

State Lotteries at the Turn of the Century:
Report to the National Gambling Impact Study Commission¹

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This report provides an overview of lottery operations, with particular attention to who plays the lottery, how the lotteries are marketed, and what kinds of policy alternatives exist for state and federal policymakers. Section I of the report provides a descriptive overview of state lotteries, a statistical profile, and a description of the distribution and size of their revenues. Section II discusses the findings from the national survey of gambling conducted by NORC for the Commission. Section III presents a preliminary analysis of data available to marketers as well as an initial assessment of marketing plans. The final section of the report discusses the prominent policy issues involved in the legalization and operation of state lotteries.

I. Overview and Description

Until 1964, lotteries were illegal in every state in this country. Today they are operated in 37 states and the District of Columbia. They are also a worldwide phenomenon: there are 100 countries where lotteries are legal.

History

Although we mark the beginning of the “modern” lotteries in 1964, when New Hampshire launched its game, lotteries actually enjoy an honored place in American history as a device for raising funds for public purposes. They provided funding for such projects as the Jamestown settlement, Harvard College, and the Continental Army, as well as public works projects throughout the Colonies and early States. Lotteries fell into disrepute after the Civil War, and, following the demise of the scandal-plagued Louisiana Lottery in 1894, they ceased to exist for the next seven decades.

Since 1964 their numbers have grown rapidly, along with their popularity. While only

one other state joined the ranks of lottery states during the 1960s (New York), 12 states adopted lotteries during the 1970s, and another 18 states did so during the 1980s. That only six states adopted lotteries in the 1990s is testament less to waning enthusiasm than to the dwindling number of non-lottery states. As of February 1999, 37 states plus the District of Columbia operated lotteries.³

Growth in Sales

As a way of showing how lotteries have grown and evolved over time, Table 1 presents summary sales data for three representative years: 1973, 1987, and 1997. While the number of lottery states increased from seven to 38 over this period, total state-lottery sales increased from \$2.0 billion in 1973, to \$17.6 billion in 1987, to \$34 billion (not counting video lottery game sales) in 1997. This rapid growth is attributable not only to the expansion of lotteries into new states, but also to the increase in per capita sales, from \$35 per capita in 1973 to \$150 in 1997. Not counting the VLT's, whose sales figures are not comparable to the other lottery games,⁴ the growth in per capita lottery sales slowed considerably from the first period shown in the table to the second. Whereas per capita sales grew at an annual rate of 9.2 percent between 1973 and 1987, they grew at only 1.6 percent a year from 1987 to 1997.⁵

The Lottery Products

The “product line” of state lotteries deserves some description, in part because it has continued to evolve over time. The lotteries of today consist of five principal games: instant games, daily numbers games, lotto, keno, and games utilizing video lottery terminals, although none of these were in evidence when New Hampshire inaugurated the modern lottery era. Thus it is helpful to begin with that earliest game, passive drawings.

Passive drawings. The lottery game introduced by New Hampshire in 1964 was not unlike the lotteries of Colonial times. It was a sweepstakes, essentially a raffle in which bettors bought tickets and waited days or weeks to see if their ticket was drawn. Today this old-fashioned game is virtually extinct, having been replaced by games with quicker payoff, bigger prizes, and greater intrinsic “play value.”

Scratch-off instant games. The lotteries’ first major innovation, introduced in the early 1970s, was the instant game, which utilized a paper ticket with spaces that could be scratched, revealing beneath the covering numbers or words indicating whether the ticket was a winning

one. This game offered the attraction of immediate gratification and, in most cases, an immediate cash payoff from the authorized sales representative. Made possible by cheat-proof materials and elaborate security measures, these games offered lotteries the opportunity to make regular changes to the product line by varying the themes and game details. They also provide new lottery agencies with an easy way to begin operations before they have installed a network of computerized terminals, which are needed for the more advanced lottery products. One feature that may become increasingly important is that instant tickets can easily be sold in vending machines, thus freeing the retail outlet from using its staff to sell tickets. Such machines open up the possibility that minors might have easy access to lottery tickets, which means they must be placed in stores where they can be observed by employees or used in bars and lounges, where minors will presumably not congregate.

Daily numbers games. The second innovation was a daily numbers game, a computerized imitation of the illegal game that has long been popular in many urban areas. Designed to appeal largely to this pre-existing market, this game, like its illegal counterpart, allows players to choose their own three- or four-digit numbers, thus giving bettors the sense that they are “players,” actively involved in the gambling process. Further enhancing this “play value,” and also emphasizing its urban and illegal pedigree, is the variety of types of bets that the bettor can choose to make, each with a different probability and payout. The game makes it easy for bettors to choose and stick with a favorite number and a certain type of bet on that number.

Lotto. Without a doubt, the “signature” lottery product is lotto, another game that requires computers and communication networks. Again allowing bettors to choose their own numbers, this game asks them to pick a handful of numbers from a much larger set. For example, bettors might pick six numbers from a field of 44. Drawings of winning numbers typically take place twice a week. Unlike the 1,000 to 1 chance of correctly picking a three-digit numbers drawing, the odds of correctly picking the combination of numbers drawn in a lotto game can be astronomical. In the 6/44 format noted above, for example, the probability of picking all six numbers correctly is 1 in 7.1 million. Although part of the proceeds in lotto games are paid to those who pick almost all of the numbers correctly, the jackpots reserved for the winning combinations have garnered most of the attention in this game, especially when several consecutive drawings occur with no winner and the prize fund is “rolled over.” Since sales typically rise when jackpots are large, designers of lotto games attempt to choose formats that produce occasional rollovers, which means tailoring the format (and probability of having a winner) to the size of the betting population. Choosing a probability that is too low results in having too many consecutive drawings without a winner, which causes players to become

discouraged. Choosing a probability that is too high results in very few rollovers, and multiple winners, thus diluting the size of grand prizes. In the design of lotto games, there is an inherent advantage in drawing from a large population, which makes it possible for the game designer to choose small-probability formats, thus producing large jackpots. To offset the disadvantage of small size, some states have banded together in several multi-state consortia to run lotto games. The largest of these is the Multi-State Lottery Association, which runs the Powerball lotto game, a game that produced in 1998 jackpots of \$195 and \$295 million.⁶ Jackpots such as these are usually stated as the undiscounted sum of 20 or more annual payments from an annuity purchased at the time of the drawing, a number much larger than the cash value of the prize.⁷

Keno. Similar to lotto, keno is a game long associated with casinos that requires bettors to choose a few numbers – how many is up to the player – out of a larger group of numbers, with drawings held quite often, often several times an hour. The payoff to a winning bet is a function of how many numbers the bettor chose, which corresponds to the probability of winning in each case. Like video lottery games, described below, keno seems best suited for bars and lounges, where bettors make multiple bets over the course of a single session. Keno was the center of controversy in California in 1996, when the state's supreme court ruled that state's keno game unconstitutional, arguing that the game's fixed payouts violated the state's prohibition against "banked" games, wherein the gambling operator ("the house") stands to lose if bettors are very lucky. In response to the decision, the game was quickly altered, putting its payouts on a parimutuel basis.⁸

Video lottery games. The fifth distinct type of game now being operated by state lottery agencies is, like keno, akin to betting that takes place in casinos. Like arcade video machines, video lottery terminals (VLTs) can be programmed to carry a wide variety of games; video poker is a common game used in VLT's. Like conventional slot machines, they offer bettors the chance to play a game and receive immediate payouts for winning bets. These games have grown dramatically in a few states, but have not been adopted in others, in part due to concerns that this type of action may entice some to play more than they can afford.

Change in Product Mix

Table 1 demonstrates how the "product mix" has changed over time. In 1973, when instant scratch-off tickets were just being introduced, passive drawings accounted for 99 percent of lottery sales. By 1987, however, they had virtually disappeared, having been replaced by three games: the instant scratch-off, daily numbers, and lotto, having market shares of 24, 37, and 40

percent, respectively. The product mix continued to evolve, with the addition of keno and video lottery games. In the decade between 1987 and 1997, daily numbers games grew hardly at all, lotto showed solid growth, and instant games grew at a fever pace. By 1997, instant scratch-off games accounted for 42 percent of sales, almost twice the share they held in 1987. Lotto was second, taking 30 percent of total non-VLT sales. Keno, which was available in 12 states, weighed in with a 5 percent market share. VLT's, available in only five states, sold a remarkable \$2.3 billion, or about \$313 per capita in those states. Table 2 shows sales by game by state. While every state offers instant scratch-off games and lotto and most offer daily numbers games, keno and VLT's, as noted above, are offered in only a few states.

A Summary of Operations: 1997

Table 3 provides summary information on the 38 American state lotteries in operation during fiscal year 1997. The table excludes data for VLT's, which, as noted above, are qualitatively different from other lottery games. States are listed alphabetically, and data are provided on the distribution of revenues, the implicit state tax rate, and per capita sales. As indicated on the "Total" line, out of the average dollar wagered on all lottery games in 1997, roughly 55 cents was returned to players in the form of prizes and another 12 cents went to pay operating costs (including commissions to retail ticket outlets), leaving an average of 33 cents as net revenue for state treasuries. The percentage returned in prizes -- the payout rate -- ranged from about 50 percent in several states to a high of 70 percent in Massachusetts. Operating expenses tended to take the highest percentage of revenues in the smallest states -- 27 percent in Montana, 25 percent in New Mexico, and 24 percent in South Dakota -- and accounted for the smallest shares in the largest states.

Column I displays an interestingly high variation between states in sales per capita. For example, Massachusetts outsells neighboring Vermont by a factor of four, despite the fact that they both have well-established lotteries offering very similar products. Interstate differences such as these suggest that tastes for lottery gambling may differ widely across population groups. Such differences may also arise from the variations in payout rates noted above. Just as a reduction in price stimulates the demand for most commodities, a rise in the payout rate stimulates lottery purchases.

Columns E-G show how each state distributes its lottery revenues. As noted above, an average of 55 cents per dollar was returned to players in the form of prizes. This "payout rate" is much lower than that offered by other forms of commercial gambling such as bingo, horse

racing, or slot machines.⁹ It is important to note, however, that payout rates are not strictly comparable from one game to the next. Games such as these three forms of commercial gambling typically involve a sequence of multiple bets in a given betting “session.” When dollars are cycled through several times a day, the expected prize per dollar will be less than the payout for a single bet.¹⁰ Among all the lottery products, VLT’s appear to be qualitatively different from the rest. This type of game typically involves multiple bets, wherein winnings are “recycled” several times per session. For this reason, the higher payout rates recorded for VLT sales appear not to be strictly comparable to the payout rates for the other games sold by lotteries.¹¹

Lotteries as a Revenue Source

A principal justification, if not the only one, given for the adoption of state lotteries is revenue. The revenue arises from the “profit” that a state makes, the amount left over after prizes are awarded and retailer commissions and other operating expenses are paid. For all practical purposes, this profit amounts to an “implicit tax,” and is comparable to an excise tax levied at a certain rate on the purchases of a particular product. So, while a lottery is not a tax, one important component of it is indeed comparable to a tax. In the same way analysts would be interested in conventional taxes, it is useful here to note three aspects of this implicit tax: the earmarking of it for specific purposes, its importance to state revenues, and its rate.

Earmarking. Just as gasoline taxes are often reserved for use in highway construction, the revenues from many state lotteries are earmarked for certain purposes. Of the 38 state lotteries (as above, the D.C. lottery is treated as a state lottery), the revenue from only 10 go into their general funds. Of the remaining states, 16 earmark all or part of their lottery revenues for education, making that the most common use of lottery funds. Other uses range from the broad (parks and recreation, tax relief, and economic development) to the narrow (Mariners Stadium in Washington and police and fireman pensions in Indiana).¹² While earmarking might be an excellent device for engendering political support for a lottery, there is reason to doubt if earmarked lottery revenues in fact have the effect of increasing funds available for the specified purpose. When expenditures on the earmarked purpose far exceed the revenues available from the lottery, as is the case with the general education budget, there is no practical way of preventing a legislature from allocating general revenues away from earmarked uses, thus blunting the purpose of the earmarking.¹³ Empirical studies of this question are in fact consistent with this kind of reallocation.¹⁴

Amount. The lotteries' contributions to state budgets are modest, as shown in Table 4. In 1997, total revenues from the 38 state lotteries amounted to only about 2.2 percent of the own-source general revenue for those same states. By contrast, state general-sales taxes and income taxes each averaged one quarter of all own-source general revenue collected by states.¹⁵ However, the amount raised per capita differed greatly by state, as indicated in Column (J) in Table 3. Averaging \$49 per capita in 1997, this per capita figure ranged from \$7 in Montana to \$120 in the District of Columbia.

Implicit tax rate. It is highly instructive to compare the lottery's implicit rate of tax to excise taxes that might be thought of as comparable. It turns out that the implicit tax rates on lotteries are quite high compared to tax rates on other commodities that states tax, such as alcoholic beverages and tobacco products. Calculations we made for 1985 allowed one to compare the implicit tax rate on lotteries to the excise tax rates on several commonly-taxed products, all expressed as ad valorem taxes as a percentage of the net-of-tax price. The average excise tax rates on four products, counting federal, state and local taxes, were: beer, 15 percent; wine, 17 percent; liquor, 43 percent; tobacco products, 49 percent. By contrast, the comparable implicit tax rate on lotteries was 85 percent.¹⁶ Since that time, these rates have tended to converge. The percentage of lottery sales going to state net revenues has declined since 1985, from about 41 to 33 percent, making the implicit tax rate on lotteries in 1997 something like 61 percent.¹⁷ Over the same period, excise tax rates on alcohol and tobacco products have increased.

Lotteries as an Activity of State Government

A state lottery is an enterprise operated (as a monopoly) by the state, producing a service and selling it directly to citizens. As such, lotteries are noteworthy on at least two counts. First is the sheer size of the operation. The second is the marketing in which it engages.

Size. In terms of dollars spent on them, they have become one of the largest operations run by state governments. In 1997 individual citizens spent some \$36 billion on them. As an activity undertaken by state government, this amount was exceeded only by education, public welfare, highways, and health, and it was greater than the total that all states – including states without lotteries – spent on corrections, or on parks and natural resources (U.S. Bureau of the Census, 1998, Table 514, p. 317).

Marketing. In lotteries as in no other state function (with the possible exception of

tourism), the states have adopted the tools of commercial marketing, including product design, promotions, and advertising. In 1997 state lotteries spent a total of \$400 million to advertise their products, which amounted to about 0.9 percent of total sales in that year.¹⁸ This does not count the free exposure provided by newspaper coverage of winners and winning numbers. Harder to measure but potentially more important is product design. With the assistance of vendors who sell lottery products to states, the state lottery agencies worry about modifying existing products and developing new products that will reinvigorate sagging sales without “cannibalizing” existing products.¹⁹ Using conventional techniques of modern marketing, the managers of state lotteries appear to be motivated by a desire to maximize the revenues they turn over to their states.

But concerns have been raised when some of those conventional approaches are evaluated alongside other aims of state government. For example, some lottery advertising has been criticized as being insufficiently forthcoming about important aspects of the games. In particular, the probability of winning various prizes in a game -- information that must be provided in commercial sweepstakes games regulated by the Federal Trade Commission is often not provided by state lotteries, and certainly not publicized as much as the size of prize jackpots (see Section III). Another source of concern relates to the themes used in advertising, particularly ones that exalt luck over hard work as an avenue to financial success, as in New York’s “All you need is a dollar and a dream” ad campaign. In response to concerns such as these, several states placed restrictions on what kind of advertising its lottery agency could do. In particular, Virginia, Minnesota, and Wisconsin ban ads designed to induce people to play. A few other states require odds of winning to be displayed or ads to be accurate and not misleading.²⁰

Legal Status and Form of State Lottery Agencies

In establishing their lottery agencies, the states and the District of Columbia have differed in the degree to which the lottery agency is differentiated administratively from the rest of state government. While some states placed their lotteries within the existing administrative structure, a majority of states established a separate agency, many bound by different rules from the rest of state government. Table 5 summarizes information gathered from the lottery agencies about the administrative status of state lottery agencies in 1998. Fourteen of the 38 agencies are part of a department of state government, most often the state’s revenue department. In all but one of those cases, the lottery is subject to state regulations covering the employment and compensation of state employees and procurement. In the remaining 24 jurisdictions, separate agencies have been established. In a few of these cases, the lottery agency is an independent, quasi-public

entity, not bound by the states' civil service requirements or their rules for procurement. Such independence, it is argued, allows the lottery to operate more "like a business," including the ability to pay its top managers salaries that would exceed those permissible to otherwise similar state workers. The amount of oversight and control the state legislature has over each lottery no doubt differs for a variety of reasons not reflected in the table. A fuller understanding of those differences would require a careful analysis of the governing structure of each agency, which is beyond the scope of the present report.

II. Results for Lottery Play from the 1998 National Survey on Gambling

Much of the public concern about lotteries is the result of the belief that lottery spending places a real burden on household budgets of poor and minority households. A recent survey, the first of its kind since 1975, provides relevant data on this and other issues.

Survey Design

The survey was conducted by the National Opinion Research Corporation (NORC). The details on survey design are included in a report from that organization.²¹ We use the combined survey, which included a random-digit-dial (RDD) sample and a patron sample. The RDD survey was conducted during the Summer and Fall months of 1998, and included 4,358 households. NORC interviewers successfully screened 3,281 of these households to establish the number of adults residing there (age 18 or over) and select one at random. Interviews were completed with 2,425 adults, of which 2,406 were included in the survey data examined here. A second survey of patrons of gambling establishments was conducted between November and January, and included over 500 respondents; we were able to use data from 461 of them. Sample weights were calculated for each respondent based on age group, sex, ethnic/racial group, and state, so that the final sample composition, when weighted, would match the composition of the US adult population in these dimensions.²² On average, each respondent represented about 70,000 adults.

The survey questionnaire included items about all types of gambling. In what follows we report some of the results from the module that was addressed to lottery play. It should be noted that the lottery module was limited to three types of games: instant scratch-off, numbers (pick-3 or pick-4) and lotto (including the multi-state version). The casino-type games offered by some lotteries, including video poker and keno, were consigned to another part of the survey.

Estimation

Respondents were asked whether and how often they had played the lottery in the previous year. Those who had played were asked whether they had purchased a ticket in the previous 7 days, or, if not, the previous 30 days. The answer to this question establishes a reference period. (For those who had played in the last year but not the last 30 days, the reference was to the “last day that you bought one or more lottery tickets.”) They were then asked what types of lottery games they had played during that reference period, and how much they had spent on each type of game when they played that game during the reference period.²³ They were not asked for their total expenditure on lottery tickets during the reference period (or for the year), and there is some ambiguity: If they played several times during the reference period, and they say they played more than one game, we don’t know whether they played all games every time, or rather played different games on different occasions. In order to develop estimates of expenditure patterns, then, we had to make some assumptions that would allow us to project from respondent answers to an estimate of their total expenditure for the year.

First we estimated the frequency of play during the previous year by imputing numerical frequencies to the qualitative response categories that were used in the relevant survey question. We used numerical frequencies of 300 (“about every day”), 100 (“1 to 3 times per week”), 18 (once or twice a month”), 8 (“a few days all year”), or 1 (“only one day in the past year”).

Then we estimated the amount respondents played on average each day they played during the past year. Here are our assumptions:

*If they played only one type of game during the reference period, we used their per-occasion expenditure on that game during the reference period as our estimate of average play for the year;

*If they played both instant and numbers during the reference period, we assumed that they played both on every occasion, and used the total of the two as our estimate of average play for the year;

*If they played more than one type of game during the reference period, including the multi-state game and/or lotto, we assumed that the respondent played lotto and/or multi-state games no more than once each week.²⁴ We used numerical frequencies of 52

(“about every day” or “1 to 3 times per week”), 12 (“once or twice a month”), or 1 (a few days all year” or “only one day in the past year.”). But in these cases we used the same assumption as before about how often they played instant and/or numbers.

These procedures allow us to estimate the amount spent in the previous year by each respondent. We estimated total national expenditures for the year by calculating a weighted sum of these individual estimates, using the population weights provided by NORC. Under certain assumptions our estimate of total expenditure is unbiased. These assumptions include:

- *The sample, adjusted by the given weights, is representative of the U.S. adult population;
- *The months in which the survey was conducted were representative of the year;
- *The procedures used to estimate individual expenditures (outlined above) are accurate on the average.

Table 6 provides the results of this exercise, together with the official sales statistics for fiscal year 1998. Our survey-based estimates of national expenditures total \$27 billion, 86 percent of recorded sales (\$32 billion). The underestimate stems from instant-game expenditures, where our survey-based estimate is only 51% of sales. We suspect that players buy instant-game tickets on a more haphazard basis than they do numbers or lotto, which makes accurate recall difficult. The numbers estimate actually overstates sales.²⁵

In what follows, we adjust the survey-based estimates of individual play by the “adjustment ratios” presented in Table 6, using a different ratio for each of the three types of games. If based on her responses we would estimate that a respondent spent \$100 on instant games and \$150 on lotto during the year, our adjusted estimate is $\$100(1.96) + \$150(.98)$, or \$343. Respondents who say they did not play the lottery are taken at their word. This procedure will provide a valid representation of lottery play if reported play is proportional to actual play for each type of game. For example, in comparing average per capita play by racial group, our results are valid if white respondents, black respondents, and other respondents each report, on the average, 129 percent of their numbers play, 51 percent of their instant-game purchases, and 102 percent of their lotto purchases.

Lottery vs. Non-lottery States

As a start, we compute the difference in participation rates and average play between residents of lottery states and residents of states that do not have a lottery. Currently about 87 percent of the adult population resides in one of the 38 lottery states (including Washington DC). Residents of non-lottery states have various opportunities to purchase lottery tickets, either when they travel or on the gray market in their own state, so it is not surprising that they are not entirely out of the lottery picture. Table 7 presents estimates of total spending by residents of lottery states and non-lottery states by game. Table 8 reports the participation rates and per capita play using the adjusted figures. As shown, annual lottery participation for lottery-state residents (55 percent) is twice that of residents from states without lotteries (27 percent). Per capita play in lottery states is three times as great as for non-lottery states.

Demographic and Socioeconomic Patterns

Lottery play is common -- about half the adult population play the lottery in any one year -- but the degree of involvement is highly heterogeneous. Among those who played in the last year, we find that the top 5 percent of players (who played \$3,870 or more) accounted for 54 percent of total sales, the top 10 percent (who played \$2,593 or more) accounted for 68 percent of total sales, and the top 20 percent (who played \$1,619 or more) accounted for fully 82 percent. The median player, who might be considered "typical," is in fact of little interest from the revenue perspective. To illustrate that point, consider what would happen if *all* players spent the same as this "typical" median player, \$75 a year. The answer is that sales would fall by 76 percent to \$7.7 billion. Clearly it is the relatively small group of atypically heavy players who cause average sales to be as large as they are.

Lottery play differs systematically among groups. To explore demographic patterns of play, we calculate the participation rates and adjusted average play by gender, race, marital status and age. These results are presented in Table 9 and also Figures 1-4. Overall we estimate that 51.5 percent of the adult public played in the previous year, and that their average expenditure was \$313. Multiplying these two statistics together provides the per capita play of \$162. In is interesting to note in reviewing the statistics in this table (and the subsequent table on socioeconomic characteristics) that the differences among groups are much greater with respect to amount played than with respect to participation rate. Indeed, with a few exceptions there is remarkable uniformity in participation.

Reviewing the demographic categories, we see first that men are a bit more likely to play,

and play somewhat more on the average, than women. For the race/ethnicity category, participation rates are nearly identical across groups. However, average spending by blacks who play is much larger than for other categories, and hence per capita spending by blacks is higher than for other categories. Across marital categories, singles spend less than married or divorced people. With respect to age, we find that participation is lowest for those over 64, and spending/player tends to increase with age; per capita spending is highest for those of middle age, 45-64.

Table 10 provides the same information by education and income (see also Figures 5 and 6). Participation rates do not differ much by education, but spending by players drops sharply as we move up through the education categories. The result is that the education category with the highest per capita spending is those who did not complete high school, and the college graduates have the lowest. With respect to household income, we see that participation rates increase up to \$100,000. But players with incomes less than \$50,000 spend more than others, and the lower-income categories have the highest per capita spending.

To develop a clearer idea of how household income relates to lottery play, we need to adjust for the fact that many households have more than one adult in them, and that higher-income households tend to have more adults per household. Table 11 reports the average number of adults per household and the implied result for per-household lottery play, by income category. (Each entry in the last column of Table 11 is equal to the per-capita play for adults in that income category multiplied by the number of adults per household in that income category.) The basic qualitative result is as before: Income has little relationship to lottery play overall up to \$50,000, and drops off sharply at higher incomes. Hence lottery expenditures represent a much larger burden on the household budget for those with low incomes than for those with high incomes.

Finally, Table 12 offers some data on the demographic characteristics of those who are the heaviest lottery players. Given the results reported above, it is not surprising that males, blacks, high-school dropouts, and people in the lowest-income category are heavily over-represented among those who are in the top 20 percent of lottery players.

Perception of Winnings and of Payout Rate

The popularity of the lottery does not appear to be the result of a mistaken belief that it offers a good bet. The survey asks respondents "How much of the ticket price of your favorite

game do you think is returned...in the form of prize money?" By way of comparison, the true average payout rate is 55 percent for lottery games in the U.S. Yet 63 percent of the respondents who had played the lottery in the last month thought that the correct answer was "25 cents or less." Only 7.5 percent of players had an exaggerated notion of the lottery's generosity.

Players also seemed to have a realistic notion of how they were doing. All told, 86 percent of those who had played in the last year, and 82 percent of those who had played in the last week, said that they had lost more than they won during the previous year. Only about 8 percent said that they were ahead, and the rest thought they had broken even.

Section III. Marketing Lottery Products

Effective marketing of any product or service requires a sound marketing strategy based on specific goals and objectives. The marketing of state lotteries is no exception. Each state lottery agency must make a series of marketing decisions concerning product offerings, price, promotion, and distribution. While the states engage in all aspects of marketing for lottery products, this section of the report focuses on how states define their target customers for lottery products and the particular communications choices--both media and advertising themes--used to reach and attract those customers.

Twenty-five lottery commissions provided marketing plans for our review. These plans were coded to examine the nature of the customer analysis and resulting segmentation and target market definition, the advertising themes used, and the basis for media selection.

Customer Analysis, Segmentation, and Targeting

A key marketing activity in any product category is identifying and understanding the motivations of those consumers who are likely to purchase the product. Customer analysis usually involves identifying and grouping those customers on a number of dimensions. Demographic characteristics, lifestyle or psychographic characteristics, and usage or volume characteristics (e.g., for lotteries, the frequency of play or the amount wagered) are three of the most common ways to define segments, and are reflected in the 1998 National Survey on Gambling discussed in Section II. Data are also available from various media sources (e.g., Mediamark Research, Inc.) that produce demographic, lifestyle, and product-category-usage information for the audiences of various media so that marketers can choose the media that best

reaches their target audience. For instance, Mediamark's Spring 1997 survey reports that heavy purchasers of lottery tickets (i.e., those who purchased more than five tickets in the last 30 days) account for 82 percent of the lottery ticket volume, are much more likely than the general population to listen to Golden Oldies and watch TV Police docu-dramas and are much less likely to listen to NPR or watch Black Entertainment TV.

Thirteen of the 25 marketing plans (52%) did not report any customer analysis. Four of the plans (16%) described their target customers only in terms of age, often using broad age categories such as 24-65 years. Four (16%) of the plans described their target audience on a more complete range of demographics and three (12%) of the plans have separate demographic descriptions for the customers of each of the lottery products (instant games, lotto, etc). Four plans (16%) had psychographic profiles for their lottery products; three had specific profiles for each lottery product. Thus, it appears that some lottery agencies are more systematic than others in doing market research. The more sophisticated the description of the target customer, the more targeted the communications message and media choice can be.

Advertising Themes

Once target customers are identified, communications messages can be designed to appeal to those customers. The better defined the profile of a potential consumer, the easier it is to design a communication that will get the consumer's attention, get customers to process the communication, and act on the message. For lottery products the agency's aim may be to motivate non-players to play, to encourage players to play more often or to play more types of games, or to encourage lapsed players to start playing again. Communications may be designed to influence public opinion about lotteries generally, rather than to encourage consumers to participate in any particular game.

There are many ways to communicate these basic messages to potential and current lottery customers. Twenty-two of the 25 marketing plans mentioned advertising themes specifically. The themes reflected in the marketing plans are listed in Table 13 from the most commonly used themes to the least common. The three most common themes were 1) size-of-the-prize or jackpot, 2) the fun and excitement of playing, and 3) winner awareness. The aggressiveness and styles of communicating with potential lottery customers varied tremendously across states. For example, Indiana has the following advertising creative code of conduct:

Commercials will treat the talent, players and customers with class and dignity. No children will be used in advertising nor will advertising be directed toward them. The Lottery will not be promoted as an alternative to work and terms like checking account,

savings account and references to financial institutions will be avoided. Ads will be careful not to sell the dream of a “way out” of their current financial situation or flash big signs of extreme wealth. Odds of winning will be clearly stated in advertising where appropriate.

This was the only example of an explicit statement that could be used to guide the advertising creative process. Other states, as noted earlier, do place some restrictions on advertising content (Virginia, Minnesota, and Wisconsin) ban ads that are designed to induce people to play.

Size of the prize. Fifty-six percent of the plans use a size-of-the-prize message in at least one of their campaigns. There is a great deal of variety in how the message is delivered. Some ads focus almost exclusively on the jackpot. A print campaign from Colorado, for example, used 80 percent of the space in a print ad to show "\$10,000,000," 10 percent of the space for the lottery logo, 5 percent of the space for the tag line, "What WILL You Do with It All?" and 1.25 percent of the space to present the odds of winning (1:5,245,786). Another campaign, from Arizona, used 60 percent of the ad space to show a bank deposit slip with a deposit of \$175,000,000 on it. The text of that ad, which accounted for 10 percent of the space, went on to elaborate that "you could bank on receiving \$7 million every year for the next 25 years... that's \$583,333 every month... or a \$134,615 paycheck every week!" The fine print (34 characters per inch) indicated, "Overall odds of winning a cash prize are 1 in 35," but did not specify the odds of winning \$175,000,000. Clearly, the allocation of space in these ads indicates that the goal is to focus the attention of the reader on the prize and away from the odds.

Not all campaigns that focus on the jackpot do so to the exclusion of other information. A print campaign from Virginia devoted 75 percent of the space to the title of the game, 9 percent to the jackpot amount, and 6 percent to the odds of winning the jackpot and the overall odds. Another, from Indiana, used only 5 percent of the space to focus on the prize, "Win Up To \$ 1 MILLION Every Day!" and used a chart in the body of the ad to show the odds of winning from \$2 (1:11), \$5 (1:99), \$100 (1:1911), \$5,000 (1:81,237) to \$1 million (1:9,261,000).

In radio and television ads it is more difficult to assess the relative allocation of "space" devoted to the size-of-the-prize. Many TV and radio campaigns repeat the size of the games big prize numerous times in a thirty-second spot. For example when Arizona introduced a new bingo game, the focus was on the grand prize of \$10,000 even though the odds (1:5) stated in the audio portion of the ad were for winning any prize, not the grand prize. This focus on the grand prize was amplified by supporting statements such as, "Chances are good that you can be \$10,000 richer" and "two dollars gives you three chances per ticket to be \$10,000 richer." Other examples

abound, including these two from Colorado: “\$7 million, collect your share” and “win \$20,000 in a heartbeat.”

As with print ads, there are examples of TV and radio campaigns that focus on the jackpot. For instance, Wisconsin had a campaign that had nine different executions. Each advertising execution included only one line focused on the top prize, e.g., “Introducing a new one dollar instant scratch game, where you can win \$ 2,000 instantly.” In all nine of the campaign’s advertising executions, the odds of winning both the top prize and various other prizes were shown in the video portion of the ad for about five seconds (in a thirty-second spot).

Fun and Excitement. Tied with a size-of-the-prize or jackpot for most commonly used theme, is the fun and excitement of playing the lottery. Ads with this theme are much more likely to be TV ads than print ads. Frequently, the fun and excitement of playing was tied to the fun and excitement of winning. For example, a Kentucky ad showed a couple in an exclusive restaurant with the accompanying audio: “There’s a place where the steaks are big enough to get their own zip code and the lobsters are the size of small appliances, the meals are four-course and the service is five-star. Which credit card do they accept? Who cares? You’ve got cash. The big cash you won playing Easy Street, the new three-dollar instant game from the lottery where you can win \$10,000 per month for a year. Play Easy Street. Somebody’s going to win – it might as well be you.” No odds were stated or shown. An ad campaign in Colorado showed what it was like to win using a series of ten-second spots. The spots had no audio, and did not state the odds. The spots consisted of a series of images such as a collection of vintage Rolls Royces, a mansion with a Lamborghini in front, a huge boat sailing in the Caribbean, a person getting his golf clubs from the trunk of a Porsche and putting them in a Lear jet. The tag line was simple: “Another reason to play Lotto.” An Oregon campaign emphasized the fun of playing instead of the fun of winning: “that feeling you have when you know something good just might happen,” and assured players that the lottery “can do that.”

Winner Awareness. Nearly half of the states with a marketing plan had an advertising campaign that was focused on making potential buyers aware of former winners. These campaigns took a variety of forms, some focusing on real winners, while others emphasized that anyone could be a winner. The winner awareness campaign in Texas focused on real winners of the Texas Lotto. Each of the winners told the story of how they came to be a millionaire: a man who lost his ticket and was a millionaire for 147 days before he knew it; the \$7.4 million dollar winner who uses a lucky penny system to pick his numbers; the man who bought his Lotto ticket four minutes before the drawing and thirty minutes later was the winner of \$23.6 million; and the

4.8 million dollar winner who only bought one ticket in his entire life. Each of these winners' stories was upbeat and the audience could feel the excitement of playing the lottery.

The winner awareness campaign of the Virginia lottery had a different feel entirely. This campaign used a "detective" to tell of the events leading up to the purchase of the ticket and winning of the lottery. The scenes were often dark and the story was presented in a way that emphasized the mysteriousness of the happenings. For example, the detective said, "On Friday, September 4, 1994, the freezer belonging to Gloria and Steve Kanoy of Weere's Cove, suddenly and mysteriously broke down. Distraught, the couple set off the next day in search of a new one. Stopping for gas at Lake Raceway, 607 Main Avenue, they spontaneously decided to buy a Lotto ticket. That night they won half of the eight million-dollar jackpot. This has been a true story from the files of the Virginia Lottery." Others in the series told of a man playing the date of his house fire for two years before winning the lottery, and of another who played the numbers from a fortune cookie.

Other states emphasize how anyone can win and the huge number of people that win, rather than focusing on the stories of winners of large sums of money. Arizona ran a series of radio ads stating, "Every single second, the lottery makes someone very happy. Every single second, someone is cashing a winning ticket." Another state showed the names and cities of lottery winners on the screen of the television ad, while the voice over stated, "The list of instant game winners is growing at the average rate of two per second." By the time the thirty-second ad was complete, the screen was so covered with names that nothing could be read, reinforcing the idea that there are many, many winners.

Media Choices

Most of the marketing plans that we reviewed contained detailed descriptions of the media schedule. However, in all of the plans except five (20%), the media choices appeared to be driven by the schedule of the products and costs rather than reaching particular consumers. Most of the states used a mix of television, radio, billboards, and point-of-sale communications. In five of the marketing plans there were indications that media vehicles (particular programs, newspaper sections, dayparts, etc.) were being chosen to efficiently reach the target consumer. Examples from these plans are, "Media was (sic) strategically chosen to reach the target," "We are using cable networks to reach specific targets and have specified dayparts for ads to air," "Both media and messages are tailored to fit target player attitudes," and "We selected programs for ad placements based upon the target definitions."

IV. Public Policy Issues Regarding State Lotteries

The importance of lotteries goes far beyond their contribution to the treasury. While lotteries typically raise less than 3 percent of state revenues, selling lottery tickets is one of the most visible and readily identified activity of state government. The lottery is in a sense the state governments' biggest business venture, and a rather problematic one given widespread ethical and pragmatic concerns about gambling. These concerns are compounded by the fact that state lottery agencies adopt marketing practices that are intended to persuade people to spend more on this form of gambling than they otherwise would. While most state lotteries are operated to make as much money as possible for the state, there is in fact more than one way to run a lottery.

Lotteries as a New Kind of Government Agency

Owing to its structure and management orientation, the typical state lottery authority has evolved into a new breed of government agency. Virtually all state lotteries conform to a single basic model: a state-run monopoly paying out only about half of its revenues in prize money and marketing its products aggressively to stimulate demand. Most of these agencies are set up as separate bureaus under a weak state commission, free of the close scrutiny and some of the hiring restrictions of other government agencies. This autonomy allows the typical lottery agency to behave in most respects as a private business, responding to the constant pressure to bring in more and more revenue for the state.

Whether or not they say so explicitly, the clear objective implicit in the structure and behavior of lottery agencies is to maximize net revenue.²⁶ Two features of lotteries are particularly important in pursuing this end: a high profit rate and aggressive marketing.

High profit rate. As a business, a lottery has the great advantage of being a legal monopoly. Every state that has established a lottery has granted itself the sole right to engage in this business within its borders. And while the lotteries do face increasing competition from other forms of commercial gambling and from other state lotteries (given the possibility of buying out-of-state), this monopoly position has made possible an impressive profit margin. As noted above, for every dollar spent on tickets, lottery agencies pay out about 55 cents in prizes, a percentage that differs little from one state to another but is substantially less than the payout rate for other forms of commercial gambling. Of the remainder, 12 cents go to pay commissions to

retailers and operating expenses, leaving a profit of 33 cents for the state's treasury. Viewed as an implicit tax, this transfer to the treasury is comparable to a 61 percent excise tax.

Systematic marketing. The second feature shared by virtually all lotteries today is systematic marketing. Like private firms, lottery authorities want to increase the sales of their product. To do so, they have adopted many of the methods of modern marketing. First, this means lotteries are constantly searching for ways to modify their existing games or for altogether new lottery products that will appeal to players. Much of the growth in lottery sales has been fueled by the development and introduction of new products, as noted in section I. In the last decade a number of states have added two new types of games, keno and video lottery machines, to their product line. There is reason to believe, however, that the fast action they provide will be especially tempting for problem gamblers.

Aggressive marketing also means ubiquitous advertising, which makes lotteries the most visible government program. While such marketing methods are common in the commercial marketplace, they may be problematic when utilized by government. In its promotion of the lottery, the government is encouraging the consumption of a specific product, one long viewed by many people as a vice and which for most of this century was provided only by criminal syndicates. Its primary if not sole public virtue is that it generates revenue.

Not only does the fact of lottery promotion raise troubling questions, so too do some of the techniques used in that promotion. First, lottery ads are often misleading. For example, advertised lotto jackpots usually refer to the sum of 20 or more annual payments rather than the annuity value of the jackpot, and no mention is made of taxes. In a recent highly publicized Big Money game the advertised jackpot of \$197 million had a lump sum equivalent (an optimal form of payment that the winner did in fact choose) of only \$70.2 million after taxes.²⁷ Only a few states require that the odds of winning be posted or advertised. Indeed, the federal government requires private sweepstakes operators to offer more information about prizes and probabilities than most state-run lotteries provide. In addition, the effect of lottery advertising is to create an impression that winning is easy, a message that we previously documented in a survey of lottery advertising.²⁸

Promoting lotteries does more than persuade the public that playing is a good investment. At one level, the sales job may be viewed as values education, teaching that gambling is a benign or even virtuous activity that offers a desirable escape from dreariness of work and the confines of limited means. Not only does lottery advertising endorse gambling per se, it may

also endorse the dream of easy wealth that motivates most gambling. Many ads are unabashedly materialistic, with winners basking in luxury and lives transformed. Yet this is not the materialism of hard work and perseverance but rather of genies and magic lamps, rooted in hopes, dreams and superstition. And every lottery manager knows that many of his or her best customers base their bets on personal superstitions, astrological tables, self-styled seers, and the venerable "dream books" that list numbers corresponding to names, dates, and dreams. Rather than emphasizing that all numbers have the same probability of being selected and that playing popular numbers will reduce a person's expected payoff in parimutuel games, lottery agencies have chosen to encourage players to choose (and stick with) personally significant numbers.

It is probably not an exaggeration to say that the message of lottery advertising is a subversive one -- that success lies in picking the right number. This perverse "education" initiative being promulgated by the lottery agencies may have the ironic effect of reducing government revenues over the long run, by reducing economic growth. Specifically, if the lottery promotion erodes the propensities to work, save, and self-invest in education and training, the consequence will eventually attenuate growth in productivity. In any case, betting on a miracle is not the formula for success we usually teach to our children. Indeed, one straightforward test of the acceptability of the message might be to imagine using lottery ads in the public school curriculum. Few school boards across the country would endorse teaching children lessons such as, "Play your hunch. You could win a bunch."

Policy Choices

Ignored in virtually all of the debate on this issue has been the fact that there really is more than one way to run a lottery. Which approach a state should choose depends on a rather obvious question, but one that has likewise been given little attention in public debate: What is the state's ultimate objective in having a lottery? In virtually all states, the operational answer to this question has been that the lottery should be run so as to maximize revenue. We refer to this high-tax, heavy-promotion model as the Revenue Lottery. But this is not the only model that a state could choose. There are at least two alternative answers worth serious consideration. One derives from a primary concern for the social costs of gambling and state promotion efforts, while the other sees lotteries as a more or less harmless form of recreation. Both of them are oriented to serving lottery players and the citizenry at large, rather than exploiting players for the sake of financing state government.

We call the first alternative model the Sumptuary Lottery. The objective here is to

accommodate the widespread interest in betting on long-shots without encouraging that interest. Obviously, the first thing to go under this plan would be the promotional advertising now used. Instead of pushing its product, the state would simply make it available to those who want to play, in effect selling lottery products in a plain brown wrapper. Information would be provided regarding the types of games available, the locations of retail outlets, the rules of play, and the odds of winning, but always in a dispassionate manner -- take it or leave it. While the Sumptuary Lottery would dispense with most of the Revenue Lottery's advertising, it would retain the high implicit tax rate as a brake on consumption. The Sumptuary approach would also require limits on the types of lottery games made available; games with a high intrinsic "play value," such as video lottery machines and sports cards, would be prohibited precisely because they would prove too enticing. Another feature of the Sumptuary Lottery would be limitations of the number and kinds of retail outlets, so that the public would not be subjected to the temptation created by omnipresent availability. Purchases by high school-aged youths would be prohibited, as they are now, and the prohibition would be rigorously enforced. In sum, the Sumptuary Lottery would be the gambling analog to the state liquor store.

A second alternative to lotteries as we know them is what we call the Consumer Lottery, designed simply to serve the interests of players as the players themselves define them. In contrast to the Sumptuary Lottery, this approach would begin with the premise that for most people lottery play is no more harmful than, say, eating cookies or drinking a beer at dinner. From this point of view, the most serious offense of the current Revenue Lottery is its extraordinarily low payout rate. Whether it is run by the government, an independent corporation, or by several competing suppliers, a Consumer Lottery would offer products with payout rates much higher than the current 55 percent. After all, if lottery play is a benign activity, there is no valid justification for taxing lottery products more heavily than liquor or tobacco, as they are, in effect, now. Offering guilt-free fun, lotteries would then be made available at reasonably competitive prices, with consumers being allowed to be the final judge of what purchases are best for them. Sales would be higher than currently as a result of the higher payout rate, but state profits would probably fall for the same reason. Such a lottery would also have the effect of making the revenue structure less regressive. Since low income citizens on average spend a higher percentage of their incomes on lotteries, a cut in the implicit tax rate would lessen their implicit tax burden.

While there has been little political support for raising the payout rates, as suggested by the Consumer Lottery, the Sumptuary Lottery has garnered some interest. Several state legislatures have signaled that they are uncomfortable with the state's role in the promotion of

gambling. For example, the legislation which created lotteries in Virginia and Wisconsin prohibited all but informational advertising. Minnesota also places severe restrictions on the content of their ads.²⁹ And a number of state legislatures have resisted introduction of keno and video terminals. Still, the quest for ever-increasing revenue from lotteries tends to undercut resistance to promotion and expansion.

States therefore have several choices -- over and above the initial decision of whether to institute a lottery -- concerning the design and operation of the lottery. The two most important have to do with pricing and marketing. If it operates its lottery as a monopoly, a state can choose just about any payout rate under 85 percent (assuming 15 cents per dollar is needed to operate the games and distribute the tickets). As shown in section I of the report, payout rates do differ, but most are clustered in the range from 50% to 60%. Experience suggests that higher payout rates will boost sales. But from the state-revenue perspective, the question is whether sales will increase by enough to make this increase profitable. The answer may have changed in recent years, as the market environment has become more competitive; the fact that payout rates have been drifting upward suggests that increasing competition from other types of gambling and from neighboring state lotteries have forced the states to be more "generous." Revenues aside, the higher the payout rate, the more attractive the games (and "fairer") the games will be to potential customers.

The second important choice is marketing. As we have seen, most lotteries have chosen to actively market their products. This marketing takes two forms: product design and promotion. The product design part of active marketing means a continual effort to fine-tune existing lottery products as well as a willingness to consider introducing new products. States with lotteries face choices about which games they will introduce. If some games, such as video poker, are thought to appeal excessively to problem gamblers, states have the option of placing them off limits. Given the high likelihood that the lottery industry will continue to develop new games, with ever more sophisticated applications of developing technology, choices about products will continue to be important. What a lottery's ultimate objective is will determine how aggressively it pursues these new products.

The other part of marketing is promotion, which includes both advertising and other means of spreading the word about lottery games. Here again, lottery agencies have non-trivial choices to make. How heavy should advertising be? Should it be coordinated with times of the day and week, or focused on the media, to maximize its impact on sales, no matter what groups end up being targeted? Should there be any limits on the themes used in making the appeal?

How prominently should information on odds or actual prize values be presented?

Other choices are less crucial, but still significant. One is whether the state should give itself a monopoly on the production and distribution of lottery products, as all states to date have done. A state could certainly choose to license more than one supplier. However, the monopoly model appears to have worked well in keeping out unsavory elements from lottery operations. If it chooses to distribute lottery games itself, the state can choose one of several organizational models, from putting the lottery agency into an existing department of government to establishing it as a quasi-government independent corporation. Presumably, the practical difference among these approaches would differ from state to state, depending on laws related to procurement by government agencies and civil service employees. An independent corporation might also allow the lottery to be separated in people's minds from the rest of state government, if that is considered to be important. Probably more important than the form of the agency is the form and composition of the agency's governing board. If the board contains on it representatives who can reasonably be expected to address questions of public impact such as the rate of implicit taxation and the appropriateness of advertising themes, and not just revenue performance, one would anticipate behavior different from that seen in the Revenue Lottery.

Earmarking of revenues is also a design choice, though, as we note above, earmarking probably has little effect on the pattern and level of state spending in most cases. Only where the object of spending is small relative to what would have been spent in the absence of the lottery is it likely to make a big difference.

A final choice worth noting applies more to non-lottery states, but could apply to states with lotteries as well. States could make it simpler to purchase lottery tickets from other states by authorizing their sale. At the same time, perhaps through agreements with other states, they could tax the purchase of these tickets. In this way, a non-lottery state might collect some of the lottery revenue its citizens contribute to other states when they buy those other states' lottery products.

The most important choice, for states with lotteries, is whether to adopt the high implicit tax rate and aggressive marketing of the Revenue Lottery. States must ask whether the desire for greater government revenues justifies the effort to entice people to gamble more than they would otherwise want. If they choose one of the alternative models we outline above, revenues will surely be smaller than they would be under the Revenue Lottery. If it is believed that the costs of excessive gambling warrant a somewhat restrictive policy, though not an outright prohibition,

then a Sumptuary Lottery, with high implicit tax rates but little advertising, would be called for. If gambling in the form of lotteries is thought to be more or less harmless, then a Consumer Lottery would be appropriate.

Table 1

Growth and Change in U.S. Lottery Sales, 1973, 1987, and 1997

(Sales totals in billions of 1997 dollars)

	1973	1987	1997
Number of state lotteries	7	23	38
Sales by type of game			
Passive drawings	1,946	1	0
Instant games	24	4,196	14,435
Daily numbers	0	6,418	7,731
Lotto	0	6,937	10,088
Keno	0	0	1,791
Other	0	0	34
Total without VLT's	1,970	17,553	34,079
VLT's	0	0	2,318
Per capita sales without VLT's	35	127	150

Source: Clotfelter and Cook, "Redefining 'Success' in the State Lottery Business," *Journal of Policy Analysis and Management* 9 (1990), Table 1, p. 100; *International Gaming & Wagering Business*, April 1998, p. 44; June 1998, pp. 48-49.

Table 4

State Own-source Revenues and Lottery Revenues, 1997
(amounts in millions of dollars)

State	Own-source general revenue (a)	Lottery revenue (b)	Lottery as percent of total
Arizona	8,262	79.7	0.96%
California	73,584	711.9	0.97%
Colorado	7,349	92.7	1.26%
Connecticut	10,071	252.6	2.51%
DC*	2,986	34.2	1.14%
Delaware	2,797	66.7	2.38%
Florida	25,984	802.4	3.09%
Georgia	13,707	558.5	4.07%
Idaho	2,552	17.7	0.70%
Illinois	23,355	571.2	2.45%
Indiana	12,132	172.0	1.42%
Iowa	6,352	42.5	0.67%

Table 6. Actual Sales vs. Survey-reported Purchases.

Game	FY98 Sales \$billion	Survey Sales \$billion	Adjustment Ratio
Multi-State/Lotto	9.82	10.04	0.98
Numbers	7.87	10.15	0.78
Instant	14.21	7.26	1.96
TOTAL	31.89	27.45	1.16

Sources: FY98 Sales Figures-LaFleur's Lottery World, FY98 Lottery Sales, available online at www.lafleurs.com; Survey sales figures-National Survey on Gambling Behavior, National Opinion Research Center, University of Chicago, 1999.

Table 7. Total Play in Lottery vs. Non-lottery States.

Game	Spending by Lottery State Residents \$billion (Adjusted)		Spending by Non-Lottery State Residents \$billion (Adjusted)	
	Sales	% of Total	Sales	% of Total
Multi-state/Lotto	8.88	90.4	0.83	8.5
Numbers	7.61	96.7	0.08	1.0
Instant	13.66	96.1	0.52	3.7
TOTAL	30.15	94.5	1.43	4.5

Notes: Sales figures adjusted for under-reporting using ratios in Table 6. Total spending is less than total sales because for a few survey respondents the state of residence is missing.

Source: National Survey on Gambling Behavior, National Opinion Research Center, University of Chicago, 1999.

Table 8. Average Play and Participation Rates in Lottery and Non-Lottery States.

	Lottery States	Non-Lottery States
Game	Per Capita Play (Adjusted)	Per Capita Play (Adjusted)
Multi-state/Lotto	\$51	\$33
Numbers	\$44	\$3
Instant	\$78	\$21
TOTAL	\$173	\$57
Participation Rate	55.1%	27.9%

Note: Sales figures adjusted for under-reporting using ratios in Table 6. Participation rate determined by dividing sum of survey weights for respective categories by sum of weights for entire survey.

Source: National Survey on Gambling Behavior, National Opinion Research Center, University of Chicago, 1999.

Table 9. Demographic Patterns in Participation and Per Capita Play.

Demographic Characteristic	Participation Rate	Annual Per Capita Play-Lottery Players (Adjusted)	Annual Per Capita Play-Overall (Adjusted)
Overall	51.5%	\$313	\$162
Male	55.3%	\$368	\$204
Female	47.9%	\$254	\$122
White	52.0%	\$210	\$109
Black	48.2%	\$998	\$481
Hispanic	53.6%	\$289	\$155
Other	49.8%	\$295	\$147
Single	52.8%	\$281	\$149
Married	49.7%	\$304	\$151
Divorced/Widowed	56.7%	\$387	\$220
Age 18-29	49.2%	\$152	\$75
Age 30-44	55.8%	\$280	\$156
Age 45-64	56.0%	\$413	\$231
Age 65+	38.6%	\$475	\$183

Note: Sales figures adjusted for under-reporting using ratios in Table 6.

Source: National Survey on Gambling Behavior, National Opinion Research Center, University of Chicago, 1999.

Table 10. Socioeconomic Patterns in Participation and Per Capita Play.

Socioeconomic Characteristics	Participation Rate	Annual Per Capita Play-Lottery Players (Adjusted)	Annual Per Capita Play-Overall (Adjusted)
Dropout	47.7%	\$700	\$334
High school graduate	52.4%	\$409	\$214
Some college	55.6%	\$210	\$117
College graduate	48.0%	\$178	\$86
HH Income<\$10,000	48.5%	\$597	\$289
\$10,000-24,999	46.7%	\$569	\$266
\$25,000-49,999	57.9%	\$382	\$221
\$50,000-99,999	61.2%	\$225	\$137
Over \$100,000	51.0%	\$289	\$147
Don't Know/Refused	43.0%	\$196	\$84

Note: Sales figures adjusted for under-reporting using ratios in Table 6.

Source: National Survey on Gambling Behavior, National Opinion Research Center, University of Chicago, 1999.

Table 11. Household Income and Per-Household Lottery Expenditures.

Household Income	Number of Adults Per Household	Annual Per Household Play-Overall (Adjusted)
<\$10,000	1.8	\$520
\$10,000-24,999	1.9	\$505
\$25,000-49,999	2.1	\$464
\$50,000-99,999	2.2	\$301
Over \$100,000	2.3	\$338

Note: Sales figures adjusted for under-reporting using ratios in Table 6.

Source: National Survey on Gambling Behavior, National Opinion Research Center, University of Chicago, 1999.

Table 12. Characteristics of Heaviest Lottery Players.

Demographic Group	Percentage of Heaviest Players	Percentage of US Adults
Male	61.4%	48.5%
Black	25.4%	12.2%
HS Dropouts	20.3%	12.3%
HH Income Under \$10,000	9.7%	5.0%
Median Age	47.5	43.0

Note: Heaviest lottery players defined as those in the top 20% of lottery purchasers.

Source: National Survey on Gambling Behavior, National Opinion Research Center, University of Chicago, 1999.

Table 13. Advertising Themes Identified in Marketing Plans of Lottery Agencies, 1998.

	Percent of plans using theme
Size of the prize or the jackpot	56
Fun and excitement of playing the lottery	56
Winner Awareness	46
Benefits to state of lottery dollars	28
Sports themes	28
Product Awareness	24
How to Play	20
Playing responsibly	16
Odds of winning	16
Tie-in with fairs and festivals	12
Play more often	12
Emotions of Winning	12
Answer to your Dream	12
Benefits of Winning	8
Instant gratification	8
Social interaction of playing	4
Low Price	4

Figure 1. 1998 Per Capita Sales by Gender.

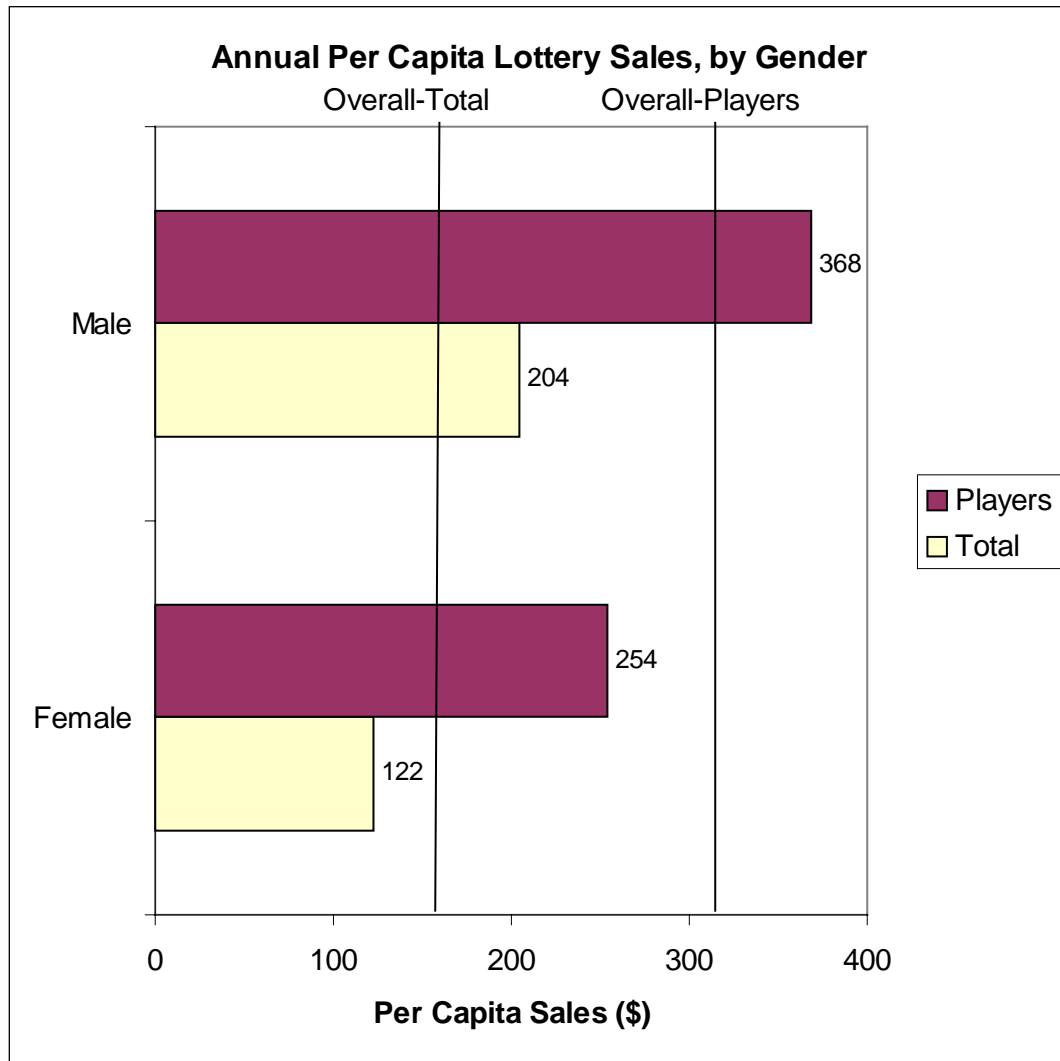


Figure 2. 1998 Per Capita Sales by Race/Ethnicity

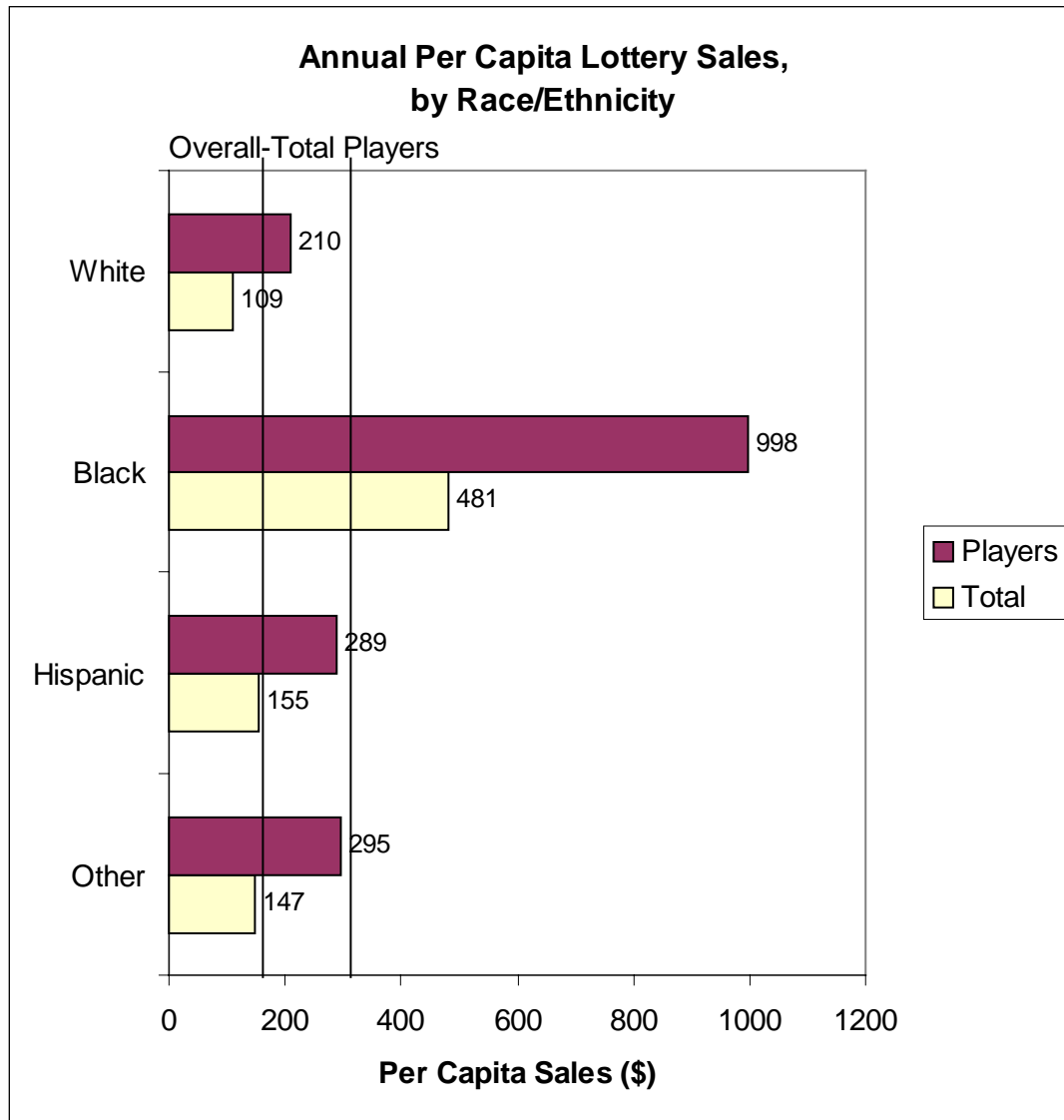


Figure 3. Per Capita Sales by Age

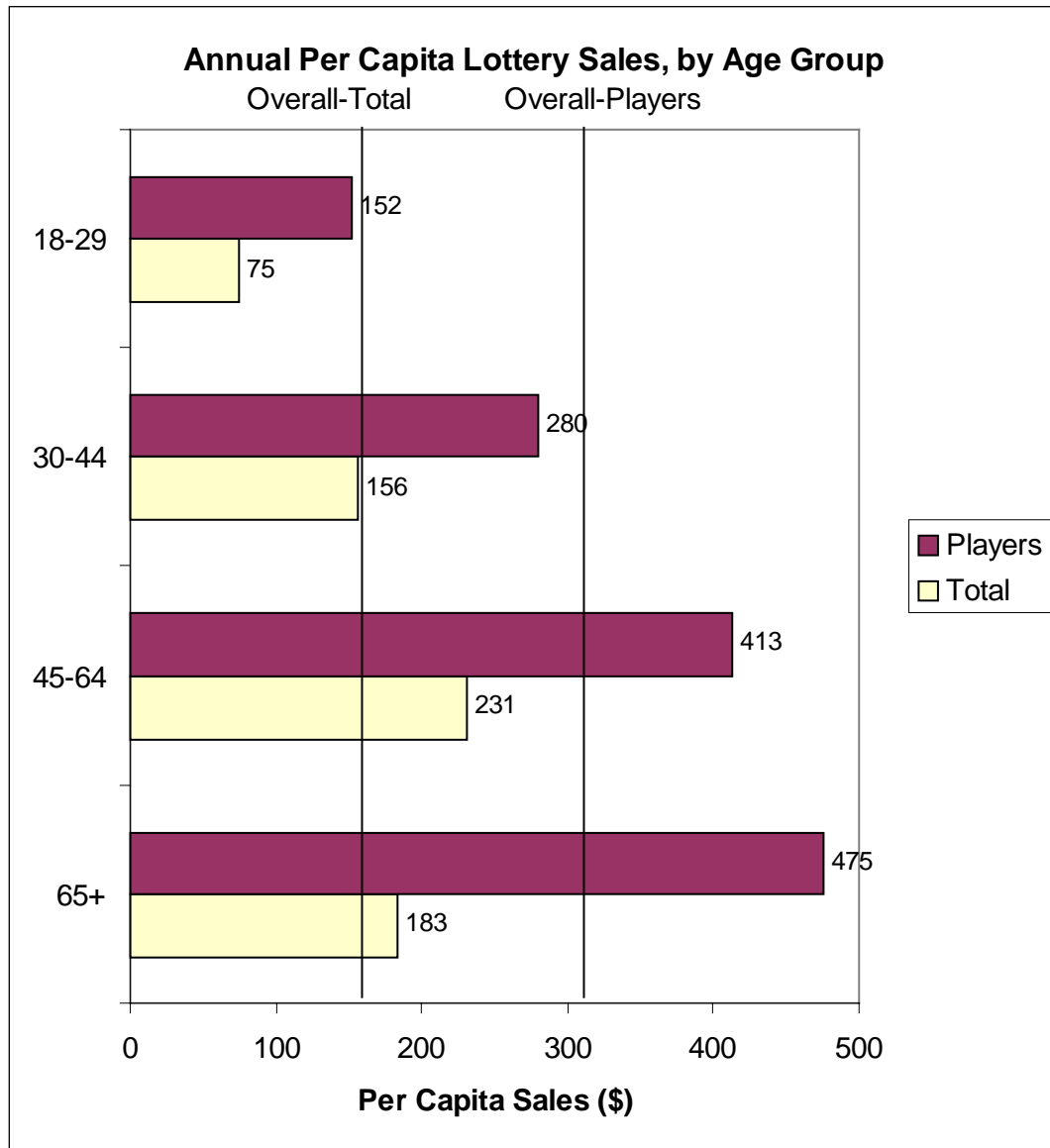


Figure 4. 1998 Per Capita Sales by Marital Status

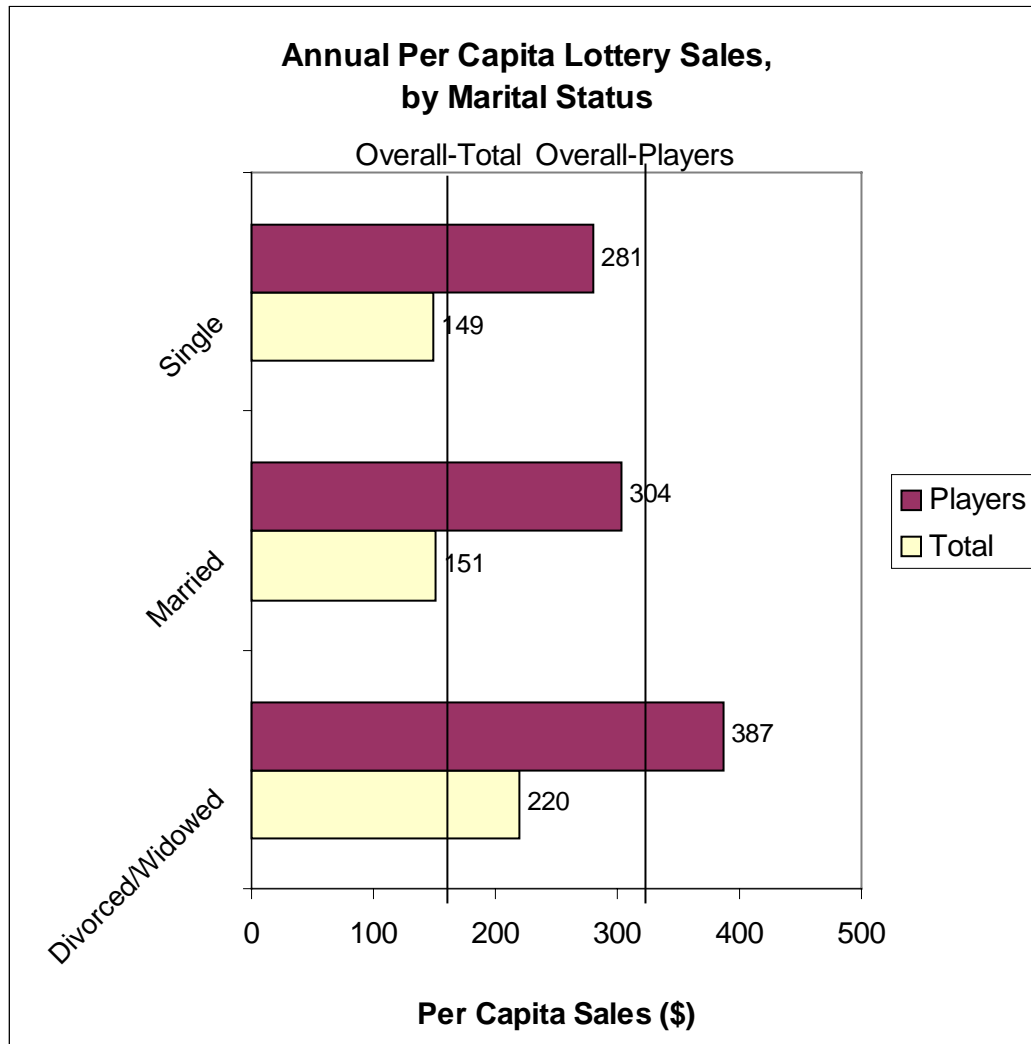


Figure 5. 1998 Per Capita Sales by Educational Attainment

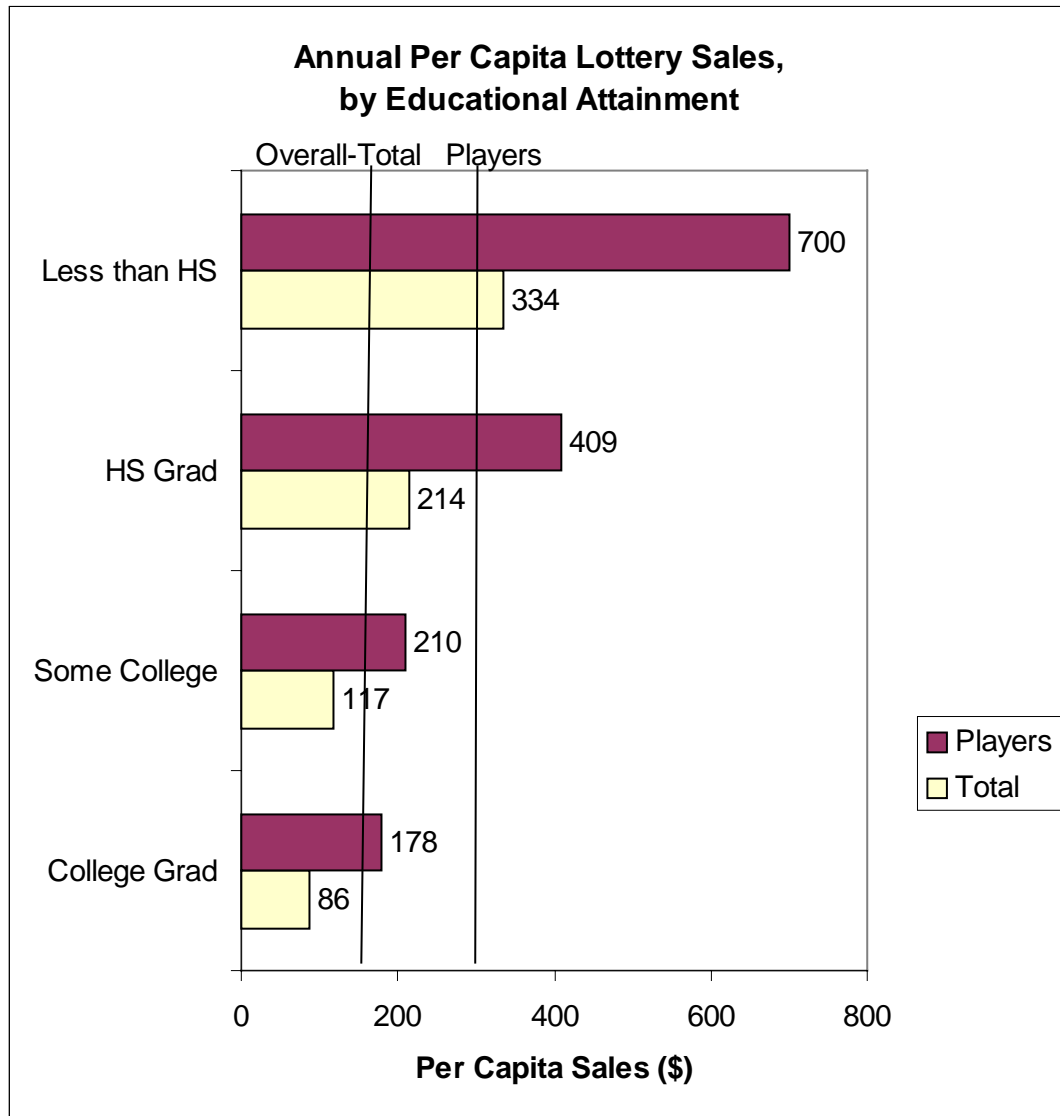
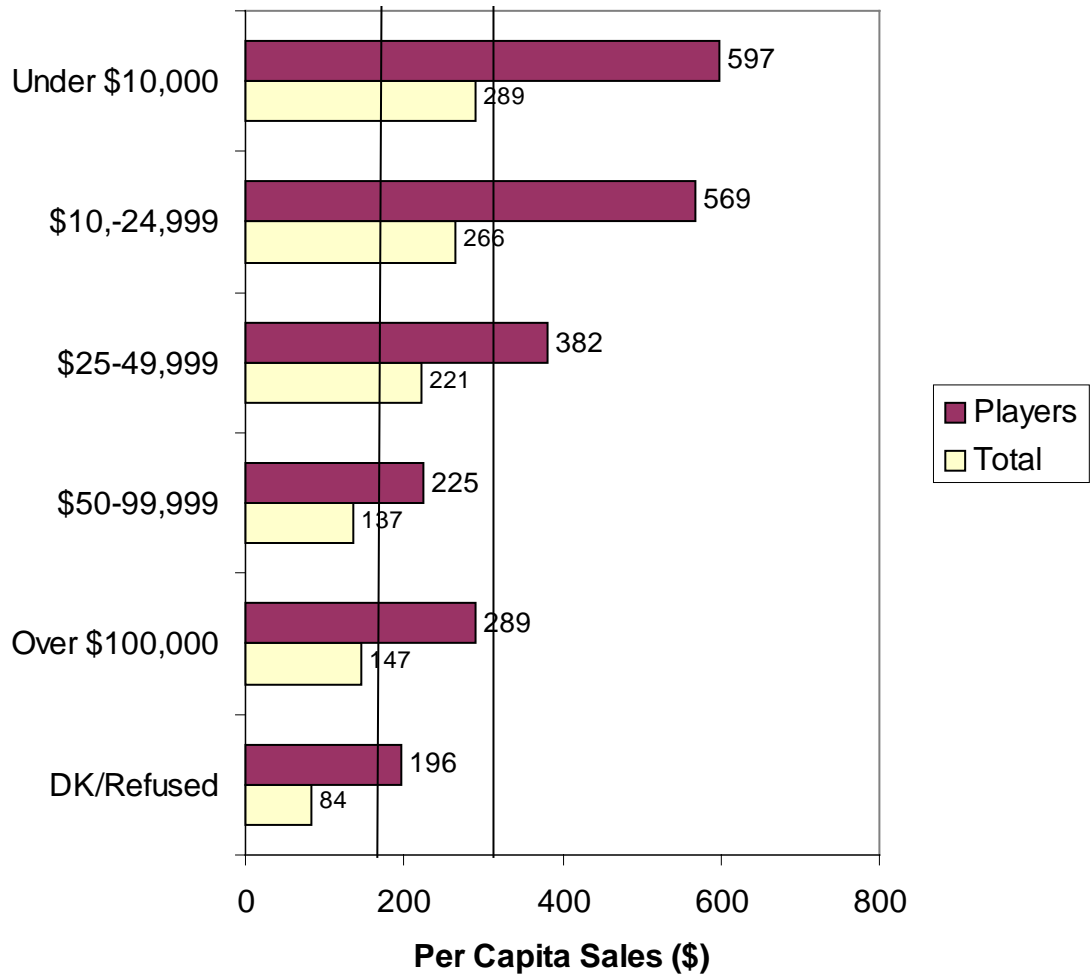


Figure 6. 1998 Per Capita Sales, by HH Income

Annual Per Capita Lottery Sales, by HH Income

Overall-Total Players



Notes

1. Pursuant to contract SPS No. 100897, signed August 26, 1998.
2. The authors thank Robert Malme for his assistance in research and data processing.
3. Lottery games were also operated by municipalities in Nebraska, but we do not consider them here.
4. The sales figures provided by the states on video lottery operations are neither comparable to other lottery games, nor to each other. Three states report “net machine income,” sales minus prizes, one state as sales minus prizes and operator payments, and one as total cash received. See *International Gaming and Wagering Business*, April 1998, p. 48.
5. The exponential growth rate is g in the equation $X_2 = X_1 e^{gt}$, where X_1 and X_2 are expenditures in years 1 and 2 and t is the number of years between them. Thus $g = \ln(X_2/X_1)/t$.
6. In 1998 the Association included 21 state lotteries. McQueen (1998b, p. 1).
7. In recent years, as the decline in interest rates has reduced the undiscounted sum of 20 annual payments from an annuity, some states have sought to offset this effect by lengthening the period of payment, to as many as 30 years. Lottery agencies continue to state jackpots as a sum of annuity payments despite a strong tendency of prize winners to choose to receive their winnings in one lump sum (“Winner Take All,” *International Gaming and Wagering Business*, December 1998, p. 39).
8. Besides the temporary cessation of keno and an apparent drop-off in demand following the change, the principal effect of this decision in California was to prevent Indian tribes from offering slot machines, which they argued were no different than the former version of keno. See, for example, Maura Dolan and Max Vanzi, “State Court Bans Keno; Says It's Not True Lottery,” *Los Angeles Times*, June 25, 1996.
9. Clotfelter and Cook (1989, Table 2.1).
10. Where p is the payout rate for a single bet, the expected prize per dollar from N consecutive bets is p^N . Thus, when the payout rate is 0.81 on an individual bet, the expected prize per dollar bet after five successive bets is 0.35.
11. To a lesser extent, keno shares this recycling feature, implying that its sales figures are also somewhat noncomparable.
12. LaFleur's Lottery World, <http://www.lafleurs.com>, 1/11/99.
13. For a discussion, see Clotfelter and Cook (1989, p. 227).
14. In a recent study of lottery revenues earmarked for education, Spindler (1995, p. 60) concludes: “Despite the earmarking of net lottery revenues, there is no guarantee that state

legislatures will not substitute lottery revenues for general education funding.”

15. Own-source general revenue excludes intergovernmental grants as well as special sources of revenue such as that generated by utilities or liquor stores. U.S. Bureau of the Census (1998, Table 515, p. 318).

16. See Clotfelter and Cook (1989, p. 231). To illustrate the calculation, federal, state and local taxes accounted for 30 cents of every dollar paid for liquor, leaving 70 cents the net-of-tax portion. Taxes were $30/70 = 43$ percent of the net-of-tax cost of the product. The tax rate for lotteries includes estimated average federal income taxes on prizes of 5 percent.

17. With a 5 percent average income tax, prizes would be 50.4 percent of sales. Taxes would then be $38/62 = 61$ percent of the net cost of prizes and operating costs.

18. McQueen (1998a, p. 48). The author notes that figures on advertising should be treated with caution since reporting differs significantly among states.

19. As an illustration of lotteries' attention to product design, consider Colorado lottery spokesman Todd Greco's description of the lottery's Perfecto games, which can be varied to feature different themes, prize structures, and numbers or symbols used in playing: "We're trying to see what drives players to the games. Do players like symbols or numbers? Do they like high top prizes, or a lot of low prizes?" McQueen (1998c, p. 39). Also, see Tosh (1996, p. 48). Charles Strutt, director of the Multi-State Lottery Association, said, about product design: "As competition comes from casinos, riverboats, horse tracks and those other gaming sources, lotteries are going to have work harder. I see multi-state games as offering more opportunities to develop products and not just big jackpot games." Also: "What I think Powerball has done is give us a shot in the arm, making the other lottery products more visible and the customers more aware of them."

20. See LaFleur's Lottery World web site for February 1998, <http://www.lafleurs.com/english/lotworld/feb98.htm>

21. Dean Gerstein et al., 1999, *Gambling Impact and Behavior Study, Appendix B* "Sampling and Weighting Methodology and Pilot Studies for the Random-Digit-Dial and Combined Surveys, and the Community Data Base" National Opinion Research Center Web Site.

22. It should be noted that the sampling procedure differs from a simple random sample of the adult population in several respects. Only adults with telephones are included in the sampling frame, and adults in households with more than one residential line are proportionately more likely to be selected. Further, an adult living in a single-adult household is twice as likely to be selected for the survey as one living in a two-adult household. Finally, the likelihood of successfully completing an interview differs systematically with the characteristics of the household and the selected individual. The weighting procedure is intended to help correct the biases introduced by these sampling problems.

23. If they had not played in the last 30 days they were not asked how much they had played on the last occasion. For those cases we assume that they had spent \$1 one each type of

game they said they played.

24. The rhythm of play is likely to be different for lotto because drawings are only held once or twice each week. Numbers players may play most every day to ensure that they never miss the daily drawing, and instant games also lend themselves to frequent play since they are available any time and pay off immediately regardless when they are purchased.

25. A perfectly accurate survey of adult residents would produce an estimate of purchases that was less than actual sales, since minors and foreigners purchase some fraction of the total.

26. The Michigan law, for example, states that the "lottery shall produce the maximum amount of net revenues for the state consonant with the general welfare of the people" (Clotfelter and Cook 1989, p. 167).

27. The Big Money Game is a multi-state jackpot played in 6 states: Georgia, Illinois, Maryland, Massachusetts, Michigan and Virginia. See Chiu (1999).

28. This survey--which included more than 275 ads from 13 of the largest state lotteries -- was a sample of convenience generated by our requests to a number of lotteries and their ad agencies during the mid-1980s. We looked specifically at the kinds of information the ads provided about the chances of winning. Only 12 percent of the 151 television and radio ads in our sample provided any information about these odds. When the ads did give information on probabilities, it was invariably the probability of winning any prize, not the probability of winning the grand prize. In contrast, the dollar amounts of prizes were mentioned much more often, in half the TV and radio ads. And when prize amounts were mentioned, it was usually the amount of the grand prize that was cited. While eschewing explicit references to probabilities, lottery ads nevertheless send a consistent message about one's chances of winning. Out of the 52 television ads in our sample that portrayed anyone who plays or has played the lottery, fully two thirds showed at least one lottery winner. See Clotfelter and Cook (1989, ch.10).

29. LaFleur's Lottery World, February, 1998; web site www.lafleurs.com/english/lotworld/feb98.html.

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