

Impact of IRAs on Saving

The Congress passed legislation in 1981 broadening the eligibility criteria governing individual retirement arrangements. IRA contributions for 1982—the first year that the new rules applied—may have reached \$24 billion, substantially more than the estimated \$4 billion placed in IRAs in 1981 under the old legislation. Such a popular program (Appendix 1) could have vast implications for financial markets, in both the short and long term, and for the total volume of saving in the economy.

Indeed, one of the aims of the new law was to increase the amount of saving in the economy. This article considers to what extent the 1981 IRA legislation is likely to satisfy this objective. While personal saving has been increasing since the change in the law, it is not possible to say whether the two are really connected. The increased availability of IRAs in 1982 may have contributed to the expansion of saving, but other factors, such as a desire to hold greater precautionary balances during the recession, may have played a role as well.

In fact, our analysis shows that the individuals who were affected most by the new legislation are those who on average have substantial accumulated wealth and who save considerable sums each year. Their contributions do not have to and may not consist of additional saving. Instead, these contributions may reflect shifts of funds from other assets that these households already hold or simply the placement of saving that would have occurred anyway.

Thus, the amount of new saving induced by the extended IRA program may be significantly smaller than the level of IRA contributions might suggest.

Impact on saving: IRA incentives

The incentives to save embodied in the IRA program consist of the tax deferral on the contribution itself and on the earnings from it. There are two advantages for delaying the taxation of income until retirement. Deferred taxes on both annual contributions and their subsequent earnings accrue interest, part of which the individual may keep. The value of these deferred taxes can be substantial. Consider a 35-year-old individual in the 50 percent tax bracket. The present value of the tax saved on maximum annual contributions over thirty years (figured at a 15 percent interest rate) is about \$12,000. The present value of the tax saving on the interest earnings of this investor is more than \$88,000 (Appendix 2). In addition, since retirement income is likely to be lower than that earned during an individual's working years, the applicable marginal tax rate in retirement might be lower. Thus, the expected rate of return from an IRA contribution should be higher than the yield from the same contribution to an identical but nontax-deferred instrument.

Households may take advantage of this higher return, however, without increasing saving. For example, individuals with sufficient non-IRA assets might shift these assets into IRAs rather than increase saving. Again, consider a 35-year-old individual in the 50 percent tax bracket with at least \$2,000 in non-IRA assets. These assets, invested at 15 percent, earn 7.5 percent per year after taxes. An investment of these funds in an IRA, however, would earn an after-tax yield of at least 14 percent (Appendix 2). Abstracting from the illiquidity of an IRA, it would be advantageous for this individual to shift \$2,000 of existing

Table 1

Eligible Individuals Contributing to Individual Retirement Arrangements (IRAs)*

In percent

Annual income (dollars)	1975	1976	1977	1978	1979	1980†
Less than 5,000	0.11	0.20	0.20	0.20	0.18	0.11
5,000-9,999	0.94	1.26	1.33	1.50	1.15	0.82
10,000-14,999	2.40	3.05	3.38	3.65	3.07	2.55
15,000-19,999	4.58	5.24	5.97	6.19	5.89	5.45
20,000-49,999	19.28	21.04	23.65	24.44	23.01	22.57
50,000 and above	33.92	41.94	45.87	49.82	51.01	48.78
‡ All income groups	2.7	3.7	4.6	5.2	5.3	5.6

* Assumes the same proportion eligible in each year where eligibility is defined as not being covered by another pension plan.

† Preliminary data.

‡ Weighted average

Sources: Estimated by authors using data reported in Internal Revenue Service, *Statistics of Income: Individual Income Tax Returns*, Bureau of the Census, *Perspective on American Husbands and Wives* (Special Studies Series No. 77); *Report of the President's Commission on Pension Policy*.

Table 2

IRA Contributions in Perspective

Year	Eligible number of individuals (millions)	Arrangements established (millions)	Potential level of IRA contributions* (billions of dollars)	Total contributions (billions of dollars)	Tax revenue loss† (billions of dollars)
1975	52.7	1.3	54.6	1.4	‡
1976	54.2	1.9	56.1	2.0	0.6
1977	56.4	2.5	57.8	2.6	0.7
1978	58.1	2.7	62.6	3.0	0.9
1979	59.9	‡	64.9	3.2	1.0
1980	61.1	‡	66.2	3.4	1.2
1981	62.3	‡	67.5	3.8§	1.3§

* The potential amount of IRA contributions in a given year was estimated by multiplying the number of eligible workers in each income class by their respective maximum permitted annual IRA contribution

† Tax revenue loss reflects only deductions for contributions not deferred tax on interest earnings.

‡ Not available

§ Estimated from preliminary data

Sources: Estimated by authors using data reported in Internal Revenue Service, *Statistics of Income: Individual Income Tax Returns*; Bureau of the Census, *Perspective on American Husbands and Wives* (Special Studies Series No. 77), *Report of the President's Commission on Pension Policy*, and Joint Committee on Taxation.

assets into an IRA. After this is done, he or she would still earn only 7.5 percent after tax on any additional saving. Consequently, for this individual there is no incentive to increase saving.¹

¹ The possibility that households shift assets in response to tax-incentive savings programs may explain to a large extent the Canadian experience with these types of programs, see Gregory V. Jump, "Tax Incentives to Promote Personal Saving: Recent Canadian Experience", *Saving and Government Policy* (Federal Reserve Bank of Boston, Conference Series No. 25, October 1982), pages 46-64.

Alternatively, since both the current and expected future incomes earned on their existing assets, now including IRAs, are higher, these investors might actually increase consumption. In other words, since their stock of wealth is accumulating faster because of the earnings from the deferred taxes, IRA investors might decrease their rate of saving.

Although such households may not increase saving to fund an IRA, reallocation of their wealth into IRAs

Table 3

Distribution of IRA Contributions among Income Groups

In millions of dollars; numbers in parentheses represent percentage shares of total for the year.

Annual income (dollars)	1975	1976	1977	1978	1979	1980
Less than 5,000	17.5 (1.2)	39.0 (2.0)	43.7 (1.8)	40.6 (1.4)	19.5 (0.6)	14.5 (0.4)
5,000-9,999	95.4 (6.6)	119.3 (6.1)	123.5 (5.1)	152.1 (5.1)	122.6 (3.8)	57.5 (1.7)
10,000-14,999	270.5 (18.8)	316.3 (16.1)	364.0 (14.9)	370.2 (12.5)	282.1 (8.8)	215.1 (6.3)
15,000-19,999	182.1 (12.7)	263.5 (13.4)	273.1 (11.1)	311.3 (10.5)	370.2 (11.5)	324.3 (9.6)
20,000-49,999	718.7 (50.0)	1,003.4 (51.0)	1,343.0 (54.9)	1,668.0 (56.2)	1,872.1 (58.1)	2,045.7 (60.5)
50,000 and above	152.2 (10.6)	227.0 (11.5)	300.5 (12.2)	427.1 (14.4)	557.0 (17.3)	726.4 (21.5)
All income groups	1,436.4 (100.0)	1,968.5 (100.0)	2,447.8 (100.0)	2,969.3 (100.0)	3,223.5 (100.0)	3,383.5 (100.0)

Source: Internal Revenue Service, *Statistics of Income: Individual Income Tax Returns*.

might raise the share of assets being held for retirement. The higher relative return on an IRA may persuade individuals to hold fewer assets for the near or medium term, e.g., a car or house, and more assets for retirement.

IRA contributions can come from sources other than existing assets and still not constitute increased saving. For instance, an IRA contribution can be financed by borrowing through a personal loan or against some other asset, although the IRA itself may not be used as collateral.² Even payroll deduction contributions do not necessarily represent new saving. Although the deposit added to an IRA is drawn from current income, participants may correspondingly reduce other saving from income or liquidate assets to finance consumption.

Another source of funds is the tax saving associated with an IRA contribution. An individual who contributes to an IRA pays less in taxes for that year. This tax saving may be used, in part, to finance an IRA. These lower taxes represent a transfer from the Federal Government to households. While the Government's saving declines (i.e., the Government's deficit rises), by the associated IRA tax loss, household aftertax income rises by the same amount. With individuals saving exactly their additional aftertax income, net saving for the

economy as a whole—the sum of private and Government saving—is unchanged.

People who do not have enough assets or cannot borrow to fund IRAs would obtain the higher yield of an IRA only by increasing saving. Whether they do so depends on the responsiveness of their saving to the expected rate of return and the illiquidity of IRAs. There have been many attempts to estimate the relationship between interest rates and personal saving. While some researchers have found that people tend to save more when the rate of return is higher, others have found just the opposite—that people tend to save less when the rate of return is higher. There has been no definite indication that any additional saving is generated by an increase in the rate of return.³

Moreover, even if individuals would tend to save more in response to a higher rate of return, they may not necessarily save more because of the availability of IRAs which are less liquid than other types of assets. An IRA could have drawbacks if it had to be cashed before retirement. Except in special cases, e.g. disability or death of the investor, the drawdown of an IRA before age 59½ is subject to a 10 percent penalty as well as to the payment of ordinary income tax on these withdrawals. Individuals might be better off in-

² Because of the tax deductibility of interest payments, individuals in high enough tax brackets may be able to make a profit by borrowing funds to place in tax-deferred IRAs.

³ William Jackson, "Saving and Rate of Return Incentives: Estimates of the Interest Elasticity of Personal Savings" (Congressional Research Services, Report No. 81-198E, 1981).

vesting in a taxable asset that carries no penalty for withdrawal rather than an IRA if they expect to need these funds before the earnings on the deferred tax exceed the IRA penalty (Appendix 2). Thus, individuals who want to retain access to their assets in the near future may decide against contributing to an IRA because of its illiquidity. For instance, people may save as a precaution against unexpected declines in income or to accumulate the wherewithal to purchase high-priced items or services. Both of these motives may require saving to be held as assets which can be converted to cash more readily than IRAs.

The combination of the illiquidity of IRAs and the possibility of funding an IRA contribution by shifting assets suggests that the liberalization of the IRA law may have only a limited impact on saving. Those individuals with sufficient assets to shift into IRAs may do so without expanding saving. People without enough assets may decide that the attractive return on an IRA is not sufficient compensation for its illiquidity. In addition, even households who participate in the IRA program eventually may choose to discontinue making contributions when the liquid share of their assets reaches a minimum level.

Interestingly, another relatively new saving-incentive program, known as the 401(k) deferred compensation plan, may encourage more new saving than the IRA program. Participants in 401(k) plans may be permitted to borrow against their funds. In addition, participants may be able to withdraw funds for several purposes before their retirement. Thus, 401(k) assets are not so illiquid as IRAs. Moreover, an individual may elect to have his or her employer defer as much as 25 percent of his or her income, up to a maximum of \$30,000, to a 401(k). For example, a person earning \$50,000 could contribute \$12,500 to a 401(k), 6.25 times the maximum IRA contribution. In general, persons with an annual income above \$8,000 can contribute more to a 401(k) than to an IRA. These people may find that they do not exhaust the attractive return of a 401(k) by shifting assets. Thus, they may decide to increase their saving as well as to reallocate assets. Because of these advantages, 401(k)s might be expected to grow strongly, perhaps surpassing IRAs, as more firms offer them to their employees.

Historical evidence

While last year's tax legislation changed retirement arrangement rules in several respects, the past record of IRAs provides some insights into their likely growth and possible savings impact.

Participation rates have been very low. In no year did participation exceed 6 percent of eligible individuals (Table 1). Part of the explanation may be that

most eligible persons earned a low income and, consequently, were in a sufficiently low tax bracket to make the IRA tax incentive relatively small. Also, the illiquidity of IRAs may have dissuaded some individuals from participating. This last reason might explain why only about half of eligible individuals with incomes greater than \$50,000 a year contributed to IRAs.

Table 4

Average Holdings of Liquid Assets by Income Group, 1977

In dollars

Income group	Maximum IRA contribution minus associated tax saving	Average holding of liquid assets
Less than 3,000 . . .	1,500	2,650
3,000-4,999	1,290	2,100
5,000-7,499	1,260	3,300
7,500-9,999	1,245	3,700
10,000-14,999	1,215	5,100
15,000-19,999	1,170	5,500
20,000-24,999	1,125	6,700
25,000 and above . . .	915	12,700

Sources: Estimated by the authors using data reported in Board of Governors of the Federal Reserve System, 1977 *Consumer Credit Survey*, Internal Revenue Service, *Statistics of Income: Individual Income Tax Returns*.

Table 5

Estimated IRA Contributions in 1982

January-October, by institution

Financial institution	Billions of dollars
Commercial banks	7.2
Mutual savings banks	1.1
Savings and loan associations	6.5
Credit unions	0.7
Mutual funds	2.6
Life insurance companies	1.5
Total	19.6

Sources: Estimated by the authors using data reported by Board of Governors of the Federal Reserve System, *Statistical Release H-6*, Federal Home Loan Bank Board, Investment Company Institute, American Life Insurance Council, Credit Union National Association.

Table 6

Impact of 1981 Legislation on Potential IRA Contributions

Before and after the enactment of the Economic Recovery Tax Act of 1981 (ERTA)

Annual income (dollars)	Number of eligible individuals millions		Potential level of IRA contributions* (billions of dollars)	
	Before ERTA	After ERTA	Before ERTA	After ERTA
Less than 7,500	24.3	28.6	10.7	12.6
7,500-14,999	12.3	17.8	14.9	21.8
15,000-22,999	13.8	23.0	21.8	48.0
23,000-29,999	6.0	13.5	9.8	28.5
30,000-74,999	6.6	26.6	10.7	56.6
75,000 and above	0.5	1.9	0.8	4.0
All income groups	63.5	111.4	68.7	171.5

* The potential amount of IRA contributions in a given year was estimated by multiplying the number of eligible workers in each income class by their respective maximum permitted annual IRA contribution.

Sources: Estimated by authors using data reported in Internal Revenue Service, *Statistics of Income Individual Income Tax Returns*; Bureau of the Census, *Perspective on American Husbands and Wives* (Special Studies Series No. 77); *Report of the President's Commission on Pension Policy*.

Reflecting the relatively low participation in this program, the total IRA contributions in any given year were small compared with their potential level.⁴ In 1975, for instance, \$1.4 billion out of a possible \$54.6 billion was placed in 1.3 million IRAs (Table 2). In 1981, IRA contributions totaled \$3.8 billion compared with the maximum permitted of \$67.5 billion. Between 1975 and 1981, annual IRA contributions averaged 4.4 percent of their potential level.⁵

There is no hard evidence, however, on the amount of new saving that was stimulated by IRAs. Investors may simply have shifted assets. Indirect evidence suggests that this was at least a possibility for most IRA contributors. More than two thirds of all IRA contributions between 1975 and 1980 were made by individuals with over \$20,000 in annual income (Table 3). For these individuals, a maximum annual IRA contribution typically would not have represented a large share of their wealth. For instance, a \$1,500 annual IRA contribution minus the associated tax reduction

would have amounted to less than 11 percent of their average liquid assets—the assets generally easiest to shift (Table 4).⁶ In contrast, for individuals earning less than \$20,000 a year, a maximum IRA contribution net of the associated tax reduction would have been closer to 39 percent of their liquid assets.⁷

Despite the large amount of assets individuals held, they still may have increased their saving to fund IRAs. They may have wanted to retain liquidity of their existing assets for near-term purposes. Nonetheless, it can be concluded that in the past most IRA contributors were part of the income group that typically had enough assets to fund IRAs without saving more. To the extent that they held these assets solely for retirement, they most likely would have shifted them into IRAs instead of increasing saving. Analysis of recent data suggest that these conclusions may apply to IRA contributions made in 1982 as well.

Recent expansion of IRAs

Subsequent to the enactment of the Economic Recovery Tax Act of 1981 (ERTA), IRA contributions in 1982 have exceeded their level in any prior year. Based on

⁴ The potential amount of IRA contributions in a given year was estimated by multiplying the number of eligible workers in each income class by their respective maximum permitted annual IRA contribution.

⁵ The Government's tax loss associated with the annual deduction of IRA contributions was correspondingly small, never exceeding \$1.3 billion a year. The tax reduction typically represented about a third of annual IRA contributions. Besides the tax losses produced by annual IRA contributions, the Government also lost revenue because the interest earned on outstanding IRA funds was tax deferred. By 1981, annual interest on IRA accounts amounted to about \$5 billion. Applying a tax rate of one third produces an estimated revenue loss of about \$1.7 billion in that year.

⁶ These shifts could continue for many years. Saving that would occur in any case could replenish these assets as well as fund IRAs.

⁷ Besides liquid assets, many individuals have other forms of wealth. The distribution of ownership of these other assets also tends to be tilted toward upper income groups. Thus, for individuals with at least \$20,000 in annual income, a maximum IRA contribution may have required a much smaller share of assets to be shifted than our calculations with liquid assets suggest.

several surveys, we estimate that from January through October, IRA contributions at commercial banks, mutual savings banks, savings and loan associations, credit unions, mutual funds, and life insurance companies amounted to \$19.6 billion (Table 5).⁸ Continued growth at this rate over the balance of the year would result in new IRA contributions in 1982 of \$23.5 billion.⁹ Several factors, however, may cause the amount of IRA contributions for the year to be above or below this figure. On the one hand, the pace of monthly IRA contributions at commercial banks and mutual savings banks has slowed since April. Continuation of such a slowdown among all financial institutions would lead to a lower level of IRA contributions for the year. On the other hand, many firms are beginning to offer IRAs through voluntary payroll deduction plans. These may encourage people to participate. In addition, as the law permits an IRA contribution for a given tax year to be made up to April 15 of the following year, some individuals may be postponing participation to retain the liquidity of their saving until the last moment.

The rise in IRA contributions followed an increase in potential IRA contributions. Since participants of an employer-provided pension are now permitted to contribute to an IRA, the number of individuals eligible for an IRA expanded by about 75 percent, from 63.5 million people to 111.4 million people (Table 6). In addition, the increase in the maximum annual IRA contribution per worker—by about a third on average—enlarged the potential level of IRA contributions. Taking account of the greater eligibility and higher maximum annual contribution, the aggregate pool of new funds that can be placed in IRAs more than doubled, from \$68.7 billion to \$171.5 billion.

Relative to their potential level, the annualized amount of IRA contributions was larger in 1982 than it was in earlier years—about 14 percent of potential in 1982, compared with under 6 percent between 1975 and 1981. Does this mean that the IRA program this year attracted more individuals from lower middle-income groups who might actually need to save to set up an IRA?

⁸ Besides placing their IRA contributions in the special IRA accounts established by financial institutions, individuals may place their contributions in any other type of qualified investment. Data on these IRA contributions may not be included in the available surveys. However, the level of these contributions is not considered to be significant in the aggregate.

⁹ The Treasury's projection of the associated tax loss of \$2.5 billion for 1982 seems to reflect an underestimate of the growth of IRAs. Using the relationship between tax loss and IRA contributions during the 1970s—adjusted for the 1982 10 percent individual tax cut—the tax loss resulting from IRA contributions made in 1982 most likely will be between \$7 billion and \$8 billion.

The expanded eligibility affected individuals earning \$30,000 or more annually to a greater extent than others. (Most people in this group are covered by pension plans and were not eligible under prior legislation.) In the past, this income group had the highest rate of participation in the IRA program. Now the number eligible in this group is four times larger than before the new law. These individuals also own a large share of assets with which they might fund IRAs (Table 7). In contrast, among individuals who earn less than \$30,000 a year eligibility increased by only 47 percent.

While information on IRA contributions in 1982 by income group is not yet available, calculations can be made to ascertain whether increased participation rates are needed to explain the rise in IRA contributions. Alternatively, the expanded eligibility, holding participation rates constant, may provide the answer. When the 1980 participation rates for different income groups are applied to our estimate of eligible individuals in 1982, the amount of IRA contributions that results is about \$18 billion, just below the annualized 1982 level. Thus, the primary reason for the program's apparently greater appeal seems to be the fact that ERTA expanded IRA eligibility the most for the income group that in the past had the highest rate of participation. It is not known whether these individuals increased saving to fund IRAs. However, since this group contains those individuals who already own

Table 7

Average Holdings of Liquid Assets by Income Group, 1982

In dollars

Income group	Maximum IRA contribution minus associated tax saving	Average holding of liquid assets
Less than 4,500 . . .	2,000	3,900
4,500-7,499	1,760	3,100
7,500-11,249	1,730	4,800
11,250-14,999	1,710	5,400
15,000-22,499	1,680	7,400
22,500-29,999	1,630	8,000
30,000-37,499	1,580	9,800
37,500 and above . . .	1,340	18,540

Sources: Estimated by the authors using data reported in Board of Governors of the Federal Reserve System, 1977 *Consumer Credit Survey*, Internal Revenue Service, *Statistics of Income: Individual Income Tax Returns*, Commerce Department, *National Income Accounts*.

many assets, the chances that they increased saving in response to the availability of IRAs are small.

Concluding remarks

Although only a year has passed since the legislated expansion of the IRA program, some observations can be made concerning its impact on household saving. IRA contributions in 1982 may total about \$24 billion. As a percentage of potential level, these IRA contributions are about twice as large as the contributions of earlier years. Much of the improved popularity probably reflects the fact that the liberalization of eligibility

requirements affected mostly income groups with the highest participation rates in the past. Individuals in these groups on average already have accumulated assets that may be used to fund IRAs. IRA contributions that reflect only shifts of assets do not constitute increased saving. Thus, the gain in new saving may be well below the level of IRA contributions. However, shifts of assets to fund IRAs decrease tax revenue. For example, the tax loss resulting from IRA contributions in 1982 may fall between \$7 billion and \$8 billion. Consequently, the IRA program may not be the most effective policy approach to stimulate saving

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Appendix 1: Savings Incentive Plans

The Economic Recovery Tax Act of 1981 (ERTA) significantly increased the availability of IRAs. As of January 1982, any employed person under 70½ years of age is eligible to open a tax-deferred individual retirement arrangement (IRA). The original legislation creating IRAs—the Employee Retirement Income Security Act of 1974 (ERISA)—had limited the availability of IRAs to persons not covered by any other retirement plan. In addition, the new law raised the maximum annual deductible IRA contribution to \$2,000 or 100 percent of earned income, whichever is less. ERISA had set the ceiling at \$1,500 or 15 percent of earned income. An amendment effective in 1977 raised the maximum deduction for an eligible individual with a nonworking spouse to \$1,750. ERTA increased this latter ceiling to \$2,250.

Few restrictions have been placed on the type of investments held as IRAs. Three types of IRAs were established: accounts at financial institutions, annuities offered by insurance companies, and retirement bonds issued by the Treasury.* The accounts must be administered as trusts by a financial institution or other organization approved by the Treasury. Allocation of funds among assets within these trusts can be arranged by individual investors. However, IRA monies cannot be used to purchase life insurance or collectibles.

* Retirement bonds were discontinued in April 1982

Similar to an IRA, a Keogh or H.R.10 plan, established by law in 1962, allows a self-employed individual to deduct annually a certain amount of earned income for investment and defer the tax on it as well as on interest earnings until retirement. ERTA increased the ceiling on deductions from \$7,500 to the lesser of \$15,000 or 15 percent of yearly income through 1983. The ceiling is scheduled to be even higher thereafter.

The 401(k) or deferred compensation plan is an arrangement which is part of a firm's profit-sharing or stock bonus plan. The 401(k) was created by a change in the tax law in 1978, but only recently has the Internal Revenue Service issued guidelines governing these plans. An individual may choose to have his or her employer make payments as contributions to a trust on his or her behalf. These payments may represent up to 25 percent or \$30,000 of the participant's annual income. For many individuals this may be a larger proportion than the \$2,000 limit set for IRA contributions. Participants may borrow against 401(k) funds. They may also withdraw their funds without penalty before attaining 59½ years by meeting a need or "hardship" requirement. Further, distributions from 401(k) plans may qualify for the favorable tax treatment of ten-year averaging not afforded to IRA distributions. Thus, 401(k)s are less illiquid and, because of ten-year averaging, can provide a higher return to investors than IRAs.

Appendix 2: Improved Rate of Return from an IRA

To measure the improvement in rate of return from an IRA, two hypothetical investment choices may be compared. The first investment choice is an annual \$2,000 deposit in a fully taxable instrument earning 15 percent per year. The alternative investment is an annual deposit of \$2,000 minus the part financed by the tax deduction in a tax-deferred account also earning 15 percent annually. The maturity of both investments was set at the retirement age of the investor which was assumed to be 65 years. It was also assumed that no funds would be withdrawn prior to retirement and that the income tax faced by the investor during the working years was constant. The future value of each of these contributions was obtained.

Then, assuming a fifteen-year period of retirement, an annual income stream from an annuity based on the accumulated funds was derived. Since the IRA-type investment is taxable upon withdrawal, appropriate tax rates were applied to the retirement stream generated by IRA funds to obtain an aftertax income stream. Both a marginal tax rate based solely on income derived from the IRA and a tax rate based upon the rate paid during the working years were used.* The income stream resulting from the hypothetical annuity based on the non-IRA investment was not taxed. In fact, the interest earned on an actual annuity would be taxed, lowering the stream of retirement income. However, this bias serves only to understate the spread between the returns on the two investment options. Each retirement annuity was assumed to earn the same rate as the original investments, 15 percent per year. All compounding was annual. The rate of return on each investment was obtained using the stream of annual outlays and the retirement income stream.

The gains in return from annual IRA contributions can be substantial. For investors currently in the 50 percent tax bracket, the rate of return can be double or triple that available on a taxable investment (depending upon the holding period of the IRA) when retirement income tax is based solely on IRA funds (Table A). Interestingly, the oldest investors in this income group gain the most from IRA contributions because the retirement income stream generated by IRA funds is sufficiently small as to be tax free.

If investors faced the 50 percent tax rate both before and after retirement, the return is two-thirds higher to about double that otherwise available, again

* Assuming an inflation rate of 10 percent per year of investment and perfect indexing of current tax rates, the tax rate based only on IRA income was calculated. In most cases, the retirement tax rate was significantly lower than that faced while working

Table A

Expected Improvement in Aftertax Rates of Return from IRA Investment*

In percent

IRA investment (years to retirement)	Retirement tax rate based only on IRA income			Retirement tax rate equals working tax rate		
	Marginal tax rate during working years (percent)					
	20	35	50	20	35	50
40	21	54	116	21	48	95
30	21	56	124	20	45	92
20	22	59	140	18	40	85
10	33	81	201	13	29	65

* Improvement expressed as a percentage increase over taxable yield

Table B

Value of Each Type of Tax Saving when IRA is Held to Retirement*

In dollars

IRA invest- ment (years to retire- ment)		Contribution					
		Marginal tax rate during working years (percent)					
		20	35	50	20	35	50
40	3,300	7,010	12,590	25,510	77,060	199,700	
30	3,220	6,740	11,810	15,330	40,220	88,820	
20	2,990	6,060	10,200	7,690	17,640	33,550	
10	2,260	4,350	6,860	2,380	4,780	7,900	

* Present value is calculated using the aftertax rate of return based on 15 percent before-tax rate as the discount factor. Assumes contributions of \$2,000 each year.

Table C

Number of Years Non-IRA Investment Return Exceeds IRA Return

In years

Before-tax rate of return (percent)	Marginal tax rate during working years (percent)					
	25	30	35	40	45	50
5	22	20	19	18	18	18
7	16	15	14	14	13	13
9	13	12	11	11	11	11
11	11	10	10	9	9	9
13	10	9	9	8	8	8
15	9	8	8	7	7	7

Source: J. Snailer, "IRAs: A Nonretirement Investment", Federal Reserve Bank of New York memorandum dated April 26, 1982.

Appendix 2: Improved Rate of Return from an IRA (continued)

depending on the length of time the IRA investment is held. Lower income individuals obtain smaller tax advantages and consequently reap smaller but still significantly improved rates of return from investing in IRAs. Their gain ranges from about 20 to 60 percent.

The difference in rate of return between the IRA and the taxable investment is a consequence of both the deduction of the annual contribution from taxable income and from the deferral of tax on the interest earnings. Each of these tax advantages can be viewed as a stream of future payments to the investor. The present value of the annual deductions and that of the deferred tax on earnings may be compared.

On average, the value of the deferred tax on the annual contributions exceeds that of the deferred tax on interest for the first nine to fourteen years of the investment. For older individuals or those planning only a short-term IRA investment (subject to penalties), the present value of the deferred tax on the

contribution outweighs that of the deferred tax on interest. For younger investors or investors planning longer term investments in IRAs, the tax saving on interest accumulates rapidly, far surpassing that of the contribution by the retirement age (Table B). In general, the higher the return on the IRA and the higher the working tax rate, the faster the tax saving on interest overtakes the tax saving on the contributions.

For some investors, however, the higher return available from an IRA may not be sufficient to offset its illiquidity. The 10 percent excise tax for early withdrawal reduces the rate of return on an IRA to below that of a non-IRA asset if funds are withdrawn before the compounded interest on the deferred income tax exceeds the penalty. For a 15 percent rate of interest, drawdown in less than seven to nine years (depending on tax bracket) would make the IRA a less desirable investment (Table C). For lower interest rates, this time period can be longer.