

Section 529 plans as retirement accounts

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Abstract

Section 529 plans were created to provide tax incentives for savings for qualified higher education expenses (QHEE). Earnings in 529 plans are tax-free if withdrawals are made for QHEE, otherwise there is a 10% penalty on the earnings, which are taxed at ordinary rates. Although nonqualified withdrawals are subject to a 10% penalty on the earnings, taxes on the earnings are deferred until withdrawal. This paper examines the use of Section 529 plans as retirement accounts by comparing after-tax and after-penalty future dollars from Section 529 plans with after-tax future dollars from ordinary taxable investments and tax-advantaged annuities. © 2003 Academy of Financial Services. All rights reserved.

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1. Introduction

Federal legislation was passed in 1996 to allow states to create Section 529 plans. The plans, named after the Internal Revenue Code Section, are created by the states to provide tax incentives to save for qualified higher education expenses (QHEE). With legislative changes made in 2001, earnings in 529 plans are tax-free if withdrawals are made for QHEE. Otherwise, earnings are taxable when withdrawn and subject to a 10% penalty. (Because original investment dollars into the plan are made with after-tax dollars, their withdrawal is not taxed.) Though fund limits and institutional details differ from state to state, 529 plans are functionally (economically) equivalent to Roth IRAs for *qualified* withdrawals.

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Investments in 529 plans may be subject to gift taxes if the lifetime exclusion has been fully used and the annual contribution exceeds the maximum exemption (currently \$1,000,000 lifetime exclusion and \$11,000 per donor per recipient per year exemption) but only earnings are subject to penalty and income taxation.

Although nonqualified withdrawals are subject to a 10% penalty on the earnings, taxes on the earnings are deferred until withdrawal. Thus, for individuals who have already optimized deductible IRAs and deductible employee savings options and are attempting to invest additional dollars for retirement, such plans may be a more optimal savings vehicle than investing after-tax dollars in traditional investment assets or in tax-deferred annuities.

This paper examines the use of Section 529 plans as retirement accounts. Future dollars available for consumption from Section 529 plans derived from nonqualified withdrawals (i.e., for retirement as opposed to education purposes) are compared to future dollars available for consumption from ordinary taxable accounts and to future dollars available for consumption from tax-advantaged annuities.

2. Previous research

A significant amount of research has analyzed tax-advantaged savings alternatives with much of the research focusing on traditional IRAs versus Roth IRAs. For example, Krishnan and Lawrence (2001) review the previous literature and analyze various IRA options and taxable investments. They compute after-tax future values for each of the various options and explore sensitivity to investment horizons, investment returns, and, more significantly, differing tax rates in the present and future. In general, the Roth IRA dominates the traditional, deductible IRA unless future tax rates at the time of withdrawal are less than current tax rates. This result depends on the assumption about available funds at time of investment. If one assumes equal before-tax investments in the deductible and Roth IRAs and tax rates do not change, both IRAs result in equal future after-tax values (see Crain and Austin, 1997). Krishnan and Lawrence (2001) assume the investor makes equal after-tax investments, and reinvests the tax savings from the deductible IRA in taxable investments that are taxed each year. Both the deductible IRA and Roth IRA dominate nondeductible IRAs and taxable investments. The comparison of nondeductible IRAs with taxable investments depends on the form (ordinary income vs. capital gain) and tax rate on earnings annually and at withdrawal. More recently Sibley (2002) and Horan (2002) review the literature and carefully analyze tax-advantaged retirement accounts. Sibley (2002) derives valuation models for three groups of tax-advantaged accounts:

1. Accounts where contributions are tax deductible and withdrawals are fully taxable at ordinary income tax rates at time of withdrawal. [These would include traditional tax deductible IRAs, 401(k)s, 403(b)s and similar accounts.]
2. Accounts where contributions are not tax deductible and only the earnings portion of withdrawals is taxed at the time of withdrawal. (A traditional IRA funded with after-tax dollars is the example.)

3. Accounts where contributions are not tax deductible and all qualifying withdrawals are free from taxation. (A Roth IRA would fit this description.)

Horan (2002) expands on the analysis by deriving valuation models that focus on annuitized withdrawals rather than lump sum withdrawals, and which also allow for some variation in the tax rate through time.

This paper takes a slightly different approach by assuming the individual's income is too high to make use of the traditional and/or Roth IRAs or that the individual has already fully utilized these options and is attempting to save additional funds for retirement. In the absence of the Section 529 plan, the individual could invest after-tax dollars in taxable investments or in a tax-deferred annuity.

The Section 529 plan offers another option. With this plan, earnings are not taxed when earned. When funds are withdrawn for retirement or any other unqualified purpose, the earnings are taxed as ordinary income and are also subject to a 10% penalty. Unlike IRA accounts, there is no income limit on the owner or contributor to a Section 529 plan.

Therefore, the analysis of this paper is more akin to that in Burgess and Madeo (1980) and O'Neil, Saftner, and Dillway (1983), who analyze the impact of premature withdrawal penalties on early withdrawals from IRAs to derive break-even investment horizons and optimal withdrawals from the IRAs. Their research compares early withdrawals from *tax-deductible* IRAs with withdrawals from taxable accounts. This paper differs because Section 529 deposits are not tax-deductible, and is thus analogous to comparing early withdrawals from nondeductible IRAs with withdrawals from taxable accounts. In addition, Section 529 plans as retirement vehicles are compared to annuities, which could be considered a tax-advantaged alternative.

3. Description of 529 plans

Section 529 plans are of two types. One is a tuition credit plan, the other is a savings plan. This paper discusses the latter. Section 529 provides that 'qualified state tuition programs' shall be exempt from taxation. Such plans must be established and maintained by a State or agency or instrumentality thereof. Most states have outsourced the management of their programs to investment advisory or financial services firms. While each state has its own specific requirements, the salient requirements applicable to all plans are:

1. Only cash contributions are allowed.
2. There must be separate accounting for each designated beneficiary.
3. There may be no investment direction by any contributor to, or designated beneficiary under, such program. The account owner may choose among several broad-based investment options once per year.
4. No interest in the program may be used as security for a loan.
5. The program must provide adequate safeguards to prevent contributions on behalf of a designated beneficiary in excess of those necessary to provide for the QHEE of the beneficiary.
6. There must be a penalty imposed on distributions from an account that are not used for

QHEE, except death or disability of the designated beneficiary, or to the extent the designated beneficiary receives a scholarship.

QHEE include tuition, fees, books, supplies, and equipment required for the enrollment or attendance of a designated beneficiary at an eligible educational institution. Reasonable costs for room and board are also QHEE for students who are enrolled at least half-time. An *eligible educational institution* is one which is described in section 481 of the Higher Education Act of 1965 (20 U.S. C. 1088) and which is eligible to participate in a program under Title IV of such act. *Designated beneficiary* is the individual designated at the commencement of the participation in the qualified state tuition program. If the designated beneficiary is changed, the new beneficiary must be a member of the original designated beneficiary's family (as defined in the code) to avoid treatment as a nonqualified withdrawal.

A potential downside of the 529 plan when compared to the taxable and tax-deferred annuity alternatives is that the investor has no direct investment direction. Thus, the potential range of investment opportunities is limited. However, from a practical standpoint and consistent with modern portfolio theory most of the plans offer broad based equity portfolio options that can be suited to a particular time horizon, and can be changed once per year.

4. Comparison with taxable investments

4.1. Two-period case

Consider an individual saving for retirement who has already optimized other tax-advantaged accounts, or whose income level makes him ineligible for such accounts. For simplicity, first assume a two-period model where the individual will invest \$1 after-tax immediately, pay tax at the rate t on earnings when taxable, and withdraw all proceeds, net of tax and penalties (10%), at the end of the second period. The \$1 after-tax investment can be made to a taxable investment account, or to a Section 529 account, both of which earn the same R percentage before-tax rate of return.

Below are the after-tax and after-penalty future values of the two savings options:

End of Period	Taxable Investment	Section 529
0	\$1	\$1
1	$1 + R(1 - t)$	$1 + R$
2	$[1 + R(1 - t)]^2$	$[(1 + R)^2 - 1] (1 - t - .1) + 1$

Subtracting the future value for the taxable investment from the future value from the 529 plan, with a little algebra (see appendix), yields.

$$\begin{aligned} \text{Future Value Earnings:} \quad & \text{Section 529} - \text{Taxable} = (t \times R) \times R \times (1 - t) \\ & - .1(2R + R^2). \end{aligned} \tag{1}$$

The intuition behind the above expression is straightforward. The first term, $(t \times R) \times R \times (1 - t)$, represents the after-tax earnings on the tax savings, $(t \times R)$, realized in year one from being able to defer taxes. The second term, $0.1(2R + R^2)$, is the amount of penalty on the earnings for the two periods. Using a Section 529 plan as a retirement vehicle involves trading off the future value of the after-tax earnings on the tax deferral against the future penalty for nonqualified withdrawals. This tradeoff is the same as that made in comparing early withdrawals from a nondeductible IRA with withdrawals from a taxable investment.

4.2. *N*-period case

For the *n*-period case, the future value of after-penalty and after-tax earnings for the two investment alternatives are:

$$\text{Section 529:} \quad \text{FV Earnings} = [(1 + R)^n - 1] \times (1 - t - .1). \quad (2)$$

$$\text{Taxable:} \quad \text{FV Earnings} = [1 + R(1 - t)]^n - 1. \quad (3)$$

Unfortunately, the algebra and intuition become complex for the *n*-period case. However, the difference between the two is a function of the tax rate, *t*, the investment return, *R*, and the number of periods, *n*. Intuitively, or from Eq. (1), the higher the tax rate, the higher the investment rate of return, or the longer the investment horizon, the greater the value of the tax deferral relative to the penalty. Note that by setting the penalty equal to 0 and taking the ratio of the 529 Account future value to the Taxable Account future value for *n* periods yields Eq. (14) in Sibley (2002), with α set equal to 1. This equation measures the after-tax dollar equivalent of a dollar invested in a nondeductible IRA to a dollar invested in a taxable account.

Table 1, Panels A and B present simulation results which compare the future value of after-tax and after penalty earnings from the Section 529 investment with the after tax earnings from a taxable investment. Table 1, Panel A presents the ratio of Section 529 plan future after-tax dollars to future after-tax dollars from a taxable investment for tax rates of 15% and 27%. Table 1, Panel B presents the same for tax rates of 30% and 35%. As Table 1, Panel A indicates, for individuals in the 15% tax bracket and an assumed rate of return of 8%, it would take 20 years for the advantage of the tax deferral to overcome the nonqualified withdrawal penalty.

However, in the more probable scenario of investments by higher income individuals, Table 1, Panel B indicates it would take 13 years for the Section 529 plan to overcome the taxable investment alternative for individuals in the 30% and 35% tax brackets. At a 12% earnings rate, these individuals would experience a positive benefit from the 529 plan in 10 and 9 years, respectively. Of course, earnings on taxable investments may be in the form of interest, dividends or capital gains, and the latter may be deferred. This paper assumes all earnings are ordinary income taxed at the same rate through time. For a different treatment, see Horan (2002), who examines the effect of treating income as either ordinary or capital gain, taxed at different rates.

Table 1
Ratio of future after-tax earnings: 529 plans/taxable investments

Panel A								
Horizon (yrs)	Tax rate = 15%				Tax rate = 27%			
	Investment return				Investment return			
	6%	8%	10%	12%	6%	8%	10%	12%
5	0.898	0.904	0.909	0.915	0.891	0.901	0.911	0.920
10	0.920	0.934	0.948	0.962	0.931	0.956	0.981	1.008
15	0.945	0.968	0.993	1.019	0.975	1.019	1.066	1.117
20	0.971	1.007	1.045	1.085	1.025	1.092	1.167	1.249
25	1.000	1.050	1.103	1.161	1.080	1.176	1.285	1.408
30	1.032	1.097	1.168	1.246	1.141	1.272	1.424	1.598
Breakeven years	25	20	16	14	18	14	12	10

Panel B								
Horizon (yrs)	Tax rate = 30%				Tax rate = 35%			
	Investment return				Investment return			
	6%	8%	10%	12%	6%	8%	10%	12%
5	0.889	0.899	0.910	0.921	0.882	0.895	0.907	0.920
10	0.932	0.960	0.989	1.019	0.933	0.965	0.999	1.035
15	0.982	1.031	1.084	1.141	0.991	1.049	1.112	1.180
20	1.037	1.113	1.198	1.291	1.056	1.147	1.248	1.362
25	1.099	1.208	1.333	1.474	1.130	1.261	1.413	1.589
30	1.168	1.317	1.493	1.696	1.213	1.394	1.611	1.870
Breakeven years	17	13	11	10	16	13	11	9

Breakeven years represents number of years needed for Section 529 plan after tax and penalty withdrawals to equal after-tax withdrawals from taxable investments.

5. New tax law

On May 28, 2003, President Bush signed into law the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JAGTRRA). The 2003 Tax Act contained several provisions relating to taxation of investments. In particular, the Act reduced the rates for most taxpayers on long-term capital gains and dividends to 15%. These reductions are scheduled to expire after 2008. In addition, the Act reduced marginal tax rates. Because it is likely that much, if not most, retirement assets would include equity investments, the income taxed under the 'taxable investment' strategy would now be taxed at significantly lower (15% vs. ordinary rates) rates. Consequently, more detailed analysis along the lines of Horan (2002) would be appropriate. However, as a crude guide, Table 2 presents the number of years necessary for the Section 529 plan to breakeven with the taxable alternative, assuming all Section 529 earnings are taxed at 25% and all taxable investments are taxed at 15%. As expected, an investor would require a long investment horizon, high expected returns, or a combination of both in order for the tax deferral benefit from the Section 529 plan to overcome the withdrawal penalty and differential tax rates.

Table 2

Breakeven assuming section 529 earnings taxed at 25% and taxable investment earnings taxed at 15%

Horizon (yrs)	Investment Return			
	6%	8%	10%	12%
Breakeven	47	36	29	25

6. Comparison with tax-deferred annuities

As an alternative to taxable investments an individual who has optimized other tax-advantaged options might choose a tax-deferred annuity. Earnings from an annuity are taxed upon withdrawal at ordinary rates. Withdrawals before age 59½ are assessed a 10% penalty. In the comparison that follows, we assume withdrawals occur after age 59.5 years and are thus not subject to the penalty. While annuities have the same tax deferral advantage as a Section 529 plan, annuities also have additional expenses associated with them. Most annuities have commissions and/or deferred sales charges. In addition, annuities have an

Table 3

Ratio of future earnings: 529 plans/annuities

Panel A								
Excess Annuity expense = .35%					Excess annuity expense = .6%			
Horizon (yrs)	Investment return				Investment return			
	6%	8%	10%	12%	6%	8%	10%	12%
5	0.962	0.948	0.939	0.934	1.012	0.985	0.969	0.959
10	0.972	0.957	0.948	0.943	1.029	1.001	0.985	0.975
15	0.982	0.967	0.959	0.954	1.047	1.019	1.004	0.994
20	0.992	0.978	0.970	0.965	1.066	1.040	1.025	1.015
25	1.004	0.990	0.983	0.978	1.088	1.062	1.047	1.039
30	1.016	1.003	0.996	0.992	1.111	1.086	1.072	1.064
Breakeven years	24	29	32	33	1	10	14	17
Panel B								
Excess annuity expense = .75%					Excess annuity expense = 1%			
Horizon (yrs)	Investment return				Investment return			
	6%	8%	10%	12%	6%	8%	10%	12%
5	1.044	1.008	0.988	0.974	1.102	1.049	1.020	1.002
10	1.065	1.029	1.009	0.995	1.132	1.078	1.049	1.030
15	1.089	1.053	1.032	1.020	1.165	1.111	1.082	1.064
20	1.114	1.079	1.059	1.047	1.201	1.148	1.120	1.102
25	1.142	1.107	1.089	1.077	1.242	1.189	1.161	1.144
30	1.172	1.138	1.121	1.110	1.285	1.234	1.207	1.191
Breakeven years	1	3	8	11	1	1	1	5

Breakeven years represents number of years needed for Section 529 plan after tax and penalty withdrawals to equal after-tax withdrawals from annuities.

insurance element and thus contain a mortality charge. Because Section 529 plans and annuities both benefit from the tax-deferral of income, comparison of these two alternatives can be made without regard to taxes. [In contrast, see Milevsky and Panyagometh (2001) and references therein for a comparison of variable annuities with taxable mutual funds.] For these two alternatives the comparison involves trading the penalty for nonqualified withdrawals from a Section 529 plan against the annual mortality and other expenses associated with an annuity. The n -period future values are represented below, where E represents the annual mortality and expense cost of the annuity. Alternatively, think of E as representing the excess expense ratio of an annuity as compared to the 529 plan investment fund. Commissions and deferred sales charges are assumed to be zero for the annuity.

$$\text{Section 529:} \quad \text{FV Earnings} = [(1 + R)^n - 1] \times .9 \quad (4)$$

$$\text{Annuities:} \quad \text{FV Earnings} = (1 + R - E)^n - 1 \quad (5)$$

Table 2 contains simulation results that compare the future value of Section 529 dollars with the future value of annuity dollars. The tables calculate the ratio of future value of Section 529 dollars to future value of annuity dollars. Annuity expenses are varied from 0.35% in Table 2, Panel A to 1% in Table 2, Panel B. These expenses are assumed to be the *excess* expenses associated with an annuity. Both annuities and Section 529 plans have portfolio management expenses, so the annuity expense represents the excess expense. Table 2, Panel B indicates that for annuity annual expenses from 0.75% to 1%, the Section 529 plan nearly always dominates. The annuity dominates for high investment rates of return and short investment horizons. Table 2, Panel A indicates that annuities with annual expenses of 0.35% or less will generally dominate the Section 529 plan. For example, for an investment return of 10% and annual annuity expense of 0.35%, it would take the Section 529 plan 32 years to break even. In summary, the lower the annual annuity excess expense or the higher the investment return, the longer the required time necessary for Section 529 plan to dominate. As a benchmark, Reichenstein (2000) reports average excess total expenses of equity variable annuities over equity mutual funds of 0.66%.

7. Summary and conclusion

This paper has examined the use of Section 529 accounts as retirement, rather than education, accounts. Distributions from such plans for nonqualified higher education expenses are subject to a 10% federal tax penalty and are taxed at ordinary rates. However, since taxes are not paid until the time of withdrawal, there is tax-deferral advantage to such plans.

The after-tax and after-penalty future dollars available for consumption from investment in a Section 529 account are compared to the after-tax dollars available from an ordinary taxable account and to the after-tax dollars available for consumption from tax-advantaged annuities. In addition, the years needed for the Section 529 investment to breakeven with the taxable investments and tax-deferred annuities are calculated. In comparison with ordinary taxable investments, breakeven years for Section 529 accounts decreases with the tax rate

and the investment return. In comparison with tax-deferred annuities, breakeven years for Section 529 accounts decrease with the excess annuity expense ratio and increase with the investment return. In comparison with either the taxable investment or deferred-tax annuity alternative, Section 529 plan investments are preferable for most investment horizons. Only the tax-deferred annuity with a very low excess expense ratio (.35%) and high investment return (10–12%) requires a breakeven longer than 30 years.

Appendix

Derivation of Eq. (1) in text

Assume the before-tax rate of return is R and the tax rate is t . Since both original investments involve after-tax dollars, only the earnings need be analyzed. Consequently the \$1 original investment is subtracted below to simplify the algebra. For the taxable investment, taxes are paid annually, so the two-period after tax future *earnings* of a \$1 investment yields:

$$[1 + R(1-t)]^2 - 1.$$

Expanding this expression gives:

$$\begin{aligned} & 2R(1-t) + R^2(1-t)^2 \\ & (1-t)[2R + R^2(1-t)] \\ & (1-t)[2R + R^2 - R^2t] \end{aligned} \tag{i}$$

For the Section 529 plan earnings will be taxed at the end of the second period, at which time a 10% penalty will be paid as well. The after-tax and after-penalty future *earnings* of a \$1 investment in the 529 plan is:

$$\begin{aligned} & [(1 + R)^2 - 1](1-t-0.1) \\ & (1 + 2R + R^2 - 1)(1-t-0.1) \\ & (1-t)(2R + R^2) - 0.1(2R + R^2) \end{aligned} \tag{ii}$$

Subtracting (i) from (ii) yields:

$$R^2t(1-t) - 0.1(2R + R^2)$$

Rewriting: $(t \times R) \times R \times (1-t) - 0.1(2R + R^2)$ Eq. (1) in text.
The term in brackets represents the before-tax and before-penalty earnings on the 529 plan.

References

- Auster, R. (2003). Qualified tuition programs: The often-overlooked downside. *Practical Tax Strategies*, 70(6), 336–340.

- Burgess, R. D., & Madeo, S. A. (1980). A simulation study of tax sheltered retirement plans. *Journal of American Taxation Association*, 1, 34–41.
- Crain, T. L., & Austin, J. R. (1997). An analysis of the tradeoff between tax deferred earnings in IRAs and preferential capital gains. *Financial Services Review*, 6(4), 227–242.
- Horan, S. M. (2002). After-tax valuation of tax-sheltered assets. *Financial Services Review*, 11, 253–275.
- Horan, S. M., & Peterson, J. H. (2001). A reexamination of tax-deductible IRAs, Roth IRAs, and 401(k) investments. *Financial Services Review*, 10, 87–100.
- Krishnan, V. S., & Lawrence, S. (2001). Analysis of investment choices for retirement: a new approach and perspective. *Financial Services Review*, 10, 75–86.
- Milevsky, M. A., & Panyagometh, K. (2001). Variable annuities versus mutual funds: a Monte-Carlo analysis of the options. *Financial Services Review*, 10, 145–161.
- O'Neil, C. J., Saftner, D. V., & Dillway, M. P. (1983). Premature withdrawals from individual retirement accounts. *Journal of American Taxation Association*, 4, 35–43.
- Reichenstein, W. (2000). An analysis of nonqualified tax-deferred annuities. *The Journal of Investing*, Summer, 1–12.
- Sibley, M. (2002). On the valuation of tax-advantaged retirement accounts. *Financial Services Review*, 11, 233–251.