

The Impact of State 529 Plan Tax Incentives on Take- Up and Savings

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Abstract

This paper examines the impact of the 529 plan tax benefits on plan participation and savings. Using state-level data on tax benefits for plan contributions and on the number of open accounts and the amount of assets under management, we estimate fixed effects regression of the use of 529 accounts as a function of measures of tax benefit generosity. Our results imply that offering a tax benefit per se does not significantly increase the percentage of children with an account or the average balances in accounts. In addition, while regression analysis suggests that offering a larger tax benefit for a moderate contribution leads to a small increase in the growth of the percentage of children with 529 savings plans and a larger tax benefit for the maximum contribution is associated with larger balances in savings plans, neither finding is sustained within multiple permutation tests and both are likely spurious.

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Introduction

Over the past two decades, college tuitions have increased dramatically in real terms, with tuition and fees increasing by 65 percent at four-year private universities and by 110 percent at four-year public universities.¹ At the same time, federal and state governments have implemented or expanded a number of provisions aimed at helping students afford college. Direct government aid to students in the form of Pell and SEOG Grants increased over the first half of this period, though the total amount awarded has steadily declined in recent years.² The federal government passed the Hope Tax Credit (now the American Opportunity Credit) and the Lifetime Learning Credit, which provide tax credits for qualified tuition expenses that are incurred in a given year. Finally, to help families save for college, Section 529 college savings and pre-paid tuition plans were introduced, and numerous states now offer tax benefits for contributions to these plans.

A 529 plan is a tax-preferred savings plan for higher education expenses. These plans were created in 1996 as part of the Small Business Job Protection Act of 1996 and are named “529 plans” due to the section of the Internal Revenue Code that created them. Earnings on contributions to these plans are exempt from income taxation at the federal level, and two-thirds of states offer an additional tax deduction or credit for such contributions. Given the cost of these policies to state budgets, it is important that the effectiveness of these policies is understood. This paper examines the impact of these tax incentives on plan participation and savings accumulation.

Section 529 plans are operated either by states or by educational institutions, though contributors to the plan need not reside in the state that sponsors the plan. Plans come in two forms – savings plans and pre-paid tuition plans. For both of these types of plans, an account is opened for a designated beneficiary (generally, a child or grandchild). Contributions to saving plans are made in after-tax dollars (that is, they are not deductible from federal income taxes) and are invested by the plan. Earnings in these plans grow tax-free, and distributions are tax-exempt so long as the proceeds are used to pay for qualifying post-secondary education expenses. Contributions can be made up to the amount necessary to pay the qualified education

expenses of the beneficiary, but contributions over \$14,000 per beneficiary per donor in a year are subject to gift taxes. In contrast, in pre-paid tuition plans, tuition credits are purchased for a particular college or university at current rates, which can then be used to cover the cost of a child's future college attendance.^{3,4}

In addition to these tax benefits from the federal government, many states either allow contributions to be deductible from state income taxes or offer a state income tax credit for contributions. In 2015, 34 states and the District of Columbia offered tax benefits for contributions to 529 plans. Among states offering tax deductions, the amounts of contributions that qualify range from \$250 to \$400,000, with an average of about \$50,000. Among states that offer tax credits, the credit amounts ranged from \$95 to \$1000, with an average of about \$450. The state offering the highest tax credit amount, Indiana, saw over \$59 million in credits claimed in 2015, which amounts to over 1 percent of individual income tax revenue. Across states that offered credits, the tax expenditure on 529 plans averaged around \$10 million.⁵ Although contributions can be made to out-of-state 529 plans, these additional tax benefits are usually limited to contributions to plans in the taxpayer's state of residence. However, six states (Arizona, Kansas, Minnesota, Missouri, Montana, and Pennsylvania) allow deductions for contributions made to any state's 529 plan.

Prior to the passage of this law, families wishing to save for college in a tax-preferred manner could create and fund Coverdell Education Savings Accounts (also known as ESAs or education IRAs). These plans function like 529 plans, though the range of investments is broader and the account could be used for primary and secondary education, as well as post-secondary education, but have a much lower contribution limit (\$2,000 per year).

Although Section 529 plans have been in existence for almost two decades, many families are still unaware of them. A 2017 study by Edward Jones found that 68 percent of Americans could not identify a 529 plan as a vehicle for college savings⁶. In addition, though these plans are available to families of all income levels, actual usage tends to be concentrated among higher income families. For example, U.S. GAO (2012) estimates that 47 percent of families with 529 plans had income in excess of \$150,000 in 2010, even though only 11 percent of families with college students had income that high. Further, Sallie Mae (2009) estimated that among those who saved for college, the average amount saved by those with income over \$150,000 was over \$30,000, while those with lower incomes saved less than half that amount on average.

Section 529 plans have been the subject of several recent policy proposals. At the federal level, President Obama in 2015 proposed taxing withdrawals from 529 plans, while the Tax Cuts and Jobs Act of 2017 allows contributions to these plans to be used for K-12 expenses. Most recently, the SECURE 2.0 Act of 2022 allows funds left in a 529 college savings plan to be rolled over without penalty into a Roth IRA for the child. At the state level, Maine ceased offering a tax benefit in 2015, while Massachusetts began offering a deduction in 2017.

The extant literature on the impact of 529 plans is very limited. Clancy, Orszag and Sherraden (2005) and Clancy, Cramer and Parrish (2005) examine the potential for 529 plans to increase asset building in an inclusive manner. Ma and Fore (2002) and Maag (2009) compare 529 plans to other types of savings vehicles. Alexander and Luna (2005) examine tax and non-tax factors that affect 529 plan investment choices. Holden (2002) and Dynarski (2004a, 2004b) examine the benefits of 529 and Coverdell plans, and find that the highest income families benefit the most, while some families might be worse off contributing to these accounts due to interactions with financial aid. However, Clancy and Beverly (2017) argue that financial aid for low-income students is unlikely to be affected by 529 plan savings. Finally, Bogan (2014) finds that states that offer greater tax benefits tend to have funds with higher plan fees, while Balthrop and Cici (2022) find that plans that extract more revenue for the sponsoring state offer investments with higher fees, weaker performance, and more limited options while not offering other direct or indirect benefits to investors.

The study most closely related to this one, Alexander and Luna (2005), examined tax and non-tax factors that affect 529 plan investment choices, and unexpectedly found that tax benefits were negatively related to investment in these plans.⁷ However, the data in that study only spanned two years, through September 2003, and so pre-dated the recent large expansion of tax benefits for these plans. Further, given the limited timespan, the authors were unable to include state fixed effects that would control for unobserved state-level characteristics that are correlated both with the propensity to save for college and with the size of the tax incentives.

In this paper, we estimate the impact of Section 529 plan tax benefits on the decision to open an account, and the amount held in such accounts. The study uses data from the College Savings Plan Network, which collects information on the number of open accounts and the amount of assets under management at the state level, matched to data on tax benefits for plan contributions as well as data on demographic characteristics from the American Community Survey. We estimate fixed effects regressions of

changes in the number of accounts per minor in the state and of changes in the average balance per account as a function of measures of tax benefit generosity. Our results imply that offering a tax benefit per se does not significantly increase the percentage of children with an account or the average balances in accounts. In addition, while regression analysis suggests that offering a larger tax benefit for a moderate contribution leads to a small increase in the growth of the percentage of children with 529 savings plans and a larger tax benefit for the maximum contribution is associated with larger balances in savings plans, neither finding is sustained within multiple permutation tests and both are likely spurious.

The paper proceeds as follows. Section 2 describes the data, and Section 3 outlines the estimation method. Section 4 presents our results, and Section 5 presents results from robustness checks. Section 6 concludes.

Data

Data on 529 plan participation and savings accumulation come from the College Savings Plan Network (CSPN n.d.). CSPN is an affiliate of the National Association of State Treasurers, and serves as a clearinghouse for information on state-administered college savings programs. As part of their role, CSPN has collected data since 2001 from all Section 529 plans on the amount of assets under management and on the number of open accounts, and makes the data available on their website. We use CSPN data from 2001 to 2015 for the 50 states and the District of Columbia. During the sample period, all states (including those with no income tax) offered 529 plans in all years except Wyoming, which terminated their plan in 2006, and the District of Columbia, which started their plan in 2003. Since many states have multiple savings plans, we aggregate all plans to the state level.

CSPN altered its methodology in 2009 for counting the number of open accounts,⁸ making this variable not strictly comparable before and after this adjustment (CSPN Plan Data n.d.). We account for this by including in our main specifications an interaction of a dummy variable for the post-2008 period and each state fixed effect. Further, in robustness checks, we allow for the treatment effect estimates to differ before and after the change in the data collection methodology by interacting the post-2008 dummy variable with the treatment variables. The results do not challenge the conclusions from our main specifications.

Although we have measures of the number of accounts in a particular state, we do not know whether the accounts were opened by residents of

that particular state. Further, we do not know whether the beneficiaries of the accounts are residents of that particular state, and we do not know whether multiple accounts are for the same beneficiary. As a result, in the measures of account usage that follow, we are forced to implicitly assume that each account was opened by a resident of that state, the beneficiary is also a resident of that state, and each account has a different beneficiary.⁹ To the extent that these assumptions do not hold, our results may be biased downward.¹⁰

In addition, the data do not contain information on the characteristics of investment options available in a particular state, such as fees or fund performance. However, the inclusion of state and time fixed effects will account for any availability, fees, and performance that are constant within a state over time, as well as any trends in these across all states during our time period.^{11,12}

Using these data, along with data on the number of children under 18 in each state compiled by the U.S. Census Bureau (n.d.), we created two measures of the use of 529 savings plans. The first is an estimate of the percentage of children in a state with a 529 account, which was created by dividing the number of accounts in a state by the number of children in the state. The second is the average balance per account, created by dividing the state-level amount of assets under management by the number of accounts in the state. These measures of the use of 529 plans were calculated for all plans, as well as separately for savings plans. Far fewer states have active pre-paid tuition plans for a significant number of years over our study period, so we do not use measures of the use of 529 pre-paid tuition plans separately.

To compile information on state-level tax benefits for contributions to 529 plans, we collected information from state income tax forms and state statutes. For states that offered a tax credit, we captured the amount of the credit in percentage terms and the maximum amount of contributions to which it could be applied. For states that offered a deduction, we captured the maximum amount of contributions to 529 plans that could be deducted from taxpayers' taxable income. We also collected information on average marginal state tax rates from the National Bureau of Economic Research.¹³

Using this information, we created three measures of the generosity of tax benefits at the state level. Our first measure is a simple indicator that denotes that the state offered some tax benefit for 529 plan contributions in a particular state in a given year. Our second measure captures the tax benefit, in 2010 dollars, that would accrue to a contribution of \$3600 in current dollars, which is roughly the annual contribution required over a child's first 18 years to cover the four-year cost of a moderate in-state public

college.¹⁴ This variable is calculated by multiplying the credit or average marginal tax rate by either \$3600 or the maximum amount of qualifying contributions, whichever is less.¹⁵ Our third measure captures the maximum tax benefit that could accrue to 529 plan contributions in a particular state in a given year.¹⁶

Both of these variables are equal to zero for states with either no state income tax or no tax benefit for 529 plans in a particular year. We were unable to determine the tax benefit available in Iowa for years 2001–2004 and Utah for years 2001–2003. The CSPN data for 2001 were missing values for the number of open accounts and the amount of assets under management in Georgia, Hawaii, Minnesota, North Dakota, and Wyoming. These observations are coded as missing.

Recall, however, that state-level 529 credits or deductions are not the only tax benefits that accrue to 529 plan contributions. Although contributions are made in after-tax dollars, distributions from the plan are made tax free, and so taxes are not owed on the inside buildup of assets. To control for the tax benefit that results from this exemption of distributions from taxation, we also include the mean net-of-tax share in each state, which is calculated as one minus the average state and federal marginal income tax rate.

To control for other socioeconomic and demographic variables that might affect the decision to contribute to a 529 savings plan, we utilize data from the 2001 to 2015 waves of the U.S. Census Bureau's American Community Survey, accessed through the IPUMS-USA database (Ruggles et al. 2015). We restrict the data to heads of household who have at least one child under the age of 18, and calculate the following state-level variables: the average number of children in households; the average age of the head of household; the median family income; the percentage of heads of household that are female; that are married; that are a homeowner; whose highest educational attainment is each of less than high school, high school, some college, college graduate, more than college graduate; whose race/ethnicity is each of White, Black, and other; that are Hispanic; and that are employed. All control variables are time-varying.

Table 1 presents descriptive statistics of the estimation sample. Across all years, 56 percent of state years had a benefit available, the unconditional average benefit for a \$3,600 contribution to a 529 plan was around \$100, and the unconditional average maximum benefit was \$1,556.

Across states, the mean percentage of children with a 529 savings account was 1.7 percent, most of which were savings plans. The mean average balance in an account was \$12,830.

Table 1. Descriptive Statistics.

	Observations	Mean	StdDev	Min	Max
<i>Policy Variables</i>					
Benefit Available	738	0.56	0.5	0	1
\$3600 Benefit, \$1s	738	96	115	0	720
Max Contribution Benefit, \$1s	731	1556	5301	0	30,018
<i>Outcome Variables</i>					
Percentage of Children with Plans	746	1.7	2.9	0.006	17
Average Balance per Account, \$1s	746	12,830	5746	2163	81,500
Percentage of Children with Savings Plans	729	1.7	2.9	0.0033	17
Average Balance per Savings Account, \$1s	729	12,769	5909	2163	81,500
Percentage of Children with Plans, First-Differenced	693	0.13	0.55	-6.7	4.7
Average Balance per Account, \$1s First-Differenced	693	725	4437	-65,078	64,548
Percentage of Children with Savings Plans, First-Differenced	674	0.13	0.55	-6.7	4.7
Average Balance per Savings Account, \$1s First-Differenced	674	749	4499	-65,078	64,548
<i>Control for State-Level Benefit on Tax Exempt Distributions</i>					
1-Mean State & Federal Marginal Tax Rate	765	0.74	0.03	0.64	0.84
<i>Controls for State-Level Head of Household Demographics</i>					
Number of Children	765	1.8	0.09	1.6	2.2
Mean Age	765	43	1.7	40	49
Median Family Income, \$1000s	765	61	11	40	88
Female	765	0.5	0.052	0.33	0.7

(continued)

Table I. (continued)

	Observations	Mean	StdDev	Min	Max
Married	765	0.67	0.056	0.36	0.81
Homeowner	765	0.69	0.064	0.4	0.84
Black	765	0.12	0.13	0	0.74
Other Race	765	0.11	0.1	0.012	0.69
Hispanic	765	0.1	0.11	0.0034	0.52
Less than High School	765	0.12	0.043	0.042	0.26
Some College	765	0.32	0.042	0.19	0.45
College Graduate	765	0.18	0.033	0.09	0.27
More than College Graduate	765	0.1	0.033	0.051	0.27
Employed	765	0.77	0.042	0.62	0.88

Source: Data from College Savings Plan Network and 2001–2015 waves of the American Community Survey Note: All monetary amounts are in real 2010 \$.

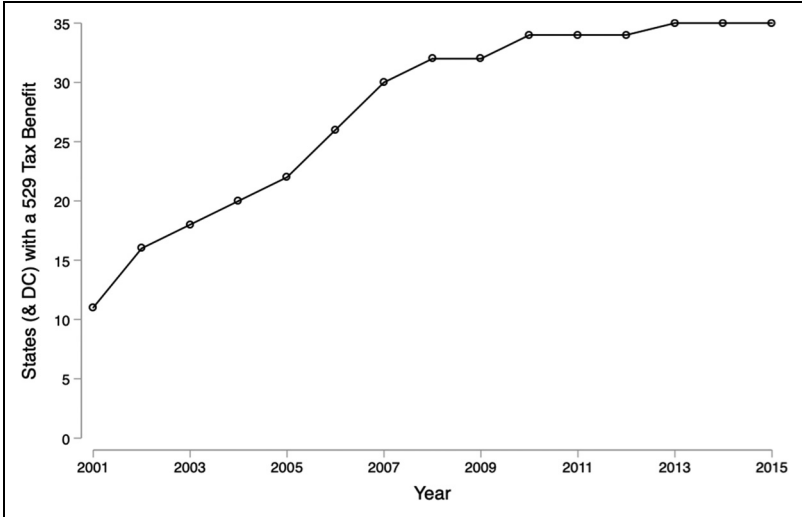


Figure 1. Adoption of 529 tax benefits by states and the district of Columbia, 2001–2015.

Figure 1 shows the expansion of tax benefits for 529 plans over our sample period. In 2001, only eleven states offered an additional tax benefit for contributions to 529 plans, but this figure increased to 34 and the District of Columbia by 2015.

Table 2 provides further detail on the characteristics of state 529 plan tax benefits. In 2015, 34 states and the District of Columbia had some form of tax benefit available for contributions to 529 savings plans. Most of these states allow a deduction; only three states (Indiana, Utah, and Vermont) offer a tax credit. The amount of tax benefits from a \$3,600 contribution varies widely across states, ranging (in 2010 \$) from \$17 in Maine to \$720 in Indiana, and the benefit from a maximum contribution varies in a commensurate manner. Of course, this variation is driven both by variation in the rate of the tax credit or deduction and variation in the amount of contributions that qualifies for a tax benefit.

To further illustrate the sources of variation in 529 tax benefits that will identify the effect of 529 plan benefits, Table 3 summarizes the changes that occurred within states over the 2001–2015 period. During our sample period, 17 states began offering a benefit, but no further changes were made once the benefit was offered. Seven states began offering a benefit,

Table 2. Characteristics of State 529 Plan Tax Benefits.

State	1st Year	\$3600 ^a , 1st Year	\$3600 ^a , 2015	Max, 1st Year	Max, 2015	Type, 1st Year	Type, 2015
AK	—	—	0	—	0	—	—
AL	2008	134	144	188	184	0	0
AR	2005	187	198	290	253	0	0
AZ	2008	24	66	24	61	0	0
CA	—	—	0	—	0	—	—
CO	2001	166	165	22,758	16,822	0	0
CT	2006	201	231	302	295	0	0
DC	2003	257	293	304	300	0	0
DE	—	—	0	—	0	—	—
FL	—	—	0	—	0	—	—
GA	2002	117	117	142	108	0	0
HI	—	—	0	—	0	—	—
IA	2001	175	170	—	156	0	0
ID	2001	248	250	339	255	0	0
IL	2002	107	181	14,354	462	0	0
IN	2007	720	720	1052	920	1	1
KS	2006	181	140	196	129	0	0
KY	—	—	0	—	0	—	—
LA	2002	80	88	97	81	0	0
MA	—	—	0	—	0	—	—
MD	2004	167	182	267	233	0	0
ME	2007	18	17	19	16	0	0
MI	2013	154	154	200	197	0	0
MN	—	—	0	—	0	—	—
MO	2001	170	181	465	370	0	0
MS	2001	145	162	496	413	0	0
MT	2001	169	170	208	157	0	0
NC	2007	173	143	182	132	0	0
ND	2007	99	64	145	82	0	0
NE	2001	58	239	71	611	0	0
NH	—	—	0	—	0	—	—
NJ	—	—	0	—	0	—	—
NM	2003	219	165	28,780	16,859	0	0
NV	—	—	0	—	0	—	—
NY	2005	257	250	399	320	0	0
OH	2001	79	43	98	40	0	0
OK	2002	157	178	191	456	0	0

(continued)

Table 2. (continued)

State	1st Year	\$3600 ^a , 1st Year	\$3600 ^a , 2015	Max, 1st Year	Max, 2015	Type, 1st Year	Type, 2015
OR	2009	175	196	178	180	0	0
PA	2006	110	110	463	393	0	0
RI	2006	28	24	30	22	0	0
SC	2002	223	224	30,018	22,859	0	0
SD	—	—	0	—	0	—	—
TN	—	—	0	—	0	—	—
TX	—	—	0	—	0	—	—
UT	2001	220	95	—	87	0	1
VA	2001	112	202	138	207	0	0
VT	2004	180	250	231	230	1	1
WA	—	—	0	—	0	—	—
WI	2001	205	103	253	95	0	0
WV	2009	210	210	15,773	14,226	0	0
WY	—	—	—	—	—	—	—

a Lesser of \$3600 or max contribution.

Source: Author's calculations using information collected from state tax forms. Note: All monetary amounts are in real 2010 \$.

and changed the magnitude of the benefit in subsequent years. Six states already had a benefit in 2001 and made no further changes over the period, while three states already had a benefit in 2001 and changed the magnitude of the benefit in subsequent years.¹⁷ Finally, in 16 states, no benefit was available during our entire sample period.

Figures 2 and 3 display the increase in the usage of 529 plans over our sample period. These figures show that the number of accounts and the average balance of accounts increased dramatically and concurrently with the increase in benefit availability. In 2001, the mean percentage of children with a 529 account across states was around 0.3 percent, but by 2015, this figure exceeded 2 percent, a seven-fold increase. The across-state mean average balance in 529 accounts also displays a dramatic increase, from around \$6000 in 2001 to around \$16,000 in 2015 (in 2010 \$).

Since the increase in the availability of tax benefits for 529 plan contributions corresponded to an increase in the percentage of children with an account and to an increase in average account balances, it appears that the tax benefits may have led to increased utilization of 529 plans. In the next section, we outline our estimation method that seeks to identify whether these trends are related using a more rigorous identification strategy.

Table 3. Types of Within-State Variation of 529 Tax Benefits.

Benefit Starts Between 2001–15; No Additional Policy Change
 AL, AR, CT, GA, IN, KS, LA, MD, ME, MI, NC, ND, NM, NY, PA, RI, SC

Benefit Starts Between 2001–15; Some Additional Policy Change
 AZ Increases 2013
 DC Increases 2007
 IL Decreases 2005
 OK Increases 2005
 OR Small annual increases
 UT Small annual increases; deduction becomes credit 2008 VT Decreases 2007

Benefit Available 2001–15; No Additional Policy Change
 OH, MT, ID, MO, MS, CO

Benefit Available 2001–15; Some Additional Policy Change
 NE Increases 2007 and 2013
 VA Increases 2009
 WI Increases 2014; decreases 2015

No Benefit Available 2001–15
 AK, CA, DE, FL, HI, KY, MA, MN, NH, NJ, NV, SD, TN, TX, WA, WY

Miscellaneous
 IA Unknown 2001–04; small annual increases 2005–15 WV Unknown 2001–09;
 available 2010–15

Method

For our estimation method, we utilize across-state and over-time variation in the institution of state-level tax benefits for 529 plan contributions, as well as variation in the size of such benefits, to examine whether the availability and generosity of a tax benefit led to higher levels of investment in 529 savings plans.

We assume that the tax benefits that are available for 529 contributions in a given year would affect account openings and contributions to a 529 plan in that year. However, the CSPN data measures the stock of plans and account balances in a given year (essentially, all account openings and contributions prior to and in that year), rather than the activity in that year. So, for our dependent variables, we take first differences of the outcome variables, as the change in the fraction of children with a plan and the change in the average account balance better reflects activity that occurred within a given year.

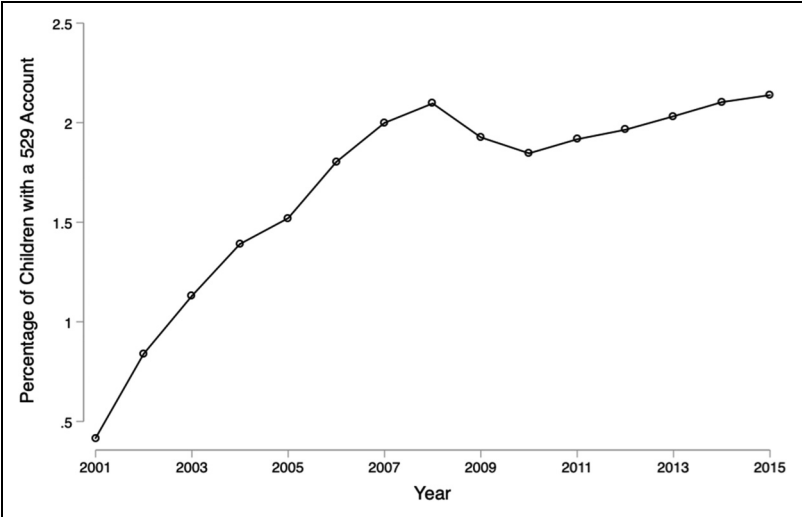


Figure 2. Percentage of children with a 529 account, 2001–2015.

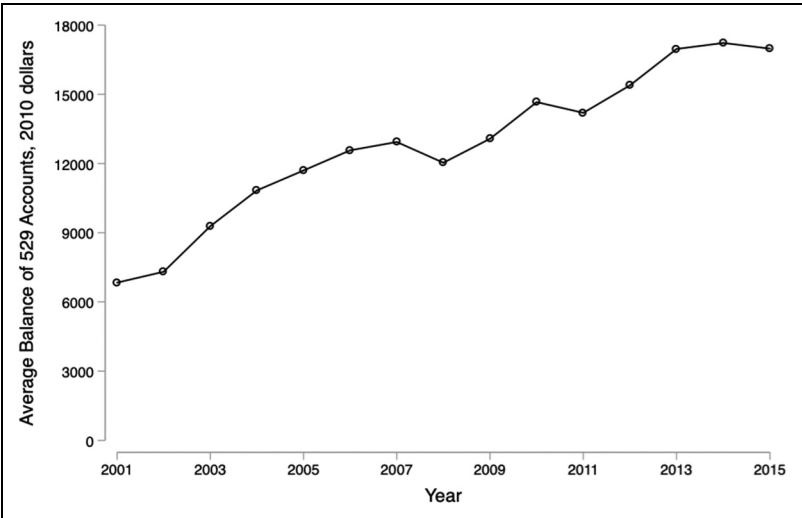


Figure 3. Average balance of 529 accounts, 2001–2015.

As such, we estimate two-way fixed effect regression models of the form:

$$\Delta Outcome_{it} = \beta * TaxBenefit_{it} + \gamma X_{it} + \theta_s + \delta_t + \varepsilon_{it}$$

where $\Delta Outcome_{it}$ denotes the change in an outcome of interest (the percentage of children with 529 accounts or the average balance per account) between years $t - 1$ and t . $TaxBenefit_{it}$ denotes a measure of the tax benefit resulting from contributing to a 529 plan, X_{it} is a vector of control variables that vary by state and year, including the state average net-of-tax share and state-level demographic characteristics, and θ_s and δ_t denote state and year fixed effects.

As noted above, CSPN altered its methodology in 2009 for counting the number of open accounts by subtracting off the number of 529 accounts that had been closed, making this variable not strictly comparable before and after this adjustment. This feature of the data affects both of our dependent variables. Though year fixed effects will control for any level shift in our dependent variables that was constant across all states, it is possible that the change differed by state. Thus, we also interact a post-2008 dummy variable with each state dummy, to account for any differences across states in how the break affected the state-specific mean of each variable.

We use cluster-robust standard errors, clustered at the state level to correct for the likely correlation of observations within states that may lead to Type I error due to inflated test statistics.

One may be concerned that changes in the number of 529 accounts or in balances in such accounts may be driving the changes in the offer of tax benefits, rather than the reverse. This might be the case, for example, if people in states with many accounts with large balances lobby their state government for increases in benefits on contributions they plan to make. To test whether this is a concern, we conduct Granger causality tests, which test whether the consequences happen before the causes.¹⁸ In such a test, one includes a number of leads of the independent variable, and tests whether the leads enter significantly. In our case, a significant relationship between the dependent variable (the change in contributions) and a lead of the independent variable (a future tax benefit) would imply that changes in contributions were affecting policy, and not the other way around.

Results from the Granger causality tests are presented in Table 4. For each of our eight specifications (four dependent variables x two independent variables), we estimated tests that included one, two, three, or four leads. Each cell in the table presents the F -statistic and the p -value from a test of the null that the coefficients on all of the lead variables are 0.

Table 4. Estimation Results: Granger Causality Tests.

	Benefit Available				\$3600 Contribution Benefit				Max Contribution Benefit			
	1	2	3	4	1	2	3	4	1	2	3	4
Number of Leads:												
F-statistic												
% w/ 529	1.44	0.753	0.694	0.44	0.0787	0.691	0.979	0.699	0.979	0.917	3.98**	1.84
% w/ 529 Savings	2.03	1.14	0.96	0.608	0.956	0.788	1.09	0.864	0.00251	0.204	2.89**	2.33*
529 Balance, \$1000s	2.03	1.36	1.19	0.967	0.152	0.447	0.505	0.472	1.75	2.91*	1.95	1.24
529 Savings Balance, \$1000s	1.56	1.08	0.944	0.598	0.0761	0.534	0.571	0.53	0.133	2.63*	1.78	1.22

Notes: Data from College Savings Plan Network and 2001–2015 waves of the American Community Survey.

* $p < .10$, ** $p < .05$, *** $p < .01$.

Across the 32 specifications, all pass the Granger causality test. Thus, we are confident that contributions to 529 accounts are not driving whether a benefit is offered or the tax benefit of a moderate contribution.

Results

Percentage of Children with Section 529 Accounts

Table 5 presents the results from several specifications that estimate the effect of having a tax benefit for 529 contributions on the percentage of children with a 529 account. One would expect the relationship to be positive, but in Column 1, when OLS is utilized without covariates, the estimated coefficient is wrongly signed, though statistically insignificant. Adding covariates in Column 2 switches the sign of the estimated coefficient, but it is still small and statistically insignificant. In Column 3, we additionally include state fixed effects, to control for differences across states in the unobserved characteristics that might affect the propensity to contribute to a college savings plan, and year fixed effects, to control for nation-wide trends in college savings plan contributions. When this is done, the estimated coefficient on offering a tax benefit is still positive and small, and still insignificant.

As noted above, CSPN altered its methodology in 2009 for counting the number of open accounts, by subtracting off the number of 529 accounts that had been closed, making this variable not strictly comparable before and after this adjustment. To account for this break, in Column 4, we interact a post-2008 dummy variable with each state dummy to account for any differences across states in how the break affected the state-specific mean of each variable. With this adjustment, the estimated coefficient on offering a tax benefit again switches signs to negative, remaining small and statistically insignificant.

The results in Table 5 suggest that offering tax benefits for 529 plan contributions does not lead to an increase in participation in these plans. However, these results may mask the impact of offering a tax benefit for 529 plan contributions for two reasons. First, this specification does not take into account the magnitude of the benefit offered, treating all benefits as equivalent. Second, this specification lumps together contributions to two types of plans (pre-paid tuition plans and savings plans), and the responsiveness to tax benefits might differ across types of plans.

To examine whether these considerations are driving the null result above, in Table 6 we present results from six specifications. In these

Table 5. Estimation Results: Percentage of Children with 529 Account.

	(1)	(2)	(3)	(4)
Benefit Available	-0.0919 (0.0703)	0.0115 (0.0478)	0.0756 (0.126)	-0.0727 (0.106)
I—Mean State & Federal Marginal Tax Rate		1.453 (1.304)	0.329 (2.133)	-1.002 (4.201)
Number of Children		-0.585 (0.492)	-1.359 (1.887)	-2.941 (2.241)
Female		0.925 (0.836)	3.025 (2.036)	0.118 (1.823)
Mean Age		-0.119*** (0.0406)	-0.0272 (0.0479)	-0.0577 (0.141)
Married		0.758 (1.005)	-0.285 (1.486)	0.285 (1.713)
Homeowner		-1.213* (0.704)	-5.058 (3.355)	-3.993 (3.898)
Black		-0.366 (0.356)	-6.323 (4.987)	-5.795 (5.444)
Other Race		0.180 (0.416)	1.790 (2.122)	2.019 (2.393)
Hispanic		-0.000254 (0.291)	0.586 (4.298)	-2.161 (3.253)
Less than High School		-1.130 (1.689)	1.845 (2.592)	0.807 (1.161)
Some College		-1.175 (0.771)	0.830 (1.272)	0.212 (1.626)
College Graduate		-2.548 (1.943)	1.352 (2.676)	-2.120 (2.598)
More than College Graduate		1.160 (1.852)	3.544 (4.108)	1.440 (2.718)
Employed		-0.401 (1.189)	-0.115 (1.923)	-2.166 (2.865)
Median Family Income, \$1000s		0.0143** (0.00602)	-0.00508 (0.0105)	-0.00523 (0.00873)
Constant	0.177*** (0.0612)	5.466** (2.717)	5.491 (5.691)	14.10 (12.89)
Year Dummies	no	no	yes	yes
State Dummies	no	no	yes	yes
Post-2008 State Interactions	no	no	no	yes

(continued)

Table 5. (continued)

	(1)	(2)	(3)	(4)
Observations	686	686	686	686

Notes: Data from College Savings Plan Network and 2001–2015 waves of the American Community Survey. Standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$.

Table 6. Estimation Results: Percentage of Children with 529 Account—Alternative Specifications.

	(1) Benefit Available	(2) Benefit for \$3600, \$100s	(3) Max Benefit, \$100s
A. All Plans			
Benefit	-0.0727 (0.106)	0.0290 (0.0204)	-0.00117* (0.000588)
Observations	686	686	681
B. Savings Plans			
Benefit	-0.0469 (0.107)	0.0368* (0.0196)	0.000129 (0.00152)
Observations	668	668	663

Notes: Data from College Savings Plan Network and 2001–2015 waves of the American Community Survey. Clustered standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$.

specifications, we use one of two different dependent variables (the percentage of children with any 529 account (including savings plans and pre-paid tuition plans, or the percentage of children with a savings plan) and one of three different measures of tax benefits for 529 contributions (a dummy for offering a benefit, the benefit from a \$3600 contribution, or the benefit from a maximum contribution). In these and all subsequent specifications, we include covariates and state and year fixed effects, as well as the interactions of a post-2008 dummy variable and each state dummy.

Column 1 presents results when the regressor of interest is an indicator variable for offering any tax benefit. The top panel presents results when the dependent variable is the percentage of children with any type of account, and the bottom panel presents results when the dependent variable is the percentage of children with a 529 savings plan. In these specifications,

the impact of offering any tax benefit is estimated to be negative, small, and statistically insignificant. Thus, the specifications in Table 3 did not mask different impacts by 529 plan type.

Column 2 changes the independent variable to the benefit from a \$3600 contribution. In this column, the estimated effects are positive and for savings plans marginally statistically significant, with a \$100 increase in the benefit for contributing \$3600 to a 529 plan estimated to increase the annual change in the percentage with a 529 savings account by 0.037 percentage points for savings plans (which is 2.2 percent of the average percentage of children with these plans).

Finally, Column 3 changes the independent variable to the benefit from a maximum contribution. In this column, the estimated effects are marginally significant, though wrongly signed with a very small magnitude, for all plans and statistically insignificant for savings plans, suggesting that a larger maximum benefit does not lead to an appreciable increase in the percentage of children with a 529 account.

Amount in Section 529 Accounts

We now turn to examine whether tax benefits for 529 plan contributions lead to higher amounts contributed to 529 accounts.

In Table 7, we estimate the same set of specifications as in Table 6, but now the dependent variable is the change in the state-level average balance

Table 7. Estimation Results: Average Balance per Accounts, \$1000s.

	(1) Benefit Available	(2) Benefit for \$3600, \$100s	(3) Max Benefit, \$100s
A. All Plans			
Benefit	0.242 (1.884)	-0.310 (0.311)	0.00247 (0.00417)
Observations	686	686	681
B. Savings Plans			
Benefit	0.485 (1.978)	-0.257 (0.322)	0.0132** (0.00611)
Observations	668	668	663

Notes: Data from College Savings Plan Network and 2001–2015 waves of the American Community Survey. Clustered standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$.

in 529 accounts. Ideally, we would be able to estimate such a specification in which the dependent variable is the change in the average balance among plans that were open in both periods, so that any estimated effect would only reflect an intensive margin change. However, the CSPN data does not provide data with this level of detail. As a result, if newly opened plans tend to have smaller average balances than older plans, the estimated coefficient may be downward biased. Mitigating this concern, however, in Table 6 we find either no or a very modest increase in accounts opening in response to 529 tax benefits, and so the magnitude of such a bias is likely to be small.

In Columns 1 and 2 of Table 7, none of the coefficients are statistically significant, suggesting that offering any benefit, or offering a larger benefit for a moderate contribution, are not associated with increased growth in account balances. However, in Column 3, the coefficient on the maximum benefit is positive in both specifications, and is significant in the savings plan specification, with a \$100 increase in the benefit for contributing the maximum amount to a 529 plan estimated to increase the annual change in the average balance per account by \$1.32 (which is 0.2 percent of the average increase among these accounts).

Overall, these results imply that simply offering a tax benefit for 529 plan contributions or increasing the maximum amount does not lead to an increase in 529 plan usage, but an increase in benefit generosity for a modest contribution does increase the growth in the percentage of children with 529 savings accounts, and thus results in more children with 529 accounts. Conversely, offering a tax benefit of any amount or offering a larger tax benefit for a moderate contribution does not lead to increased growth in account balances, but increasing the maximum tax benefit available leads to growth in 529 saving account balances.

Robustness Checks

Accounting for Break in Data

As noted above, CSPN altered its methodology in 2009 for counting the number of open accounts, by subtracting off the number of 529 accounts that had been closed, making this variable not strictly comparable before and after this adjustment. To account for this break, in our main specifications, we interact a post-2008 dummy variable with each state dummy to account for any differences across states in how the break affected the state-specific mean of each variable.

To further examine whether this break in the data has an impact on our estimates, we reran the specifications in Tables 6 and 7, but added an interaction of the post-2008 dummy with our regressor of interest to allow the effects of the tax benefits to differ in the pre- and post-2008 period.

We present the results in Tables 8 and 9. In Table 8, we again find that a \$100 increase in the benefit to a \$3,600 benefit increases the percentage of children with a 529 savings account, with marginal statistical significance, and the estimated increase of 0.039 percentage points is slightly higher than our main specification in Table 6. The results in the other specifications in Table 8 are similar to those in Table 6. We do not find a statistically significant different effect of the tax benefits in the post-2008 period, as all of the post-2008 interactions are statistically insignificant.

In Table 9, the results again indicate that offering a higher maximum benefit leads to an increase in savings plan balances, but that neither offering a benefit nor offering a larger benefit for a moderate contribution leads to greater increases in account balances.¹⁹ Again, in none of the specifications

Table 8. Estimation Results: Percentage of Children with 529 Account—Accounting for Break in Data.

	(1) Benefit Available	(2) Benefit for \$3600, \$100s	(3) Max Benefit, \$100s
A. All Plans			
Benefit	-0.0797 (0.118)	0.0294 (0.0213)	-0.00134*** (0.000470)
Post-2008 Benefit	0.0762 (0.145)	-0.00614 (0.0787)	0.0145 (0.0108)
Observations	686	686	681
B. Savings Plans			
Benefit	-0.0488 (0.119)	0.0391* (0.0205)	-0.000201 (0.00129)
Post-2008 Benefit	0.0199 (0.144)	-0.0390 (0.0738)	0.0144 (0.0108)
Observations	668	668	663

Notes: Data from College Savings Plan Network and 2001–2015 waves of the American Community Survey. Clustered standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < 0.01$.

Table 9. Estimation Results: Average Balance per Account, \$1000s—Accounting for Break in Data.

	(1) Benefit Available	(2) Benefit for \$3600, \$100s	(3) Max Benefit, \$100s
		A. All Plans	
Benefit	0.444 (2.080)	-0.138 (0.364)	0.00195 (0.00429)
Post-2008 Benefit	-2.212 (2.351)	-3.020 (2.651)	0.0444 (0.0657)
Observations	686	686	681
		B. Savings Plans	
Benefit	0.733 (2.191)	-0.0782 (0.385)	0.0126** (0.00508)
Post-2008 Benefit	-2.608 (2.459)	-3.097 (2.639)	0.0286 (0.0682)
Observations	668	668	663

Notes: Data from College Savings Plan Network and 2001–2015 waves of the American Community Survey. Clustered standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$.

is the interaction of the benefit with the post-2008 period statistically significant, meaning that the effects of the tax benefits do not differ in the pre- and post-2008 period.

Including Interactions of Whether the Benefit is a Tax Credit

We next examine whether the effects of offering a tax credit for 529 contributions differs from offering a deduction (in which case the benefit will depend on the taxpayer’s marginal tax rate). One might expect that tax credits are more salient, since they are a simple percentage of the contribution amount, and so may have more of an effect.

In Tables 10 and 11, we interact offering a tax benefit (or the amount of either the tax benefit for a \$3600 contribution or the maximum tax benefit) with an indicator variable denoting that the state offered a tax credit.²⁰ This interaction is insignificant in all specifications, implying that the effect of offering a credit does not have an appreciably different effect than offering a deduction.

Table 10. Estimation Results: Percentage of Children with 529 Account—Interaction with Tax Credit.

	(1) Benefit Available	(2) Benefit for \$3600, \$100s	(3) Max Benefit, \$100s
A. All Plans			
Benefit	-0.0974 (0.115)	0.0208 (0.0375)	-0.00124** (0.000561)
Credit*Benefit	0.220 (0.152)	-0.00207 (0.0468)	0.0226 (0.0206)
Observations	686	686	681
B. Savings Plans			
Benefit	-0.0708 (0.116)	0.0404 (0.0362)	-0.0000131 (0.00147)
Credit*Benefit	0.205 (0.157)	-0.0255 (0.0450)	0.0192 (0.0215)
Observations	668	668	663

Notes: Data from College Savings Plan Network and 2001–2015 waves of the American Community Survey. Clustered standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$.

Table 11. Estimation Results: Average Balance per Account, \$1000s—Interaction with Tax Credit.

	(1) Benefit Available	(2) Benefit for \$3600, \$100s	(3) Max Benefit, \$100s
A. All Plans			
Benefit	0.669 (2.134)	-0.258 (0.703)	0.00330 (0.00425)
Credit*Benefit	-3.818 (2.868)	0.722 (0.869)	0.248 (0.289)
Observations	686	686	681
B. Savings Plans			
Benefit	0.933 (2.245)	-0.178 (0.754)	0.0153** (0.00713)
Credit*Benefit	-3.847 (2.940)	0.668 (0.924)	0.252 (0.307)
Observations	668	668	663

Notes: Data from College Savings Plan Network and 2001–2015 waves of the American Community Survey. Clustered standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$.

Including Both Policy Measures as Regressors

Finally, we ran specifications in which we included both the indicator for having any tax benefit and one of the measures of the generosity of the benefit on a moderate contribution as regressors in a single regression. The results, presented in Tables 12 and 13, show that merely offering a tax benefit has no statistically significant effect on either the increase in the percentage of children with an account, or on increases in the average balance per account. Nor does the benefit on a \$3600 contribution have a statistically significant relationship with increases in the average balance per account. Further, the finding in our main specification that the benefit amount on a \$3,600 contribution is associated with growth in the percentage of kids with plans and that the maximum benefit is associated with a growth in savings account balances become statistically insignificant when both policy measures are included.

Multiple Permutation Tests

Finally, we conduct permutation analyses of the specifications in Tables 6 and 7, i.e., the effect of either any benefit or the amount of benefit for a

Table 12. Estimation Results: Percentage of Children with 529 Account—Benefit Availability and Amount.

	(1) Benefit for \$3600, \$100s	(2) Max Benefit, \$100s
A. All Plans		
Benefit	-0.239 (0.180)	-0.0524 (0.108)
Benefit Amount	0.0920 (0.0575)	-0.00100 (0.000678)
Observations	686	681
B. Savings Plans		
Benefit	-0.212 (0.181)	-0.0434 (0.105)
Benefit Amount	0.0917 (0.0587)	0.000270 (0.00157)
Observations	668	663

Notes: Data from College Savings Plan Network and 2001–2015 waves of the American Community Survey. Clustered standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$.

Table 13. Estimation Results: Average Balance per Account, \$1000s—Benefit Availability and Amount.

	(1) Benefit for \$3600, \$100s	(2) Max Benefit, \$100s
A. All Plans		
Benefit	1.528 (3.174)	0.0974 (2.004)
Benefit Amount	-0.714 (0.860)	0.00214 (0.00887)
Observations	686	681
B. Savings Plans		
Benefit	1.775 (3.236)	0.0974 (2.004)
Benefit Amount	-0.717 (0.850)	0.00214 (0.00887)
Observations	668	681

Notes: Data from College Savings Plan Network and 2001–2015 waves of the American Community Survey. Clustered standard errors in parentheses.

* $p < .10$, ** $p < .05$, *** $p < .01$.

\$3,600 contribution on the share of children with an account, the share with a savings account, the average balance per account, and the average balance per savings account. We conduct the permutation analysis by first randomly assigning the first year of adoption of a benefit to states and then randomly assigning the benefit levels within randomly assigned first years. Eleven states adopted a 529 benefit in 2001, five in 2002, and so on, so we randomly assign 11 states as having a benefit from 2001 on and five from 2002 on, following the observed pattern for all 35 states that adopted a benefit during the period. Because one of our treatment variables incorporates information on the level of benefit, among states with a pseudo-first-year of treatment of, e.g., 2001, we randomly assign benefit levels from the set of states who truly adopted a benefit in 2001. States retain their true values of the four outcome measures used in Tables 6 and 7. We repeat this process 5,000 times, saving the parameter estimate on the four primary variables of interest for both outcome measures. We present kernel density estimation plots of the permutation distributions and the corresponding estimate, represented by a solid vertical line, from observed data in Figures 4 and 5; the plots also contain dashed vertical lines for the fifth and 95th percentiles, equivalent to a two-sided test at the 90 percent confidence level. In our primary

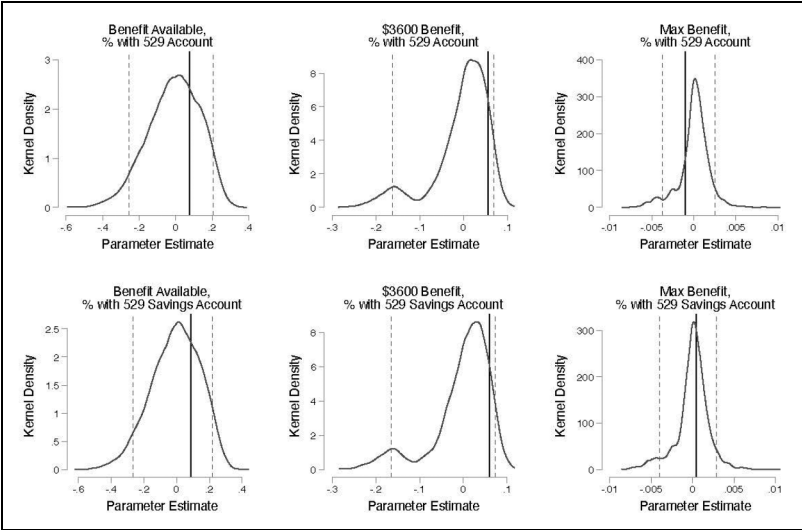


Figure 4. Multiple permutation tests—percentage of children with a 529 account.

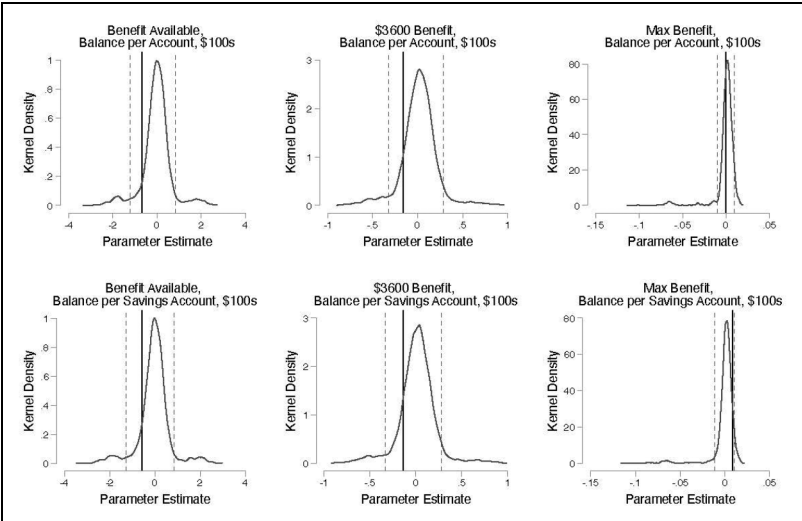


Figure 5. Average balance of 529 accounts.

analysis, only the effect a benefit for a \$3,600 contribution on the share of children with a savings plan account of and the effect of the maximum benefit on the average balance in a savings plan were statistically significant. However, the permutation analysis reveals that these estimates does not fall in the tails of the permutation distribution, an indication that the effect is likely spurious or due to random variation (see Figure 4 (bottom middle) and Figure 5 (bottom right)).

Conclusion

In this paper, we estimate the impact of Section 529 plan tax benefits on the decision to open an account, and the amount held in such accounts. Using data on tax benefits for Section 529 plan contributions, matched to data from the College Savings Plan Network and the American Community Survey, we estimate fixed effects regression of the number of accounts per minor in the state and of the average balance per account as a function of measures of tax benefit generosity.

Our results imply little responsiveness of changes in account balances to three different measures of 529 tax benefit generosity. While regression analysis suggests that offering a larger tax benefit for a moderate contribution leads to a small increase in the growth of the percentage of children with 529 savings plans, the finding is not sustained in multiple permutation tests and is likely spurious. Likewise, the positive association between the maximum benefit and the average account balance for 529 savings plans does not hold up in multiple permutation tests.

When considering these results, one should keep in mind the caveat that this study only examines two potential outcomes that might be directly affected by offering a tax benefit for 529 contributions. We do not study the potential impact on important downstream effects, including the potential impact on total household savings, eligibility for financial aid, or college attendance or completion, which are all important in their own right.

Nevertheless, these results suggest that state legislators may want to consider whether the significant tax expenditures associated with Section 529 tax benefits are justified, given the lack of behavioral response on the extensive and intensive margins. Alternatively, other policies should be considered that might more effectively induce opening college savings accounts for children, or larger contributions to those accounts. Further, policymakers should consider other policies that may increase college enrollment and

completion though direct subsidies rather than relying on inducing savings behavior through the tax code.

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Notes

1. See <https://trends.collegeboard.org/college-pricing/figures-tables/tuition-fees-room-and-board-over-time>
2. See <https://trends.collegeboard.org/student-aid/figures-tables/federal-aid-recipient-program-over-time-current-constant-dollars>
3. For further discussion of the differences between the two types of plans, see <https://www.usnews.com/education/best-colleges/paying-for-college/articles/2015/06/03/3-key-differences-between-prepaid-regular-529-savings-plans>.
4. If the child chooses to not go to the college for which the pre-paid plan was opened, the balance of the plan can be used to pay tuition at other colleges or universities, and most plans allow transfers to siblings. See <http://www.finra.org/investors/529-prepaid-tuition-plans>.
5. All monetary amounts in this paragraph are in real 2015 dollars.
6. See <https://www.edwardjones.com/about/media/news-releases/majority-of-americans-do-not-know-about-529s.html>
7. Interestingly, congressional testimony in Noven (2004) estimated that in Illinois at the time, which only allows a tax benefit for contributions to its state plan, for every dollar contributed to the Illinois plan, two dollars went to an out-of-state plan with higher fees but more aggressive selling tactics.

8. Starting in 2009, the CSPN began to subtract from the total number of accounts the number of 529 plan accounts that had been closed. This change results in a drop in the number of accounts around 2009 that is an artifact of how the data were compiled.
9. Although there are obviously exceptions, these assumptions are likely to be valid for the majority of accounts in our data. As evidence of this, ICI (2003) found that 80% of households that invest in a 529 plan do so in their own state, though the report is from 2003. Further, six states require that either the account owner or beneficiary must be a resident at the time of enrollment (see http://www.savingforcollege.com/compare_529_plans/index.php?plan_question_ids%5B%5D=47&mode=Compare&plan_type_id=1&page=compare_plan_questions), and Savingforcollege.com (2017) found that 18% of respondents believed that they had to use the plan offered by their state of residence. Finally, potential savers are given the advice not to open multiple accounts for the same child (see <https://www.savingforcollege.com/articles/multiple-529-accounts-for-the-same-child-does-it-ever-make-sense>), and Savingforcollege.com (2017) found that among respondents who intended to open an additional plan in the near future, 65% said that they were going to open the plan for a different child.
10. To examine the impact that this assumption might have on our results, as a robustness check, we omitted several states that give tax benefits to residents who invest in other states' plans (Arizona, Arkansas, Kansas, Missouri, Montana and Pennsylvania), and a state that is a common destination for out of state contributions (Virginia), since both of those conditions would attenuate the relationship between the tax benefits in a state and contributions to that state's plan. When this was done, the results were qualitatively similar to our main results.
11. Our results would only be biased if the remaining variation in these plan characteristics in a state-year are systematically correlated with the tax benefits available in that state-year, and we see no reason a priori that this would be the case.
12. To address this concern, we estimated our main specifications on data that had not been aggregated to the state level, i.e. where the unit of observation is at the plan-year level so that we are able to use plan fixed effects to control for plan characteristics that do not vary over time. However, particulars about the data seriously limit the analysis. Our study period shrinks from 2001 to 2015 to 2009 to 2015. Additionally, due to changes in how the programs are named in the data and to the apparent introduction of new plans and retirement of existing plans, we lose six states entirely in the plan-level analysis, three of which have a state tax benefit. The number of observations contracts from 765 in our main analysis (at the state level) to 539 at the plan level. The estimates indicate (where sufficiently precisely estimated) that a state tax benefit results in a

- reduction in the use of 529 plans, a finding we are disinclined to suggest as credible given the loss in variation and introduction of statistical noise.
13. See <http://www.nber.org/taxsim/marginal-tax-rates>.
 14. Assuming 5 percent real annual returns, \$3,600 contributions in each of a child's first 18 years would result in a 529 account balance of just over \$100,000, while the College Board reported that a "moderate" in-state public college budget for the 2016-17 academic year averaged \$24,610. See http://www.collegedata.com/cs/content/content_payarticle_tmpl.jhtml?articleId=10064.
 15. Conditional on having any tax benefit, 180 out of a possible 416 state-years are coded as having equal values for the benefit that would accrue to a contribution of \$3600 and the value that would accrue to the maximum amount of qualifying contributions, while 236 state-years are coded as having a benefit that would accrue to a contribution of \$3600 less than the value that would accrue to the maximum amount of qualifying contributions. The remaining 341 state-years are one in which no tax benefit is available.
 16. Four states (Colorado, Illinois, New Mexico, and South Carolina) do not have a statutorily specified annual maximum amount of qualifying contribution. For these states, we set the maximum to the highest statutory contribution limit in any state, which is \$400,000.
 17. As noted above, we were unable to identify benefit availability for two states in the beginning of our sample period.
 18. See Angrist and Pischke (2009), p. 177-178.
 19. We also tried specifications that did not account in any way for the break in the CSPM data, by omitting both the post-2008*state interactions, and the post-2008*tax benefit interactions. When this was done, the results were qualitatively similar to those in Tables 7 and 8.
 20. We also included an uninteracted indicator for the state offering a tax credit.

References

- Alexander, Raquel Meyer, and LeAnn Luna. 2005. "State-Sponsored college §529 plans: An analysis of factors that influence Investors' choice." *Journal of the American Taxation Association* 27 (s-1): 29–50. <https://doi.org/10.2308/jata.2005.27.s-1.29>.
- Angrist, Joshua D., and Jörn-Steffen Pischke. 2009. *Mostly harmless econometrics: An empiricist's companion*. Princeton, New Jersey: Princeton University Press.
- Balthrop, Justin, and Gjergji Cici. 2022. "Conflicting Incentives in the Management of 529 Plans." Working Paper.
- Bogan, Vicki L. 2014. "Savings incentives and investment management fees: A study of the 529 college savings plan market." *Contemporary Economic Policy* 32 (4): 826–42. <https://doi.org/10.1111/coep.12052>.

- Clancy, Margaret, Reid Cramer and Leslie Parrish. 2005. *Section 529 savings plans, access to post-secondary education, and universal asset building*. New America Foundation. https://static.newamerica.org/attachments/3761-section-529-savings-plans-access-to-post-secondary-education-and-universal-asset-building/Doc_File_2246_2.c0ffd03bcc5462fb41deaa3f0282974.pdf
- Clancy, Margaret M, and Sondra G Beverly. 2017. "Do Savings and Assets Reduce Need-Based Aid for Dependent Students?"
- Clancy, Margaret, Peter Orszag and Michael Sherraden. 2005. "College Savings Plans: A Platform for Inclusive Saving Policy?"
- College Savings Plan Network. n.d. "529 Plan Data." <http://www.collegesavings.org/529-plan-data>.
- College Savings Plan Network. n.d. "Overview of CSPN." <http://www.collegesavings.org/cspn-overview>.
- Dynarski, Susan. 2004a. "Tax policy and education policy: Collision or coordination? A case study of the 529 and coverdell saving incentives." *Tax Policy and the Economy* 1: 81–116.
- Dynarski, Susan. 2004b. "Who benefits from the education saving incentives? Income, educational expectations and the value of the 529 and coverdell." *National Tax Journal* 57 (2): 359–83.
- Holden, Sarah. 2002. "Saving for college with 529 plans." *Proceedings. Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association* 9: 89–98.
- Ma, Jennifer, and Douglas Fore. 2002. *Saving for college with 529 plans and other options: An update*. TIAA-CREF Institute. <https://www.tiaainstitute.org/publication/saving-college-529-plans-and-other-options>.
- Maag, Elaine. 2009. "The Effect of Alternative Savings Approaches on College Aid." Urban Institute: Opportunity and Ownership Facts, No. 15. <https://www.urban.org/sites/default/files/publication/30586/411944-The-Effect-of-Alternative-Savings-Approaches-on-College-Aid.PDF>.
- National Bureau of Economic Research. n.d. "TAXSIM Calculated Net State Rate after Federal Deduction." <http://users.nber.org/~taxsim/state-marginal/avrate.html>.
- Noven, Martin. 2004. "High Fees, Inadequate Disclosure, Disparate State Tax Treatment and Questionable Broker Sales Practices." Testimony before the Financial Management, the Budget, and International Security Subcommittee of the Committee on Governmental Affairs, U.S. Senate. <https://eric.ed.gov/?id=ED496033>.
- Ruggles, Steven, Katie Genadek, Ronald Goeken, Josiah Grover and Matthew Sobek. 2015. *Integrated public use microdata series: Version 6.0*. Minneapolis: University of Minnesota.

- Sallie Mae. 2009. "How America Saves for College: Sallie Mae's National Study of College Students and Parents – Conducted by Gallup." http://news.salliemae.com/sites/salliemae.newshq.businesswire.com/files/doc_library/file/GCR2123HowAmericaSavesforCollege2009Report.pdf.
- Savingforcollege.com. 2017. "2016 Annual College Savings Survey." <https://www.savingforcollege.com/survey/files/annual-college-savings-survey2016.pdf>.
- U.S. Census Bureau. n.d. "Population and Housing Unit Estimates Datasets." <https://www.census.gov/programs-surveys/popest/data/data-sets.html>.
- U.S. Government Accountability Office. 2012. "Higher Education: A Small Percentage of Families Save in 529 Plans, GAO-13-64."

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