The Reverse Robin Hood Effect: The Distribution of Net Benefits From the Florida Bright Futures Scholarship

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Using data compiled by the Florida Lottery Commission that reports the total dollars received by each of the 67 counties for Florida Bright Futures (FBF) Scholarships, combined with county demographic data from the 2000 Census, we estimate a model of the distribution of FBF scholarships by county. In addition to examining the incidence of the benefits received by each Florida County for FBF scholarships, we also examine the budgetary incidence of the FBF scholarships by subtracting each county's lottery revenues from the amount of FBF scholarship dollars received. We examine the relationship between county income levels, education levels and race distributions and the net amount of Florida Bright Futures Scholarship dollars received. We find that counties with higher percentages of well-educated and high income households receive a disproportionately large share of the net benefits from the FBF scholarship. A geographical analysis shows that the counties with the highest levels of net benefits are well dispersed throughout the state, contributing to the wide-spread popularity of the program.

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Introduction

Florida is one of a growing number of states that use a portion of their lottery revenues to fund merit-based college scholarships. Georgia pioneered this trend in 1993 with the introduction of their 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, eight of the 40 states with lotteries earmark a portion of their lottery dollars for merit-based scholarships. Ironically, five of these eight states are in the southeast United States where religious objections to gambling are the strongest. In spite of religious opposition, it seems that many of these states feel a keen need to provide these merit-based lottery scholarships in order to compete with surrounding states. In Alabama, an effort to reintroduce a lottery to support merit-based college scholarships is gaining momentum in spite of the voters having defeated a similar ballot initiative in 1999.

In 2004-2005, approximately 18% of Florida's lottery tax appropriations went to fund the merit-based FBF scholarships, while only 1.7% of the state's lottery appropriations went to fund need-based financial aid.[1] FBF scholarships provide partial or full tuition to all qualified high school graduates attending public post-secondary institutions in Florida.[2] An equivalent monetary amount of funding is given to qualified students who attend a private post-secondary institution in Florida, as well. There is no doubt that these scholarship programs are popular with middle and upper-class voters. Given the political clout of this group of voters, it is likely that merit-based scholarships will be part of the fiscal landscape of these states for the foreseeable future. But should they be?

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

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1 This percentage was calculated from the numbers found on the Florida Lottery's web page, www.flalottery.com.

2 To qualify for the 100% Bright Futures Scholarship, students must have at least a 3.5 high school GPA, at least 75 hours of community service, and a score of at least 1270 on the SAT I or 28 on the ACT. To qualify for the 75% Bright Futures Scholarship, students must have at least a 3.0 high school GPA, at least 75 hours of community service, and at least a 970 SAT I score or a 20 ACT. These criteria are found at http://www.firn.edu/doe/brfutures/acadrequire.htm.

most significant predictors of a student's success in the classroom and on standardized tests (Bishop, 1977; Campbell and Siegel, 1967; Ellwood and Kane, 1999; Hansen and Weisbrod, 1969a, 1969b; Hoenack, 1967; Hopkins, 1974; Jackson and Weathersby, 1975, Mare, 1980; Peltzman, 1973**;** Radner and Miller, 1970). 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 (Borg and Mason, 1988; Borg, et. al., 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; and Vailancourt and Grignon, 1988). In essence, public sector economists fear that the vast majority of taxes that fund this program come from lower socioeconomic households while the benefits are distributed largely to those in higher socioeconomic households, which leads to a reverse Robin Hood effect.

Literature Review

There is a growing body of research that concludes that the reverse Robin Hood effect is indeed a problem when lottery revenues fund merit-based scholarships. Two recent studies have examined Georgia's HOPE scholarship and Florida's Bright Futures scholarship. Rubenstein and Scafidi (2002) estimate the tax incidence of the Georgia lottery combined with the incidence of the benefits of the HOPE scholarship for households in each of Georgia's counties. Their results indicate that lower income and non-white households purchase a disproportionately large number of lottery tickets; whereas, higher income and white households receive a disproportionately large number of HOPE scholarships. They conclude that households that earn $25,000 per year or less receive negative net annual benefits from the lottery funded HOPE scholarship, while households that earn more than $25,000 per year receive positive annual net benefits. Households in the highest income group ($75,000 or more) receive the highest amount of annual net benefits ($384 per year).

Stranahan and Borg (2004) conducted a similar analysis in Florida. Using a choice-based sample of households, they estimated the budgetary incidence for three typical households (high socioeconomic status (SES), low SES, and the sample average household). Rather than estimating *annual* net benefits for households, as Rubenstein and Scafidi did, they estimated the household's lifetime net benefit from the FBF program. Under their assumptions, they found that the sample average household received approximately $756 in net lifetime benefits from the FBF program. In contrast, typical high SES households received $2248 in lifetime net benefits from the FBF program because their scholarship benefits significantly outweighed their lifetime lottery taxes, but typical low SES households lost $701 from the program.

Campbell and Finney (2005) believe that the reverse Robin Hood effect of the HOPE scholarship may be mitigated by local high school grade inflation in the poorer and more African American counties in Georgia. They use a longitudinal data set containing 153 of the 159 counties in Georgia over the period 1996-2002 to estimate a model of HOPE eligibility[3]. After controlling for income and student's educational achievement levels, proxied by the county SAT average and the percentage of students in the county taking the SAT, they find that more students qualify for the HOPE scholarship as the African American percentage of the county's population increases. They interpret this to mean that counties with larger African American populations are inflating their high school grades so that more students will earn the B average necessary for the HOPE scholarship. However, this result could also mean that SAT scores underestimate the academic abilities of African American students who therefore outperform their predicted levels of HOPE eligibility based solely on SAT scores. Regardless of the interpretation, their results are not relevant for Florida since eligibility for the FBF scholarship includes a minimum SAT or ACT score as well as a grade point average minimum.

Lottery-funded merit scholarships have other troubling unintended consequences in addition to their negative distributional effects. For example, Susan Dynarski (2000) found that the HOPE scholarship had a large impact on the in-state college attendance rates of middle and

[3] Six of the counties were discarded from the data set because they did not contain a high school.

upper-income students in Georgia compared to the same set of students in surrounding states without lottery-funded scholarships. These were students who would have gone to college without the HOPE scholarship but were now staying in Georgia to attend college. Although this may have positive implications for the future economy of Georgia, the immediate effect has been to increase the average SAT scores of students entering the most competitive state universities in Georgia. Cornwell and Mustard (in press) show that this effect has caused the black share of freshmen enrollments to fall at the state's most selective universities -- the University of Georgia and Georgia Tech. They believe that HOPE is exacerbating the racial stratification of Georgia's elite colleges and universities and may impede further progress in narrowing wage inequality.

In a recent book on state merit scholarship programs published by the Civil Rights Project at Harvard University, Donald Heller (in press) concludes that programs like HOPE and Florida Bright Futures are awarding scholarships disproportionately to students who have historically had the highest rates of college participation. By giving more to the "haves" than to the "have-nots," these programs are leaving poor and minority students lagging far behind their white and wealthier counterparts.

Data and Methodology

The data for this research came from three sources. We obtained the amount of lottery sales per county for the 67 counties in Florida during the 1999-2000 fiscal year from the Florida Lottery Commission. We obtained the amount of FBF scholarship benefits that were distributed to each county during the 2000-2001 school year from the Florida Department of Education (FDOE), and we obtained demographic statistics on each of the counties in Florida from the 2000 US Census. We combined these data to estimate three regression models.

The dependent variable in the first regression model is the per capita lottery revenue that supports the FBF scholarship in each county (FBF tax). We calculate this variable by taking the amount of lottery expenditures/revenues that are generated in each county and multiplying that amount by the proportion of lottery revenue that goes into the educational enhancement trust

fund (38%).[4] We then multiply that amount by the proportion of the educational enhancement trust fund that funds the FBF scholarships (about 19% in 2000). Therefore the share of lottery expenditures/revenues that fund FBF scholarships is approximately 7.189% (.38 X .19) of total lottery revenues. We then divide each county's lottery revenues that fund the FBF scholarship (FBF tax) by the county's population to obtain a per capita amount. The dependent variable in the second regression model is the per capita amount of FBF benefits that accrue to each county. The total amount of FBF benefits for each county is available from the FDOE; therefore, we just divide each county's amount by the county's population to obtain the per capita amount.

The dependent variable in the third regression model is the difference between each county's per capita FBF benefits and the county's per capita FBF tax. We call this variable the net benefits per capita of the FBF scholarship. This last model allows us to determine the budgetary incidence of the FBF scholarship.

In addition to the regression models, we conduct a demographic and geographic analysis of the data to answer the political question of which counties are winners and which are losers in the redistribution that occurs as a result of the Florida Bright Futures Scholarship. We hope to analyze the public choice rationale for why this inherently inequitable scholarship program is so popular.

The Regression Models and Results

The definitions of the variables used in the regression models and their means and standard deviations are shown in Table I. Table II shows the coefficient estimates of the regression models that estimate per capita county benefits, tax expenditures, and net benefits for the FBF scholarship.

[4] For every $1 lottery ticket sold in Florida, 50 cents goes to prizes, 12 cents goes to administrative costs and 38 cents goes into the state's educational enhancement trust fund to support education expenditures.

Table I. Independent Variable Definitions with Means and Standard Deviations

Variable	Definition	Mean	Standard Deviation
Dependent:			
FBF Benefits	Per capita FBF scholarship benefits received in each county	$9.53	$2.86
FBF Tax	Per capita lottery tax expenditures that support the FBF scholarship in each county	$9.95	$3.07
FBF Net Benefits	FBF Benefits – FBF Tax	--$0.42	$4.47
Independent:			
WHITE	Percent of county population that is White	0.803	0.102
AGE60+	Percent of the county population that is age 60 and over	0.226	0.081
AGE18-24	Percent of the county population that is 18 – 24 years of age	0.085	0.032
EDUC16+	Percent of the county population that has a Bachelors degree or higher	0.167	0.081
INC60K+	Percent of county households with HH income $60,000 and higher	0.237	0.071

Table II. Results of the Regression Models

(1) Independent Variables	(2) Dependent Var : FBF NET Benefits Coefficent Est. (T-statistic)	(3) Dependent VAr: FBF BENEFITS Coefficent Est. (T-statistic)	(4) Dependent VAR: FBf tax Coefficent Est. (T-statistic)
CONSTANT	-25.622*** (-4.12)	-1.532 (-0.44)	24.090*** (4.69)
WHITE	21.052*** (3.94)	14.057*** (4.68)	-6.994 (-1.58)
AGE60+	-10.965 (1.15)	-17.615*** (-3.28)	-6.650 (-0.84)
AGE18-24	59.52** (2.20)	6.52 (0.43)	-52.99** (-2.36)
EDUC16+	-10.92 (-0.78)	13.933* (1.77)	24.85** (2.14)
INC60K+	32.00** (2.04)	3.715 (0.42)	-28.28** (-2.18)
R^2 adj.	35.3%	50.4%	6.4%
F Statistic	8.19***	14.41***	1.90*

* Significant at .10, **Significant at .05, and ***Significant at less than .01

Our regression results confirm what previous studies (Rubenstein and Scafidi, 2002; Stranahan and Borg, 2004) of the budgetary incidence of lottery funded merit scholarships have shown – white households and higher income households are the primary beneficiaries of these scholarship programs. As column 2 of Table II shows, the percentage of a county's population that is white and the percentage that has income of $60,000 or higher both have positive and significant coefficients in the model explaining the net benefits of the program (the scholarship benefit less the tax burden). The only other significant variable in the model is the percentage of

the county's population that is between the ages of 18 and 24, which is understandable since those are the prime ages for college attendance.[5]

We conducted a sensitivity analysis to determine the impact of some of the significant independent variables in the net benefits regression equation. The regression equation allows us to estimate that an "average" county loses 38 cents per capita from the combined taxes and benefits of the Florida Bright Futures Scholarship Program.[6] However, if the percentage of whites in that average county increases by 10 percentage points (from 80.3% to 90.3%) then the net benefits increase to +1.73 dollars per capita. Similarly, if the percentage of households with incomes of $60,000 or more increases by 10 percentage points (from 23.7% to 33.7%), then the net benefits goes from -38 cents per capita to +2.82 dollars per capita. These effects imply large premiums for counties that are mostly white and wealthy.

We separated the net benefits from the FBF program into its component parts, lottery taxes and scholarship benefits, and estimated regressions on those variables separately. The results of those regression models are shown in columns 3 and 4 of Table II. This breakdown allows us to determine if the significant variables in the net benefits regression are due to the effect that the independent variable has on scholarship benefits received, lottery taxes paid, or both. For example, the WHITE variable seems to have its most powerful effect on the amount of FBF scholarship benefits received by the county since the coefficient estimate is 14.057 and is significant at the 1% level in the benefits equation. However, its effect is reinforced in the tax equation since the coefficient on WHITE in that equation is negative and almost significant (at the 12% level). This means that counties with higher percentages of Caucasians not only receive significantly more FBF scholarship benefits, they also pay less of the tax that supports the FBF scholarship. These two effects combine to produce the even larger and significant positive coefficient (21.0552) in the net benefits equation.

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5 We controlled for the impact of the smaller rural counties by including a variable in the model that reflected the percentage of the county that was rural or urban. These variables were insignificant in all the preliminary models so we dropped them from the final models. If there had been a significant difference in the way the other explanatory variables affected net benefits in the rural vs. the urban counties, one of these (urban or rural) would have been significant in the regression model.

6 In this example, the average county is actually a county with the average value of each of the independent variables inserted into the regression equation.

Looking at the separate regressions in this way, we see that the AGE60+ variable only affects the distribution of the FBF benefits. This makes sense since counties with higher percentages of citizens over the age of 60 are less likely to have children in college. Surprisingly, the AGE18-24 variable seems to have its primary effect on the tax that supports the FBF scholarship, rather than on the benefits received from the scholarship, since the coefficient on the variable is significant in the tax regression but not in the benefits regression. Although this seems counter-intuitive since 18-24 year olds are the primary recipients of FBF scholarships, households with children in those age ranges are also the most likely to be in their peak earning years. Therefore, this effect probably results from the spurious correlation between household income and having children between the ages of 18-24. Counties with higher percentages of 18-24 year olds are likely to be high-income counties that don't play the lottery as much as counties that have both higher percentages of young children and older residents. The EDUC16+ variable significantly affects both the benefits received from and the taxes paid for the FBF scholarship. However, since the effect in the benefit equation acts to increase the net benefits and the effect in the tax equation acts to reduce the net benefits, the overall effect is washed out and becomes insignificant in the net benefits equation. The income effect works primarily to reduce the tax burden of the FBF scholarship since the coefficient estimate on INC60K+ is significant in the tax equation but not in the benefits equation.

Winners Versus Losers

In order to understand the political appeal of the FBF scholarship program, we analyze the distinctive demographic and geographic attributes of the "winners" and "losers" in the FBF scholarship program. We define the winners as those counties in which the net benefits per capita are positive and the losers are the counties in which the net benefits per capita are negative. There are more losers (n=39) than winners (n=28) among Florida's counties. We examine the means of each of the independent variables for the winning and losing counties and calculate a t-statistic to test for significant differences between the means of the two groups. Table III reports the results of this analysis.

Table III. Means of Independent Variables for Losers and Winners

INDEPENDENT VARIABLE	WINNER MEAN VALUE	LOSER MEAN VALUE	t-statistic
Percent White	0.815	0.794	0.89
Percent Black	0.126	0.149	-1.02
Percent Hispanic	0.072	0.095	-1.59
Percent Asian	0.121	0.008	2.04**
Percent 18-24	0.094	0.0794	1.79*
Percent Age 60 and Over	0.195	0.249	-2.89***
Percent Urban	0.604	0.578	0.32
Percent Rural	0.396	0.422	-0.32
Percent without High School Diploma	0.239	0.197	0.82
Percent with HS Diploma and/or Some College	0.317	0.320	-0.19
Percent with a College degree or more education	0.191	0.150	1.90*
Percent with Incomes of $10,000 or Less	0.252	0.281	-1.76*
Percent with incomes between $20,000 & $40,000	0.289	0.304	-2.02**
Percent with incomes between $40,000 & $60,000	0.200	0.195	0.92
Percent with incomes $60,000 or more	0.259	0.220	2.18**

* Significant at .10, **Significant at .05, and ***Significant at less than .01

There is little new information that comes from comparing the means of the independent variables for the losing and winning counties. Once again, we find that the losing counties have significantly higher percentages of older citizens (60 and over) and poorer citizens (incomes of $40,000 and less). In contrast, the winning counties have higher percentages of well-educated (college and graduate degrees) and high income ($60,000 and more) citizens as well as a higher percentage of 18-24 year olds and Asians. Politically, the citizens that drive the popularity of the FBF scholarship are the well-heeled, middle and upper income households who have college-aged children. These citizens are motivated by their own self-interest to support this extremely inequitable redistribution scheme, and they have the means and the connections to influence the political process.

Next, we examine the geographic distribution of the winning and losing counties to see if there is a particular region or area within the state that benefits most from the FBF scholarship program. Since a picture is worth a thousand words, Figure 1 shows a map of the net benefits received by each county in Florida. The amount of net benefits per county ranges from a low of about -$11.00 per capita (a loss, in other words) to a high of about +$11.00 per capita. As the areas of the map get darker, the amount of net benefits per capita increases. The map allows a more fine-grained analysis since a graduation of benefits and losses can be shown.

The northern part of the state from the panhandle across to the northeastern corner contains many counties in the darker shades of red indicating that their net benefits are higher. The Interstate 4 corridor that runs southwest across the state from Daytona in Volusia county to Tampa in Pinellas county and the southwestern Gulf coast of the state also appear in darker shades of red. The heavily populated Miami-Dade area appears in light red indicating much lower net benefits, but just to the north of it, Broward County and Palm Beach counties are shaded darker red. The map indicates that the counties that receive the greatest net benefits are indeed the high income counties, but the map also shows how geographically dispersed around the state these winning counties are. There are dark shaded counties in every corner of the state – the panhandle, northeast Florida, the I-4 corridor, as well as southwestern and southeastern Florida. It is no wonder that the Florida Bright Futures scholarship and the lottery that supports it are so popular. There is no region of the state that does not share in its largesse.

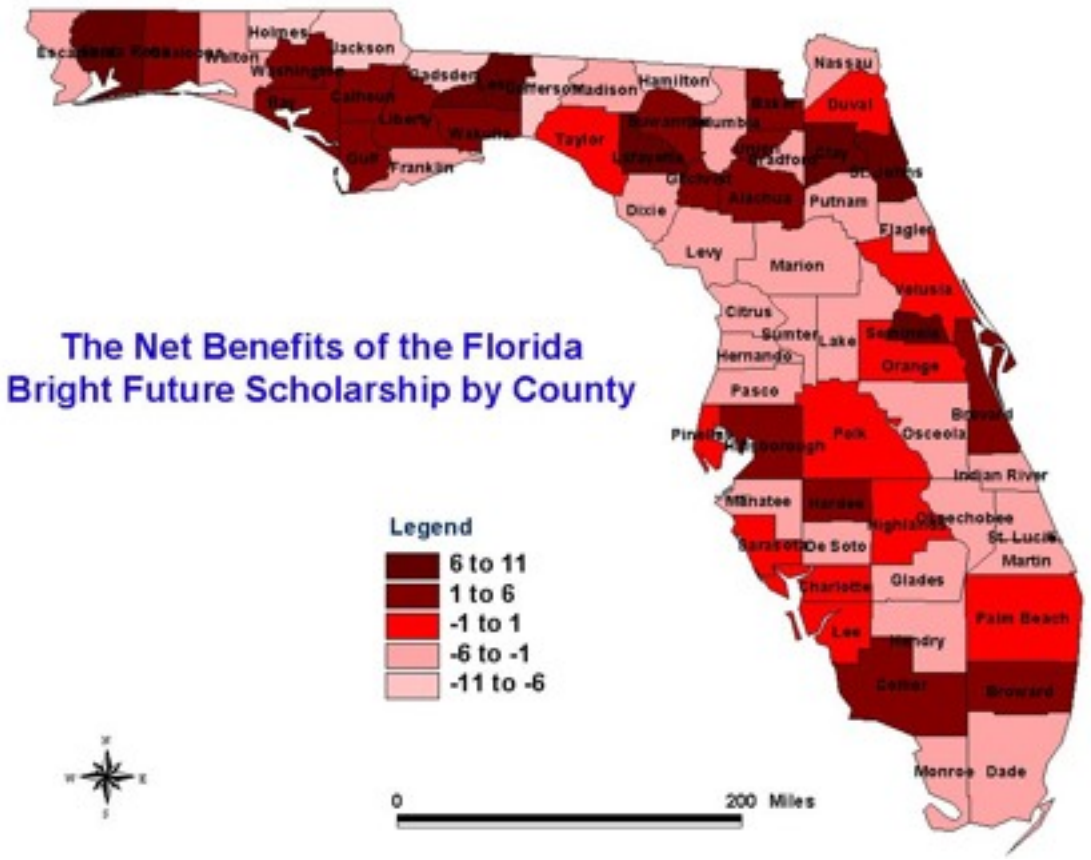

Figure 1

Conclusions and Policy Recommendations

Using county level aggregate data, we confirm what other researchers have discovered about the budgetary incidence of lottery funded merit scholarships. The net benefits of the scholarships accrue disproportionately to counties with heavier concentrations of white, wealthy, and well-educated households. In a geographic analysis, we discover that the counties with the greatest amount of net benefits tend to be geographically dispersed throughout all regions of the state. Although there are more losing counties (negative net benefits) than winning counties (positive net benefits) in the state, those winning counties are located in every corner of the state, making it broadly popular. In the presence of a strong and influential group of advocates who stand to benefit handsomely from the Florida Bright Futures Scholarship program, there is no organized group of opposition coming from a particular region that is being harmed by the program.

However, there are many losers from this program and they tend to be members of the most vulnerable groups in our state. If the Florida Bright Futures Scholarships are going to be made more equitable, the citizens who are harmed -- the poor, the less-educated, and minorities, as well as citizens who care about fairness -- need to get involved.

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