

# The Kentucky Lottery

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*The KEES program does appear to redistribute income in a regressive pattern, both in its funding and its awards.*

The use of lotteries as sources of public revenue in America has a long and colorful history. As is well documented in the literature, lotteries served to provide funding for among other things, the Jamestown settlement, Harvard College, the Continental Army and various other public works projects.<sup>1</sup> In the current day, lotteries are used to fund a variety of projects from educational programs (such as the Hope Scholarship in Georgia and the KEES program in Kentucky), to athletic stadiums (such as Oriole Park at Camden Yards and PSINet stadium in Baltimore) to general state expenditures.

The beginning of the modern lottery is traced to 1964 when New Hampshire introduced a state lottery. The introduction of the lottery was an addition to a growing legal gambling market in the United States which included horse racing (legal in only three states in 1900, twenty-six states in 1963) as well as the casino and other legal gambling establishments in Nevada. Legalized gambling in many forms would continue to expand over the next several decades.<sup>2</sup>

This paper aims to provide an understanding of the issues surrounding lottery play, with a particular emphasis on the Kentucky Lottery and the impacts on Marshall County, KY. This paper is organized as follows. The next section will provide a brief overview of the mechanics of the Kentucky Lottery. Section II will provide a brief overview of the taxation issues related to the lottery. Section III will examine who plays the lottery, and will report survey

results from surveys conducted over the U.S., the Commonwealth, and Marshall County. Section IV will discuss the revenue impacts of the lottery. Section V will examine the use of lottery profits in the KEES program with an application to Marshall County.

### **The Kentucky Lottery<sup>3</sup>**

The Kentucky lottery began in April, 1989 after a November 1988 vote in which over 60% of voters cast ballots in favor of a lottery. On April 4, 1989 lottery sales began with first day sales of over \$5 million for the two available instant games. In October of that year on-line games (Kentucky lotto and what would become pick 3) were launched. In July 1990 pull-tabs were introduced as an additional type of instant game. Powerball was added to the line-up of lottery games in April 1992.

The Kentucky Lottery features several types of games. Instant games consist of both pull tab and scratch off games. These games require the player to reveal winning combinations from several concealed areas on a playing card. The Kentucky Lottery web site<sup>4</sup> describes 41 pull tab games and 65 scratch off games. Many of these games have been recently introduced and there seems to be a rather continuous rotation of games. The scratch off games are typically \$1 or \$2 games with odds of winning between 1:4 and 1:5. Top prizes are typically very small, roughly a few thousand dollars, though one game promises \$1,000 per week for life. Pull tab games are usually in the \$.50 to \$1 range with much smaller top prizes and

odds of winning typically in the 1:7 to 1:9 range.

There are three forms of daily numbers games in Kentucky. The pick three game requires players to correctly match a three digit number. The pick four game requires the matching of a four digit number. There are two drawings per day for each of these games, one in the early afternoon, and one around 11pm. With each of these games there are a number of ways to win on a given ticket. The highest prize requires matching three (or four) numbers in exact sequence. The cash 5 game is a type of mini-lotto which requires players to select five numbers from 35 possible numbers. The top prize is \$100,000 for matching all five numbers, though the odds of winning this prize are only 1:324,632. Cash 5 is chosen each day, save Sunday.

There are two forms of lotto games active in Kentucky. Lotto Kentucky has players choose 6 out of 42 numbers, with a minimum jackpot for correctly choosing the six numbers of \$1 million. Kentucky Powerball asks players to choose five numbers out of 49 and then a powerball number (1 out of 42). Winning numbers for both games are chosen twice weekly, with the jackpot amount increasing if there are no winners. The odds of winning these jackpots are quite remote with a 1:5,235,786 chance of winning the top prize in Lotto Kentucky and a 1:80,089,128 chance of correctly winning the powerball.<sup>5</sup> Lotto winners are able to claim a 20 year stream of payments, or may choose a cash option which pays a smaller lump sum at the time of winning.

According to a survey of Lottery players conducted in 1998, 55% of adults in Kentucky had played some

lottery game at least once in the previous twelve months.<sup>6</sup> Lotto Kentucky, Powerball, and scratch offs were the games most frequently played with over 30% of Kentuckians playing at least once in the previous twelve month period.

## **Taxation Issues and the Lottery**

Lotteries exist to raise revenue for the state. As a result it is proper to ask questions related to the distribution of the tax burden imposed by the lottery. Lotteries however raise other issues which must be acknowledged in this discussion. First, unlike excise taxes on other goods such as tobacco or gasoline, the lottery offers a new product which consumers value. A determination of the overall effects of the lottery must take into consideration the consumer surplus generated from the consumption of a product desired by society with the potentially regressive nature of the tax. Consumer surplus is defined by economists to be the difference between the amount a consumer is willing to pay for a particular good and the amount they actually have to pay. The concept of consumer surplus is used to evaluate the total value of a good or service to consumers, as the amount paid for the service will only capture some of the total value. Clotfelter and Cook report that in a 1986 *Los Angeles Times* poll, respondents were evenly divided over whether they played the lottery for fun or money, though for those with incomes below \$30,000 money was the predominant motivation.<sup>7</sup>

The second issue is related. Many states designate all or part of their lottery profits to various spending programs. For instance, Missouri designates lottery profits to fund education. In Kentucky, a portion of lottery profits are being used

to pay for the KEES scholarships. Georgia's Hope Scholarship program is funded out of lottery profits. The state of Maryland used lottery money to fund the construction of two new stadiums in Baltimore. Numerous other examples could be cited. There is an issue of redistribution when lottery profits are used for specific government programs. The regressive nature of the tax effects of the lottery may be further exacerbated if the primary benefits of the lottery revenues accrue to those in higher income classes than the source of the funds.

Charles Clotfelter has been the primary researcher in the area of the incidence of lottery taxation. Many of the studies listed in the bibliography of this paper focus on lottery surveys from the 1970s and 1980s. The general consensus of all lottery related research is that lotteries are in fact a regressive form of taxation. The reason for this is the fact that the amount of revenue one contributes to the state through a lottery is proportional with the amount that one spends playing the lottery. As will be discussed in more detail in the next section, normally lottery participation falls as income increases.

Clotfelter and others have noted that the regressive nature of lottery taxation varies slightly with the game under consideration. Clotfelter found that the tax incidence of daily numbers games was "significantly more regressive than the weekly games."<sup>8</sup> Indeed, the Maryland numbers game was found to be a more regressive source of revenue than was the state sales tax. Clotfelter and Cook find that while in general lotteries are a regressive means of raising revenue, lotto games are in some cases less regressive than other lottery games.<sup>9</sup> This is particularly true when

the lotto jackpot becomes very large. In the presence of a large lotto jackpot it is possible that the tax incidence may be described as progressive.<sup>10</sup> (This is true only for the week with the large drawing).

Another issue of concern with lotteries as a form of finance (and thus taxation) is the unique nature of the lottery product. In the United States, states have reserved for themselves monopoly rights to the provision of lottery services. States also aggressively advertise their lottery offerings. Thus, the state is in the business of advertising a good, provided solely by the state, whose primary purpose is adding to state revenues. This is one of the claims made to counter arguments that like taxes on tobacco, alcohol, or gasoline, lottery taxes are completely voluntary. As an example of this, Clotfelter and Cook note that in the 18 states where the state holds a monopoly in wholesale liquor, there is no effort by the state to increase consumption, even though increased consumption would increase revenue to the state.<sup>11</sup>

Because of their monopoly status lotteries are able to offer a much lower payout rate than other forms of gambling. Clotfelter and Cook report that the payout rate of lotteries averaged roughly 50%. In contrast, at that time casino slot machines had a payout rate of 89%, casino table games a payout rate of 97% and horse racing a payout rate of 81%.<sup>12</sup> The Kentucky lottery has an average payout rate of 58.6%.

Several researchers have looked at the implicit tax rate charged on lottery profits. The implicit tax rate is found by dividing the revenue to the state from the lottery by the cost of payouts and operation. Thus, if a state receives \$0.40 from a \$1 lottery ticket for revenue and

incurs expenses of \$0.60 of the \$1 in prize payouts and administrative costs, the implicit tax rate is  $.4/.6 = .67$ . To see this another way, suppose that the printed price of the lottery ticket was equal to the administrative costs and prizes, with a special sales tax added. A lottery ticket that would then sell for \$0.60 (the proportion used for prizes and costs) would have to have a tax of \$0.40, or 67%, added in order to bring the total price to \$1. This implicit tax rate is one of the highest of any state excise taxes, higher than cigarettes, alcohol, hotel/motel rates, gasoline, and as mentioned, other forms of gambling. It must be pointed out that the implicit nature of the lottery tax as opposed to the explicit nature of some of the other taxes, makes higher rates less controversial than if the tax was added to the price of the ticket. In Kentucky, for FY 99 the implicit tax rate for the lottery would be 37.6%, that is  $.2736$  (the proportion of ticket sales transferred to the State's general fund) divided by  $(1 - .2736)$ .

There are also issues of the externality effect of lotteries (and for that matter, any taxes). While the Kentucky lottery may add \$150 million in profits to state revenue, there is an issue that if lottery players view the lottery and other forms of gambling, or other taxable activities, as substitutes, then the amount of lottery profits overstates the incremental effect of the lottery. Borg, Mason, and Shapiro suggest that between 15 and 20% of net lottery revenue comes from reductions in other state taxes.<sup>13</sup> If this is correct, then based upon the lottery providing approximately \$150 million to the state, the net increase to the state would be only \$120 million to \$127.5 million. Gulley and Scott found a similar impact

on attendance at race tracks and reported that each dollar spent on the lottery reduced betting at race tracks by \$0.18.<sup>14</sup>

An important part of gaining lottery revenues is encouraging people to play. Clotfelter and Cook have an informative chapter on lottery advertising in their book *Selling Hope*. Advertising is typically aimed at increasing users of lotteries, that is, enticing new people to play the lottery, or increasing the usage of the lottery, that is, enticing current users to play more. The most common of these two strategies seems to be the increase usage approach. Many of these advertisements focus on the possibility of becoming rich by winning the lottery. It is also mentioned though that "among the ads we looked at, statements about the odds of winning or the payout rate were conspicuous by their absence."<sup>15</sup>

The primary conclusion of the authors is that much lottery advertising focuses on winning and fantasies of winning. The authors raise the concern that because of the advertising, consumers may not have an adequate understanding of the actual likelihood of winning. Thus, it is important from a marketing standpoint to have a sufficient number of significant winners to keep people playing.

The 1998 Attitudes Study performed by the University of Louisville found that 71% of poll respondents had seen advertising for the Kentucky Lottery in the previous 30 days.<sup>16</sup> An overwhelming majority of the respondents had been exposed to television or radio advertising. There was little reported difference in advertising awareness between players and non-players. Advertising includes television and radio, newspaper ads (including those showing recent winners), as well as advertising on

busses, retail stores, and billboards. In addition, a large amount of media attention is focused on the lottery when jackpots are sufficiently large. In fiscal year 1999, the Kentucky lottery spent

\$10.125 million on advertising. This represented 1.7% of sales based on information found in the 1999 Annual Report of the Kentucky Lottery Corporation.

**TABLE 1**  
**Demographic and Socioeconomic Patterns in Lottery Participation and Per Capita Play.**

Characteristic	Participation Rate	Annual Per Capita Spending by Lottery Players
Overall	51.5%	\$313
Male	55.3	368
Female	47.9	254
White	52.0	210
Black	48.2	998
Hispanic	53.6	289
Other	49.8	295
Single	52.8	281
Married	49.7	304
Divorced/Widowed	56.7	387
Age 18-29	49.2	152
Age 30-44	55.8	280
Age 45-64	56.0	413
Age 65 +	38.6	475
Dropout	47.7	700
High school graduate	52.4	409
Some college	55.6	210
College graduate	48.0	178
HH Income <\$10,000	48.5	597
\$10,000 - 24,999	46.7	569
\$25,000 - 49,999	57.9	382
\$50,000 - 99,999	61.2	225
Over \$100,000	51.0	289
Don't Know/Refused	43.0	196

Source: Tables 9 and 10 of Clotfelter et. al., *State Lotteries at the Turn of the Century*.

## Who Plays The Lottery?

Lotteries are widely played, if one considers the proportion of people who play the lottery in a given year. Clotfelter et.al. report that “about half the adult population play the lottery in any one year.”<sup>17</sup> The distribution of frequency of play is quite skewed however with a few lottery players accounting for most of the money spent. Results of a survey performed for Clotfelter et.al. by the National Opinion Research Center (NORC) find that the top 5% of lottery players account for 54% of total sales. Additionally, the top 20% of lottery players account for 82% of total sales. These figures are higher than what Clotfelter and Cook reported in *Selling Hope*.<sup>18</sup> This would indicate that high volume players are becoming more important for lottery revenues.

Lottery participation differs significantly by demographics, in terms of both participation rates and in terms of spending rates. Results of the NORC survey are found in Table 1. Clotfelter et.al. report that the participation rate for men is higher than the participation rate for women. Additionally, men who play the lottery spend more per capita on the lottery than do women players. Divorced and widowed individuals have the highest participation rate among the marital status categories with 56.7% of this group playing the lottery at least once in the preceding year.

Among ethnic categories, Hispanics had the highest participation rate at 53.6%, though this is only slightly higher than the 48.2% participation rate among Blacks, which was the lowest in the survey. What is surprising however is that even though Blacks participate less frequently, Black lottery players spend the most per capita of any demographic group at \$998. In contrast,

the overall per capita annual spending on the lottery is \$313.

Lottery participation rates increase with age up to the category 65+. Of those ages 18-29, 49.2% have played the lottery. Those over 65 play at a 38.6% rate. The per capita amount spent however does increase with age with those over age 65 who play spending \$475 per year per capita.

The per capita amount spent by lottery players drops as education increases with high school dropouts spending \$700 per year and college graduates spending \$178. The annual per capita spending also drops as income increases.

A similar survey was conducted in 1998 by the University of Louisville for the Kentucky Lottery. These results are presented in Table 2. During the year previous to the survey, 55% of Kentuckians had played the lottery at least once. (These are considered current players). Since the onset of the lottery, 68% reported playing the lottery at least once. As with the national data, the average Kentucky lottery player is a relatively infrequent player with the most common player playing once a month or less.<sup>19</sup>

The survey found that males are more likely to play the lottery than females (61% to 51%) and minorities are more likely to play than whites (67% to 54%).<sup>20</sup> The results on age and education follow a similar U-shaped pattern to the results of Clotfelter et.al.

The Kentucky survey defines those who have played a lottery game in the past, but not within the previous twelve months, as “lapsed.” Thirteen percent of Kentucky residents fall into this category. Over three quarters of this group reported spending less than \$5 per month when they did play. Only 6% of

**TABLE 2**  
**Kentucky Demographic and Socioeconomic Lottery Participation**

<b>Characteristic</b>	<b>Current Player</b>	<b>Lapsed Player</b>	<b>Never Played</b>
Overall	55%	13%	32%
Male	61	13	27
Female	51	13	36
White	54	13	33
Minority	67	10	23
Age 18-20	56	15	29
Age 31-55	61	13	26
Age 56+	42	13	45
Dropout	49	12	40
High school graduate	59	13	27
College graduate	46	14	40
Urban	62	12	25
Rural	51	14	36
HH Income < \$15,000	46	17	36
\$15,000 - 24,999	62	15	24
\$25,000 - 34,999	59	15	26
> \$35,000	56	11	33

**Notes:**

Current Player: Has played the lottery within the previous 12 months

Lapsed Player: Has played the lottery, but not within the previous 12 months

Never Played: Has never played the Kentucky lottery.

Source: 1998 Kentucky Lottery Study, University of Louisville.

the lapsed group had played a game on a weekly basis during their playing time. When asked what would entice them to resume playing in the lottery, 75% claimed that there was nothing which would entice them to return to lottery play. Of the 25% who were open to playing the lottery in the future, a desire for better odds, and more winners were the strongest attractions. When asked

about specific strategies to encourage play, 63% indicated they would play again in the future if all lottery profits went to support education.

The results of the Kentucky survey found that those who played the lottery were also more likely to have participated in other forms of gambling as well. Table 3 provides further breakdown of this information. While



**TABLE 3**  
**Participation in Other Forms of Gambling**

Type of Gaming	Twelve Month Participation Rate - Lottery Players	Twelve Month Participation Rate - Lottery Non-players
Office Pools	22%	8%
Racetracks	13	5
Other States / Lotteries	26	5
Bingo	16	2
Land-based Casino	7	4
Riverboat Casino	6	3

Source: 1998 Kentucky Lottery Study, University of Louisville.

the results are not surprising, they do seem to indicate that those Kentuckians who actively play the lottery gamble more frequently in all forms than do non-players.

A recent survey by Gerry Muuka and Phil Niffenegger, discussed elsewhere in this special volume, examined lottery issues in Marshall County, Kentucky. Of the 625 residents surveyed, 34% play the lottery. This is lower than has been found in the national and Kentucky surveys. Of those who play, playing once or twice a month is the most frequent response (46.8%). Of those who play the lottery, 25% play 1-3 times per week, and 25% play less than once per month. Only 1.8% play everyday. Of those who play the lottery, 88% spend no more than \$5 per play. Survey respondents participated at lower levels in the lottery by education groups and by income as compared to the results of the national and Kentucky surveys.

### **Revenue Impacts of the Lottery**

A primary benefit that is attributed to the lottery is the amount of revenue raised for the state as a result of playing

the lottery. Indeed there is currently a debate in Tennessee over the merits of a lottery. Advocates argue that the state is losing between \$80 million and \$200 million per year watching Tennessee residents play the lottery in surrounding states.<sup>21</sup> While this seems like a large amount, \$200 million would represent roughly 1.3% of 1998 revenue in Tennessee. Revenues raised through a lottery are usually designated towards programs popular in the state. For instance, in the state of Missouri, as a result of Amendment 11, all lottery proceeds have been earmarked for education. During Fiscal Year 1999, this represented \$150 million. While a seemingly large dollar amount, this accounted for only 3.6% of the education budget.<sup>22</sup> Recent discussions in Tennessee also have proceeds earmarked for education purposes, including scholarships.

While the idea that lottery proceeds benefit specific programs is an attractive selling point of lotteries, from a budgeting viewpoint it can be a misleading argument. It seems likely that lottery proponents wish to imply that lottery profits will be spent in

**TABLE 4**  
**Lottery Revenues by State, U.S. Census Bureau, 1998 State Government Finances.**

State	Total Revenue (000s)	Lottery Revenue (000s)	Lottery Revenue percent of total
California	144,984,973	797,455	0.6%
New York	96,131,411	1,217,939	1.6
Texas	57,807,137	1,085,057	1.9
Florida	51,751,884	795,181	1.5
Pennsylvania	48,503,491	672,306	1.4
Ohio	48,133,067	878,794	1.8
Illinois	40,460,377	510,447	1.3
Michigan	40,069,007	615,159	1.5
New Jersey	37,007,323	638,677	1.7
Massachusetts	28,234,686	748,900	2.7
Washington	27,980,014	115,614	0.4
Virginia	25,918,315	271,666	1.0
Georgia	25,707,202	551,506	2.1
Minnesota	24,508,758	62,362	0.3
Wisconsin	21,394,590	125,487	0.6
Maryland	20,559,098	399,317	1.9
Missouri	19,020,637	150,465	0.8
Indiana	18,507,747	186,338	1.0
Louisiana	17,605,336	111,945	0.6
Arizona	16,582,495	75,907	0.5
Connecticut	16,520,398	257,717	1.6
Kentucky	15,989,084	158,448	1.0
Oregon	15,688,295	551,984	3.5
Colorado	13,514,305	96,288	0.7
Iowa	10,029,402	34,355	0.3
New Mexico	9,058,548	20,842	0.2
Kansas	8,443,997	52,415	0.6
West Virginia	7,808,416	89,296	1.1
Maine	5,689,618	47,669	0.8
Nebraska	5,635,696	18,936	0.3
Idaho	4,705,173	20,562	0.4
Delaware	4,593,997	209,608	4.6
Rhode Island	4,437,538	112,832	2.5
New Hampshire	4,010,298	56,537	1.4
Montana	3,625,865	6,495	0.2
South Dakota	2,874,277	96,980	3.4
Vermont	2,372,580	22,653	1.0
<b>Total</b>	<b>945,865,065</b>	<b>12,164,139</b>	<b>1.3</b>

addition to any other amount currently being spent. Economic theory however suggests that so long as lottery proceeds are less than the currently budgeted amount for that good, it is unlikely that there will be a dollar for dollar increase in spending as lottery profits are realized. While it is likely that more money will be spent on education, or the other targeted programs, it is also likely that more money will also be spent on all programs the state values. Thus, while dedicating lottery proceeds to education makes for good public relations, it is unlikely to lead to an increase in the amount of overall spending on education equal to the lottery profits.<sup>23</sup>

In fiscal year 1999, lotteries in the United States earned profits of over \$12 billion.<sup>24</sup> This represents a per capita profit of \$154.81 per lottery player. The use of this profit varies from state to state, though in many states, some amount of lottery profits are funneled into education related funds. Of the 37 states and the District of Columbia who operate lotteries, twenty-five list education as one of the beneficiaries of lottery profits.<sup>25</sup> In Kentucky, “money for the schools” is listed by survey respondents as the top benefit of the lottery. Interestingly, lower taxes is seen as a benefit by less than 5% of those surveyed.<sup>26</sup>

While lottery profits are large in dollar figures, they make up a very small share of the revenues in most states. Of the 37 states which operate a lottery, 15 states receive less than 1% of their overall revenue from lottery profits. Only 6 states receive more than 2% of their revenue from lottery profits with Delaware, at 4.6%, being the only state receiving more than 4% of revenue from lottery sources.<sup>27</sup> On average, states with lotteries receive 1.3% of their

revenues from lottery profits. The percentages by state are given in Table 4 on the previous page.

The Kentucky Revenue Cabinet publishes a table of state revenue, tax and non-tax, by source.<sup>28</sup> The latest year for which this is available is fiscal year 1997-98 (year ending June 30, 1998). In that year, the lottery transferred profits of \$153 million to the state. This represented 2.5% of the size of the general fund of \$6.012 billion.<sup>29</sup> In comparison with sales and use taxes, the lottery accounts for 7.7% of the money collected from sales and use taxes. To make this more concrete, assume for a moment that the state wished to raise this \$153 million through a sales tax as opposed to a lottery. Based upon sales tax and lottery revenues in fiscal year 1998, the general sales tax would have needed to have been roughly 6.46% (as opposed to 6%) in order for the state to earn the same revenue with no lottery.<sup>30</sup>

In fiscal year 1999, the Kentucky lottery earned profits of \$161.8 million and transferred \$159.6 million to the state. Of this amount \$5.8 million represented unclaimed prizes. The profits are used in the general fund and for education. In fiscal year 1999, \$14 million was designated for education, while \$139.8 million was added to the general fund. This represented 27.7% of lottery sales and accounted for 2.59% of the state general fund. These profits came from sales of \$583.1 million in sales. In fiscal year 2000, sales increased to \$585.3 million.

The Kentucky Lottery Corporation will make available upon request lottery sales data by county. For fiscal year 2000 (ending June 30, 2000) lottery sales were \$585,283,264. Of this amount roughly 58.6% is returned as prizes. Of the sales, 21.7% of total sales

occurred in Jefferson County. The 28 counties comprising Western Kentucky purchased \$114.6 million in lottery tickets. Lottery sales in Marshall County totaled \$2,983,444. Given the estimated prize payout percentage, gross state revenues (sales minus prizes) from Marshall County were estimated to be \$1,235,146. In contrast, sales and use taxes from Marshall County amounted to \$11,765,566.

### **The Kentucky Lottery and KEES**

In 1998 the Kentucky Legislature authorized the formation of the Kentucky Educational Excellence Scholarships. The money for these scholarships was to come from the profits of the Kentucky Lottery. These scholarships would be automatically awarded to Kentucky students attending post-secondary school in the Commonwealth.

The KEES scholarship program works by awarding money to students based upon their grade point averages (GPAs), this constitutes the base award, and their ACT scores, which is designated the bonus award. Table 5 shows the awards based upon GPA and the ACT bonus awards. A student can earn a maximum of \$2,500 per year. The student then has five years to claim eight semesters worth of awards. Thus, there is an effective maximum of \$10,000 per student.

The KEES program allows students to enroll at any Kentucky post-secondary institution. One can see however that the award distribution is skewed towards those who perform well in high school, and would thus be likely to earn other forms of financial assistance as well.

**TABLE 5**  
**KEES award amounts.**  
(amounts are subject to future adjustment based on availability of funds.)

<b>GPA</b>	<b>Amount</b>
2.50	\$125
2.60	150
2.70	175
2.75	187
2.80	200
2.90	225
3.00	250
3.10	275
3.20	300
3.25	312
3.30	325
3.40	350
3.50	375
3.60	400
3.70	425
3.75	437
3.80	450
3.90	475
4.00	500
<b>ACT Score</b>	<b>Bonus</b>
15	\$36
16	71
17	107
18	143
19	179
20	214
21	250
22	286
23	321
24	357
25	393
26	428
27	464
28+	500

Source: KHEAA web page.

While Borg and Stranahan discuss these types of programs in more detail, there are several things worth noting here. First, while students receive the KEES money in addition to any other scholarships or financial aid they may receive, it is expected that institutions will take the potential KEES award into consideration when calculating the student's ability to pay for their education. As a result, it is not clear that the out of pocket cost of attending post-secondary school will change considerably for students receiving financial aid. As a second consideration, since the funding for this scholarship program is coming from lottery profits, it is reasonable to expect that this represents a regressive funding pattern, as the regressive nature of lotteries as taxing instruments has been well established in the economics literature.<sup>31</sup> If the primary benefits of the KEES scholarships flow to better students, and if there is a positive correlation between income and school performance, the KEES program will represent a transfer of wealth up the income distribution. That is, relatively low income families will be providing resources for scholarships to relatively high income families.

The award pattern is also a concern if we are concerned about the decision of the marginal student to pursue post-secondary education. It is reasonable to expect that students who do very well in high school would not only have already decided to go to college, but they are likely to qualify for other scholarship assistance in going to college. For these students, the KEES is unlikely to influence the decision of whether to attend a post-secondary school. The students who may benefit from this money the most are those who are

unlikely to go to post-secondary schools without some type of financial incentive. It is possible however that these students would receive relatively little money under KEES, and thus the KEES program may not make a large enough difference in their financial situation to encourage them to attend post-secondary school. The economics literature is unclear on this. While much of the literature has found that both enrollment decisions, and the decision where to attend college are both impacted in a non-trivial way by the net cost of attending college, time series enrollment data do not seem to show the predicted changes. Hansen indicates that financial aid aimed at students from below-median-income families does little to increase access to higher education.<sup>32</sup> It will take some time to determine the actual impact of KEES.

To see the distribution of KEES awards, consider four students with GPAs of 2.5, 3.0, 3.5 and 4.0 respectively. For simplicity assume that these students earn the same GPA in each year of high school. The KEES awards would be:

<b>GPA</b>	<b>KEES Annual Award (base amount)</b>	<b>KEES Total Award (base amount)</b>
<b>2.5</b>	\$500	\$2,000
<b>3.0</b>	\$1,000	\$4,000
<b>3.5</b>	\$1,500	\$6,000
<b>4.0</b>	\$2,000	\$8,000

In addition, one would expect higher ACT bonus awards to be granted to those with higher GPAs.

For Marshall County, KHEAA calculated that 940 students would be

**Table 6**  
**Kentucky Lottery Sales by Game Type**  
 (All numbers in thousands of dollars)  
 Years ending on June 30.

	<b>Instant Sales</b>	<b>Instant Prizes</b>	<b>On-Line Sales</b>	<b>On-Line Prizes</b>
1996	304,348	185,562	238,497	127,872
1997	317,915	201,118	251,140	138,750
1998	294,381	187,010	290,608	163,070
1999	277,763	177,037	305,382	163,635

Source: Kentucky Lottery, Annual Reports, various years.

Note: Instant games consist of pull-tab and scratch off games. On line games are pick 3, pick 4, Cash 5, and the two lotto games.

eligible for KEES awards based on preliminary information from the 1999-2000 school year. If all students were eligible for the maximum award, this would translate into an annual grant to Marshall County students of \$9.4 million. Estimated actual KEES grants were \$325 per student, per year of high school for the base amount (KHEAA estimates). Additionally, bonus amounts to Marshall County students average \$210 per year. Thus, the estimated average grant to a Marshall County student is \$1,510 per year of college. If the number of Marshall County graduates in post-secondary school is stable at 940 per year, annual KEES payments to Marshall County students would be \$1.42 million. Estimated gross profits (sales minus estimated payouts) from Kentucky Lottery tickets sold in Marshall County in fiscal year 2000 were approximately \$1.24 million.<sup>33</sup> It would appear from these numbers that the KEES scholarship program may cause the lottery to actually represent a net gain to Marshall County in that more money will flow into Marshall County as

a result of the scholarship than flows out of Marshall County in lottery profits. It is not clear however that KEES payments would reach this level. There are several reasons why the KEES grants may be lower. Most of these reasons would reduce the number of Marshall County students receiving KEES money, or would reduce the amount of time for which they could receive KEES money. First, not all students who are eligible for KEES money will move on to post-secondary education. Second, some proportion of the students may enroll in vocational programs of less than four years. Third, not all students who graduate from Marshall County High School would choose to enroll in a Kentucky institution. (It should be pointed out that if the student transfers back into Kentucky, they are able to receive KEES money in accordance with the eight semester/five year rule). Finally, students must maintain a 2.5 grade point average during their first two years of post-secondary school, and a 3.0 grade point average after this time, so it is anticipated that not all students would

**TABLE 7**  
**KEES Awards in Marshall County**  
(Dollar award at midpoint of GPA range in parentheses)

	Number of Students	Percentage of Students	Estimated Percentage of KEES Base Awards
<b>1998-1999</b>			
<i>Ninth Grade</i>			
GPA ≥4.0 (\$500)	19	4.5%	11.5%
3.5 ≤ GPA < 4.0 (\$437)	72	17.1	38.1
3.0 ≤ GPA < 3.5 (\$312)	94	22.3	35.5
2.5 ≤ GPA < 3.0 (\$187)	66	15.6	15.0
GPA < 2.5	171	40.5	0
<i>Tenth Grade</i>			
GPA ≥4.0 (\$500)	27	8.9	20.2
3.5 ≤ GPA < 4.0 (\$437)	44	13.2	28.8
3.0 ≤ GPA < 3.5 (\$312)	71	21.3	33.1
2.5 ≤ GPA < 3.0 (\$187)	64	19.2	17.9
GPA < 2.5	127	38.1	0
<i>Eleventh Grade</i>			
GPA ≥4.0 (\$500)	33	10.5	23.4
3.5 ≤ GPA < 4.0 (\$437)	70	22.3	43.5
3.0 ≤ GPA < 3.5 (\$312)	63	20.1	27.9
2.5 ≤ GPA < 3.0 (\$187)	43	13.7	11.4
GPA < 2.5	105	33.4	0
<i>Twelfth Grade</i>			
GPA ≥4.0 (\$500)	42	14.3	25.2
3.5 ≤ GPA < 4.0 (\$437)	69	23.5	35.4
3.0 ≤ GPA < 3.5 (\$312)	84	28.6	30.8
2.5 ≤ GPA < 3.0 (\$187)	39	13.3	10.4
GPA < 2.5	60	20.4	0
<b>1999-2000</b>			
<i>Ninth Grade</i>			
GPA ≥4.0 (\$500)	13	3.4%	8.9%
3.5 ≤ GPA < 4.0 (\$437)	61	16.0	36.4
3.0 ≤ GPA < 3.5 (\$312)	75	19.7	32.0
2.5 ≤ GPA < 3.0 (\$187)	89	23.4	22.8
GPA < 2.5	143	37.5	0
<i>Tenth Grade</i>			
GPA ≥4.0 (\$500)	24	6.5	14.7
3.5 ≤ GPA < 4.0 (\$437)	67	18.2	36.0
3.0 ≤ GPA < 3.5 (\$312)	88	23.9	33.8
2.5 ≤ GPA < 3.0 (\$187)	67	18.2	15.4
GPA < 2.5	122	33.2	0
<i>Eleventh Grade</i>			
GPA ≥4.0 (\$500)	18	6.2	14.4
3.5 ≤ GPA < 4.0 (\$437)	42	14.5	29.4
3.0 ≤ GPA < 3.5 (\$312)	68	23.4	34.0
2.5 ≤ GPA < 3.0 (\$187)	74	25.5	22.2
GPA < 2.5	88	30.3	0
<i>Twelfth Grade</i>			
GPA ≥4.0 (\$500)	16	5.4	9.6
3.5 ≤ GPA < 4.0 (\$437)	107	36.1	55.9
3.0 ≤ GPA < 3.5 (\$312)	69	23.3	25.8
2.5 ≤ GPA < 3.0 (\$187)	39	13.2	8.7
GPA < 2.5	65	22.0	0

Note: Percentages may not add to one due to rounding.  
Source: Data supplied by Marshall County High School.

actually receive their full allotment of KEES money. Information provided by the Financial Aid office at Murray State University indicates that 46.8% of Murray State students were not eligible for a second year of KEES money. Statewide, 41% of students were not eligible for a second year of funding. Additionally, given the increase in required cumulative grade point average, it is likely that many students who meet the requirement in their first two years will cease to receive KEES money after their second year.<sup>34</sup> Since the KEES program has just awarded its first payments, a few years will be needed to see the actual amount of money which flows to Marshall County students as a result of this program.

There is also an issue as to whether the KEES program will actually lower the net cost of college. As McPherson and Schapiro discuss, there is uncertainty in the economics literature on how changing the net cost of tuition affects college enrollment.<sup>35</sup> However, the Financial Aid Office at Murray State University indicated that KEES money is counted as part of a student's ability to pay when making financial aid calculations. As a result, the net cost of attending post-secondary schools may not change for the student.

For the 1999-2000 year, the estimated total amount awarded to high school students in the state was \$35,189,000 for the base award and \$5,439,000 in ACT bonus awards. If these numbers continue, this would represent a payment by the state of \$146,195,000 per year in KEES money. This amount represents 92.6% of total lottery contributions to the state. While it is true that actual KEES payments will not meet the promised amounts (for the reasons given in the previous

paragraphs), the KEES program promises to divert a large amount of lottery money which has up until now been added to the general fund. This would indicate that either revenue growth or a new revenue source will need to be found to offset this transfer, or spending on other state programs will need to be reduced.

Even if it turns out that Marshall County receives more in KEES money than they contribute to the state in lottery profits, there is still the issue of the redistributive effects of this type of program which the County may wish to consider. As Borg and Stranahan point out, perhaps a more effective and equitable use of lottery profits in education would be to use lottery money for need based scholarships, so long as this does not displace other financial aid, as opposed to merit based scholarships.

Marshall County High School has summarized the past two years of KEES awards to their students. The summary statistics are found in Table 7. The total base awards to MCHS students was \$355,826 in 1998-99 and \$370,176 in 1999-2000. These numbers would indicate that when KEES is fully implemented, between \$1.423 million and \$1.481 million would flow to Marshall County students from KEES base awards.<sup>36</sup> This is consistent with the estimates given above.

The data sent from MCHS gives a breakdown of the number of students in each grade point average (GPA) range. This data can be used to estimate the distribution of KEES awards. The KEES base award is calculated at the midpoint of the range and is used to estimate the total base awards. The percentage of students in each GPA range is then calculated, as well as the percentage of the KEES money that flows to each



GPA range.<sup>37</sup> As can be observed in the table, much of the KEES money flows to the relatively few students at the top of the grade distribution.

## Policy Implications

Since the lottery is a state activity, there are few direct policy implications for Marshall County in relation to the lottery. The following are some suggestions based upon those factors in the control of Marshall County.

The lottery participation rate in Marshall County is much lower than the statewide participation rate. Perhaps this is because community values of Marshall County discourage gambling. Marshall County opinion leaders may want to continue to influence community beliefs and practices as related to the lottery.

The primary impact of the lottery on Marshall County is the KEES program. Marshall County may wish to do several things in relation to this. As it currently stands, an overwhelming majority of Marshall County High School students receive some KEES money for post-secondary education. As previously mentioned, estimates show that inflow of scholarship money to Marshall County exceeds the outflow of lottery profits. This gap could be widened through continuing awareness efforts to make students aware of the rewards from KEES.

The KEES program does appear to redistribute income in a regressive pattern, both in its funding and its awards. Marshall County may wish to encourage its state legislators to move the KEES program from a merit based program, towards a need based program. While the funding for this program would still be a regressive tax, the regressivity of the benefits would likely

be reduced. In addition, moving towards a need based scholarship program may provide incentives for Marshall County students who are less likely to enroll in post-secondary education or training programs to do so. This would have a positive impact on earnings and productivity in Marshall County.

Finally, it appears that the KEES program is going to require a significant portion of lottery profits which have until now been contributed to the general fund. As a result of this, it is likely that additional state revenue will need to be generated, or current programs will need to be reduced. Marshall County may wish to instruct its legislators to keep watch for these changes in the next legislative session.

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## Endnotes

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1. Charles T. Clotfelter and Philip J. Cook. *Selling Hope: State Lotteries in America*. (Cambridge: Harvard University Press, 1991), chapter 3. See also Charles T. Clotfelter, Philip J. Cook, Julie A. Edell, and Marian Moore. 1999. "State Lotteries at the Turn of the Century: Report to the National Gambling Impact Study Commission."

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2. Clotfelter and Cook, 1991, 41-42.
  3. Source for information on the history of the Kentucky Lottery is "A Chronological History of the Kentucky Lottery Corporation," Revised 4/10/99.
  4. [www.kylottery.com](http://www.kylottery.com)
  5. It is worth noting that popular belief among players is that as the jackpot increases, the odds of winning decrease because of the additional players. While the odds of winning are independent of the number of players, the likelihood that there are multiple winners should increase as more people play.
  6. Kentucky Lottery Corporation, 1988. *Attitudes and Players Survey*, University of Louisville, Urban Studies Institute.
  7. Charles T. Clotfelter and Philip J. Cook. "On the Economics of State Lotteries", *Journal of Economic Perspectives*. 4(1990), 109.
  8. Charles T. Clotfelter. "On the Regressivity of State Operated 'Numbers' Games." *National Tax Journal*, 32(1979), 546.
  9. Charles T. Clotfelter and Philip J. Cook. "Implicit Taxation in Lottery Finance." *National Tax Journal*, 40(1987), 537.
  10. The critical value for the lotto to become progressive was estimated by Clotfelter and Cook to be \$5 million based on data collected in the mid-1980s. It would be expected that this number would be larger in 2000.
  11. Clotfelter and Cook, "Redefining Success", 101.
  12. Ibid, 100.
  13. Mary O. Borg, Paul M. Mason, and Stephen L. Shapiro. "The Cross Effects of Lottery Taxes on Alternative State Tax Revenue." *Public Finance Quarterly* 21(1993): 123-140.
  14. Reported in Ronald C. Fisher, *State and Local Public Finance*, 2<sup>nd</sup> edition (Chicago: Irwin), 481.
  15. Clotfelter and Cook, 1991, 209.
  16. Kentucky Lottery Corporation, 23.
  17. Clotfelter et.al, 1999, 12.
  18. Clotfelter and Cook, 92.
  19. Kentucky Lottery Corporation, 9.
  20. Playing the lottery refers to playing at least once in the 12 month period preceding the survey.
  21. Anne Paine, *Senate Advances Lottery Legislation, Tennessean*, March 31, 2000. See also Drew Sullivan, *Lawmakers Pushing Lottery Bills, Tennessean*, May 11, 1999.
  22. Missouri Lottery Fact Book, revised 12/1/99, 27.
  23. See Charles J. Spindler, "The Lottery and Education: Robbing Peter to Pay Paul?" *Public Budgeting and Finance*, 15(1995): 54-62.
  24. NASPL Sales Survey, found at [www.naspl.org/survey.html](http://www.naspl.org/survey.html).
  25. NASPL, Profit Allocation Transfer to Beneficiaries, FY97-98, [www.naspl.org/profits9798.html](http://www.naspl.org/profits9798.html).
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26. Kentucky Lottery Corporation, 5.

27. U.S. Census Bureau, 1998 State Government Finances.

28. Kentucky Revenue Cabinet, State Revenue, Tax and Non-tax, By Funds, Fiscal Year 1997-98.  
[www.state.ky.us/agencies/revenue/97statisticaltables/table1.htm](http://www.state.ky.us/agencies/revenue/97statisticaltables/table1.htm).

29. The revenue figures reported in Table 5 include all sources of revenue to the state including intergovernmental transfers. This includes sources of revenue to the state not included in the Revenue Cabinet report.

30. This calculation assumes no change in spending patterns with a sales tax increase.

31. Clotfelter 1979, Clotfelter and Cook 1987, 1990.

32. W. Lee Hansen, "Impact of Student Financial Aid on Access," in Joseph Froomkin, ed., *The Crisis in Higher Education*. (New York: Academy of Political Science, 1993), 93.

33. It is assumed that Marshall County residents purchases of lottery tickets in other counties, and non Marshall County residents purchases of lottery tickets with Marshall County cancel each other.

34. To see this, assume a student has completed 30 hours of college credit (their freshman year) with a 2.5 grade point average (GPA). If that student takes 30 hours in their second year, they would need to have a 3.5 GPA in their second year to maintain KEES funding.

35. Michael S. McPherson and Morton Owen Schapiro. "Does Student Aid

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Affect College Enrollment? New Evidence on a Persistent Controversy. " *American Economic Review*, 81(1991): 309-318.

36. It is difficult from the MCHS data to add the ACT bonus amount since students can take the ACT numerous times, but receive KEES money for only their highest score.

37. As an example, in 1998-99, 72 ninth graders had GPAs between 3.5 and 4.0. The midpoint of this range is 3.75, for which the KEES base award is \$437. Multiplying \$437 by the 72 students gives a total award to ninth graders in 1998-99 of \$31,464. A similar calculation is performed for each GPA range and an estimated total KEES award to ninth graders is found. The 72 students in the 3.5 to 4.0 GPA range received 38.1% of the estimated amount of KEES awards to ninth graders.