



# PENNSYLVANIA GAMING REVENUE ANALYSIS

DATA 400 Mini  
Project

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# INTRODUCTION & DATA SOURCE

- Motivation for this analysis comes from wanting to investigate the relationship legalized sports betting has had on general population-level behaviors
- Pennsylvania Gaming Control Board (PGCB)
  - Publishes fiscal year revenue reports in excel and pdf format
  - Reports include public monthly revenue at the casino level for:
    - Sports Betting
    - Table Games
    - Slots
    - iGaming (not considered)
  - Note: excel files are in report format; not intended for data analysis
    - Significant processing was required to get data ready for analysis



# DATA COLLECTION & DIFFICULTIES

- Downloaded 40 Excel Reports Between FY 2010-11 and 2025-26
- Reports were imported into pandas, but were not readable (see example)
- Each sector and year's report had slightly different formats
- Casino name changes & spelling errors

<div>   </div>						
MONTHLY TABLE GAME REPORT <sup>1</sup>						
	July 2024	August 2024	September 2024	October 2024	November 2024	December 2024
<b>MOHEGAN PENNSYLVANIA</b>						
<b>Total Table Games</b>	<b>67</b>	<b>67</b>	<b>67</b>	<b>67</b>	<b>66</b>	<b>64</b>
Gross Revenue	\$2,258,536	\$2,662,462	\$2,700,022	\$2,166,423	\$1,851,000	\$2,118,321
State Tax Due <sup>2</sup>	\$316,195	\$372,745	\$378,003	\$303,299	\$259,140	\$296,565
Local Share Assessment	\$45,171	\$53,249	\$54,000	\$43,328	\$37,020	\$42,366
<b>Non-Banking Tables <sup>3</sup></b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>
Gross Revenue	\$127,048	\$126,631	\$115,000	\$118,632	\$119,763	\$125,521
State Tax Due <sup>2</sup>	\$17,787	\$17,728	\$16,100	\$16,608	\$16,767	\$17,573
Local Share Assessment	\$2,541	\$2,533	\$2,300	\$2,373	\$2,395	\$2,510
<b>Banking Tables <sup>4</sup></b>	<b>52</b>	<b>52</b>	<b>52</b>	<b>52</b>	<b>52</b>	<b>50</b>
Gross Revenue	\$2,093,202	\$2,414,025	\$2,462,305	\$1,955,774	\$1,604,436	\$1,894,929
State Tax Due <sup>2</sup>	\$293,048	\$337,964	\$344,723	\$273,808	\$224,621	\$265,290
Local Share Assessment	\$41,864	\$48,281	\$49,246	\$39,115	\$32,089	\$37,899
<b>Electronic Tables <sup>5</sup></b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Gross Revenue	\$0	\$0	\$0	\$0	\$0	\$0
State Tax Due <sup>2</sup>	\$0	\$0	\$0	\$0	\$0	\$0
Local Share Assessment	\$0	\$0	\$0	\$0	\$0	\$0
<b>Fully Automated Electronic Tables</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Gross Revenue	\$0	\$0	\$0	\$0	\$0	\$0
State Tax Due <sup>2</sup>	\$0	\$0	\$0	\$0	\$0	\$0
Local Share Assessment	\$0	\$0	\$0	\$0	\$0	\$0
<b>Hybrid Tables</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>5</b>
Gross Revenue	\$38,286	\$121,806	\$122,717	\$92,017	\$126,801	\$97,871
State Tax Due <sup>2</sup>	\$5,360	\$17,053	\$17,180	\$12,882	\$17,752	\$13,702
Local Share Assessment	\$766	\$2,436	\$2,454	\$1,840	\$2,536	\$1,957
<b>PARX</b>						
<b>Total Table Games</b>	<b>181</b>	<b>182</b>	<b>174</b>	<b>183</b>	<b>183</b>	<b>178</b>
Gross Revenue	\$17,519,471	\$15,611,016	\$15,494,820	\$14,662,722	\$15,986,669	\$17,074,702
State Tax Due <sup>2</sup>	\$2,452,726	\$2,185,542	\$2,169,275	\$2,052,781	\$2,238,134	\$2,390,458
Local Share Assessment	\$350,389	\$312,220	\$309,896	\$293,254	\$319,733	\$341,494
<b>Non-Banking Tables <sup>3</sup></b>	<b>48</b>	<b>48</b>	<b>48</b>	<b>48</b>	<b>48</b>	<b>48</b>
Gross Revenue	\$1,329,582	\$1,477,845	\$1,219,621	\$1,270,334	\$1,389,302	\$1,317,190
State Tax Due <sup>2</sup>	\$186,141	\$206,898	\$170,747	\$177,847	\$194,502	\$184,407
Local Share Assessment	\$26,592	\$29,557	\$24,392	\$25,407	\$27,786	\$26,344
<b>Banking Tables <sup>4</sup></b>	<b>121</b>	<b>122</b>	<b>114</b>	<b>123</b>	<b>123</b>	<b>118</b>
Gross Revenue	\$15,702,336	\$13,638,177	\$13,905,243	\$13,024,957	\$14,196,903	\$15,297,352
State Tax Due <sup>2</sup>	\$2,198,327	\$1,909,345	\$1,946,734	\$1,823,494	\$1,987,566	\$2,141,629
Local Share Assessment	\$314,047	\$272,764	\$278,105	\$260,499	\$283,938	\$305,947

Example format of PGCB Reports



# DATA PROCESSING

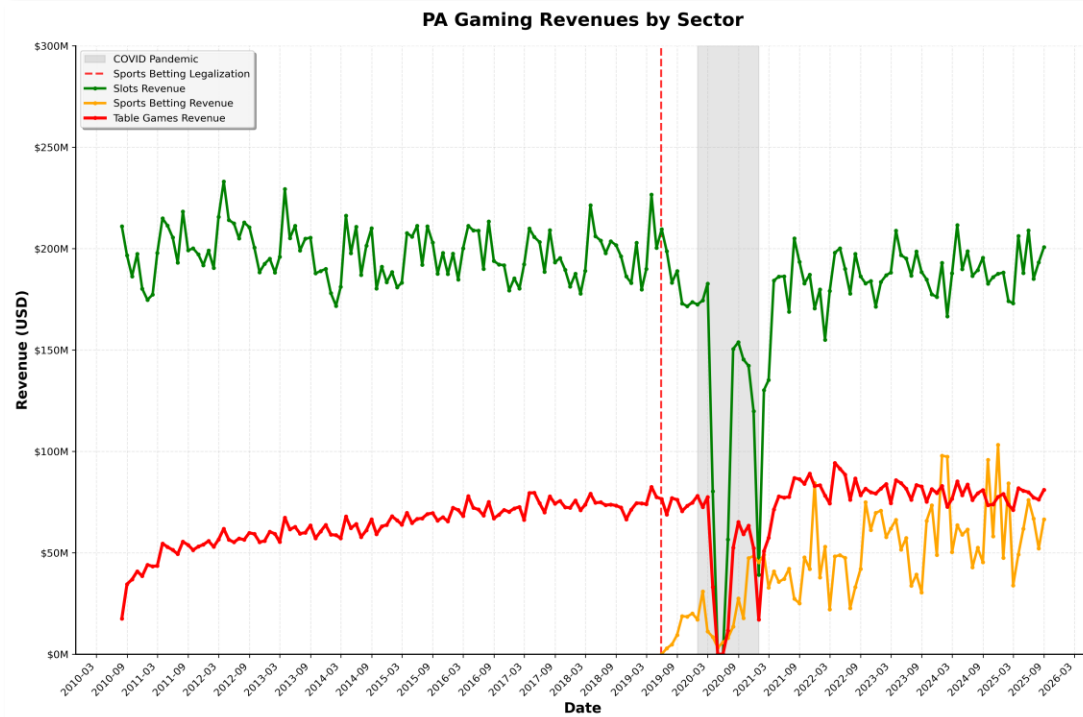
- Wrote python functions to:
  - Parse individual reports for casino names & revenues by gaming sector
  - Parse every year's revenue report by revenue sector
  - Standardize casino names
- Final Dataset:
  - Monthly Revenue by Sector at Casino Level
  - July 2010 – August 2025
  - 17 Casinos
  - 1 physical sportsbook only
  - 2,498 rows

```
slots_df['casino'].value_counts()
✓ 0.0s
```

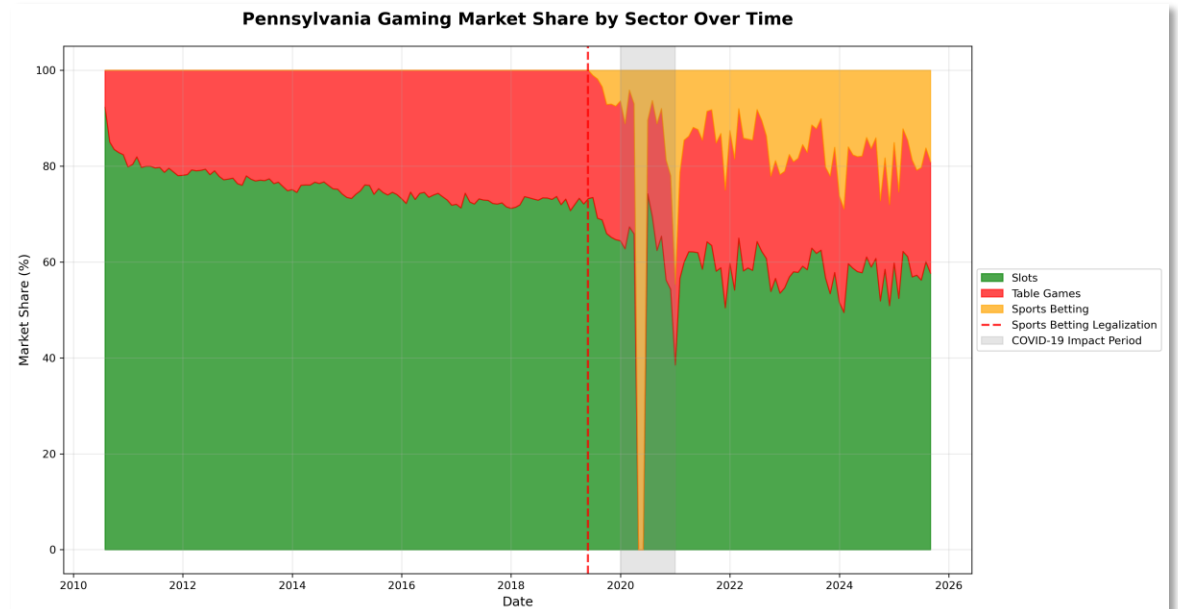
casino	
Mount Airy	182
Presque Isle	182
Valley Forge	162
Nemacolin	147
Harrah's Philadelphia	146
The Meadows	132
Penn National	132
Parx	108
Mohegan Sun	108
The Rivers	108
SugarHouse	106
Sands Bethlehem	96
Parx Casino	74
Rivers Philadelphia	74
Rivers Pittsburgh	74
Wind Creek	74
Live! Casino Philadelphia	62
Live! Casino Pittsburgh	62
Hollywood Casino York	50
Hollywood Casino Morgantown	50
Hollywood Casino at the Meadows	38
Parx Shippensburg	32
Hollywood Casino at Penn National	26
Hlloywood Casino at Penn National	24
Harrah's Chester	24
Wind Creek Bethlehem (Formerly Sands)	12
Hollywood Casino at The Meadows	12
Harrah's Chester Downs	12
Name: count, dtype: int64	

# EDA – MARKET SHARE BY SECTOR

- For physical casino locations:
  - Slots have made up >50% of revenues each month since 2010
  - COVID crashed revenues for table games and slots, but recovered quickly
  - After legalized sports betting



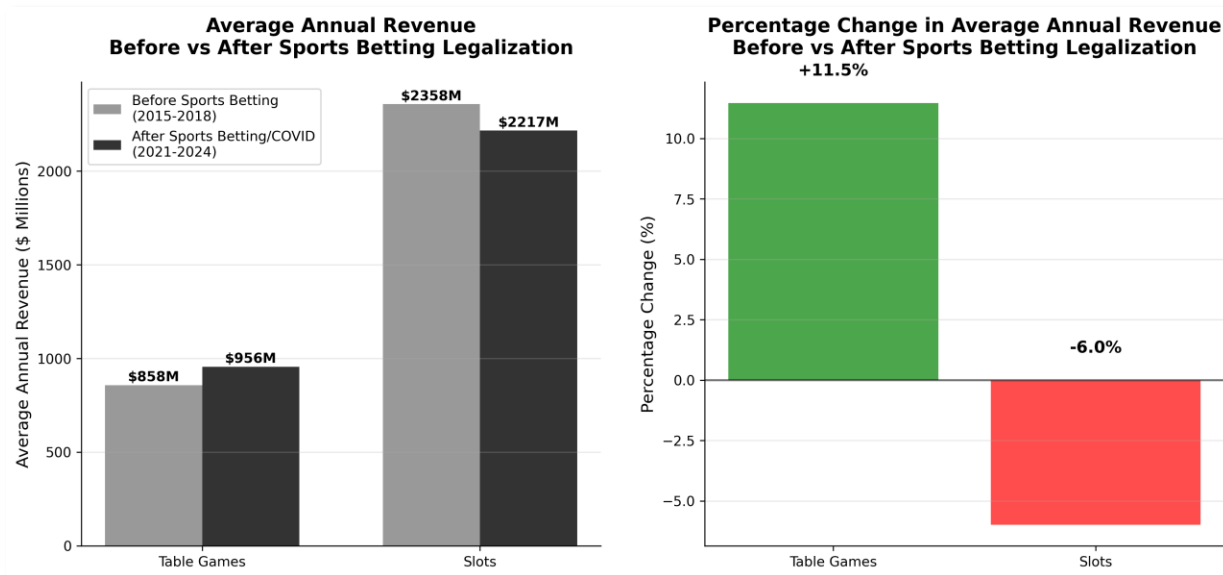
- Market share of table games remained consistent
- Market share of slots decreased



# EDA – INTERVENTION ANALYSIS

- Key Interventions & Dates:
  - Table Games Legalized: 2010
  - All Sports Betting Legalized: May 2019
  - COVID Pandemic: 2020

- 2 Time Periods Analyzed:
  - 2015 – 2018 (period 1)
  - 2021 – 2024 (period 2)
- Total average annual slots revenue was 6% lower in period 2 than period 1
- Total average annual table game revenue was 11.5% higher in period 2 than period 1



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# ECONOMIC INSIGHTS

- Possible relationships:
  - Table games & sports betting are complements
    - Similar customer demographics, etc
  - Slots & sports betting are supplements
    - Slots still maintain a majority of total revenue, but with decreasing market share
- Consumer Behavior:
  - Shift towards games with more perceived skill
- Overall Market:
  - Overall gaming revenue has increased since the legalization of sports betting





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# STAKEHOLDER IMPLICATIONS

- Casinos
  - Marketing strategies may shift to better represent the relationships sports betting has with other gaming types
- Policymakers
  - Tax policies to represent market dynamics
  - Monitoring for cross-sector harmful gambling addictions





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# POTENTIAL FOR FUTURE WORK

- The correlational results show potential for
  - An econometric analysis of the sports betting legalization intervention
    - DiD model with out of state controls
  - Further time series analysis
    - Revenue prediction
    - Seasonality analysis
  - Casino-level analysis
    - Comparing intervention impact on rural & urban casinos
    - Revenue share by casino
- iGaming analysis

