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ABSTRACT

Recent legislative proposals have included restoring Individual Retirement Accounts (IRAs) to their pre-1987 eligibility rules. Whether IRAs are simply tax windfalls with no effect on saving, or whether IRAs stimulate saving, is a crucial issue in evaluating the effectiveness of such proposals. In this paper, I review the previous literature on IRAs as well as presenting new evidence on the saving behavior of IRA contributors. In brief, IRA contributors are wealthier and older than the general population. There is no clear consensus from structural economic models on whether IRA contributions are new saving or old, shuffled, saving. Nevertheless, IRA contributors during the 1980s were remarkably active savers. For example, the typical IRA contributor was estimated to have increased total financial wealth in real terms by 71 percent between 1982-86. Individual Retirement Accounts may have induced saving through psychological factors not normally present in orthodox economic models, but evidence on such factors is speculative rather than conclusive.

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I. Introduction

Recent legislative proposals have included restoring liberalized Individual Retirement Accounts (IRAs) as part of a package of middle-class tax cuts. Who would benefit from such an expansion? Will the tax breaks provide a windfall to the wealthy, or benefit the struggling middle class? This paper draws on existing literature and provides new evidence on the economic effects of IRAs during the mid-1980s when IRAs were available to nearly every working family. Based on a number of studies, a picture of the typical IRA contributor emerges. Contributors tend to be older, with higher levels of liquid wealth and more income relative to non-contributors. They are also tend to be persistent; the reenrollment rate of contributors remained above 80 percent during 1982-86, the "golden years" of IRAs.

A different, and much harder question, is whether a reexpanded IRA program would be effective at encouraging national saving, or whether taxpayers instead would shuffle taxable assets into IRAs and spend the tax break on current consumption. In a study of IRA saving behavior during 1983, Venti and Wise (1987) concluded that conventional IRA contributions were largely new saving rather than shuffled saving from existing taxable assets. In this view, IRAs were a bulwark against the declining saving rate of the 1980s.

Others viewed IRAs as a windfall for wealthy taxpayers who would have saved the money anyway. Gale and Scholz (1990), for example, estimated that a large fraction of IRA contributions were drawn from existing taxable assets, so that IRAs were ineffective at promoting new saving. One indication of the confusion over whether IRAs were new saving or

recycled saving is that Venti and Wise (1987) and Gale and Scholz (1990) reach their different conclusions based on an identical data set: The Survey of Consumer Finances.[1]

IRAs are a particularly good example of the difficulty in evaluating a government program designed to change economic behavior.[2] In this paper, I consider theoretical, microeconomic, and macroeconomic evidence on whether IRAs promoted saving during the 1980s. Five years after the Tax Reform Act of 1986, there is still considerable debate on the saving effectiveness of IRAs. As noted above, there is no conclusive answer from orthodox economic models. Nevertheless, IRA contributors during 1982-86 were remarkably active savers. Venti and Wise (1991b) showed that during 1982-86, the median IRA contributor increased real financial wealth holdings by 71 percent of initial 1982 wealth. By contrast, noncontributors experienced little change in financial wealth holdings. There is also evidence that psychological factors, such as the appeal of an up-front tax deduction and aggressive marketing by banks, may have also played a role in the popularity of IRAs. Whether these psychological factors in turn generated new saving is more speculative.

Finally, suppose one makes the assumption that IRAs were effective at stimulating saving. Will a reinvigorated IRA program turn around the decline in US national saving? The national saving rate declined from 7.5 percent of GNP during 1950-79 to only 2.2 percent in 1985-89. IRA contributions never comprised more than one percent of GNP, and even the newly proposed expanded IRAs are unlikely to account for much more than that. So IRAs alone

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[1] Gale and Scholz (1990) used two years of the sample, 1983 and 1986, while Venti and Wise (1987) were only able to use one year.

[2] For a review of government saving incentives, see Bovenberg (1989).

are unlikely to arrest the decade-long slide in national saving. This is particularly true if IRAs are financed by an expanded deficit. Individual Retirement Accounts, if they in fact do promote saving, could be more effective at attaining a different goal: to strengthen the financial security of middle-class retirees. The median financial wealth of households at ages 55-65 is only $6600 (Venti and Wise, 1991a), so a few years of IRA contributions could double existing financial wealth. In short, the original goal of IRAs when first introduced in 1974 -- to encourage retirement security -- may be their most feasible goal.

II. A Primer on IRAs

Individual Retirement Accounts were first provided in 1974 to provide a tax-preferred retirement saving program for employees without preexisting pension plans. The tax advantage was the ability to defer paying taxes on the "pension" contribution until the assets were withdrawn at retirement. Initially, enrollment was sparse. Fewer than 3 percent of all taxpayers contributed $3 billion in 1978 despite the fact that 51 percent of the labor force had no pension plan at that time.[3]

In 1982, IRA limits were increased and eligibility was expanded to allow nearly every working taxpayer to contribute. Limits were expanded to $2000 for single taxpayers and $4000 for joint filers.[4] Individual Retirement Accounts (IRAs) struck a popular chord with taxpayers.

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[3] Mankiw and Zeldes (1991), quoting an unpublished 1983 report by Daniel Beller.

[4] The spouse was required to earn at least $2000 to contribute the full $4000; households with a spouse without any earnings could contribute up to $2250. There was a 10 percent penalty on early withdrawals, and taxpayers over age 70 could not contribute. The entire IRA was taxed at death, thereby excluding stocks from a stepped up basis at death.

Between 1982 and 1983, IRA contributions jumped from $5 billion to $28 billion; during 1982-86, more than $170 billion were contributed to IRA accounts. By 1986, annual IRA contributions comprised one-quarter of aggregate personal saving.

Following the 1986 Tax Reform Act, eligibility was cut back sharply. While those without employer-provided pensions could still buy IRAs regardless of income, those with existing employer-provided pension funds were fully eligible only if their income was below $25,000 for single filers or $40,000 for married filers.[5] Total tax-deductible IRA contributions fell by 62 percent in 1987, in part because eligibility was tightened, but also because those still eligible reduced their contributions. Some investors continued to contribute to nondeductible IRAs, but the size of these contributions is not known.

What are the benefits of contributing to an IRA? Individual Retirement Accounts provided an immediate tax break but imposed the full tax on principal plus interest when the account was cashed out. Assuming that the marginal tax rate today is equal to the tax rate during retirement when the IRA is withdrawn, the present value of the future tax liability is exactly equal to the value of the tax break today.[6] So for a constant marginal tax rate, the IRA

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[5] The upper limits on contributions were gradually phased out between $25,000 and $35,000 for single taxpayers and between $40,000 and $50,000 for married taxpayers.

[6] To see this, suppose I contribute $2000 today with a marginal tax rate of 28 percent and an interest rate of 8 percent. My tax deduction today is $560 ($.28 \times 2000$), so the net out-of-pocket payment is $1440. The IRA accumulates at 8 percent over, say, 15 years so when I cash it out in 2006, it is worth $6344. My tax liability is $1776 ($.28 \times 6344$), paid in the year 2006. In terms of 1991 dollars, the present value of that future tax liability is $1776 \div (1.08)^{15}$, or $560, the amount of my original deduction.

provides the gross (before-tax) rate of return, and the present value of government revenue from the capital income is zero.

A further benefit is the ability to deduct an IRA during working years when marginal tax rates are high but pay taxes on the proceeds during retirement when marginal rates are low (Ozanne and Lindeman, 1987). To assess the relative benefits of an IRA for different marginal tax rates, one can calculate how one dollar invested at 8 percent annually over a 15-year would fare under different tax rates and IRA programs.

Suppose that the typical investor earning 8 percent before the 1986 tax reform was in a 40 percent tax bracket. Then the net return in a conventional taxable account would be 4.8 percent; one dollar would return a net accumulation of $2.02 after 15 years. Under an IRA, the after-tax return is the same as the pre-tax return, 8%, yielding an accumulated return of $3.17, assuming that the taxpayer's marginal tax rate at retirement is 40 percent. Suppose instead that the taxpayer's marginal rate was 25 percent when the IRA is withdrawn. Then the after-tax return rises to 9.6 percent; the accumulated investment yields $3.97, nearly triple the accumulated net return relative to the taxable asset ($2.97 vs. $1.02). Note that this ability to shift income to a lower tax bracket provides nearly half the overall benefit of purchasing an IRA.

The benefits of the IRA have been eroded since 1986 because of lower marginal tax rates. For example, a taxpayer in a constant 28 percent tax bracket who invests one dollar at 8 percent would, after 15 years, have accumulated to $2.32, with a net return 39 percent below the comparable return in an IRA. The relative advantage of the IRA would be amplified by a lower marginal tax rate at retirement, but retirees may be less likely to fall into a lower tax

bracket when the IRA is withdrawn. In sum, the Tax Reform Act of 1986 reduced the demand for IRAs even for those eligible to contribute. When marginal tax rates decline, the relative advantage of tax-sheltered income also declines.

Recent proposed saving incentives such as the Family Saving Account proposed by the Bush Administration seek to provide similar saving incentives with less pressure on current budget deficits. The Family Savings Account (FSA) is "back-ended" because the tax incentives are provided in the future. That is, interest is allowed to accumulate tax-free in an FSA, so there is no tax liability on either the principal or the interest when it is withdrawn. Holding marginal tax rates constant, it can be shown that the front-ended IRA and the back-ended FSA have precisely the same impact on the after-tax rate of return.[7]

The two plans differ with respect to the timing of the revenue loss.[8] In the case of the IRA, there is an immediate revenue loss, with much of the initial revenue loss recovered when the IRA is cashed out. Hence the five-year revenue cost of a traditional IRA is overstated because it ignores the future tax benefits. Currently, the present value of this future tax benefit is conservatively estimated to exceed $70 billion, a figure calculated by multiplying the more than $350 billion in IRA accounts by a conservative 20 percent marginal tax rate. By contrast,

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[7] Consider the previous example in footnote 6. The net out-of-pocket investment in an FSA would be $1440. Accumulated over 15 years at 8 percent tax-free, the investor withdraws $4568, exactly the same return as the traditional IRA.

The proposed limits on FSAs are $2500 for single taxpayers and $5000. These new limits represent a substantial expansion of the saving incentive because a $2500 contribution to an FSA after the 28 percent income tax is paid is equivalent (in terms both of the size of the investment and the government revenue cost) to a $3472 (or $2500/.72) IRA contribution before the income tax.

[8] See Burman, Cordes, and Ozanne (1990) for a good discussion of this issue.

the five-year revenue cost of FSAs are understated because the future tax benefits -- the ability to exempt future interest income from taxes -- are provided beyond the 5-year horizon. While FSAs and IRAs have an equivalent impact on the long-term government balance sheet, they have a very different effect on current budget deficits (see Kotlikoff, 1988).

Individual Retirement Accounts, as well as the proposed FSAs, are clearly effective at increasing the rate of return on the tax-sheltered investment, although their benefits have been somewhat diminished by the 1986 Tax Reform. The next section examines in some detail the characteristics of those who availed themselves of the IRA tax subsidies during 1982-86.

III. Who Buys IRAs?

Individual retirement accounts have been touted by proponents as the saving vehicle for the average American. But the enrollment pattern of IRAs tends to indicate that on average, IRA purchasers are quite different from the rest of the population. They are older, hold more liquid assets, and have higher income. Perhaps this is not terribly surprising in itself, since a large fraction of the population hold very little in wealth (aside from housing), and those who save are also more likely to buy IRAs. This section provides a short guide to some distinguishing characteristics of IRA contributors.

A. IRA Contributors have higher incomes and tend to be older

The "snapshot" distribution of IRA purchasers can be summarized by noting that in 1985, taxpayers with adjusted gross income in excess of $50,000 accounted for 37 percent of IRA contributions, but only 8 percent of taxpayers. A more detailed picture of the typical IRA contributor comes from Venti and Wise (1991c) who used 20,000 observations from the Survey

of Income and Program Participation (SIPP) to describe the enrollment patterns of those who enrolled in IRAs. An IRA participant included anyone who held an IRA account, even if the contribution had been made in a prior year. The pattern of IRA enrollment is shown in Table 1, which tabulates the percentage owning IRAs by both age and family income. For example, four percent of families with incomes less than $20,000 and age between 25 and 34 enroll in IRAs. Holding income constant at less than $20,000, this fraction rises as age rises, to 11.2 percent at age 45-54 and 17.7 percent at age 55-64. Holding age constant at 25-34, the fraction who contribute to an IRA rises as income rises, to 15.3 percent for income between $20,000 and $40,000, up to a peak of 62.5 percent for those with income above $75,000.

Some new evidence on secular changes in the characteristics of new IRA contributors comes from the public use tape of tax returns created by the IRS and made available by the Center for Tax Analysis at the University of Michigan. It contains a sample of more than 5,000 tax returns who filed in every year between 1979 and 1986, so that changes in behavior over time for individual taxpayers can also be identified.[9] As Table 2 illustrates, the median income of new enrollees (expressed in 1984 dollars) was $41,277, a number consistent with the results from Venti and Wise (1987). Over time, the median income of new contributors has fallen to only $28,677 by 1986, although the fraction of new enrollees was also quite low in that final year.

[9] The sample may not be entirely representive of the entire population of taxpayers since households were excluded if they did not file an income tax return in any of the years 1982-86.

B. IRA Contributors tend to be wealthier

Families with higher levels of wealth, holding income constant, are also more likely to buy IRAs. Venti and Wise (1991b) report that for those who held IRA accounts in 1986, their holding of (non-IRA) liquid assets in 1983 was $9,400, compared to only $729 for noncontributors. By 1986, that discrepency had increased further; the median IRA contributor held $13,500, while the median noncontributor owned $1,000 in liquid assets (Gale and Scholz, 1990). In sum, IRA contributors are systematically wealthier than noncontributors.

C. The marginal tax rate affects IRA purchases

While Collins and Wykoff (1988) present evidence suggesting little impact of marginal tax rates on IRA purchases, the majority of studies find a significant and substantial impact. The best evidence comes from a study by Long (1990) that uses variations in state income tax rates to estimate the effect of the marginal tax rate on IRA contributions. He found that a one-percentage point change in the marginal tax rate had an average overall impact of $20 in IRA enrollments averaged over both contributors and non-contributors. O'Neil and Thompson (1987) and Feenberg and Skinner (1989) similarly estimated a large impact of the marginal tax rate on the probability of contributing (or on the amount contributed) although neither of these latter studies corrected for differences in state taxes.[10] To some extent, the decline in IRA enrollment following the 1986 Tax Reform Act may be attributable to the fall in marginal tax rates. But as Long (1990) has documented, those still eligible to contribute to IRA accounts experienced little change in their marginal tax rates. Hence the decline in statutory rates was unlikely to have explained a large fraction of the decline in total IRA enrollments.

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[10] Also see O'Neil and Thompson (1988) and Long (1988).

D. Neither Income Windfalls nor Mortgages Predict IRA Contributions

Some factors that might be expected to encourage IRA purchases do not. In the standard life cycle view of saving, an unusually pleasant surprise in income would often be reflected in increased saving, perhaps in the form of an IRA. To test this hypothesis, the IRS/Michigan taxpayer sample was separated into five groups depending on the percentage change in AGI from the previous year, with results presented in Table 3. As the table shows, IRA purchases are more likely when there is a decline in AGI rather than an increase. For example, consider those with AGI between $30,000 and $50,000. Forty-five percent of those who experienced between a 5-20% drop in real AGI purchased IRAs, while only 29 percent purchased IRAs when their AGI grew by more than 20 percent. Similar results were found for "first-time" buyers of IRAs in 1984; that is, those who had not contributed in 1983.

Another possible reason for contributing to an IRA is the ability to tax arbitrage using a (tax-deductible) second or home equity mortgage to finance the IRA (Kotlikoff, 1990; Manchester and Poterba, 1989). This possibility was tested by comparing the pattern of new IRA enrollees in 1984 according to whether the individual experienced an increase or decrease in deductible home mortgage interest. The shuffling hypothesis would suggest that new IRA enrollees would be overrepresented among those who increased their deductible home mortgage payments. But as Table 4 shows, if anything, IRA purchases were more likely for those who reduced their mortgage payments.[11] While mortgage interest payments are a noisy measure

[11] Similar results were found for the entire universe of all IRA enrollees and not just new enrollees in 1984.

of the existence of home equity loans, secular changes in (floating) interest rate payments are implicitly controlled for by including the comparison group of those who did not purchase IRAs.

E. Dynamic Patterns of IRA Contributions

One of the striking aspects of IRA enrollment is that once taxpayers buy IRAs, they continue to buy IRAs. Table 5 suggests a strong persistence in IRA purchases, with the probability of contributing to an IRA -- given enrollment in the prior year -- remaining over 80 percent during the entire period 1982-86.[12] This finding suggests a core group of taxpayers who rely heavily on IRAs for their saving rather than occasional contributors who open an IRA account when they have some extra funds to invest.

Based on the analysis by Feldstein and Feenberg (1983), one might expect many initial enrollees in 1982 to "run out of steam" if in fact they limited IRA contributions to their existing (taxable) wealth. However, Table 5 suggests surprising persistence in IRA contributions among contributors who initially enrolled in 1982. More than 70 percent of those who contributed in 1982 continued to contribute in 1986.

A different view of the dynamic patterns of IRA enrollees can be seen in Figure 1 which describes the subsequent IRA enrollment decisions of the universe of all sampled IRA enrollees in 1982. Fully 61 percent continued to purchase IRAs in every year, and 74 percent purchased an IRA for 4 of the 5 possible years. For individuals who did drop out in 1983, more than one-quarter returned to purchase an IRA in 1984. One systematic difference between the occasional contributors and the permanent contributors was income; median income (averaged over all 5

[12] This was also noted by Joines and Manegold (1991).

years) was $43,412 for the regular contributors and less than $35,000 for the irregular contributors.

The picture of the typical IRA contributor that has emerged in this section is one who is older, with higher income and more liquid wealth than the typical taxpayer. For this reason, many economists have viewed IRAs as providing a tax windfall to the wealthy. However, the benefits of IRA purchases may better be cast in a lifetime framework. If a large fraction of taxpayers purchase IRAs after age 50, then the lifetime distribution of IRAs may be more equitable than simple annual calculations would suggest. For example, Venti and Wise (1991b) calculate that under the pre-1987 IRA eligiblity rules and marginal tax rates, 50 percent of families with income in excess of $20,000 would purchase IRAs before they retired. Still, given that higher income groups, in higher tax brackets, accounted for much of total IRA contributions, it is not surprising that they enjoyed a large fraction of the tax benefits.

Individual Retirement Accounts may not be "Everyman's" saving vehicles. But are they effective at encouraging saving among those who do buy them? This is a much more difficult question that is addressed in the next section.

V. Are IRAs New Saving? Three Approaches

Individual Retirement Accounts may have been successful with the public but unsuccessful at promoting aggregate saving. The important question is whence these IRA contributions -- were they shuffled out of existing assets, or did they represent a reduction in consumption and consequent increase in saving? If they were entirely shuffled, then net private saving remained unaffected, but the revenue loss placed increased pressure on the government

deficit. We address this question from three angles: economic theory, evidence from aggregate data, and results from microeconomic surveys.[13]

A. The Life Cycle Theory Speaks

The life cycle theory, first developed by Franco Modigliani, Albert Ando, and Richard Brumberg, emphasizes the importance of saving as a means of providing for retirement consumption. In this view, rational individuals make lifetime consumption plans subject to their lifetime budget constraint, and saving is primarily the residual between current income and (optimal) consumption. If the interest rate is high, consumers forgo current consumption for more future consumption, which generally leads to higher rates of saving.

Since IRAs provide a higher rate of return, the implication of the simple life cycle model is first that everyone should put at least some of their retirement saving into an IRA. This is clearly not the case, since two-thirds of all families hold no IRA. However, a more realistic model of saving recognizes a precautionary demand for liquid assets (e.g., Gale and Scholz, 1990), so some families may be loath to "lock up" their life cycle saving in an IRA.[14]

A number of observers have noted a second implication of the life cycle model -- that IRAs rarely provide a marginal incentive to save (Kelly and Miles, 1987; Gravelle, 1991; Burman, Cordes, and Ozanne, 1990). The logic behind their reasoning is shown in Figure 2. A supply curve is drawn (SS) showing a hypothetical positive relationship between net saving

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[13] Also see the review article by Gravelle (1991) that addresses this same issue, but at a more technical level. She concluded that IRAs were largely shuffled.

[14] It is not clear that the penalties from locking up assets in IRAs are particularly large. When interest rates are high, an IRA may pay a higher rate of return over an equivalent taxable account after 8 or 10 years, even after paying the tax penalty.

(on the horizontal axis) and the after-tax rate of return. An IRA provides the gross rate of return r up to $2000; any saving beyond that point yields only the after-tax rate of return r_n. The way that the saving schedule SS is drawn, there is no impact on the marginal dollar saved, and hence no impact on total saving S^*. The $2000 saved in the IRA represents funds that would have been saved anyway, and the tax break is just a windfall. Only if the saving schedule is such that original saving (at r_n) is less than $2000 would there be a marginal incentive to save more (e.g., S'S'). And many observers point to the large number of contributions exactly at the $2000 (or $4000) limit as evidence that marginal incentives are minimal.

Unfortunately, this simple analysis confuses annual IRA limits with lifetime IRA limits. In the context of lifetime saving plans, the limit on IRA contributions is not the *annual* limit of, say, $2000, but the *lifetime* limit of up to $95,000, including interest accumulated at 3 percent, over a thirty-year span of saving. (Alternatively, a 50-year-old working couple could save as much as $74,400 before retiring at age 65.) Few families hold more than $74,000 in liquid assets, implying that few families will be at their lifetime limit with respect to IRA contributions. Hence in a properly specified life cycle model, IRAs provide at least a partial increase in the marginal incentive to save.

An equivalent way to think about this distinction between annual and lifetime limits is to note that the median wealth of families holding IRA accounts was $13,500 in 1986 (Gale and Scholz, 1990). Suppose that all contributors to IRAs shuffled their existing assets. After 6 or 7 years, the median household would have run through all their assets and could no longer shuffle; hence IRAs would provide a marginal incentive to save (Feldstein and Feenberg, 1983; Summers, 1990). Of course, some households are sufficiently wealthy that they could afford

to contribute to IRAs indefinitely. And Gravelle (1991) has noted that since IRA contributors also tend to save in taxable forms of wealth, they may be unlikely over the medium term to face constraints on shuffling.[15] Nevertheless, the view of many observers that IRAs provide no marginal incentive for retirement saving is correct only for very wealthy families or for (hyper) active savers.

Gravelle (1991) and others have questioned the assumption of the upward-sloping supply curve of saving shown in Figure 2. A higher interest rate leads not just to a substitution effect in favor of more saving, but also to an income effect -- less current saving is necessary to attain a "target" retirement consumption stream in the future. The empirical finding that interest rates have, if anything, a negative correlation with saving rates lends credence to the importance of these income effects. Taking an extreme view, then, one might conclude that IRAs will actually reduce aggregate saving: there are no marginal effects to increase saving (because of the limits on contributions), while the income effect would tend to increase consumption (Gravelle, 1991).

For the income effect to dominate the substitution effect, however, requires a set of quite stringent conditions. First, the tax breaks from IRAs must be financed entirely by deficits at the margin. Determining how IRAs were financed during the 1980s is, of course, highly problematic. Second, these deficits must be viewed as net wealth, rather than current spending paired with future tax liabilities. Barro (1989), for example, has argued that budget deficits should have little impact on consumption behavior, given that consumers expect higher taxes in the future. And finally, theoretical research using life cycle simulation models has shown that

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[15] For example, between 1983 and 1986, median non-IRA wealth increased among IRA contributors. That is, there was no evidence that contributors were running out of taxable assets.

the substitution effect always dominates the income effect, sometimes by a substantial amount (Summers, 1981; Evans, 1983). The standard theoretical life cycle model therefore typically implies a positive impact of marginal saving incentives on overall capital accumulation.

Orthodox life cycle models may not prove to be the best guide to economic policy, since their theoretical predictions are not always borne out in practice.[16] A more promising approach is to examine the empirical record.

B. Macroeconomic Evidence

The evidence from aggregate macroeconomic saving rates appears to cast doubt on the hypothesis that IRAs are new saving. Before IRAs were expanded in 1982, the OECD measure of US household saving as a percentage of disposable household income was 7 percent; by 1986, the last full year of expanded IRA eligibility, household saving had dropped to 4.3 percent. Figure 3 graphs household saving for the United States as well Canada, Great Britain, and France during 1976-89.[17] Average saving rates declined by nearly two percentage points from 7.2 percent in 1977-81 to only 5.5 percent during 1982-86. Since that time, household saving has stabilized at an average rate of 4 percent during 1987-89.

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[16] For example, empirical evidence from consumption behavior implies that as many as half of families choose consumption based on a Keynesian (rather than life cycle) consumption function (Campbell and Mankiw, 1989). Another disturbing aspect of conventional life cycle models is that they imply implausibly high saving elasticies (e.g., Summers, 1981). Recent models instituting plausible uncertainty parameters generate more realistic saving elasticities (Engen, 1991).

[17] These and subsequent saving rates are taken from the OECD Economic Outlook (December 1990). There may be differences in the level of saving depending on what is included and excluded from the definition of consumption and income.

There are currently two interpretations of this macroeconomic evidence. The first is that IRAs not only did nothing to increase the saving rate, but actually reduced saving (e.g., Gravelle, 1991). The intuition is that first, IRA saving was shuffled from a taxable account, so net saving was zero. But along with the IRA came a sizable tax windfall, which by increasing disposable income also increased total consumption (Gale and Scholz, 1990). Hence IRAs were viewed as decreasing personal saving as well as widening the government deficit.

The problem with this explanation is that the magnitude of such wealth effects is trivial. Assume that the marginal tax rate for IRA purchasers is 31 percent (Venti and Wise, 1991c). Then the tax saving on the $38 billion of IRA contributions in 1986 was at most $12 billion.[18] Suppose that consumers consumed 20 percent of the windfall. Saving would have fallen by only 0.06 percent of disposable personal income.

A second interpretation of the macroeconomic evidence is that while IRAs did not actively reduce saving, the fact that saving fell so dramatically suggests that IRAs failed badly at preserving saving at its minimal level. It is certainly clear from Figure 3 that saving during 1982-86 was lower than the period 1978-81. And while saving in 1987 was substantially below the rate in 1986, since 1988 the saving rate in the United States has hovered between 4 and 5 percent of disposable income -- essentially similar to the saving rate in 1986.

Some perspective on the dramatic slowdown in saving may also be realized by comparing the saving experiences of other countries during the same period. As Figure 3 suggests, the United States was not the only country experiencing a sharp decline in saving rates during the

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[18] Even this is not entirely a tax windfall since the tax is only deferred until the money is withdrawn.

mid-1980s and a turnaround in saving rates during the latter 1980s. It is not entirely clear what caused this worldwide decline in saving rates, but it would seem particularly difficult make inferences about how IRAs affected national saving given the dramatic shifts in world saving patterns during the same period.[19]

Carroll and Summers (1987) attempted to control for these secular changes by comparing the saving patterns of two similar countries, the United States and Canada. Saving rates in the United States and Canada had moved in tandem through the early 1970s; by 1973 the saving rates were within one percentage point. Following the introduction of generous retirement saving incentives in Canada during 1974, the Canadian saving rate surged to a peak of 18 percentage points, as shown in Figure 3. By contrast, the US saving rate stagnated during the 1970s. Based on econometric results comparing US and Canadian saving rates, they concluded that retirement saving programs do affect aggregate saving. However, it is unlikely that a retirement saving program could account for the entire difference in US and Canadian saving, since retirement contributions in Canada never accounted for more than one-quarter of the total

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[19] Additional country saving rates (also from the OECD Economic Outlook are shown below:

	1981	1987	1989
Japan	18.3	15.1	15.0
Germany	13.5	12.6	12.5
Italy	20.5	14.3	13.9
Austria	8.1	12.0	14.2
Australia	9.7	5.7	7.8

Nearly every country (except Austria) experienced a general decline in saving rates but not every country has experienced a rebound.

saving rate differential. And as Carroll and Summers note, their model does not account for differences over time in US saving patterns (also see Gravelle, 1991).

In conclusion, inferring how retirement saving programs affects aggregate saving can yield quite divergent conclusions, in part because economists understand so little about why saving behavior changes. Since saving in IRAs accounted for less than 1.5 percent of household income, they cannot have had a large impact on saving patterns in the US (much less in Great Britain). Furthermore, there is no compelling evidence from the macroeconomics evidence that would lead one to believe that IRAs were effective at stimulating national saving. To get a clearer picture of how IRAs affect saving, I turn next to the microeconomic data from large-scale households surveys.

C. Microeconomic Evidence: Empirical Regularities

The standard view of IRAs based on life cycle models is that individuals will shuffle their portfolio by taking assets from taxable accounts and putting them into IRAs even if they save nothing in that year: "...many Americans would merely shift old savings into tax-favored accounts."[20]

Feenberg and Skinner (1989) tested this hypothesis using the IRS/Michigan survey of taxpayers during 1980-84. According to the standard shuffling hypothesis, those who enrolled in IRAs should have experienced a decrease in taxable interest and dividend income relative to those who did not enroll. However, Feenberg and Skinner found the opposite; taxpayers who purchased IRAs saved more in other types of wealth. Table 6 illustrates these differences in saving behavior. Each column describes the number of years taxpayers enrolled in an IRA,

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[20] Samuelson (1990), paraphrasing C. Eugene Steurle.

ranging from nonenrollees (0 years) to those who enrolled in all three years 1982-86 (3 years). Each cell describes the *change* in taxable interest and dividend income between the years 1980/81 (the base years before IRAs) and 1984. For example, for households with less than $2000 in liquid wealth (defined to be assets paying interest and dividend income)[21], taxpayers purchasing IRAs in all three years experienced an increase in taxable interest and dividend income of $848 compared to only $121 for those who did not.

This pattern of saving behavior could also be explained by noting that families who are actively saving are likely to do so in both IRA and non-IRA assets. But active savers are more likely to hold more wealth than inactive savers, and Table 6 corrects for differences in initial wealth holdings. Still, the patterns shown above can be explained by families who, having saved little in the past, suddenly decide to become active savers. So while these results do rule out the simplest form of IRA "shuffling," they cannot rule out more realistic models of saving behavior.

Venti and Wise (1991b) compiled successive years from the Consumer Expenditure Survey to measure the changes in IRA and non-IRA wealth balances for a "synthetic" panel.[22] They also found little depletion of non-IRA assets by active IRA contributors. In fact, they calculated that the net gain in IRA balances during the period 1982-86 exceeded the level of pre-1982 (non-IRA) liquid wealth.

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[21] Wealth was grossed up using average Aaa bond and dividend yields for each year.

[22] That is, each successive year of the Consumer Expenditure Survey sampled different individuals. The large sample size, however, allowed inferences to be made about representative individuals in each cohort group.

Manegold and Joines (1991) report an intriguing test of the proposition that IRAs are new saving. Rather than comparing new IRA subscribers with those who never enroll in IRAs, as did Feenberg and Skinner, they compare new IRA subscribers with those who purchased IRAs before 1982. The idea is that if IRAs are new saving, then newly enrolled subscribers in 1982 should increase their saving by more than those who continue to contribute to IRAs. The authors find no evidence that new IRA enrollees increase saving by more than old IRA enrollees, which they interpret to mean that IRAs are shuffled saving.

Based on a comparison of asset wealth and income, Manegold and Joines suggest that their control group is more similar to post-1982 contributors than individuals who never purchased an IRA. However, the pre-1982 contributors were also few in number and without existing pension funds, and hence may not have been representative of the universe of potential IRA contributors.

Gale and Scholz (1990) have noted that 58 percent of contributions to IRAs come from individuals who are either over 59 years of age or who have more than $20,000 in liquid assets. They surmise that for this group, IRAs should be good substitutes for taxable saving, either because they can withdraw IRA contributions without penalty (over age 59 1/2) or because they have a large cushion of liquid assets available for future contingencies. Again, while suggestive, these results cannot rule out the proposition that IRAs represent new saving. First, if IRAs were perfect substitutes for non-IRA saving, then nearly every taxpayer over 59 1/2 should enroll in one. And second, retirement saving is strongest among those who are nearest to retirement, so it is not entirely surprising that IRAs should be particularly popular among that group.

In sum, none of these empirical regularities can rule out or confirm the hypothesis that IRAs stimulate saving. Other researchers have therefore turned to complex statistical models to provide a more definite answer to this question.

D. Microeconomic Evidence: Structural Econometric Models

The first structural estimate of how retirement saving incentives affect saving was by Hubbard (1984), who used evidence from 1979 on both the limited enrollment in IRAs as well as in the closely related Keogh plans. He found that individuals making contributions to these plans had higher average wealth/income ratios that those who did not. He partially controlled for the "self-selection" problem (those with a taste for saving are more likely to open IRAs) by including in his sample families who may have wanted to save in IRAs or Keoghs, but failed to meet the legal restrictions. More recent evidence from structural equations modelling the joint determination of IRAs and taxable saving are described in a series of papers by Venti and Wise (1986,1987,1990,1991a) and in Gale and Scholz (1990).[23]

Venti and Wise model the choice of three goods, consumption, taxable (liquid) saving, and IRA saving.[24] Their test is whether taxable saving is a good substitute for IRA saving. If they are perfect substitutes, then the individual will immediately shift saving into IRAs since IRAs yield the higher rate of return. If IRAs are imperfect substitutes, contributions to retirement will not come at the expense of taxable saving, but at the expense of consumption --

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[23] Also see Anderson (1989).

[24] Gravelle (1991) has criticized the Venti and Wise model for being a reduced form expression of saving without an underlying utility function. For a further discussion of the Venti and Wise model, see Deaton (1987).

i.e., IRAs would be new saving. The authors find that the latter outcome holds. For example, in their most recent paper, they estimate that only 3 percent of the total increase in IRA enrollment comes from existing saving; the remainder comes from a reduction in consumption (66 percent) and in taxes (31 percent).

The econometric model is quite complex, but one explanation for the results is as follows. A large number of individuals do not buy IRAs at all. According to the logic of the model, if IRAs were perfect substitutes, then everyone should own one. Hence if a large number of people ignore the substantial tax advantage and spurn IRA purchases, then they must be imperfect substitutes for taxable saving.

Gale and Scholz (1990) focus on the fundamental reason for why IRAs are not perfect substitutes for taxable saving -- the likelihood that at some future point, saving will be locked up in an IRA when it needed for some future uncertain consumption contingency such as a decline in future income. Saving is not an end in itself (as in Venti and Wise) but a means to an end -- future consumption. They derive the implied saving function for a particular utility function, allow it to differ between IRA contributors and noncontributors, and estimate the nonlinear saving equation. While they use the same data set as Venti and Wise (1987), the Survey of Consumer Finances, they have access to two years of data. Their results directly contradict the Venti and Wise findings, suggesting that IRAs are almost entirely shifted from existing old saving.

What explains these contradictory results? Both papers are essentially cross-sectional comparisons of saving behavior between contributors and noncontributors.[25] While Gale and Scholz specifies a flexible econometric model of saving, they still must make some ad-hoc assumptions to measure the independent effect of IRAs on saving (Gravelle, 1991).[26] Another reason may be that their model is unable to disentangle the effect on saving specific to the individual and the effect specific to the IRA.[27] Nevertheless, their study represents an important advance in the modeling of life cycle saving behavior.

The strict structure imposed on conventional life cycle models may miss a rich variety of nonstandard saving behavior. The next subsection examines such saving behavior in more detail.

E. Microeconomic Evidence: Psychological Factors

In the context of the orthodox life cycle model, the only reason to favor IRAs over other types of saving is that it provides a higher rate of return. But there is little evidence that saving

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[25] Gale and Scholz have estimated their model using only IRA contributors, but their results are not yet available.

[26] For example, they assume that IRA saving is a linear function of age but that non-IRA saving is a quadratic function of age.

[27] There are two empirical regularities of IRA enrollees that may be important factors in the Gale and Scholz results. First, taxpayers tend to re-enroll in IRAs, and second, taxpayers who buy IRAs tend to save in other, taxable, assets. Gale and Scholz find that past IRA purchases is the single most significant factor in explaining desired retirement saving S^*. They also find that desired retirement saving S^* is positively correlated with non-IRA (taxable) saving. These empirical regularities could drive their empirical results.

responds positively to a higher after-tax rate of return.[28] For example, during the 1970s personal saving was at its highest level in the postwar period despite low real after-tax interest rates. By contrast, the 1980s were characterized by very high after-tax interest rates and low saving rates. Often saving regressions imply a negative partial correlation between the after-tax rate of return and saving (e.g., Skinner and Feenberg, 1990).

The empirical finding that the real after-tax interest rate does not have a large impact on saving may cast doubt more on the predictive power of the life cycle model than on whether IRAs promote saving. Evidence in recent years suggests that the widespread popularity of IRAs was due to more than the higher after-tax rate of return. In particular, Summers (1989) has called attention to the very active marketing campaign during the mid-1980s designed to encourage IRA purchases; "[i]t may well be that saving like life insurance is sold not bought." Certainly the sharp decline after 1986 in both IRA advertising by banks, and in IRA contributions among those still eligible, lends support to this view.

Feenberg and Skinner (1989) similarly report that a large fraction of IRA households were "falsely constrained"; they contributed exactly $2000 even when they were eligible to contribute more.[29] One explanation might be that the transactions costs of opening a new account for one's spouse was too high. Another explanation would be that the information

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[28] For evidence favoring the hypothesis that saving responds positively to the after-tax rate of return, see Boskin (1978). Hall (1988) and Howrey and Hymans (1978) suggest that neither saving nor consumption responds to changes in the real interest rate.

[29] A spouse was eligible for a $250 contribution if not working and the minimum of annual earnings or $2000 if working.

gleaned from the marketing was both correct (IRAs yielded a higher rate of return) and incorrect (families were limited to a $2000 contribution). One acquaintance (with a Ph.D. in Economics) thought that $2000 was the minimum contribution allowable.

Some of the decline in IRA enrollment following the 1986 Tax Reform Act may similarly have been the consequence of taxpayer ignorance. A survey, quoted in Venti and Wise (1991b), suggested that half of those still eligible to contribute to the tax-deductible IRA under post-1986 tax rules thought they were ineligible (IRA Reporter, September 30, 1988).

More evidence on psychological factors in saving comes from Feenberg and Skinner (1989) who report that one strong predictor of IRA enrollment was whether the taxpayer owed money to the IRS in excess of taxes withheld, even holding wealth and income constant. They interpreted this to mean that a taxpayer in a 40 percent bracket preferred to open a $2000 IRA than to write an $800 check to the IRS. That is, the instant gratification of the IRA deduction (and the psychological rewards from denying the IRS its due) was sufficient to override the usual preference for consuming income today. Some support for this psychological profile of IRA contributors comes from IRS statistics reporting that in 1983, $12.5 billion of the total $32 billion in contributions were actually made (legally) in 1984.

While these bits of evidence are suggestive, they are not conclusive. For example, the marketing argument cuts both ways. An advertising blitz could just as well encourage shuffling of existing saving as encouraging new saving. Those who underwithhold could be aggressive tax-planning taxpayers who are also more likely to purchase IRAs. Alternatively, finding that taxpayers who owe money to the IRS are likely to open IRAs is consistent with a story in which taxpayers are more likely to shuffle when they owe money to the IRS.

I find the psychological aspects of saving behavior particularly intriguing, especially in light of similar findings with respect to pensions and saving behavior (e.g., Katona, 1964). While there is currently no clear test of the importance of psychological factors, there is increasing interest in "nonrational" approaches to saving behavior (see Thaler, 1990).

VI. If IRAs are the Answer, What is the Question?

Given that there is a saving problem, can IRAs help to solve it? For IRAs to be effective at stimulating national saving, they must pass two tests. First, they must be effective at increasing saving, and second, they must be large enough to have a substantial impact on saving. The first issue has already been discussed, and let us for argument's sake assume that IRAs are new saving. Can they have a substantial impact on saving?

The answer is that they are unlikely by themselves to make a large dent on overall saving rates. Suppose that all IRAs represented new saving, and that the tax revenue loss from IRAs had no impact on the government deficit. Because IRAs never accounted for more than 1 percent of GNP, they could not have affected saving rates by more than one percentage point. In short, IRAs can never serve as the only solution to low saving rates.

A different justification for IRAs (again, assuming they are successful at their stated goal) is their original one: to promote income security at retirement. As Venti and Wise (1991a) have noted, the median wealth holdings of families nearing retirement is only $6600. Table 7 sheds further light on the distribution of liquid assets available to families with household heads between ages 50-64. This age group should exhibit the largest accumulation of wealth since they are at their peak earning capacity and are facing retirement in the near future. Yet the fraction

of families with stocks, bonds, and checking accounts greater than $10,000 in 1984 is minimal, especially for those with combined (head plus spouse) family earnings of less than $30,000. For example, less than half of all families aged 50-64 and with earnings between $15-$30,000 held more than $10,000 in liquid assets. Two years of a $2000 IRA contribution could increase liquid wealth by more than 40 percent.

While families may have adequate pension and social security wealth, they do not appear to have large holdings of liquid wealth for unforseen contingencies such as catastrophic health expenses. For the large fraction of families with little wealth beyond their house, IRAs can therefore provide a potentially large source of liquid wealth at retirement.

VII. Conclusion

During Congressional testimony in 1980 and in 1985, a number of policy experts suggested that IRAs were simply shuffled saving and would not increase overall saving rates (U.S. Congress, 1980; 1985). Since that time, more data and an expanding number of studies have become available. Are we any closer to answering the question of whether IRAs promote saving?

I would argue that the answer is yes. We can rule out the simple shuffling story in which taxpayers dig into their existing taxable accounts and roll them over into IRAs. The large majority of IRA subscribers are actively saving in other, taxable, assets as well. One can also rule out the view of IRA subscribers as comprised largely of Everyman, with little or no existing wealth. They are not. They tend to be older than the national average, and to have sizable

holdings of liquid assets. Furthermore, there is a surprising amount of persistence in IRA enrollment that cannot be explained solely by income or wealth effects.

While the question of whether IRAs are new saving cannot be resolved conclusively, the fact that psychological factors appeared to play a role in their popularity is certainly a promising avenue for research. For example, the potential of a "critical mass" of potential IRA contributors could induce marketing and advertising efforts by banks that in turn stimulate interest in saving for retirement. Saving could also be induced by a "peer group" effect, in which conformity to norms within social groups encourages behavior such as IRA contributions (Bernheim, 1991).

How can this accumulating body of information on traditional IRAs be used to evaluate current proposals for expanding the use of tax-deferred retirement accounts to buying a house or paying for college? Unfortunately, we know little about the response of taxpayers to more short-term saving incentives. While taxpayers would be more willing to contribute to an expanded IRA, they would also find it easier to shuffle existing assets in and out of the liberalized IRA accounts. Furthermore, it is not clear that short-term savers would choose to expose themselves to the risk of a higher marginal tax rate (through income or tax law changes) when the IRA is withdrawn. A higher tax rate at withdrawal can easily wipe out any tax advantages of a short-term IRA. The fact that many wealthy taxpayers over age 59 1/2 -- who can withdraw savings from an IRA without penalty -- never opened an IRA, suggesting the presence of some fixed cost or uncertainty associated with IRA accounts. In sum, any evaluation of such expanded and liberalized IRAs is speculative, given that they do differ from the pre-1987 IRA.

Finally, what is the role for the U.S. government in encouraging saving? While there are a number of IRA options under consideration in the US Congress, it seems unlikely that IRAs by themselves will turn around the saving rate in the short term. (One might also wonder whether IRAs would be effective at stimulating demand -- i.e., consumption -- given their stated objective to stimulate saving.) Nevertheless, IRAs may be of greatest use for the longer term in encouraging families to focus on the often neglected objective of saving for unforeseen health expenses and other contingencies during retirement.

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Table 1: Percent of Families With IRA Accounts by Age and Income, 1985

Age	Adjusted Gross Income			
	< $20,000	$20,000-$40,000	$40,000-$75,000	> $75,000
25-34	4.0	15.3	31.1	62.5
35-44	5.9	22.9	45.4	74.4
45-54	11.2	31.4	58.3	74.2
55-64	17.7	49.7	71.0	74.1

Source: Venti and Wise (1989, Table 2b). Note: Percentage of families calculated from the original Venti and Wise tables as a simple average of their more detailed income brackets (except for the $75,000+ category). Some bias could result by not using a weighted average.

Table 2: Median Income of New IRA Enrollees (1984 $)

Year	1982	1983	1984	1985	1986
Median Income of New Enrollees	41,277	32,884	30,470	33,191	28,677
Number of New Enrollees (N=5786)	1014	296	249	214	126

Source: IRS/Michigan Panel Data. Median Income converted to 1984 dollars.

Table 3: Effect of Changes in Adjusted Gross Income on IRA Enrollment, 1984

	Percentage Change in AGI, 1983-84				
AGI in 1984	< -20%	-20% to -5%	-5% to 5%	5% to 20%	> 20%
< $15,000	5	7	8	4	2
$15-30,000	25	19	25	14	12
$30-50,000	40	45	35	35	29
$50-75,000	54	67	60	56	45
> $75,000	39	65	74	57	75

Note: Numbers shown indicate percentage of taxpayers contributing to IRA accounts in 1984. Source: IRS/Michigan Public Use Sample.

Table 4: Effect of Mortgage Interest Payment Change on New IRA Enrollments, 1984

	Change in Mortgage Interest, 1983-84		
AGI in 1984	< -$500	-$500 to $500	> $500
< $15,000	0	2	2
$15-30,000	4	5	4
$30-50,000	12	7	7
$50-75,000	17	7	9
> $75,000	12	5	9

Note: Numbers shown indicate percentage of taxpayers who are new contributors to IRA accounts in 1984. Source: IRS/Michigan Public Use Sample.

Table 5: Probability of IRA Purchase

Year	1983	1984	1985	1986
For Enrollees in the Previous Year	.834	.851	.855	.822
For 1982 Enrollees Only	.834	.790	.760	.712

Source: IRS/Michigan Public Use Sample.

Table 6: Increase in Dividend and Interest Income, by Years of IRA Enrollment, 1980/81 to 1984

Taxable Wealth 1980/81	Years of IRA Participation			
	0	1	2	3
< $2000	121	363	672	848
$2000 - 10,000	466	571	1203	1279
$10,000 - 50,000	795	1646	1309	1801
> $50,000	6579	3705	5062	6958

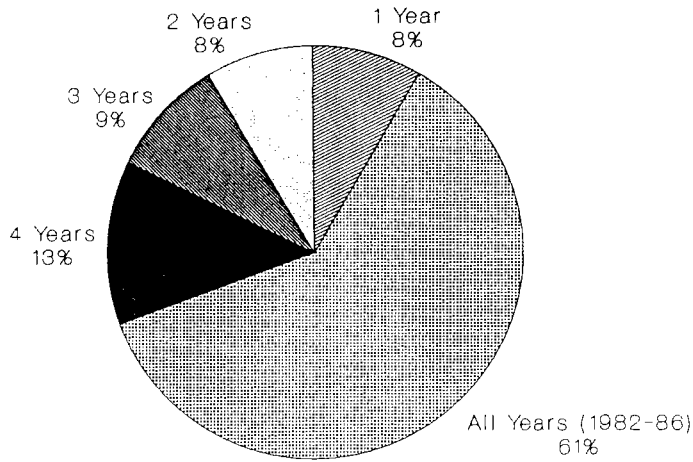
Source: Feenberg and Skinner (1989), page 37.

Table 7: Distribution of Liquid Asset Holdings at Ages 50-64, by Family Earnings 1984

Percent of Families With Liquid Wealth Greater Than:	Family Earnings			
	< $15,000	$15,000 - $30,000	$30,000 - $50,000	> $50,000
$20,000	8.5	31.4	48.3	81.3
$10,000	17.9	44.0	67.3	91.1
$4,000	24.5	61.0	72.5	98.5

Source: Author's calculations, Panel Study of Income Dynamics. Sample includes SEO population, with all averages weighted by population weights. Observations excluded if major changes were reported in household composition between 1983-87. All results in 1984$.

Figure 1: Subsequent IRA Enrollment of 1982 IRA Contributors



Source: IRS/Michigan Public Use Tapes

Figure 2: The Theoretical Effect of IRAs on Saving

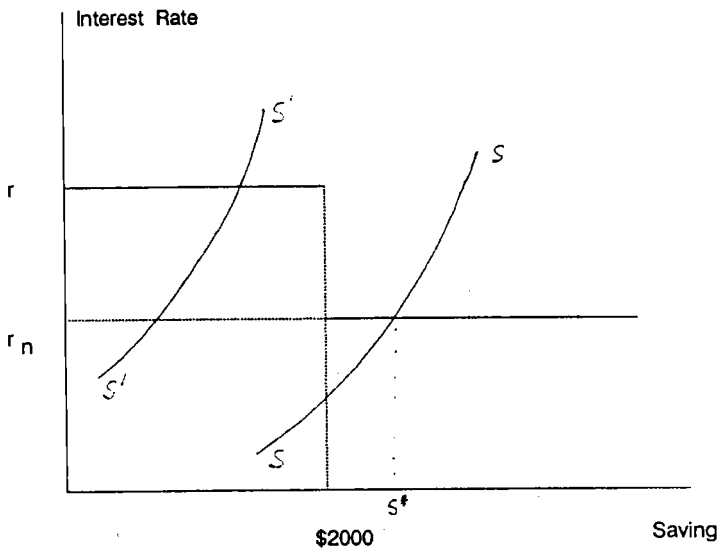


Figure 3: Household Saving in Selected OECD Countries, 1976-89