

# Savings Incentives and Investment Management Fees: A Study of the 529 College Savings Plan Market

Vicki L. Bogan\*

*Forthcoming* Contemporary Economic Policy

## Abstract

This paper analyzes the 529 College Savings Plan market using a plan level panel data set covering the years 2002 - 2006. The results show evidence of limited market competition and a positive relationship between state tax benefits and 529 plan fees. A \$100 increase in potential taxable income benefit from investing in a 529 plan is associated with a 3-6 basis point increase in investment management fees for direct-sold 529 College Savings Plans. This suggests that government policies designed to make college more affordable could enable investment firms to charge excess fees. (JEL: G11, H24, I22)

---

\*Charles H. Dyson School of Applied Economics and Management, Cornell University, 201K Warren Hall, Ithaca, NY 14853. E-mail: vlb23@cornell.edu. I would like to thank Chris Barrett, Nancy Chau, Jiajia Cui, Marie Mora and Cecilia Rouse for useful comments and discussions. I also would like to thank Susan Dynarski for the state tax rate data. An earlier version of this paper was entitled "Are Higher 529 College Savings Plan Fees Linked to Greater State Tax Incentives?"

# 1 Introduction

*“Next in importance to freedom and justice is popular education, without which neither freedom nor justice can be permanently maintained.”*

*- James A. Garfield, 20th American President*

The government’s province of encouraging educational attainment has been a priority for countless administrations in the U.S. at the federal and state levels. In the early 2000s, the Internal Revenue Code §529 was amended by the Economic Growth and Tax Relief Reconciliation Act to create an investment vehicle that would further encourage parental saving for college. Given exponentially rising college education costs, the appeal of these investment vehicles has been expanding such that now almost every state has multiple 529 plan options.<sup>1</sup> The increasing interest in these plans as investment options has spawned a corresponding interest in the fees associated with these plans and thus the analysis of the 529 plan market has become a salient issue for a considerable portion of the population.

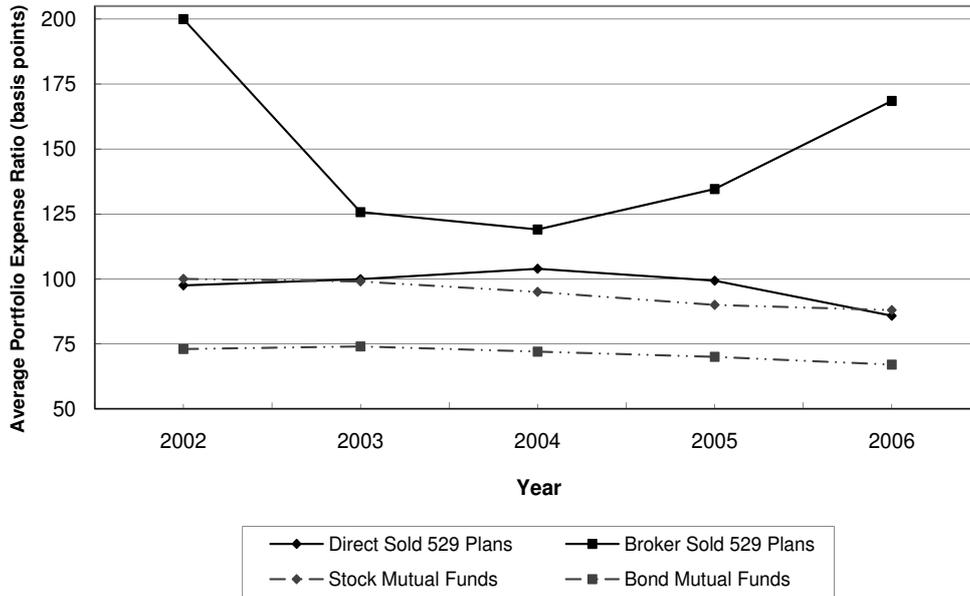
The 529 plans, especially those with deductibility of contributions from state income, are potentially of great benefit to consumers. Dynarski (2004b) finds that the advantages of 529 plans rise sharply with income. However, Dynarski (2004a) demonstrates that college savings plans can actually harm certain families on the margin of receiving financial aid when the joint treatment of college savings by the income tax code and financial aid system create tax rates that exceed 100 percent of college savings. Moreover, if most of the tax deductibility benefit is captured by the fund companies, prior to the convergence in the means and variances in plan fees, people in some states are no better off than they would have been by investing in housing equity or a non-tax-advantaged account.

The fees charged on 529 plan accounts have been well above those charged by the underlying mutual funds that comprise the 529 plans (See Figure 1). While it is plausible that the average costs of 529 plans should be different from that of the mutual funds, it is not immediately obvious

---

<sup>1</sup>529 plans managed over \$88 billion worth of assets in 2008 (FRC, 2010). Between 2002 and 2007, 529 plan assets grew steadily with a five-year compound annual growth rate of 48 percent. In comparison, assets in 401(k) plans had a 14 percent five-year compound annual growth rate during the same period (CSPN, 2010).

**Figure 1: Average Portfolio Expense Ratio in Basis Points, 2002 - 2006**



Source: Collins (2010); Hurley (2006)

why there exists such variability of 529 fees across the states. For example, in 2006 Utah ran a 529 plan whose annual fees represented 0.39 percent of assets while North Carolina's plan fees were 1.32 percent of assets annually (Hurley, 2006). Annual 529 plan fees range from 0.25 percent to 3.45 percent of assets charged annually (Hurley, 2006). While the costs do differ depending on whether the 529 plan is broker sold or allows direct enrollment, even direct enroll plans exhibit considerable variation in fees across states.<sup>2</sup>

Variation in the fees of the underlying mutual funds is well-documented (e.g., Khorana, Servaes, and Tufano (2007); Dellva and Olson (1998)), so some of this variation appears to be consistent with mature equity markets. However, the changes in the tax rules of 2001, which provided additional investor benefits, should be serving to increase 529 plan competition and market efficiency.<sup>3</sup> Moreover, as information about the programs and their costs disseminates through the media, word

<sup>2</sup>Broker-sold plans are sold to investors through a financial advisor, brokerage firm, or bank. Generally, there are higher commissions and sale fees when dealing with a broker. Direct-sold plans are ones in which individuals invest in the plan directly without a broker and thus get the plan without extra fees or broker commissions.

<sup>3</sup>The tax changes permitted federal tax exempt qualified withdrawals. Additionally, it allowed for the annual rollover from one state's plan to another state's. However, some states do tax the earnings portion of rollovers from out of state plans.

of mouth, financial planners, and tax professionals, prices should further converge. Yet, from the data it is clear that competitive pressures have yet to eliminate large price differentials.

In light of the fact that numerous investment management companies manage 529 plans for multiple states, the considerable heterogeneity with respect to 529 plan fees across states is particularly striking. Within the raw data, one can identify a number of instances in which a single investment management company sets significantly higher fees for one state over another. For example, in 2006, TIAA-CREF managed direct-sold 529 plans in both Michigan and Idaho. The average fee for the direct-sold 529 plan in Michigan was 60 basis points (bps) while the average fee for the direct-sold 529 plan in Idaho was 32 bps higher at 92 bps. Correspondingly, the fixed population average state tax rate on wage income in Michigan was 3.87% while the fixed population average state tax rate on wage income in Idaho was 7.39%.

There are several other unique elements that influence 529 plan fees and could account for the differences in fees across states. States are monopoly providers of a limited number of plan options and therefore should be able to demand fee concessions from investment management companies. Conversely, it could be the case that state fee sharing arrangements with the investment management companies create disincentives to negotiate fee concessions or even incentives to increase fees. Further, many 529 plans vary in their structure across the states and keeping up with the reporting requirements of each state's program might impose some extra costs for 529 plans (though these costs should certainly diminish over time).

The literature on mutual fund asset management fee structure has established four main factors that influence fees: market position / competition; fund portfolio management; administrative structure; and fund size (See for example, Cullinan and Bline (2005)). I will use a similar framework to analyze the factors relating to 529 plan fees. However, due to the characteristics of 529 plans, I posit that there are other market frictions that could significantly influence plan fees: 1) taxes and regulation and 2) agency issues - revenue sharing practices from investment management companies to the state. Given the heterogeneity in state tax rates and state policies, I focus on these factors

to explain the considerable heterogeneity in fees across states.<sup>4 5</sup>

There have been several key studies that investigate the effects of various tax incentives on prices in specific markets. Poterba (1984) illustrates that tax provisions for mortgage interest deductibility (in tandem with rising inflation rates) could explain most of the 30 percent increase in real estates prices during the 1970s. Goolsbee (1998) demonstrates that much of the benefit of investment tax incentives did not go to investing firms but rather to capital suppliers through higher prices. Bergstresser and Poterba (2002) show that after-tax returns affect mutual fund inflows. Of the limited academic attention that has been devoted to 529 College Savings Plans, most of the literature explores the effects of pre-specified asset allocations on participation (e.g., See DeGennaro (2004); Spitzer and Singh (2001)). Alexander and Luna (2005) investigate questions relating to fees and identify a positive relationship between plan participation rates and plan fees that they link to plan marketing efforts by brokers. With respect to the 529 plan market, an open question exists in the literature as to how or if state tax benefits influence 529 plan fees.

In the spirit of Barber and Odean (2003) who demonstrate that taxes do matter with regard to individual investment decisions, I investigate if state tax rates matter for individual 529 plan investment decisions. I analyze the relationship between investment management firm pricing behavior, state tax benefits, and other plan characteristics. I find that after accounting for the potential effects of competition, fund portfolio management, administrative structure, fund size, kickbacks and other state effects, a positive link between state tax benefits and 529 plan fees remains; suggesting that government policies designed to make college more affordable could be creating market frictions which enable investment firms to charge excess fees.

The remainder of the paper proceeds as follows. Section 2 discusses 529 college savings plans in general. Section 3 describes the data. Section 4 presents the econometric analysis and discusses

---

<sup>4</sup>Generally, financial market frictions are placed into five main categories: transaction costs, taxes and regulations, asset indivisibility, nontraded assets, and agency and information issues (DeGennaro & Robotti, 2007). Two of these five categories, asset indivisibility and nontradable assets, are not applicable. However, transaction costs, taxes and regulation, and agency and information issues are salient issues in the 529 market.

<sup>5</sup>For example, Brady, Cronin, and Houser (2003) find that 20 percent of the regional differences in the utilization of the U.S. mortgage interest deduction is due to differences in state and local taxes.

the main results. Section 5 summarizes key findings and provides concluding remarks.

## 2 529 College Savings Plans

### 2.1 The Mechanics of 529 Plans

A 529 plan is a tax-advantaged investment plan designed to encourage saving for the future higher education expenses of a designated beneficiary. The 529 plans began as a state government (not a federal government) innovation when, through a series of court cases and legislative responses, states gained federal tax-advantaged status for their plans (Dynarski, 2004b). The plans take their name from §529 of the Internal Revenue Code and are administered by state agencies and organizations. Contributions are not deductible on federal tax returns but investments grow tax-deferred and all withdrawals from 529 plans for qualified education expense are exempt from federal income tax.

The 529 college savings plans are distinctly different from 529 prepaid tuition plans. The 529 prepaid tuition plans allow for pre-purchase of tuition based upon present day prices and then tuition is paid when the beneficiary is in college. Thus, performance is based upon tuition inflation. The states offering prepaid tuition contracts covering in-state tuition allow one to transfer the value of a contract to private, out-of-state schools. (Although, depending on the particular state, one may or may not be able to realize the full value of the contract.) The 529 college savings plan account earnings are based upon the market performance of the underlying investments, which typically consist of mutual funds. The full value of the account can be used at any accredited college or university in the country (along with some foreign institutions, vocational schools, or other post secondary educational institution eligible to participate in a student aid program administered by the U.S. Department of Education).<sup>6</sup>

Each state that offers a 529 college savings plan determines how the plan is structured, what investment options are offered, and which (if any) investment management company manages the

---

<sup>6</sup>Source: [www.irs.gov](http://www.irs.gov)

plan.<sup>7</sup> The contracting practices and policies are specific to the individual states, though many follow a competitive bid procurement process to select an investment management company (Clancy & Jovanovich, 2009). Most plans allow investors from out-of-state. The majority of states allow state tax deductions for their residents who invest in one of their state's 529 plans.<sup>8</sup> However, several states currently allow deductions for contributions to any plan, not solely those plans from their state. For the remainder of this paper, I will use the term 529 plans to refer specifically to 529 college savings plans.

## 2.2 529 Plans and Taxes

The tax implications of 529 plans could have a strong impact on household saving and investment decisions. The 529 plans are part of an array of savings vehicles available to families. Thus, understanding how the tax benefits and fees affect returns is important for investors when they are choosing among plans. Before analyzing the marginal incentive effect of the 529 plan, it is useful first to understand generally how savings are taxed outside of a 529 plan. Consider savings placed in a typical, non-tax-advantaged mutual fund account. The savings is taxed at three points:

1. *Earned income is taxed before it is put into savings*

A dollar of pre-tax income destined for savings is first taxed at the federal and state level (at rates  $\tau_f$  and  $\tau_s$ , respectively), so that  $1 - \tau_f - \tau_s$  remains to be invested.

2. *Certain earnings are taxed as they accrue*

---

<sup>7</sup>For regulatory purposes, 529 plans are classified as municipal fund securities and are governed by the rules of the Municipal Securities Rulemaking Board (MSRB), a self-regulatory agency created by Congress and subject to SEC administrative oversight. The MSRB is authorized to create rules designed “to prevent fraudulent and manipulative acts and practices, to promote just and equitable principles of trade, to foster cooperation and coordination with persons engaged in regulating, clearing, settling, and processing information with respect to, and facilitating transactions in municipal securities, to remove impediments to and perfect the mechanism of a free and open market in municipal securities, and, in general, to protect investors and the public interest.” Source: [www.msrb.org](http://www.msrb.org).

<sup>8</sup>There are nine states for which there are no state income taxes: Alaska, Florida, Nevada, New Hampshire, South Dakota, Tennessee, Texas, Washington, and Wyoming (Source: [www.irs.gov](http://www.irs.gov)). However, Tennessee and New Hampshire do tax interest and dividends over a threshold amount. Over half of the states in the U.S. have caps on the tax benefits allowed to state residents.

Interest and dividends are taxed as they are earned. The federal tax code treats interest and ordinary dividends as ordinary, taxable income; most states do the same.<sup>9</sup> Capital gains are taxed as they are realized, which for savings in a mutual fund may occur before funds are withdrawn. When fund managers sell stock at a profit, they generate earnings for those who hold shares in the fund, who must then pay capital gains taxes. The states generally treat capital gains as ordinary income, while the federal government currently taxes them at a lower rate than ordinary income.<sup>10</sup> Returns are reduced by these taxes, from a pre-tax rate of  $r$  to a post-tax rate of  $r(1 - \tau_f - \tau_s)$ .

### 3. *Any yet untaxed earnings are taxed at withdrawal*

For an ordinary savings account or money market fund, there are no additional taxes at this point, since the interest earnings were taxed as they accrued. If a saver instead holds stock that has grown in value, however, he pays state and federal capital gains taxes on the profit when the gains are realized. Also, dividend income is recognized when received. (For direct stock holding, gains are realized when the stock is sold. For mutual funds, gains that are realized within the fund are reported to investors and taxed as capital gains. Those gains are added to the investor's basis. When the investor sells the mutual fund shares, the taxable gain is the selling price minus the basis adjusted for any previously taxed capital gains.)

The 529 plans eliminate taxes on asset returns; that is, the second and third forms of taxation. In many states, such as Illinois, even the first form of taxation is reduced, because contributions by residents to that state's 529 can be deducted from state taxable income. Once any initial federal and state taxes are paid, there are no further taxes if the funds are used for qualified education expenses. In this way, a 529 plan is identical to a Roth IRA, in which after-tax dollars grow without

---

<sup>9</sup>In 2003, *qualified* dividends began being taxed at a preferential rate for federal purposes for individuals, similar to long term capital gains. Source: Department of Treasury, Internal Revenue Service - Publication 553 (Rev. January (2004)).

<sup>10</sup>For funds that follow a buy-and-hold strategy, which include funds that track an index like the S&P 500, capital gains are a minimal portion of earnings. These are referred to as tax-efficient funds. In order to streamline notation in the theoretical model, I do not differentiate between the ordinary income rate and the special federal tax rate on capital gains.

taxation until the saver's retirement, when they can be withdrawn tax-free. A comparison of the net returns from different savings vehicles is summarized in Table 1. From Figure 2, one can see that net returns are substantially greater for 529 vehicles in states that allow deductions for contributions.<sup>11</sup> However the magnitude of this result is predicated on the relationship between annual asset-based fees for savings vehicles in states that allow contributions deducted from taxable income ( $f_n^{sE}$ ) and annual asset-based fees for savings vehicles in states that do not allow contributions deducted from taxable income ( $f_n^{sN}$ ). (In Figure 2, I assume  $f_n^{sE} = f_n^{sN}$ .)<sup>12</sup>

### 2.3 529 Plans and Fees

Like taxes, fees associated with 529 plans also vary considerably across the states. Fees reduce net returns on assets in the same way as a tax. Fees in 529 plans take two forms: lump-sum fees, such as enrollment fees and annual maintenance fees, and asset-based fees, which are calculated as a percentage of the account balance. Most of the analysis will focus on asset-based fees. The asset-based fees are larger in magnitude, more variable, and more susceptible to the market frictions discussed in the next subsection. Asset-based fees consist of a special 529 administrative fee charged by some states and the expense ratios charged by the individual mutual funds that underlie the age-based or static portfolios.<sup>13</sup> The expense ratios on the underlying funds vary substantially, from nearly zero for some passively managed funds to 345 bps for one actively managed emerging-markets fund.<sup>14</sup> The lump-sum fees are relatively minor, ranging from \$0 to around \$100 (See Table 2), and they are generally waived when deposits are automated or balances exceed a fairly low level, typically \$25,000.

---

<sup>11</sup> Allowable state tax deductions are usually limited (See Section 3.2).

<sup>12</sup> I also assume no tax risk or other implicit taxes.

<sup>13</sup> Age-based portfolios are portfolios in which the fund manager adjusts the asset allocation from aggressive to conservative as the beneficiary nears college age. Static portfolios are portfolios in which the asset allocation stays the same until the account owner makes a change, which can be done once per calendar year.

<sup>14</sup> 2006 data from Hurley (2006)

**Table 1: Net Returns on Different Savings Vehicles**

Type of Account	Nominal Value at Time $T$ of a Dollar of Pre-Tax Income Invested in Different Vehicles	After-Tax Return
Non-tax-advantaged account (held in the name of parent)		$(1 - \tau_j^f - \tau_j^s)[1 + (1 - \tau_j^f - \tau_j^s - f_n^{sN})r]^T$
529 Plan in state that does <i>not</i> allow contributions deducted from taxable income		$(1 - \tau_j^f - \tau_j^s)[1 + r(1 - f_n^{sN})]^T$
529 Plan in state that allows contributions deducted from taxable income		$(1 - \tau_j^f)[1 + r(1 - f_n^{sE})]^T$

where  $r$  = annual gross return to assets

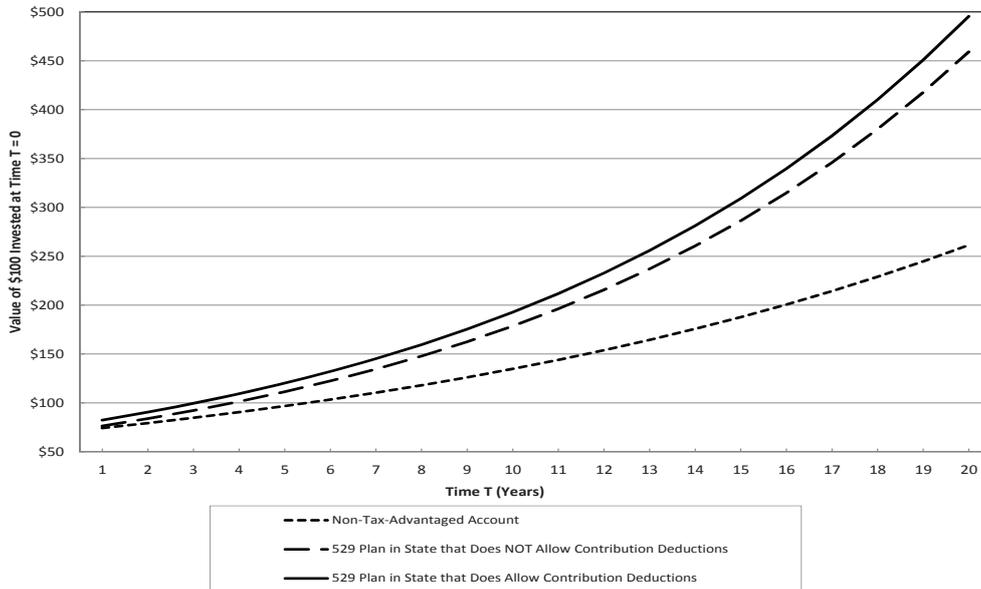
$f_n^{sE}$  = annual asset-based fees for savings vehicle  $n$  in state  $s$  that allows contributions deducted from taxable income

$f_n^{sN}$  = annual asset-based fees for savings vehicle  $n$  in state  $s$  that does not allow contributions deducted from taxable income

$\tau_j^f$  = marginal federal income tax rate of income group  $j$

$\tau_j^s$  = marginal state income tax rate of income group  $j$

**Figure 2: Comparison of Net Returns on Different Savings Vehicles**



**Note:** Comparison assumes a federal tax rate of 25.0 percent, a state tax rate of 5.5 percent, annual asset-based fees for 529 College Savings Plans of 1.0 percent, and an annual gross return to assets of 10.0 percent. Example also assumes that fees for 529 College Savings Plans in states that allow and do not allow contributions deducted from taxable income are equal.

## 2.4 Theoretical Framework

When evaluating returns, investors should consider the performance of the underlying funds, the ongoing expense ratio, and the benefit from deductible contributions (when available). Similar to Gruber and Poterba (1994), I start by defining the tax-induced distortion in the relative returns. Specifically, I look at the distortion that results when states allow 529 plan contributions to be deducted from state taxable income. I define the after tax return for a (*no fee*) plan that does not allow contributions deducted from state taxable income as:  $q = (1 - \tau_j^f - \tau_j^s)[1 + r]^T$  and the after tax return for a (*no fee*) plan that does allow contributions deducted from state taxable income as:  $q' = (1 - \tau_j^f)[1 + r]^T$ . Thus, the tax induced distortion in relative returns ( $\theta$ ) is:

$$\theta = \frac{(q' - q)}{q} = \frac{(1 - \tau_j^f)[1 + r]^T - (1 - \tau_j^f - \tau_j^s)[1 + r]^T}{(1 - \tau_j^f - \tau_j^s)[1 + r]^T} = \frac{\tau_j^s}{(1 - \tau_j^f - \tau_j^s)} \quad (1)$$

When asset management fees are included, the fee and tax induced distortion in relative returns ( $\hat{\theta}$ ) is:

$$\begin{aligned} \hat{\theta} &= \frac{(\hat{q}' - \hat{q})}{\hat{q}} = \frac{(1 - \tau_j^f)[1 + r(1 - f_n^{sE})]^T - (1 - \tau_j^f - \tau_j^s)[1 + r(1 - f_n^{sN})]^T}{(1 - \tau_j^f - \tau_j^s)[1 + r(1 - f_n^{sN})]^T} \\ \hat{\theta} &= \frac{(1 - \tau_j^f)}{(1 - \tau_j^f - \tau_j^s)} \left[ \frac{1 + r(1 - f_n^{sE})}{1 + r(1 - f_n^{sN})} \right]^T - 1 \end{aligned} \quad (2)$$

Therefore, the distortion is a function of taxes and fees.

$$\hat{\theta} = \hat{\theta}(\tau_j^f, \tau_j^s, f_n^{sE}, f_n^{sN}) \quad (3)$$

As with mutual funds, the asset management fee structure of 529 plans is influenced by a number of factors. Cullinan and Blin (2005) categorize the independent variables relating to mutual fund fees into four categories: market position / competition; fund portfolio management; administrative structure; and fund size. Since 529 plans typically consist of mutual funds, I will use a similar framework to describe variables relating to 529 plan fees. Four of the categories will be similar: competition ( $C^s$ ); fund portfolio management ( $m_n$ ); administrative structure ( $a_n$ ); and fund size

( $S_n$ ). However, due to the tax-advantaged status of 529 plans, I include two additional market frictions that could influence plan fees: 1) taxes and regulation - state tax rates ( $\tau_j^s$ ) and 2) agency and information issues - revenue sharing (“kickbacks”) from investment management companies to the state ( $k_n^s$ )<sup>15</sup>

$$f_n^{sE} = f_n^{sE}(C^s, m_n, a_n, S_n, k_n^s, \tau_j^s) \quad (4)$$

The relationship between fees and competition, fund portfolio management, administrative structure, and fund size is well documented in the literature (See for example Cullinan & Bline, 2005). I posit that the two additional market frictions place **upward** pressure on 529 plan fees: i) Higher state tax rates increase the value of the 529 investment benefit to consumers. Thus, higher state tax rates could induce investment management companies to try to absorb any consumer surplus. ii) Kickbacks are an expense for the investment management companies that could induce them to increase fees. Moreover, if states share in the fee revenue earned by the investment management companies, agency problems are created that discourage states from trying to curb asset based fees.<sup>16</sup>

To find the rate of change of  $\hat{\theta}$ , one would need to evaluate the following total derivative:

$$d\hat{\theta} = \frac{\partial \hat{\theta}}{\partial \tau_j^s} d\tau_j^s + \frac{\partial \hat{\theta}}{\partial f_n^{sE}} df_n^{sE} + \frac{\partial \hat{\theta}}{\partial f_n^{sN}} df_n^{sN} \quad (5)$$

Consequently, understanding the relationship of  $f_n^{sE}$  with respect to competition, fund portfolio management, administrative structure, fund size, kickbacks, and state taxes is essential for household decision making (Equation 4). Empirically understanding the relationship between fees and state tax benefits will be main the focus of this paper.

---

<sup>15</sup>Some states turn the management of their programs over to well-known financial services companies. In return for the contract, the investment management company pays a fee (kickback) to the state agency charged with the program implementation. (Savingforcollege.com, March 12, 2008.)

<sup>16</sup>The regulation and practice of revenue sharing between investment management firms and third parties has been widely criticized within the mutual fund industry. Specifically, the disclosure practices have been under scrutiny (Bullard, 2009). Similarly, the 529 plan revenue sharing disclosure practices among firms has not been transparent or consistently reported.

## 3 Data

### 3.1 Description

For the empirical analysis, I utilize 529 plan level data from 2002 through 2006.<sup>17</sup> These data were compiled from various sources. The fee and plan characteristic data were collected from “The Best Way to Save for College: a Complete Guide to 529 Plans” by Joseph Hurley. The fee sharing/kickback data were collected from the individual state plan disclosure statements. The data on total number of contracts for each plan were compiled from the College Savings Plans Network (CSPN). The U.S. household and population data were collected from the U.S. Census Bureau. State tax rate information was collected from the National Bureau of Economic Research (NBER).<sup>18</sup>

### 3.2 Summary Statistics

The panel data set, which covers a five year time period, contains 238 observations of direct-sold 529 savings plans and 76 observations of broker-sold 529 savings plans.<sup>19</sup> Table 2 and Table 3 present the summary statistics of the panel data. Notably in Table 2, the average maximum value of a deduction for a single taxpayer with one beneficiary is \$3,598 for the direct-sold sample with a minimum value of \$0 and a maximum value of \$12,500. During the time period studied, of the states that had a limit for the maximum value of deduction, \$12,500 was the largest amount for a single taxpayer with one beneficiary.<sup>20</sup> However, there were six states in which the full contribution could

---

<sup>17</sup>2002 - 2006 are the years for which the most comprehensive data on 529 plans are available.

<sup>18</sup>The NBER calculates the tax rates as follows: Allow the state marginal tax rates to vary across states and years only due to state tax rates. The nationwide population of households in 1995 is run through each state’s tax code in each year. This generates the average marginal tax rates, by state and year, that would exist if only tax rates varied across time and state, but households were held constant. Note that the marginal tax rates are based upon a nationwide population of households and the population of equity investors generally has a higher average income. Thus, one can infer that the population of 529 investors would be subject to a higher average marginal tax rate. Furthermore, this implies that any results obtained would be *understated*.

<sup>19</sup>Not every state has a 529 plan in each year of the sample. Over the course of the sample period, both the number of states with plans and the number of plans in certain states increased (See Table 4).

<sup>20</sup>Using the value for a single taxpayer with one beneficiary is an extremely conservative assumption considering many states allowed married filing jointly (MFJ) taxpayers to double the maximum value of a single taxpayer deduction. Further, other states allowed deductions per beneficiary, per taxpayer which could allow this maximum value to exceed \$12,500 for a specific household. When the maximum value of deduction is doubled, the significance levels improve in some specifications.

Table 2: **Summary Statistics – Direct-Sold and Broker-Sold Plan Characteristics (2002-2006)**

	Direct-Sold			Broker-Sold		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Average Portfolio Expense Ratio (bps) <sup>†</sup>	97.0	14.0	210.0	141.4	25.0	245.5
Minimum Portfolio Expense Ratio (bps)	81.1	0.0	180.0	93.3	0.0	231.0
Maximum Portfolio Expense Ratio (bps)	112.9	28.0	275.0	189.4	25.0	345.0
Average Enrollment Fee (\$)	6.4	0.0	90.0	2.1	0.0	20.0
Average Maintenance Fee (\$)	13.5	0.0	50.0	24.9	0.0	50.0
% of Plans with State Deduction Available	69.9	–	–	73.0	–	–
Average Max Value of Deduction <sup>‡</sup>	3,598	0	12,500	4,488	0	12,500
States (plus DC) Represented <sup>‡‡</sup>	50	–	–	22	–	–
Observations	238			76		

<sup>†</sup> Average portfolio expense ratio is the average of the average fees for each plan. Average fees for each plan are calculated from the highest and lowest expense ratio option available for each plan.

<sup>‡</sup> During the time period studied, of the states that had a limit for the maximum value of deduction, \$12,500 was the largest amount. However, there were eight states in which the full contribution could be deducted from state taxable income for at least one year during the time period studied (Colorado, Illinois, Michigan, Mississippi, New Mexico, South Carolina, Tennessee, and West Virginia). For states in which the full contribution could be deducted from state taxable income, a conservative maximum value of \$12,500 is assumed.

<sup>‡‡</sup> Washington state has only a 529 prepaid tuition plan during the time period studied.

be deducted from state taxable income for at least one year during the time period studied.<sup>21</sup> For states in which the full contribution could be deducted from state taxable income, a conservative maximum value of \$12,500 is assumed. Because the maximum value of deductions assumed could be lower than the actual value, this assumption will understate any significant results for taxable income benefit in the empirical analysis.<sup>22</sup> Table 3 also shows the average asset-based fees that direct-sold plans in the sample paid to the states. On average states received over 10 bps from asset-based fee sharing arrangements with the direct-sold plans. 50.77 percent of the plans paid between 0 and 5 bps to states, 34.86 percent of the plans paid between 10 and 20 bps to the states, 10.77 percent paid between 25 and 40 bps to the states, and 3.59 percent paid 75 bps to the states.

<sup>21</sup> Colorado, Illinois, Mississippi, New Mexico, South Carolina, and West Virginia (Hurley, 2006; 2005; 2004; 2003; 2002)

<sup>22</sup> During the time period studied, a few states started additional matching grants or tax credit programs. These matching programs did not significantly influence the results since by the last year of the period studied, only seven states had any type of matching program. Moreover, the matching programs did not affect the majority of households since they chiefly were for low income households only and/or for small sums of money (less than \$500) for a fixed amount of time (up to five years) (Hurley, 2006).

**Table 3: Summary Statistics - Control Variables**

	Direct-Sold			Broker-Sold		
	Mean	Min	Max	Mean	Min	Max
Plan Age (years)	4.64	1.00	16.00	3.23	1.00	8.00
Number of State Households	1,990,300	192,000	11,389,000	1,578,200	223,000	11,389,000
State Population Under Age 18	1,371,800	115,000	9,250,000	1,075,200	191,000	9,250,000
Number of Competing 529 Plans in State	1.66	1.00	6.00	2.89	2.00	6.00
Number of Contracts Per Plan	73,900	1,354	885,361	575,900	491,240	673,910
Number of Options in Plan	7.38	1.00	36.00	13.58	3.00	31.00
Asset-Based State Fee Sharing Per Plan (bps)	10.64	0.00	75.00	–	–	–

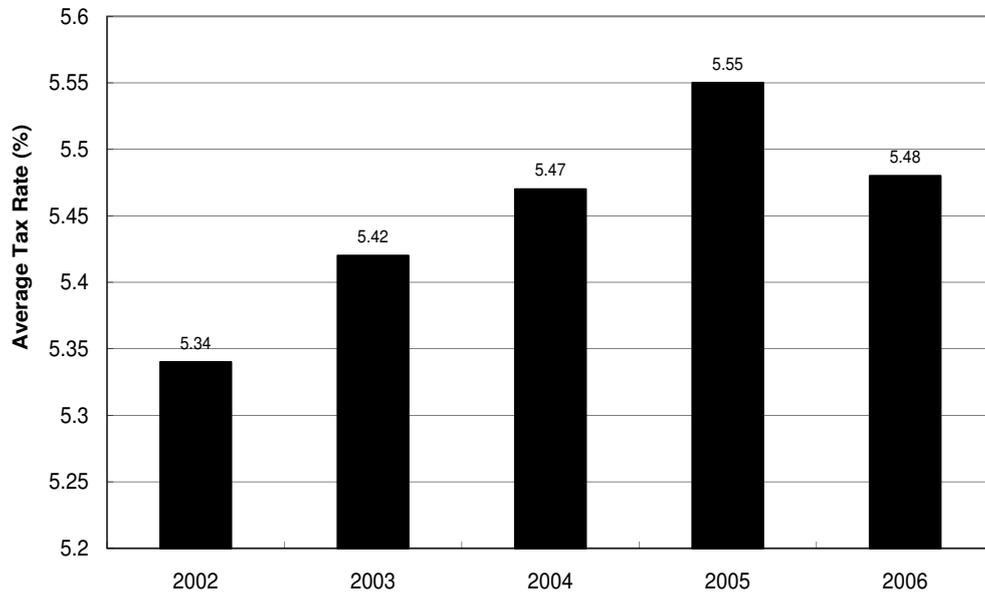
Figure 3 presents the 2002 - 2006 average state tax rates on wage income which I use as the relevant tax rates for calculating the value of investing in a 529 plan.<sup>23</sup> Figure 3 shows that during the period studied, average state tax rates were between 5.34 percent and 5.55 percent.

Table 4 shows the average portfolio expense ratio means and standard deviations in basis points (bps). Average portfolio expense ratio is the average of the average fees for each plan. Average fees for each plan are calculated from the highest and lowest expense ratio option available for each plan. From this table, one sees that the average fees for direct-sold 529 plans peak in 2004 and subsequently decline. Yet, the broker-sold plans generally have increasing fees. The variance in fees for direct-sold or broker-sold plans do not seem to have a discernable pattern. The raw statistics in Table 4 indicate that there are large differences in the fees between direct-sold and broker-sold plans.<sup>24</sup> Broker-sold plans have much higher fees than direct-sold ones. Moreover, an analysis of variance (ANOVA) indicates that the differences in the means are statistically significant. The direct-sold and broker-sold plans have significantly different fee structures (Table 5).

<sup>23</sup>For the main econometric specification, I do perform sensitivity analysis using interest income tax rates and find consistent results due to the high correlation between wage income and interest income tax rates.

<sup>24</sup>Note that some states have both broker and direct-sold plans. Broker-sold and direct-sold plans within a state are identified as two separate plans in the data set.

**Figure 3: Average State Tax Rates on Wage Income, 2002 - 2006**



Source: National Bureau of Economic Research

**Table 4: Average Portfolio Expense Ratio (bps) Means and Std. Deviations - Plan Level Fees**

	2002	2003	2004	2005	2006
Direct-Sold 529 Plans					
Mean	97.5	99.9	103.9	99.3	85.8
Std. Deviation	37.5	35.5	29.7	34.5	28.0
Observations	30	40	55	56	57
Broker-Sold 529 Plans					
Mean	200.0	125.7	119.0	134.6	168.5
Std. Deviation	.	35.5	40.6	52.5	39.8
Observations	1	9	17	25	24
Total 529 Plans					
Mean	100.8	104.7	107.4	110.1	109.6
Std. Deviation	41.2	36.5	32.9	43.6	49.2
Observations	31	49	72	81	81

**Table 5: Analysis of Variance - Average Portfolio Expense Ratios for Direct Sold and Broker Sold 529 Plans**

	SS	df	F	Prob > F	R-squared
2002	10167.34	1	7.22	0.0118	0.1993
2003	4884.63	1	3.88	0.0548	0.0762
2004	2962.80	1	2.81	0.0983	0.0386
2005	20777.42	1	12.52	0.0007	0.1399
2006	112243.40	1	111.16	0.0000	0.5877

## 4 Econometric Analysis and Results

The model presented in Section 2.4 postulates that returns are related to fees and the relevant state tax rates while fees also are related to the relevant state tax rates. Thus, in the data one should expect to observe a relationship between plan fees and the taxable income benefit of a state tax deduction (\$). I would like to test the hypothesis that for every dollar increase in potential income benefit there is a corresponding increase in fees for 529 plans.

### 4.1 Full Sample Analysis

As a first step using the full sample of 529 plans, I utilize a fixed effects model where the dependent variable is a measure of average asset-based plan fees for plan  $i$  at time  $t$ .<sup>25</sup> The measure of average asset-based plan fee is an average of the portfolio expense ratios (bps) for the lowest cost fund and the highest cost fund in the plan. While I use average portfolio expense ratio, I find similar results if the highest cost fund expense ratio or the lowest cost fund expense ratio is used as the dependent variable.<sup>26</sup>

<sup>25</sup>While the total universe of plan observations in the U.S. between 2002 and 2006 is 314, full plan characteristic information (e.g., number of investment options within a plan) was not available for all plans for all years. Full plan characteristic information was available for over half of the total universe of plan observations. However, the subset of plans for which I have full plan characteristic information does not have a statistically significant different fee structure from the plans for which I do not have full plan characteristic information. The mean of the average fees for plans in my sample are 5 bps lower than in the sample for which I do not have full plan characteristic information but this difference is **not** statistically significant at the 5 percent level.

<sup>26</sup>When the dependent variable is lump sum fees instead of average asset based fees the relationship between state tax rates and lump sum fees is not significant. The point estimate of the potential taxable income benefit variable is 0.01 and the p-value 0.500.

Numerous investment management companies manage 529 plans for more than one state. Since specific investment management companies could charge higher fees due to differing fund management practices ( $m_n$ ) or differing administrative structures ( $a_n$ ), I use a firm-level fixed effects regression model to control for investment management company fixed effects. The baseline fixed effect model specification for the full sample analysis is presented in Equation 6.

$$FEES_{it} = \alpha_i + \sum \beta_j X_{ijt} + \epsilon_{it} \quad (6)$$

where  $X_{ijt}$  includes plan, fund, and state characteristic control variables and year dummy variables.

The main independent variable of interest is a variable indicating the potential taxable income benefit (in \$'s) of the tax deduction (wage income tax rate\*maximum value of state tax deduction). I focus on this variable as opposed to simply the wage income tax rate to capture the true individual/household benefit of investing in a 529 plan.<sup>27</sup>

The other independent variables include: a dummy variable indicating if the plan is broker sold, a plan age variable, a variable for the total number of investment options (funds) in the plan, a dummy variable indicating if there is an age-based investment option in the plan, the log of the state population under age 18, the number of competing plans in the state, a dummy variable if the plan is in a state with a state tax deduction and year dummy variables. Due to data limitations, not all of the controls that will be used in the direct-sold plan analysis can be used in the full sample analysis.

The broker sold dummy controls for the different expense structures of broker sold plans. The plan age variable is to control for the maturity of the individual plan that might influence scale economies ( $S_n$ ).<sup>28</sup> The variable for the total number of investment options (funds) in the plan and the age-based investment option dummy variable control for the complexity of the plans that might influence costs and thus plan fees ( $m_n$ ). The number of competing plans in the state variable

---

<sup>27</sup>I perform sensitivity analysis using interest income tax rates and find consistent results due to the high correlation (0.9524) between wage income tax rates and interest income tax rates.

<sup>28</sup>More mature plans may be able to realize more overhead cost efficiencies and economies of scale (Khorana et al., 2007).

controls for level of competition in the 529 market ( $C^s$ ). The log of the state population under age 18 variables controls for varying demand levels and economies of scale ( $S_n$ ). The state tax deduction dummy variable is included to control for potential nonlinear effects of having a state taxable income deduction available. (A description of all variables used and how they are constructed can be found in the Appendix.)

The results of Equation 6 are presented in Table 6. From Table 6 one can see that the broker-sold dummy variable is positively related to average fees and significant at the 1 percent level (See also Alexander and Luna (2005)). The age-based portfolio option dummy variable is significant at the 1 percent level. The potential taxable income benefit variable has a positive point estimate of 0.05 and significant with a p-value of 0.033. This point estimate indicates a 5 basis point increase in fees for each \$100 in potential taxable income benefit that could correspond to substantial investor costs over time. None of the other variables are significant.

**Table 6: Plan Fees Regression - Full Sample**

Dependent Variable: Avg. Portfolio Expense Ratio (bps)	
Potential Taxable Income Benefit	0.05** (0.02)
Broker-Sold Plan Dummy	32.45*** (7.45)
Plan Age	-1.39 (1.44)
Number of Investment Options in Plan	-0.29 (0.59)
Age-Based Plan Available Dummy	34.43*** (13.00)
Year 2003 Dummy	-5.81 (10.04)
Year 2004 Dummy	-3.16 (10.67)
Year 2005 Dummy	-5.76 (11.67)
Year 2006 Dummy	5.89 (12.50)
State Tax Deduction Dummy	-9.51 (19.17)
Log of State Population Under Age 18	-5.70 (4.22)
Number of Competing 529 Plans in State	-1.34 (4.29)
Intercept	105.45 (35.08)
Observations	167
Within R-squared	0.2619

Standard errors in parentheses.

\*\*\* Significant at the 1% level.

\*\* Significant at the 5% level.

\* Significant at the 10% level.

## 4.2 Subsample Analysis

While the analysis of the full sample is a useful starting point, there are more data (control variables) available for the direct sold plans. Therefore, I separately study the direct-sold plans. I also separate the sample in this way because empirical evidence suggests that the direct-sold plans and broker-sold plans are two fundamentally different samples. A Chow test indicates that the coefficients on specifications using direct-sold plans are significantly different than those for broker-sold plans ( $F(8, 112) = 2.02$  with a p-value of 0.0498). The direct-sold and broker-sold plans have significantly different enrollment procedures and average fee structures (see Table 4). Further, one could argue that, in general, broker-sold plans generate cash inflows at higher prices because investors are paying for investment advice.<sup>29 30</sup>

For the direct plan subsample analysis, it is possible to employ a richer set of controls. The firm-level fixed effect model specification for the subsample analysis is as follows:

$$FEES_{it} = \alpha_i + \sum \beta_j X_{ijt} + \sum \beta_k Y_{ikt} + \sum \beta_l Z_{ilt} + \epsilon_{it} \quad (7)$$

where  $X_{ijt}$  includes tax related variables,  $Y_{ikt}$  contains plan and fund characteristic control variables, and  $Z_{ilt}$  contains state characteristic controls and year dummy variables.

Again, the dependent variable is average portfolio expense ratio for plan  $i$  at time  $t$ . I find similar results if the highest cost fund or the lowest cost fund expense ratio is used as the dependent variable.<sup>31</sup> The main independent variable of interest is a variable indicating the potential

---

<sup>29</sup>Due to the sales commissions and the potential for financial advisory services provided with broker-sold plans, the fees are generally higher and have greater variability (See Table 4).

<sup>30</sup>In the sample, direct-sold plans represent more of the total contracts than broker-sold plans. The contract number data were compiled from the College Savings Plan Network (CSPN) Dec. 31, 2006 Program Statistics Report. The contract data were matched with the Hurley (2006) plan data using state, plan type, and date of inception information. The CSPN data were aggregated such that some of the contract data could not be linked to a specific state 529 plan. In 2006, of the 9,269,968 total contracts reported by CSPN, 3,774,656 of the contracts could be linked to the Hurley (2006) plan level data. Of these 3,774,656 contracts, 1,781,612 were for 529 prepaid tuition plans. Of the remaining 1,993,044 contracts, 66 percent were for direct-sold plans and 34 percent were for broker-sold plans. While the number of broker-sold contracts is lower than direct-sold contracts and the total assets managed under broker-sold contracts has been declining over time, the total assets managed under broker-sold accounts is larger than the total assets managed under direct-sold accounts during the time period studied in this paper (Skinner, 2011).

<sup>31</sup>When the dependent variable is lump sum fees instead of average asset based fees there is no significant relationship between state tax rates and lump sum fees.

Table 7: **Theoretical Framework and Empirical Analysis**

Theoretical Factors	Empirical Controls
Competition ( $C^s$ )	<ul style="list-style-type: none"> <li>• Number of competing plans in state</li> <li>• State dummies</li> </ul>
Fund Portfolio Management ( $m_n$ )	<ul style="list-style-type: none"> <li>• Age-based plan available</li> <li>• Number of investment options</li> </ul>
Administrative Structure ( $a_n$ )	<ul style="list-style-type: none"> <li>• Firm fixed-effects</li> </ul>
Fund Size / Economies of Scale ( $S_n$ )	<ul style="list-style-type: none"> <li>• Plan age</li> <li>• Number of contracts</li> <li>• Log of number of state households</li> <li>• Log of state population under 18</li> </ul>
Kickbacks ( $k_n^s$ )	<ul style="list-style-type: none"> <li>• State revenue sharing (bps)</li> <li>• State dummies</li> </ul>

taxable income benefit (in \$'s) of the tax deduction (wage income tax rate\*maximum value of state tax deduction).<sup>32</sup> The other independent variables include plan and fund characteristic control variables, and state characteristic control variables that can map directly to the factors identified in the theoretical framework in Section 2.4 (See Table 7).

The results of Equation 7 using the subsample of direct-sold plans are presented in Table 8. In the first column of Table 8, the specific independent variables are: a plan age variable, a variable for the total number of investment options (funds) in the plan, a dummy variable indicating if there is an age-based investment option in the plan, the number of competing plans in the state, the log of the number of households in the state, the log of the state population under age 18, a dummy variable if the plan is in a state with a state tax deduction, and year dummy variables. As in the full sample analysis, the age variable controls for the maturity of the individual plan and the variable for the total number of investment options (funds) in the plan and the age-based investment option dummy variable control for the complexity of the plans. The four additional independent variables are included to control for key factors that could influence fees. The number of competing plans in the state variable controls for level of competition in the 529 market. The log of the number of households in the state and the log of the state population under age 18 variables control for

---

<sup>32</sup>I perform sensitivity analysis using interest income tax rates and find consistent results due to the high correlation (0.9524) between wage income tax rates and interest income tax rates.

varying demand levels by state. These variables also control for potential scale economies. The state tax deduction dummy variable is included to control for potential nonlinear effects of having a state taxable income deduction available.

In the first column of Table 8, potential taxable income benefit is positively related to fees with a p-value of 0.060. The coefficients for plan age, total number of investment options, and age-based investment option dummy are all negative and significantly related to average 529 plan fees (with p-values of 0.014, 0.024, and 0.001 respectively).

In the second column of Table 8, I control generally for any and all state effects using state dummy variables. In this specification, fees are still positively related to the potential taxable income benefit variable. The potential taxable income benefit variable has a p-value of 0.085. From this coefficient, one can see that a \$100 increase in potential taxable income benefit is associated with a 6 basis point increase in fees for direct-sold plans. Plan age and the age-based portfolio option dummy also are significantly related to fees. Because age-based plans decrease complexity and individual induced reallocations, this should decrease administrative costs and thus fees. Similarly, older plans presumably have had more time to realize operating efficiencies to reduce administrative costs. These two findings are consistent with Khorana et al. (2007) who find that mutual fund fees are negatively related to fund age and that less complex mutual funds have lower fees.

Due to data limitations, information on total number of contracts is not available for all plans. However, for a subsample of the data, I also can control for total number of contracts in order to additionally account for plan size and any potential economies of scale from managing a large number of contracts. The third column of Table 8, which includes state dummy variables and an independent variable for total number of contracts, further supports the analysis and identifies a 5 bp increase in fees for each \$100 in potential taxable income benefit. The potential benefit for taxable income coefficient has a p-value of 0.070.

During the time period studied, revenue sharing arrangement disclosure was limited and in-

consistent.<sup>33</sup> Generally, I can control for kickbacks and any other state effects with state dummy variables. However, I was able to collect specific revenue sharing information for the last year of the sample. Using 2006 state fee sharing information as a proxy for level of asset-based fees (bps) received by each state from investment management companies, I create a kickback variable for each plan. I focus on asset-based fees since the majority of states have asset based fee sharing arrangements during the time period studied. The last column of Table 8 shows the results for a subset of the data in which I also can control directly for kickbacks in addition to having state dummy variables.<sup>34</sup> <sup>35</sup> In this specification, there is a 6 bp increase in fees for each \$100 in potential taxable income benefit. This result is highly significant with a p-value of 0.016.

The relationship between the potential state taxable income benefit and annual asset-based fees persists after accounting for: market position / competition ( $C^s$ ); fund portfolio management ( $m_n$ ); administrative structure ( $a_n$ ); fund size ( $S_n$ ); kickbacks ( $k_n^s$ ) and other state effects. The survival of this result, the stability of the point estimate, and the conservative assumptions for value of a state tax deduction provide compelling evidence for the assertion that investment management companies may set fees based in part on the 529 related state tax benefits.

When using the broker-sold subsample, the results of Equation 7 are generally consistent with those in Table 8. However, the point estimates of the potential taxable income benefit variable are positive and much larger in magnitude. The point estimate of the potential taxable income benefit variable is 0.29 for the specification similar to column 1 of Table 8, and is 0.31 for the specification similar to column 2 of Table 8. Thus, for broker-sold plans a \$100 increase in potential taxable income benefit is associated with an approximately 30 bp increase in fees. The subsample of broker-

---

<sup>33</sup>In 2004, increased public criticism of 529 plans providing insufficient disclosure to investors caused subcommittees of both the U.S. House of Representatives and the Senate to hold hearings to explore this issue. In response, the CSPN formulated disclosure guidelines on behalf of the states. The initial guidelines were approved in mid-2004 and in 2005 revised guidelines were adopted by all of the states (Hurley, 2006). Sufficient data were available from 529 plan disclosure statements in a consistent and usable form by 2006.

<sup>34</sup>The age-based investment option in the plan variable was dropped in columns 3 and 4 due to collinearity with the total number of contracts variable.

<sup>35</sup>When a dummy variable indicating if qualified distributions from a state's plan are excluded from state taxable income and a dummy variable indicating if qualified distributions from another state's plan are excluded from state taxable income were included in the model, these variables were dropped due to collinearity.

sold plans is about one-half of the size of the direct-sold sample. Consequently, the coefficients of interest are not significant (p-values of 0.329 and 0.275 respectively).

### 4.3 Economic Significance

The 3-6 basis point increase in fees for every \$100 in tax benefit may not seem large in absolute value. However, it could represent substantial cost to an individual investor. Consider an investor placing \$10,000 in a 529 plan each year for five years. If the investor is subject to a 5 percent state tax rate and \$10,000 can be subtracted from her state taxable income, then there is a “taxable income benefit” of \$500 each year. This savings of \$500 in state taxes would yield a net benefit of  $\$500(1 - \tau^f)$  for the investor, as a reduction in state taxes will increase federal taxes through foregone state tax deductions. Assume that for each \$100 in potential taxable income benefit there are 4 bps in additional asset-based fees over the average portfolio expense ratio of 97 bps (Table 2). This means that an additional 20 bps (4 bps \* 5 - for each \$100 in potential taxable income benefit) would be added to the average portfolio expense ratio of 97 bps so that the total annual cost of asset-based fees would be 117 bps in year 1. The costs and benefits to the investor are presented in Table 9. By year four or five (depending on the individual investor’s federal tax rate), the annual asset-based fees completely cannibalize the state taxable income benefit. If one looks solely at the additional 20 bps cost, the investor would pay an additional \$300 during the first five years.<sup>36</sup> Moreover, the investor would pay an *additional* \$500 (the total amount of the maximum available tax benefit) annually in extra annual asset-based fees if the investor’s account balance reached \$250,000.<sup>37</sup>

These additional 529 asset-based fees can eventually erode investor returns such that 529 plans are not competitive compared to non-tax advantaged investment vehicles. Consider an investor purchasing a 529 plan for a newborn child and placing \$10,000 in the plan each year until the child

---

<sup>36</sup>The sum of the annual additional costs of asset-based fees (last column) is \$300. This \$300 alone would have a future value of over \$1300 if the investor instead was able to invest the \$300 in a 10 percent investment vehicle over the next 18 years.

<sup>37</sup>Plans accept contributions until all account balances for the same beneficiary reach a specified level. The maximum contribution level for most plans is between \$200,000 and \$300,000 during the time period studied.

Table 8: Direct-Sold Plan Fees Regression

	Plan-Level and State-Level Variables	State Dummies	State Dummies and Total No. of Contracts	State Dummies, Contracts, and Kickbacks
<b>Dependent Variable:</b>				
Average Portfolio Expense Ratio (bps)				
Potential Taxable Income Benefit	0.03* (0.02)	0.06* (0.03)	0.05* (0.03)	0.06** (0.02)
Plan Age	-2.46*** (0.98)	-3.81*** (1.45)	-5.27*** (1.56)	-5.69*** (1.22)
Number of Investment Options in Plan	-1.80** (0.78)	-1.15 (0.84)	0.83 (1.10)	1.21 (0.86)
Age-Based Plan Available Dummy	-68.65*** (18.85)	-58.68*** (19.38)		
Year 2003 Dummy	0.51 (5.68)	1.04 (5.63)	1.86 (5.70)	5.52 (4.62)
Year 2004 Dummy	11.98* (6.55)	10.27 (6.47)	11.64 (7.86)	12.40 (6.17)
Year 2005 Dummy	11.02 (7.43)	9.00 (7.36)	10.50 (9.07)	17.44 (7.16)
Year 2006 Dummy	9.56 (8.05)	3.84 (8.69)	7.43 (10.34)	10.14 (8.14)
State Tax Deduction Dummy	-6.79 (11.00)			
Log of Number of State Households	-7.12 (28.70)			
Log of State Population Under Age 18	2.05 (28.99)			
Number of Competing 529 Plans in State	-3.79 (2.64)			
Total Number of Contracts			-0.00 (0.00)	0.00 (0.00)
Revenue Sharing/Kickbacks				0.07 (0.16)
State Dummy Variables	No	Yes	Yes	Yes
Intercept	215.16 (25.91)	154.19 (22.13)	112.86 (10.17)	114.38 (7.89)
Observations:	123	123	80	64
Within R-squared:	0.3903	0.5550	0.6363	0.7650

Standard errors in parentheses.

\*\*\* Significant at the 1% level.

\*\* Significant at the 5% level.

\* Significant at the 10% level.

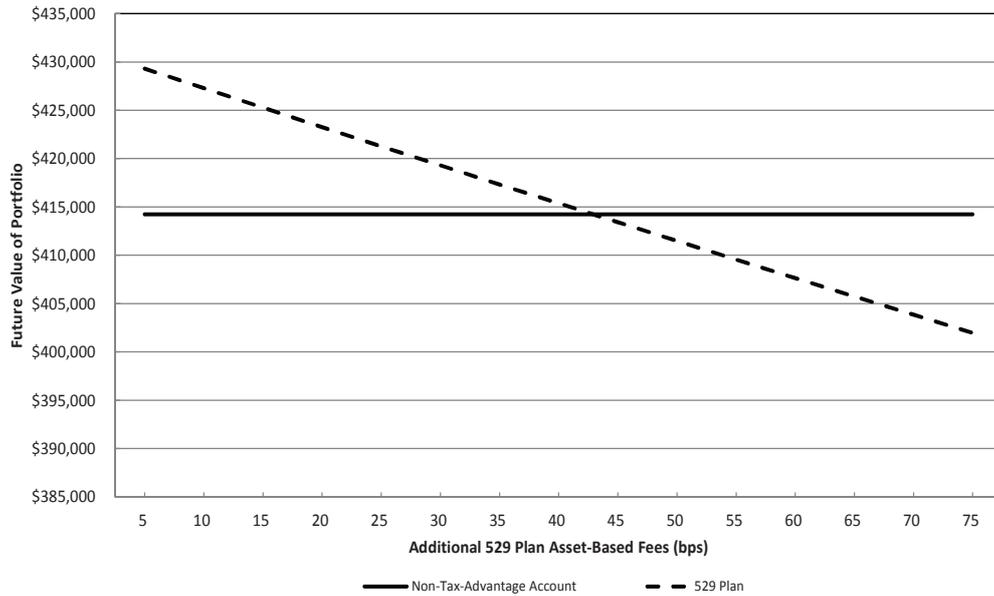
starts college (18 years). Similar to the scenario above, assume the investor is subject to a 5 percent state tax rate. Thus, the savings of \$500 in state taxes would yield a net benefit of  $\$500(1 - \tau^f)$  for the investor. Assume that the average portfolio expense ratio of the underlying mutual funds is 97 bps, that the mutual fund portfolio earns an annual return of 10 percent and that the investor is subject to a 25 percent federal tax rate. Figure 4 presents the future values of two investor portfolios for various levels of additional 529 plan fees. The solid line represents the future value (in 18 years) of a portfolio in which the investor places \$10,000 per year for 18 years in a non-tax advantaged mutual fund. This line is flat because it is not influenced by the higher 529 plan fees. The dotted line represents the future value (in 18 years) of a portfolio in which the investor places \$10,000 per year for 18 years in a 529 plan and invests the yearly tax savings  $\$500(1 - \tau^f)$  in an investment vehicle that also earns 10 percent annually. Figure 4 shows that if the 529 plan charges more than 42 bps in additional asset-based fees, then the non-tax-advantaged portfolio is superior. The crossover point would be lower if the investor was subject to a higher federal tax rate or if the annual return of the portfolio was higher. The crossover point would be higher with a higher state tax rate.

Table 9: **Economic Significance of Total Fees**

Year	Amount Invested	Cumulative Amount Invested	Annual Taxable Income Benefit	Total Annual Cost of Asset-Based Fees	Cost of Additional Asset-Based Fees ONLY
1	\$10,000	\$10,000	$\$500(1 - \tau^f)$	\$117	\$20
2	\$10,000	\$20,000	$\$500(1 - \tau^f)$	\$234	\$40
3	\$10,000	\$30,000	$\$500(1 - \tau^f)$	\$351	\$60
4	\$10,000	\$40,000	$\$500(1 - \tau^f)$	\$468	\$80
5	\$10,000	\$50,000	$\$500(1 - \tau^f)$	\$585	\$100

Assumes average asset-based fees of 97 bps plus and additional 4 bps in fees for each \$100 in potential taxable income benefit. Also assumes investor is subject to a 5 percent state tax rate and may deduct up to \$10,000 from state taxable income.

Figure 4: **Comparison of Portfolio Future Values**



**Note:** Comparison assumes a federal tax rate of 25.0 percent, a state tax rate of 5 percent, an annual return to assets of 10 percent, and an investment horizon of 18 years. Comparison of final values before withdrawals and capital gains taxes are incurred by non-tax-advantaged account.

## 5 Concluding Remarks

The explosion in availability of tax-advantaged savings vehicles provides a rich opportunity to develop further insight into the behavior of individual investors and financial institutions. This paper provides a better understanding of the relationship between investment management fees and savings incentives within the 529 College Savings Plan market. This paper presents evidence to suggest that the 529 plan market is still an immature market in which competitive pressures have yet to eliminate the price differentials caused by heterogeneous state government savings incentives. The government policies designed to make college more affordable create market frictions that enable investment firms to charge fees in excess of the minimum payments necessary to supply the plans.

This paper identifies the mechanisms that influence investment management company fees for 529 plans. A positive link with household state tax benefits and 529 plan fees remains even after accounting for the potential effects of competition, investment management expertise, administrative structure, plan size, types of funds within a plan, kickbacks, and other state effects. I find that 529 plan investment management fees (prices) are positively related to state tax incentives. Accordingly, households would be well advised to educate themselves about each specific educational savings plan prior to investing. Within a few years, excessive annual asset-based fees can easily usurp any tax benefit received from investing in a 529 plan and begin to erode returns earned by the underlying mutual funds.

Furthermore, the results also suggest a broader issue requiring attention. The fee sharing arrangements between state governments and investment management firms create moral hazard risks. When states share in the asset-based fee revenue, agency issues may discourage states from trying to curb these types of fees. Policies that facilitate more competition by allowing more financial services providers of 529 plans should be considered. Additionally, federal regulation of the investment management firms may be required to preclude financial management companies and/or state governments from appropriating the benefits intended for individuals.

## Appendix

### A Description of Variables Used in Analysis

- Average Expense Ratio - The average of the minimum expense ratio and the maximum expense ratio (bps). (The average of the fees charged as a percent of assets of the minimum expense ratio fund and maximum expense ratio fund within a plan.)
- Minimum Expense Ratio - The portfolio expense ratio (bps) of the fund with the lowest portfolio expense ratio in the plan. (Fees charged as a percent of assets in the individual investor's portfolio).
- Maximum Expense Ratio - The portfolio expense ratio (bps) of the fund with the highest portfolio expense ratio in the plan. (Fees charged as a percent of assets in the individual investor's portfolio).
- Lump Sum Fees - The enrollment fee (\$) plus the annual maintenance fee (\$) charged by the plan.
- Broker-Sold Dummy Variable - A variable that has a value of 1 if the plan is only available through a broker and has a value of 0 if the plan is sold directly to investors.
- Plan Age - The number of years the 529 college savings plan has been in existence.
- Number of Investment Options in Plan - The total number of investment options (portfolios) available in the plan.
- Age-Based Plan Available Dummy Variable - A variable that has a value of 1 if the plan has an age-based investment option (portfolio) and has a value of 0 otherwise.
- State Tax Deduction Dummy Variable - A dummy variable that is given a value of 1 if the plan's state allows a state tax deduction for contributions to the plan and is set to 0 otherwise.
- Maximum Value of State Tax Deduction - The maximum annual value (\$) that an investor may deduct from state income for state tax purposes. During the time period studied, of the states that had a limit for the maximum value of deduction, \$12,500 was the largest amount for a single taxpayer with one beneficiary. However, there were six states in which the full contribution could be deducted from state taxable income for some period of the time period studied (Colorado, Illinois, Mississippi, New Mexico, South Carolina, West Virginia). For states in which the full contribution could be deducted from state taxable income, a conservative maximum value of \$12,500 is assumed.
- Tax Rate on Wage Income - The state tax rate on wage income assuming only tax rates varied across time and state, but households were held constant.
- Potential Taxable Income Benefit of State Tax Deduction - The wage income tax rate multiplied by the maximum value of the state tax deduction. This assumes only one beneficiary.

- Revenue Sharing / Kickbacks Variable - The asset-based fees (bps) paid to the state by the investment management company in 2006.
- Log of Number of Households in Each State - The natural log of the number of households in the state according to the 2000 U.S. census.
- Log of State Population Under Age 18 - The natural log of the population of individuals under 18 in the state according to the 2000 U.S. census.
- Number of Competing 529 Plans in State - The total number of 529 college savings plans available in the state.
- Year Dummy Variables - Dummy variables for the years 2003, 2004, 2005, and 2006.
- State Dummy Variables - Dummy variables for the states with 529 college savings plans.

## References

- Alexander, R., & Luna, L. (2005). "State-Sponsored College 529 Plans: An Analysis of Factors that Influence Investors' Choice." *The Journal of the American Taxation Association*, 27, 29-50.
- Barber, B., & Odean, T. (2003). "Are Individual Investors Tax Savvy? Evidence From Retail and Discount Brokerage Accounts." *Journal of Public Economics*, 88, 419-442.
- Bergstresser, D., & Poterba, J. (2002). "Do After-Tax Returns Affect Mutual Fund Inflows." *Journal of Financial Economics*, 63, 381-414.
- Brady, P., Cronin, J.-A., & Houser, S. (2003). "Regional Differences in the Utilization of the Mortgage Interest Deduction." *Public Finance Review*, 31(4), 327-366.
- Bullard, M. E. (2009, March). "Enhancing Investor Protection and the Regulation of Securities Markets." Testimony before the Committee on Banking, Housing, and Urban Affairs - U.S. Senate.
- Clancy, M., & Jovanovich, J. (2009). "College Savings Plans: Investment Options, Safety, and Policy Implications." (Policy Brief No. 09-23). Center for Social Development, George Warren Brown School of Social Work, Washington University in St. Louis.
- "College Savings Plans Network 529 Report: A Comprehensive Look at Section 529 Plans addendum." (2010). *College Savings Plans Network*.
- Collins, S. (2010). *Research Fundamentals* (Vol. 19; Tech. Rep. No. 2). 1404 H Street, NW, Washington, DC 20005: Investment Company Institute.
- Cullinan, C. P., & Bline, D. M. (2005). "An Analysis of Mutual Fund Custodial Fees." *The Journal of Applied Business Research*, 21(1), 13-21.
- DeGennaro, R. P. (2004). "Asset Allocation and Section 529 Plans." *International Journal of Business*, 9(2), 125-132.
- DeGennaro, R. P., & Robotti, C. (2007). "Financial Market Frictions." *Economic Review - Federal Reserve Bank of Atlanta*, 1-16.
- Dellva, W., & Olson, T. (1998). "The Relationship Between Mutual Fund Fees and Expenses and Their Effects on Performance." *The Financial Review*, 33, 85-104.
- Dynarski, S. (2004a). "Tax Policy and Education Policy: Collision or Coordination? A Case Study of the 529 and Coverdell Saving Incentives." *Tax Policy and the Economy*, 18, 81-116.
- Dynarski, S. (2004b). "Who Benefits from the Education Saving incentives? Income, Educational Expectations and the Value of the 529 and Coverdell." *National Tax Journal*, 57(2), 359-383.
- Goolsbee, A. (1998). "Investment Tax Incentives, Prices, and the Supply of Capital Goods." *The Quarterly Journal of Economics*, 113(1), 121-148.

- “Growth Opportunities for 529s in the College Savings Market.” (2010). *Financial Research Coporation*.
- Gruber, J., & Poterba, J. (1994). “Tax Incentives and the Decision to Purchase Health Insurance: Evidence from the Self-Employed.” *The Quarterly Journal of Economics*, 109(3), 701-733.
- Hurley, J. (2006). *The Best Way to Save for College: A Complete Guide to 529 Plans*. (2007 ed.). Pittsford, NY: Savingforcollege.com, LLC.
- Khorana, A., Servaes, H., & Tufano, P. (2007). “Mutual Fund Fees Around the World.” (Mimeo, Georgia Institute of Technology)
- Poterba, J. M. (1984). “Tax Subsidies to Owner-Occupied Housing: An Asset-Market Approach.” *The Quarterly Journal of Economics*, 99(4), 729-752.
- Publication 553 - Highlights of 2003 Tax Changes* (Tech. Rep.). (2004). Internal Revenue Service - U.S. Department of the Treasury.
- Skinner, L. (2011). “States, Funds Woo Advisers as Direct-Sold 529s Grow.” *Investment News*, 15, 3.
- Spitzer, J. J., & Singh, S. (2001). “The Fallacy of Cookie Cutter Asset Allocation: Some Evidence from New York’s College Savings Program.” *Financial Services Review*, 10(1-4), 101-116.