“Billy’s Sports Bar and Grill” Market Analysis

ECMT 673 Fall 2021

Group 16

Meet Shukla

UIN: 730008293

Samarth Pandya

UIN: 624007931

Brenna Larson

UIN: 629001270

Coan Milton

UIN: 727001895

Table of Contents

Case Study Background

According to a global market analysis given by Market Growth Reports, the global sports bar market is forecasted to experience steady growth within the next five years[6]. Given this information, Billy's Sports Bar and Grill is looking to expand their business. The end result of the research is to find the top three best potential Texas counties to enter with populations ranging between 100,000 and 300,000. We will be providing an analysis involving aspects of geographic market analysis, demographic, and income growth analysis. We will examine revenue from the sale of alcoholic beverages and compare them to the counties' income per capita, labor force, and population data to come up with the best three potential investment opportunities.

I. Research Objective

Our objective is to provide the management of Billy's with the best counties for their investment opportunity based on their preference of a population between 100,000 to 300,000. We used Texas county population data, income data, and TABC data as the backbone of our analysis. Our research will determine which county characteristics have the most influence on total alcohol sales. When this is determined, we can weigh our variables accordingly and gather the best potential counties.

II. Target Market

Our team ran observational and statistical analyses on what factors influence total sales of alcohol in businesses with mixed beverage, food and beverage, and mixed beverage with food permits.

In a report by the CDC, roughly 59% of men and 47% of women surveyed reported drinking in the past 30 days[2]. The World Health Organization found that in 2016 men consumed 2.847 times more alcohol than women[11]. This has made a male gender dominated location a high priority when selecting the best investment opportunity. According to Statista, the two largest age ranges of avid sports fans are between the ages of 18-34 and 35-44.[10] We calculated a percentage for each county's male population in the age range of 20-39 to help determine the best investment potential.

Based on our matrix, we found the percentage of males aged 20 to 39 to be the most highly correlated to total alcohol sales in industries like Billy's. We also find that the percentage of total male population is a significant factor. In terms of income, we find that average net earnings per capita have a heavy influence on total receipts for permit types related to Billy's, so we want to consider counties with high values here. For labor data, we found that labor force percentage and employment percentage also have a significant impact on total sales, so we will use this to help conduct our analysis.

III. Methodology

With the provided data, we first had to filter out the counties that were outside of the population range provided. We averaged out the populations from yearly data and filtered accordingly, leaving us with 22 total counties to analyze. In reference to the

TABC data, we looked closely at the permit types that were associated with Billy's, those being mixed beverage, food and beverage, and mixed beverage with food establishments. We summed all of the total receipts for these specific permit types and used this variable as our regressand (dependent variable). We formatted the rest of our variables to be in per capita percentages.

Because our variables ranged in size, we normalized the values of each (see appendix) and ran our regression. Through our regression analysis, we found that the percentage of males aged 20 to 39, total male population percentage, net average earnings per capita, labor force percentage, and employment rate were the most influential on total alcohol sales in a given county. Below we have provided charts of labor force, male population, and earnings data for the 22 potential counties in the population range.

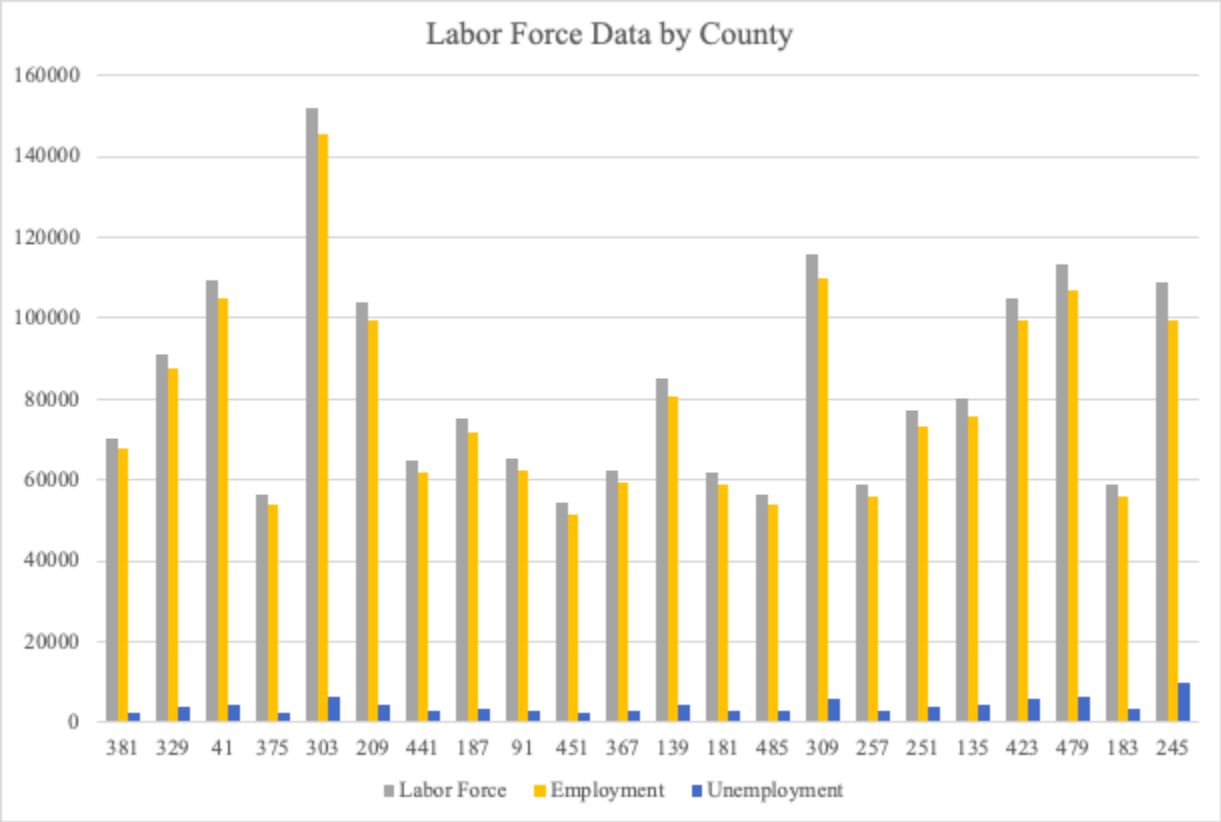

Figure 1: Labor force data by county, sorted by highest to lowest unemployment rate

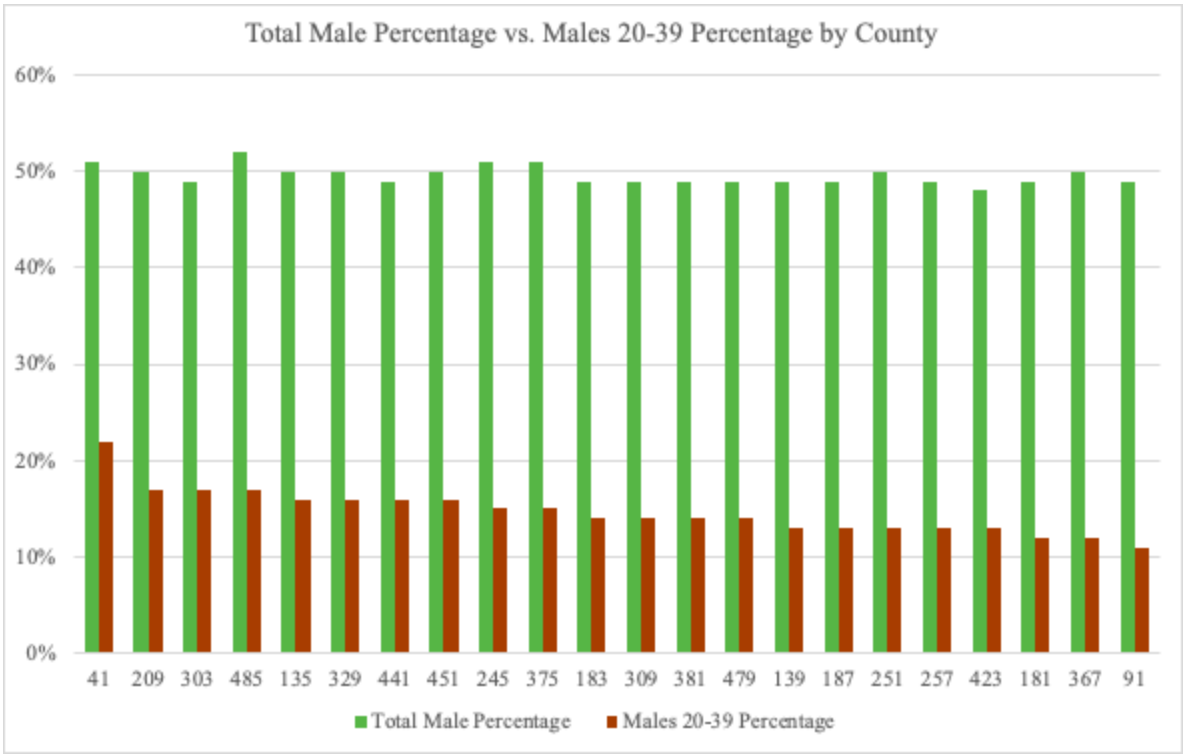

Figure 2: Male population statistics by county, sorted highest to lowest males 20 to 39

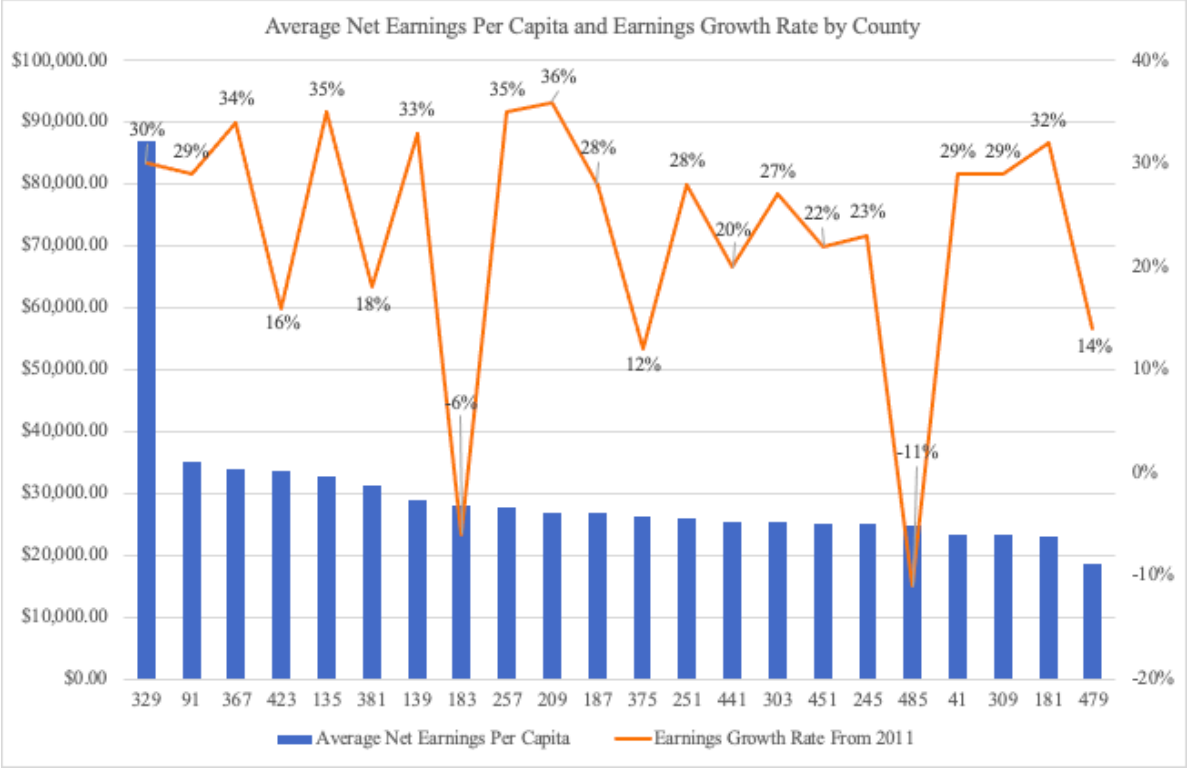

Figure 3: Earnings per capita statistics, sorted highest to lowest average net earnings by county

While conducting observational research, we found that Hays County, Midland County, and Ector County were to be the top potential investments. Although this analysis did not consider any impacts on total receipts, it still helps reveal significant investment opportunities. The way this analysis was conducted was through filtering the data down by the most significant features. We found the top thirteen counties with the highest males 20 to 39, then sorted those by highest total male percentages. Then, we took the top eight counties from total male percentage and sorted by the highest net average earnings per capita. Lastly, we took the top five from that group and sorted by labor force percentage, giving us those three counties. When we applied the weights of the coefficients from our regression to per capita total sales, we found somewhat similar results to those in the observational analysis.

IV. Recommendations

I. Midland County

A. County FIPS code 329 is Midland County and has the best potential investment opportunity as per our analysis. This county is a major hotspot for anyone in oil and gas, which happens to be a male dominated industry according to business insider[4]. The data shows that this county has the highest net average earnings per capita, totalling about $86,000. This is over $50,000 higher than the next highest county's average earnings.

B. According to a news article from Our Midland, data shows that alcohol sales increased by 2.5 million dollars in 2020 from the previous year[8]. Another news article from MRT, backed up by data from the Texas

Comptroller's Office, states that bartenders served 5 million dollars in alcohol sales just in March of 2021[3]. This is 1.3 million dollars more than the sales in the previous month. With these trends, it is hard to dispute the idea that this is a great investment opportunity.

II. Brazos County

A. County FIPS code 41 is Brazos County and encompasses Texas A&M University. They have the highest percentage of males aged 20 to 39 and second highest percentage of male population, which makes it clear as to why this is a good investment. The average net earnings fall to fourth on the list, and labor force percentage as sixth, but those are still very high values.

B. The university's enrollment alone is 68,000 students. According to a government survey conducted in 2018 and 2019, about 53 percent of full-time college students ages 18 to 22 drank alcohol in the past month, which is about 9 percent higher than non-students 18 to 22 year olds[7].

III. Hays County

A. County FIPS code 209 is Hays County which is home to Texas State University. Given the fact that it is another college town, it is likely that a sports bar would be a great fit here. This county has the second highest population of males aged 20 to 39, and fifth total male percentage. Home to a beautiful floatable river and a suburb of Austin, Texas means it has great potential for visitors outside of the county as well.

For the third potential investment opportunity, we made a choice between three different counties. We had Ector, Hays, and Wichita County as options to choose from. Ector County had the third highest sales per capita from our analysis, but we chose not to use it since it is adjacent to Midland County. When comparing Hays County to Wichita County, we saw that Hays had a higher average net earnings and labor force percentage, but a slightly lower total male population. Although Wichita had slightly higher sales per capita in our results, we chose Hays based on the fact that it is home to Texas State University, commonly referred to as a party school, as well as the tourism associated with the county[1].

V. Appendix:

In order to merge the different datasets, we cleaned and ordered each datum table around the county FIPS codes.

For the labor data analysis, we combined monthly totals into yearly averages for each county, leaving us with 11 years of data for each county. From there, we used a proc summary function by county FIPS code to aggregate labor force, unemployment, and employment means for each specific county.

The average net earnings per capita and earnings growth rate by county were calculated by pulling Average Net Earnings Per Capita for years 2011-2019 and adjusting them by their respective CPI. After having the corrected Net Earnings per Capita we created the county average for the multiple years as well as the growth rate over this time period.

Using population data from the U.S Census Bureau, we created a dataset that represented the total male, female, and the subset of the male population defined by males between the ages

of 20 and 39 for each Texas county in the time horizon from 2011-2019. This was done first by creating a new dataset that defined only the total male, female, and sum of male and female populations. The new data set was created by keeping the variables associated with an 'agegrp' of zero, which is meant to define the total population of those variables. Another data set was created for the 20-39 male subset population by using a proc summary function to aggregate the total number of males that fell in the range of 5-8 in the 'agegrp' column. Then, we merged the two data sets by county to represent the population data that was used for the rest of our analysis.

Similarly, we performed analysis using the total sales available to us from the TABC dataset. Here we map location fips_codes (obtained from location number by running a simple algorithm) to the total_receipts sale. We obtained the time horizon for that entity in operation from Obligation_End_Date. Also to filter the data according to the establishments suitable for Billy's Bar, we substringed the TABC_Permit_Number so we can subset the data for Mixed Beverage, Food Beverage and Mixed Beverage with food served. We summed the receipts for these permit types and ran our analysis according to these sales rather than total sales.

By merging the above data sets by county FIPS code and filtering for populations between 100,000 and 300,000, the following data summary was constructed:

	A	C	E	G	H	I	J	M	N	O	R
1	County	Labor Force	Employment	Unemp_Rate	_Avg__Per_	Earnings_G	TOT_POP	Male_20_39	Male_Percer	Male_20_39_	total_receipt
19	41	51.20%	95.87%	4.130924114	$23,439.22	29%	213,967.44	47,927.44	51%	22%	51989639.33
20	485	42.90%	94.95%	5.046841863	$24,732.33	-11	131,702.67	22,140.78	52%	17%	247428743
21	209	53.12%	95.62%	4.37824134	$26,902.22	36%	195,501.00	33,271.22	50%	17%	38566660.77
22	303	51.12%	95.74%	4.26295105	$25,380.89	27%	297,484.11	50,649.22	49%	17%	354563911.7
23	329	57.01%	95.98%	4.023196807	$86,899.89	30%	159,718.89	25,652.56	50%	16%	579052948
24	135	51.82%	94.70%	5.301681212	$32,675.00	35%	154,586.22	24,932.89	50%	16%	171384659.7
25	451	46.58%	95.36%	4.641540317	$25,078.33	22%	116,220.56	18,092.44	50%	16%	34731553.88
26	441	47.83%	95.52%	4.480032982	$25,442.67	20%	135,578.11	21,203.89	49%	16%	31499272.44
27	375	46.48%	95.78%	4.224285385	$26,268.89	12%	120,844.67	18,695.67	51%	15%	116565974.8
28	245	42.98%	91.06%	8.937496036	$25,075.11	23%	253,641.67	39,215.44	51%	15%	279184949.5
29	381	53.91%	96.43%	3.573957702	$31,396.00	18%	130,446.00	18,628.56	49%	14%	204168726
30	183	47.91%	94.21%	5.79262049	$27,906.78	-6%	123,259.89	16,733.33	49%	14%	43408620.4
31	309	47.07%	94.92%	5.081724142	$23,279.33	29%	246,364.00	35,628.22	49%	14%	1683289
32	479	42.15%	94.37%	5.625282078	$18,668.78	14%	268,450.44	37,542.33	49%	14%	367327555
33	251	47.89%	94.84%	5.164062256	$26,020.44	28%	161,426.11	20,760.11	50%	13%	55443461.5
34	139	51.29%	95.09%	4.905617193	$28,788.00	33%	165,567.22	20,831.67	49%	13%	79888265.5
35	257	50.29%	94.89%	5.105611601	$27,735.44	35%	116,654.67	14,772.33	49%	13%	34509069.33
36	187	49.71%	95.52%	4.482024246	$26,845.56	28%	151,108.22	19,369.44	49%	13%	3737088.107
37	423	47.24%	94.61%	5.391591377	$33,670.56	16%	222,326.44	28,831.22	48%	13%	62390817.43
38	367	48.89%	95.33%	4.674274372	$33,947.56	34%	127,643.33	15,016.67	50%	12%	41261230.33
39	181	48.61%	95.02%	4.978723071	$23,046.89	32%	127,146.11	15,077.33	49%	12%	28024470.14
40	91	50.08%	95.38%	4.624706434	$35,231.56	29%	130,781.78	14,445.22	49%	11%	19781715.04

Not the full data summary

Statistical Regression:

After cleaning and merging our data into a single dataset, the data was normalized, and a multivariable regression and correlation were performed. In order to avoid an overbearing of one variable over the others, we normalized the values for each regressor with the following formula:

$$x_{scaled} = \frac{x - \min(x)}{\max(x) - \min(x)}$$

We normalized the features, like earnings since it was in thousands, and percentages since they were between 0-100. We normalized the values between 0 and 1 to have uniformity between regressors.

From running a correlation between sales_per_capita (total receipts/population) and every other variable in our data set, the most important indicators for sales per capita were determined. We used the following formula to do:

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[\, n\Sigma x^2 - (\Sigma x)^2 \,][\, n\Sigma y^2 - (\Sigma y)^2 \,]}}$$

And the results were as follows:

A	B	C	D	E	F	G	H	I
	Per_Capita_Net_Earnings	Unemp_Rate	laborforceavg	male_20_39avg	tot_maleavg	tot_femaleavg	employment_rate	Sales_Per_capita
Sales_Per_Capita	0.404564702	-0.278919371	0.302705586	0.491208837	0.477689965	-0.477688997	0.278919371	1

From the above table we can see that male 20_39avg, tot_maleavg, per_capita_net_earnings, and employment_rate are the important predictor variables we need to consider to filter out our top counties here.

Then a multilinear regression was performed by taking our y-variable as total receipts (sales) per capita against a number of independent variables. The regression equation is given by: $y\_pred=B_0 + B_1X_1 + B_2X_2 + ... + B_6 X_2 + e$, where B_1, B_2, B_3 B_4 B_5, and B_6 are the coefficients for the predictor variables male 20_39_avg, tot_maleavg, Per_Capita_Net_Earnings, laborforceavg, employment_rate, and unemp_rate. Using these coefficients, we calculated our prediction of sales per capita for each county as below and sorted it as highest to lowest sales per capita to finalize the top 3 counties here:

	A	B	C	D
1	County	Year	Sales_Per_capita	
2	329	2019	402.4219608	
3	329	2018	393.8597918	
4	329	2014	345.5332632	
5	329	2013	306.4625406	
6	329	2017	305.9834375	
7	329	2015	286.100112	
8	329	2012	279.1745977	
9	41	2016	267.8782158	
10	41	2018	266.6435575	
11	41	2017	262.8646374	
12	41	2013	261.0750761	
13	41	2019	260.1195936	
14	41	2015	257.6186895	
15	41	2014	256.8218937	
16	135	2019	253.1860409	
17	41	2012	250.190938	
18	41	2011	246.3957663	
19	135	2018	242.7786026	
20	329	2016	242.0004539	
21	329	2011	237.7787809	
22	485	2017	224.6724157	
23	485	2019	222.1725779	
24	375	2016	221.4410753	

From the above image it is clear that county 329 (Midland) has the highest sales for the majority of years from 2019 to 2011. Similarly Brazos County (41) performs the second best. For the third potential investment opportunity, we made a choice between three different counties. We had Ector, Hays, and Wichita County as the next highest values for average sales per capita. Ector County had the third highest results from our analysis, but we chose not to use it since it is adjacent to Midland County, and we believe opening in Midland is a better investment. When comparing Hays County to Wichita County, we saw that Hays(209) had a higher average net earnings and labor force percentage, but a slightly lower total male population. What it really came down to was the fact that Hays is home to Texas State University, commonly referred to as

a party school, as well as the tourism associated with the county[1]. Wichita County did not have any special attraction to it.

VI. References:

1. *2022 top party schools in Texas*. Niche. (2021). Retrieved November 19, 2021, from https://www.niche.com/colleges/search/top-party-schools/s/texas/.
2. Centers for Disease Control and Prevention. (2020, October 23). *Excessive alcohol use and risks to men's health*. Centers for Disease Control and Prevention. Retrieved November 19, 2021, from https://www.cdc.gov/alcohol/fact-sheets/mens-health.htm#:~:text=Almost%2059%25%20of%20adult%20men%20report%20drinking%20alcohol,a%20month%2C%20consuming%208%20drinks%20per%20binge.%202.
3. Cordero, M. (2021, April 29). *Midland County Alcohol Sales Top $5 million mark in March*. Midland Reporter-Telegram. Retrieved November 19, 2021, from https://www.mrt.com/entertainment/restaurants-bars/article/Midland-County-alcohol-sales-top-5-million-mark-16140033.php.
4. Jones, B. (2020, February 6). *An analysis of 870,000 linkedin profiles reveals just how male-dominated the energy industry really is. Four experts told us how to make it more inclusive.* Business Insider. Retrieved November 19, 2021, from https://www.businessinsider.com/linkedin-analysis-reveals-how-male-dominant-the-energy-industry-is-2020-2.

5. Loukas, S. (2021, October 8). *Everything you need to know about min-max normalization in Python*. Towards Data Science. Retrieved November 19, 2021, from https://towardsdatascience.com/everything-you-need-to-know-about-min-max-normalization-in-python-b79592732b79.
6. More, A. (Ed.). (2021, June 29). *Sports bar market growth 2021 : Movements by key findings, definition, SWOT analysis, applications, trends and forecast to 2026 with leading regions and countries data*. The Express Wire. Retrieved November 19, 2021, from https://www.theexpresswire.com/pressrelease/Sports-Bar-Market-Growth-2021-Movements-by-Key-Findings-Definition-SWOT-Analysis-Applications-Trends-and-Forecast-to-2026-with-Leading-Regions-and-Countries-Data_13521338.
7. SAMSA. (2020, August). *Results from the 2019 National Survey on Drug Use and Health:* SAMHSA.GOV. Retrieved November 19, 2021, from https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetailedTabs2019.pdf.
8. Schafer, A. (2021, March 4). *Midland spent more on alcohol in 2020*. Midland Daily News. Retrieved November 19, 2021, from https://www.ourmidland.com/insider/article/Midland-spent-more-in-alcohol-in-2020-15997719.php.
9. *Small business snapshot reports* – . SBDC Net. (2020, June 1). Retrieved November 19, 2021, from https://www.sbdcnet.org/category/small-business-research-reports/.
10. Statista. (2021, June 24). Sports fans in the U.S. 2021 by age. Retrieved from https://www.statista.com/statistics/1018802/sports-fans-usa-age/

11. World Health Organization. (2018, August 24). *Average daily intake in grams of alcohol by country* . World Health Organization. Retrieved November 19, 2021, from https://apps.who.int/gho/data/node.main.A1037?lang=en.