NBER WORKING PAPER SERIES

IRA'S AND HOUSEHOLD SAVING REVISITED: SOME NEW EVIDENCE

Orazio P. Attanasio
Thomas C. DeLeire

Working Paper No. 4900

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
October 1994

This paper is part of NBER's research program in Public Economics. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

© 1994 by Orazio P. Attanasio and Thomas C. DeLeire. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

NBER Working Paper #4900
October 1994

IRA'S AND HOUSEHOLD SAVING REVISITED: SOME NEW EVIDENCE

ABSTRACT

The effectiveness of tax-favored savings accounts in raising national savings depends crucially upon the willingness of households to reduce consumption in order to finance contributions to these accounts. The debate over the tax deductibility of IRA's has centered on whether IRA contributions represented new savings or reshuffled assets. We devise a test to distinguish between these two hypotheses where we compare the behavior of households which just opened an IRA account with that of households which already had an IRA account. Our test accounts for any unobservable heterogeneity across the two groups. We find evidence that supports the view that households financed their IRA contributions primarily through reductions in their stocks of other assets. Our results indicate that less than 20% of IRA contributions represented addition to national savings.

Orazio P. Attanasio
Dipartimento di Scienze Economiche
Università di Bologna
Strada Maggiore 45
40125 Bologna
ITALY
and NBER

Thomas C. DeLeire
Department of Economics
Stanford University
Stanford, CA 94305-6072

I. INTRODUCTION

The decline in personal and national saving rates in the US during the 1980's has stimulated a lively debate on saving incentives and, in particular, on the effectiveness of the tax-favored savings account. Many have proposed expanding the tax incentives for retirement savings (such as IRA's or 401(k)'s) to achieve increased private savings.

In this paper, we address the issue of whether the increase in IRA contributions that occurred between 1982 and 1986 was primarily new savings or whether households merely reshuffled their existing assets to take advantage of the tax benefits of these accounts. We present evidence that supports the idea that reshuffling explains this increase in contributions to IRA's.

Most economists and policy makers would agree that national saving was 'too low' in the 1980's. To effectively raise national saving, a plan that includes tax incentives must increase private saving by more than the amount of lost government revenue. Therefore, evidence that households primarily reshuffle is evidence that tax incentives for retirement saving are not an effective way to increase national savings.

As there is little consensus on the model that best describes saving behavior, the issue of the effectiveness of tax incentives in raising national saving is mainly an empirical one. Unfortunately, empirically it is very difficult to assess the effectiveness of these incentive schemes. From an aggregate stand point, we know that personal saving rates have continued to decline even after Congress implemented fiscal incentives for saving. Of course, it is conceivable that without these incentives saving rates would have declined *even more.* From a microeconomic stand point, we know that households participating in these schemes save more than households not participating in them. It is extremely difficult, however, to establish how much the same households would have saved without the tax incentive. A legitimate hypothesis is that participation in IRA accounts is simply an indicator of a high propensity to save and that participants would have saved approximately the same amount without the tax incentives. If so, these tax incentives merely represent a transfer from taxpayers to savers.

Authors have approached the question of whether the large amount of IRA contributions that occurred from 1982 to 1986 came from decreased consumption or from

other assets in three ways. First, there are econometric estimates of formal structural models of the household savings decision such as Venti and Wise (1986, 1987, 1990, 1991, 1992) and Gale and Scholz (1994). Others such as Burman, Cordes, and Ozanne (1990) draw inferences based upon an examination of what types of households contribute to IRA's. This type of analysis relies on the fact that the tax incentives of IRA deductibility will affect some households more than others. A third way to answer this question is to directly examine the behavior of households which contribute to IRA's. This approach is taken by Feenberg and Skinner (1989), Engen, Gale, and Scholz (1994), and is the approach we take here.

We compare the behavior of two groups of IRA contributors: 'new' contributors -- households which just opened an IRA account -- and 'old' contributors -- households which previously had made contributions. We can identify the effect of the tax incentives for retirement savings because the behavior of these two groups is likely to differ depending upon whether households reshuffle their existing assets into IRA's. In particular, if the tax incentives lead to increased private savings, we would expect households to reduce consumption to finance contributions when they open an IRA account. If the tax incentives lead to portfolio reshuffling then we would expect households to initially decrease their stocks of non-IRA assets when they open an IRA account. Given that both groups participate in IRA's, both show a 'taste' for saving. Therefore, the problems of unobserved heterogeneity that have plagued comparisons between the changes in non-IRA assets of contributors and non-contributors are less likely to arise.[1] As discussed below, in comparing these groups we account for any differences in their unobservable tastes for saving and discuss whether these differences can explain our results.

We find strong evidence that, during the 1982-1986 period, households reshuffled their existing assets into IRA's as opposed to reducing their consumption. While it is conceivable that unobserved heterogeneity could explain some of our results, we find this possibility extremely unlikely for reasons discussed below.

---

[1]Venti and Wise (1990), for example, use the CEX to compare the non-IRA saving of IRA contributors with that of non-contributors.

II. LITERATURE REVIEW

Many papers address the issue of whether IRA's induced households to increase their saving. There are, in general, three approaches to this problem: formal models, studies of the types of households which contribute to IRA's, and direct examinations of household behavior. Venti and Wise (1986, 1987, 1990, 1991, 1992) estimate formal models of household saving behavior using many different data sets including the CEX, the SIPP, and the SCF. In each of these papers, Venti and Wise adopt a functional form for savings behavior that specifically allows IRA saving to be a distinct commodity from other forms of saving. They find that most households finance their IRA contributions through reductions in consumption rather than through reductions in other forms of saving.

The model of household saving chosen by Venti and Wise purposefully departs from the classical life-cycle model in which different forms of saving are substitutes for each other. Unfortunately, the model they choose is ad hoc in that it is not the result of any consumer optimization problem, a point made by Deaton (1988) and Gravelle (1990). Furthermore, Venti and Wise do not account for unobserved heterogeneity across households in respect to savings behavior (see Kotlikoff (1990)).

The other prominent structural model of IRA savings is that of Gale and Scholz (1994). They estimate a 'typical' life-cycle model and find that little if any of the increase in IRA contributions would have been new saving. Gale and Scholz also specifically account for heterogeneity in their model. Both the Gale and Scholz model and the Venti and Wise model require strong functional form assumptions for identification.

There is little room in the life-cycle model for IRA's to represent new saving. The intertemporal allocation of consumption (and therefore saving) depends on its intertemporal price, i.e., the interest rate. However, as is well known, the income and substitution effects of changes in the interest rate will have opposite signs and result in an overall ambiguous effect on consumption.[2] Furthermore, even if the curvature of the utility function is such that

---

[2]Engen, Gale, and Scholz (1994) simulate a life-cycle model which displays almost no short-run response in savings to IRA and 401(k) tax incentives. However, their simulations

an increase in the interest rate leads to a decrease in current consumption, the tax deductibility of IRA contributions (with a limit to the contribution) only will increase the saving of consumers in particular regions of the intertemporal budget constraint. Under the life-cycle model, only households which do not save or which save little will, perhaps, have an incentive to increase their saving in response to the tax incentives of IRA's. Thus, several studies have examined the composition of IRA contributors. The idea is that if an IRA contributing household is at the contribution limit or has saved a lot previously to saving via IRA's, it is unlikely that this household has any incentive to increase its saving in response to IRA's. Thus, these studies use the fraction of IRA contributors that are limit contributors or that have large stocks of assets as an indication of the effectiveness of IRA's in increasing saving.

Burman, Cordes, and Ozanne (1990) use the IRS-Michigan Tax Panel to examine the composition of IRA contributors. They find that most IRA contributions were made by limit contributors. They also report that these limit contributors had higher incomes and higher wealth than non-contributors and non-limit contributors, implying that it is likely that most contributions came from households with no additional incentive to save as a result of IRA's. Ozanne (1994) provides further evidence on this point. He shows that, in addition to being primarily limit contributors, few households eligible to contribute did and most contributors had sizable assets holding and were older than non-contributors.[3]

A third approach to answer this question is to directly examine the behavior of households which contribute to IRA's in order to determine whether their contributions came from decreased consumption. Feenberg and Skinner (1989), using the IRS-Michigan Tax Panel, compare IRA contributors' holdings of taxable assets with those of non-contributors. They find that IRA contributors increased their non-IRA asset holdings more than non-contributors did during the period when contributions were tax deductible. Feenberg and Skinner interpret this evidence as showing that households did not substitute other assets for

---

do display a long-run response.

[3]16 percent of households eligible to contribute to IRA's did. Whether this fraction represents 'few' or 'many' households is debatable.

IRA's. However, as many authors have noted, households which save tend to save in all forms. Thus, it is likely that in the absence of IRA's the taxable assets holdings of IRA contributors would have grown just as much as or more than they did. Their finding could merely indicate that IRA contributors tend to save in all types of assets while non-contributors do not.

In a recent study, Engen, Gale, and Scholz (1994) use the IRS-Michigan Tax Panel to examine how variation in IRA contribution limits affects household savings.[4] They estimate a fixed effects model in first-differenced form in order to remove the influence of unobservable, time-invariant characteristics. They find no evidence that increases in IRA contribution limits led to increased household savings.

III. OUR TEST

Consider a household that can invest in two assets: an IRA and an alternative asset. One can see that, due to the intertemporal budget constraint, the household must finance an increase in IRA assets either by a reduction in other assets (reshuffling) or by an increase in savings.

If contributions to IRA's do not represent 'new saving,' when a household opens an IRA account it will move its existing assets into that account to take advantage of the tax benefits. To the extent that IRA accounts and other forms of assets are not perfect substitutes, households will hold, in equilibrium, both types of assets. A household will continue to reshuffle its assets until one of three things occurs: it reaches the equilibrium point, it reaches the contribution limit, or it runs out of other assets. If a household reaches its contribution limit, that household will continue to reshuffle in subsequent periods. The median levels of other assets (checking, savings, securities, and government bonds) for

---

[4] Engen et al. (1994) also analyze the effects of incentives of 401(k)'s. Unlike Poterba, Venti, and Wise (1993) they reach the conclusion that the incentives of these plans have little or no effect in generating new saving.

households and IRA contributors in our sample are $1050 and $9664 respectively. Thus, it is likely that many households will quickly reach equilibrium or run out of assets with which to reshuffle. If this assertion is true, a household that has already been contributing to IRA's is likely to adjust the flows rather than the stock of other assets. Therefore, we would expect that assets other than IRA's should grow faster (or decline more slowly) for 'old' contributors than for 'new' contributors.

On the other hand, if IRA incentives do stimulate saving, when a household opens an IRA account it will reduce its consumption. Furthermore, the household will continue to consume (and save) at the new level indefinitely. Therefore, we expect that households which start participating in IRA's should decrease their consumption, while households which have participated for an extended period should not.[5] If IRA assets and other forms of assets are distinct goods as some authors suggest, the household will not alter its stock of other assets when making IRA contributions.

These considerations suggest some simple tests of the 'reshuffling' hypothesis. We consider only households which reported making IRA contributions at the end of their observation period and divide this group into 'new' contributors -- households which reported contributing at the end but not at the beginning of their observation period -- and 'old' contributors -- households which reported contributing both at the beginning and at the end of their observation period. We might expect that the differences in unobservable tastes for savings between 'new' and 'old' contributors would be relatively small compared to that between contributors and non-contributors. If so, we can draw valid inferences on whether households reshuffle their other assets into IRA's or not.

The Consumer Expenditure Survey (CEX) provides the ideal data set on which to do such a test because it provides information on the change in and stock of financial assets at

---

[5] It should be stressed that this argument is not completely rigorous. It might be argued that households which were not surprised by the enactment of IRA's tax incentives should have taken these incentives into account, even before participating, in formulating their optimal consumption plans and, therefore, consumption should not be affected by the decision to participate. If one takes this argument literally, one should focus on the households which started participating in IRA's when the scheme was first introduced.

the end of the observation period, the consumption flow throughout the period, and annual income at the beginning and at the end of the period.

To summarize, we will be testing the following restrictions, the first implied by the 'new saving' hypotheses and the second implied by the 'reshuffling' hypotheses:

1) Changes in assets other than IRA's of 'new' contributors are not different from those of 'old' contributors,

2) Changes in consumption between the beginning and the end of the observation period should be the same for 'new' and 'old' contributors.

Thus, we formulate the following empirical model:

$$\Delta A_i = \beta^A X_i^A + \gamma^A NEW_i + \epsilon_i^A \tag{1}$$

$$\Delta C_i = \beta^C X_i^C + \gamma^C NEW_i + \epsilon_i^C \tag{2}$$

where ΔA_i is household i's change in assets, ΔC_i is household i's change in consumption from the beginning to the end of the observation period,[6] X_i is a set of individual and aggregate control variables and NEW_i is a dummy variable which equals one if household i is a 'new' contributor and zero otherwise.

The prediction of the 'new saving' hypothesis is that γ^A is zero while γ^C is negative. The prediction of the 'reshuffling' hypothesis is that γ^A is negative while γ^C is zero. In this simple model, both interpretations require that 'new' and 'old' contributors have the same unobserved tastes for saving.

Of course, it is possible that 'new' contributors are systematically different from 'old' contributors. The indicator we use to discriminate between the two hypotheses could be

---

[6]Note that we are unable to compute the change in savings from the beginning to the end of the observation period. Annual income is reported at both the beginning and the end of the observation period. However, the flow of consumption is what is reported throughout the observation period of one year. Our savings figure is computed by subtracting the sum of all twelve months of consumption flows from the annual income figure reported at the end of the observation period. It is not possible, therefore, to construct another savings measure using the earlier annual income figure as there are no consumption figures to match to it.

correlated with unobserved heterogeneity. However, if unobserved heterogeneity is to explain our results, we should observe a systematic difference in saving rates between the two groups. Therefore, we test the hypothesis that the two groups have the same saving rates.

$$SAVING_i = \beta^S X_i^S + \gamma^S NEW_i + \epsilon_i^S \tag{3}$$

The fact that our sample covers years in which the saving incentives existed (1982-1986) and years in which they did not (1987-1991) suggests another way to control for unobserved heterogeneity.[7] If unobserved heterogeneity is to explain the difference in changes in assets and in consumption between the two groups, we should expect to find these differences both when saving incentives were implemented and when they were not. On the other hand, the 'reshuffling' hypothesis predicts that differences in non-IRA asset changes between 'new' and 'old' contributors were mainly induced by the tax incentives. Therefore, we would expect to find significant differences in the change in assets only when the incentives were in place. Likewise, the 'new saving' hypothesis predicts significant differences in the change in consumption only when the tax incentives were in place. We, therefore, allow the coefficient on 'new' contributors in the period when the incentives were in place to differ from the coefficient on 'new' contributors in the other period.

Our empirical model is now:

$$\Delta A_i = \beta^A X_i^A + \gamma_1^A \delta_t NEW_i + \gamma_2^A (1 - \delta_t) NEW_i + \epsilon_i^A \tag{4}$$

$$\Delta C_i = \beta^C X_i^C + \gamma_1^C \delta_t NEW_i + \gamma_2^C (1 - \delta_t) NEW_i + \epsilon_i^C \tag{5}$$

$$SAVING_i = \beta^S X_i^S + \gamma_1^S \delta_t NEW_i + \gamma_2^S (1 - \delta_t) NEW_i + \epsilon_i^S \tag{6}$$

---

[7]The CEX begins in 1980. We exclude the 1980-1981 period from our sample because, although IRA contributions were tax deductible, eligibility was severely restricted prior to the enactment of the Economic Recovery Tax Act of 1981. The results, however, are not affected by the addition of observations from the 1980 and 1981 surveys.

where δ_i equals one if household i was interviewed between 1982 and 1986 and zero otherwise.

The hypothesis of new saving implies that $\gamma_1^A - \gamma_2^A = 0$ in equation (4) (and $\gamma_1^C - \gamma_2^C < 0$ in equation (5)). The 'reshuffling' hypothesis, instead, implies that $\gamma_1^C - \gamma_2^C = 0$ in equation (5) (and $\gamma_1^A - \gamma_2^A < 0$ in equation (4)).

A finding that neither γ_1^S nor γ_2^S in equation (6) is significantly different from zero would imply that it is unlikely that unobserved differences in tastes for saving can explain differences between the two groups in the accumulation of financial assets other than IRA's. A finding that $\gamma_1^S - \gamma_2^S = 0$ would indicate that unobserved heterogeneity is unlikely to explain a finding of $\gamma_1^A - \gamma_2^A$ significantly less than zero.

IV. DATA AND RESULTS

The CEX is a revolving panel dataset. Each household is interviewed four times. See Attanasio (1994) for a complete description of the CEX dataset. Each interview contains three months of household consumption data as well as personal and demographic information. In addition, the first and fourth interviews contain information on income (including IRA contributions). The fourth interview also contains information on assets and changes in assets. Not all households complete all four interviews; a household can miss any one (or more) of the interviews. Because of the nature of our test, however, we restrict our sample to include only those households which complete all of the interviews. While we are aware of the possibility that this procedure could introduce sample selection bias, we ignore this problem.

The only variable which deserves explanation is non-durable consumption which is defined as total consumption expenditure minus expenditure on durables, health, education and housing. Nominal dollars are converted into 1982-1984 dollars using a Stone price index for non-durable consumption constructed from the detailed BLS price indexes using expenditure shares as weights.

The observable characteristics of the two groups -- 'new' and 'old' contributors -- are

listed in Table 1. There are several significant differences in the average level of the observable characteristics between 'new' and 'old' IRA contributors. 'New' contributors tend to be less educated, slightly younger, poorer, less wealthy, more likely to be black, and have more children than 'old' contributors. This finding suggests, but does not ensure, that there may be differences in unobservable characteristics between the two groups.

The results obtained from estimating equations (4) to (6) can be found in Tables 2 through 4. Because consumption and savings behavior can differ dramatically over the life cycle and the business cycle, we include as controls five age dummies, indicators for both the number of children and the number of senior citizens in the household, a dummy for the presence of a spouse, and annual time dummies. Because the change in consumption between the first and the fourth interviews spans less than a year, monthly time dummies are also included as controls in equation (5). We also include controls for the education level, race, and region of residence of the households. The regional and time dummies as well as the regression constant are not reported in the tables. Due to the presence of top-coding and a potentially skewed distribution of wealth, income, or consumption in our sample, we report results using both least squares and quantile regressions.

In Table 2 we report the estimates of equation (6). As stressed above, the main reason for looking at such an equation is to establish whether 'new' and 'old' contributors exhibit different saving behavior during the two periods we are examining. To control for possible differences in current and/or permanent income between the two groups, we consider the ratio of saving to non-durable consumption. This variable is a monotonic transformation of the saving rate and has the advantage of being defined even when income is equal to zero.

We find that the ratio of savings to non-durable consumption decreases by a tenth for each child in the household. Surprisingly, that ratio is four-tenths higher for black households than for non-black households. Households with a spouse present also have higher savings rates relative to other households. Savings increases strongly with the level of education and increases and then decreases with age. The coefficients on age are, however, measured rather imprecisely.

Both columns of Table 2 indicate that in neither period do 'new' contributors have

lower savings rates than 'old' contributors, indicating that unobservable differences between the two groups is most likely not a problem. In the 1982 to 1986 period, the point estimate of the coefficient on the 'new' contributors is somewhat smaller (in absolute value) than in the following period. However, the difference between the coefficients on the 'new' contributors in the two periods is not significant at the 35% level.

In Tables 3a and 3b, we report the estimates of equation (4). We use two definitions of non-IRA assets. The first includes stocks, bonds, savings, and checking accounts, while the second excludes savings and checking accounts. In Table 3a, the dependent variable is the change in non-IRA assets divided by non-durable consumption while in Table 3b we simply deflate the change by a consumer price index. Finally, we report OLS estimates as well as quantile regressions.

We find that the presence of children leads to slower non-IRA asset growth. In contrast to the results in Table 2, black households tend to have slower non-IRA asset growth relative to non-black households. Asset growth increases with education and age, but the coefficients on age are imprecisely measured.

The change in non-IRA assets of 'new' IRA contributors is significantly (statistically and economically) lower than that of the 'old' IRA contributors during the period in which IRA incentives were implemented (1982-1986). Furthermore, the coefficient on 'new' contributors in the period in which IRA incentives were implemented is significantly lower than that in the following period in columns 2 - 5 of both tables. This evidence supports the hypothesis that IRA incentives caused mainly a reshuffling of existing assets, rather than creating new saving. Our argument is supported by the evidence in Table 2 which shows no significant differences between the total saving of 'new' contributors across the two periods. The point estimates in Table 2, if anything, show that in the period when IRA incentives were in place, the difference in saving rates between 'new' and 'old' contributors was minimal and smaller than in the previous period.

One can use the results reported in Table 3 to assess the amount of IRA contributions that represent increases in household saving and that represent new national saving. Because medians do not aggregate, we use the OLS point estimate (from Table 3a, column 1) for this exercise. If one assumes that 'old' contributors, having already reached an equilibrium, do

not 'reshuffle' the stock of non-IRA assets (savings, checking, stocks, and bonds) and that there are no income differences between 'new' and 'old' contributors, one could use the coefficient on the new contributors dummy as an estimate of the dollar amount of reshuffling. However, we know that 'old' contributors are, on average, richer so that the negative coefficient on the new contributors dummy in column 1 of Table 3b could simply reflect this effect; this difference was the main reason we used the ratio of changes in assets to non-durable consumption rather than levels. If one ignores the covariance between the level of consumption and the ratio of changes in asset to consumption, one can multiply the coefficients on the 'new' contributors dummy in the first column of Table 3a by average non-durable consumption and interpret the result as the amount of reshuffling in response to IRA incentives. The possibility that 'old' contributors do some reshuffling implies that this calculation should be interpreted as a lower bound on the amount of reshuffling. Furthermore, it is also possible that IRA contributions come, at least in part, from the flow of saving (saving that would have been done anyway) rather than from adjusting the stock.

The average real IRA contribution for households which just opened an IRA account during the 1982 to 1986 period was $2471. The average real level of non-durable consumption for these same households was $12093. Table 3a then implies that the percent of IRA contributions that represent net additions to personal savings is less than 40%.[8]

To calculate the effect on national saving we estimate each household's marginal tax rate using the procedure described in Maki (1994) and compute the average loss of revenue due to the deductability of IRA contributions. This figure is equal, for new contributors, to $439. [9] This implies that less than 20% of IRA contributions represented addition to national savings. We should stress, once more, that this is an upper bound.

In Table 4, we report the estimates of equation (5). Changes in consumption are computed as the change in real consumption expenditure between the quarters preceding the first and last interviews. Because there is less than a year between these interviews, it is

---

[8] 0.377 = 1 - 0.1272 x 12093 / 2471.

[9] The mean and median marginal tax rate for the sample of new contributors were 18.6% and 20%.

crucial to control for seasonality (as well as year effects and other demographics, as in Tables 3). Again, we report both OLS and quantile regressions results.

We find that the presence of additional children tends to reflect faster consumption growth at the center of the distribution, but slower growth at the upper tail. The presence of senior citizens in the household leads to slower consumption growth. Black households and households with a spouse present both exhibit slower consumption growth relative to other households. The coefficients on the number of children, the number of senior citizens, and race are all imprecisely measured, however. Consumption growth tends to increase with the level of education and to decrease and then increase with age.

The estimates of the coefficient on the 'new' contributors dummy, once again, seem to favor the 'reshuffling' hypothesis. There is no evidence that 'new' contributors reduced their consumption relative to 'old' contributors during the 1982 to 1986 period. If anything, 'new' contributors exhibit positive consumption growth relative to 'old' contributors. Importantly, the difference between the coefficients on the 'new' contributors in the two periods is not significant at the 40% level.

V. DISCUSSION

Our analysis relies on the assumption that unobserved tastes for saving for each group do not change with the period of IRA tax deductibility given all other explanatory variables. It may appear that the difference between 'new' and 'old' contributors is due to the composition of the two groups changing with the popularity of IRA's. However, this argument is unlikely to explain our result.

Suppose that, during the heyday of IRA's, many households that did not usually save opened IRA accounts, perhaps due to the influence of heavy advertising. Once IRA deductibility was removed, however, non-savers no longer opened IRA accounts. If this were the case, then the ranks of 'new' contributors would be filled with relatively more households with low tastes for saving during the period when IRA's were tax deductible. This fact would bias down the estimates of 'new' contributors, during the period in which

IRA incentives were implemented, for the other assets equation and the savings equation and bias up those for the consumption equation. Thus, if the deductibility of IRA's induced otherwise marginal savers to save, this new saving potentially could be mistaken for reshuffling.

If the above argument were true, however, we would expect saving rates to be lower for 'new' contributors in the period when IRA's were tax deductible relative to that for the following period. The results in Table 2 do not support this hypothesis; while it is true that the point estimates indicate that 'new' contributors save less than 'old' ones, the effect is particularly pronounced when saving incentives were not in place. The difference in saving rates between the two groups is smaller when incentives were effective than they were not. In any event, the difference between the two coefficients is not statistically different from zero. Thus, it is unlikely that either unobserved tastes for saving or changes in these tastes can explain our results.

Furthermore, if the above argument is true, we would expect 'new' contributors to have observable characteristics that change over time as well. A comparison of some observable characteristics is given in Table 5. In the period when IRA's were tax deductible, 'new' contributors are less educated, are more likely to be white, are less likely to contribute to a pension, are older, and have more senior citizens in the household than 'new' contributors during the period when IRA's were not tax deductible. The ratios of income and wealth to consumption, however, do not change across periods. Overall, we think it is unlikely that a potentially changing composition of 'new' contributors over time can explain our results.

The results we report are robust to a number of experiments. As we mentioned above, adding 1980 and 1981 to the years in which saving incentives were not implemented does not change our results. We also tried adding changes in real income to our specification. It is conceivable that, if 'new' contributors had faster real income growth relative to 'old' contributors, 'new' contributors would exhibit faster consumption growth as well. Failing to account for differences in real income growth between 'new' and 'old' contributors could mask any relative decrease in consumption by 'new' contributors and weaken the results reported in Table 4. That is, 'new' contributors could be generating new

savings out of increases in income rather than decreases in consumption. In fact, 'new' contributors had an average change in real income of $5548 compared to $663 for 'old' contributors.[10] When we include changes in real income as a control variable in equation (5), however, our results do not change; there continues to be no evidence that 'new' contributors reduced their consumption relative to 'old' contributors during the period in which IRA's were tax deductible.

Note that failing to account for differences in real income growth will, if anything, strengthen the results of Tables 3a and 3b that the change in non-IRA assets of 'new' contributors is lower than that for 'old' contributors. Again, including changes in real income in equation (4) does not change our results.

VI. CONCLUSION

We approach the question of whether IRA contributions represent primarily new saving or reshuffled assets by comparing the behavior of households which just opened an IRA account to that of households which already had an IRA account. 'New' contributors and 'old' contributors will behave differently depending upon whether their contributions come from reduced consumption or reductions in other assets. In particular, the 'new saving' hypothesis predicts that 'new' contributors should have slower consumption growth than 'old' contributors while the 'reshuffling' hypothesis predicts that 'new' contributors should have slower growth in non-IRA assets than 'old' contributors.

Comparing IRA contributors with non-contributors is problematic due to the likelihood of unobserved heterogeneity across the two groups. We specifically account for heterogeneity by testing the parameter restrictions implied by each hypothesis across periods of IRA deducibility. Because neither hypothesis predicts a difference in behavior between 'new' and 'old' contributors when IRA's were not tax deductible, we can identify the effect of IRA's separately from the effect of unobserved heterogeneity.

---

[10]The difference is significant at the 99.9% level.

We find that 'new' contributors have slower non-IRA asset growth relative to 'old' contributors, and that there is no difference in consumption growth between 'new' and 'old' contributors. Furthermore, we find that there is no difference in savings behavior between the two groups. Thus, we have strong evidence, accounting for unobserved heterogeneity, in support of the hypothesis that from 1982 to 1986 households made contributions to IRA's primarily from reductions in other assets and not from reduced consumption.

REFERENCES

Attanasio, Orazio P. (1994), "Personal Saving in the U.S." in James M. Poterba, ed., *International Saving Comparisons*, University of Chicago Press, Chicago (forthcoming).

Bovenberg, Lans A. (1989), "Tax Policy and National Savings in the United States: A Survey," *National Tax Journal*, Vol 42, pp. 123-128.

Burman, Leonard, Joseph Cordes, and Larry Ozanne (1990), "IRA's and National Savings," *National Tax Journal*, Vol 43, pp. 259-283.

Deaton, Angus (1987), "Comment" in Martin A. Feldstein, ed., *The Effects of Taxation on Capital Accumulation*, University of Chicago Press, Chicago.

Engen, Eric M., William G. Gale, and John Karl Scholz (1994), "Do Savings Incentives Work?" *Brookings Papers on Economic Activity*, pp. 85-180.

Feenberg, Daniel and Jonathan Skinner (1989), "Sources of IRA Savings" in Lawrence H. Summers, ed., *Tax Policy and the Economy*, M.I.T. Press, Cambridge, Mass.

Gale, William G., and John Karl Scholz (1994), "IRA's and Household Savings," *American Economic Review* (forthcoming).

---------- (1994), "Examining the Evidence on IRA's and Household Saving" in M. Kosters, ed., *Personal Saving, Consumption, and Tax Policy*, AEI Press, Washington, DC.

Gravelle, Jane G. (1991), "Do Individual Retirement Accounts Increase Savings?" *Journal of Economic Perspectives*, Vol 5, pp. 133-148.

Hubbard, R. Glenn (1984), "Do IRA's and Keoghs Increase Savings?" *National Tax Journal*, Vol. 37, pp. 43-54.

Kotlikoff, Laurence J. (1990), "The Crisis in U.S. Savings and Proposals to Address the Crisis," *National Tax Journal*, Vol 43, pp. 233-246.

Maki, Dean (1994), "Household Debt and the Tax Reform Act of 1986," Mimeo, Stanford University.

Poterba, James M., Steven F. Venti, and David A. Wise (1993) "Do 401(k) Contributions Crowd Out Other Personal Saving?" *Working Paper No. 4391*, National Bureau of Economic Research, Cambridge, Mass.

Ozanne, Larry J. (1994), "Past Experience and Current Proposals for IRA's" in M. Kosters, ed., *Personal Saving, Consumption, and Tax Policy*, AEI Press, Washington, DC.

Venti, Steven F., and David A. Wise (1986), "Tax-Deferred Accounts, Constrained Choice, and Estimation of Individual Saving," *Review of Economic Studies*, Vol. 53, pp. 579-601.

---------- (1987), "IRA's and Saving" in Martin A. Feldstein, ed., *The Effects of Taxation on Capital Accumulation*, University of Chicago Press, Chicago.

---------- (1990), "Have IRA's Increased U.S. Savings? Evidence from Consumer Expenditure Surveys," *Quarterly Journal of Economics*, Vol. 105, pp. 661-698.

---------- (1991), "The Saving Effect of Tax-Deferred Retirement Accounts: Evidence from SIPP" in B. Douglas Bernheim and John B. Shoven, eds., *National Savings and Economic Performance*, University of Chicago Press, Chicago.

---------- (1992), "Government Policy and Personal Retirement Saving" in James M. Poterba, ed., *Tax Policy and the Economy*, Vol. 6, M.I.T. Press, Cambridge, Mass..

Wise, David A. (1994), "IRA's and Saving" in M. Kosters, ed., *Personal Saving, Consumption, and Tax Policy*, AEI Press, Washington, DC.

TABLE 1: OLD vs. NEW CONTRIBUTORS

MEANS (Standard Deviation)	OLD N=2872	NEW N=2054	t-Test for Equality of Means
INCOME	41843 (27225)	38702 (27613)	-4.081
CONSUMPTION	26866 (14367)	26516 (15563)	-0.823
WEALTH	32374 (44202)	21304 (36382)	-9.315
BLACK	0.0206 (0.1419)	0.0375 (0.1901)	3.684
SPOUSE PRESENT	0.7526 (0.4316)	0.7510 (0.4325)	-0.127
DROP-OUT	0.1025 (0.3033)	0.1094 (0.3122)	0.799
HIGH SCHOOL GRAD	.2398 (.4270)	0.2865 (0.4522)	3.797
SOME COLLEGE	.2163 (.4118)	0.2224 (0.4160)	0.531
COLLEGE GRAD	.4415 (.4966)	0.3817 (0.4860)	-4.322
AGE	48.62 (11.41)	46.78 (12.51)	-5.496
NUMBER OF CHILDREN	0.5846 (0.9479)	0.7304 (1.0601)	5.207
NUMBER OF SENIOR CITIZENS	0.1260 (0.4025)	0.1400 (0.4221)	1.220
PENSION	0.1589 (0.3656)	0.1629 (0.3694)	0.393

TABLE 2: SAVING EQUATION

	(1) OLS	(2) Median
NEW CONTRIBUTOR *(1982-1986=TRUE)	-0.0425	-0.0253
	(0.0701)	(0.0619)
NEW CONTRIBUTOR *(1982-1986=FALSE)	-0.0984	-0.1097
	(0.0684)	(0.0603)
NUMBER OF CHILDREN	-0.1409	-0.1182
	(0.0288)	(0.0252)
NUMBER OF SENIOR CITIZENS	-0.1249	0.0046
	(0.0986)	(0.0871)
BLACK	0.3339	0.4146
	(0.1446)	(0.1275)
SPOUSE PRESENT	0.1177	0.2637
	(0.0579)	(0.0511)
HIGH SCHOOL GRAD	0.1201	0.2083
	(0.0864)	(0.0764)
SOME COLLEGE	0.1726	0.2355
	(0.0903)	(0.0798)
COLLEGE GRAD	0.4635	0.4889
	(0.0843)	(0.0744)
AGE: 25-34	0.6822	0.6848
	(0.3357)	(0.2914)
AGE: 35-44	0.6054	0.5965
	(0.3346)	(0.2905)
AGE: 45-58	0.4878	0.4576
	(0.3329)	(0.2888)
AGE: 59-64	0.5468	0.4500
	(0.3364)	(0.2920)
AGE: >= 65	0.6086	0.3038
	(0.3657)	(0.3182)
P-VALUE	0.5612	0.3204

Column (1): OLS Regression.
Column (2): Median Regression.
Real Savings is the ratio of after-tax income less total consumption to non-durable consumption.
Also included in the regression but not reported are annual and regional dummy variables and a constant.
Standard errors are reported in parenthesis.
P-Value is the result from a Wald Statistic on the hypothesis that the coefficients on New Contributor*(1982-1986=True) and New Contributor*(1982-1986=False) are the same.

TABLE 3a: CHANGE IN NON-IRA ASSETS EQUATION

	(1) OLS	(2) 75th	(3) 90th	(4) OLS	(5) 90th
NEW CONTRIBUTOR * (1982-1986=TRUE)	-0.1272 (0.0443)	-0.1368 (0.0206)	-0.2837 (0.0680)	-0.0597 (0.0350)	-0.2090 (0.0153)
NEW CONTRIBUTOR * (1982-1986=FALSE)	-0.0269 (0.0432)	-0.0531 (0.0200)	-0.0949 (0.0659)	0.0356 (0.0342)	-0.0267 (0.0145)
NUMBER OF CHILDREN	-0.0242 (0.0182)	-0.0335 (0.0091)	-0.0818 (0.0299)	-0.0030 (0.0144)	-0.0161 (0.0064)
NUMBER OF SENIOR CITIZENS	-0.0147 (0.0623)	0.0796 (0.0294)	-0.1358 (0.1013)	0.0042 (0.0492)	0.0384 (0.0203)
BLACK	-0.1996 (0.0914)	-0.1205 (0.0418)	-0.3770 (0.1379)	-0.0638 (0.0722)	-0.0419 (0.0308)
SPOUSE PRESENT	-0.0946 (0.0366)	-0.0354 (0.0169)	-0.2404 (0.0564)	-0.0105 (0.0289)	-0.0009 (0.0127)
HIGH SCHOOL GRAD	0.0813 (0.0547)	0.0268 (0.0254)	0.1126 (0.0857)	0.0377 (0.0432)	0.0137 (0.0187)
SOME COLLEGE	0.1216 (0.0571)	0.0512 (0.0266)	0.1912 (0.0906)	0.0119 (0.0451)	0.0290 (0.0199)
COLLEGE GRAD	0.1184 (0.0532)	0.0994 (0.0248)	0.3023 (0.0850)	0.0342 (0.0421)	0.1356 (0.0186)
AGE: 25-34	0.0833 (0.2121)	0.0884 (0.0955)	0.3369 (0.2971)	0.0399 (0.1676)	0.0440 (0.0657)
AGE: 35-44	0.1668 (0.2115)	0.1074 (0.0953)	0.4588 (0.2964)	0.0915 (0.1671)	0.0560 (0.0656)
AGE: 45-58	0.1416 (0.2104)	0.0381 (0.0945)	0.4263 (0.2943)	0.1171 (0.1662)	0.0411 (0.0652)
AGE: 59-64	0.1925 (0.2126)	0.0483 (0.0956)	0.6046 (0.2984)	0.1039 (0.1680)	0.0290 (0.0661)
AGE: >=65	0.2271 (0.2311)	-0.0313 (0.1046)	0.7350 (0.3294)	0.0486 (0.1826)	0.0779 (0.0710)
P-VALUE	0.0993	0.0031	0.0419	0.0476	0.0000

Column (1): OLS regression where the Real Change in Assets is defined as the Ratio of the annual change in stocks, government bonds, savings and checking accounts to non-durable consumption.
Column (2): same as (1) but a 75th quantile regression.
Column (3): same as (1) but a 90th quantile regression.
Column (4): OLS regression where the Real Change in Assets is defined as the Ratic of the annual change in stocks and government bonds to non-durable consumption.
Column (5): same as (4) but a 90th quantile regression.
P-Value is the result from a Wald Statistic on the Hypothesis that the Coefficients on New Contributor*(1982-1986=True) and New Contributor*(1982-1986=False) are the same.

TABLE 3b: CHANGE IN NON-IRA ASSETS EQUATION

	(1) OLS	(2) 75th	(3) 90th	(4) OLS	(5) 90th
NEW CONTRIBUTOR * (1982-1986=TRUE)	-1740.1 (534.2)	-1713.4 (218.6)	-4714.7 (862.1)	-925.5 (385.4)	-2587.4 (199.1)
NEW CONTRIBUTOR * (1982-1986=FALSE)	-424.0 (528.7)	-741.5 (213.8)	-1197.8 (834.5)	238.1 (381.4)	-336.5 (187.1)
NUMBER OF CHILDREN	-254.7 (221.4)	-260.2 (97.5)	-612.7 (384.0)	-25.5 (159.7)	-168.3 (79.8)
NUMBER OF SENIOR CITIZENS	-143.8 (764.4)	598.0 (315.9)	669.3 (1235.1)	-333.2 (551.5)	204.0 (272.6)
BLACK	-2224.2 (1092.7)	-996.3 (444.4)	-3642.5 (1726.0)	-916.1 (788.4)	-529.7 (406.7)
SPOUSE PRESENT	186.9 (443.6)	209.6 (182.0)	505.3 (717.5)	127.2 (320.1)	256.3 (164.3)
HIGH SCHOOL GRAD	507.9 (681.4)	221.2 (279.0)	621.0 (1106.3)	87.6 (491.7)	109.0 (251.7)
SOME COLLEGE	1046.9 (707.7)	494.2 (290.4)	1501.9 (1166.6)	244.4 (510.6)	281.1 (268.5)
COLLEGE GRAD	1887.4 (659.1)	1045.9 (270.8)	4336.4 (1100.4)	588.4 (475.5)	1371.3 (251.7)
AGE: 25-34	584.2 (2539.8)	310.7 (943.4)	1112.4 (3726.6)	373.6 (1832.4)	330.2 (854.3)
AGE: 35-44	1537.1 (2531.3)	698.5 (939.5)	2598.1 (3706.2)	1017.8 (1826.3)	336.6 (851.5)
AGE: 45-58	1479.7 (2517.2)	37.6 (933.0)	2308.0 (3681.8)	1259.9 (1816.2)	252.5 (845.0)
AGE: 59-64	1595.7 (2545.8)	96.0 (946.9)	3491.8 (3739.0)	588.2 (1836.8)	141.0 (858.5)
AGE: >=65	3722.8 (2781.4)	-66.1 (1051.9)	5571.0 (4172.7)	2259.9 (2006.8)	2329.8 (929.7)
P-VALUE	0.0747	0.0012	0.0029	0.0290	0.0000

Column (1): OLS regression where the Real Change in Assets is defined as the annual change in stocks, government bonds, savings and checking accounts deflated by a Consumer Price Index.
Column (2): same as (1) but a 75th quantile regression.
Column (3): same as (1) but a 90th quantile regression.
Column (4): OLS regression where the Real Change in Assets is defined as the annual change in stocks and government bonds deflated by a Consumer Price Index.
Column (5): same as (4) but a 90th quantile regression.
P-Value is the result from a Wald Statistic on the Hypothesis that the Coefficients on New Contributor*(1982-1986=True) and New Contributor*(1982-1986=False) are the same.

TABLE 4: CHANGE IN CONSUMPTION EQUATION

	(1) OLS	(2) Median	(3) 75th	(4) 90th
NEW CONTRIBUTOR * (1982-1986=TRUE)	0.4025	0.1254	0.2187	0.6511
	(0.1953)	(0.0885)	(0.1199)	(0.2670)
NEW CONTRIBUTOR * (1982-1986=FALSE)	0.3266	0.2315	0.1592	0.7845
	(0.2078)	(0.0943)	(0.1268)	(0.2808)
NUMBER OF CHILDREN	0.0822	0.0611	-0.0315	-0.2086
	(0.0831)	(0.0377)	(0.0521)	(0.1209)
NUMBER OF SENIOR CITIZENS	-0.0236	-0.2821	-0.1928	-0.7043
	(0.2839)	(0.1283)	(0.1754)	(0.3964)
BLACK	-0.5159	-0.6482	-0.4885	-0.8389
	(0.4362)	(0.1974)	(0.2617)	(0.6037)
SPOUSE PRESENT	-0.3302	-0.1380	-0.6473	-1.3416
	(0.1689)	(0.0766)	(0.1031)	(0.2298)
HIGH SCHOOL GRAD	-0.0870	0.0646	0.1979	0.0313
	(0.2491)	(0.1130)	(0.1522)	(0.3382)
SOME COLLEGE	0.1626	0.0902	0.0934	0.1247
	(0.2603)	(0.1180)	(0.1593)	(0.3515)
COLLEGE GRAD	0.3784	0.1912	0.1943	0.1992
	(0.2415)	(0.1096)	(0.1474)	(0.3263)
AGE: 25-34	-1.0239	-1.0316	-1.4574	0.3085
	(1.0400)	(0.4631)	(0.5751)	(1.0615)
AGE: 35-44	-0.4999	-0.6266	-1.3750	-0.0415
	(1.0369)	(0.4616)	(0.5728)	(1.0529)
AGE: 45-58	-0.7251	-0.6298	-1.4705	-0.1559
	(1.0314)	(0.4590)	(0.5694	(1.0449)
AGE: 59-64	-0.1155	-0.2674	-0.8624	0.5929
	(1.0406)	(0.4632)	(0.5763)	(1.0626)
AGE: >=65	-0.2593	-0.1607	-1.0177	2.2850
	(1.1201)	(0.4998)	(0.6306)	(1.2061)
P-VALUE	0.7863	0.4031	0.7272	0.7232

Column (1): OLS Regression on log change in real total consumption between the 2nd and 5th interviews. Real total consumption is nominal consumption deflated by a consumer price index..
Column (2): same as (1) except median regression.
Column (3): same as (1) except 75th quantile regression.
Column (4): same as (1) except 90th quantile regression.
P-Value is the result from a Wald Statistic on the Hypothesis that the Coefficients on New Contributor*(1982-1986=True) and New Contributor*(1982-1986=False) are the same.

TABLE 5: NEW CONTRIBUTORS ACROSS PERIODS OF TAX DEDUCTIBILITY

MEAN (Standard Deviation)	1982-1986 N=1014	1987-1990 N=1040	t-Test for Equality of Means
RATIO OF INCOME TO NON-DURABLE CONSUMPTION	2.891 (1.718)	2.961 (1.606)	-0.968
RATIO OF WEALTH TO NON-DURABLE CONSUMPTION	1.681 (3.147)	1.610 (2.887)	0.520
BLACK	0.029 (0.167)	0.0463 (0.2103)	-2.181
SPOUSE PRESENT	0.764 (0.425)	0.7384 (0.4397)	1.374
DROP-OUT	0.137 (0.344)	0.0817 (0.2741)	4.186
HIGH SCHOOL GRAD	0.287 (0.453)	0.2861 (0.4521)	0.041
SOME COLLEGE	0.197 (0.398)	0.2470 (0.4315)	-2.793
COLLEGE GRAD	0.378 (0.485)	0.3851 (0.4868)	-0.331
AGE	47.35 (12.44)	46.22 (12.56)	2.123
NUMBER OF CHILDREN	0.701 (1.054)	0.7593 (1.0657)	-1.283
NUMBER OF SENIOR CITIZENS	0.122 (0.387)	0.1580 (0.4538)	-2.009
PENSION	0.141 (0.348)	0.1844 (0.3880)	-2.740