

Lottery Jackpots: Selecting the Rational Payout in the Face of Irrationality

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Lotteries have existed for thousands of years. In particular, they have frequently been used by governments to finance various state-backed projects. Today, state lotteries such as the Powerball lottery are often presented to voters as a way to pay for better education, provide services for senior citizens, increase retirement benefits for police, firemen, and educators, and undertake assorted other socially beneficial projects that would otherwise require increases in state taxes.

For an individual, buying a lottery ticket seems to be a bad bet because it has a negative expected value in addition to a negative expected net present value. Nonetheless, over 30 million lottery tickets are sold each week for Powerball alone. Are all of these purchasers behaving irrationally? Not necessarily! Economists observe that people frequently make investments that have negative expected values—the purchase of fire or flood insurance and the purchase of lottery tickets are popular examples. Buying insurance means taking a certain loss in exchange for avoiding the tiny probability of a very large loss at some time in the future. Buying a lottery ticket means taking a certain loss today in exchange for the tiny probability of a very large gain at some time in the future. Each of these investments has a negative expected value; otherwise neither insurance companies nor state lotteries would be economically viable.

Over sixty years ago, Friedman and Savage (1948) provided an economic analysis of this phenomenon. They showed how taking a small certain loss (insurance) to avoid a huge and possibly devastating loss and how taking a small certain loss (a lottery ticket) to create the possibility of a huge and life-changing gain can increase a rational person's state of well being and therefore, their utility. Insurance brings more than a financial reimbursement in the event of

disaster; it also brings a sense of well-being and freedom from fear while awaiting the unlikely disaster. Similarly, although a lottery ticket carries only a minuscule chance of actually winning, it also provides a hope of “winning the lottery” with all the happiness and bliss that the ticketholder chooses to imagine. To paraphrase the title of a book by Charles Clotfeter and Philip Cook on the subject, “state lotteries sell hope.”

Both the dreamers and the actual winners of the jackpot in Powerball or any other lottery face an important financial decision: Should they take the cash value – a one-time cash payment, or the annuity – a series of annual payments stretching over 25 or 29 years? From the choices made by actual winners in the past seven years, it would appear to be a simple decision. The majority of winners chose the cash payment regardless of age or socio-economic status.

This paper takes an analytical approach to evaluating the cash value versus annuity decision. The analysis focuses on the Powerball lottery because it is the most widespread lottery game in the United States. Figure 1 shows the 31 states currently offering Powerball. Most of the states that do not have Powerball have another state lottery, as shown in Figure 2. Table 1 lists the specific lotteries offered in various states. Only six states have no state-sponsored lottery. Although we focus on Powerball lotteries, the general approach to analyzing the decision between taking the cash value and taking the annuity that we present is applicable to any lottery.

The paper is organized as follows. Section One describes the evolution of lotteries, followed in Section Two by an overview of the Powerball lottery. Information about the size of jackpots from 2003 through 2009 is also contained in this section. Section Three illustrates the financial analysis of the choice between the cash value option and the annuity option. Section Four discusses various considerations that should or could influence the choice between the cash value and the annuity. Conclusions are in the fifth section.

1. Evolution of Lotteries

A brief historical review of lotteries reveals that the use of lotteries to fund state projects is nothing new. In 100 B.C. the Great Wall of China was financed by funds collected from lotteries to support defense spending. There were lotteries in Europe during medieval times, whence they eventually migrated to the United States. During the 1700’s Benjamin Franklin used lotteries to finance cannons for the Revolutionary War; John Hancock operated a lottery to rebuild historic Faneuil Hall in Boston; George Washington operated a lottery to finance construction of the Mountain Road, opening westward expansion from Virginia; Thomas Jefferson, deep in debt at the end of his life, used a lottery to dispose of the bulk of his property. By the end of the 18th century and the beginning of the 19th century, lotteries played a role in funding private institutions of higher education – Harvard, Yale, Princeton, and Columbia were all funded by lotteries. At the same time, many states found lotteries a convenient way to finance various types of infrastructure such as courthouses, jails, and hospitals. As the use of lotteries in financing more types of projects became common, corruption in private lotteries increased dramatically and promised prizes were not always awarded to winners. New York passed the first constitutional prohibition of lotteries in 1820. By 1878, all states prohibited lotteries, the sole exception being Louisiana, whose lottery was ended by edict of a U.S. Supreme Court ruling in 1905.

Lotteries re-emerged in 1964 when New Hampshire instituted a state lottery linked to horse racing. New York followed in 1967 and New Jersey in 1970. Seventy-three million dollars worth of tickets (at fifty cents each) had been sold by the end of New Jersey’s first fiscal year of lottery sales. At the time, that amount accounted for almost 75% of lottery sales in the United

States. Five years later, lottery sales in the United States exceeded \$1 billion.

The concept of pooling ticket sales from several states to generate bigger jackpots arose in 1985, when Maine, Vermont, and New Hampshire linked their lotteries to form the Tri-State Lotto. Three years later the Multi-State Lottery Association (MUSL) was created with five states and the District of Columbia participating. MUSL's original Lotto game evolved into Powerball in 1992, and has become the predominate multi-state lottery game in the United States. Table 1 shows that as of 2008, aggregate lottery sales in the U.S. exceeded \$60 billion, with aggregate profits of approximately \$18 billion. With profits such as these, it is understandable that many states have come to depend on the revenue stream generated through lottery sales to help fund social services and other projects.

2. The Powerball Lottery¹

Powerball is a shared jackpot pool lottery game sold in the United States through retailers in 31 states, as well as Washington D.C. and the U.S. Virgin Islands. To participate in Powerball, a state must be a member of the non-profit organization, the Multi-State Lottery Association (MUSL), which was formed in 1987 with six original members. Powerball was introduced in 1992, using a two drum draw instead of the one drum draw under Lotto America, which preceded it. One dollar bought one ticket to play then, as it does now. The Powerball matrix was changed in October 2002, when all "1's" were removed from the Power Play wheel and Match 5 BONUS was added. With this innovation, the odds of winning the jackpot jumped from 1:80,089,128 to 1:120,526,770. Currently the odds of winning the jackpot are 1:195,249,054.

The play of the game is as follows: To win the jackpot, a player has to match all five of the numbers drawn from the 59 white balls in the first drum and the one number drawn from the 39 red balls in the second drum. Drawings are held on Wednesdays and Saturdays at 10:59 p.m. EST in Orlando, Florida, so there are 104 drawings per year.

Since 1997, the winner has had the choice of receiving their winnings as either a lump sum cash payment, once their winning ticket has been verified, or a stream of annuity payments. These payments were originally a constant amount per year paid over 25 years, but in October of 2005 the annuity payments changed to 30 payments paid over 29 years with the amount of the payment increasing by 4% annually. The winner has to claim his or her winnings in the state where they bought the ticket, and winners usually have sixty days after claiming winnings to make decision between the lump sum payment and annuity. All states require that Federal taxes of 25% be withheld at the time of winning. Since the current Federal income tax rate is 35%, and until recently was even higher, the amount withheld is generally much less than the actual tax payment due. In some states, but not all, lottery winnings are also subject to state income tax, and some states levy a special state tax on lottery winnings. If a winner dies before receiving all the annuity payments, the remaining payments become part of their estate. There are literally hundreds of firms that are ready and willing to purchase the remaining payments due to lottery winners or their heirs if they want to receive a lump sum instead of the annuity.

Thirty cents of each dollar spent on a Powerball ticket is put into the cash jackpot pool, which is how the lottery payout is funded. If a person chooses to take the single, lump sum cash payout, they receive all the cash in the jackpot pool. On the other hand, if the winner selects the annuity payout, they receive an immediate, smaller, cash payment and the right to 29 future annual payments. The prize winner receives a legally binding contract with the state, and

¹ The source of most of the information in this section is the Powerball website, <http://powerball.com>.

payment of the annuity stream is guaranteed by all of the states that are in MUSL at the time of the win. In addition to this legal guarantee, MUSL invests the money remaining in the pool after the initial payment in a portfolio of zero coupon U.S. government obligations that funds the actual payment of the annuity by the state. The returns from this portfolio are sufficient, in and of themselves, to fully fund the series of payments due to the winner. Thus, with regard to risk, the lottery annuity is essentially equivalent to a AAA bond.

Information about the Powerball jackpots won from 2003 through 2009 is shown in Table 3. There were 10 winners in 2004, 2006, and 2009 and more than 10 winners in each of the other years. Both annuity values and cash values were higher after the change from a constant annuity to an annuity growing at 4% per annum. The advertised jackpot for a growing annuity will be larger than the jackpot for a constant annuity, for a given cash value, simply due to the arithmetic of compound interest. Recall that the advertised jackpot is an estimate of the total annual payments that will be available to the winner based on the cash value at the time of the drawing. The larger advertised jackpots after the change probably attracted more players.²

3. Choosing between the Cash Value and the Annuity

We illustrate the financial considerations in choosing between the cash value and the annuity using Neal Wanless' situation when he won a Powerball jackpot on the 27th May 2009. His picture was taken on 5th June 2009 holding a check made out to him in the amount of \$232,100,000. That amount was the so-called jackpot – the total of the 30 payments growing at 4% per year over 29 years. Neal chose the cash payment instead of the annuity, and actually received a lump sum payment of \$118,005,530.33. Since \$118 million was the lump sum, the interest rate at which the lottery managers could lock in the annuity was approximately 4.37 % at the time. The \$118 million payment was taxable income to Neal in the year he received it. After

paying Federal income tax of 35%, or about \$41.3 million, Neal's net after-tax cash payment was \$76.7 million.

If Neal had chosen the annuity instead of the lump sum, he would have received an initial cash payment of \$4,138,365.98 and 29 subsequent annual payments growing at a rate of 4% per annum. Table 3 shows the before-tax and after-tax amounts of the 30 annuity payments. The after-tax proceeds are based on a marginal income tax rate of 35%, which is expected to be the highest income tax bracket in the U.S. for 2009 and the foreseeable future. Our analysis ignores state income taxes because they vary widely from state to state; some states tax lottery income as ordinary income, others have no income tax (South Dakota, where Neal Wanless resides, is one such state), and some states, such as New Hampshire, levy special taxes on lottery proceeds.

Did Neal make the right choice? It is unlikely. After paying Neal the initial \$4.1 million payment, the Multi-State Lottery Association was able to invest about \$113.8 million to obtain the annuity shown in Table 4. In comparison, Neal will have only \$72.6 million to invest after paying his taxes and taking out an amount of spending money equal to the initial payment of the annuity. How can Neal win?

4. Why do Winners take the Cash Payment?

² Shapira and Venezia (1992) document an association between the size of the prizes and demand for lotteries. Gulley and Scott (1993) find that demand is associated with the price of the bet (i.e. the cost of the ticket minus the expected value of the bet).

The analysis in the preceding section suggests that it is generally financially advantageous for a lottery winner to take the annuity to avoid the double taxation that occurs if a winner selects the lump sum. There is a massive up-front tax payment on the full amount of the lump sum, and subsequent investment earnings are taxed in the same way as the annuity. However, as shown in

Table 4, the vast majority of Powerball winners (more than 93%) opt to take the cash value instead of the annuity.³

The small group of winners that select the annuity payout not only receive a higher present value payout over the life of the annuity than their lump sum payment counterparts, but also obtain an externally imposed mechanism for self discipline. By receiving a known, but limited amount of cash each year for 29 years, annuity winners are less likely to become financially bankrupt than those that select the lump sum payment. If the winner is financially naïve when he or she first wins the lottery, making mistakes with a smaller annual amount will not be as devastating as with a huge one-time payout. Over the years, the annuity winner can improve his or her financial sophistication, making fewer mistakes. Lump sum selectors have a very short time period from which to learn from their mistakes and so the possibility of becoming financially bereft is much higher.

Another obstacle that lottery winners face is the instant recognition that accompanies winning the lottery. Once it becomes common knowledge that a certain person has won the lottery, they become the target of people either wanting money (friends, family, charities, etc.) or those willing to invest on behalf of the winner (advisors, entrepreneurs, etc.). If the amount that is available is limited to the annual annuity payment, there is not as much money to go around. Again the annuity payments offer a limiting mechanism on how much can flow out on an annual basis. Given both the increased after-tax wealth effect of the annuity choice and the inherent self-control mechanisms that help to ensure maintenance of a minimum amount of wealth, why do winners take the cash payment?

Many lottery winners consult financial advisors, including Certified Financial Planners (CFPs) and similar professionals for help in making this once in a lifetime decision. Thus we may presume these winners have been counseled to take the lump sum payment. Two possible explanations for this advice: First, unless they are fee-based, financial advisors often take a percentage of assets under management, so it is in their best financial interests to advise the winner to take the lump sum. Second, the financial advisor may be overoptimistic with regard to his or her ability to manage money. From the research in behavioral finance, we know overconfidence is widespread among financial professionals, who in fact do not perform as well as they anticipate, on average. One financial planner was quoted as saying he would advise clients to take the annuity payments, so the client wouldn't "blow the money" all at once. However, if the planner himself won, he would take the lump sum, reasoning he could "earn a higher rate of return" on the money. The inference here is that financial advisors might recommend taking the lump sum payment because the planners actually believe that they will be able to perform better than the guaranteed, safe, return represented by the annuity payments. We call this the Hubris Explanation for taking the lump sum payment.

³ An informal survey of 34 students in a master's level finance program also showed a definite preference for the cash payment over the annuity, with over 66% selecting the cash payment.

In a similar vein, the decision to take a lump sum payment mirrors the prevalent option made by people when choosing between an annuity and a lump sum payment for their retirement or pension payment. Again, people overwhelmingly select a lump sum payment when given the choice, even though it is in their rational financial best interest to take the pension in the form of annuity payments. One huge difference between the pension and lottery payout decision is what happens to annuity payments after death. If a pension is being paid in the form of annuity payments, those payments will cease upon death. In the case of a lottery winner who dies before receiving all annuity payments, however, the remaining annuity payments become part of the estate of the deceased and are inherited by beneficiaries of the estate.

Obviously there is something more involved in the decision to take the lump sum or annuity payment that is not captured in traditional financial models based on rational decision-making by individuals. In a recent article, Meir Statman (2010) expanded the traditional utilitarian motive and endeavored to capture the “wants” of an investment through the inclusion of emotional and expressive benefits.

Lottery tickets, as noted earlier, give people hope that they will win so much money that they will never have money troubles again. This is the emotional benefit of purchasing a lottery ticket. How the money will be spent – or fantasies of how the money will be spent – serve to express characteristics about that individual, both to himself or herself and to the world at large. Using this model, the lump sum payment may provide a greater expressive benefit than the annuity payments, although from a financial or from a utilitarian perspective, it seems like an irrational move. If a person gains more value from being able to spend a seemingly unlimited amount of money on items that convey to the world the sort of person that he or she is, then the expressive benefit outweighs the utilitarian benefit. The act of simply buying the lottery ticket has already served an emotional benefit that becomes magnified through the expressive benefit when it is a winning ticket.

Temporal construal theory in psychology also provides some insights as to why individuals select the lump sum payment. Berns, Laibson, and Lowenstein (2007) postulate that inter-temporal preferences influence how humans make decisions. In their study, they find that more psychological weight is placed on alternatives with near term consequences. Less psychological weight is placed on alternatives where the outcome will not be realized until further in the future. In the case of lotteries, psychologically the winner weighs the large, immediate, but one-time lump sum payment more heavily than a smaller, immediate lump sum payment followed by another one next year, and so forth for the next 29 years. People prefer a smaller payout today to a larger total payout stretched out over a long period of time.

Examining decision-making in the context of neurobiology, McClure et al. (2004) focused on two parts of the brain – the “pleasure” center and the executive function. For decisions that must be made within a short time frame, the emotional center of the brain dominates. If a person has a longer time to make a decision, then the executive function normally takes precedence. Regarding Neal Wanless and his choice of the lump sum payment, we see that the time between discovering he had won the lottery and actually receiving the payment was less than two weeks – he won on 27th May and received his payment on 5th June. In terms of inter-temporal preferences, it could be predicted that Neal would react as he did. From a neurological perspective, the executive function of his brain only had a short time to function in the decision process, given what undoubtedly was an emotional high of winning so much money.

Going beyond the cognitive psychological approach and delving deeper into the psyche using analytical psychology, the winner of the lottery might identify with the archetype of the

hero. Within this Jungian paradigm, the winner assumes the attributes and characteristics of what our culture deems a hero to possess, which includes winning. As the successful hero who has conquered the lottery game, the winner is seen as having obtained the resources to not only give to others who are less fortunate, but also to have the right to display his or her own success. This would include buying expensive items and engaging in behaviors that demonstrate the winner's newfound financial status in society. In this paradigm, the winner perceives the lump sum would enable him or her to act in such a manner sooner and with greater immediate financial resources. This hypothesis concurs with Statman's expressive benefit described above.

One financially rational exception to the preceding reasons for preferring the lump sum payment would be the case of someone whose life expectancy is very short. In such a situation, a person may indeed prefer to use the option to spend and distribute money as he or she sees fit while still alive, rather than waiting until after death for those distributions to occur. All winnings from Powerball go into the estate of the winner and are distributed according to the deceased's will.

Having examined multiple psychological perspectives that might explain why individuals select the lump sum payment despite that being a financially irrational decision, one other aspect of the lottery needs to be considered. Do individuals trust lottery officials to carry through on their obligation to make annuity payments over twenty-nine years? Janet Butler and Cecily Riaborn (2010) focus on the importance of internal control measures that lotteries can take to promote the trustworthiness of their lotteries. They argue that these control measures are the key to success for a state lottery, implying that if the lottery is not perceived as being trustworthy, it will fail to attract ticket buyers. This in turn will reduce the revenues that the state can generate through the lottery.

Re-examining the history of lotteries in the United States, it appears that state lotteries are being used today for much the same purpose as they were in the 18th and 19th centuries: to help fund projects that individual states otherwise would not have the funds to undertake without additional taxation. If history does indeed repeat itself, it may be that individuals who win the lottery today are concerned about the bureaucrats who control the lottery funds. Corruption of lottery owners and their unwillingness to pay prizes per the rules of the game led to the abolition of lotteries in the past. As states become more constrained in their ability to pay for basic infrastructure needs, will politicians decide to use funds earmarked and legally contracted for annuity payments of winners for other more immediately pressing state needs? In 2004 this very issue was raised in England, as politicians sought to move money from the lottery pot to more immediate needs not in the original contract with the State. This would not be an unsurprising move in the United States if a state were in need of more funding and unwilling to raise taxes.

From Table 5, it can be seen that lottery ticket sales in all 50 states and the District of Columbia grew from \$34,711.77 million in 1996 to \$58,426.94 million in 2007. The percentage retained as profit by the states on an aggregate level hovers around the 30% mark each year over the same time period. Lottery sales represent a large contribution to the state coffers that might be tapped in financially unstable times. Seen in this light, the decision by a jackpot winner to take the lump sum may be related to a lack of trust. The funds for the lump sum payment are readily available and not under the custody of a potentially non-binding contract with the state.

5. Conclusions

From a purely rational financial perspective, we have shown that individuals who win the large Powerball jackpots would be better off selecting the annuity over the lump sum payment at

the time of winning. The annuity payment provides not only a higher after-tax return, but also encourages self discipline in managing the winnings, by limiting how much is available in any given year. Yet over 90% of the winners select the lump sum payment. Addressing this seemingly irrational inconsistency, we find that there are both behavioral and neurological reasons why people may select the lump sum payment. Financial planners advising new lottery winners have both a financial motive, as well as a behavioral bias for selecting the lump sum. We termed this the Hubris Explanation.

In expanding the traditional finance utilitarian motive to include expressive and emotional benefits, we discussed how these benefits can outweigh the utilitarian benefit. This finding concurs with the analytical psychology approach of identifying with the hero archetype. Under this paradigm, the winner needs to be aware of the possibility of becoming possessed by this archetype. Should this happen, the probability is high that poor choices will be made concerning how the winnings are tended.

The psychological and neurobiological components involved in decision-making can also outweigh the traditionally posited financial utilitarian motives for most individuals. One implication of these research findings is that people should take all the time given by the lottery to decide whether to receive the lump sum payment or the growing stream of 30 annuity payments. The time element allows the executive function of the brain to contribute more to the decision than the emotional function.

Further support for lump sum preference may be related to trust. It has been less than a hundred years since lotteries were prohibited in the United States due to corruption and prizes not being received by winners. During times of financial uncertainty, when mistrust of financial institutions and politicians is high, individuals may indeed be acting in their own best financial interests by choosing to receive all their winnings upfront, despite annuity payments being backed by U.S. Treasuries and legally designated for payment to the winner. Supporting this hypothesis is the noticeable absence of any winners selecting the annuity payments in the past two years – a time of considerable financial uncertainty at both the state and federal levels.

Selecting which payout to take after winning the lottery is not simply a matter of opting for the highest after-tax cash flows. What appears at face value to be an irrational financial decision may in fact be quite rational when taking non-financial variables into consideration.

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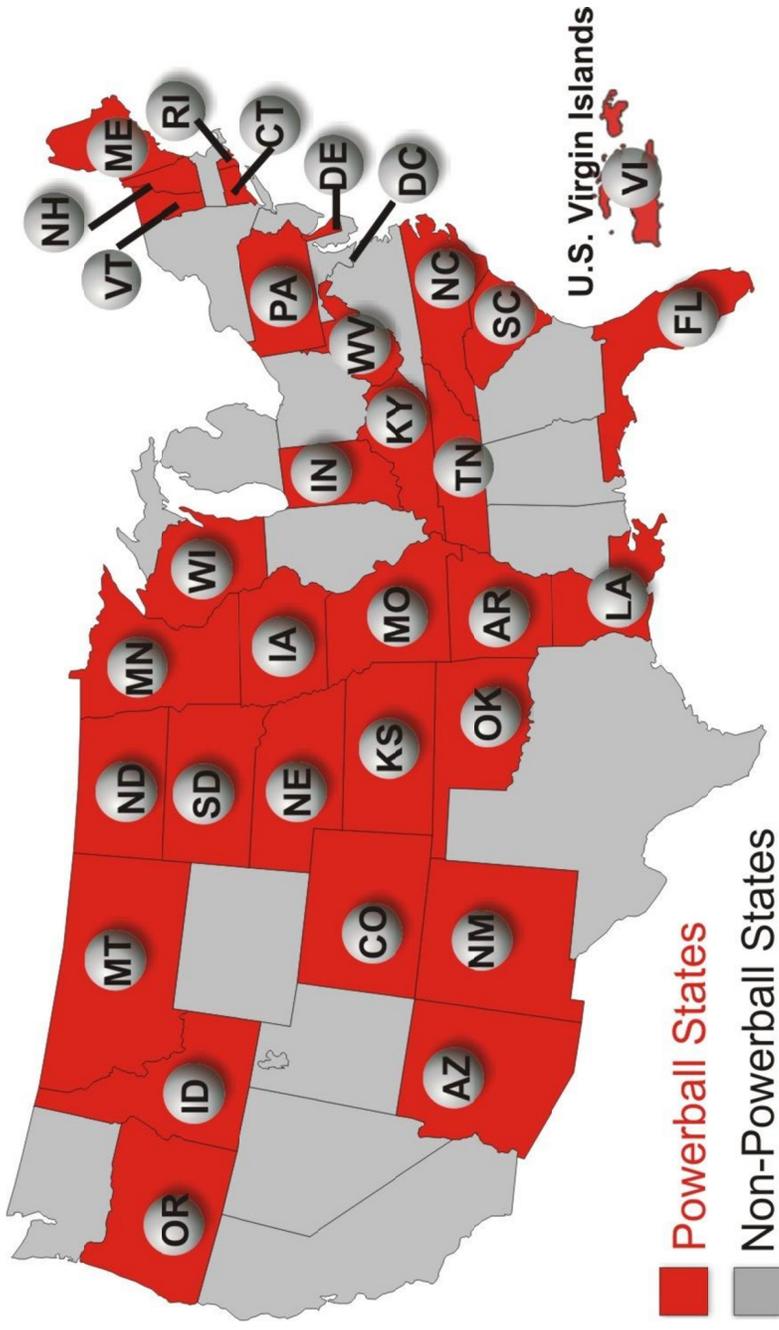


Figure 1: The 34 states and territories offering the Powerball lottery as of November, 2009.

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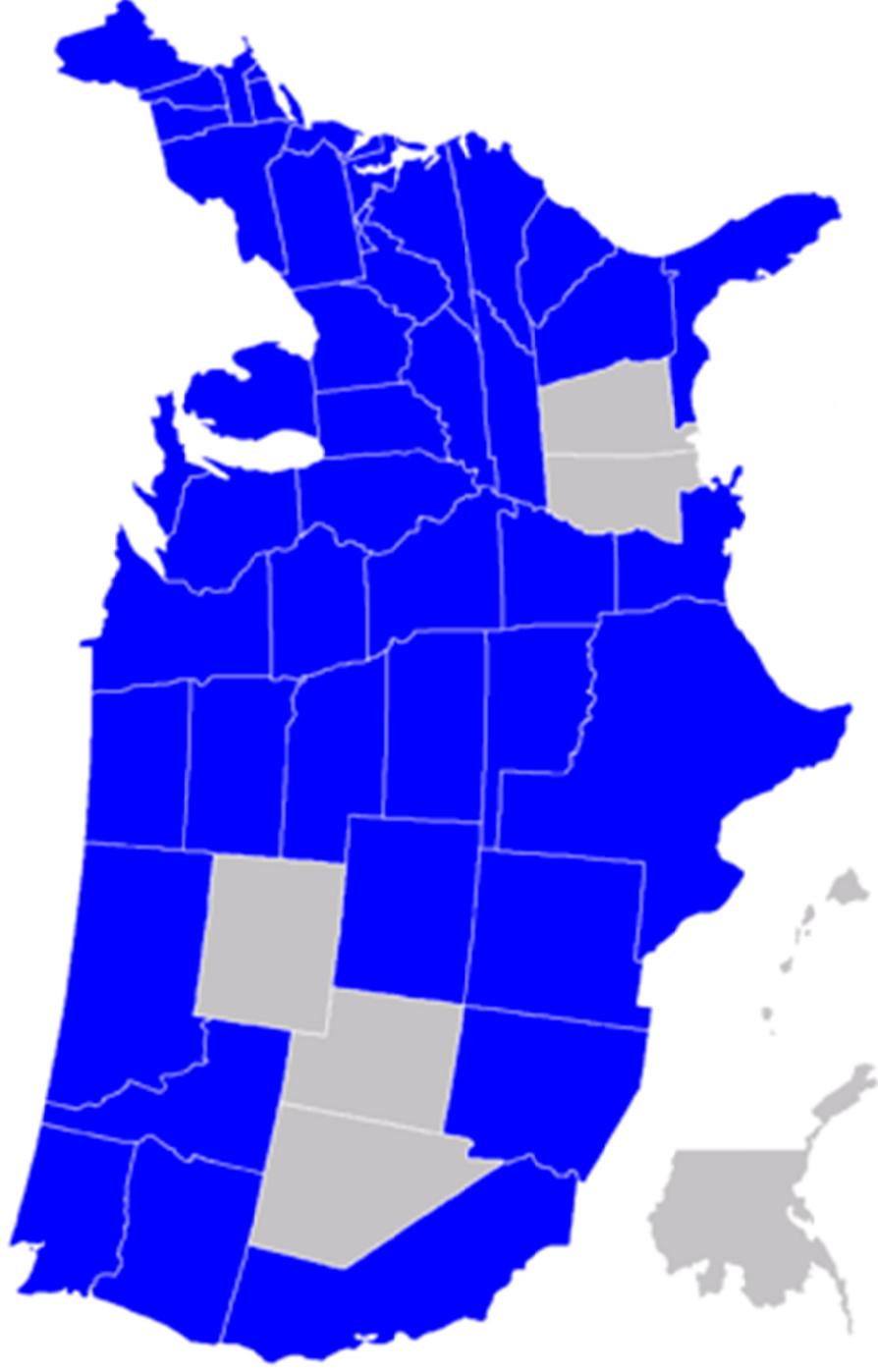


Figure 2: States with Lotteries

Table 1: Aggregate Lottery Historical Sales and Profits, 1996 – 2007

Year	U.S. Lottery Sales (US \$ millions)	U.S. Lottery Profits (US \$ millions)
1996	\$34,711	\$11,680
1997	\$35,970	\$11,929
1998	\$36,011	\$12,171
1999	\$36,390	\$12,103
2000	\$37,651	\$12,158
2001	\$38,872	\$12,334
2002	\$42,431	\$13,410
2003	\$45,198	\$14,032
2004	\$49,430	\$15,092
2005	\$52,639	\$16,418
2006	\$57,442	\$17,101
2007	\$58,426	\$17,403
2008	\$60,626	\$17,893

Source: NASPL

Table 2: State Lotteries

Name of Lottery	States Offering a Particular Interstate Lottery
Powerball	Arizona, Arkansas (October 2009), Colorado, Connecticut, Delaware, District of Columbia, Florida, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland (future), Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, U.S. Virgin Islands, Vermont, West Virginia, Wisconsin
Hot Lotto	Delaware, District of Columbia, Idaho, Iowa, Kansas, Maine, Minnesota, Montana, New Hampshire, New Mexico, North Dakota, Oklahoma, South Dakota, West Virginia
Mega Millions	California, Georgia, Illinois, Maryland, Massachusetts, Michigan, New Jersey, New York, Ohio, Texas, Virginia, Washington, Arkansas, Tennessee
Wild Card 2	Idaho, Montana, North Dakota, South Dakota
Ca\$hola (video lottery)	Delaware, Rhode Island, West Virginia
2by2	Kansas, Nebraska, North Dakota
Midwest Millions	(scratch game) Iowa, Kansas

Table 3: Summary Information about Powerball Jackpots, 2003-2009

Time Period	Number of Winning Jackpots	Average Cash Value	Average Annuity Value	Median Annuity Value	Highest Annuity Amount	Lowest Annuity Amount
<i>A. Winners received either the cash value or a 30-payment annuity growing at 4% per year</i>						
2009	10	\$73,988,570	\$140,370,000	\$153,600,000	\$314,000,000	\$25,000,000
2008	11	\$51,576,029	\$103,290,909	\$84,900,000	\$276,300,000	\$20,000,000
2007	16	\$40,851,799	\$75,243,750	\$61,500,000	\$314,300,000	\$15,000,000
2006	10	\$66,462,750	\$141,580,000	\$116,800,000	\$365,000,000	\$15,000,000
8/28/05-12/31/05	3	\$78,789,738	\$163,066,667	\$113,200,000	\$340,000,000	\$36,000,000
<i>B. Winners received either the cash value or a 30-payment constant annuity</i>						
1/1/05-8/27/05	11	\$29,200,313	\$51,792,092	\$26,400,000	\$220,300,000	\$10,000,000
2004	10	\$54,048,478	\$100,470,000	\$89,000,000	\$214,700,000	\$14,400,000
2003	11	\$56,107,339	\$103,681,818	\$88,700,000	\$261,300,000	\$10,000,000

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Table 4: Before and After-tax Annuity Payments for a jackpot winnings of \$232,100,000.00

This table shows the stream of payments for a winner of a Powerball “jackpot” of \$232.1 million, which means that the total of the payments is estimated to be \$232.1 million. The winner electing to take the lump sum cash payment received \$118,005,530, which was the actual cash amount available to fund the stream of annuity payments. After paying Federal income tax (35%) of \$41,301,935, the winner has cash winnings of \$76,703,595.

Year	30 payments beginning today	Federal taxes @ 35%	After-tax amount	Year	30 payments beginning today	Federal taxes @ 35%	After-tax amount
0	4,138,365.98	1,448,428.09	2,689,937.89	15	7,452,963.39	2,608,537.19	4,844,426.20
1	4,303,900.63	1,506,365.22	2,797,535.41	16	7,751,081.92	2,712,878.67	5,038,203.25
2	4,476,056.62	1,566,619.82	2,909,436.81	17	8,061,125.20	2,821,393.82	5,239,731.38
3	4,655,098.94	1,629,284.63	3,025,814.31	18	8,383,570.21	2,934,249.57	5,449,320.63
4	4,841,302.90	1,694,456.01	3,146,846.88	19	8,718,913.02	3,051,619.56	5,667,293.46
5	5,034,955.02	1,762,234.26	3,272,720.76	20	9,067,669.54	3,173,684.34	5,893,985.20
6	5,236,353.22	1,832,723.63	3,403,629.59	21	9,430,376.32	3,300,631.71	6,129,744.61
7	5,445,807.35	1,906,032.57	3,539,774.77	22	9,807,591.37	3,432,656.98	6,374,934.39
8	5,663,639.64	1,982,273.87	3,681,365.77	23	10,199,895.03	3,569,963.26	6,629,931.77
9	5,890,185.22	2,061,564.83	3,828,620.40	24	10,607,890.83	3,712,761.79	6,895,129.04
10	6,125,792.63	2,144,027.42	3,981,765.21	25	11,032,206.46	3,861,272.26	7,170,934.20
11	6,370,824.34	2,229,788.52	4,141,035.82	26	11,473,494.72	4,015,723.15	7,457,771.57
12	6,625,657.31	2,318,980.06	4,306,677.25	27	11,932,434.51	4,176,352.08	7,756,082.43
13	6,890,683.61	2,411,739.26	4,478,944.34	28	12,409,731.89	4,343,406.16	8,066,325.73
14	7,166,310.95	2,508,208.83	4,658,102.12	29	12,906,121.16	4,517,142.41	8,388,978.76

Table 5: Choice of payment by winning ticket, 2003 – 2009

Year	Number of winning tickets	Number choosing cash payment	Number choosing annuity payments
2009	11*	10	0
2008	11	11	0
2007	16	15	1
2006	11	11	2**
2005	14	12	2
2004	12	12	0
2003	16	16	0

* One person remains undecided as to how to receive payment

** Two winning tickets were held by multiple people, some of whom took the cash payment and some of whom took the annuity.