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SOME FUTURES ARE BRIGHTER THAN OTHERS: THE NET BENEFITS RECEIVED BY FLORIDA BRIGHT FUTURES SCHOLARSHIP RECIPIENTS

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Using a choice-based sample of households in Florida, the authors provide new empirical evidence on the budgetary incidence of lottery-funded merit scholarships. Specifically, they estimate the benefits received from the Florida Bright Futures (FBF) scholarship and the lottery taxes paid for three typical households in Florida. They find that high socioeconomic (SES) households receive a net program benefit of almost $2,200, whereas low SES households incur a net program loss of almost $700. This result obtains because lower SES households tend to pay more in lottery taxes but are less likely to receive scholarships. Also, the lower SES households with members who do receive the FBF scholarship are more likely to receive the 75% partial scholarship (vs. the 100% full scholarship) than the higher SES households. The results indicate that lottery-funded merit scholarships redistribute income from lower income, non-White, and less educated households to higher income, White, well-educated households.

Keywords: *Florida Bright Futures; scholarships; lottery taxes; socioeconomic status*

Forty states and the District of Columbia operate state lotteries, and 20 of those states allocate some part of their lottery tax revenues to education programs. Florida, in addition to being one of those 20 states, is one of a growing number of states that use part of their lottery revenues to fund merit-based college scholarships. Georgia pioneered this trend in 1993 with the introduction of its Helping Outstanding Students Educationally (HOPE) scholarship, and Florida quickly followed suit with the introduction of the Florida Bright Futures (FBF) scholarship in 1997. At the present time, 8 states earmark a portion of their lottery dollars for merit-based scholarships, and Alabama and Tennessee are considering instituting lotteries for the sole purpose of

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funding merit-based scholarships. In Florida, approximately 19% of the state's lottery tax appropriations went to fund the FBF scholarships in 2001-2002.[1] These scholarships provide partial or full tuition to all qualified high school graduates attending public postsecondary institutions in Florida. An equivalent monetary amount of funding is given to qualified students who attend a private postsecondary institution in Florida as well. Most voters see this as a wonderful way to use the proceeds from lottery revenues, and this has now become a very popular program.

However, using lottery tax dollars to fund merit-based college scholarships is likely to have an inequitable effect on the distribution of income. Studies on educational achievement suggest that parents' levels of education, parental income, marital status, and ethnicity are among the most significant predictors of a student's success in the classroom and on standardized tests. If the FBF program is like other merit-based scholarship programs, then students from higher socioeconomic households are most likely to receive program benefits. On the other hand, numerous lottery studies have shown that lower socioeconomic households pay proportionately more of their income in lottery tax. In essence, public-sector economists fear that the vast majority of taxes that fund this program come from lower socioeconomic households, whereas the benefits are distributed largely to those in higher socioeconomic households. This is the public policy issue that we wish to explore in this article.

Because the FBF scholarships are relatively new, no published research has yet explored this issue. However, several recent studies have examined Georgia's HOPE scholarship. Dynarski (2000) examined the enrollment effects of the HOPE scholarship. Using aggregate enrollment data, she found that the HOPE scholarship had a large impact on the in-state college attendance rates of middle- and upper-income students in Georgia compared to the same set of students in surrounding states without lottery-funded scholarships. Dee and Jackson (1999) examined the determinants of losing the HOPE scholarship after the student's freshman year. About half of their sample of students from Georgia Tech University lost their scholarships after the first year, and the most significant predictor of who would lose the scholarship had nothing to do with race, ethnicity, or income—it was choice of major. Students planning to major in science, engineering, or computer science were much more likely to lose their scholarships. Henry and Rubenstein (2002) examined the impact that the HOPE scholarship has on high school performance. They found that African American students with a 3.1 high school grade point average (GPA) have increased their average score on the Scholastic Aptitude Test (SAT) by more than 20 points since the introduction of the HOPE scholarship program. It seems that the promise of a college scholarship has motivated these students to work harder.

Although interesting, none of these previous studies has examined the distributional effects of the scholarships coupled with the tax that funds them. Using a choice-based sample of households in Florida, we provide new empirical evidence on the budgetary incidence of the FBF scholarship program. Specifically, we estimate the benefits received from the FBF scholarship as well as the lottery taxes paid for three typical households in Florida. We do this by estimating lottery purchases for the household as well as the probability that the household has a member who receives a FBF scholarship. We use these predictions to infer the equity consequences of the FBF program.

LITERATURE REVIEW

As mentioned, there are no previously published studies that examine the budgetary incidence of lottery-funded merit scholarships. However, a lengthy literature examines the two separate veins of research necessary for studying lottery-financed merit scholarships—the distributional effect of the tax inherent in the purchase of a lottery ticket and the distributional effect of the benefits received from the state's subsidization of higher education.

The regressivity of the lottery tax is universally documented in the economic literature about lotteries (Borg and Mason 1988; Borg, Mason, and Shapiro 1991; Brinner and Clotfelter 1975; Clotfelter 1979; Clotfelter and Cook 1987, 1989; Heavey 1978; Koza 1982; Livernois 1987; Spiro 1974; Stranahan and Borg 1998a, 1998b; Suits 1977; Vaillancourt and Grignon 1988). This regressivity results because even if lottery purchases increase as income increases, they increase at a much smaller rate than the increase in income. Therefore, research conclusively shows that low-income households spend a greater percentage of their income on lottery tickets, and thus they bear a greater percentage of the tax that is inherent in the price of a lottery ticket.

Hansen and Weisbrod's (1969a, 1969b) seminal work on the three-tiered system of higher education in California was the first to show that the distribution of benefits received from state-supported higher education was skewed toward households with high median incomes. Since the publication of their work, many other empirical studies have documented similar results both in the United States (Bishop 1977; Radner and Miller 1970; Peltzman 1973; Jackson and Weathersby 1975) and in developing nations (Mayanja 1998; Psacharopoulos 1986). This result persists because the probability that a student will go to college, especially to a premier college such as those in the University of California system, is highly dependent on family income (Bishop 1977; Campbell and Siegel 1967; Ellwood and Kane 1999; Hoenack 1967; Hopkins 1974; Jackson and Weathersby 1975; Mare 1980; Peltzman 1973).

Taken together, these empirical studies suggest that households with the lowest income are the *least* likely to have children that go to college. In addition, these same households are likely to spend a disproportionate amount of their income on lottery tickets. Combining these results with the results from lottery studies leads one to infer that the households that spend the most on the lottery are the same households that are least likely to send children to college and thus receive the benefits of lottery-funded college scholarships. However, this has not been tested empirically.

DATA AND METHOD

In this study, we calculate the budgetary incidence of the FBF scholarship. Our study uses survey information from a sample of 2,459 households in Florida. We combine data from two sources to arrive at our final data set. We gathered data from a mail survey to FBF recipients during the summer and fall of 1999. We sent 2,000 surveys to the families of FBF recipients attending the University of North Florida (UNF), a state university, and Jacksonville University, a private college, which has a similar mission to UNF. We included the private university because the FBF scholarship is also available to students attending private in-state colleges.

Of the 1,260 returned mail surveys, 1,049 households had no missing data. We combined these data with data obtained from a random telephone survey covering all of Florida. The telephone survey included the same questions as the mail survey. The Florida Bureau of Economic and Business Research conducted the phone survey in November and December of 1998. The sample for the phone survey was chosen randomly based on population densities within each county. A total of 2,014 observations were collected, and 1,410 respondents remained after eliminating all observations with missing data. Table 1 gives a description of the variables contained in the combined sample of 2,459 observations.

Table 2 presents the demographic makeup of these households, showing the variable means for each of the two samples and the combined sample. The means for the FBF sample, the all-Florida sample, and the combined samples are in columns 1, 2 and 3, respectively. These numbers show that the families of FBF recipients are more likely to be non-Black and non-Hispanic to live in urban areas, to have higher household incomes, and to have more highly educated parents than families in the sample of Florida as a whole. These results are consistent with other studies examining the determinants of children's educational attainment. Table 2 also shows that the average amount spent on lottery products does not seem appreciatively different across samples. Households from both samples spend about $15 per month on Lotto and all other games combined.

The budgetary incidence of the lottery tax is calculated by estimating how much a typical family spends on the lottery (38% of which is their tax burden) and then how much a typical family benefits from the FBF program funded by lottery taxes. First, we estimate a Tobit regression that allows us to predict the amount of lottery expenditures for households from three different socioeconomic backgrounds. From these estimated expenditures, we then calculate the amount that each of the three households can expect to pay in lottery taxes in 1 year and over the remaining lifetimes of the household heads.

TABLE 1: Variable Descriptions

Age	Age of the male head of household, unless none exists, in which case this records the age of the female head of household.
White	Dummy variable that equals 1 if the household is Caucasian, 0 otherwise.
Black	Dummy variable that equals 1 if the household is African American, 0 otherwise.
Hispanic	Dummy variable that equals 1 if the household is Hispanic, 0 otherwise.
Other	Dummy variable that equals 1 if the household is any other ethnicity, 0 otherwise.
Rural	Dummy variable that equals 1 if the household lives in a rural area, 0 otherwise.
City	Dummy variable that equals 1 if the household lives in a city with a population more than 100,000, 0 otherwise.
Suburb	Dummy variable that equals 1 if the household lives in a small city or suburb of a large city, 0 otherwise.
Married	Dummy variable that equals 1 if the head of household is married, 0 otherwise.
Widowed	Dummy variable that equals 1 if the head of household is widowed, 0 otherwise.
Divorced	Dummy variable that equals 1 if the head of household is single or divorced.
Less than high school	Dummy variable that equals 1 if the male head of household's highest educational attainment is less than a high school education, 0 otherwise. This records the female head of household's education level if no male head of household exists.
High school graduate	Dummy variable that equals 1 if the male head of household's highest educational attainment is high school graduate, 0 otherwise. This records the female head of household's education level if no male head of household exists.
Some college/ community college	Dummy variable that equals 1 if the male head of household's highest educational attainment is some college or community college graduate, 0 otherwise. This records the female head of household's education level if no male head of household exists.
College graduate	Dummy variable that equals 1 if the male head of household's highest educational attainment is college graduate, 0 otherwise. This records the female head of household's education level if no male head of household exists.
Postgraduate work	Dummy variable that equals 1 if the male head of household's highest educational attainment is some postgraduate work or a postgraduate degree, 0 otherwise. This records the female head of household's education level if no male head of household exists.
Blue-collar	Dummy variable that equals 1 if the head of household has an occupation identified as blue-collar or hourly worker.
Income less than 20K	The household income of the Florida Bright Futures (FBF) recipient is less than $20,000.

(continued)

TABLE 1 (continued)

Income 20-40K	Household income is between $20,000 and $40,000.
Income 40-60K	Household income is between $40,000 and $60,000.
Income 60-80K	Household income is between $60,000 and $80,000.
Income more than 80K	Household income is greater than $80,000.
Household size	Number of people in the household
Employed	Dummy variable, which equals 1 if the male head of household is currently employed. This records the female head of household's employment status if no male head of household exists.
Monthly Lotto expenditure	Monthly household expenditure on the Lotto game
Monthly expenditure on all other games	Monthly household expenditure on all games except Lotto. These include Fantasy 5, Play 4, Cash 3 (these are all daily games), and instant games (scratch-off tickets).
BF	Dummy variable that equals 1 if an 18- to 24-year-old in the household holds a Bright Futures (BF) scholarship.

Next, to estimate predicted benefits from the FBF scholarship program, we estimate a multinomial logit model using a sample of households who have someone who is college age (18 to 24 years old) and would be eligible to receive a FBF scholarship. This model estimates the probability of a typical household receiving a 75% scholarship, a 100% scholarship, or no scholarship.

Our sample, which combines a random sample from all Florida counties with a sample of just FBF recipients, contains an oversampling of FBF scholars by its design. Oversampling is a strategy frequently used to focus in on a particular group of interest. (For example, the National Longitudinal Survey of Youth oversampled military personnel, enabling researchers to closely study their personal and work experiences.) Following the most common method of handling samples of this type, we use weighted least squares to correct for the oversampling (Manski and McFadden 1981). This results in unbiased coefficient estimates that reflect the population as a whole.

We calculate the FBF scholarship benefits that accrue to households from different socioeconomic backgrounds by multiplying the

TABLE 2: Descriptive Statistics

	Bright Futures Scholars		*All of Florida*		*Combined Samples*	
Variable	*Mean*	*Standard Deviation*	*Mean*	*Standard Deviation*	*Mean*	*Standard Deviation*
Age	48.91	6.19	47.12	16.99	47.88	13.52
White	.894	.304	.778	.303	.829	.42
Black	.038	.190	.089	.284	.067	.250
Hispanic	.021	.143	.095	.293	.063	.244
Other	.047	.211	.038	.190	.041	.199
Rural	.078	.269	.206	.405	.152	.359
City	.459	.499	.314	.464	.376	.484
Suburb	.463	.499	.479	.499	.472	.499
Married	.858	.349	.562	.496	.688	.463
Widowed	.016	.126	.072	.259	.048	.215
Divorced	.126	.332	.190	.392	.163	.369
Less than high school	.018	.134	.059	.235	.041	.199
High school graduate	.149	.356	.282	.450	.225	.418
Some college/community college	.339	.474	.308	.462	.321	.467
College graduate	.277	.448	.193	.395	.229	.420
Postgraduate work	.215	.411	.159	.366	.183	.387
Income less than 20K	.042	.203	.164	.371	.112	.316
Income 20-40K	.142	.350	.314	.464	.241	.428
Income 40-60K	.256	.435	.264	.441	.260	.439
Income 60-80K	.231	.421	.182	.386	.202	.402
Income more than 80K	.324	.468	.076	.265	.182	.386

Household size	3.94	1.05	2.70	1.47	3.23	1.44
Employed	.838	.369	.624	.484	.715	.451
Monthly Lotto expenditure	9.77	20.00	7.532	17.09	8.49	18.42
Monthly expenditure on all other games	5.39	16.74	7.93	29.92	6.85	25.19
Number of observations	1,049		1,410		2,459	

NOTE: For definitions of variables, see Table 1.

TABLE 3: Tobit Estimates for Lotto and All Other Games Expenditures

Independent Variable (1)	*Lotto Coefficient Estimates (Standard Errors) (2)*		*All Other Games Coefficient Estimates (Standard Errors) (3)*	
Constant	–24.21***	(4.03)	–60.92***	(9.63)
Age	0.184***	(0.055)	0.22*	(0.129)
Hispanic	2.444	(2.576)	–1.61	(6.26)
Black	–6.70**	(2.73)	15.08***	(5.79)
Other race	8.69***	(3.02)	36.47***	(6.55)
Married	3.77**	(1.63)	6.27	(3.84)
City	0.126	(1.26)	–1.74	(3.04)
Blue-collar	2.45	(1.88)	13.73***	(4.34)
Employed	4.72***	(1.59)	3.03	(3.79)
Household size	0.008	(0.505)	–0.033	(1.18)
Less than high school	4.13	(3.41)	20.23***	(7.49)
High school graduate	4.75***	(1.73)	10.99***	(4.07)
Some college/community college graduate	5.49***	(1.49)	4.09	(3.63)
Income 40-60K	5.97***	(1.72)	–1.66	(4.02)
Income 60-80K	6.24***	(1.93)	–2.35	(4.56)
Income more than 80K	6.54***	(2.13)	–11.19**	(5.22)
Sigma	27.38***	(0.56)	56.42***	(1.67)
N	2,459		2,459	

NOTE: For definitions of variables, see Table 1.
*Significant at .10. **Significant at .05. ***Significant at less than .01.

probability of receiving a scholarship (from the multinomial logit) by the amount of the scholarship. We then calculate the net present value of the benefits received from the FBF scholarship for these households by subtracting the present value of the lifetime lottery taxes paid from the present value of the monetary benefit received from the FBF scholarship. This estimated net present value approach shows how the costs and benefits of the FBF program differ among demographic groups. It also provides a clearer picture of the equity consequences of the FBF scholarship and other similar lottery-funded merit scholarships currently under way or being proposed in other states.

ESTIMATED MODELS OF LOTTERY EXPENDITURES

The Tobit models used to predict the lottery expenditures of households in our combined sample are shown in Table 3. We estimate separate models for Lotto expenditures and expenditures on all other lottery games (Pick 3 and Pick 4 daily numbers games, instant scratch-off games, and the daily Fantasy Five game). We separate these because researchers have found that Lotto is less regressive than the other games and generally appeals to a different clientele than other lottery games (Mikesell 1989; Stranahan and Borg 1998b).

Table 3, column 2 shows the estimated coefficients for the Tobit model of household Lotto expenditures. A majority of coefficients are highly significant in the Tobit regression and indicate that older, married, and employed heads of households have higher Lotto expenditures than their younger, unmarried, and unemployed counterparts. We also find that Caucasians spend more on Lotto than African Americans as a group but less than households included in the other race category, which includes Asians, American Indians, and other ethnicities. We find that households with heads who are high school graduates or have some college tend to spend more on Lotto than households with heads who are college graduates or have completed some postgraduate education. Consistent with other studies showing that Lotto leads to a less regressive tax, the coefficients on the income dummy variables indicate that households with incomes below $40,000 spend statistically less on Lotto than households falling into all higher income categories.

Table 3, column 3 shows the estimated coefficients for the Tobit model of household expenditures on all lottery games other than Lotto. These results indicate that African Americans and households in the other race category spend significantly more on these products than Caucasian households. We also find that older and blue-collar households have higher expenditures on these scratch-off and numbers games. The results also show that households in the lowest education categories (high school graduate and less than high school graduate) spend significantly more on these games than households with higher levels of education. In addition, households in the highest income category spend significantly less on non-Lotto games than households with incomes below $40,000, which leads to the increased regressivity of the tax inherent in these games.

We have used the estimated Tobit models to predict the amount that three typical households will spend on the lottery in a year. We then take 38% of their total expenditures, which represents the tax portion of their lottery expenditures, and assume that the household will continue to spend that same amount on lottery taxes over the remaining life expectancy of the household head.[2] Assuming a discount rate of 6.16%,[3] we then calculate the discounted present value of the future lottery tax receipts for these households.

We have created the three typical households by putting specific values of the independent variables into the estimated lottery equations. The first typical household is the sample average and is created by putting the sample mean value of each of the independent variables into the estimated models. The second household is the lower socioeconomic status (SES) household. The relevant values of the independent variables for that household are the following: employed 48-year-old African American, single-household head, urban residence, blue-collar occupation, high school graduate, household size of three, and household income in one of the lowest two income categories (the omitted categories). The third household is the high SES household that has the following values for the independent variables: 48-year-old Caucasian, married household head, suburban residence, employed college graduate, household size of four, and household income in the highest category.

Table 4 shows that the lottery taxes paid by the high and low SES households are quite different for non-Lotto games. Lower SES households pay $83.01 per year in taxes on the non-Lotto lottery games compared to only $24.67 per year in taxes on non-Lotto games paid by the high SES households. Lower SES households pay somewhat less in Lotto excise taxes, $30.32 per year compared to $49.11 per year for the high SES household. However, the lower amount they pay in lotto taxes is not enough to counteract the greater amount that they pay in other lottery game taxes. The differences in these yearly amounts are compounded when we calculate the lifetime total of taxes paid by both groups. Differences such as these between the taxes paid on Lotto and the taxes paid on non-Lotto games are the reason why other studies have found Lotto to be less regressive than other lottery games.

TABLE 4: Predicted Annual Tax Receipts and Lifetime Tax Receipts From Other Games, Lotto, and Total Lottery for Florida Bright Futures Recipients

	Lotto		*Other Games*		*Total Lottery*	
	Annual Lottery Tax(12 months • .38 tax rate = 4.56) (1)	*Present Value of Lifetime Lotto Tax (2)*	*Annual Lottery Tax, All Other Games (3)*	*Present Value of Lifetime All Other Games Tax (4)*	*Annual Lottery Tax, All Lottery Games (5)*	*Present Value of Total Lifetime Lottery Tax (6)*
Sample average	\$9.94 • 4.56 = \$45.33	\$624.54	\$37.71	\$519.61	\$83.04	\$1,144.04
Lower socioeconomic status (SES)	\$30.32	\$417.83	\$83.01	\$1,143.84	\$113.33	\$1,561.39
Higher SES	\$49.11	\$676.69	\$24.67	\$339.92	\$73.78	\$1,016.44

TABLE 5: Multinomial Logit Marginal Effects: No Scholarship, 75% Florida Bright Futures (FBF) Scholarship, and 100% FBF Scholarship

Independent Variable	*No Scholarship*		*75% Scholarship*		*100% Scholarship*	
Constant	0.877***	(0.056)	–0.522***	(0.008)	–0.354***	(0.093)
Age	–0.003***	(0.0009)	0.002***	(0.0001)	0.001	(0.001)
White	–0.153***	(0.018)	0.082***	(0.003)	0.069***	(0.026)
Single/divorce	0.109***	(0.016)	–0.065***	(0.002)	–0.044**	(0.022)
City	–0.121***	(0.011)	0.075***	(0.002)	0.045**	(0.015)
Blue-collar	–0.016	(0.016)	–0.014***	(0.002)	–0.002	(0.018)
Employed	–0.112***	(0.015)	0.069***	(0.002)	0.042**	(0.019)
Household size	–0.044***	(0.003)	0.027***	(0.0005)	0.017***	(0.005)
Some college/ community college graduate	–0.034**	(0.016)	0.026***	(0.002)	0.007	(0.019)
College graduate	–0.057***	(0.017)	0.024***	(0.003)	0.033	(0.021)
Postgraduate work/ degree	–0.008	(0.018)	–0.015***	(0.003)	0.023	(0.022)
Income 60-80K	–0.011	(0.014)	0.005**	(0.002)	0.005	(0.016)
Income more than 80K	–0.109***	(0.015)	0.081***	(0.002)	0.028*	(0.017)

NOTE: Number of observations = 1,304. For definitions of variables, see Table 1.
*.05 ≤ p < .10. **.01 ≤ p < .05. ***p < .01.

ESTIMATED BENEFITS FROM THE BRIGHT FUTURES SCHOLARSHIP

To calculate the expected benefits of the FBF scholarship program, we first estimate a multinomial logit regression (see Table 5) for households receiving a 75% FBF scholarship, a 100% FBF scholarship, or no FBF scholarship. Using these results, we estimate the probability of these three outcomes for the lower SES, higher SES, and sample average households (see Table 5). The expected scholarship benefit for any one of these households is the probability of receiving the FBF scholarships times the dollar value of the 1-year benefit. Finally, we calculate the expected benefits of receiving the FBF scholarships for up to 4 years for each of the three households (see Table 7).

The 100% FBF scholarship goes to any student who graduates from a Florida high school with a 3.5 GPA and a 1270 SAT score or a 28 ACT score. Students who graduate with a 3.0 GPA and a 970 SAT or 20 ACT receive the 75% FBF scholarship. The full scholarship pays 100% of the tuition and fees at a Florida State University System

(SUS) university or a state community college in addition to giving the student a $600 educational allowance. The partial scholarship pays 75% of the tuition and fees at a state university, vocational school, or community college. An equivalent amount is given to students entering a private university in Florida.

Table 5 shows results of the multinomial logit. Because qualification for the scholarship depends on the student's high school GPA and SAT scores, we would expect these results to be theoretically consistent with much of the literature on student educational achievement.

The results indicate that race is an important predictor of the probability of receiving a scholarship. Caucasian households have a higher probability of receiving both a 75% and a 100% FBF scholarship than students in African American or Hispanic households. This is consistent with studies that indicate that African Americans and Hispanics have lower standardized test scores than Caucasians, on average (Jencks and Phillips 1998). The results also suggest that children who come from larger households and households in which the parents are married, older, and employed have a higher probability of receiving a partial or full FBF scholarship. Other studies have also shown the importance of family structure on education attainment. For example, Mare (1980) found that children growing up in households with a single parent have lower educational achievement, on average.

Also consistent with other studies, our results show that higher levels of parental income and education are strong predictors of children's education attainment. Children from households making more than $80,000 per year have a statistically higher probability of receiving both a 100% and 75% FBF scholarship than children from households in all lower income categories. Also, children who have a parent who is a college graduate, or at least some college experience, are statistically more likely to get a FBF scholarship than children whose parents are less educated.

The higher SES, lower SES, and average SES households in the multinomial logit model use the same values for the independent variables that were used in the Tobit model of lottery expenditures. The results for the sample mean household show scholarship probabilities that reflect a representative or average household in Florida. The figures in Table 6 show that the children growing up in a higher SES versus a lower SES household have very different prospects for receiving FBF scholarships. For example, a child growing up in the higher SES household has a 16.7% chance of making the GPA and SAT score that will earn him or her a full FBF scholarship and a 28.2% chance of getting a partial FBF scholarship. This is in contrast to a child growing up in a lower SES household, who has only a 3.3% chance of getting a full ride and 9.3% chance of getting a 75% FBF scholarship. These results clearly indicate that the distribution of scholarships is not neutral with respect to socioeconomic class. Indeed, higher SES households are more than four times as likely to obtain a state-funded scholarship for higher education. In particular, we find that demographic characteristics are strong predictors of who will receive a full scholarship, partial scholarship, or no scholarship at all.

Not surprisingly, these results translate into lower expected FBF benefits for lower SES households, as shown in Table 6. The amount of dollar benefit for 1 year of the FBF scholarship is calculated as the probability of receiving a scholarship times the expected amount of the scholarship for 1 year. The average dollar value for the full 100% scholarship is $2,834.00 per year, whereas the 75% scholarship is worth an average of $1,676.00 per year.[4] Figures in Tables 6 and 7 show that the expected benefit from the FBF program is much larger for a higher SES household than for a lower SES household.

In Table 6, we multiply the probability of receiving the full and the partial FBF scholarship by the expected amount of monetary benefit for each household type. This gives us the expected amount of benefit for each scholarship (not household) type, assuming that the FBF scholarship is received for 1 year. In Table 7, we calculate the amount of benefit for households who receive the scholarship for 2 to 4 years by multiplying the average dollar value of the scholarship by the appropriate number of years and taking the present value of that amount.[5] The results show that in Florida, a higher SES household with at least one college-age child can expect to receive about $945.91 per year in FBF benefits compared to only $249.39 for the low SES households. The expected benefits of the program clearly favor higher SES households. In fact, the ratio of higher SES to lower SES benefits is more than 3 to 1, assuming that both households maintain the scholarship for the same number of years. If the lower SES household has a

TABLE 6: Predicted Probability of Receiving a Florida Bright Futures (FBF) Scholarship by Household Type

Type of Household	*Probability of Receiving No Scholarship*	*Probability of Receiving a 75% Scholarship*	*Probability of Receiving a 100% Scholarship*	*Expected Annual Benefit*
Sample average	.734	.173	.092	$0.00 • .734 + $1,676.00 • .173 + $2,834.00 • .092 = $550.68
Lower socioeconomic status (SES)	.873	.093	.033	$0.00 • .873 + $1,676.00 • .093 + $2,834.00 • .033 = $249.39
Higher SES	.551	.282	.167	$0.00 • .551 + $1,676.00 • .282 + $2,834.00 • .167 = $945.91

TABLE 7: Present Value of the Expected Benefits Received From the Bright Futures Scholarship

Type of Household	*Expected Benefit, 1-Year Scholarship*	*Present Value of Expected Benefit for a 2-Year Scholarship*	*Present Value of Expected Benefit for a 3-Year Scholarship*	*Present Value of Expected Benefit for a 4-Year Scholarship*
Sample average	$550.68	$1,006.46	$1,466.78	$1,900.39
Lower socioeconomic status (SES)	$249.39	$455.32	$663.82	$860.22
Higher SES	$945.91	$1,729.46	$2,520.13	$3,264.92

TABLE 8: Predicted Net Benefits Received From the Florida Bright Futures Scholarship

Type of Household	*Expected Benefits Received From 4-Year Scholarship (1)*	*Predicted Lifetime Lottery Taxes Paid (2)*	*Net Benefits Received From a 4-Year Scholarship (1) – (2)*
Sample average	$1,900.39	$1,144.04	$756.35
Lower socioeconomic status (SES)	$860.22	$1,561.39	–$701.17
Higher SES	$3,264.92	$1,016.44	$2,248.48

greater probability of losing the scholarship after 1 or 2 years (a likely scenario), then the inequity would be greater.

COMPARING THE BENEFITS FROM THE FBF SCHOLARSHIP TO LOTTERY TAX RECEIPTS

To determine whether the households whose children receive the FBF scholarships are paying their own way or are receiving income transfers from other lottery players, we have calculated the net benefits of the FBF scholarships. These amounts are shown in Table 8. The table shows very clearly that the higher socioeconomic status households get a larger expected benefit from a 4-year FBF scholarship than they will pay in lifetime lottery taxes. This is not the case for the lower socioeconomic status households. They can expect to pay more in lottery taxes than they will receive in expected benefits, even if their children keep the scholarship for all 4 years. In Florida, the higher SES households receive a positive net benefit of $2,248.48 compared to a negative net benefit (i.e., a net tax) of $701.17 for the lower SES household. The sample's average household can expect to receive a positive net benefit of $756.35. These estimates suggest that a lottery-funded, merit-based scholarship program results in a transfer of wealth from the lower socioeconomic classes to the higher socioeconomic classes in Florida—a reverse Robin Hood effect.

CONCLUSIONS AND POLICY RECOMMENDATIONS

This research suggests that combining the lottery tax with a merit-based educational subsidy results in greater gains to higher income and higher socioeconomic status households. We find that high SES households receive a net program benefit of more than $2,200, but low SES households have a *net program loss* of more than $700. This result obtains because lower SES households tend to pay more lottery tax but are less likely to receive any type of scholarship. Also, the lower SES households who do receive the scholarship are more likely to receive the 75% partial scholarship (vs. the 100% full scholarship) than the higher SES households are. We find that higher SES households can expect to receive more from 2 years of the FBF scholarship than they will pay in lottery taxes over a lifetime.

Probably the most important finding of this research is that children growing up in households in which the parents are married, well educated, and White and have higher incomes are much more likely to receive FBF scholarships. These are exactly the same demographic characteristics that decrease lottery expenditures and therefore lottery taxes. Although many economists had expected these results, our empirical research is the first to estimate merit-based scholarship benefits and use them in a joint analysis to confirm that this is indeed the case. The adverse effect on the distribution of income that these scholarship programs produce should cause policy makers to reexamine these programs. Simple changes in the way in which these scholarships are awarded can make significant improvements in their distributional effects. For example, states could use a portion of their lottery revenues to support scholarships that are purely need based and have no high school GPA or standardized test score minimums required of the students.

In recent years, the anti-poverty focus of education policy has all but disappeared. Need-based programs were wholly or greatly reduced during the 1990s. Student loans are the primary source of financial aid, even for the lowest income groups. At the same time, we have seen a rapid increase in the growth of state lotteries as a means of raising revenues so that 38 states and the District of Columbia now have lotteries. The conjoining of these two trends has resulted in politically popular but clearly inequitable lottery-funded merit scholarships.

NOTES

1. This percentage was calculated from the numbers found on the Florida Lottery's Web page (www.flalottery.com/lottery/edu/edufund.html).

2. The average age of the household head in our sample is 47.8 years. The majority of these heads are males, although some are female. Therefore, we have chosen to use the remaining life expectancy for both sexes at the age of 47 to 48, which is 31.6 years (Life Tables, 1997, Center for Disease Control, www.cdc.gov/nchs/data/series/sr_02/sr02_129.pdf).

3. The 6.16% rate is the average yield on long-term government bonds from 1947 to 1998, a period of time equivalent to the discounting period (31.5 years).

4. Average monetary awards for each type of scholarship are published on the Florida Bright Futures Web site (http://www.firn.edu/doe/brfutures/bffacts.htm).

5. Once again, we assume a discount rate of 6.16%.

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