes the manufacturers of slot machines. In the United States, most of these manufacturers are based around Las Vegas, so it is unsurprising that all of these funds were spent on out-of-state vendors. All told, PPC spent $18.6 million on private sector vendors, with $7.8 million of that going to vendors in Massachusetts.

Figure 7: In-State and Out-of-State Spending by Plainridge Park Casino by Industry

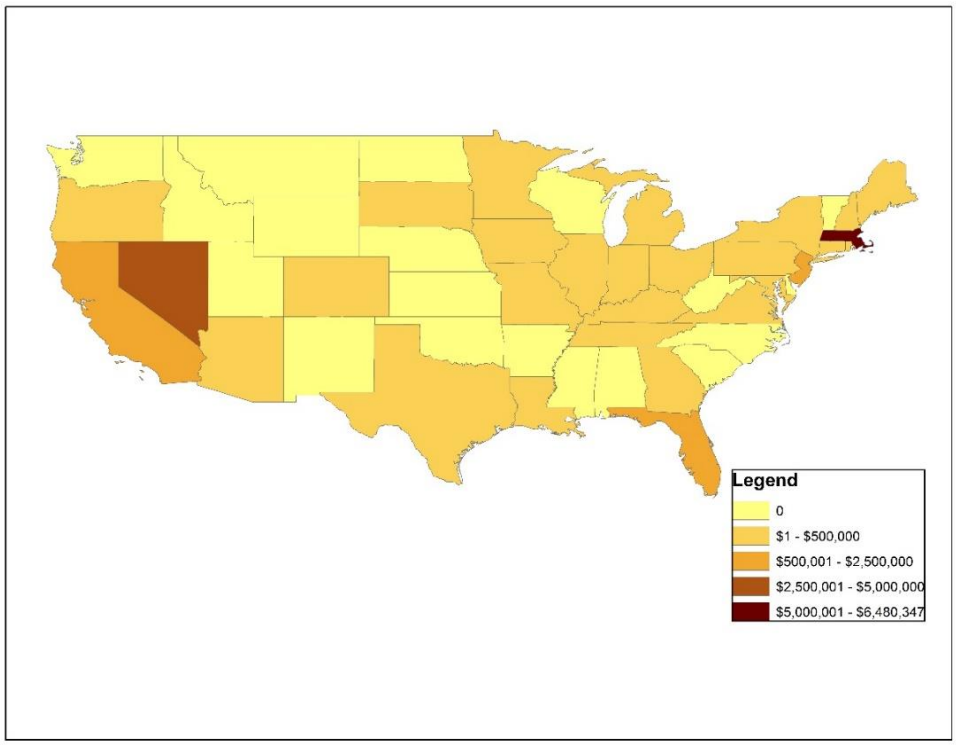


Source: Plainridge Park Casino

Figure 8 shows private non-farm vendor spending by state. While PPC spent more on private sector goods and services from outside of Massachusetts than inside, Massachusetts is still the single largest state in terms of private vendor spending. The next is Nevada, from which PPC purchased most of its gaming equipment. PPC purchased goods or services from private sector vendors in 29 out of 50 US states. Its business with vendors from outside the US was limited to a few purchases from a vendor in Canada.

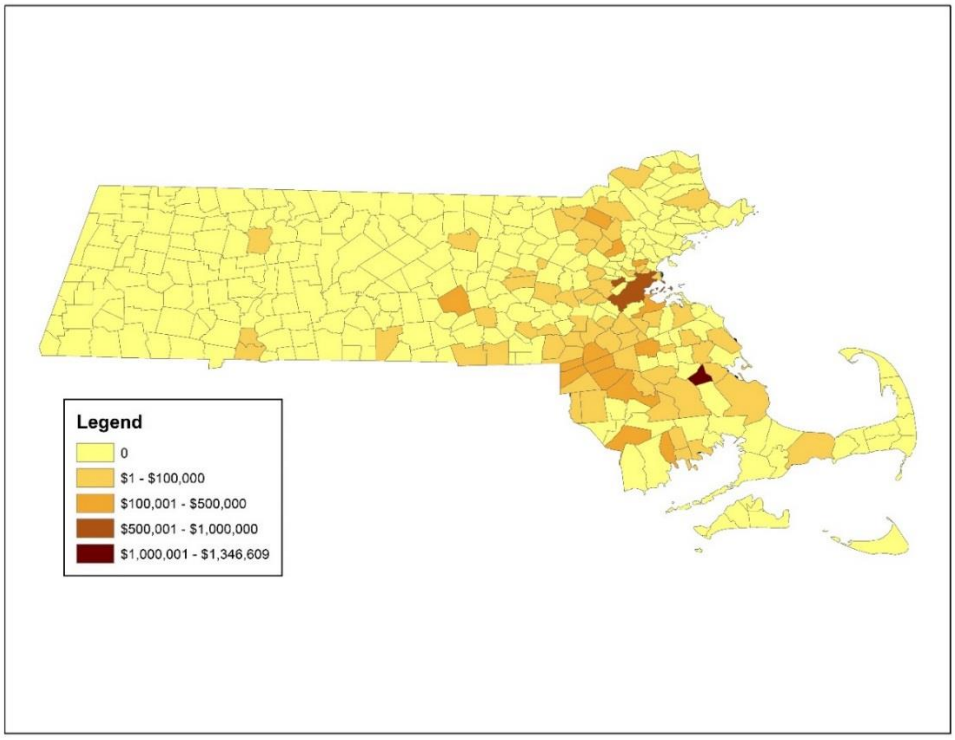
Figure 9 shows private non-farm vendor spending by city or town within Massachusetts. Private sector vendor spending within Massachusetts in PPC's first year was largely clustered in the eastern part of the state. Boston, Plainville, and Plainville's surrounding communities all feature prominently as places where PPC spent money on private sector vendors. Plympton, in Plymouth County, however, received the most vendor spending from PPC. Plympton, the only city or town in Massachusetts to receive over $1 million in vendor spending from PPC, is the home of a major food distributor to PPC, as well as a veterinarian who cares for the horses at PPC's harness racing track.

Figure 8: Map of Plainridge Park Casino Private Vendor Spending by State



Source: Plainridge Park Casino

Figure 9: Map of Plainridge Park Casino Private Vendor Spending within Massachusetts by City/Town

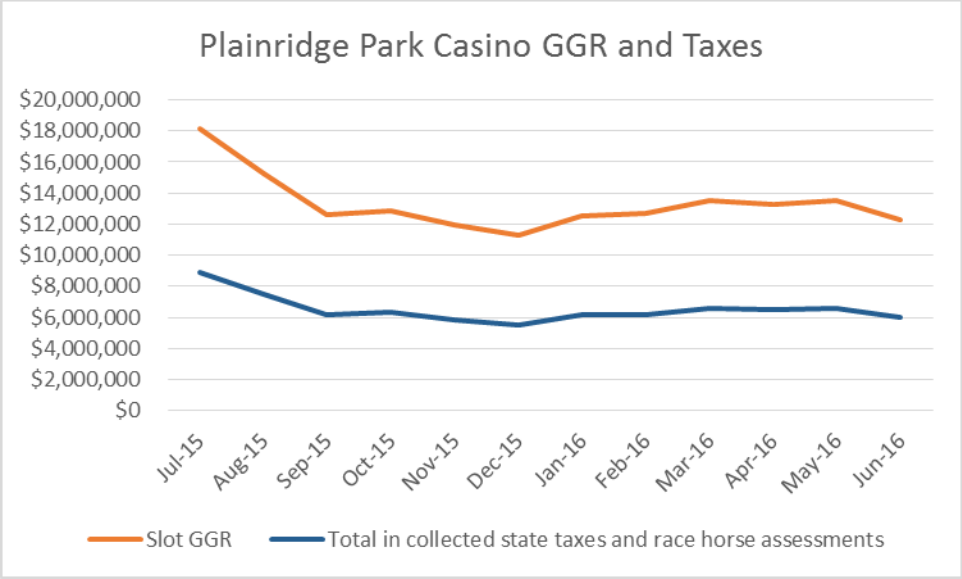


Source: Plainridge Park Casino

Public Sector Impacts from Gross Gaming Revenue

In addition to the regular business taxes paid by PPC, the Expanded Gaming Act also collects 49% of PPC's gross gaming revenue (GGR) in gaming taxes and horse racing assessments. Since the data surrounding the collection and disbursement of this revenue is relatively rich, it is presented separately from the rest of PPC's taxes. PPC paid far more in GGR taxes than any other tax in its first 12 months of operation, amounting to just over $81 million on $166 million in gross gaming revenue generated by their slot machines. As shown in Figure 10, after an initial spike in revenue in the first month of operation, slot GGR remained fairly level for the remainder of the year, rising and falling between just over $11 million to just under $13.5 million. This meant that revenue to the Commonwealth remained roughly level as well.[15]

Figure 10: Plainridge Park Casino Monthly Gross Gaming Revenue, FY 2016

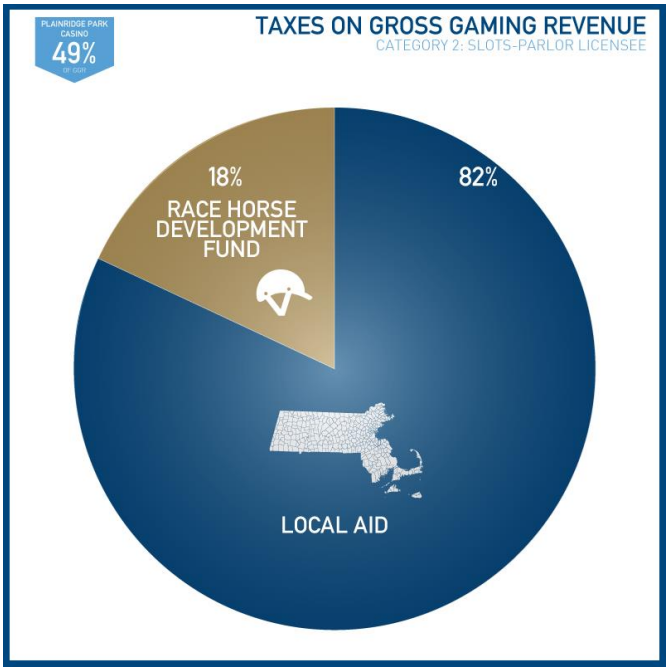


Source: Massachusetts Gaming Commission

Taxes on PPC's gross gaming revenue are allocated according to a formula set in place by the Expanded Gaming Act. This is unlike most of the taxes paid by PPC, which are not earmarked for a specific purpose by the local, state, or federal government entities collecting them. Of the $81.4 million collected in PPC's first fiscal year of operation, 18% ($14.9 million) was collected by a race horse assessment and sent to the Massachusetts' Race Horse Development Fund, while the remaining 82% ($66.4 million) was collected in taxes that were then used to increase local aid to Massachusetts cities and towns.

[15] In addition to these payments, PPC, 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 PPC in its first year of operation, these payments are not modeled, but they may be addressed in a future report.

Figure 11: Disbursement of Taxes on Plainridge Park Casino's Gross Gaming Revenue



Source: Massachusetts Gaming Commission

Massachusetts Race Horse Development Fund

Of all taxes on GGR collected from PCC, 18% (which is equivalent to roughly 9% of PPC's total GGR), is allocated to the Massachusetts Race Horse Development Fund. Money in the fund is further divided among three main programs. The majority (80%) of funds is kept for purses in an interest-bearing account, with the only stipulation being that those funds are mixed with funds from the track itself to form the total purse for a given racetrack. Of the remaining funds, 16% is used for horse breeding programs, while 4% is put towards health and pensions for racing industry workers. Unfortunately, at this time, there is no tracking system in place which would allow UMDI to adequately capture the exact economic impact of the activities supported by the fund. For example, UMDI was unable to locate data on when and where payments from the fund's purses were made, what share of the winning horse owners were Massachusetts residents, what share of the horses running in races for that purse were stabled in Massachusetts, or how much was being spent to stable and train race horses within Massachusetts. Without these data, UMDI did not have enough information to build the set of inputs for the PI^+ model, which led to the decision to table this aspect of the analysis until these data become available.

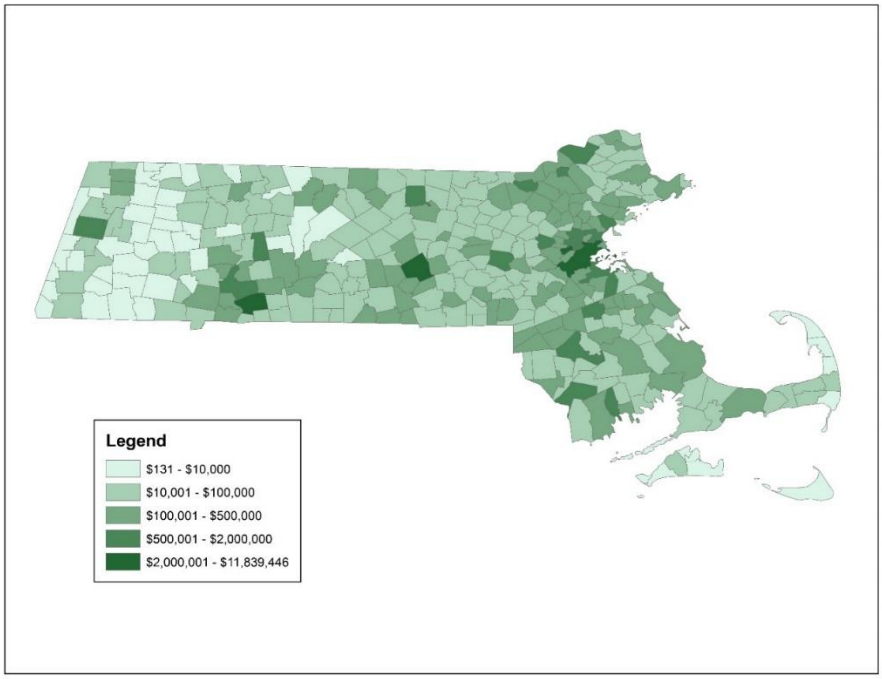
Local Aid

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, 82% of the taxes on PPC'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.[16] The formula currently set by the Massachusetts legislature distributes local aid funds based

[16] For more information on local aid distribution, see <http://www.mass.gov/bb/h1/fy16h1/os_16/h3only.htm>

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 PPC. Figure 12 and Table 13 show how local aid funds were distributed across Massachusetts.

Figure 12: New Local Aid Money from Plainridge Park Casino Gross Gaming Revenue by City/Town



Source: Massachusetts State Legislature, UMDI calculations

When aggregated into the regions that were used for our PI^{+} model, it becomes clear that the majority of local aid funds are distributed to the Metro Boston region. This is unsurprising given the sheer size and population density of the region, along with the fact that many of the Commonwealth's more economically distressed cities and towns are within this region. As mentioned previously, public sector spending was the reason for a net positive economic impact in most regions of Massachusetts. This local aid spending is by far the largest source of that spending.

Table 13: Distribution of Local Aid from Gross Gaming Revenue by REMI Region

Region	New Local Aid (Millions of Dollars)
Metro Boston	$39.7
Southeast	$9.3
Central	$7.7
Pioneer Valley	$7.7
Cape and Islands	$0.6
Berkshires	$1.4
Total	$66.4

Source: Massachusetts State Legislature

Changes in Consumer Spending: Patrons and Their Spending Patterns

Like any gambling establishment, Plainridge Park Casino makes its revenue by attracting consumers to spend their money there. But that money does not come from nowhere. Just like with any major attraction, the people visiting PPC are spending money that otherwise would have been spent elsewhere. While the collection of data on employment, wages, vendor spending, and revenue was fairly straightforward, it only describes part of PPC's economic impact. In order to fully capture the impact of PPC's opening, we also had to estimate the amounts of spending diverted from other Massachusetts businesses. The following sections describes our process for forming those estimates.

One of the greatest challenges facing researchers conducting economic impact studies is conceiving of a counterfactual[17] for consumer behavior. To determine how changes in patron behavior affect the economy, it is critical to understand what patrons would be doing if Massachusetts had not expanded in-state gaming. To do this, SEIGMA's patron survey asked four questions which help establish what the patrons' spending patterns would look like in a world without Plainridge Park Casino.[18] Those questions are: Question 1, which establishes the patron's home zip code (and whether or not they live in Massachusetts); Question 5, which targets patrons living out-of-state and Question 6, for in-state patrons, which together establish whether or not Plainridge Park Casino prompted the patron's visit to Massachusetts or Plainville; and Question 20, which asks the patron whether they would have spent the money that they spent at Plainridge Park Casino on gambling in another state if Plainridge Park Casino did not exist. Based on the patrons' answers, they are categorized into one of six patron types created by UMDI and modeled slightly differently in the economic model. Descriptions of the six patron types and how they were treated in the model are given below.

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 PPC at an out-of-state casino. A **reallocated** patron is someone who indicated that, had PPC never opened, they would have spent the money they spent at PPC 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 PPC. An **incidental** patron is someone whose visit to Plainville (if from Massachusetts) or to Massachusetts (if from out-of-state), was not prompted by PPC.

Recaptured in-state patrons are people who live in Massachusetts but who would have gambled out-of-state 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 PPC 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,

[17] 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 Plainridge Park Casino patrons would have spent their money if PPC had never opened.

[18] For detailed information on the patron survey, including a copy of the survey instrument, see SEIGMA's forthcoming *Patron and License Plate Report: Plainridge Park Casino 2016*.

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 Plainville 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 PPC 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 PPC did not prompt their visit to Plainville. For example, they may live in Plainville itself, or they may have been running errands or visiting family in Plainville. 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 PPC. 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 PPC. 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 PPC.

Captured out-of-state incidental patrons are people who would have visited Massachusetts regardless of whether or not PPC 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 PPC did not prompt their visit to Massachusetts, but also reported they would have spent the money that they spent at PPC on gambling at an out-of-state casino if PPC did not exist. Similar to reallocated in-state incidental patrons, these patrons are drawn to Plainville 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 PPC. These patrons do not have any effect on the economic model because their spending at PPC 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 PPC, and who would not have otherwise spent the money they spent at PPC 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 PPC 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 out-of-state tourists in Massachusetts.

Table 14: Patron Type Definitions

Patron Type	Q1 Origin	Q20 Would have gambled elsewhere	Q5 Casino prompted visit (from MA)	Q6 Casino prompted visit (not from MA)	On Site Spending	Off Site Spending
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

Shares of Patron Spending

Using these definitions, patron spending assumptions can now be made and used in our economic impact model. Shares of patron spending by type are calculated and are applied to known spending at the casinos to come up with spending estimates for the model in several categories. For the purposes of this analysis, UMDI used PPC's gross gaming revenue as reported by the MGC to capture the total amount of patron gambling spending at PPC. To estimate non-gaming revenue, UMDI used reported non-gaming revenue for 2016, which was reported by PPC's parent company – Penn National Gaming – in their annual report.[19] 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.

As can be seen in Table 15, for every dollar that PPC patrons spent on non-gambling activities during their visit, either at the casino or off-site, they spent over $16 on gambling at the casino. UMDI estimates that less than half of non-gambling spending by casino patrons occurred off-site.

[19] While Penn National's figure was for calendar year 2016 rather than PPC's first fiscal year of operation, UMDI's contacts at PPC stated that the figure is an acceptable proxy.

Table 15: Patron Spending by Spending Type

Spending Type	Amount
On-Site Gaming Revenue	$166,046,937
On-Site Non-Gaming Revenue	$6,500,000
Estimated Off-Site Patron Spending	$4,046,878

Source: Massachusetts Gaming Commission, Penn National Gaming, SEIGMA

With the total amounts of spending on and off-site established, the next task was to establish shares of spending by patron type and geographical origin. The team which was sent to administer the survey at Plainridge Park Casino over the winter of 2015 and the summer of 2016 returned a sample of 421 respondents whose surveys were complete enough for our use. While this sample is more comprehensive than most similar surveys, it is not large enough to avoid issues of small sample sizes and high margins of error in some of our estimates. This is particularly true when the patron groups were tabulated by region of origin. Because the REMI model estimates the amount of new economic activity occurring in each region, we used the estimated shares provided by the survey for our modeling exercise. However, the high margins of error mean that some activity ascribed to one region may have actually occurred in a different region. The decision to only report REMI outputs related to changes in consumer spending at the state level was made in response to this issue. The remainder of this section will show a few of the more high-level tables created with patron survey data. The remaining patron survey data used to inform the model are presented without analysis in Appendix 4. However, UMDI does not endorse the use of these data for any purpose other than better understanding the REMI modeling process.

Patron Spending at Plainridge Park Casino

As shown in Table 16, the majority of respondents who indicated that they had gambled at PPC were identified as recaptured in-state patrons, with the next most prominent patron type being reallocated in-state patrons. Taken together with new out-of-state patrons, this leads to an estimate that $121.4 million, or 73.1% of gambling spending was new spending to Massachusetts. This value should be treated with some caution, due to the high margin of error in the estimates for new out-of-state patrons. The remaining spending would likely have been spent on some other type of activity within Massachusetts. The three patron types designated as “incidental”, which are patrons who indicated that they would have been in the area regardless of whether or not PPC had opened, represent a smaller share of gambling spending compared with their share of all respondents. This suggests that the incidental patron groups are more casual gamblers than other patron types, who all represent a greater share of gambling spending than their share of respondents would suggest.

Table 16: Share of On-Site Gambling Spending by Patron Type

Patron Type	Share of Respondents	Spending	Share of Spending
Recaptured In-State	54.5%	$96,726,780	58.3%
Reallocated In-State	16.9%	$27,141,634	16.3%
Reallocated In-State Incidental	7.4%	$6,718,167	4.0%
New Out-of-State*	9.7%*	$24,680,357*	14.9%*
Captured Out-of-state Incidental	10.1%	$9,625,773	5.8%
Reallocated Out-of-State Incidental**	1.6%**	$1,154,226**	0.7%**
Total	100.0%	$166,046,937	100.0%

Source: SEIGMA Patron Survey

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

As with gambling spending, the majority of respondents who indicated that they had spent money on non-gambling amenities at PPC identified as recaptured in-state patrons. Reallocated in-state patrons were again the second most prominent patron group here. There is a large discrepancy between the share of patrons and share of spending for this group (16.9% versus 37.6%). The high margin of error associated with the spending estimate, however, makes it difficult to assess the significance of this finding. Reallocated in-state incidental patrons are largely the inverse of reallocated in-state patrons, with their share of non-gambling spending (4.1%) less than half their share of respondents (9.3%). Since these patrons indicated that they would have visited Plainville regardless of whether or not PPC was there, it is possible that these patrons were more likely to prefer non-gambling attractions outside of the casino that out-of-town or out-of-state patrons may not have been aware of. Table 17 shows the breakdown of on-site non-gambling spending.

Table 17: Share of On-Site Non-Gambling Spending by Patron Type

Patron Type	Share of Respondents	Spending	Share of Spending
Recaptured In-State	56.2%	$3,275,716	50.4%
Reallocated In-State	16.9%	$2,446,034	37.6%*
Reallocated In-State Incidental	9.3%	$265,638	4.1%
New Out-of-State*	7.0%*	$182,147*	2.8%*
Captured Out-of-state Incidental	9.8%	$293,120	4.5%*
Reallocated Out-of-State Incidental**	0.8%**	$37,345**	0.6%**
Total	100.0%	$6,500,000	100.0%

Source: SEIGMA Patron Survey

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

Patron Spending Off-Site

The majority of patrons surveyed indicated that they did not spend money off-site during their trip to PPC. Among those patrons who did report some off-site spending, the most commonly reported expenditures were food or beverage or retail shopping. Very few survey respondents reported staying at a hotel or attending any sort of entertainment outside of PPC. 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. To form those estimates, UMDI used data from the Massachusetts Office of Travel and Tourism (see Table 19).

Table 18: Off-Site Spending by Plainridge Park Casino Patrons by Non-Gambling Activity

Non-Gambling Activity Off-Site (Check All That Apply)	Respondents (Unweighted)	Weighted		
		Respondents	Share of Respondents	95% CI
Bought food or beverage in a restaurant or fast food outlet	106	387,170	21.4%	(17.4, 26.1)
Retail shopping like at store or mall	52	202,142	11.2%	(7.7, 16.0)
Stayed at a hotel outside of the casino	7	29,518	1.6%	(0.7, 3.7)
Went to a live entertainment show, concert or performance	10	38,232	2.1%	(1.1, 4.2)
Spent money on other entertainment (e.g. amusement park, bowling, museum)	14	57,488	3.2%	(1.8, 5.7)
Nothing	296	1,216,216	67.2%	(61.6, 72.3)

Source: SEIGMA Patron Survey

To estimate the economic impact of off-site spending from PPC patrons, UMDI spread out the estimated spending by industry. The basis for this was a set of spreadsheets provided to UMDI by the Massachusetts Office of Travel and Tourism (MOTT), showing the average consumption habits of different types of tourists in Massachusetts. Using day-tripping tourists as a rough proxy for casino patrons (nearly all lived within a day's drive of PPC), UMDI then modified MOTT's data to remove any consumption categories which were very underrepresented in the patron survey data (e.g., spending at hotels). The shares presented in Table 19 were then used to distribute new off-site spending (spending by patron groups other than reallocated in-state incidental and captured out-of-state incidental) to corresponding consumer spending categories within the PI^{+} model.

Table 19: Off-Site Spending by MOTT Spending Category and REMI Consumption Category

MOTT Spending Category	REMI Consumption Category	Share of New Spending
Transportation within State	Ground transportation	7.5%
Gasoline within State	Motor vehicle fuels, lubricants, and fluids	15.1%
Parking/Tolls within state	Other motor vehicle services	3.2%
Food/Beverage/Dining (excluding groceries)	Purchased meals and beverages	28.0%
Groceries	Food and nonalcoholic beverages purchased for off-premises consumption	6.5%
Entertainment (excluding gaming)/Admissions	Membership clubs, sports centers, parks, theaters, and museums	10.8%
Shopping/Gifts/Souvenirs	Recreational items	17.2%

MOTT Spending Category	REMI Consumption Category	Share of New Spending
Amenities (golf fees, spa, health club, ski passes, etc.)	Membership clubs, sports centers, parks, theaters, and museums	1.1%
Other	All Consumption Categories	10.8%
Total		100.0%

Source: Massachusetts Office of Travel and Tourism, UMDI modifications

A similar method was used to estimate which types of spending might not be occurring across the state due to the shifts in spending from reallocated out-of-state incidental patrons. In this case, UMDI used MOTT data for tourists who did stay more than one day as a proxy for these patrons, whose visit to Massachusetts was not prompted by PPC and who would not have spent their money gambling out-of-state if PPC had not opened. This reallocated spending was then spread around the state based on the regional share of consumption for each of these goods or services.

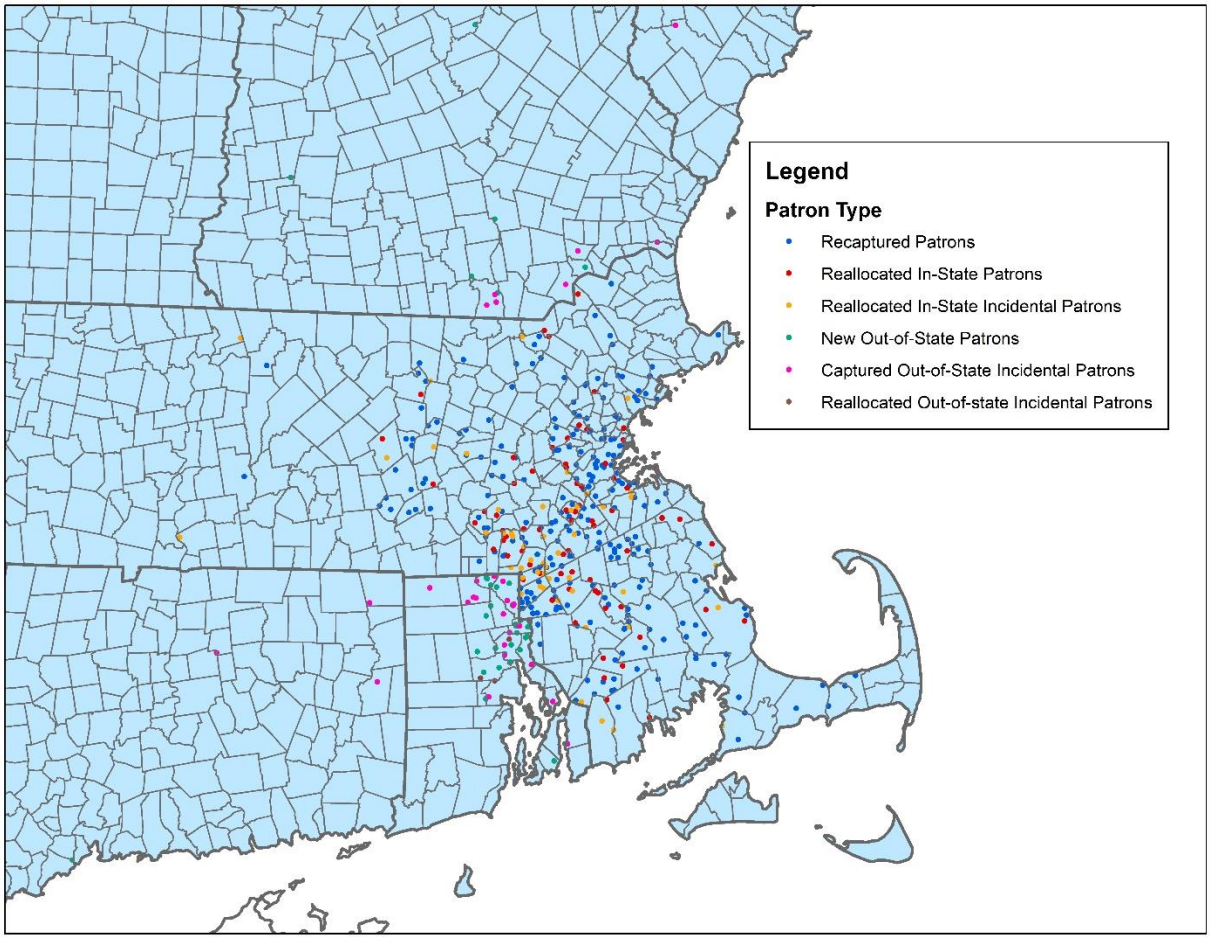
Table 20: Spending by Reallocated Out-of-State Incidental Patrons, by Previous REMI Consumption Category

MOTT Spending Category	REMI Consumption Category	Share of Reallocated Spending
Transportation within State	Ground transportation	5.2%
Gasoline within State	Motor vehicle fuels, lubricants, and fluids	5.2%
Parking/Tolls within state	Other motor vehicle services	1.9%
Lodging - Total including day trippers	Accommodations	38.9%
Food/Beverage/Dining (excluding groceries)	Purchased meals and beverages	24.6%
Groceries	Food and nonalcoholic beverages purchased for off-premises consumption	5.0%
Entertainment (excluding gaming)/Admissions	Membership clubs, sports centers, parks, theaters, and museums	8.2%
Shopping/Gifts/Souvenirs	Recreational items	7.6%
Amenities (golf fees, spa, health club, ski passes, etc.)	Membership clubs, sports centers, parks, theaters, and museums	1.5%
Other	All Consumption Categories	1.9%
Total		100.0%

Source: Massachusetts Office of Travel and Tourism, UMDI modifications

Figure 13 shows the approximate location of survey respondents, based on zip code. Patrons of the casino are heavily clustered in the cities and towns around Plainville, and along the Route 1 corridor, which runs through Plainville on its way from Boston to Providence, Rhode Island. Reallocated in-state incidental patrons seem to be clustered more closely to PPC than recaptured or reallocated in-state patrons. Almost all new out-of-state patrons and reallocated out-of-state incidental patrons lived in Northeastern Rhode Island. Almost all of the other out-of-state patrons were classified as captured out-of-state incidental patrons whose visit to Massachusetts was not prompted by PPC, but who would have otherwise spent their money gambling out-of-state at some point.

Figure 13: Map of Survey Respondents by Patron Type



Source: SEIGMA Patron Survey

Conclusion

The economic impact of Plainridge Park Casino's first year of operation went far beyond the 556 positions at the casino. Between the $17.8 million in new wages being spent in the economy, $19.1 million spent on vendors and organizations, and the $77.6 million in new revenue collected by various government entities, the majority of the 2,758 jobs created or supported by the casino were not actually on site. These positive impacts must be somewhat tempered by the estimated 340 jobs lost due to reallocations in patron spending, leading to a net impact of 2,417 jobs. This number would have been much lower were it not for the substantial amount of new revenue collected by the state, which ultimately had a larger economic impact than all other new activity. It also could have been much lower if not for the majority of patron spending coming from patrons who would otherwise have spent their money out-of-state.

In measuring the economic impact of PPC, UMDI had an opportunity to produce a study informed not only by proprietary data from PPC but also by a customized survey of casino patrons. While the use of proprietary data and access to a business's patrons are not uncommon in economic impact studies, their use tends to be concentrated in studies funded by the organizations whose impact is being assessed. Because of the robust and forward-thinking regulatory environment in Massachusetts and the research agenda mandated by it, UMDI was able to model PPC's impact using a level of detailed data which otherwise would not have been granted to outside researchers. Cooperation from PPC and the Massachusetts Gaming Commission, as well as the exceptional work of UMDI's partners on the SEIGMA team, allowed for a rich set of model inputs that add credibility to these findings.

While the scope of this report is limited to a single year of operation for a single casino, the methodological decisions made in generating this report and presenting the associated data will inform subsequent studies. This offers a pathway to monitor the ongoing impacts of PPC and evaluate the impacts of the other casinos as they open. UMDI believes that the methodology used in this report can serve as a template for other studies of large and/or multi-year economic development projects, both within Massachusetts and elsewhere. We hope that this study and future studies utilizing its methodology will serve a key role in helping the MGC, the Legislature, and the residents of Massachusetts evaluate the degree to which the expansion of gaming in Massachusetts has met the expectations and objectives of the state.

While other organizations have performed economic impact studies of PPC prior to its opening, UMDI believes that comparing those studies to this one would be of limited value. The reasons for caution are multifaceted. Most prominently, our study was based on data from actual operations rather than predictions of future activity. Across studies, these data were then input into different economic models with only this one using REMI PI+. Lastly, our methodology takes into account factors such as government spending of new revenues and reallocation of consumer spending which are not considered at the same level of detail in other reports. Furthermore, the detailed methodology used in this study, and its reliance on detailed operational data from PPC, limits the ability to extend these findings to the potential impacts of other casinos, racinos, and slot parlors around the country or to compare it to previously completed studies of similar properties without first comparing their methodologies.

UMDI plans to continue to study PPC, as well as the other casinos as they come online. In future years, we hope to increase the sample size of the patron survey so we can more confidently report on shifts in

patron spending and its impacts at a regional level, increasing the usefulness of this information for policymakers and the general public.

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 14 and Figure 15.

Figure 14: REMI Model Linkages

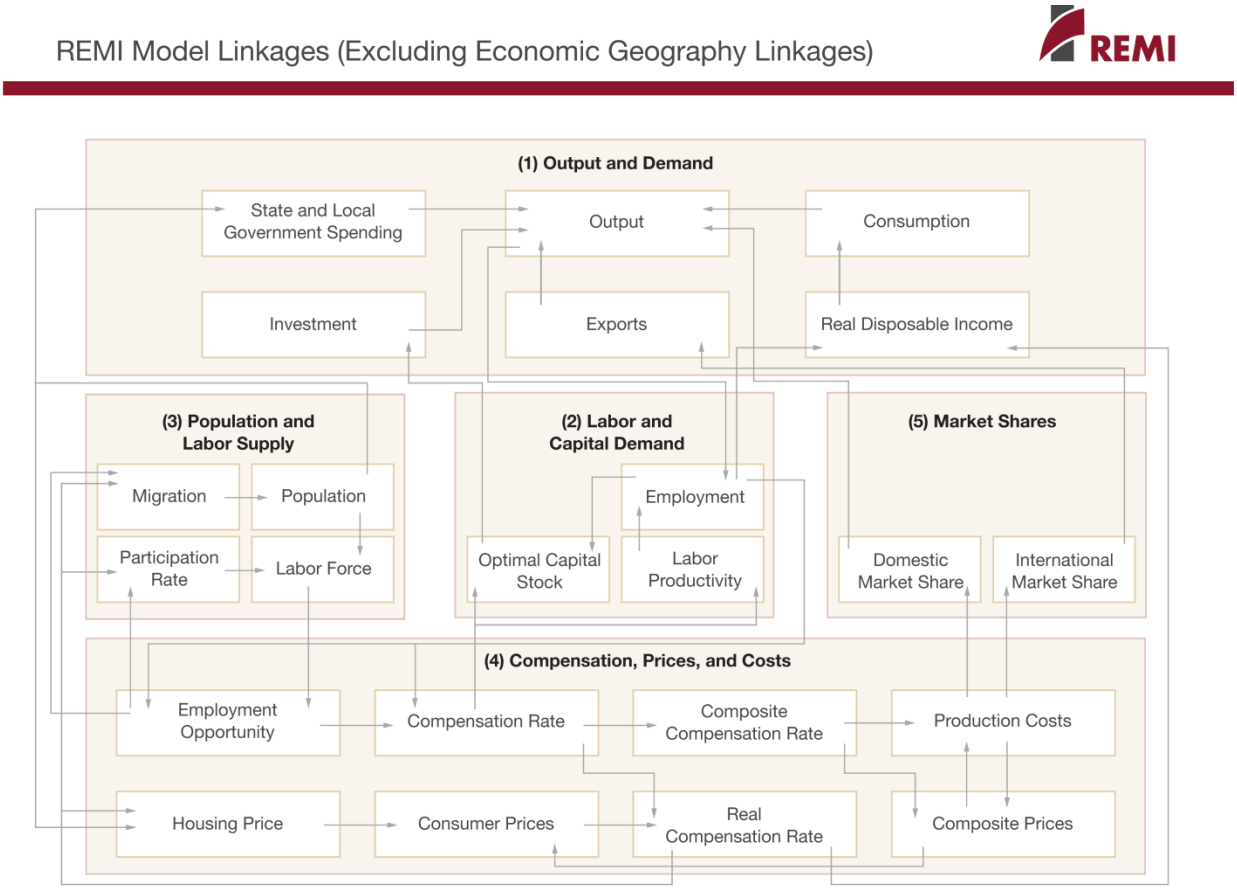
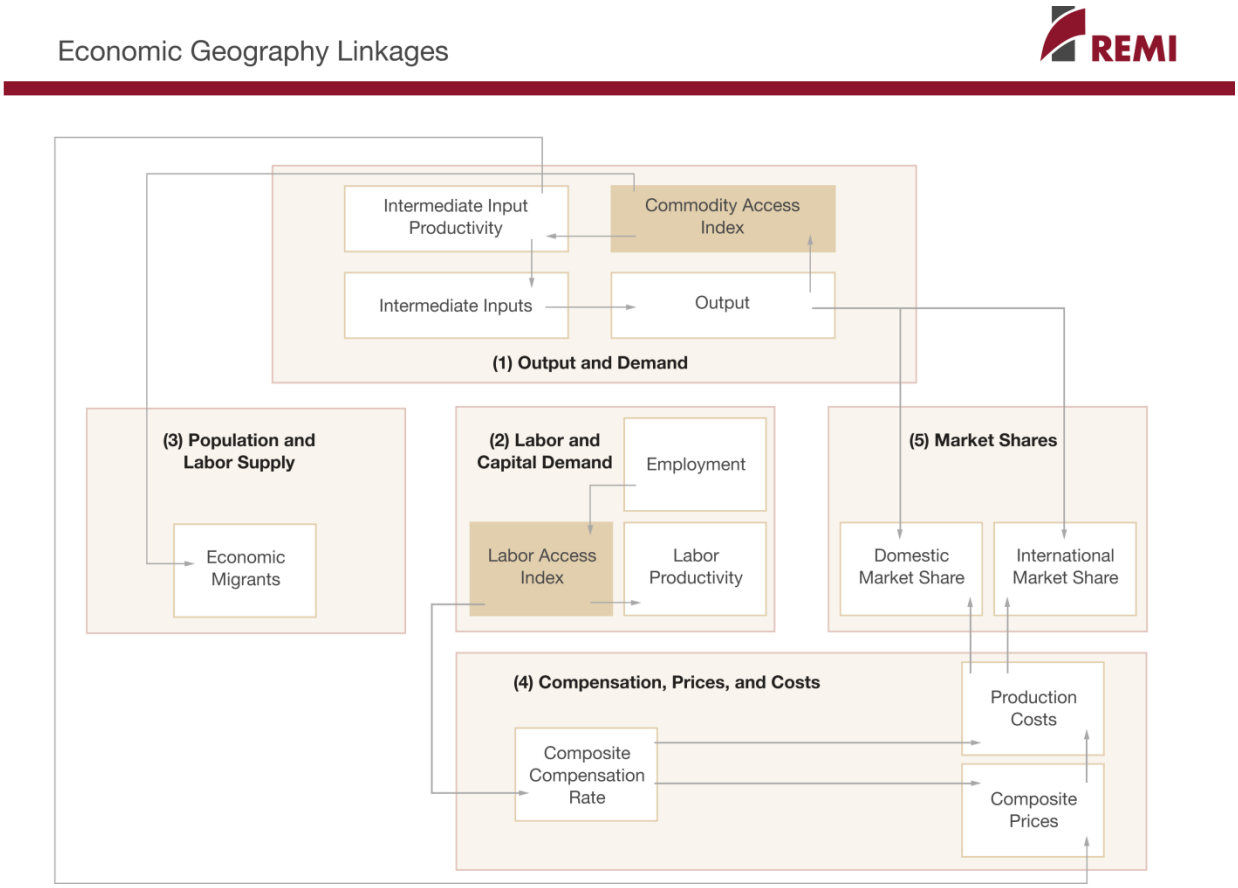


Figure 15: Economic Geography Linkages



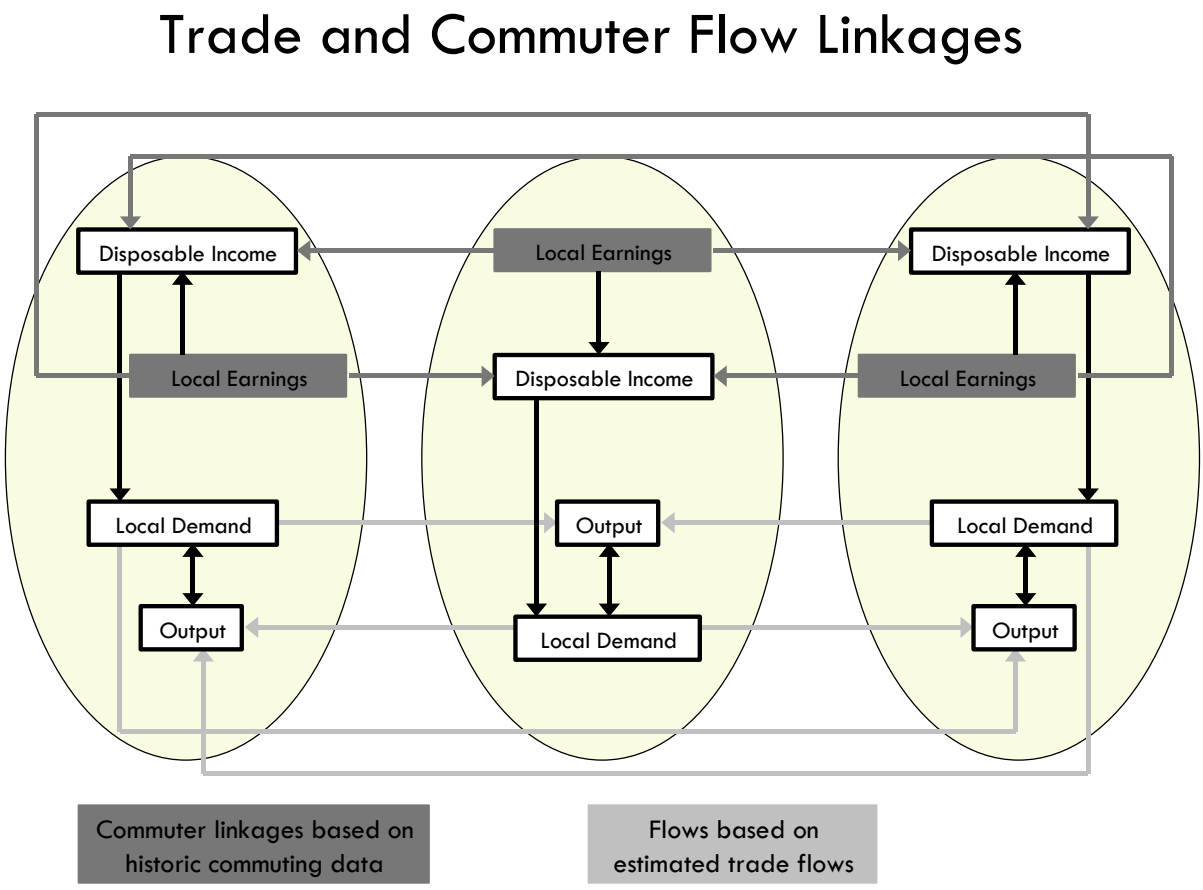
The Output and Demand block consists of output, demand, consumption, investment, government spending, exports, and imports, as well as feedback from output change due to the change in the productivity of intermediate inputs. The Labor and Capital Demand block includes labor intensity and productivity 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 16.

Figure 16: 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 after-tax 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, taking into account 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 PPC. 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 PPC 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

PPC 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 PPC, 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.

Cases where individuals were sent money by PPC were modeled as proprietor's income in the individual's home region, since most of the money sent to individuals from PPC were associated with franchise arrangements at the facility.

Commuter Adjustment

Given its location on the border of both the Southeast region and Rhode Island, a much smaller share of PPC wages are earned by workers in the Metro Boston region than the PI$^+$ model would assume. UMDI took the difference between the model's assumptions of wage leakages from the Metro Boston 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 PPC'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 PPC in its first fiscal 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. In the Southeast region, the money awarded from the Massachusetts Gaming Commission's Community Mitigation Fund was added to this number. For the first year of operation, this was a very small amount of money, but in future simulations it may be an aspect that is modeled in greater detail.

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

As stated earlier, UMDI elected not to model the share of tax revenue from PPC's gross gaming revenue that went to the Race Horse Development Fund. This aspect may be covered in more detail in a future report, should more comprehensive data sources become available.

Consumer Spending

While it may seem counterintuitive, no attempt was made to model the patron spending at PPC. The reason for this is that the impacts of that spending – PPC'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 PPC, that is, the new off-site spending by PPC visitors, and spending reallocated by Massachusetts residents and visitors from other Massachusetts businesses to PPC.

UMDI estimated the total amount of off-site spending by PPC 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[20] of $6.5 million. The resulting $3.8 million was then allocated across regions and patron types based on shares of reported income. The off-site spending of patrons who indicated that they would have been in the area regardless of whether PPC had opened or not (reallocated in-state incidental patrons and captured out-of-state incidental patrons) was excluded since it cannot be attributed to PPC. This money was then allocated as new consumer spending on a basket of goods and services estimating the spending behavior of tourists on day-trips. This is based on information provided to UMDI by the Massachusetts Office of Travel and Tourism. Some small adjustments were made to this data based on patron survey expenditure data.

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 PPC, 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 PPC and who would not have otherwise spent their money at an out-of-state casino),

[20] PPC did not publicly report their non-gaming revenue but indicated to us that the amount reported in the annual report of their parent company, Penn National Gaming ($6.5 million), was roughly comparable.

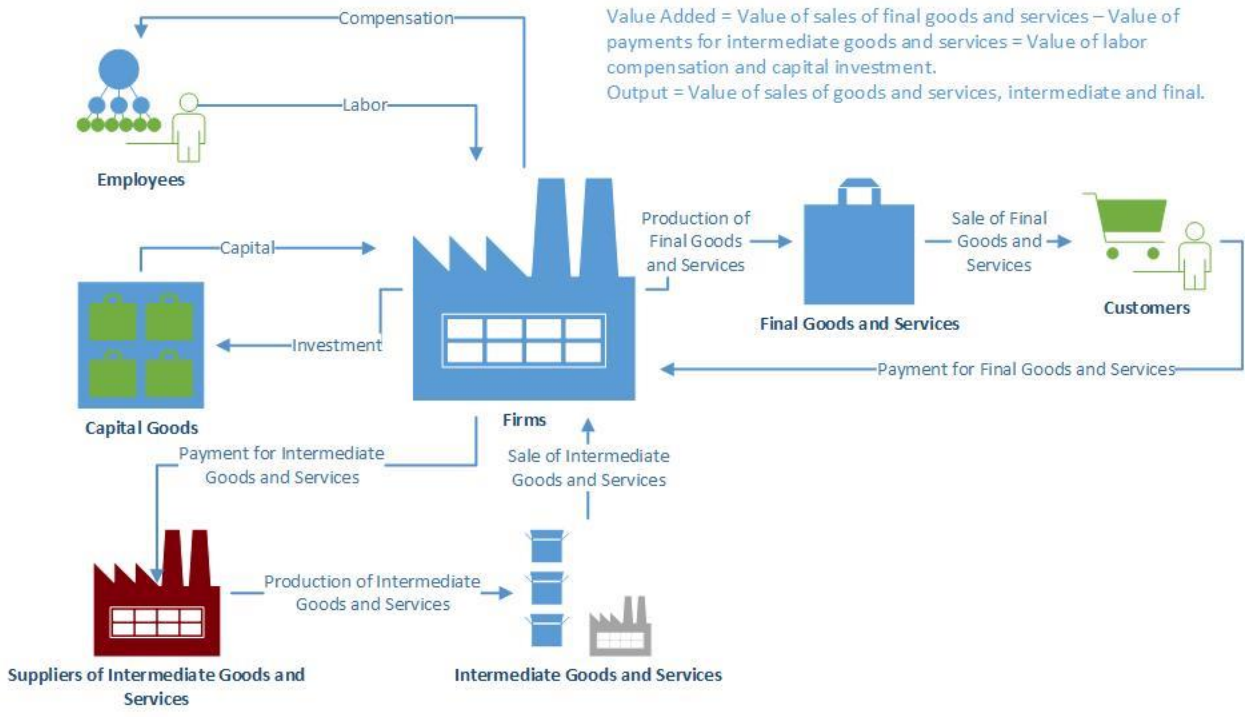
reallocated in-state consumption was spread across another basket of goods and services provided by the Massachusetts Office of Travel and Tourism. This spending was then spread across the 6 regions in the model based on each model's share of consumption of each good or service.

Appendix 3: 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.

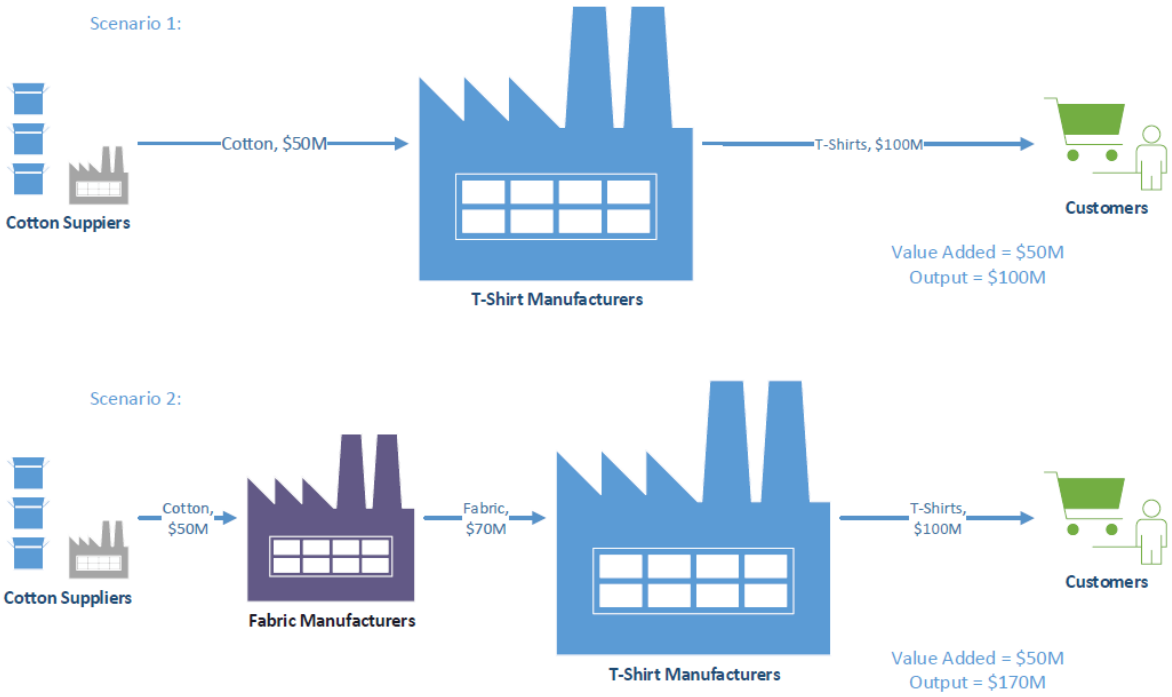
The concept of **value added** captures only the portion of the output which is directly created by the firm's capital goods and labor. In other words, value added is the value of the final goods and services produced minus the cost of the intermediate goods and services which were purchased to produce 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 4: Patron Survey Tables

Table 21: Share of On-Site Gambling Spending by Patron Type

Patron Type	Share of Respondents	Spending	Share of Spending
Recaptured In-State	54.5%	$96,726,780	58.3%
Reallocated In-State	16.9%	$27,141,634	16.3%
Reallocated In-State Incidental	7.4%	$6,718,167	4.0%
New Out-of-State*	9.7%*	$24,680,357*	14.9%*
Captured Out-of-state Incidental	10.1%	$9,625,773	5.8%
Reallocated Out-of-State Incidental**	1.6%**	$1,154,226**	0.7%**
Total	100.0%	$166,046,937	100.0%

Source: SEIGMA Patron Survey

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

Table 22: Share of On-Site Non-Gambling Spending by Patron Type

Patron Type	Share of Respondents	Spending	Share of Spending
Recaptured In-State	56.2%	$3,275,716	50.4%
Reallocated In-State	16.9%	$2,446,034	37.6%*
Reallocated In-State Incidental	9.3%	$265,638	4.1%
New Out-of-State*	7.0%*	$182,147*	2.8%*
Captured Out-of-state Incidental	9.8%	$293,120	4.5%*
Reallocated Out-of-State Incidental**	0.8%**	$37,345**	0.6%**
Total	100.0%	$6,500,000	100.0%

Source: SEIGMA Patron Survey

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

Table 23: Share of Recaptured Patron Gambling Spending by REMI Region

REMI Region	Share of Respondents	Spending	Share of Spending
Metro Boston	50.6%	$48,033,288	49.7%
Southeast	34.7%	$34,995,798	36.2%
Central*	10.0%*	$5,826,044*	6.0%*
Pioneer Valley**	1.4%**	$2,510,043**	2.6%**
Cape and Islands*	3.3%*	$5,361,608*	5.5%*
Total	100.0%	$96,726,780	100.0%

Source: SEIGMA Patron Survey

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

Table 24: Share of Recaptured Patron On-Site Non-Gambling Spending by REMI Region

REMI Region	Share of Respondents	Spending	Share of Spending
Metro Boston	52.9%	$2,175,791	66.4%
Southeast	30.8%	$631,980	19.3%
Central*	11.9%*	$260,280*	7.9%*
Pioneer Valley**	2.2%**	$62,863**	1.9%**
Cape and Islands**	2.2%**	$144,802**	4.4%**
Total	100.0%	$3,275,716	100.0%

Source: SEIGMA Patron Survey

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

Table 25: Share of Reallocated In-State Patron Gambling Spending by REMI Region

REMI Region	Share of Respondents	Spending	Share of Spending
Metro Boston*	71.6%*	$13,053,454*	48.1%*
Southeast*	23.6%*	$13,046,140*	48.1%*
Central**	4.8%**	$1,042,039**	3.8%**
Total	100.0%	$27,141,634	100.0%

Source: SEIGMA Patron Survey

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

Table 26: Share of Reallocated In-State Patron On-Site Non-Gambling Spending by REMI Region

REMI Region	Share of Respondents	Spending	Share of Spending
Metro Boston*	82.9%*	$2,224,364*	90.9%*
Southeast*	11.3%*	$186,045*	7.6%*
Central**	5.8%**	$35,625**	1.5%**
Total	100.0%	$2,446,034	100.0%

Source: SEIGMA Patron Survey

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

Table 27: Share of Reallocated In-State Incidental Patron Gambling Spending by REMI Region

REMI Region	Share of Respondents	Spending	Share of Spending
Metro Boston*	60.6%*	$4,208,345*	62.6%*
Southeast*	29.9%*	$1,935,547*	28.8%*
Central**	4.9%**	$400,678**	6.0%**
Pioneer Valley**	3.2%**	$173,597**	2.6%**
Cape and Islands**	1.4%**	$0**	0.0%**
Total	100.0%	$6,718,167	100.0%

Source: SEIGMA Patron Survey

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

Table 28: Share of Reallocated In-State Incidental Patron On-Site Non-Gambling Spending by REMI Region

REMI Region	Share of Respondents	Spending	Share of Spending
Metro Boston*	55.0%*	$127,351*	47.9%*
Southeast*	31.3%*	$67,704*	25.5%*
Central**	7.7%**	$44,959**	16.9%**
Pioneer Valley**	4.1%**	$16,800**	6.3%**
Cape and Islands**	1.9%**	$8,824**	3.3%**
Total	100.0%	$265,638	100.0%

Source: SEIGMA Patron Survey

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

Table 29: Reallocated In-State Patron Off-Site Spending by REMI Region

Patron Type	Share of Respondents	Spending	Share of Spending
Metro Boston*	89.4%*	$420,160*	88.3%*
Southeast**	5.3%**	$20,785**	6.2%**
Central**	5.3%**	$26,013**	5.5%**
Total	100.0%	$728,704	100.0%

Source: SEIGMA Patron Survey

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