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The Relationship Between Powerball Jackpot Size and Lottery Sales in Texas: Evidence from 2022–2025 Data

Yihan Dai

College of Letters & Science, University of Wisconsin–Madison, Madison, USA
ydai88@wisc.edu

Abstract. In recent years, Powerball jackpots have reached exceptionally high levels, attracting substantial public attention and raising questions about how jackpot size is related to lottery ticket sales. This study examines the relationship between large Powerball jackpots and ticket sales in Texas from 2022 to 2025. Monthly Powerball net ticket sales are combined with historical advertised jackpot data, resulting in a sample of 48 monthly observations. The maximum advertised jackpot in each month is used as the main measure of jackpot size. The results show a strong positive association between jackpot size and ticket sales. A $100 million increase in the maximum monthly jackpot is associated with approximately $6.24 million higher monthly Powerball ticket sales in Texas. Additional analyses using the average monthly jackpot and a $1 billion jackpot threshold are conducted to test the robustness of the main relationship. The positive association remains when the alternative jackpot measure is used, while the evidence of a separate $1 billion threshold effect is only suggestive. Overall, the results show that unusually large Powerball jackpots are closely associated with higher ticket sales, although the findings should be interpreted as associations rather than causal effects.

Keywords: Powerball, Lottery Sales, Jackpot Size, Consumer Behavior, Texas

1. Introduction

Powerball is one of the most widely recognized lottery games in the United States. When there is no jackpot winner, the prize rolls over to the next drawing and can continue to grow over time. After several consecutive rollovers, the advertised jackpot can reach hundreds of millions or even more than one billion dollars. These unusually large jackpots often receive substantial public attention and may encourage more people to purchase lottery tickets. This raises an important question: how strongly are large Powerball jackpots associated with ticket sales?

Previous research suggests that jackpot size is an important factor in lottery demand. Garrett and Sobel [1] examine lottery sales across different games in the United States and find that the size of the top prize and the odds of winning it are important determinants of lottery sales. Their results also show that top prizes are particularly important for large-jackpot Lotto games. More recent research has also shown that lottery demand responds strongly to jackpot-related incentives and that probability weighting may help explain why consumers respond strongly to jackpot prizes [2].

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Together, these studies suggest that jackpot size plays an important role in lottery demand, although the relationship may differ across lottery settings.

Although previous studies have examined the relationship between lottery prizes and ticket sales, there is still room to study this relationship in a more recent and specific setting. Some previous research compares different lottery games, while other studies use national draw-level data or focus on earlier periods [1, 3]. In recent years, Powerball jackpots have reached extremely high levels, making it useful to examine ticket sales during a period characterized by unusually large jackpots. This study therefore focuses specifically on Powerball in Texas from 2022 to 2025 and asks the following research question: How are large Powerball jackpots associated with Powerball ticket sales in Texas?

To answer this question, this study combines monthly Powerball ticket sales in Texas with historical Powerball jackpot data from January 2022 to December 2025, resulting in a sample of 48 monthly observations. The maximum advertised jackpot in each month is used as the main measure of jackpot size because it captures the largest jackpot observed during that month. Using regression analysis, this study finds a strong positive association between jackpot size and monthly Powerball ticket sales in Texas. Additional analyses are conducted to examine the robustness of this relationship.

2. Data and methodology

2.1. Data sources and sample

This study uses Powerball ticket sales and jackpot data from January 2022 to December 2025. The ticket sales data are obtained from the Texas Open Data Portal [4]. The original dataset reports Texas Lottery sales by fiscal month and year, game, and retailer. To construct the dataset for this study, the sample was first restricted to Powerball and the calendar years from 2022 to 2025. Net ticket sales were then aggregated across all retailers by calendar year and month. This process produces a monthly measure of total Powerball net ticket sales in Texas.

Historical Powerball jackpot data are obtained from the Texas Lottery's Powerball Estimated Jackpot Calculation Documents [5]. The original jackpot data are reported at the drawing level and include the advertised jackpot for each Powerball drawing. Because the Texas ticket sales data are analyzed at the monthly level, the drawing-level jackpot data were aggregated by calendar month. Both the maximum advertised jackpot and the average advertised jackpot were calculated for each month, and the jackpot data were then merged with the Texas sales data by calendar year and month. The final dataset contains 48 monthly observations from January 2022 through December 2025.

2.2. Variable construction

The dependent variable in this study is monthly Texas Powerball net ticket sales. It is calculated by summing net ticket sales across all Texas retailers for each calendar month. For easier interpretation, ticket sales are measured in millions of dollars. The main independent variable is the maximum advertised Powerball jackpot in each month, also measured in millions of dollars. It is defined as the largest advertised jackpot among all Powerball drawings that occurred during that month.

The maximum monthly jackpot is used as the main jackpot measure because this study focuses on unusually large jackpots. A monthly average may reduce the importance of a very large jackpot when smaller jackpots also occur in the same month. In contrast, the maximum value directly captures the highest advertised jackpot observed during the month. To test whether the results

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depend on this choice, the average monthly jackpot is also used as an alternative measure in the robustness analysis.

A large-jackpot indicator was also constructed to examine whether extremely large jackpots may be associated with an additional change in ticket sales. The indicator equals 1 when the maximum advertised jackpot in a month is at least $1 billion and equals 0 otherwise. The number of Powerball drawings in each month is also recorded because the number of drawings varies slightly across months.

2.3. Empirical method

To examine the relationship between jackpot size and ticket sales, a linear regression model was first estimated using ordinary least squares (OLS). Monthly Texas Powerball net ticket sales are the dependent variable, and the maximum advertised jackpot in each month is the main independent variable. The baseline model is written as:

$$Sales_t = \beta_0 + \beta_1 MaxJackpot_t + \varepsilon_{t_t} \quad (1)$$

where Salest represents Texas Powerball net ticket sales in month t, and $\mathrm{MaxJackpot_t}$ represents the maximum advertised Powerball jackpot in the same month. Both variables are measured in millions of dollars. The coefficient β_1 measures the change in monthly ticket sales associated with a one-million-dollar increase in the maximum jackpot. The error term ε_t represents other factors affecting ticket sales that are not included in the model.

In addition to the baseline model, several additional analyses were conducted to test the robustness of the main relationship. First, a squared jackpot term was included to examine whether the relationship between jackpot size and ticket sales is nonlinear. Second, a $1 billion jackpot indicator was used to examine whether months with extremely large jackpots show an additional difference in ticket sales. Finally, the maximum monthly jackpot was replaced with the average monthly jackpot to test whether the results depend on how jackpot size is measured.

Because the data are monthly, the regression errors may be correlated over time. Therefore, heteroskedasticity and autocorrelation consistent (HAC) standard errors were reported in the main regression results. The results are interpreted as associations rather than causal effects.

3. Results and analysis

3.1. Descriptive statistics and main relationship

Table 1 presents the descriptive statistics for the main variables used in this study. The sample contains 48 monthly observations from January 2022 to December 2025. The average monthly Powerball net ticket sales in Texas are approximately $42.82 million, with a minimum of $16.29 million and a maximum of $151.25 million. The maximum monthly advertised jackpot averages $553.42 million and ranges from $154 million to $1.9 billion. These large differences across months provide substantial variation for examining the relationship between jackpot size and ticket sales.

Table 1. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max	N
Texas Powerball Monthly Net Sales ($M)	42.82	31.23	16.29	151.25	48
Maximum Monthly Jackpot ($M)	553.42	471.24	154.00	1900.00	48

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Table 1. (continued)

Average Monthly Jackpot ($M)	274.32	190.81	83.62	884.86	48

The descriptive statistics show substantial variation in both jackpot size and ticket sales over the sample period. Months with relatively small jackpots generally have lower ticket sales, while months with very large jackpots tend to have much higher sales. To examine this pattern more directly, Figure 1 plots monthly Texas Powerball net ticket sales against the maximum advertised jackpot in each month.

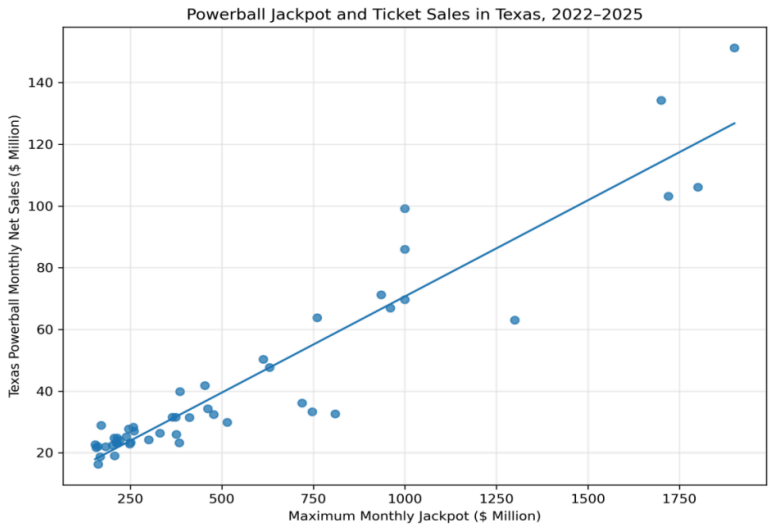


Figure 1. Maximum Monthly Powerball jackpot and Texas Powerball ticket sales, 2022-2025

As shown in Figure 1, there is a clear positive relationship between the maximum monthly Powerball jackpot and monthly ticket sales in Texas. Most months with jackpots below $500 million are concentrated at relatively low levels of ticket sales, while months with jackpots above $1 billion generally show much higher sales. The fitted line also shows an upward pattern, suggesting that ticket sales tend to increase as the jackpot becomes larger. However, the figure only shows an association between the two variables and does not establish a causal relationship.

3.2. Regression results

Table 2 presents the regression results for the relationship between Powerball jackpot size and monthly ticket sales in Texas. Column (1) reports the baseline model using the maximum monthly jackpot. Column (2) adds an indicator for months in which the maximum jackpot reaches at least $1 billion. Column (3) replaces the maximum jackpot with the average monthly jackpot. HAC standard errors are reported in parentheses to account for possible heteroskedasticity and serial correlation in the monthly data.

Table 2. Regression results

Variable	(1) Maximum Jackpot	(2) $1B Threshold	(3) Average Jackpot
Maximum Jackpot ($M)	0.0624***	0.0509***	—
	(0.0051)	(0.0055)	
$1B+ Jackpot	—	17.1414*	—

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Table 2. (continued)

		(9.0841)	
Average Jackpot ($M)	—	—	0.1261***
			(0.0108)
Constant	8.3174***	11.8162***	8.2297***
	(1.9956)	(2.1675)	(1.7766)
R2	0.8854	0.8981	0.5938
Observations	48	48	48

Notes: HAC standard errors are reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.

As shown in Column (1) of Table 2, the coefficient on the maximum monthly jackpot is 0.0624 and is statistically significant at the 1% level. Because both jackpot size and ticket sales are measured in millions of dollars, this estimate indicates that a $1 million increase in the maximum monthly jackpot is associated with approximately $0.0624 million, or $62,400, higher monthly Powerball ticket sales in Texas. Equivalently, a $100 million increase in the maximum monthly jackpot is associated with approximately $6.24 million higher monthly ticket sales. The model has an R^2 of 0.8854, indicating that the maximum monthly jackpot explains a large share of the variation in monthly ticket sales during the sample period.

Column (2) examines whether jackpots of at least $1 billion are associated with an additional increase in ticket sales. After controlling for the maximum jackpot size, the coefficient on the $1 billion indicator is 17.1414, suggesting that months with jackpots of at least $1 billion have approximately $17.14 million higher ticket sales. However, this coefficient is statistically significant only at the 10% level and not at the conventional 5% level. Therefore, the result provides only suggestive evidence of an additional $1 billion threshold effect and should be interpreted with caution.

Column (3) uses the average monthly jackpot instead of the maximum monthly jackpot. The coefficient is 0.1261 and is statistically significant at the 1% level, showing that the positive relationship between jackpot size and ticket sales remains when an alternative jackpot measure is used. However, the R^2 decreases from 0.8854 in the baseline model to 0.5938 in the average-jackpot model. This suggests that the maximum monthly jackpot is more closely associated with the variation in monthly ticket sales in this sample.

3.3. Additional analysis and discussion

To further examine whether the relationship changes as jackpots become larger, a quadratic model was estimated by adding the squared value of the maximum monthly jackpot. The coefficient on the squared jackpot term is positive but not statistically significant at the 5% level ($p = 0.104$). The R^2 increases only slightly from 0.885 in the linear model to 0.892 in the quadratic model. Therefore, the sample does not provide strong evidence that a nonlinear model describes the relationship better than the simpler linear model. For this reason, the linear specification remains the main model in this study.

Matheson and Grote [6] also examine nonlinear responses to jackpot size using draw-level Powerball data and find evidence of a nonlinear relationship. In contrast, the quadratic term in this study is not statistically significant. Differences in the time period and level of data aggregation may help explain the different results.

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It was also examined whether months with extremely large jackpots show an additional increase in ticket sales. A large-jackpot indicator was defined as equal to one when the maximum monthly jackpot reached at least $1 billion. As shown in Column (2) of Table 2, the coefficient on this indicator is 17.1414, suggesting that $1 billion jackpot months are associated with approximately $17.14 million higher monthly ticket sales after controlling for the maximum jackpot level. However, using HAC standard errors, the coefficient is only statistically significant at the 10% level ($p = 0.059$), rather than the 5% level. Therefore, this result should be interpreted as suggestive evidence rather than strong evidence of a separate $1 billion threshold effect.

To examine whether the threshold result is robust to alternative definitions of a large jackpot, the analysis was repeated using thresholds of $750 million and $1.25 billion. Neither alternative threshold is statistically significant. Therefore, the $1 billion result should be viewed as suggestive rather than evidence of a precise behavioral threshold.

4. Conclusion

This study examines the relationship between Powerball jackpot size and monthly ticket sales in Texas from 2022 to 2025. The results show a strong positive association between the maximum advertised jackpot and monthly Powerball ticket sales. This relationship remains positive when the average monthly jackpot is used as an alternative measure. However, the additional effect associated with jackpots above $1 billion is only suggestive, and the result is sensitive to the choice of threshold.

These findings suggest that unusually large jackpots are closely associated with higher lottery participation, consistent with previous research showing that jackpot size is an important factor in lottery demand. At the same time, the results should be interpreted as associations rather than causal effects. The analysis uses only 48 monthly observations from Texas, and other factors that may affect ticket sales are not fully captured. Future research could use draw-level data, a longer time period, or data from multiple states to examine the relationship more precisely.

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