

What Drives Record Lottery Jackpots?



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During fiscal year (FY) 2022-23, the Mega Millions and Powerball Lottery games generated several unusually large jackpots. For FY 2022-23, these games are projected to generate record ticket sales of \$559 million (+56.2% growth over prior year) or roughly 10% of Lottery ticket sales for the state.¹ The state retains 50% of Mega Millions and Powerball ticket sales, which translates into roughly \$279 million in Lottery revenue for this fiscal year. It is unclear whether these games can maintain their strong gains, or if this year's rapid growth was a statistical anomaly.

Game/ Fiscal Year	PA Gross Sales		U.S. Jackpots Won (Dollar Values in Millions)			
	Amount (\$ millions)	Growth (%)	Number	Cash Value	Advertised Estimated Value	Advertised to Cash Value Ratio
Mega Millions						
2017-18	\$134	41.8%	6	\$1,023	\$1,654	1.62
2018-19	230	71.4	6	2,011	3,394	1.69
2019-20	106	-53.7	5	977	1,379	1.41
2020-21	170	60.2	7	1,409	1,982	1.41
2021-22	105	-38.3	6	841	1,213	1.44
2022-23	244	132.6	8	2,027	3,700	1.83
Powerball						
2017-18	\$273	8.0%	8	\$1,618	\$2,621	1.62
2018-19	260	-4.5	5	1,425	2,345	1.65
2019-20	138	-47.1	10	1,058	1,471	1.39
2020-21	187	35.6	7	1,162	1,572	1.35
2021-22	253	35.5	5	1,564	2,358	1.51
2022-23	315	24.5	6	1,792	3,511	1.96

Sources: Jackpots and cash value data from Powerball and Mega Millions websites with calculations by the IFO. FY 22-23 includes jackpots through June 12, 2023. Gross Sales are from the Pennsylvania Lottery, "Comparative Statement of Income and Expenditures" (June, various years). FY 22-23 Gross Sales are estimated by IFO.

While chance does impact whether a jackpot is won on any given day, non-random factors can play important roles too. Apart from FY 2020-21, recent large year-over-year ticket sales growth was partially due to rule changes designed to generate more jackpot rolls and larger jackpots.^{2,3} The table details Pennsylvania annual gross ticket sales, number and total amount of all jackpots won within a year (including

¹ Internal estimates by IFO as of June 12, 2023.

² Jackpot rolls occur if there is no jackpot winner and the jackpot "rolls over" to the next drawing.

³ For FY 2020-21, strong year-over-year growth in both games was primarily due to the removal of COVID-19 stay-at-home orders in FY 2019-20 and extra disposal income from various pandemic payments and tax credits.

total cash value and advertised estimated jackpot) and the ratio of advertised estimated value to the cash value of jackpots won for Mega Millions and Powerball.

Mega Millions experienced large year-over-year sales growth in FY 2017-18 (+41.8%) and FY 2018-19 (+71.4%) due to October 2017 rule changes that (1) reduced the odds of winning a jackpot (allowed more jackpot rolls), (2) raised the ticket price from \$1 to \$2 and (3) increased the starting jackpot from \$15 million to \$40 million. Powerball experienced strong growth in FY 2021-22 (+35.5%) due to an extra weekly drawing (increased to three weekly drawings) and a new double-play option to provide players another opportunity to win.

For FY 2022-23, a rapid increase in interest rates likely contributed to strength in sales growth. Both games deposit a portion of ticket sales into a jackpot pool and the total in the pool is referred to as the cash value of the jackpot. Jackpot winners can choose to receive the cash value in a single lump sum payment or the advertised estimated jackpot in 30 annual payments. The estimated jackpot is the cash value plus interest paid in 30 payments over 29 years, and each payment increases roughly 5% over the previous year. Therefore, in years with low interest rates (FY 2019-20 and FY 2020-21), the advertised jackpots won were roughly 1.35 to 1.40 times larger than total cash value. (See final column in table.) In FY 2022-23, interest rates were much higher, and the ratio increased to 1.83 for Mega Millions and 1.96 for Powerball.⁴ If these ratios had remained at 1.40, then the total advertised jackpots won in FY 2022-23 would have been roughly \$2,837 million (\$2,027 million * 1.4) for Mega Millions (\$863 million lower than advertised actual) and \$2,509 million (\$1,792 million * 1.4) for Powerball (\$1,002 million lower than advertised actual).

Higher interest rates increase advertised jackpots, which promote more play that enhances jackpot pools and state revenue from the games. With elevated interest rates expected into FY 2023-24, unusually large, advertised jackpots could continue in the near term. If interest rates decline, then the average advertised jackpot will likely grow more slowly, and this slowdown could impact sales and ultimately state revenue.

Lottery revenues from Mega Millions, Powerball and other Lottery games are deposited into the Lottery Fund that benefits older Pennsylvanians. The roughly \$279 million net revenue earned from Mega Millions and Powerball ticket sales funds the following programs supported by the Lottery Fund in FY 2022-23:

- Programs within the Department of Aging including the PACE/PACENET program (prescription benefits to low-income adults) and distributions to Area Agencies on Aging and senior centers (\$452 million),
- Programs within Human Services to support long-term living services for older adults (\$353 million),
- Programs within PennDOT to provide transportation for older adults (\$171 million) and
- Property Tax and Rent Rebate (PTRR) program (includes administration, \$244 million).⁵

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This research brief was produced by Karen Maynard. Questions regarding this research brief can be directed to kmaynard@ifo.state.pa.us.

⁴ These calculations only include jackpots won through June 12, 2023.

⁵ Includes current available appropriations and executive authorizations for FY 2022-23 detailed on the Lottery Fund Spring Update, May 2023.