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How lottery legend Joan Ginther likely used odds, Uncle Sam to win millions

Basic gambling principles go a long way toward explaining why Joan Ginther bet enormous sums on high-priced scratch-off games.

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Second of three parts. [See Part 1.](#)

Joan Ginther wasn't necessarily lottery loco.

Maybe it wasn't a case of dumb luck, but smart luck.

She may have purchased at least 80,000 pricey tickets worth \$2 million or more, according to expert analysis of 28 instant prizes she won, including three totalling \$15 million.

If she also was the source of two dozen lesser wins by her friend Anna Morales, Ginther might have spurred the purchase of [as many as 100,000 tickets worth \\$3.3 million](#).

Sure sounds crazy.

Why would Joan Ginther, a math-savvy woman with a Ph.D. from Stanford, leave her home in Las Vegas, a block from three casinos, to devote countless hours to [lottery longshots](#)?

No answers were available from Ginther, who never responded to a series of interview requests, or Morales, who declined to speak. And months of painstaking analysis of Texas Lottery records cast doubt on the most common suspicions.

A simpler theory surfaced: The costs and odds in the games she played weren't so wild after all.

That \$3.3 million in tickets may have only actually cost about \$1 million, thanks in part to Uncle Sam. And her chances were sometimes at least four times better than the published odds, thanks in part to player-friendly websites.

If she was winning, without damaging her interpersonal relationships, the term for her isn't "pathological," it's "professional," said Tim Fong, co-director of UCLA's Gambling Studies Program.

And win she did, putting together an amazing five-year run.

She scored \$2 million playing Holiday Millionaire in 2006, \$3 million in Millions & Millions in 2008 and \$10 million in \$140,000,000 Extreme Payout in 2010, all on top of apparently lucking out in 1993, when she claimed a \$5.4 million share of a Lotto Texas jackpot.

In rare cases, buying a ton of lottery tickets can be smart. The [International Lotto Fund](#) bought five million tickets to win a \$27 million Virginia Lotto jackpot in 1980, and four groups regularly bought hundreds of thousands of tickets to reap millions playing [Massachusetts' Cash WinFall](#) from 2005 to 2012.

Maybe she figured out a similar scheme with scratch-off games.

"I think she's addicted," said Dawn Nettles, publisher of the Texas-based [Lotto Report](#). "She's going to go belly up. ... We'll see in time."

Or perhaps she moved to Vegas in 2001 because she's an advantage player, someone who zeroes in on ways to turn a profit gambling, suggested Yuran Lu, co-organizer of the MIT group that beat Cash WinFall.

Vegas is a mecca for people seeking to turn gambling into an income stream. Poker pros and [card counters](#) just the best-known examples. [Some video poker machines favor perfect players](#). Sometimes [progressive slots](#) have such big jackpots, they're worth relentlessly pursuing. Sports bettors have cashed in on ["rogue" point spreads](#). [Even craps can supposedly be gamed](#).

In [all the theorizing about Ginther](#), analysts have largely overlooked the importance of an assortment of basic gambling principles.

Here's a rundown of a series of powerful factors she may have worked to her advantage.

First, a warning: Play games of chance at your own risk.

"Most of the world is suffering, and shouldn't be playing at all," said often-interviewed Richard Lustig, who's won [multiple top prizes](#) and [wrote a book for lottery players](#). His advice: Set a budget, but "do not spend grocery money, do not spend rent money."

"Nobody can guarantee you're going to win a grand prize," he said.

Powerful Factor 1: House money

Thanks to her 1993 Lotto Texas win, Joan Ginther had \$270,000 coming in every July through 2012. Many gamblers reason that winnings are found money, the lottery's money, house money,

so why not risk some, or most? Even if you lose it all, you're no worse off than when you started. So, Ginther didn't need a foolproof strategy or some pay-as-you-go ticket-screening process to justify a search for huge prizes. If games were relatively reasonable bets, she could probably afford to risk sizeable sums every year.

Factor 2: Generous Texas

In mid 2000, \$80,000 was the biggest lump-sum instant payout in Texas, for a game called Piece of Cake.

Then Texas started feeding its scratch-off games growth hormones.

2002: first \$1 million prize, first \$20 tickets. 2003: first \$2 million prize. 2004: first \$30 ticket (many states still don't have them), for another \$2 million prize.

In April 2006, Ginther won \$2 million playing Holiday Millionaire, a \$30 game.

In 2007, Texas introduced its first \$5 million prize with [North America's first \\$50 game](#), \$130,000,000 Spectacular.

In 2008, Ginther won \$3 million playing Millions & Millions.

In 2009, Texas launched North America's first instant game with a \$10 million prize, \$140,000,000 Extreme Payout, another \$50 game.

In 2010, Ginther won that game's second \$10 million prize.

There are two ways of looking at this timeline. Texas tempted, Ginther succumbed. Or, maybe, as Texas kept sweetening the formula, Ginther realized some games weren't such crazy gambles.

Factor 3: Guaranteed prizes

Trick question: How much does a thousand \$25 lottery tickets cost?

In a generous scratch-off game, less than \$10,000, thanks to a high rate of prize payback.

This powerful factor has been overlooked or underappreciated in dozens of accounts about Ginther.

In winning \$2,000 in Run the Table in 2005, Ginther may have bought a thousand \$25 tickets, an industry analyst calculated. But that doesn't mean she coughed up \$25,000. The game paid prize money back at a remarkable rate: 66.9 percent, *not counting* the top three prizes.

Ginther could have calculated this rate using [the game's online page](#).

Suppose she repeatedly redeemed winners for more tickets. On \$10,000, she'd win \$6,690 back. Reinvesting that would win another \$4,470, and she's already doubled her tickets. Continue the pattern and it works out to roughly buy one, get two free.

Total out-of-pocket cost for 1,000 tickets: about \$8,275.

Other games were far less generous. Lotto Texas' drawings offered about a 10 percent return in smaller prizes. 10 Times Lucky, a middling instant game back then, had a high payback rate, but its top prize was a puny \$2,500.

Figure in an average 60 percent return rate for all her games, and the real cost of \$3 million worth of tickets works out to about \$1.2 million. Over eight years, that's \$150,000 a year, leaving a lot of her annuity and all of her savings untouched.

Factor 4: Tax break

Uncle Sam's generous, too. Gambling losses can be written off against gambling winnings on federal income-tax returns, and with her annuity, Ginther easily met that test.

From 2005 to 2012, when Ginther won 28 scratch-off prizes of \$1,000 or more, the top tax rate was 35 percent.

If she lost \$150,000 in a given year, she could have saved \$52,500 on her taxes, making the real risk less than \$100,000.

In effect, with prize paybacks and tax breaks, she could have bought about \$375,000 worth of tickets a year for \$97,500.

Some gamblers can legally boost their tax break further by declaring themselves professionals. That would have allowed her to deduct expenses such as trips to Texas or even a home office in her condo, though pros also have to pay self-employment tax, according to New York tax attorney [Brad Polizzano](#). (There were no state-tax implications, since neither Texas nor Nevada has a state income tax.)

Factor 5: Expected value

Cost is just one side of the ledger. There's also the payday side.

Each ticket has a dollar value just for its chances of winning, according to statisticians.

A 1-in-a-million chance to win \$5 million is statistically worth \$5, for example. If the ticket costs less than \$5, it's said to have "positive expected value," making the purchase a rational bet.

In such situations, the more the player can afford to bet, the more likely he or she will come out ahead in the long run.

If Ginther thought she found such situations in Texas scratch-offs with gigantic prizes, her wild buying becomes more understandable.

It's not clear she did, however. In \$140,000,000 Extreme Payout, for instance, the payoff side fell well short of her discounted cost.

But that's not the final answer. Scratch-off players can do better than the published odds.

Factor 6: Info = better odds

Casinos don't tell blackjack players how many face cards and aces are left.

Yet lottery websites in many states tell scratch-off players how many top prizes are left.

In January 2006, Texas became one of the first states to do so, a few months before Ginther won her first top scratch-off prize. And Nettles' Lotto Report, a newsletter for Texas players, had already been providing that information for years.

Such information is a huge edge.

It lets players exploit a simple process of elimination – other players scratching tons of tickets without finding a winner.

Watch how quickly longshots can get shorter.

When \$140,000,000 Extreme Payout began in 2009, three top prizes of \$10 million were scattered among 3.6 million tickets.

Apparent odds of winning a top prize: 1 in 1.2 million.

In June 2010, when Ginther won \$10 million, it was one of two top prizes still left, even though more than half of the tickets were sold.

Apparent odds: 1 in 800,000.

Actually, the odds were better than that. Scratch-off prizes are not randomly distributed. Lotteries use a system of "pools" to create a fairly even distribution of prizes, as described in [Indiana](#) and [Massachusetts](#) reports.

"Most lotteries want prizes to be evenly spread throughout the game and not back-to-back, and our job is to securely and as randomly as possible accomplish this for the lotteries," said Joe Bennett, vice president of game development for Scientific Games, which prints scratch-offs for every state lottery but Michigan's.

Strictly speaking, “evenly spread” and “randomly as possible” are contradictory. So lotteries, in a way, divide the game into sections, then randomize each section. It’s like shuffling three decks of cards separately, instead of shuffling them together.

Scratch-offs do seem to work like that, as confirmed by an analysis of data for a few dozen games with top prizes of \$1 million or more.

The point is, the second prize was likely to show up in the middle “deck” of 1.2 million scratch cards. But only about 400,000 tickets were left in that group.

Apparent odds: 1 in 400,000.

This improvement means Ginther’s play was actually a logical gamble at times, though at other times that clearly wasn’t the case.

Maybe after she won big, she felt free to take more chances – knowing she was going to lose a lot of winnings anyway to Uncle Sam.

Factor 6: Sustained strategy = better odds?

There are still more key ways Ginther could have bettered her odds.

A player might try getting a retailer to hold tickets as long as possible. As sales continue, and the winner isn’t found, the more likely it’s in that stack. Records show, however, that Ginther didn’t try that trick with \$140,000,000 Extreme Payout. The top-prize ticket arrived a week before she claimed it.

Ginther could also have bet more heavily as the odds improved, and sometimes she clearly did.

Perhaps most important of all, she might have justified her commitment to buy and buy on the fact that odds can steadily improve.

Say a game will become a rational bet with 400,000 tickets left. Why not buy earlier, reasoning that the slightly longer odds will be balanced by even better ones later?

Whether such a strategy is sound is complex, according to mathematician Skip Garibaldi, who holds positions at Emory University and UCLA.

“Expected value in this sense is additive,” he said. “... The formulas say she would improve her expected value if she bought more.”

Assessing her strategy

We still can’t say the mystery’s solved.

Although buying a ton of tickets would have improved her odds dramatically, winning millions was never guaranteed.

Even with 104,000 tickets, while the odds of hitting a single top prize were better than 1 in 10, the chances of her winning three top scratch-off prizes was about 1 in 1,300 -- and that's assuming her average odds were at least double the published values, according to a lottery industry analyst.

She could easily have been a major loser, and probably was in 2011 and 2012, while failing to find instant millions in a game called Ultimate Casino Jackpot.

So, until Ginther shares her secrets, people will continue to wonder.

Was it all persistence and luck -- or did she have some secret edge?

"We're having a lot of trouble coming up with a plausible explanation for how Ginther wins," said James Harvey, co-organizer of the MIT group that mined Massachusetts' CashWinfall.

"Even with her odds of winning the big prize being doubled, I'm still skeptical that she was simply lucky and that her ability to win the big prizes was due simply to playing way more than anyone ever realized," said Mohan Srivastava, the Toronto statistician who "[cracked the scratch lottery code](#)."

Then again, maybe luck has its own logic. Winning early gave her the confidence -- and cash -- to keep playing long enough to keep getting lucky and make headlines around the world.

She could resolve the mystery by cashing in again -- by telling all in a book or selling her story to Hollywood.