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# Education Savings Incentives and Household Saving

## Evidence from the 2000 TIAA-CREF Survey of Participant Finances

Jennifer Ma

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### 4.1 Introduction

College tuition inflation in the past thirty years has averaged 2 to 3 percentage points higher than the general price inflation and is showing no sign of slowing down. For the 2002–2003 academic year, the average in-state tuition and fees at four-year public colleges and universities was \$4,081, a 9.6 percent increase from the previous year. For the same academic year, the average tuition and fees at four-year private colleges and universities was \$18,273, a 5.8 percent increase from the previous year (College Board 2002).

As the cost of college continues to rise at a fast pace, how to finance a college education has become a growing concern for many families. In order to help families save for college, the federal government has introduced two tax-favored education savings programs in recent years: the 529 plan and the Education Individual Retirement Account ([IRA] recently renamed the Coverdell Education Savings Account). These savings programs can be considered Roth IRAs for education expenses. Contributions to these programs are not deductible for federal income tax purposes, but earnings on qualified withdrawals are exempt from federal income tax.<sup>1</sup> These education savings programs, the 529 plan in particular, have grown

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1. Note that the tax law that provides federal tax exemption on earnings on qualified 529 plan withdrawals is scheduled to expire on December 31, 2010. Congress may or may not extend the law beyond this date.

rapidly since their inception and will likely grow even more quickly under the tax law passed in 2001.

The introduction of education savings programs is only one of the government's interventions in the capital market for higher education investments. However, it is an important one. The introduction of these savings programs represents a redirection of state and federal efforts toward saving and away from two major forms of public subsidy to higher education—direct state appropriations to public institutions and federal needs-based financial aid. For example, while state and local appropriations accounted for 47.4 percent of the total current-fund revenue for public degree-granting institutions in the 1980–1981 academic year, they accounted for only 35.6 percent in the 1999–2000 academic year (U.S. Department of Education 2003).

Enthusiasm for the tax-favored education savings programs was partly spurred by the idea that they would raise households' saving rate by targeting a segment of the population that is not targeted already by IRAs and 401(k)s. Moreover, by offering tax incentives, these programs may encourage marginal families to save and plan for college, which may have a positive influence on students' college experience.<sup>2</sup>

As in the case of other tax-favored savings programs, whether saving in education savings programs represents new saving is an empirical issue. In the last two decades, a large and contentious literature has developed over the impact of IRAs and 401(k)s on private and national saving. Some researchers (for example, Poterba, Venti, and Wise) have found evidence that suggests the majority of saving in tax-favored retirement accounts represents new saving, while other researchers (for example, Engen, Gale, and Scholz) have found evidence that suggests just the opposite.

While the debate on the impact of retirement savings programs has continued for years, little is known about how education savings programs affect household saving. One explanation for this gap in the literature is that because education savings programs are relatively new, data on education saving are not readily available. Using wealth data from a survey of TIAA-CREF participants, this paper attempts a first check on whether education savings programs offset other household saving, controlling for saver heterogeneity. Results suggest that, in general, education saving does not seem to offset other forms of household saving. For households with a high likelihood of using education savings accounts, education saving seems to be positively correlated with other household assets.

2. Despite the fact that loans are available and can be made the responsibility of the student himself, anecdotal evidence suggests that many families with a record of successful college attendance make considerable use of internal family financing (i.e., parental savings). Although the greater college success of savers may be due to their greater incomes or superior planning, it is also possible that savings and loans do not have parallel effects on students' college experience. Perhaps piling up debt worries students and causes them to disengage from college in order to earn money. It is also possible that the act of saving for college causes a family to think more concretely about college and prepare for it better.

The remainder of the paper is structured as follows. Section 4.2 describes the 529 plan and the recently renamed Coverdell Education Savings Account. Section 4.3 describes the data and presents some summary statistics. Section 4.4 provides a brief summary of the IRA and 401(k) literature and discusses the empirical strategies used in this paper to identify savers from nonsavers. Section 4.5 presents the regression results. Section 4.6 provides some concluding remarks.

## **4.2 The 529 Plan and the Coverdell Education Savings Account**

### **4.2.1 The 529 Plan**

Named after the section of the Internal Revenue Code (IRC) that created them, 529 plans are qualified tuition plans designed to help families save for college expenses. Two types of 529 plans are available: savings and prepaid. Savings plans are investment programs that typically offer a variable rate of return. Prepaid plans usually allow plan purchasers to prepay future tuition credits at current prices. As of August 2003, all of the existing 529 savings and prepaid plans were sponsored by individual states. However, a consortium of private colleges and universities is scheduled to launch an independent 529 plan in fall 2003. The independent 529 plan will allow investors to lock in the cost of future tuition at any of the consortium's participating colleges and universities.

Although the first prepaid plan (Michigan Education Trust) was introduced in 1988, it was not until 1996 that Section 529 was added to the IRC to clarify the federal tax treatment of state-sponsored plans. Under Section 529, earnings in state-sponsored plans grow federal and state tax-free until withdrawal. Contributions to 529 plans are not deductible for federal income tax purposes. However, they are deductible (usually subject to an annual maximum) in some states for state income tax purposes.

Before 2002, when withdrawals from a 529 plan were made to pay for qualified higher education expenses, the earnings portion was subject to federal income tax at the beneficiary's rate. The Economic Growth and Tax Reconciliation Act of 2001 (the 2001 Tax Act) provided more favorable tax treatment for 529 plans, as the earnings on qualified withdrawals from state-sponsored plans were made exempt from federal income tax, starting in 2002.<sup>3</sup> Most states exempt earnings on qualified withdrawals from state tax as well. Starting in 2004, independent prepaid plans established by private colleges and universities will also be eligible for the same benefits as state-sponsored plans.

The 529 plan is also more flexible than most tax-favored savings vehicles.

3. Note that the provisions of the 2001 Tax Act regarding Section 529 of the IRC are scheduled to expire on December 31, 2010. Congress may or may not extend the tax benefits beyond this date. If the law is not extended, the federal tax treatment of 529 plans will revert to its status prior to January 1, 2002.

There is no income restriction on participation or tax benefits. Anyone, regardless of income, can contribute to a 529 plan. Withdrawals may be used to pay for tuition, fees, room and board, books, supplies, and equipment required for enrollment or attendance at an eligible undergraduate, graduate, or professional institution of higher education, or any approved vocation/technical school. Eligible postsecondary institutions include those that are accredited and are eligible to participate in student aid programs administered by the U.S. Department of Education.

While most state-sponsored prepaid plans are open to state residents only, most savings plans allow anyone from any state to open an account. There is generally no annual contribution limit for 529 plans. Most plans impose a lifetime limit per beneficiary on account balances (the sum of contributions and earnings, less fees and expenses); a few plans impose a lifetime limit on gross contributions. Lifetime limits vary widely across states and are usually adjusted once a year to reflect inflation. Table 4A.1 shows that as of August 2003 the lowest lifetime limit on account balances was \$187,000 (Arizona), and the highest was over \$305,000 (New Jersey and South Dakota).<sup>4</sup> Table 4A.1 also shows that minimum contribution requirements are generally low.

Awareness of and interest in 529 plans have increased considerably after the 2001 Tax Act made the earnings on qualified withdrawals exempt from federal income tax. As of March 2003, there were approximately 4.9 million accounts with a total asset value of \$29.4 billion across all 529 savings and prepaid plans, an increase of 53 percent in assets compared with March 2002. As of August 2003, forty-nine states and the District of Columbia had 529 savings plans in operation. The state of Washington was the only state that had not yet established a 529 savings plan. Nineteen states had 529 prepaid plans in operation.<sup>5</sup>

With increased interest in 529 plans, more and more employers are offering 529 plan automatic payroll deductions for their employees. To take things one step further, it would be interesting to see whether employers will make 529 plan enrollment a default for some employees (for example, those with young children) and whether automatic 529 enrollment would lead to a higher participation rate. There is some evidence in the 401(k) literature that suggests automatic 401(k) enrollment leads to a higher participation rate among employees (Madrian and Shea 2001).

Earnings on nonqualified withdrawals from a 529 plan are subject to

4. See Ma et al. (2001) for a study of using an economic approach to set the contribution limits for 529 plans. In practice, limits are set by states according to broad considerations set forth in the IRC and regulations. In states with lifetime limits on account balances, once the combined balance for a designated beneficiary reaches the maximum limit, the program will stop taking new contributions.

5. The sources of this information are the Investment Company Institute and the College Savings Plan Network.

federal and state income taxes at the distributee's rate in addition to a 10 percent penalty tax. However, the account owner may make a penalty-free, tax-free rollover by designating another "member of the family" as the new beneficiary. The 10 percent penalty does not apply in the event there is a withdrawal due to the beneficiary's death or disability. If the beneficiary receives a tax-free scholarship, educational assistance allowance, or other tax-free educational benefits, then the distribution from a 529 plan is not subject to the 10 percent penalty to the extent that the distribution is not more than the amount of the scholarship, educational allowance, or other similar benefits.

#### 4.2.2 The Coverdell Education Savings Account

The recently renamed Coverdell Education Savings Account was introduced as part of the Taxpayer Relief Act of 1997. Contributions to the Coverdell are not tax deductible. However, earnings are exempt from federal and state income taxes if withdrawals are used to pay for qualified education expenses. Before 2002, qualified expenses included higher education expenses only. The 2001 Tax Act provided that, starting in 2002, qualified expenses would also include elementary and secondary school expenses at public, private, or religious schools.<sup>6</sup>

There is an income restriction on participation in the Coverdell. For 2003, the phaseout range was between \$95,000 and \$110,000 for single tax filers and between \$190,000 and \$220,000 for joint tax filers. Before 2002, the annual contribution limit for the Coverdell was \$500 per beneficiary. The 2001 Tax Act raised the annual contribution limit to \$2,000 per beneficiary, starting in 2002.

Earnings on nonqualified withdrawals from Coverdells are subject to federal and state income taxes at the distributee's rate in addition to a 10 percent penalty (with similar exceptions as those for 529 plans). Before the tax law changes in 2001, an excise tax was imposed if individuals contributed to both a 529 plan and a Coverdell on behalf of the same beneficiary in the same year. The new law provided that, starting in 2002, the excise tax would no longer apply. However, the federal law prohibits the use of same education expenses to support tax-free distributions from both a 529 plan and a Coverdell. Furthermore, the education expenses used to support tax-free distributions from a 529 plan or a Coverdell may not be used to claim a Hope or Lifetime Learning Credit.

Table 4.1 summarizes some key features of the 529 plan and the Coverdell. Because the 529 plan and the Coverdell have very similar tax treatment on earnings and contributions, a comparison of the attractiveness of

6. Allowable higher education expenses are the same as those for 529 plans. Allowable elementary and secondary school expenses include tuition, fees, academic tutoring, books, supplies, other equipment, "special needs services," room and board, uniforms, transportation and "supplementary items and services."

**Table 4.1 Key Features of the 529 Plan and Coverdell Education Savings Account**

	529 Plan (1)	Coverdell Education Savings Account (2)
Tax benefits	Earnings federal and state income tax deferred and federal income tax free, if withdrawals are used for qualified higher education expenses. Most states exempt earnings on qualified withdrawals from state tax. Some states also allow contributions to be deducted from state income tax (usually subject to an annual limit). Yes	Earnings federal and state income tax free, if used for qualified elementary, secondary, and higher education expenses
Is the value of the account <i>excluded</i> from the owner's taxable estate? How much can be invested?	Varies by state. Currently, the highest account balance limit is \$305,000 per beneficiary.	Yes Up to \$2,000 per year
Qualified education expenses	Tuition, fees, books, supplies, room and board, and equipment at an eligible postsecondary education institution	Same as (1) for higher education expenses. Elementary and secondary education expenses also qualify.
Financial aid treatment	Savings plans: parents' assets if the account is under a parent's name; prepaid plans may reduce aid dollar for dollar. State sponsor with input from program money manager No	Student's assets Account owner Yes
Who makes investment decisions? Income restriction	Education expenses used to support tax-free distributions from a 529 plan may not be used to claim a Hope or Lifetime Learning credit.	Education expenses used to support tax-free distributions from a Coverdell may not be used to claim a Hope or Lifetime Learning credit.
Impact on Hope and Lifetime Tax Credits	Earnings on nonqualified withdrawals taxed at the distributee's income tax rate plus an additional 10 percent tax	Earnings on nonqualified withdrawals taxed at the distributee's income tax rate plus an additional 10 percent tax
Flexibility		

the two programs reduces to a comparison of fees (Ma and Fore 2002). Assuming both programs have the same rate of return, the one with lower fees will result in a higher level of asset accumulation. Another difference between the two savings programs is that 529 investors may not make direct investment decisions, while Coverdell investors may. Finally, when it comes to calculating a student's Expected Family Contribution (EFC) for financial aid purposes, assets in a Coverdell account will be considered as the student's assets and assessed at a 35 percent rate, while assets in a 529 account will be considered as the parents' assets (if the owner is a parent) and assessed at a 5.6 percent rate. Because a higher level of EFC means a lower level of financial needs, assets in a Coverdell account will reduce a student's financial aid more than assets in a 529 plan will.

Table 4.2 illustrates how families may use the 529 plan and the Coverdell to save for future college expenses. Column (1) of table 4.2 indicates that assuming a 5 percent annual increase in the college cost and a 6 percent annual rate of return on saving, monthly contributions of \$22 over an eighteen-year investment horizon would be sufficient to fund the average cost of a two-year education at a public two-year college. Columns (2) and (3) indicate that monthly contributions of \$257 and \$668 over an eighteen-year investment horizon would be sufficient to fund the average cost of a four-

**Table 4.2**                      **Examples of Saving for a College Education with the 529 Plan and the Coverdell**

	Public Two-Year College	Public Four-Year College	Private Four-Year College
Current annual cost (2002–2003 average total charges including tuition, fees, and room and board) <sup>a</sup>	\$1,735	\$9,663	\$25,052
Projected cost (savings goal) <sup>b</sup> (average cost of a four-year education—or a two-year education for public two-year colleges—for a student enrolling in 2020)	\$8,560	\$100,233	\$259,860
Investment period (years)	18	18	18
Monthly saving needed to meet the goal <sup>c</sup>	\$22	\$257	\$668
Savings programs may be used	Coverdell or 529 plan	529 plan or combination of 529 plan and Coverdell	529 plan or combination of 529 plan and Coverdell

Source: *Trends in College Pricing 2002*, the College Board.

<sup>a</sup>Tuition and fees only for public two-year colleges.

<sup>b</sup>Assuming the average college costs increase by 5 percent per year into the future.

<sup>c</sup>Assuming a 6 percent annual nominal rate of return on saving.



year education at a public four-year and private four-year college, respectively.

It is also worth noting that the Registered Education Savings Plans (RESPs) in Canada are similar to the 529 plan and the Coverdell. Contributions to the RESPs are not tax deductible. However, earnings grow tax-free until withdrawal. When withdrawals are used to pay for qualified higher education expenses, earnings are taxed as the beneficiary's income. Earnings on nonqualified withdrawals (withdrawals not used for higher education) are taxable as the account subscriber's (owner's) income. As of August 2003, the annual contribution limit per beneficiary was \$4,000 Canadian (CAD), and the lifetime limit was CAD \$42,000.

### **4.3 The 2000 TIAA-CREF Survey of Participant Finances**

To examine the impact of education savings programs on other household saving, information on contributions or accumulations in education saving, other saving, and demographics is required. At the time of this study, there was no publicly available wealth data that contained information on contributions or accumulations in education savings programs.<sup>7</sup>

The data used in this study are drawn from the 2000 TIAA-CREF Survey of Participant Finances (SPF) conducted by TIAA-CREF. TIAA-CREF is a nonprofit organization that provides retirement plans at about 12,000 colleges, universities, research centers, medical organizations, and other nonprofit institutions throughout the United States. The 2000 SPF sample consists mostly of employees of colleges and universities. A small portion of the sample consists of employees of research and other nonprofit organizations.

The 2000 SPF was conducted among members of the TIAA-CREF research panel. The research panel was established in 1993 when 60,000 participants were randomly selected to participate in the research panel project. The purpose of the research panel project was to select a sample of participants for future studies of participant financial decisions. A brief questionnaire was mailed to these 60,000 randomly selected participants asking information about themselves and their families. Of these 60,000 individuals selected, 9,847 responded to the 1993 research panel questionnaire and formed the initial research panel. In the subsequent years, some members were dropped from the research panel due to death, change of participant status, or change of address. Several sample replenishment efforts were made in 1995, 1997, and 1999.

The 2000 SPF is a comprehensive survey of household finances. It was

7. The 2001 SCF conducted by the Federal Reserve Board included questions on education savings programs such as the 529 plans. However, the 2001 SCF data was not yet available when the analysis for this study was conducted.

designed to examine in detail the types and amounts of financial assets owned by participants and apply this information to the study of household asset allocation and other financial decisions. Survey packets containing a cover letter and an eight-page questionnaire were mailed in January 2000 to a total of 9,234 research panel members. A total of 2,835 completed questionnaires (2,793 usable) were received, representing an overall response rate of 31 percent.

The 2000 SPF gathered a wide range of information on household finances and demographics. The demographic information gathered includes the respondent's age, gender, education, employment status, occupation, marital status, and the number of children for whom the respondent's household is financially responsible. The financial information gathered includes the amount and sources of the respondent's income, the types of retirement investments, nonretirement financial accounts, real estate holdings in the household, and the estimates of the current value for each of those investments. Information on household mortgages and other types of financial commitments was also gathered. For married respondents, information on the spouse's employment status, income, and retirement assets was also collected. Most importantly, respondents were asked whether anyone in his or her household had a Coverdell, a 529 savings account, or a 529 prepaid contract. Respondents were asked to provide a value if they answered "yes" to any of these questions. Respondents were also asked to measure on a scale of 1 to 10 how important it was for them to leave a bequest.

#### 4.3.1 A Comparison of the 2000 SPF with the 1998 Survey of Consumer Finances

Table 4.3 shows the summary statistics of households from the 1998 Survey of Consumer Finances (SCF) and the 2000 SPF. Clearly, households from the two surveys are quite different in terms of both demographic and financial characteristics. As table 4.3 shows, respondents in the 2000 SPF are much older than those in the 1998 SCF—the median age of the 2000 SPF respondents was fifty-nine, compared with forty-six for the 1998 SCF. Moreover, respondents in the 2000 SPF are much more educated than those in the 1998 SCF. For example, while only 33.2 percent of the 1998 SCF respondents have a college degree, 87.5 percent of the SPF respondents have at least a college degree, and 33.4 percent have a PhD degree. This is not surprising given that the majority of SPF respondents are faculty members.

Table 4.3 also shows that households from the 2000 SPF, on average, earned much higher incomes than those from the 1998 SCF. The median 1999 household income from the 2000 SPF was more than twice as much as the median 1997 household income from the 1998 SCF (\$75,000 versus \$33,000). Even when the median household income from the 1998 SCF is inflated by 10 percent to the 1999 level, it is still less than half of that from

**Table 4.3** Summary Statistics of Households from the 1998 SCF and the 2000 TIAA-CREF SPF

	Median	25th percentile	75th percentile	Mean
<i>1998 SCF</i>				
Financial characteristics				
Household income	\$33,000	\$17,000	\$60,000	\$52,296
Total financial assets	\$17,320	\$1,500	\$85,000	\$134,234
Total personal debt	\$1,530	\$0	\$11,000	\$9,920
Total real estate assets	\$70,000	\$0	\$140,000	\$109,063
Total mortgage debt	\$0	\$0	\$55,000	\$37,621
Total net worth	\$71,700	\$9,920	\$208,850	\$282,592
Percent own primary residence				66.3
Demographics				
Respondent's age	46.0	35.0	61.0	48.7
Respondent's education level				
Less than high school (%)				16.5
High school or GED (%)				31.9
Some college (%)				18.5
College and above (%)				33.2
<i>2000 TIAA-CREF SPF<sup>a</sup></i>				
Financial characteristics				
Household income	\$75,000	\$48,000	\$111,000	\$94,550
Total financial assets	\$336,750	\$119,117	\$859,000	\$665,330
Total personal debt	\$0	\$0	\$5,000	\$9,221
Total real estate assets	\$160,000	\$95,000	\$300,000	\$257,469
Total mortgage debt	\$15,000	\$0	\$89,000	\$62,943
Total net worth	\$467,728	\$187,375	\$1,108,500	\$837,333
Percent own primary residence				85.7
Demographics				
Respondent's age	59.0	48.0	69.0	57.9
Respondent's education level				
High school or less (%)				3.2
Some college (%)				9.1
College graduate (%)				18.9
Master's or first professional (%)				35.2
PhD (%)				33.4

Source: Author's calculations based on the 1998 SCF and the 2000 TIAA-CREF SPF.

<sup>a</sup>For 2000 TIAA-CREF SPF, financial assets and demographic information was as of December 31, 1999.

the 2000 SPF. (The March Current Population Survey data suggest that for households with householders twenty-five years and older, the median income in current dollars rose by 10.1 percent between 1997 and 1999, while the mean income in current dollars rose by 10.6 percent.) Moreover, households from the 2000 SPF are much wealthier than those from the 1998 SCF. The median net worth for households from the 1998 SCF is only \$71,700, compared with \$467,728 for those from the 2000 SPF.

The above comparisons suggest that the sample in the 2000 SPF is quite different from the general population. The respondents in the 2000 SPF are older, much more educated, and wealthier than the general population. These unique characteristics make the 2000 SPF particularly well suited to the task of assessing the effectiveness of education savings programs for two main reasons. First, the SPF sample is more likely to be saving prone and more likely to plan for college. Thus, they are more likely to use the new education savings programs than the typical American household, especially when the programs are new and unfamiliar to most people. In fact, as of December 1999 (when the SPF was conducted), while 2.4 percent of the SPF households reported owning a 529 savings or prepaid plan, less than 1.2 percent of the U.S. households owned a 529 plan.<sup>8</sup> This confirms the SPF sample is much more likely to use education savings programs than the general population. The proneness of the SPF sample to use savings programs allows one to find a sufficient number of users in a small sample.

Second, estimates from the SPF sample will likely overstate the extent to which education saving crowds out other saving. Research on retirement saving suggests that reshuffling of assets is more likely to occur for high-income households (Engen and Gale 2000). Moreover, not only is the SPF sample wealthier and has accumulated higher levels of saving (and more saving to crowd out), it also consists largely of education-sector workers who are very consciously dedicated to ensuring their children's college opportunities. These individuals are far more likely to have been saving explicitly for college even in the absence of tax-favored programs, which also raises the likelihood of crowding out. Therefore, one can confidently predict that there would be much less crowding out in the overall population than in the SPF sample.

While the SPF has many advantages in examining the impact of education savings programs on household saving, it also has some limitations. One limitation is that the sample is representative of neither the U.S. population nor the TIAA-CREF participant population.<sup>9</sup> Therefore, results from this study should be interpreted accordingly.

8. These comparisons are for 529 plans only because data on the aggregate number of Coverdell accounts are not readily available. The source of this information comes from the author's calculations. The percentage of U.S. households owning a 529 plan was calculated by dividing the total number of 529 accounts in the United States by the total number of households, as of December 1999. Data on the total number of 529 accounts are from the College Savings Plans Network and data on the total number of households are from the U.S. Census Bureau. It is worth noting that to the extent that some households may have multiple 529 accounts, the actual percentage of *households* owning 529 plans may be slightly lower than the calculated 1.2 percent.

9. Because not much information is available on the characteristics of those individuals who did not respond to the SPF, it is not clear whether there are any systematic differences between those who did respond and those who did not respond to the survey and how the estimates would be affected.

### 4.3.2 Nonresponses in the Survey and Sample Selection

Although missing data are common for many wealth surveys, the item response rates in the 2000 SPF are quite high. Table 4.4 presents the proportions of nonresponses to financial asset questions in the 2000 SPF survey. As table 4.4 shows, the item response rates for the 2000 SPF are over 90 percent for most nonretirement financial assets (column [4]).

Missing data could arise as a result of nonresponse to ownership questions, value questions, or sometimes both. Column (1) in table 4.4 indicates that between 2.0 and 16.3 percent of respondents did not provide an answer to the ownership question for various types of financial assets. Column (3) suggests that among those who answered “yes” to the ownership questions, between 6.2 and 20.6 percent did not provide a value. As a result, between 5.9 and 23.2 percent of respondents had missing data for various assets (column [4]).

Of all of the assets listed in table 4.4, TIAA-CREF retirement assets (row one) seem to have a much higher nonresponse rate (23.2 percent) than other assets. One reason for this is that a third of the sample consists of annuitant respondents who were already receiving life-annuity income from TIAA-CREF. For these respondents, it was difficult for them to report the value of their TIAA-CREF retirement assets. In other words, since they had already annuitized part or all of their TIAA-CREF retirement assets, they would need to calculate the present value of their future annuity income in order to figure out the total value of their TIAA-CREF retirement assets. Fortunately, for annuitants, the value of their total TIAA-CREF retirement assets can be calculated by adding together their nonannuitized assets and an annuity reserve calculated based on TIAA-CREF accounting data.<sup>10</sup>

Nonresponses become more of an issue when one calculates aggregate wealth levels, even though the nonresponse rates for individual assets are rather low. For example, when one calculates households’ self-reported noneducation net worth (the sum of net noneducation financial assets and real estate equity), 54.9 percent of the respondents have missing data due to nonresponses to the ownership and/or value questions for at least one of the assets. In order to reduce the number of observations with missing net worth, the respondent’s self-reported data on TIAA-CREF retirement assets were replaced with TIAA-CREF accounting data for the analysis. As a result, the proportion of respondents with missing data for net worth dropped to 51.1 percent. It is worth noting that the net worth calculated

10. The annuity reserve for an annuitant is the amount of reserve set aside to fund the annuitant’s life-annuity income. The value of an annuitant’s annuity reserve can be considered as the present value of the annuitant’s life-annuity income, using the TIAA-CREF guaranteed interest rate as the discount rate.

**Table 4.4 Nonresponses to Financial Asset Questions in the 2000 TIAA-CREF SPF**

Type of Asset	Nonresponse to Ownership Questions (%) (1)	"Yes" to Ownership Questions (%) (2)	Of Those Who Answered "Yes" to Ownership, Did Not Provide a Value (%) (3)	Observations with Missing Information (%) (4)
<b>Respondent's retirement assets</b>				
1. TIAA-CREF employer-sponsored retirement accounts	7.2	77.8	20.6	23.2
2. Non-TIAA-CREF employer-sponsored retirement accounts	7.7	31.2	17.3	13.1
3. IRA or KEOGH account	7.7	44.3	10.9	12.5
4. Other tax-deferred annuities	10.2	17.8	19.8	13.7
<b>Other financial assets</b>				
5. Stock mutual funds	5.8	46.8	10.6	10.7
6. Publicly traded stock	4.1	48.2	11.5	9.6
7. Tax-free bond mutual funds	5.8	16.0	17.9	8.7
8. Other bond mutual funds	6.3	11.7	17.7	8.4
9. U.S. government savings bonds	5.4	24.3	11.6	8.3
10. Corporate bonds or foreign bonds	6.4	5.7	20.3	7.6
11. Savings accounts	2.0	71.0	6.2	6.4
12. Checking accounts	2.1	94.9	6.3	8.1
13. Certificates and deposit	3.3	29.9	8.9	5.9
14. Money market mutual funds	5.2	41.9	11.2	9.9
<b>Education saving</b>				
15. Coverdell (former Education IRA)	16.3	3.9	11.9	16.8
16. 529 savings plan	16.0	2.0	7.0	16.2
17. 529 prepaid contract	16.0	0.5	15.4	16.0

*Source:* Author's calculations based on the 2000 TIAA-CREF SPF data.

*Note:* Total number of respondents 2,793.

from TIAA-CREF accounting data is highly correlated with that from self-reported data, with a correlation coefficient of 0.96.

Also of special attention are the nonresponses for the three questions on education saving. At first glance, the nonresponse rates for these questions seem much higher than those for other financial assets. Further investigation of the data reveals that the majority of these nonresponses represent nonresponses to all three questions on education saving (440 cases). Of these 440 cases, household's noneducation net worth is available for 184 cases. This indicates that these 184 respondents filled out all the necessary information needed for the calculation of household noneducation net worth but left the questions on education saving blank. Because the 529 plan and the Coverdell were rather new at the time of the survey (approximately two years after their introduction), it is likely that many respondents were not familiar with these savings programs and did not understand the questions. However, those respondents who did report having a 529 or a Coverdell account seemed to understand the questions and most of them provided a valid and positive answer for the value question. Therefore, it is reasonable to assume that these 184 respondents did not have such accounts. Under such an assumption, the nonresponse rate for the education ownership questions dropped to around 10 percent.

Of the 2,793 respondents, 171 reported having at least one education savings account. The number of respondents reported having a Coverdell, a 529 savings account, and a 529 prepaid contract was 109, 57, and 13, respectively. Moreover, 96, 53, and 11 provided a nonzero account balance. The reported median balance for the three types of accounts was \$2,000, \$10,000, and \$5,000, respectively. Due to the small number of respondents who reported having these accounts, it is difficult to empirically distinguish the impact of each of these education incentives on household wealth. Therefore, all three education savings accounts are treated equally in the empirical analysis. In other words, the balances of all education savings accounts are aggregated to create a variable that measures a household's total education saving.

Observations with missing values for explanatory variables in the regressions are excluded from the analysis. Also excluded from the regression analysis are observations with extreme values of net worth (over \$10 million, 1 case) and observations with missing values for net worth. The final regression sample includes 1,265 cases.

#### **4.4 Empirical Strategy—How to Control for Saver Heterogeneity**

As mentioned earlier, one important public policy question for tax-favored savings programs is whether saving in these tax-favored programs represents new saving. In other words, does saving in education savings programs offset other household saving? The answer to this question in large part depends on the source of contributions to these programs. If the

source of contributions is reduced consumption or tax saving, then saving in these programs represents new household saving. However, if the source of contributions is borrowing, existing assets, or the portion of wealth that would have been saved anyway even in the absence of these programs, then tax-favored savings programs do not stimulate new private saving.

In empirically estimating the saving effects of tax-favored retirement or education savings programs, a challenging issue is how to deal with saver heterogeneity. Individuals' saving behaviors may be different due to unobservable individual-specific preferences, such as their propensities to save. For example, participants in tax-favored savings programs may have stronger tastes for saving than others and may tend to save more in all forms. Therefore, models that do not control for saver heterogeneity are likely to overestimate the saving effects of tax incentives.

In the retirement saving literature, a substantial amount of research has been devoted to estimate the impact of IRAs and 401(k) plans on household wealth. This section provides a summary of some selected studies in the retirement saving literature.

#### 4.4.1 A Summary of Selected Studies in the Retirement Saving Literature

Two major retirement savings programs—the IRA and the 401(k)—have been the subject of substantial public discussion and economic analysis. When first introduced in 1974, IRAs were only available to individuals not covered by an employer pension plan. There was no income restriction. Contributions were tax deductible and capped at \$1,500 per year. The entire proceeds were subject to income taxes upon withdrawals. There was a 10 percent penalty on withdrawals made before the owner turned age fifty-nine and a half.

The IRAs grew rapidly after the Economic Recovery Act of 1981 raised the annual contribution limit to \$2,000 and made all wage earners and their spouses eligible. However, the Tax Reform Act of 1986 reduced the tax benefits so that contributions were no longer deductible for higher-income individuals covered by a pension plan. Consequently, contributions to IRAs dropped sharply.

The 401(k) plan became popular in the 1980s and is one of the most important retirement savings programs. Sponsored by employers, only employees of firms that offer such plans are eligible to participate in a 401(k) plan. The 401(k) plan features pretax contributions, tax-free growth on earnings, and very often, employer matching contributions. The entire proceeds are subject to income taxes upon withdrawal. There is a 10 percent penalty on withdrawals made before the owner turns fifty-nine and a half. Before 1987, participants were allowed to contribute up to \$30,000 per year. The Tax Reform Act of 1986 reduced the annual contribution limit to \$7,000. The limit is adjusted annually to reflect inflation. The contribution limit for the 2003 tax year was \$12,000.



Since the introduction of the IRA and 401(k), there has been a growing literature on the saving effects of these tax-favored retirement savings programs. The focus has been whether and to what extent IRA and 401(k) saving represents new saving. A central theme of this body of research is how to deal with saver heterogeneity. In dealing with saver heterogeneity, various methods have been used to identify savers from nonsavers, some of which are described in the following. For more detailed reviews of this literature, see Bernheim (1999), Poterba, Venti, and Wise (1996), and Engen and Gale (2000).

*Comparing the Same Individuals or Similar Individuals  
Using Multiple Waves of Data*

When panel data are available, one method to control for saver heterogeneity is to follow the same households and compare the retirement and nonretirement assets of the same households over time. This method relies on the assumption that any unobserved individual-specific preferences in tastes for saving can be “differenced out” when one calculates the change in wealth levels of the same individuals over a certain time period. Studies that have used this identification strategy include Venti and Wise (1992, 1995) and Gale and Scholz (1994). For example, Venti and Wise (1995) estimate whether IRA contributions reduce other non-IRA financial assets, using two waves of the Survey of Income and Program Participation (SIPP) data. They find that whether households contributed to IRAs had little impact on their non-IRA financial assets.

Another strategy to identify savers is to compare households with similar characteristics, using multiple waves of cross-sectional data. Using data from the 1984, 1987, and 1991 waves of the SIPP, Poterba, Venti, and Wise (1995) estimate the saving effects of retirement programs. They group households by whether households participated in IRA or 401(k) savings programs. They find that after controlling for age, income, education, and marital status, a family’s IRA or 401(k) ownership or contribution status does not affect other non-IRA non-401(k) financial assets. Therefore, they conclude that contributions to IRAs or 401(k)s do not reduce other saving.

Engen and Gale (1995) use the 1987 and 1991 waves of the SIPP data and compare the wealth accumulations of the same comparison groups as Poterba, Venti, and Wise (1995). They find that, controlling for some demographics and income, 401(k)-eligible households accumulated more financial assets than other households. However, when they use a broad measure of wealth that includes net financial assets and home equity, 401(k)-eligible households did not accumulate more wealth than other households. They find similar results when comparing the wealth accumulations of IRA owners and nonowners. They argue that between 1987 and 1991, the housing value of 401(k)-eligible households rose compared with noneligible households, but the mortgage debt level of those households rose even more. As a result, the home equity of 401(k)-eligible households

fell during that period. Their results suggest that 401(k)-eligible households substitute 401(k) assets for home equity.

### *The Eligibility Experiment*

Another identification strategy, employed by Poterba, Venti, and Wise (1995) and Engelhardt (2000), relies on the assumption that the determination of 401(k) eligibility status is exogenous and uncorrelated with the observed or unobserved household characteristics.

Poterba, Venti, and Wise (1995) estimate whether 401(k) contributions offset other conventional personal financial asset saving and IRA saving, assuming the 401(k) eligibility status is independent of households' preferences for saving, given income. Using data from the 1984, 1987, and 1991 waves of SIPP, they find little substitution between 401(k) saving and other conventional personal financial asset saving. They also find very little substitution between 401(k) saving and IRA saving. They conclude that most 401(k) contributions represent net new saving.

Using the 1992 Health and Retirement Study, Engelhardt (2001) finds results that are similar to those in Poterba, Venti, and Wise (1995), when non-401(k) pension wealth is not taken into account. However, when non-401(k) pension wealth is included in the wealth measure, he finds that the total wealth levels of eligible and noneligible families are similar. Thus, his results suggest that families tend to substitute 401(k) pension wealth for non-401(k) pension wealth.

In an effort to reconcile the discrepancies in findings of different studies, Engen and Gale (2000) estimate the effects of 401(k) plans on household wealth. Their new econometric specification allows the impact of 401(k) to vary over both time and earning groups. Using data from the 1987 and 1991 waves of the SIPP, they find that 401(k) contributions by low-earning groups are more likely to represent new saving than those by high-earning groups. Because high-earning groups hold the majority of 401(k) balances, they estimate that only between 0 and 30 percent of 401(k) balances represent net additions to private saving between 1987 and 1991.

Given the wide range of estimates of the impact of retirement savings programs on household saving, which studies' results are closer to the "truth"? In a review of several studies, Hubbard and Skinner (1996) argue that the saving effects of retirement programs are likely to lie somewhere between the extremes of "no new saving" and "all new saving." Their conservative estimate is that twenty-six cents per dollar of IRA contribution represent new saving.

#### 4.4.2 The Empirical Strategy to Control for Saver Heterogeneity in This Study

To examine the issue of saver heterogeneity in this study, table 4.5 presents some summary statistics of the respondents to the 2000 SPF by the ownership status of education savings accounts. Clearly, households who

**Table 4.5** Summary Statistics of Respondents to the 2000 TIAA-CREF SPF by Ownership of Education Saving

	Own at Least One Education Savings Account (171 cases)	Do Not Own Any Education Savings Account (2,347 cases)
<b>Median</b>		
Respondent's age (years)	52.0	59.0**
Household 1999 income	\$100,000	\$73,000***
Household net noneducation financial assets	\$346,493	\$332,500
Household noneducation net worth	\$473,000	\$465,000
Number of children the household is financially responsible for	1	0***
Age of oldest child in the household	8.0	13.0***
<b>Mean</b>		
Respondent's age (years)	55.3	57.6**
Household 1999 income	\$119,390	\$93,995**
Household net noneducation financial assets	\$680,093	\$664,998
Household noneducation net worth	\$892,684	\$832,778
Number of children the household is financially responsible for	1.00	0.45***
Age of oldest child in the household	7.6	12.5***
Percent with a PhD degree	38.2	34.4
Percent own home	92.9	85.2***
Percent with IRA or Keogh	63.4	54.1***
Percent with supplemental pension	46.0	43.4
Percent married	82.5	65.0***

Source: Author's calculations based on the 2000 TIAA-CREF SPF data.

\*\*\*Medians (means) of the two groups are statistically different at the 1 percent level.

\*\*Medians (means) of the two groups are statistically different at the 5 percent level.

own education savings accounts have quite different economic and demographic characteristics than those who do not own. Those who own education savings accounts tend to be slightly more educated, earn higher incomes, be more likely to own a home, be married, and have an IRA or Keogh. For example, the median 1999 household income for those who own education savings accounts was \$100,000, compared with \$73,000 for those who do not own. The difference is statistically significant at the 1 percent level. Not surprisingly, households who own education savings accounts on average have more and younger children than those who do not own.

Table 4.5 also shows that households with education savings accounts have slightly more net worth than those without. But this does not necessarily mean that education savings programs stimulate new saving. It is possible that there may be systematic differences between households who own and do not own education saving. Therefore, analyses that do not take into account these fundamental differences are likely to attribute higher

levels of wealth of the participant group to participation in education savings programs and thus lead to an upward bias in the estimates of the effectiveness of education savings programs.

Generally, panel data or multiple waves of cross-sectional data are better suited to assessing the impact of savings programs than a single wave of cross-sectional data in that they allow one to compare changes in household assets over time. However, because only one wave of the survey data is available for this study, any longitudinal “over time” comparisons are not feasible for this paper.<sup>11</sup> Furthermore, unlike 401(k) plans, almost anyone is eligible for 529 plans and Coverdells.<sup>12</sup> Therefore, there is no eligibility experiment here, either.

However, whether households have an IRA or Supplemental Retirement Annuities/Group Supplemental Retirement Annuities (SRA/GSRA) may be used to identify savers.<sup>13</sup> The SRAs or GSRAs are offered by TIAA-CREF and are available through employers. The SRAs or GSRAs provide tax benefits similar to those of 401(k)s. Contributions are voluntary and made with pretax dollars. Earnings grow tax-free, and the entire proceeds are subject to income taxes upon withdrawal. The annual contribution limit for an SRA or GSRA account was \$12,000 in 2003.

Because participation in an IRA or an SRA/GSRA is entirely voluntary, it may be considered a reasonable signal for taste for saving. For example, Poterba, Venti, and Wise (1994, 1995) use whether households participated in an IRA or a 401(k) as a signal for taste for saving. In addition, participation in an IRA or an SRA/GSRA is also a good signal for households’ familiarity with tax-favored savings vehicles. As table 4.5 shows, 63.4 percent of the households who owned education savings accounts also reported owning an IRA, compared with only 54.1 percent for households who did not own education savings accounts.

To the extent that the ownership status of an IRA or an SRA/GSRA only distinguishes savers from nonsavers to a certain degree, heterogeneity in individuals’ propensities to save may still exist within the owner or nonowner group. Therefore, the propensity score approach is used to better control for unobserved saver heterogeneity. The propensity score approach is a recently developed technique often used to estimate the average

11. Although a previous wealth survey was conducted among the research panel members in 1996, less than 400 members responded to both the 1996 and the 2000 surveys, not enough to conduct a longitudinal comparison. See Bodie and Crane (1997) for a paper that used data from the 1996 Survey to analyze household asset allocation decisions.

12. Because there is no income requirement for 529 plans, almost anyone over eighteen can open a 529 account. For Coverdells, even though there is an income requirement, the income limit is high enough that more than 95 percent of U.S. households would be eligible.

13. For annuitants who had already annuitized part or all of their TIAA-CREF retirement assets, many of them no longer had existing contracts (including SRAs or GSRAs) with TIAA-CREF at the time of the survey. Therefore, the ownership status of SRA/GSRA for annuitants is determined by whether they ever owned a SRA or GSRA account before they annuitized their assets.

treatment effects of program participation. The propensity score approach has successfully reduced the selection bias in many studies where random experiments are not available. For example, Dehejia and Wahba (1999) use the propensity score approach to estimate the treatment effects in observational studies. Using LaLonde's (1986) composite data set of experimental treatment units and nonexperimental comparison units, they find that the propensity score approach succeeds in replicating the treatment effects of a random experimental study presented in LaLonde (1986). A detailed discussion of how the propensity score approach is applied in this study is included in section 4.5.3.

#### 4.4.3 Empirical Model and Specifications

The empirical model to be estimated is as follows:

$$(1) \quad W = \alpha + \beta \cdot \mathbf{X} + \gamma \cdot \text{Edsave\_balance} + \varepsilon,$$

where  $W$  is a wealth measure, and  $\text{Edsave\_balance}$  is the aggregate balance of a household's education saving.  $\mathbf{X}$  is a vector of household demographic variables, including the respondent's age, gender, education, marital status, household income, number of children, bequest motive, whether the respondent is an annuitant, and whether the household is covered by a defined benefit (DB) pension plan. For married respondents, the household income is the sum of the respondent's and the spouse's income. For other respondents, household income is set equal to the respondent's income. The income measure includes labor income, pension and social security income, rental income, interests, and dividends.

In the regression analysis, two wealth measures are employed as the dependent variable. The first measure is net noneducation financial assets, which is the total of noneducation retirement and nonretirement assets, including stock mutual funds, bond mutual funds, money market mutual funds, individual stocks, bonds, savings accounts, checking accounts, and certificates of deposit less personal loans, educational loans, and credit card balances. The second wealth measure is noneducation net worth, which is the sum of net noneducation financial assets and real estate equity. Real estate equity is defined as the difference between the total value of the household's primary home and other properties the household owns and the mortgage debt against these real estate properties.

## 4.5 Results

### 4.5.1 Using IRA Ownership to Identify Savers

This section presents results from estimating the model described in section 4.3. The model is estimated separately for households who own and do not own an IRA. Table 4.6 presents the summary statistics for the full re-

**Table 4.6** Summary Statistics of Dependent and Explanatory Variables

Variable	Own IRA		Do Not Own IRA		Full Regression Sample	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Noneducation net worth (in \$000s)	1,044.482	1,063.457	543.162	839.841	803.928	994.371
Net noneducation financial assets (in \$000s)	850.548	939.772	406.805	679.972	637.621	854.347
Education saving (in \$000s)	1.230	9.822	0.231	1.660	0.751	7.191
Respondent's age <sup>a</sup>						
45–54	0.243	0.429	0.242	0.429	0.243	0.429
55–64	0.237	0.426	0.181	0.386	0.210	0.408
65 and older	0.274	0.446	0.252	0.435	0.263	0.441
Respondent is male	0.576	0.495	0.557	0.497	0.567	0.496
Household income (in \$000s)	108.802	112.936	77.532	78.905	93.798	99.291
Respondent's education <sup>b</sup>						
Master's degree	0.388	0.488	0.329	0.470	0.360	0.480
Doctorate degree	0.340	0.474	0.316	0.465	0.329	0.470
Respondent is an annuitant	0.229	0.421	0.249	0.433	0.239	0.426
Other household variables						
Has an SRA/GSRA	0.447	0.498	0.379	0.486	0.414	0.493
Covered by a DB plan	0.348	0.476	0.298	0.458	0.324	0.468
Number of children	0.448	0.852	0.623	1.020	0.532	0.940
Bequest motive	4.711	3.269	4.890	3.330	4.797	3.298
Respondent's marital status <sup>c</sup>						
Single	0.157	0.364	0.201	0.401	0.178	0.383
Divorced	0.099	0.299	0.125	0.331	0.111	0.315
Widowed	0.043	0.202	0.051	0.220	0.047	0.211
Percent owning a Coverdell, a 529 savings, or a 529 prepaid account	0.071	0.258	0.046	0.210	0.059	0.236
No. of observations	658		607		1,265	

<sup>a</sup>The reference group consists of those respondents who are younger than forty-five.

<sup>b</sup>The reference group consists of those respondents with a college degree or less.

<sup>c</sup>The reference group consists of those respondents who are married.

gression sample and by IRA ownership. Table 4.6 indicates there are some significant differences between IRA owners and nonowners. For example, the average noneducation net worth of IRA owners is almost twice as much as that of nonowners (\$1,044,482 versus \$543,162), the average household income of IRA owners is much higher than that of nonowners (\$108,802 versus \$77,532), and a higher proportion of IRA owners have education savings accounts than nonowners (7.1 percent versus 4.6 percent).

Because wealth distribution is skewed, mean regressions are often driven by outliers. Therefore, median regressions are used instead. Hetero-

skedasticity in the error term is corrected by estimating the standard errors using bootstrap estimation with 200 iterations.

*Using Net Noneducation Financial Assets as the Dependent Variable*

Table 4.7 presents results from using net noneducation financial assets as the dependent variable. The coefficient estimates of most explanatory variables have the expected signs. Not surprisingly, net noneducation financial assets increase with household income and age for both IRA owner and nonowner groups. For example, a \$1,000 increase in 1999 household income is associated with more than \$3,000 increase in net noneducation financial assets. For both groups, having an SRA/GSRA account has a positive and significant impact on net noneducation financial assets. For the IRA owner group, those who also own an SRA/GSRA account have \$135,517 more in assets than those who do not own an SRA/GSRA ac-

**Table 4.7** Median Regression Estimates by IRA Ownership Status (dependent variable: net noneducation financial assets)

Explanatory Variable	Own IRA			Do Not Own IRA		
	Coefficient	Standard Error	Pr >  t	Coefficient	Standard Error	Pr >  t
Total education saving	5.553	2.721	0.042	10.859	10.808	0.315
Respondent's age						
45–54	198.766	58.879	0.001	103.189	26.457	0.000
55–64	422.272	67.675	0.000	311.243	61.304	0.000
65 and older	548.297	90.015	0.000	475.196	66.590	0.000
Respondent is male	129.881	43.938	0.003	18.817	20.758	0.365
Household income	3.471	0.912	0.000	3.349	0.989	0.001
Respondent's education						
Master's degree	74.682	50.279	0.138	-6.428	20.332	0.752
Doctorate degree	155.424	70.704	0.028	34.968	31.145	0.262
Respondent is an annuitant	-82.818	73.102	0.258	-141.594	60.170	0.019
Other household variables						
Has an SRA/GSRA	135.517	41.603	0.001	57.015	24.088	0.018
Covered by a DB plan	-98.677	41.094	0.017	-64.311	23.796	0.007
Number of children	3.391	33.515	0.919	7.986	11.315	0.481
Bequest motive	11.582	7.236	0.110	3.166	2.448	0.196
Respondent's marital status						
Single	53.758	64.898	0.408	57.465	33.338	0.085
Divorced	-125.311	63.726	0.050	-2.679	42.346	0.950
Widowed	87.716	107.929	0.417	-57.123	58.336	0.328
Constant	-258.595	73.870	0.000	-189.379	61.329	0.002
Pseudo R <sup>2</sup>		0.248			0.255	
No. of observations		658			607	

Note: Standard errors are bootstrapped with 200 iterations.

count. For the IRA nonowner group, those who own a SRA/GSRA account have \$57,015 more in total assets than those who do not own an SRA/GSRA account.

The coefficient estimate on the education saving variable is positive for both groups, and the estimate is statistically significant for the IRA owner group at the 5 percent level. This suggests that education saving does not crowd out other household financial assets. Specifically, for IRA owners, a \$1,000 increase in education saving is associated with a \$5,553 increase in net noneducation financial assets. This suggests that for IRA owners, saving with tax-favored education savings accounts seems to have a positive impact on other household financial assets.

Not surprisingly, a household's bequest motive (measured on a scale of 1 to 10) seems to be positively associated with net noneducation financial assets for both groups, and the estimate is somewhat significant for IRA owners. Moreover, households who are covered by a DB retirement plan tend to have less other financial assets than those who are not covered by a DB plan. This confirms that households who are covered by a DB plan save less in other forms. For example, among IRA owners, households who are covered by a DB plan have almost \$99,000 less in noneducation financial assets than those who are not covered. Among IRA nonowners, the difference is slightly over \$64,000.

#### *Using Noneducation Net Worth as the Dependent Variable*

Because there is a penalty on nonqualified withdrawals from tax-favored education savings accounts, education saving may be considered illiquid. Furthermore, education saving may be considered a long-term investment because many households are saving for their young children's future college expenses, which very often will occur many years later. To the extent that both housing and education saving may be considered illiquid and a long-term investment, households may increase education saving by taking out more home mortgage debt. Therefore, models that use wealth measures that do not include home equity may overestimate the impact of saving incentives.

To address this issue, the model is estimated using noneducation net worth (the sum of net noneducation financial assets and real estate equity) as the dependent variable. Results are presented in table 4.8. Most parameter estimates are similar to those presented in table 4.7. For both groups, a household's noneducation net worth increases with household income and age. Moreover, households who own an SRA/GSRA account have a higher level of net worth than those who do not own, while households covered by a DB plan have less net worth than those not covered by a DB plan.

The estimates of the education saving variable for both groups are still positive, yet statistically insignificant. This indicates that after real estate



**Table 4.8** Median Regression Estimates by IRA Ownership Status (dependent variable: noneducation net worth)

Explanatory Variable	Own IRA			Do Not Own IRA		
	Coefficient	Standard Error	Pr >  t	Coefficient	Standard Error	Pr >  t
Total education saving	6.480	5.269	0.219	10.859	11.422	0.342
Respondent's age						
45–54	316.490	66.325	0.000	103.189	27.820	0.000
55–64	566.248	83.876	0.000	311.243	57.901	0.000
65 and older	731.023	90.442	0.000	475.196	69.941	0.000
Respondent is male	141.981	52.787	0.007	18.817	17.625	0.286
Household income	4.119	1.127	0.000	3.349	0.860	0.000
Respondent's education						
Master's degree	111.187	56.957	0.051	-6.428	19.727	0.745
Doctorate degree	162.612	78.517	0.039	34.968	28.265	0.217
Respondent is an annuitant	-19.477	83.469	0.816	-141.594	59.597	0.018
Other household variables						
Has an SRA/GSRA	178.298	54.753	0.001	57.015	24.482	0.020
Covered by a DB plan	-116.012	50.519	0.022	-64.311	24.223	0.008
Number of children	4.087	35.706	0.909	7.986	10.296	0.438
Bequest motive	18.604	8.809	0.035	3.166	2.588	0.222
Respondent's marital status						
Single	30.548	71.989	0.671	57.465	34.433	0.096
Divorced	-149.417	83.689	0.075	-2.679	41.091	0.948
Widowed	34.226	140.933	0.808	-57.123	58.533	0.330
Constant	-331.607	103.815	0.001	-189.379	54.773	0.001
Pseudo R <sup>2</sup>		0.270			0.255	
No. of observations		658			607	

Note: Standard errors are bootstrapped with 200 iterations.

equity is taken into account, education saving has a negligible impact on households' noneducation net worth, that is, education saving does not seem to offset other household assets.

#### 4.5.2 Using the Ownership Status of SRA/GSRA to Identify Savers

This section presents results from estimating the model separately for SRA/GSRA owners and nonowners. Again, two wealth measures are used as the dependent variable. Table 4.9 presents the summary statistics for the full regression sample and by SRA/GSRA ownership. Interestingly, the proportions of SRA/GSRA owners and nonowners who have education savings accounts are almost identical (5.9 percent). Moreover, the mean value of total education saving is higher for SRA nonowners than for owners (\$949 versus \$471). This indicates that the saver and nonsaver groups defined by the ownership status of SRA/GSRAs are somewhat different from those defined by the ownership status of IRAs.

**Table 4.9** Summary Statistics of Dependent and Explanatory Variables

Variable	Own SRA/GSRA		Do Not Own SRA/GSRA		Full Regression Sample	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Noneducation net worth (in \$000s)	924.168	1,092.158	718.900	910.182	803.928	994.371
Net noneducation financial assets (in \$000s)	743.893	939.874	562.471	780.249	637.621	854.347
Education saving (in \$000s)	0.471	3.623	0.949	8.885	0.751	7.191
Respondent's age <sup>a</sup>						
45–54	0.250	0.433	0.238	0.426	0.243	0.429
55–64	0.198	0.399	0.219	0.414	0.210	0.408
65 and older	0.225	0.418	0.290	0.454	0.263	0.441
Respondent is male	0.544	0.499	0.583	0.493	0.567	0.496
Household income (in \$000s)	100.456	99.463	89.089	98.966	93.798	99.291
Respondent's education <sup>b</sup>						
Master's degree	0.355	0.479	0.363	0.481	0.360	0.480
Doctorate degree	0.336	0.473	0.324	0.468	0.329	0.470
Respondent is an annuitant	0.158	0.365	0.296	0.457	0.239	0.426
Other household variables						
Has an IRA	0.561	0.497	0.491	0.500	0.520	0.500
Covered by a DB plan	0.323	0.468	0.325	0.469	0.324	0.468
Number of children	0.529	0.938	0.534	0.942	0.532	0.940
Bequest motive	4.908	3.281	4.748	3.310	4.797	3.298
Respondent's marital status <sup>c</sup>						
Single	0.179	0.384	0.177	0.382	0.178	0.383
Divorced	0.105	0.307	0.116	0.321	0.111	0.315
Widowed	0.038	4.821	0.053	0.223	0.047	0.211
Percent owning a Coverdell, a 529 savings, or a 529 prepaid account	0.0592	0.2361	0.0594	0.2365	0.0593	0.2363
No. of observations	524		741		1,265	

<sup>a</sup>The reference group consists of those respondents who are younger than forty-five.

<sup>b</sup>The reference group consists of those respondents with a college degree or less.

<sup>c</sup>The reference group consists of those respondents who are married.

Table 4.10 presents results from using net noneducation financial assets as the dependent variable. The coefficient estimates of many explanatory variables are similar to those presented in table 4.7. For both SRA/GSRA owner and nonowner groups, net noneducation financial assets increase with income and age. A \$1,000 increase in 1999 household income is associated with a \$4,049 increase in net noneducation financial assets for the owner group, and a \$2,860 increase in net noneducation financial assets for the nonowner group.

Among SRA/GSRA owners, households who own an IRA have \$141,057

**Table 4.10** Median Regression Estimates by SRA/GSRA Ownership Status (dependent variable: net noneducation financial assets)

Explanatory Variable	Own SRA/GSRA			Do Not Own SRA/GSRA		
	Coefficient	Standard Error	Pr >  t	Coefficient	Standard Error	Pr >  t
Total education saving	19.461	12.759	0.128	5.704	2.586	0.028
Respondent's age						
45–54	174.266	50.506	0.001	119.547	28.422	0.000
55–64	526.887	91.981	0.000	298.150	51.675	0.000
65 and older	808.783	154.705	0.000	449.203	60.519	0.000
Respondent is male	97.545	38.312	0.011	23.441	18.987	0.217
Household income	4.049	1.382	0.004	2.860	0.772	0.000
Respondent's education						
Master's degree	13.354	40.578	0.742	39.874	25.280	0.115
Doctorate degree	99.337	73.087	0.175	82.344	32.122	0.011
Respondent is an annuitant	-166.672	144.350	0.249	-102.114	50.565	0.044
Other household variables						
Has an IRA	141.057	39.432	0.000	133.961	25.738	0.000
Covered by a DB plan	-31.770	48.722	0.515	-85.668	24.119	0.000
Number of children	-6.450	22.351	0.773	0.899	13.962	0.949
Bequest motive	5.619	6.272	0.371	7.705	2.880	0.008
Respondent's marital status						
Single	80.574	60.783	0.186	36.832	39.108	0.347
Divorced	-26.046	88.076	0.768	-56.097	35.198	0.111
Widowed	-51.430	157.248	0.744	-38.469	57.526	0.504
Constant	-297.439	108.130	0.006	-185.444	48.093	0.000
Pseudo R <sup>2</sup>		0.294			0.276	
No. of observations		524			741	

Note: Standard errors are bootstrapped with 200 iterations.

more in net noneducation financial assets than those who do not own an IRA. Among SRA/GSRA nonowners, households who own an IRA have \$133,961 more in net noneducation financial assets than those who do not own an IRA.

For both SRA/GSRA owner and nonowner groups, having a DB pension plan is negatively associated with net noneducation financial assets, and the estimate is statistically significant for SRA nonowners.

Total education saving is positively associated with net noneducation financial assets, and the estimate is statistically significant for SRA nonowners and somewhat significant for SRA owners. This suggests that saving with education savings accounts seem to stimulate other household saving for both groups.

Table 4.11 presents results from using noneducation net worth as the dependent variable. Table 4.11 suggests that when real estate equity is taken into account, total education saving is positively associated with noneducation net worth, and the estimates are statistically significant for both

**Table 4.11** Median Regression Estimates by SRA/GSRA Ownership Status (dependent variable: noneducation net worth)

Explanatory Variable	Own SRA/GSRA			Do Not Own SRA/GSRA		
	Coefficient	Standard Error	Pr >  t	Coefficient	Standard Error	Pr >  t
Total education saving	25.411	15.320	0.098	6.190	2.738	0.024
Respondent's age						
45–54	281.438	60.139	0.000	153.994	39.615	0.000
55–64	630.262	89.600	0.000	397.628	56.849	0.000
65 and older	942.358	149.970	0.000	574.394	63.820	0.000
Respondent is male	98.371	43.115	0.023	39.231	29.331	0.181
Household income	4.802	1.489	0.001	4.207	1.135	0.000
Respondent's education						
Master's degree	19.526	49.788	0.695	68.008	31.335	0.030
Doctorate degree	142.515	78.821	0.071	98.484	43.687	0.024
Respondent is an annuitant	-78.273	128.859	0.544	-96.857	57.587	0.093
Other household variables						
Has an IRA	180.751	51.217	0.000	172.117	34.098	0.000
Covered by a DB plan	-27.206	58.012	0.639	-116.607	30.960	0.000
Number of children	3.490	25.240	0.890	-7.758	18.330	0.672
Bequest motive	12.680	7.139	0.076	7.625	3.928	0.053
Respondent's marital status						
Single	118.639	72.100	0.100	6.973	51.340	0.892
Divorced	-61.597	88.419	0.486	-64.798	47.706	0.175
Widowed	-84.079	191.382	0.661	-115.048	68.197	0.092
Constant	-387.224	122.123	0.002	-227.520	68.632	0.001
Pseudo R <sup>2</sup>		0.3239			0.2903	
No. of observations		524			741	

Note: Standard errors are bootstrapped with 200 iterations.

SRA owner and nonowner groups. For example, a \$1,000 increase in education saving is associated with a \$6,190 increase in noneducation net worth for the nonowner group.

#### 4.5.3 Using the Propensity Score Method to Control for Saver Heterogeneity

As mentioned earlier, the saver and nonsaver groups defined by IRA ownership are somewhat different from those defined by the SRA/GSRA ownership. This suggests that the ownership status of IRA or SRA/GSRA controls for saver heterogeneity only to a certain degree, and potential unobserved heterogeneity in individuals' propensities to save might still exist within the owner or nonowner group.

One way to better control for unobserved saver heterogeneity is to use the propensity score approach. This section presents results from using the propensity score approach (as employed by Dehejia and Wahba 1999) to control for saver heterogeneity.

In this study, the propensity score approach is applied in the following steps: (1) a probit model is used to estimate the propensity of households owning an education savings account, conditional on their observed characteristics, including many of the explanatory variables described in section 4.4.3. The coefficient estimates of the model are then used to predict the likelihood of households using these accounts; (2) households are sorted from lowest to highest by their predicted likelihood of using education savings accounts; (3) households are stratified into several strata based on their predicted propensities to have an education savings account. The strata are chosen so that the covariates are “balanced” within each stratum, that is, there are no statistical differences (at the 5 percent level) in means of covariates between households who have and those who do not have an education savings account.<sup>14</sup> In order to estimate the impact of education saving on household net worth, a reasonable number of households with education savings accounts are needed for each stratum. Therefore, strata with too few numbers of observations (less than five) with education savings accounts are discarded. The discarded strata are those in the bottom 40 percent of the predicted propensity score distribution; and (4) within-stratum robust regressions are run to estimate the impact of education saving on other household assets.

The propensity score approach greatly reduces saver heterogeneity within each stratum in that, by design, households who do and those who do not have an education savings account have similar predicted propensities to use an education savings account and similar covariates. In other words, there is no systematic difference between those who have and those who do not have an education savings account within a stratum. Therefore, the propensity score approach should provide reliable estimates.

Table 4.12 presents results from robust regressions within each of the remaining five propensity score strata. Table 4.12 indicates total education saving has a positive and significant impact on other household net worth for the top two propensity score strata (strata 4 and 5). Moreover, the estimates are consistent with those obtained from using IRA or SRA/GSRA ownership to identify savers. For example, estimates for stratum 5 indicate that a \$1,000 increase in education saving is associated with a \$7,000 increase in noneducation net worth. Because stratum 5 has the highest proportion of households who own education savings accounts, estimates for stratum 5 may be most reliable. For propensity score strata 1–3, total

14. To ensure a reasonable number of households with education savings accounts in each stratum, households who do not own an education savings account and have a predicted propensity score (likelihood) higher than the maximum or lower than the minimum predicted propensity score for those who do own are discarded. The remaining households are divided into ten strata. For each stratum, *t*-tests are run to compare the means of covariates between households who have and those who do not have an education savings account. If there is “in-balance” in a stratum, that is, the means of one or more covariates are statistically different between the two groups, then the stratum is fine-tuned until “balance” is achieved.

**Table 4.12 Robust Regression Estimates Within Propensity Score Stratum (dependent variable: noneducation net worth)**

Explanatory Variable	Stratum 1	Stratum 2	Stratum 3	Stratum 4	Stratum 5
Total education saving	-0.800 (8.886)	33.378 (22.766)	-1.630 (3.227)	43.720 (5.792)	6.987 (1.612)
Respondent's age					
45-54	137.424 (116.349)	284.086 (147.428)	131.981 (128.090)	514.630 (120.373)	117.176 (61.603)
55-64	334.479 (112.218)	505.351 (146.733)	420.808 (153.895)	1,000.985 (175.217)	574.172 (139.212)
65 and older	568.080 (119.067)	1,122.364 (145.528)	889.738 (163.574)	1,602.332 (189.815)	315.813 (297.402)
Respondent is male	183.186 (65.856)	-94.846 (90.872)	214.522 (111.123)	166.300 (84.128)	97.101 (59.423)
Household income	7.492 (0.466)	2.265 (0.245)	6.192 (0.870)	1.171 (0.282)	4.156 (0.362)
Respondent's education					
Master's degree	-52.866 (75.267)	-27.975 (100.989)	-76.745 (122.333)	133.015 (90.734)	9.418 (71.019)
Doctorate degree	90.631 (77.299)	145.729 (104.068)	-233.562 (124.768)	24.053 (105.587)	26.835 (71.649)
Respondent is an annuitant	10.668 (88.019)	-359.587 (118.841)	-149.138 (144.527)	-812.914 (184.435)	1,172.186 (369.222)
Other household variables					
Has an IRA	204.630 (86.250)	237.669 (112.528)	496.727 (165.217)	191.161 (121.449)	116.935 (73.718)
Has an SRA/GSRA	171.909 (62.528)	184.538 (76.265)	168.087 (92.100)	77.488 (76.583)	117.145 (54.699)
Covered by a DB plan	-132.100 (64.673)	22.728 (79.958)	-110.346 (94.594)	-87.377 (74.608)	-90.475 (54.713)
Number of children	100.496 (101.888)	68.385 (85.665)	105.115 (94.173)	60.098 (56.592)	15.151 (40.904)
Bequest motive	28.097 (19.915)	18.675 (23.369)	12.485 (19.704)	22.126 (18.070)	-4.947 (10.231)
Respondent's marital status					
Single	-35.388 (144.566)	-89.058 (214.701)	dropped	157.695 (353.224)	dropped
Divorced	-85.597 (154.525)	-49.300 (235.296)	-241.135 (376.450)	dropped	315.586 (304.061)
Widowed	48.988 (185.194)	133.810 (536.131)	dropped	dropped	dropped
Constant	-664.085 (151.256)	-264.749 (206.924)	-625.249 (214.536)	-365.156 (189.813)	-245.880 (149.174)
<i>F</i> statistics	30.15	15.64	14.99	31.03	21.30
No. of observations	253	195	104	96	125
No. of observations with an education savings account	5	10	15	12	25

*Notes:* Standard errors are in parentheses. The first-stage probit model includes the following covariates: a dummy variable for household owning an IRA, age, age squared, the number of children in the household, bequest motive, a dummy variable indicating that the respondent is married, and an interaction term of the number of children and bequest motive. Results from the probit model are not sensitive to the addition of other covariates.

education saving does not seem to have a significant impact on other household net worth.

As a sensitivity analysis, the propensity score approach is applied to only households with children (365 cases, slightly less than one-third of the full regression sample). Households are sorted into four strata based on their estimated propensity to use an education savings account. The lowest stratum is discarded due to the low number of households with an education saving account (three cases).

Table 4.13 presents the results using the subsample of households with children. Table 4.13 reiterates the findings in table 4.12. That is, total education saving has a positive and significant impact on other household net worth for high-propensity score strata (strata 2 and 3). Moreover, the estimates are very similar to those in table 4.12. For example, estimates for stratum 3 suggest that a \$1,000 increase in education saving is associated with a \$6,666 increase in noneducation net worth. This further confirms that the propensity score approach provides reliable and robust estimates. The estimates are especially robust for high-propensity score strata.

#### 4.6 Concluding Remarks

Whether savings incentives increase total private and public saving has been the subject of an ongoing debate. In the last two decades, a substantial amount of research has been devoted to address this issue, with a focus on the saving effects of retirement savings programs on total household saving.

In recent years, the federal government has introduced two education savings programs in support of saving for education expenses. As in the case of retirement savings programs, an important public policy issue is whether these education savings programs stimulate new saving. Because these education savings programs are relatively new, data are not readily available. The lack of data makes it difficult to empirically estimate the saving effects of these education savings programs.

Using wealth data from a survey of TIAA-CREF participants, this paper attempts to estimate the impact of education savings programs on other household assets. Two strategies are used to control for saver heterogeneity in the analysis. The first strategy uses the ownership status of an IRA or a SRA/GSRA as a signal for household's taste for saving. The second strategy uses the propensity score method to control for saver heterogeneity.

Using IRA or SRA/GSRA ownership to identify savers from nonsavers, median regression results suggest that education saving does not offset other household assets. In many cases, education saving seems to stimulate other household saving, and the estimates are significant. Results from the propensity score method confirm these findings. Specifically, education saving is positively associated with other household assets for households with higher propensities to use education savings accounts. These findings

**Table 4.13 Robust Regression Estimates Within Propensity Score Stratum Including Only Households with Children (dependent variable: non-education net worth)**

Explanatory Variable	Stratum 1	Stratum 2	Stratum 3
Total education saving	19.105 (29.630)	63.864 (13.440)	6.666 (1.469)
Respondent's age			
45–54	120.958 (133.670)	182.047 (133.913)	144.011 (72.945)
55–64	552.632 (253.275)	278.244 (189.202)	dropped
65 and older	1,211.519 (357.479)	dropped	dropped
Respondent is male	–83.223 (93.673)	135.956 (74.563)	51.762 (68.098)
Household income	3.372 (0.920)	1.191 (0.220)	4.330 (0.357)
Respondent's education			
Master's degree	44.676 (114.485)	185.003 (87.852)	–0.595 (80.848)
Doctorate degree	39,580 (112.901)	87.583 (95.765)	18.004 (77.512)
Respondent is an annuitant	dropped	1,412.520 (369.338)	dropped
Other household variables			
Has an IRA	355.351 (205.025)	406.870 (141.415)	117.019 (88.270)
Has an SRA/GSRA	194.686 (99.469)	–22.755 (65.994)	99.548 (58.624)
Covered by a DB plan	–54.315 (103.928)	–68.183 (72.293)	–107.001 (56.576)
Number of children	–46.238 (65.245)	–59.692 (44.004)	57.746 (40.719)
Bequest motive	12.757 (18.554)	–8.072 (15.219)	1.060 (10.168)
Respondent's marital status			
Single	–419.492 (298.516)	289.475 (360.191)	dropped
Divorced	–75.292 (261.743)	dropped	dropped
Widowed	dropped	dropped	dropped
Constant	–41.174 (274.015)	114.553 (153.946)	–346.402 (120.001)
<i>F</i> statistics	9.25	19.42	23.90
No. of observations	60	118	91
No. of observations with an education savings account	9	10	30

*Notes:* Standard errors are in parentheses. The first-stage probit model includes the following covariates: a dummy variable for household owning an IRA, age, age squared, household income, respondent's education, the number of children in the household, bequest motive, a dummy variable indicating the respondent is married, and an interaction term of the number of children and bequest motive. Results from the probit model are not sensitive to the addition of other covariates.



are consistent with those of some studies in the 401(k) literature (Poterba, Venti, and Wise 1995; Venti and Wise 1995) that suggest retirement programs stimulate new household saving.

It is not surprising that this study finds no evidence of households shifting assets from other accounts to tax-favored education savings accounts. Such shifting behavior may be deterred because if withdrawals for education savings accounts are not used for college expenses, a 10 percent penalty is imposed on earnings in addition to regular income tax. If an individual withdraws money from an education savings account for noneducation purposes, the after-tax after-penalty asset accumulation could be easily trumped by that from a tax efficient mutual fund, assuming the same rates of return for the mutual fund and the education savings account. Therefore, if an individual anticipates that there is a high probability that withdrawals will not be used for education purposes, he or she would be unlikely to use an education savings account.

It is worth noting that the data used in this study are drawn from a survey of a nonrepresentative sample of TIAA-CREF participants. The sample of this study is quite different from the general population. One difference is that the sample of this study is much wealthier than the general population. Therefore, this study does not address the question of whether these education savings programs encourage less affluent households to save for college. Nevertheless, this study provides a useful first look at the saving effects of education savings programs. As mentioned earlier, the sample of this study is particularly suited to examining whether education saving offsets other household assets because shuffling will more likely occur for wealthy households simply due to the fact that they have more assets to shift around.

Also of considerable interest are the potential institutional responses to tax-favored education savings programs. Some researchers argue that these savings programs may have a long-term impact on admission policies. For example, Olivas (2001) argues that some higher education institutions may predicate admissions on ability to pay. There is also concern that these programs may also present an opportunity for some institutions to raise tuition even more.

As 529 plans and Coverdells continue to grow, new data may become available. With new and hopefully better data, alternative and possibly more robust methods may be used to control for saver heterogeneity. Such methods may include using panel data to compare changes in household assets for those who own and those who do not own education savings accounts. State variation in 529 plans may be used to examine the impact of plan features on individuals' saving behaviors. Another area for future research is the impact of education savings programs on national saving, which this paper does not address.

# Appendix

**Table 4A.1 Minimum and Maximum Account Balance Limits in 529 Savings Plans (as of August 2003)**

State	Program	Initial Year of Operation	Minimum Lump-Sum Contribution	Minimum Automatic Payment	Current Lifetime Account Balance Limit
Alabama	The Higher Education 529 Fund	2002	\$250 per portfolio	\$25 per month	\$269,000
Alaska	University of Alaska College Savings Plan	1991, revised May 2001	\$250	\$50	\$250,000
Arizona	Arizona Family College Savings Program	1999	\$20 to \$500 per mutual fund	\$20 to \$500 per mutual fund	\$187,000
Arkansas	GIFT College Investing Plan	1999	\$250 initial and \$50 subsequent	\$250 initial and \$50 subsequent	\$245,000
California	Golden State Scholar-Share Trust	1999	\$25	\$15 for payroll deductions	\$267,580
Colorado	Scholars Choice	1999	\$25 initial and \$15 subsequent		
Connecticut	Connecticut Higher Education Trust	1997	\$25	None for payroll deductions	\$235,000
Delaware	Delaware College Investment Plan	1998	\$500 initial and \$50 subsequent	\$15 for payroll deductions	\$235,000
District of Columbia	DC College Savings Plan	2002	\$100 initial and \$25 subsequent	\$500 initial and \$50 subsequent	\$250,000
Florida	Florida College Investment Plan	2002	\$25	\$15 for payroll deductions, \$25 for bank transfers	\$260,000
Georgia	Georgia Higher Education Savings Plan	2002	\$25	\$15	\$283,000
Hawaii	Tuition-EDGE	2002	\$15 per investment option	\$15 for payroll deductions	\$235,000
Idaho	Idaho College Savings Program	2001	\$25	\$15 per investment option	\$297,000
Illinois	Bright Start College Savings Program	2000	\$25 initial and \$15 subsequent	\$15 for payroll deductions	\$235,000
Indiana	College Choice 529 Plan	1997	\$50 initial and \$25 subsequent	None for payroll deductions	\$235,000
Iowa	College Savings Iowa	1998	\$500 for nonresidents	\$50 initial and \$25 subsequent	\$236,750
Kansas	Learning Quest Education Savings Program	2000	\$500 per year for nonresidents	\$50 per year	\$239,000
Kentucky	Education Savings Plan Trust	1990	\$25	\$500 for residents (\$2,500 for nonresidents)	\$235,000
Louisiana	Louisiana START	1997	\$10 initial and \$10 subsequent	\$15 for payroll deductions	\$235,000

(continued)

**Table 4A.1** (continued)

State	Program	Initial Year of Operation	Minimum Lump-Sum Contribution	Minimum Automatic Payment	Current Lifetime Account Balance Limit
Maine	NextGen College Investing Plan	1999	\$250	\$50 per month	\$250,000
Maryland	Maryland College Investing Plan	2001	\$250	\$25 per month	\$250,000
Massachusetts	U. Fund College Investing Plan	1999	\$1,000	\$50	\$250,000
Michigan	Michigan Education Savings Program	2000	\$25	\$15	\$235,000
Minnesota	Minnesota College Savings Plan	2001	\$25	\$15	\$235,000
Mississippi	Mississippi Affordable College Savings (MACS) Program	2001	\$25	\$15	\$235,000
Missouri	Missouri Saving for Tuition (MOST) Program	1999	\$25	\$15	\$235,000
Montana	Montana Family Education Savings Program	1998	\$250	\$25 for payroll deductions, \$100/month or \$250/quarter for bank transfers	\$262,000
Nebraska	College Savings Plan of Nebraska	2001	None	None	\$250,000
Nevada	American Skandia College Savings Plan	2001	\$250	\$50	\$250,000
New Hampshire	UNIQUE College Investing Plan	1998	\$1,000	\$50 per month	\$250,000
New Jersey	NJBEST Educational Savings Trust	1998	\$25 per month and \$300 per year, until account reaches \$1,200	\$25 per month and \$300 per year, until account reaches \$1,200	\$305,000
New Mexico	Education Plan's College Saving Program of NM	2000	\$250 initial and \$100 subsequent	\$25 per month	\$294,000
New York	New York's College Savings Program	1998	\$25	\$15	\$100,000 in total contributions or \$235,000 in account balances, whichever is reached first

North Carolina	North Carolina's National College Savings Program	1998	\$5	\$5	\$276,046
North Dakota	College SAVE	2001	\$25 initial (\$300 for the first year)	\$25 per month	\$269,000
Ohio	Ohio College Advantage Savings Plan	1989	\$15	\$15	\$245,000
Oklahoma	Oklahoma College Savings Plan	2000	\$25	\$15 for payroll deductions	\$235,000
Oregon	Oregon College Savings Plan	2001	\$250 initial and \$25 subsequent	\$25	\$250,000
Pennsylvania	TAP 529 Investment Plan	2002	\$1,000 initial and \$50 subsequent	\$1,000 initial and \$50 subsequent	\$290,000
Rhode Island	CollegeBoundFund	1998	\$1,000 initial and \$50 subsequent	\$1,000 initial and \$50 subsequent	\$301,550
South Carolina	Future Scholar 529 College Savings Plan	2002	\$250 initial and \$50 subsequent	\$50 per month for payroll deductions	\$265,000
South Dakota	CollegeAccess 529	2002	\$250	\$50 per month	\$305,000
Tennessee	Tennessee BEST Savings Plan	2000	\$25	\$15 for payroll deductions	\$235,000
Texas	Tomorrow's College Investment Plan	2002	\$25 per portfolio	\$25 per portfolio	\$257,460
Utah	Utah Educational Savings Plan (UESP) Trust	1997	\$25	\$25	\$280,000
Vermont	Vermont Higher Education Savings Plan	1999	\$25	\$15 for payroll deductions	\$240,100
Virginia	Virginia Education Savings Trust (VEST)	1999	\$25 (\$250 minimum for first year)	\$25 (\$250 minimum for first year)	\$250,000
West Virginia	Smart 529 Plan	2002	\$100 initial and \$15 subsequent	\$15	\$265,620
Wisconsin	EDVEST Wisconsin College Savings Program	1997	\$250	\$25 per month	\$246,000
Wyoming	Wyoming College Achievement Plan	2000	\$250 initial for residents (\$1,000 for nonresidents) and \$50 subsequent	\$250 initial for residents (\$1,000 for nonresidents) and \$50 subsequent	\$245,000

Sources: Information on the web sites [www.collegesavings.org](http://www.collegesavings.org), [www.savingforcollege.com](http://www.savingforcollege.com), and program disclosure booklets.

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## Comment Harvey S. Rosen

In this paper, Ma analyzes the savings effects of two programs for tax-favored saving to meet college expenses, the 529 plan and the Coverdell Education Savings Account. The details of the plans are quite complicated, including the criteria for allowable expenditures from the accounts, penalties for using the funds for nonapproved expenditures, eligibility requirements, and interactions with other programs for subsidizing higher education such as the Lifetime Learning Credit. (See Ma's table 4.1.) For purposes of thinking about their impact on saving, though, it probably makes sense to think of these programs simply as versions of the Roth IRA. The key attributes are that contributions into the accounts are nondeductible; the contributions grow at the before-tax rate of return; and neither the contributions nor the returns are taxed upon (qualified) withdrawal. Understanding that these accounts are basically Roth IRAs is important because we can then use the substantial literature on the savings effects of IRAs to help us think about the approach taken in this paper.

Ma notes that in trying to determine the impact of education IRAs (henceforth EIRAs) on saving, a challenging issue is how to deal with saver heterogeneity. It is challenging indeed! Much of the voluminous and sometimes contentious literature on IRAs and saving has focused on the difficulties involved in figuring out whether IRAs actually induce more saving, or whether households with IRAs save more only because they have particularly strong tastes for saving. To deal with this problem, Ma assumes that whether households have an IRA account can be used to identify people with strong preferences for saving. She estimates her econometric model separately for those with and without IRAs. In effect, then, she tries to find out whether EIRAs increase saving among those who are already high savers (as measured by having an IRA). The key result that emerges from the regression analysis is that education saving is positively correlated with noneducation financial assets, but the estimates are not statistically different from zero. This suggests that saving with education saving vehicles seems to have a negligible impact on other household financial assets.

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The use of IRA holdings to classify people as savers is critical to the research design. It is worth emphasizing the possible problem with this strategy that Ma herself notes—even within the set of IRA holders, there may be unobservable differences with respect to tastes for saving. Given that the data are from a single cross section, there simply isn't much to be done about it. But a special caution might be appropriate given that the data are from the year 2000. During the early 1980s, one could plausibly have made the case that IRAs were a good proxy for preferences for saving. But in recent years, some people have been using IRAs as repositories for pensions from previous jobs—when people change jobs, they may roll their pensions into IRA accounts. I do not have any figures on how important this phenomenon is, but it certainly exists. For this reason, I am inclined to put more weight on the use of SRA/GSRA ownership status as a classificatory variable than on IRA ownership status.

Another issue relates to how representative the sample is. Of course, members of TIAA-CREF are not typical of the population. But the analysis sample is probably not representative even of the members of TIAA-CREF. Sixty thousand randomly selected members were originally asked to participate in the survey in 1993. Originally 9,847 responded; by 2000 this figure was 9,234. Of these, 2,793 gave usable responses. Additional observations were lost due to the fact that certain components of wealth were missing from some observations. The basic regressions ended up including 917 cases. Now, my view is that this is a very interesting data set and that it is certainly worth exploiting. Still, one must be sensitive to the fact that the results might not generalize to the population as a whole. In this context, I found puzzling Ma's assertion that the sample was nonrepresentative in a useful way because its members were likely to be particularly focused on the costs of college. Why is this an advantage? After all, even after the program has been up and running for a number of years, information about it still won't be perfect.

To conclude, I think that Ma's self-assessment of this paper is right on target when she describes her study as an important first step in examining the impact of these saving programs. This leads naturally to the question of what the next steps should be. I would be particularly interested in seeing an estimate of the impact of EIRAs on social saving, that is, the sum of public and private saving. If Ma's conclusion is correct, then education IRAs increase private saving. But they also reduce tax revenues, which lowers public saving, other things being the same. What is the net effect? That is a key question for assessing the impact on capital formation.