District Wealth and Arizona School Voucher Program Participation

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Table of Contents

Abstract

This study estimates the effect of district wealth on Arizona Empowerment Scholarship Account program participation using data from the Arizona Department of Education. We find that students from poor districts are not more likely to participate as school performance decreases. Conversely, those from wealthy districts do increase participation as school performance decreases. We briefly try to explain the observed heterogeneity through survey results and commenting on the program design.

Introduction

The Arizona education system has been consistently ranked poorly among its peers, particularly for grades K-12. As a result, there has been an escalating debate within the state about the future of its public education. This has led to the creation of the Empowerment Scholarship Account (ESA) program in 2011. The Arizona Department of Education (ADE) administers the program and says the ESA vouchers are "funded by state tax dollars to provide educational options for qualified Arizona students." However, questions have been raised regarding which students are benefitting the most. The Arizona Republic found most vouchers went to students leaving wealthier and higher-performing districts. This study estimates the effect of district wealth on ESA program participation using OLS regression and survey data.

Data on school district poverty rates, disability rates, and the percent of D or F schools was taken manually from the *Arizona School District Spending - Fiscal Year 2018 - Report*. The ESA district participation rate was taken from ADE February 2019 data and put into a dataset by *The Arizona Republic.* Since the fiscal year of 2018 ended in September 2018, which is after the

school year begins (in August 2018), the database will have accurate data for the 2018-2019 school year.

The district data is then utilized for OLS regression. The results of the regression estimate that schools with above average poverty rates do not see increases in the program participation as the school quality decreases. On the other hand, schools with below average poverty rates see statistically significant increases in participation as school quality decreases. A survey was then administered to Arizona parents through Amazon Mechanical Turk to attempt to explain the heterogeneity as being the result of information frictions between districts of different poverty levels. The survey does not have enough results however to make a claim about the existence of information frictions.

Program Details

The ADE writes "an ESA consists of 90% of the state funding that would have otherwise been allocated to the school district or charter school for the qualified student (does not include federal or local funding). By opting out of the public-school system and accepting an ESA, applicants can seek a range of alternative educational services such as private schools, home-based education, tutoring, and educational therapies (for students with disabilities only) using state funds." The Arizona ESA program currently has ten qualifications. Students who qualify for the ESA program fit into at least one of the following categories: preschool student with a disability, K-12 student with a disability, student with an active duty military parent, student with a military parent killed in the line of duty, student with a parent who is legally blind, deaf or hard of hearing, student that attends a D or F rated school, student resides within a native american

reservation, student that is a sibling of a current or previous recipient of an ESA scholarship, student who was a Ward of Court, student was a previous ESA recipient.

The Arizona ESA program has seen a relatively small number of participants while an estimated 22 percent of students are eligible statewide. The average value of each scholarship is projected at $14,185 for the 2019-2020 school year, which is approximately 177% of the average per-student spending in public schools. However, the vast majority of students using the ESA program are special needs students, which generally have a far more expensive education. More details on the ESA program scholarship amounts can be seen in Figure 6.

We hypothesize that the way the program is structured may lead to differences in program participation among wealthy and poor school districts. The ESA program does not guarantee that the school voucher will cover the expenses of attending a private school. Instead, the program takes 90% of the money that would be spent on the student by their school and provides it to them as a scholarship. This could potentially incentivize poor school districts that are likely low on resources already to not raise awareness of the program, fearing enough students would leave that their funding would be cut even more. Perhaps more likely, the scholarships will cover most of the tuition, but if for example there is still $500 that needs to be paid, it is much more likely that parents from wealthy districts will be able to cover the cost than parents from poor districts. However, these should only be viewed as speculative statements.

Data

The data on ESA program participation is taken from the ADE's database from February 2019. It should be noted that this database, and hence the data we use for regressions later on, defines an observation as a district. There are 142 districts with at least one participant and those without

any participants were omitted from the dataset used. The data contains the number of students using school vouchers to leave each Arizona district, the name of the corresponding district, the average dollar amount of each ESA scholarship from that district, and the total value of the scholarships coming from that district. We also use data on total student population, poverty rates and school ratings by district from the ADE's district spending report for the fiscal year of 2019. Using both data sets allows us to define the ESA program participation of each district as the number of students leaving the district with ESA scholarships divided by the total number of students in that district, and we call this variable the *ESA Part Rate.* We then define *Proportion DF Schools* as the total number of schools in a particular district rated D or F divided by the total number of schools in that district.

Figure 1 in Appendix A shows the breakdown of the percent of students leaving with each qualification. It is important to note that students can qualify for more than one reason, however, the ADE only reports one qualification for each student in the program. Therefore, the numbers provide some uncertainty if, for example, we wanted to determine if a disabled student from a low-performing school is leaving due to a disability or because their school is poorly rated. Furthermore, since this study focuses specifically on the number of students leaving a poorly rated school, there will likely be some instances that go unobserved.

Another variable used is *Rich*, a binary variable equal to 1 if the school has a poverty rate below the median of 22%. We use a binary variable rather than a continuous variable for poverty because we are not focused on determining the effect of an increase/decrease in poverty on program participation. Rather, we are trying to determine the differences in the effect of a district's proportion of D/F schools on program participation between wealthy and poor districts.

We also see (through statistical significance shown later) the effect of *Proportion DF Schools* to be dependent on the value of *Rich*, so we include the interaction term *RichDF*.

The survey ran from February 10th 2020 to March 20th 2020 and had only 32 responses. The survey was administered to Arizona parents though Amazon Mechanical Turk and consisted of these three questions: *"Do you have at least one child currently attending an Arizona public school," "What school district do they attend," and "Are you aware of the Arizona Empowerment Scholarship Account (ESA) program?"* Due to the small sample size the survey cannot accurately tell us anything about information frictions and the ESA program. The smaller than expected number of responses per day tells us a more thorough study should greatly expand the amount of time the survey is administered, or consider distributing them through different means.

Empirical Method

We estimate the effect of district school quality on ESA program participation for both above and below average poverty rate schools. We will estimate the following equation:

ESA Part Rate= B0 + B1*Proportion DF Schools + B2*Rich + B3*Proportion DF Schools*Rich.

As mentioned above, *ESA Part Rate* is the district's ESA participation rate, *Proportion DF Schools* is the proportion of D or F schools in the district, and Rich is a dummy variable equal to 1 when the district has an above median poverty rate and 0 otherwise. After running the regression it became clear that the model suffered from heteroskedasticity (this can be seen in Figures 4 and 5). In order to correct for this, we used hetero-robust standard errors, which can be seen in Figure 2 where we have covariance type "HC3." Admittedly, it is very likely there are a

multitude of factors that impact the program participation rate and went unobserved by our data. We settle on this model for the sake of simplicity and with the understanding that we should still be able to somewhat accurately determine the effect of school district quality on ESA participation between wealthy and poor school districts.

Results

Figure 2 in Appendix A shows the regression results and Figure 3 graphs our estimating equation. The model summary in Figure 2 shows the coefficient on *Proportion DF Schools* to be negative and not statistically significant. We can conclude that those from poor school districts are not more likely to participate in the ESA program as district school quality decreases. In other words, even as they become eligible for the program, students from low-performing, poor districts will likely not participate. However, the *RichDF* interaction term is both positive and significant. Students from wealthier districts are more likely to participate in the program as they become eligible for the program. These are the results we expected. However, the OLS estimates also showed with statistical significance that a good quality but poor district is estimated to have greater ESA participation than a good quality and wealthy district.

The survey results can be seen in Appendix B on Figure 7. As previously mentioned, the results are not worth much attention due to the small sample size. However, as a summary of the results we did find that 1 of the 5 parents from above average poverty districts was aware of the program. On the other hand 5 of the 19 parents from below average poverty districts were aware of the program. This information can be seen graphically on Figure 8. Although we got 32 responses, 8 responses were either not parents with children currently in Arizona public schools or had to be omitted due to a response error.

Conclusion

The primary motivator for this project were reports on larger program participation coming from high-performing, wealthy school districts. However, our results show that this statement is likely not telling the whole story. Our regression estimates that a high-performing wealthy district will have less program participation than a high-performing poor district. As the districts become worse in quality, the trend quickly changes. A wealthy but low-performing district with no schools above a D or F rating is estimated to have nearly five times the participation rate of their poor counterpart in our model. Furthermore, as the school quality decreases in poor districts we estimated there would be no change in participation rates. This draws us to a very clear conclusion that many of those in low-performing districts are not utilizing the ESA scholarships and a disproportionate number of them are from poor districts.

The survey results could prove useful in determining why those in poor school districts are less likely to utilize the program. For one thing, if there is no difference in awareness of the program among wealthy and poor districts, then information frictions are likely not to blame. Instead, it is more likely the program is too expensive for parents in poor districts as hypothesized in the *Program Details* section. If the survey had reached a larger sample size and continued the trend we found, we would likely be able to claim that parents from wealthier districts are slightly more aware of the program.

Sources

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Appendix A: Details on the ESA Program

FY2019	ESA Participation	
	Disability	3,732
	Active Duty or Fallen MIlitary Parent	813
	Sibling	627
	Native American Reservation	408
	From Failing Public School	399
	Foster Care Child	359
	Prior Participant	85
	Total	6,423

Figure 1: ESA Participation Categorized by Qualification

OLS Regression Results

Dep. Variable:	ESA_Part_Rate	R-squared:	0.274
Model:	OLS	Adj. R-squared:	0.258
Method:	Least Squares	F-statistic:	3.577
Date:	Sun, 25 Oct 2020	Prob (F-statistic):	0.0157
Time:	22:16:18	Log-Likelihood:	461.69
No. Observations:	140	AIC:	-915.4
Df Residuals:	136	BIC:	-903.6
Df Model:	3		
Covariance Type:	HC3		

	coef	std err	z	P>|z|	[0.025	0.975]
const	0.0063	0.001	9.986	0.000	0.005	0.008
Proportion DF Schools	-0.0019	0.002	-1.189	0.234	-0.005	0.001
Rich	-0.0046	0.001	-3.184	0.001	-0.007	-0.002
RichDF	0.0270	0.009	2.903	0.004	0.009	0.045

Omnibus:	93.696	Durbin-Watson:	1.797
Prob(Omnibus):	0.000	Jarque-Bera (JB):	810.596
Skew:	2.235	Prob(JB):	9.58e-177
Kurtosis:	13.908	Cond. No.	10.5

Warnings:
[1] Standard Errors are heteroscedasticity robust (HC3)

Figure 2: OLS Regression Results

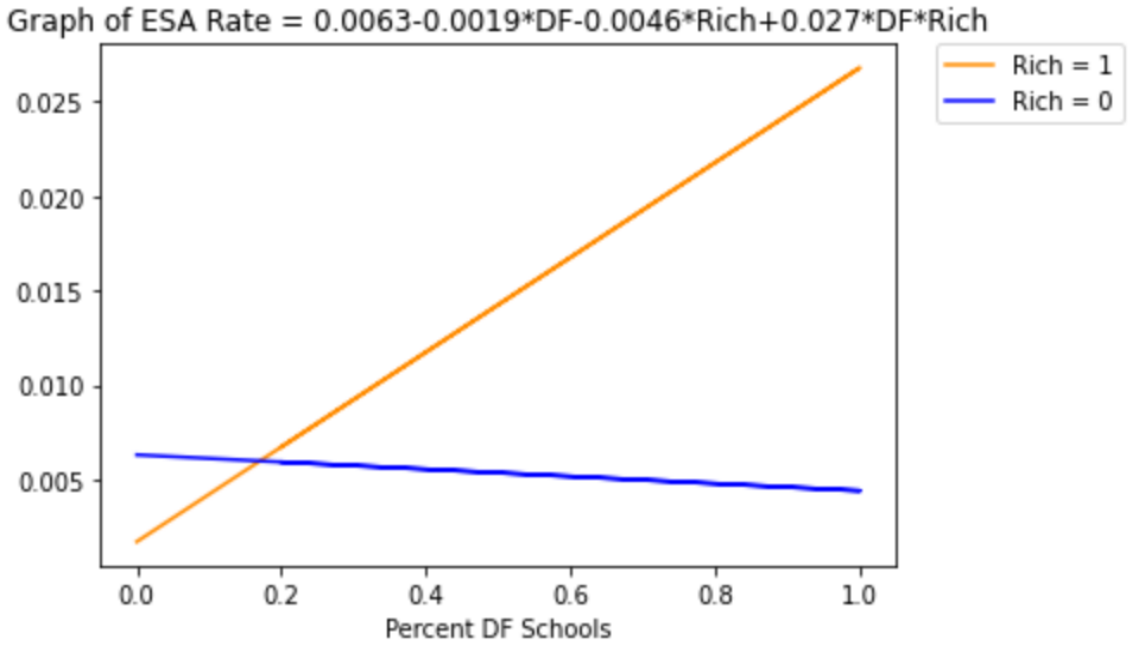

Figure 3: Plot of Estimating Equation

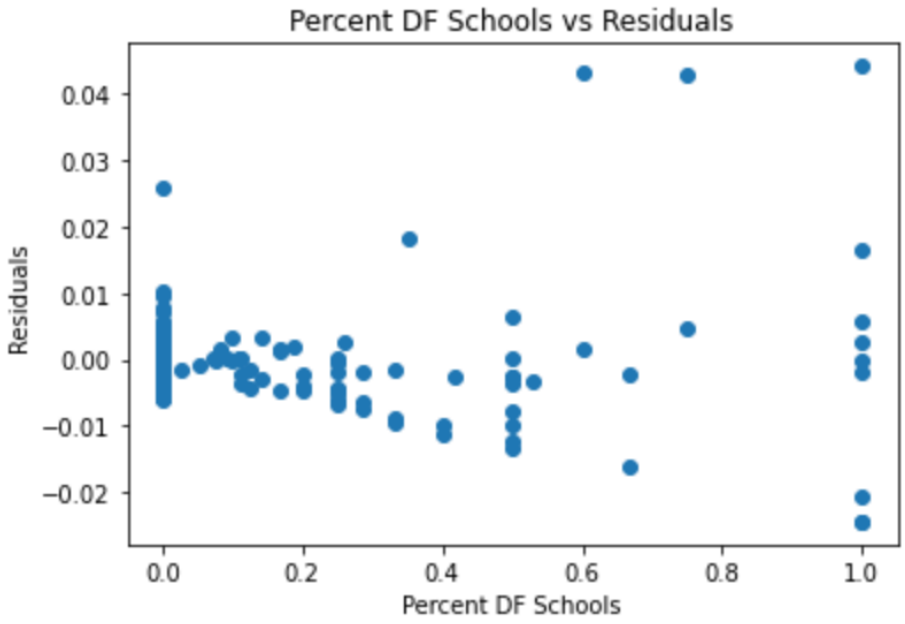

Figure 4: Percent DF Schools vs Residuals Plot

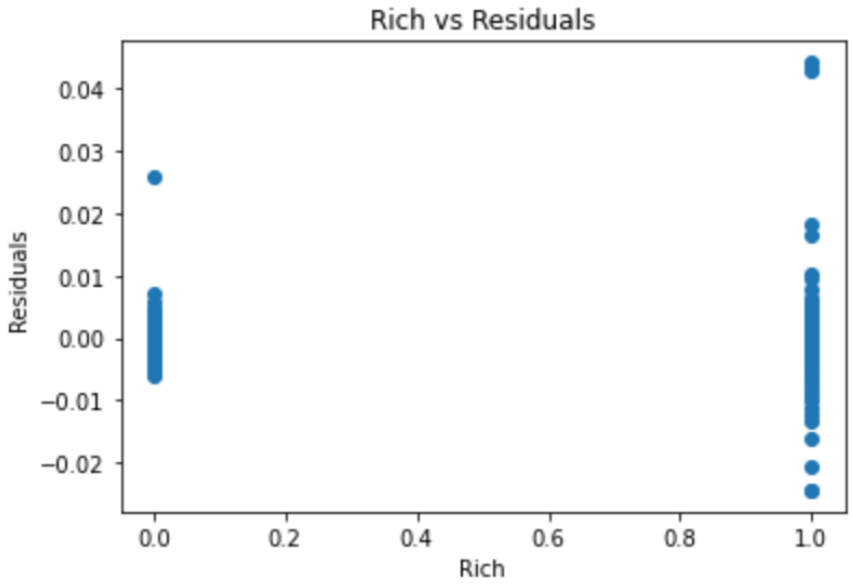

Figure 5: Rich vs Residuals Plot

Approximate* **Annual ESA Funding**
2019-2020 school year

Average funding for students with no disabilities

1st -12th: $5,200-$6,200
KG: $2,900-$3,200
****Preschool and Kindergarten students with a disability other than P-SD, are funded at ½ the amount listed below**

Average ESA funding for students with a disability
(current IEP or evaluation must be provided at the time of application)

Categories of Disabilities	***Estimated amount**
HI (hearing impairment) VI (visual impairment) MoID (moderate intellectual disability) ED-P (emotional disability-privately placed) OI (orthopedic impairment)	$18,000-$28,000
MD (multiple disabilities) SID (severe intellectual disability) A (Autism)	$25,000-28,500
MD-SSI (multiple disabilities and severe sensory impairments)	$30,000-$37,000
P-SD - Preschool students (before age 5) with preschool severe delay. ***NOTE: Any child 5 years or older cannot have their primary eligibility as PSD***	$7,000-$9,500
DD (developmental delays) ED (emotional disability) MiID (mild intellectual disability) SLD (specific learning disability) SLI (speech language impairment) OHI (other health impairment)	$5,500-$6,500
TBI (traumatic brain injury)	$5,200-$6,200
504 accommodation plan	$5,200-$6,200
Additional funding (if applicable)	
K3 – Students in Kindergarten through third grade	$150-$200
ELL – English Language learners	$100-$150

* This amount is an **estimated** ESA funding.
*ESA Funding is primarily based on disability category; grade level; and district/charter of attendance

Figure 6: Approximate ESA Funding (2019-2020 School Year)

Appendix B: Survey details

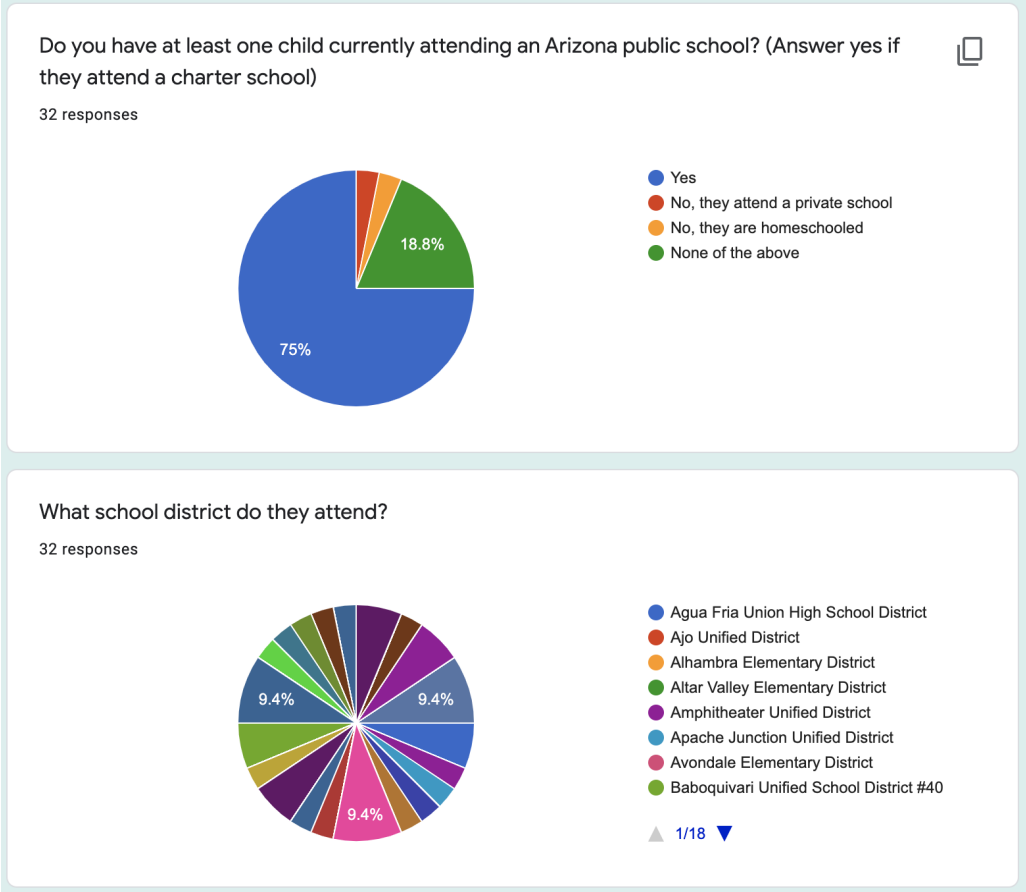

Figure 7: Survey Questions and Distribution of Answers

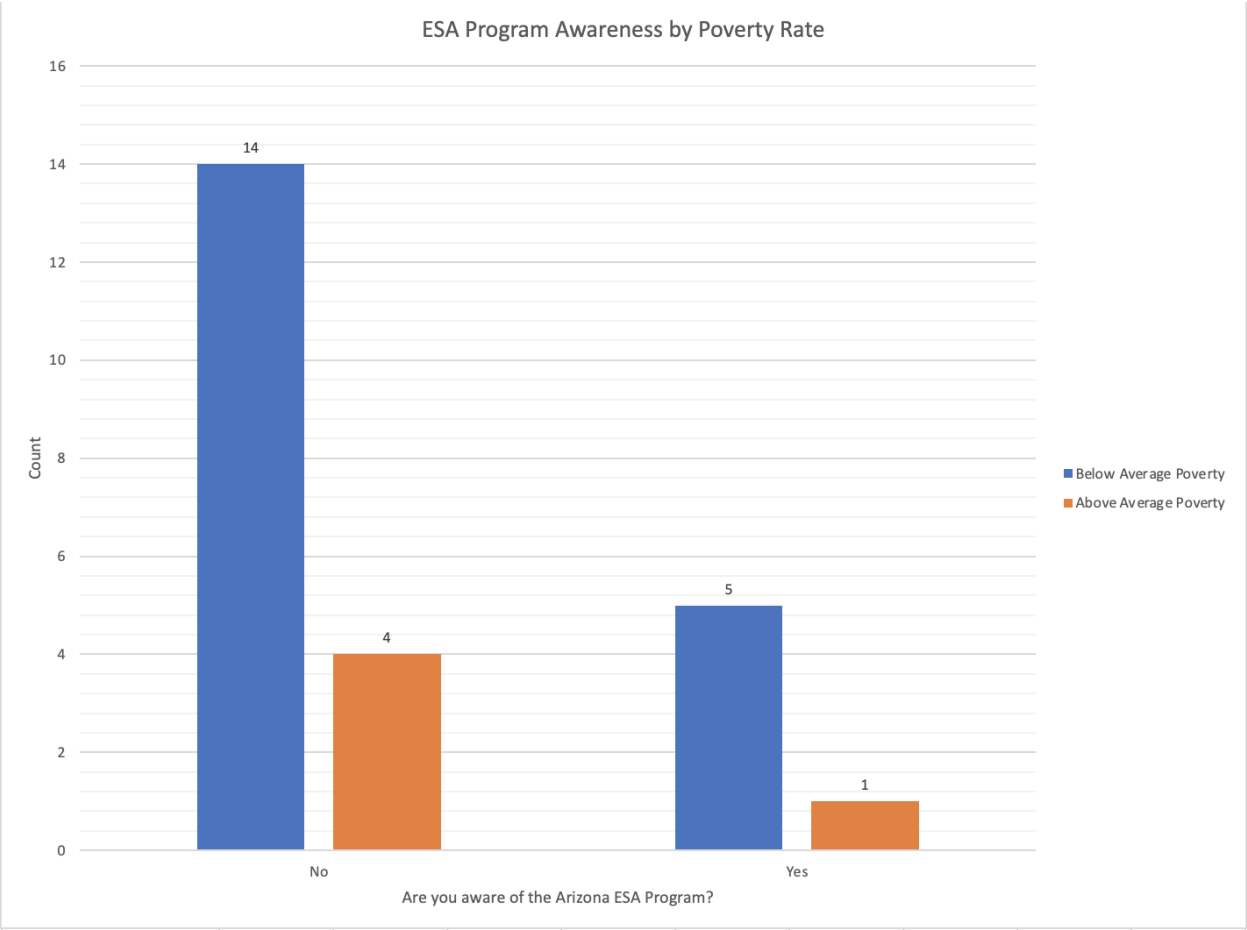

Figure 8: Graph of ESA Program Awareness from Survey Categorized by Poverty Rate