SAVING INCENTIVES FOR LOW- AND MIDDLE-INCOME FAMILIES: EVIDENCE FROM A FIELD EXPERIMENT WITH H&R BLOCK*

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We analyze a randomized experiment in which 14,000 tax filers in H&R Block offices in St. Louis received matches of zero, 20 percent, or 50 percent of IRA contributions. Take-up rates were 3 percent, 8 percent, and 14 percent, respectively. Among contributors, contributions, excluding the match, averaged $765 in the control group and $1100 in the match groups. Taxpayer responses to similar incentives in the Saver's Credit are much smaller. Taxpayers did not game the experiment by receiving a match and strategically withdrawing funds. Tax professionals significantly influenced contribution choices. These results suggest that both incentives and information affect behavior.

I. INTRODUCTION

Many low- and middle-income American families save little for retirement or for other purposes. Families with income below $40,000 are unlikely to participate in employer-provided pensions or Individual Retirement Arrangements (IRAs) and in 2001 had just $2,200 in median net financial wealth outside of retirement accounts.[1] Researchers and policy-makers have long considered ways to raise saving among these families. The conventional

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1. See Burman et al. [2004] for data on defined contribution pension coverage rates by income group. Calculations from the 2001 Survey of Consumer Finances (SCF) imply that only one-quarter of households with income below $40,000 have defined benefit coverage. Among households with cash income below $40,000,

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government approach to subsidizing saving (through 401(k)s and traditional IRAs) provides tax deductions for contributions and tax deferral on account earnings. This approach has not enticed low- and middle-income families to contribute very much to retirement accounts, in part because the value of tax preferences is modest for families with low marginal income tax rates. In contrast, matching contributions can be provided independently of an individual's marginal income tax rate and thus could more effectively bolster retirement contributions for low- and middle-income households. Little is known, however, about the effects of matching programs on low- and middle-income families.

The Saver's Credit offers one example of matching contributions (see Gale, Iwry, and Orszag [2005] and Koenig and Harvey [2005]). Enacted in 2001, the credit provides a federal income tax reduction of up to 50 percent of contributions to a 401(k) or IRA. Use of the credit, however, is limited by several factors: the credit has low income-eligibility thresholds, it is not refundable, and it has a complex structure. Matches have also been provided in Individual Development Account (IDA) programs, which subsidize specific types of saving (such as for a down payment) by low-income households [Sherraden 1991; Boshara 2005]. Given the program design, however, the effects of matching offers cannot be separated from other IDA features such as required financial education [Mills, Gale, and Patterson 2005].

Many employers offer matching contributions in their 401(k) plans. The match rate, however, may not be independent of worker characteristics, firm-specific shocks (such as changes in profitability), or other aspects of firm behavior (e.g., firms may simultaneously raise match rates and promote their 401(k) plans). It is difficult, therefore, to isolate the effects of matching rates on contributions, and previous studies have found decidedly mixed evidence.[2] In addition, 401(k)s are more likely to be offered

about 2 percent contributed to a Roth or traditional IRA in 2004 [Burman et al. 2004]. Median net financial wealth in the text is calculated from the 2001 SCF.

2. Bernheim [2003] identifies the effects of matching rates on contributions as an important and unresolved issue. See Choi, Laibson, and Madrian [2004], Even and MacPherson [2005], General Accounting Office [1997], Kusko, Poterba, and Wilcox [1998], Papke [1995], and Papke and Poterba [1995]. Two recent studies provide evidence comparable to our results. Engelhardt and Kumar [2004] use data from the Health and Retirement Study and find that introducing a 20 (50) percent match rate raises contributions by about 10 (25) percent. Huberman, Iyengar, and Jiang [2004] use data from 647 defined contribution plans administered by Vanguard and find that raising the match rate from zero to 100 percent increases participation by 13 percentage points, but that the presence of a match

in larger firms with comparatively better-off workforces, and workers contribute via automatic payroll deductions—so the results may not apply to low- and middle-income families or to policy interventions that occur outside the workplace.

This paper reports evidence from the first large-scale, randomized field experiment regarding the effects of matching rates on the willingness of low- and middle-income families to contribute to IRAs. By randomizing the matching rate across tax filers, we identify how the presence of a match and variations in the matching rate affect both take-up and contribution levels. Unlike the Saver's Credit, the match provided in this experiment is available to (virtually) all tax filers, has a simple and transparent structure, is explained to potential account holders in a straightforward manner, and is deposited directly into an IRA rather than reducing income tax liability. Unlike IDAs, the experiment provides variation in match rates across individuals and does not couple the match rate with other program features. Unlike studies of 401(k) plans, the matches examined in this paper are guaranteed (by random assignment) to be independent of individual characteristics and the workplace environment.

The experiment was conducted in conjunction with H&R Block, who paid the direct costs associated with implementing the experiment, providing the matching contributions, distributing promotional materials, and training the tax professionals. From March 5 to April 5, 2005, any client preparing a tax return in one of 60 H&R Block offices in low- and middle-income neighborhoods of the St. Louis metropolitan area was randomly assigned to one of three match rates for IRA contributions: zero (the control group), 20 percent, or 50 percent. Contributions were matched up to $1000, a limit that applied separately for each spouse for married tax filers.

The experiment generated several interesting results. First, variation in match rates affected taxpayer choices. The take-up rates were 3 percent, 8 percent, and 14 percent, respectively, for the control group, the 20-percent match group, and the 50-percent match group. Conditional on take-up, average contribution levels (excluding the match) were $765, $1102, and $1108, respectively. Average contribution levels (unconditional and exclusive of

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has either no impact or a negative impact on contribution levels conditional on participation.

the match) were $22, $85, and $155, respectively, for the three groups. Thus, the presence of a match raised participation and contribution levels. The higher (50 percent) match rate raised take-up and aggregate contributions further and did not reduce average contributions among participants, even as their number rose. Controlling for other factors, filers with a large refund, with positive investment income, or with higher overall income were more likely to respond to the matching offer.

Second, taxpayers were much more responsive to variation in matching rates in our experiment than to equivalent variation in the incentives embedded in the Saver's Credit. Changing the match rate from 20 percent to 50 percent raised IRA participation by 6 percentage points in our experiment, but we estimate that changes in the effective matching rate in the Saver's Credit from 25 percent to 100 percent increase participation by at most 1.3 percentage points. We suspect that the difference in responsiveness is due to differences in information and framing that arise from the simple and salient way the experimental match was presented compared with the opaque design of the Saver's Credit.

Third, other behavioral patterns also suggest that framing and information affect saving decisions and that a simple model of fully informed, rational savers is incomplete. Take-up rates were not only far below 100 percent, they never exceeded 20 percent, even among tax filers in the 50 percent match group who had substantial refunds, participated in other saving vehicles, or had higher incomes. Likewise, although filers could have "gamed the system" by contributing to the IRA, receiving the matching funds, and cashing out shortly thereafter, they did not do so. Moreover, the tax professional filling out the return appears to have influenced tax filer contributions.

A limitation of our analysis is that we cannot address the impact of the added IRA contributions on households' net worth. Future experimental work is needed to measure the extent to which such contributions represent net increases in saving.

The remainder of the paper is organized as follows. Section II describes the experimental design and data. Section III presents the experimental results. Section IV estimates behavioral responses to the Saver's Credit. Section V concludes by discussing several issues: why people did not game the system or respond more fully to the 50 percent match; issues in applying our findings to a national matching program; the effects of the added IRA contributions on overall wealth; and implications for the roles of

both economic incentives and the provision of information in shaping behavioral responses to, and in designing, public policy.

II. Experimental Design and Implementation

II.A. Design

The experiment took place in 60 H&R Block offices in the St. Louis metropolitan area from March 5 to April 5, 2005.[3] The experiment centers around the Express IRA (X-IRA), a product through which H&R Block offers clients the chance to make IRA contributions at the time of tax preparation. X-IRAs can be funded with the forthcoming tax refund. As many low- and moderate-income tax filers receive substantial refunds, tax preparation is potentially an advantageous time to encourage households to contribute to retirement accounts. X-IRAs can be either traditional IRAs, where the contribution is deductible for tax purposes and income taxes are paid upon withdrawal, or Roth IRAs, where the contribution is not deductible but no tax is due upon withdrawal.[4] The minimum annual contribution for an X-IRA is $300 and can be made on a one-time basis or via automatic monthly deductions of at least $25 from a bank account. In our experiment, however, only one-time contributions were eligible to be matched. There is a $15 fee for opening or recontributing to the account at the time of tax preparation (contributions and withdrawals by mail are free) and a $25 account termination fee. A $10 annual maintenance fee is waived for accounts with balances over $1000 or for those using automatic deductions. Until the balance reaches $1000, the only investment option is a FDIC-insured money market bank account. Take-up of the X-IRA has been modest. In tax season 2004, for example, 1.4 percent of H&R Block clients contributed to a new or existing X-IRA.

In the experiment, any client coming to prepare taxes at one of the relevant offices received a waiver of the $15 X-IRA set-up fee and was randomly assigned to one of three groups. The control group received no match. A second group received a 20 percent match on X-IRA contributions up to $1000. A third group received

3. Forty-five offices participated for the full experimental period. The other fifteen offices participated from March 12 through April 5.

4. As with other IRAs, withdrawals from X-IRAs before age 59.5 face a tax penalty of 10 percent (on principal and return for traditional IRAs and on return only for Roth IRAs) over and above ordinary income taxes. Penalty-free early withdrawals are allowed for first-time home purchase, medical, or education.

a 50 percent match on X-IRA contribution up to $1000. IRAs are individually owned, so the same offer was extended to each spouse for married tax filers filing jointly. For example, if a married couple filing jointly was assigned to the 20 percent match group, both the husband and the wife could simultaneously open X-IRA accounts, contribute to the limit, and receive $200 each in matching contributions, for a total family match of $400.

Random assignment was based on the last two digits of the Social Security number of the primary filer. The probability of assignment was 34 percent, 32 percent, and 34 percent in the control, 20-percent match, and 50-percent groups, respectively.

II.B. Implementation

A full interpretation of the results requires a description of some aspects of the tax return preparation process and the tax professional training provided by H&R Block. Tax professionals at H&R Block use a Tax Preparation Software (TPS) program to complete clients' tax returns. TPS has a default ordering of screens but tax professionals can skip or return to any screen at any time. Many screens are not accessed through the default sequence and appear only if relevant (triggered, for example, by entry of a particular level or type of income) or if chosen by the tax professional. Prior to the experiment, the X-IRA screen was not part of the default sequence.

To implement the experiment, TPS was modified in two ways at the affected offices. First, the X-IRA screen was made part of the default sequence. Thus, tax professionals would encounter the screen unless they actively chose not to. Second, when the X-IRA screen was activated, a special pop-up window automatically appeared presenting the offers corresponding to the client's treatment status and asking whether the client wanted to contribute to an X-IRA.[5] At any point in preparing the return, the tax professional could come back to the X-IRA screen and trigger the (same) pop-up offer window and modify the initial X-IRA contribution choice.

Because the experiment depended significantly on the knowledge and behavior of the tax professionals, extensive training and information were provided. Over 90 percent of the approximately

5. Tax professionals are paid $5.50 for each X-IRA account opened or recontributed to by their clients and this commission structure was in place for our experiment. More generally, a tax professional receives greater compensation for completing a more complicated (and therefore more time-consuming) tax return.

600 tax professionals working in the experimental offices attended one-hour group training sessions, led by an H&R Block implementation manager and a member of the research team and focused solely on this experiment. The training described the general goal of the experiment and explained the TPS changes. Tax professionals had the chance to ask questions and were provided with documentation. Several standard X-IRA refresher training sessions were also offered to local tax professionals on a voluntary basis in early March. Field observations during the experiment confirmed that there was substantial knowledge and enthusiasm for the program among the tax pros.

In the training, the tax professionals were instructed to read the pop-up offer from the screen and explain it to the tax filer. In particular, the pop-up window used $500 as an example of a contribution level and presented the associated match. Field observations, however, suggest that the tax pros instead often presented the offer in a way that they felt would be more intuitive for the client. Tax professionals were also instructed to present the offers as opportunities for retirement savings and explicitly told not to tell tax filers that they could "game the system" by making contributions and then withdrawing the funds and the match immediately after the match was deposited on April 15. Field observations and follow-up focus groups suggest that tax pros followed this advice closely.

During tax preparation, tax professionals informed clients that they were receiving a special X-IRA offer as part of a research project and that they were under no obligation to participate. The professionals also provided H&R Block's standard X-IRA explanation that IRAs are not for everyone and that there can be penalties for early withdrawal. The experiment was not advertised; therefore, almost all clients discovered the offer at the time of tax preparation.

Tax professionals were not informed of the algorithm for assigning clients to each group, and the match rate (treatment status) was not revealed by the software until after reaching the X-IRA offer screen. Thus, tax professionals' decisions to offer (or skip) the X-IRA screen were independent of treatment status. The decision may, however, have depended on an assessment of whether the client was likely to make a contribution. To ensure that our results are applicable to the entire population of IRA-eligible H&R Block clients, we do not analyze take-up conditional on a client receiving an X-IRA offer. Instead, we include all tax

TABLE I
DESCRIPTIVE STATISTICS

	Mean			Significance of the difference in means: t-stats		
	No match	20% match	50% match	20% vs. no match	50% vs. 20% match	50% vs. no match
	(1)	(2)	(3)	(4)	(5)	(6)
Fraction of returns offered X-IRA	0.748	0.741	0.747			
	(0.007)	(0.007)	(0.007)			
This tax pro made no offer	0.005	0.004	0.006			
during experiment	(0.001)	(0.001)	(0.001)			
Fraction of returns with X-IRA	0.022	0.022	0.022			
by tax pro 01/01–03/04	(0.000)	(0.000)	(0.000)			
Adjusted Gross Income ($)	42,891	44,378	43,433			
	(525)	(567)	(572)			
Adjusted Gross Income ($)	67,961	68,410	68,756			
married taxpayers	(986)	(971)	(1017)			
Adjusted Gross Income ($)	29,134	29,910	29,539			
nonmarried taxpayers	(439)	(534)	(542)			
Fraction married, filling jointly	0.354	0.376	0.354	2.145	2.150	
	(0.007)	(0.007)	(0.007)			
Overpayment amount ($)	1582	1552	1561			
	(26)	(26)	(26)			
Fraction with overpayment	0.665	0.662	0.656			
above $500	(0.007)	(0.007)	(0.007)			
Fraction with investment income	0.448	0.461	0.458			
	(0.007)	(0.007)	(0.007)			

TABLE I
(CONTINUED)

	Mean			Significance of the difference in means: t-stats		
	No match	20% match	50% match	20% vs. no match	50% vs. 20% match	50% vs. no match
Fraction who own home	0.449	0.424	0.448	2.445	2.316	
	(0.007)	(0.007)	(0.007)			
Fraction returning customers	0.711	0.715	0.714			
	(0.007)	(0.007)	(0.007)			
Fraction EITC recipients	0.174	0.161	0.173			
	(0.006)	(0.005)	(0.005)			
Fraction with savings account	0.624	0.631	0.621			
	(0.007)	(0.007)	(0.007)			
Fraction with 401(k) contributions	0.268	0.269	0.269			
	(0.006)	(0.007)	(0.006)			
Number of observations	4719	4521	4722			

The table displays descriptive statistics for the three experimental groups (columns (1), (2), (3)) and reports t-statistics when differences across groups are significant at the 5 percent level (columns (4) and (5)). Standard errors are in parentheses. The sample is all returns eligible to contribute to an X-IRA filed between March 5 and April 5, 2005, in the 60 St. Louis H&R Block offices that participated in the experiment. Row 1 reports the fraction of offers, defined as returns for which the X-IRA offer pop-up screen was reached. Row 3 reports the average over tax professionals of the fraction of returns for which an X-IRA was sold among returns completed by the tax pro before the experiment started. Adjusted gross income is always inclusive of all traditional X-IRA contributions (as X-IRA contributions are affected by the experiment). Home and savings account ownership data are collected during tax preparation. Investment income is defined as interest income (taxable and nontaxable) and all dividends.

filers regardless of whether they received an offer (i.e., we present "intent-to-treat" estimates). We allocate filers to the experimental groups based on the last two digits of their Social Security number.

Matches to the X-IRAs totaled roughly half a million dollars and were deposited on April 15, 2005, into the X-IRA accounts whose balances had not been withdrawn before that date.

II.C. Data and Descriptive Statistics

The data for the analysis were provided by H&R Block, which stripped the file of any individual identifiers (such as name, Social Security number, phone numbers, addresses, office names, etc.) before sending the information to the research team. The data include information from the tax return, X-IRA contributions, other information collected by H&R Block during tax preparation, and information about the tax professional. We exclude filers with less than $300 in earned income, since they are not eligible to make the minimum X-IRA contribution. All other filers may open an X-IRA.[6] We often divide filers into "married" (married filing jointly) and "nonmarried" (single, heads of household, and married filing separately) categories.

Table I displays the means of several variables for each experimental group. Only two variables are significantly different at the 5 percent level between the treatment and control groups. In the 20 percent match group, the proportion of married filers is slightly higher, and the fraction of homeowners is slightly lower than in the other groups. When examining a large number of characteristics, it is not surprising, of course, to find some significant differences, even when randomization was successfully implemented.

Offer rates were about 75 percent in each group. This is consistent with the idea that tax pros did not figure out the randomization algorithm. The roughly 25 percent of cases in which no offer was made do not arise from a few tax professionals systematically avoiding the pop-up screen; almost all professionals displayed the screen at some point. Tax professionals were more likely to offer the X-IRA as the experiment progressed: the

6. There is no age limit to make IRA contributions as long as tax filers have earned income. Almost no tax filer had reached the maximum IRA contributions for both 2004 and 2005 at the time of tax preparation. Tax filers with high AGI can still make nondeductible traditional IRA contributions which qualified for the experimental match.

offer rate increased from 55 percent on March 12 to almost 80 percent around March 22, and was fairly constant after that.

The average control-group AGI of $43,000 is similar to the national average.[7] A little less than half of the sample own a house. Two-thirds have a federal refund larger than $500, which would generally allow them to fund a $300 X-IRA out of their refund even if they owed taxes at the state level. Almost half of tax returns report positive investment income (interest, dividends, or rents). About two-thirds report owning a savings account, and just over a quarter make 401(k) contributions.

III. Results

III.A. Take-up Rates and Contributions by Group

Table II presents the main results of the experiment. Take-up rates for the X-IRA were 2.9 percent, 7.7 percent, and 14.0 percent, respectively, in the no-match, 20 percent match, and 50 percent match groups, and the differences are statistically significant.[8] Average contributions among contributors were significantly higher in the two matching groups (about $1100) than in the control group ($765). Overall, the average contribution levels (unconditional and exclusive of the match) were $22, $85, and $155, respectively, for the three groups.

Thus, the *presence* of a match raises IRA participation and contributions conditional on participation, relative to the control group. *Raising the matching rate* to 50 percent from 20 percent raises participation and aggregate contributions further, but does not affect the average level of contributions among participants.

7. Our sample of late season filers is a higher-income sample than the entire Block client base since lower-income clients, particularly those eligible for the EITC, tend to file early in order to receive their tax refunds as soon as possible. In St. Louis, for example, H&R Block clients eligible for an X-IRA who filed between January 1 and March 5, 2005, had average AGI of about $28,000.

8. These results contrast with Beverly, Schneider, and Tufano [2005] who obtain much larger take-up rates (around 15 percent) for a split tax refund option with no match in an experiment in Tulsa, Oklahoma, with a nonprofit tax preparer. In the Tulsa experiment, the refund was split into a regular savings account set up at the time of tax preparation. Thus, the Tulsa version allowed tax filers to withdraw funds at any time with no penalty. It is unclear whether the difference in results between the Tulsa study and our no-match X-IRA control group is due to the difference in withdrawal policy or to differences in how aggressively the savings vehicles were sold to clients and in how much the clients trusted the tax advisers. In sharp contrast to our X-IRA results below, 95 percent of initial contributions were withdrawn from the Tulsa saving accounts within 6–8 months after setup.

TABLE II
EFFECTS OF THE EXPERIMENT ON X-IRA BEHAVIOR

	Mean				Difference		
	Pre-experiment	No match	20% match	50% match	20% match vs. no match	50% match vs. 20% match	50% match vs. no match
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PANEL A: ALL TAX RETURNS							
Opened an X-IRA (%)	2.52	2.90	7.72	13.98	4.82**	6.26**	11.07**
	(0.38)	(0.24)	(0.40)	(0.50)	(0.46)	(0.65)	(0.56)
Amount contributed ($)	16.3	22.2	85.1	154.9	62.9**	69.8**	132.7**
(unconditional)	(4.5)	(3.1)	(6.1)	(7.4)	(6.7)	(9.6)	(8.0)
Amount contributed ($)	644.3	765.1	1102.3	1108.2	337.2**	5.9	343.1**
(positive contributions only)	(50.4)	(84.0)	(54.9)	(34.4)	(102.2)	(61.9)	(84.7)
Amount contributed, inclusive of match ($)		22.2	98.8	222.3	76.6**	123.5**	200.1**
(unconditional)		(3.1)	(6.9)	(10.1)	(7.4)	(12.3)	(10.5)
Amount contributed, inclusive of match ($)		765.1	1280.3	1590.7	515.2**	310.5**	825.6**
(positive contributions only)		(84.0)	(59.7)	(43.6)	(108.9)	(74.0)	(103.0)
PANEL B: MARRIED TAX RETURNS ONLY							
Opened at least one X-IRA (%)	1.97	2.39	9.36	17.81	6.97**	8.45**	15.42**
	(0.55)	(0.37)	(0.71)	(0.94)	(0.80)	(1.17)	(1.01)
Amount contributed ($)	19.8	32.6	139.9	266.9	107.3**	127.0**	234.3**
(unconditional)	(10.1)	(7.5)	(14.0)	(17.9)	(15.9)	(22.7)	(19.4)
Amount contributed ($)	1004.0	1364.4	1494.8	1498.4	130.5	3.6	134.1
(positive contributions only)	(14.7)	(230.0)	(98.4)	(62.3)	(227.4)	(111.5)	(189.6)
Amount contributed, inclusive of match ($)		32.6	162.1	381.0	129.5**	218.9**	348.3**
(unconditional)		(7.5)	(15.8)	(24.2)	(17.5)	(28.8)	(25.4)
Amount contributed, inclusive of match ($)		1364.4	1732.1	2138.7	367.7	406.6**	774.3**
(positive contributions only)		(230.0)	(106.2)	(76.8)	(241.1)	(130.7)	(225.9)

TABLE II
(CONTINUED)

	Mean				Difference		
	Pre-experiment	No match	20% match	50% match	20% match vs. no match	50% match vs. 20% match	50% match vs. no match
Both spouses opened an X-IRA (%)	0.27	0.36	4.12	8.37	3.76**	4.25**	8.01**
	(0.21)	(0.15)	(0.48)	(0.68)	(0.51)	(0.83)	(0.69)
Amount contributed, secondary taxpayer ($)	3.9	5.4	49.5	90.9	44.1**	41.3**	85.5**
(unconditional)	(3.9)	(2.7)	(6.9)	(8.3)	(7.4)	(10.8)	(8.8)
PANEL C: NONMARRIED TAX RETURNS ONLY							
Opened an X-IRA (%)	2.86	3.18	6.73	11.87	3.55**	5.14**	8.69**
	(0.50)	(0.32)	(0.47)	(0.59)	(0.56)	(0.76)	(0.67)
Amount contributed ($)	14.2	16.5	52.1	93.4	35.6**	41.3**	76.9**
(unconditional)	(4.0)	(2.4)	(4.8)	(5.6)	(5.3)	(7.4)	(6.1)
Amount contributed ($)	492.6	518.0	773.8	786.9	255.8**	13.1	269.0**
(positive contributions only)	(36.8)	(55.6)	(46.6)	(26.2)	(76.4)	(49.5)	(58.3)
Amount contributed, inclusive of match ($)		16.5	60.7	135.3	44.3**	74.6**	118.8**
(unconditional)		(2.4)	(5.4)	(7.7)	(5.8)	(9.6)	(8.1)
Amount contributed, inclusive of match ($)		518.0	902.2	1139.6	384.2**	237.5**	621.6**
(positive contributions only)		(55.6)	(50.0)	(32.8)	(80.5)	(58.0)	(69.6)

The table reports X-IRA statistics for tax returns filed by the three experimental groups (columns (2)–(4)) for all taxpayers with at least $300 in earned income (IRA eligible) who filed in the 60 St. Louis experimental offices between March 5 and April 5, 2005. Columns (5)–(7) report the differences across experiment groups. For comparison purposes, column (1) reports X-IRA statistics for taxpayers filing in the same offices on the same days in 2004. Standard errors are in parentheses. * and ** denote significance at the 5 percent and 1 percent levels, respectively. Unconditional amounts are averages including zeros (those with no X-IRA contributions). Amounts contributed for married tax filers are the sum of contribution by each spouse. Married taxpayers are defined as married filing jointly. Nonmarried taxpayers are defined as all others (single, head of household, and married filing separately). The secondary taxpayer in a married couple is defined as the one making the smaller IRA contribution. If both individuals make the same contribution, the secondary taxpayer is the one whose name is listed second on the tax return.

This does not imply, however, that the higher match rate did not have a causal effect on an individual's decision of how much to contribute. Since the higher match rate affected the probability of contributing, it also changed the pool of contributors. Indeed, the fact that the average contribution stayed constant even though more people, presumably with lower propensities to save, were induced to participate suggests that the higher match rate could well have raised contributions for those in the 50 percent match group who would also have participated at a lower match rate. (Figure I, discussed below, provides corroborating evidence.) The fact that tax filers respond to the level of the match suggests that the response is (at least to some extent) a reasoned calculation, and not simply a case where the match attracted filers' attention to the existence of the X-IRA [Bernheim 2003].

With no match, the take-up rate is only 0.4 percentage points higher than in the prior year during the same days in the same offices. While this comparison is not experimental evidence per se, it at least suggests that waiving the set-up fee, making the X-IRA screen part of the default sequence, and giving tax professionals additional training and experience delivering the X-IRA product are not enough to increase take-up significantly in the absence of a match.[9]

The last two panels of Table II show that the effects of the match on take-up rates and amounts contributed for married tax returns were substantially larger than for others.[10] The take-up rates for a second X-IRA for married filers were 0.4 percent, 4.1 percent, and 8.4 percent for the three groups. This shows that match rates also generate a large response on the spousal (or secondary) X-IRA contribution decision for couples.

Figure I shows the cumulative distribution of X-IRA contributions (excluding matching amounts) for nonmarried filers. The fraction of filers contributing at least any given amount is highest for the 50 percent match group, followed by the 20 percent match

9. Take-up rates from January 1 to March 5 were 2.58 and 2.41 percent in 2004 and 2005, respectively, suggesting that taxpayers in the prior year may be an acceptable comparison group for the no-match group.

10. We use the tax return as the unit of analysis and thus define a married couple filing jointly as participating if at least one spouse contributes to an IRA. Contribution amounts are defined as the sum of contributions for the two spouses. Viewed, alternatively, on a per capita basis, effects were lower for married couples.

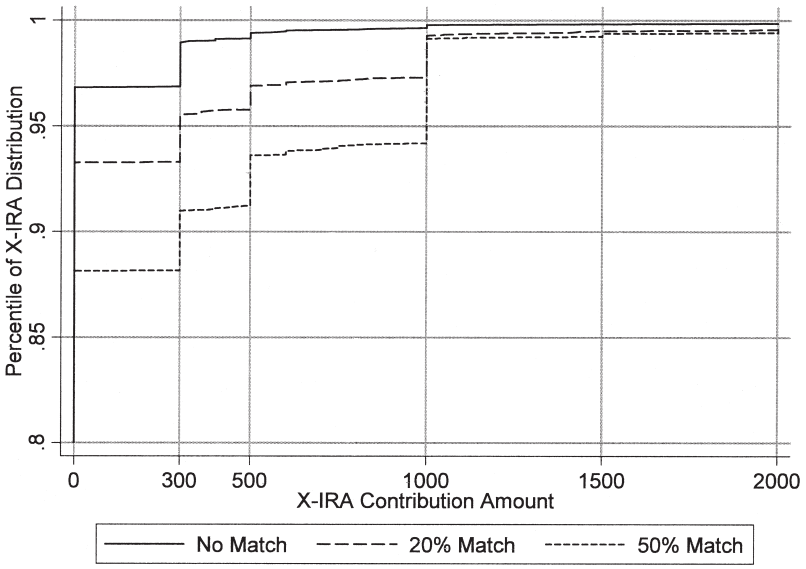

FIGURE I

Cumulative Distributions of X-IRA Contributions (Excluding Joint Filers)

The figure displays the cumulated distribution of X-IRA contributions in each of the three treatment groups (no match, 20 percent match, and 50 percent match) for tax filers not filing jointly. For example, 97 percent of tax filers in the no match group made no X-IRA contributions, 99 percent made contributions of $300 or less, etc. Vertical portions in the graphs are due to bunching of tax filers at those exact contribution levels. The minimum X-IRA contribution is $300. The maximum matched contribution is $1000. Five hundred dollars was used as the illustrative example when presenting matching offers and also may be an inherently salient number.

group, and then the control group. Contributions are clustered at $300 (the minimum) and $1000 (the maximum contribution eligible for the match). About 40 percent of nonmarried contributors contribute exactly the maximum eligible for a match. Clustering also occurs at $500, perhaps reflecting the dollar value used on the X-IRA screen as an illustration or perhaps simply because 500 is a salient number. Above the $1000 match cap, the match provides only an income effect, with no substitution effect. Standard theory would therefore predict that a higher match should reduce contributions above the cap. Instead, however, the fraction of filers contributing in excess of $1000 remains higher for the match groups than for the control group. Similar results hold for married filers (see Duflo et al. [2005]).

III.B. Individual Determinants of Participation and Contributions

Duflo et al. [2005] document that responses to the match were larger for tax filers with higher income, tax refunds, saving accounts, 401(k) contribution, and investment income (dividends or interest income); for repeat customers; and for filers who did not own homes.[11] EITC recipients, with lower incomes but large tax refunds, had somewhat lower take-up rates than nonrecipients. Take-up of the match rises sharply with age, from age 18 to age 40, is relatively flat from age 40 to age 60, and then *decreases* above age 60. The last finding is particularly interesting because those age 59.5 and above face no penalties for IRA withdrawals. Choi, Laibson, and Madrian [2005] report similar evidence for people over age 60 who do not contribute to their 401(k) even though their employer matches contributions and they face no withdrawal penalty.

To test the effects of these characteristics on take-up and contributions, controlling for other factors, Table III reports two OLS regressions. The first, examining take-up, is reported in the first three columns. The first column reports coefficients on a set of covariate dummies, while the second and third columns show the coefficients for the same set of dummy covariates interacted with the 20 percent and 50 percent treatment group indicators, respectively. Therefore, the first column reports the effect on take-up of switching a covariate from zero to one for those with no match. The second and third columns estimate the *additional* effect of the 20 and 50 percent match rates, respectively (relative to the control group), when the covariate dummy equals one. The coefficients are not causal estimates; rather, they show how the effects of matching incentives change across the population when a given characteristic changes but other characteristics are constant. Columns (4)–(6) report the same effects for unconditional contributions.

The results show that, controlling for other factors, the match has a bigger effect on take-up and contributions for those with a refund above $500, with positive investment income, or with higher income. Interestingly, none of those covariates affects

11. Informal field evidence suggests that many homeowners use their tax refund to pay past-due property tax bills, which could explain why homeowners contribute less to X-IRAs than nonhomeowners both with and without match incentives.

TABLE III
MATCH EFFECTS ON X-IRA TAKE-UP AND AMOUNTS INTERACTED

Dummy variables X	Effect on Take-up (percentage points)			Effects on Amounts ($)		
	X	20% match * X	50% match * X	X	20% match * X	50% match * X
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.18	−1.01	1.72	3.83	−29.52	−9.11
	(1.52)	(2.15)	(2.13)	(21.59)	(30.54)	(30.26)
Refund above $500	3.11**	3.04*	3.10**	9.27	44.69**	15.21
	(0.83)	(1.19)	(1.17)	(12.02)	(17.22)	(16.96)
Married	−0.90	2.31	2.26	4.95	65.95**	118.22**
	(0.97)	(1.37)	(1.37)	(14.10)	(19.96)	(19.96)
Homeowner	0.43	−0.28	−3.21*	−6.97	14.38	−19.14
	(0.98)	(1.40)	(1.39)	(14.26)	(20.29)	(20.15)
Investment income > 0	−0.29	4.54**	8.26**	15.91	71.66**	110.46**
	(0.88)	(1.26)	(1.25)	(12.83)	(18.34)	(18.10)
Repeat customer	0.92	−0.10	1.12	2.27	−2.69	1.46
	(0.90)	(1.29)	(1.28)	(13.12)	(18.80)	(18.52)
401(k) contributions > 0	0.66	−1.62	1.45	3.63	−28.93	16.82
	(0.93)	(1.34)	(1.32)	(13.49)	(19.40)	(19.13)
Income Quartile 2	0.19	2.46	2.63	15.19	8.29	1.47
	(1.24)	(1.79)	(1.76)	(18.05)	(26.04)	(25.54)
Income Quartile 3	0.58	0.03	3.60*	4.01	2.36	40.00
	(1.24)	(1.77)	(1.73)	(17.96)	(25.74)	(25.17)
Income Quartile 4	−0.38	3.01	4.51*	−10.51	49.17	98.30**
	(1.29)	(1.85)	(1.82)	(18.77)	(26.93)	(26.38)
Adj. R^2	0.0563			0.0569		

Columns (1) to (3) report OLS coefficients of a single regression of an X-IRA take-up dummy (normalized to 100) on treatment groups dummies, covariate dummies, and covariate dummies interacted with treatment dummies. Columns (4) to (6) report OLS coefficients of a single regression of unconditional X-IRA contributions on the same variables. Standard errors are in parentheses. * and ** denote significance at the 5 percent and 1 percent levels, respectively. The coefficients in column (1) can be interpreted as the effect on take-up of switching the corresponding covariate dummy variable from zero to one. The coefficients in columns (2) and (3) can be interpreted as the additional effect of the 20 percent match and 50 percent match, respectively (always relative to no match), for a tax filer with corresponding covariate dummy equal to one.

take-up in the absence of the match, except for having a refund above $500. Being married has only a marginal influence with regard to take-up (significant at the 10 percent level), but stronger effects on amounts because two people can contribute.

III.C. Tax Professional Effects

Field observations suggested that tax professionals affected X-IRA behavior and that tax professionals differed with respect to effort, enthusiasm, and knowledge about the program. To test for these effects, we categorize tax professionals in two ways. First, we assign a dummy variable equal to one for tax professionals whose returns had X-IRA take-up rates above the median (1.5 percent) during tax season 2005 but *before* the experiment began on March 5. The second split is based on behavior during the experiment. Because there is a mechanical correlation between take-up by a particular filer and the mean X-IRA take-up for the filer's tax pro, we compute for each filer the take-up rate for the *other* returns prepared by the same tax pro during the experiment, and assign a dummy equal to one when this fraction is above the median (5.4 percent).

Table IV (column (1)) shows the results of a regression of X-IRA take-up on a constant, dummy variables for the two match rates, a dummy for the tax professional X-IRA take-up (based on experience prior to the experiment in the first panel and based on experience during the experiment in the second panel), and the interaction of this dummy with the match rates. The coefficients on the interactions are all statistically significant and large relative to the observed differences in take-up across groups.

This result is consistent with the view that tax professionals' attitudes and skills influenced the effect of the match rate, but the results could also reflect differences in the mix of clients working with different tax professionals. To control for these factors, column (2) reports coefficients on the same variables, but controlling also for a full set of office dummies, all of the individual variables included in Table III, and their interaction with the treatment dummies. The coefficients on the interaction variables in column (2) are very close to those reported in column (1), suggesting that the effects are large and are robust to differences in observable characteristics and to unobservable characteristics varying at the office level. After controlling for the factors mentioned, X-IRA take-up in the 50 percent match group was no higher than in the control group for tax pros with less than

TABLE IV
OLS REGRESSIONS: TAX PRO EFFECTS ON X-IRA TAKE-UP

	All tax filers		Only new customers	
	No control variables	With control variables	No control variables	With control variables
	(1)	(2)	(3)	(4)
A. Tax Pro X-IRA Client Take-Up Rates Before March 5, 2005				
20% match	3.19**	−2.47	1.72	−0.40
	(0.79)	(2.20)	(1.29)	(3.19)
50% match	8.69**	−0.45	6.28**	1.44
	(0.78)	(2.18)	(1.26)	(3.17)
Tax pro above median	2.01**	1.53	1.52	0.83
	(0.78)	(0.81)	(1.27)	(1.32)
Tax pro above median * 20% match	3.25**	3.26**	3.41	2.78
	(1.12)	(1.10)	(1.82)	(1.80)
Tax pro above median * 50% match	4.82**	4.76**	2.32	1.65
	(1.11)	(1.09)	(1.80)	(1.78)
Number of observations	13962	13962	4006	4006
B. Tax Pro X-IRA Client Take-Up Rates During The Experiment				
20% match	1.84*	−3.01	1.98	−0.15
	(0.78)	(2.16)	(1.26)	(3.12)
50% match	5.43**	−3.11	4.17**	−0.48
	(0.77)	(2.14)	(1.24)	(3.12)
Tax pro above median	2.1**	1.02	2.81*	1.15
	(0.78)	(0.79)	(1.26)	(1.29)
Tax pro above median * 20% match	5.99**	5.69**	3.09	3.59*
	(1.11)	(1.65)	(1.82)	(1.81)
Tax pro above median * 50% match	11.45**	8.28**	6.81**	6.22**
	(1.10)	(1.63)	(1.79)	(1.77)
Number of observations	13904	13904	3984	3984

X-IRA dummy (normalized to 100) is regressed on treatment dummies, tax professional experience dummy with X-IRAs, and tax professional dummy interacted with treatment dummies. Regressions in columns (2) and (4) control for all individual variables in Table V, and all the variables interacted with the two match rate dummies; they also control for a full set (60) of office dummies. Regressions in (3) and (4) are limited to the sample of tax filers who did not file with H&R Block the preceding year. In Panel A, the tax pro experience dummy is equal to one if the tax pro is above median in the fraction of returns with X-IRA taken up before the experiment. In Panel B, the tax pro experience dummy is equal to one if the tax pro is above median in the fraction of returns with X-IRAs taken up during the experiment (excluding current return observation). Standard errors are in parentheses. * and ** denote significance at the 5 percent and 1 percent levels, respectively.

median X-IRA take-up, but was 4.7 and 8.3 percentage points higher for tax professionals above the median (using the two different definitions of above the median).

TABLE V
EVIDENCE ON WITHDRAWALS AS OF AUGUST 1, 2005

	Mean			Difference		
	No match	20% match	50% match	20% match vs. no match	50% match vs. 20% match	50% match vs. no match
	(1)	(2)	(3)	(4)	(5)	(6)
PANEL A: Initial Contributions						
Opened an X-IRA (%)	2.90	7.72	13.98	4.82**	6.23**	11.07**
	(0.24)	(0.40)	(0.50)	(0.46)	(0.65)	(0.56)
Initial X-IRA amount inclusive of effective match (unconditional)	$22	$102	$232	$80**	$130**	$210**
	(3.1)	(7.3)	(11.1)	(7.8)	(13.4)	(11.5)
PANEL B: Net Contributions as of August 1, 2005						
X-IRA still opened (%)	2.71	7.39	12.88	4.68**	5.49**	10.17**
	(0.24)	(0.39)	(0.49)	(0.45)	(0.63)	(0.54)
Amounts outstanding, inclusive of match (unconditional)	$19	$91	$204	$72**	$113**	$185**
	(2.5)	(6.7)	(10.3)	(7.1)	(12.4)	(10.6)
PANEL C: Withdrawal Activity by August 1, 2005						
Fraction of contributors withdrawing	0.109	0.138	0.144	0.029	0.006	0.035
	(0.027)	(0.018)	(0.014)	(0.034)	(0.023)	(0.032)
Average amount withdrawn among contributors	$119	$143	$198	$24	$55	$79
	(57.1)	(31.1)	(24.8)	(61.2)	(40.9)	(60.4)

TABLE V
(CONTINUED)

	Mean			Difference		
	No match	20% match	50% match	20% match vs. no match	50% match vs. 20% match	50% match vs. no match
Amount withdrawn/Initial X-IRA balance (%)	0.156	0.108	0.119	−0.048	0.011	−0.037
	(0.075)	(0.024)	(0.015)	(0.060)	(0.027)	(0.047)
PANEL D: Characteristics of withdrawers						
Fraction contributors aged 60 and above	0.109	0.143	0.159	0.034	0.016	0.050
	(0.026)	(0.019)	(0.014)	(0.034)	(0.024)	(0.034)
Fraction withdrawers aged 60 and above	0.267	0.063	0.105	−0.204*	0.042	−0.162
	(0.118)	(0.035)	(0.032)	(0.091)	(0.051)	(0.092)
Fraction contributors choosing Roth IRA	0.544	0.602	0.593	0.058	−0.009	0.049
	(0.043)	(0.026)	(0.019)	(0.050)	(0.032)	(0.046)
Fraction withdrawers choosing Roth IRA	0.633	0.646	0.663	0.013	0.017	0.030
	(0.124)	(0.068)	(0.049)	(0.140)	(0.084)	(0.132)
Fraction contributors making 2005 contributions	0.066	0.092	0.061	0.026	−0.031	−0.005
	(0.021)	(0.015)	(0.009)	(0.028)	(0.017)	(0.023)
Fraction withdrawers with 2005 contributions	0.333	0.125	0.074	−0.208	−0.051	−0.259**
	(0.126)	(0.048)	(0.027)	(0.111)	(0.051)	(0.084)

Standard errors are in parentheses. * and ** denote significance at the 5 percent and 1 percent levels, respectively. Initial contributions (inclusive of match) differ from those presented in Table I because H&R Block inadvertently matched the full contribution instead of only the first $1000. Early (nonqualified) withdrawals from traditional IRAs face a 10 percent tax penalty (in addition to regular taxes) on principal and return. Early (nonqualified) withdrawals from Roth IRAs face no tax penalty on principal and a 10 percent tax penalty on return. Tax filers making a 2005 IRA contribution who withdraw the money during 2005 face no tax penalty at all (not considered as a retirement contribution by IRS). Individuals reaching age 59.5 can withdraw IRA money with no tax penalty.

To attempt to control for other unobserved characteristics, we further restrict the sample to filers who did not file their tax return with H&R Block in 2004, since repeat tax filers may choose a tax professional they particularly like. New tax filers are often assigned to the next available tax professional when they arrive at an H&R Block office, so that within an office, the assignment of a new tax filer to a particular tax professional should not be related to the tax pro or the client's characteristics, ameliorating the concern that clients who are more likely to take up the match are working with the same tax pros. Column (3) displays the results without controls, and column (4) shows the results with controls. The drawback of the new customer subsample is that it is much smaller. Nevertheless, we still obtain quantitatively large and statistically significant effects in the bottom panel (using take-up rates during the experiment).

The results therefore suggest that tax pros have an important effect on the probability that individuals take up the match. The mechanisms through which this effect occurs, however, are unclear and worthy of further study. One issue is the extent to which such effects occur through variations in offer rates among tax professionals compared with variations in X-IRA take-up conditional on offer rates. To provide some preliminary perspectives on this issue, we constructed the offer rate for each tax professional in the first part of the experiment (March 12 to March 20) and added a control for this variable to the regressions reported in panel B of Table V (results not shown). The coefficient on the offer rate itself is positive but not statistically different from zero. Controlling for offer rate, the coefficients on the various tax professional variables were virtually the same as in panel B, suggesting that the tax pro effect goes beyond his or her decision to offer the X-IRA, and has something to do with the tax professionals' attitude, skill, or other traits involved in presenting the product.

III.D. Cash Outs

Filers in the match groups could easily have "gamed" the system by contributing to the IRA, waiting until the match was deposited on April 15, and then withdrawing all of the money. The data provide no evidence of such strategic behavior, though. As of May 2, for example, only 18 of the almost 1400 X-IRA individual accounts opened during the experiment had experienced any withdrawals.

Table V explores withdrawal activity in more detail.[12] Panel A shows the initial effects of the experiment on X-IRA take-up and contributions reported in Table II. Panel B shows that as of August 1, 2005, the differences across groups fully persist. Panel C shows that the fraction of contributors making withdrawals before August 1 was not significantly different across the three groups. While the average amount withdrawn increases with the match rate, the fraction withdrawn (as a percentage of initial contributions and match) does not.

Panel D explores other aspects of withdrawal activity, none of which supports the notion that people gamed the system. First, those aged 59.5 and above can make withdrawals free of penalties and thus would be prime candidates to game the system. However, those aged 60 and above in the matching groups are actually *less* likely to withdraw their contributions. Second, early withdrawals from traditional IRAs face a 10 percent penalty on the entire amount withdrawn as well as regular income taxation of the withdrawal amount. In contrast, early Roth IRA withdrawals face the 10 percent tax penalty only on the returns, not on the principal (since Roth IRA contributions are not deducted from AGI). By August 1, however, returns on the contributions made in April (and the associated penalties) would be negligible relative to principal. Using the Roth IRA should thus have been a preferred strategy for those intending to game the system. But the fraction of contributors who opened Roth accounts, rather than Traditional IRAs, was only slightly higher in the treatment groups than in the control group. Roth IRA contributors were more likely to make withdrawals, but there is no difference across groups. Third, X-IRA contributions could be counted for either tax year 2004 or 2005. Contributions for the 2004 tax year would incur penalties if withdrawn shortly thereafter, but contributions for 2005 would not (the IRS would consider that such a contribution had not taken place if the tax filer withdrew the funds before the end of the year and did not claim a deduction for the contri-

12. The amounts contributed inclusive of the match reported in Table VIII differ from those reported in Table I because H&R Block inadvertently matched the full contributions instead of the first $1000 of contributions. The amounts reported here are the full amounts deposited into the account as of April 15. We measure withdrawals as the difference in balances between August 1, 2005, and January 1, 2005, less the contributions (inclusive of the match) made during tax season. We also note that it was not possible to obtain balance information in a small number of cases, most likely due to administrative errors in reporting. We assumed no withdrawal activity for observations where balance information could not be obtained.

bution). Thus, the best gaming strategy would have consisted of making 2005 contributions and withdrawing the money, including the match, during the same year. More than 90 percent of contributors, however, chose to apply their funds to tax year 2004, with no significant differences across treatment groups. Those making withdrawals are indeed more likely to have made 2005 contributions, but this effect is not stronger in the matching groups.

IV. Comparison with the Saver's Credit

In this section we use quasi-experimental techniques to estimate the effects of the federal Saver's Credit on retirement contributions and compare the outcome with the experimental results reported above. In the absence of a true experiment, the Saver's Credit estimates remain necessarily tentative, but the comparison nevertheless sheds some light on the relative importance of incentives and other factors in determining behavioral responses to government programs. The Saver's Credit contains stronger economic incentives than our matching experiment, but is more complex. Moreover, in 2005 the default sequence used by tax professionals at H&R Block did not provide information about how alternative X-IRA contributions would affect Saver's Credit amounts. As a result, most tax filers almost certainly knew less about how the Saver's Credit works than the filers in our experiment understood about the matches we provided.

The Saver's Credit is a nonrefundable tax credit on the first $2000 (for each spouse) contributed to IRAs (Roth and Traditional) or voluntary pension plans (401(k), 403(b), SIMPLE IRA, Keogh, etc.). As shown in Table VI, the credit rate decreases with AGI, and is 50 percent at the bottom, 20 percent within a narrow AGI band, and 10 percent for a broad range. Because the credit is nonrefundable, many filers who would qualify based on AGI gain little if any net benefit because they have no gross income tax liability or because they are able to use other credits. The rules are quite complex.[13] We define a filer as "eligible" for the credit if, starting from zero contributions to the X-IRA, making an IRA

13. The Saver's Credit is determined before refundable credits. The nonrefundable portion of the child credit reduces the available Saver's Credit, but the EITC and the refundable portion of the child credit do not. Contributions are netted of withdrawals made during the last three years to limit gaming.

TABLE VI
SAVER'S CREDIT PARAMETERS

Credit Rate	Equivalent match rate	AGI Range		
t	$t/(1 - t)$	Married filing jointly	Head of household	Single and others
(1)	(2)	(3)	(4)	(5)
50%	100%	$0–$30,000	$0–$22,500	$0–$15,000
20%	25%	$30,001–$32,500	$22,501–$24,375	$15,001–$16,250
10%	11%	$32,501–$50,000	$24,376–$37,500	$16,251–$25,000
0%	0%	$50,001+	$37,501+	$25,001+

The Saver's Credit is a nonrefundable federal income tax credit proportional to the sum of all elective retirement contributions (all IRAs, 401(k)s, etc.) up to $2000 of contributions ($2000 for each spouse for married taxpayers). Full- time students, individuals claimed as dependents by other taxpayers, and individuals aged under 18 are not eligible. Withdrawals from IRAs and 401(k)s (within the last three years) are netted out of annual retirement contributions to estimate eligible contributions. As shown in columns (3) to (5), the credit rate varies by AGI range and marital status. The bracket length for heads of household and singles are 75 percent and 50 percent of the bracket length for married, respectively. A credit rate of t (column (1)) is equivalent to a match rate of $t/(1 - t)$ (column (2)). AGI used to compute the credit rate t is net of most retirement contributions with the exception of Roth IRAs and is therefore endogenous. The Saver's Credit is determined before refundable credits. The nonrefundable portion of the child credit reduces the available Saver's Credit, but the EITC and the refundable portion of the child credit do not. Taxpayers might report positive saver's credit on their tax form but still not actually benefit from it because the Saver's Credit might crowd out the nonrefundable child tax credit one for one.

See IRS Form 8880 and IRS Publication 590 for more details.

contribution would reduce taxes or raise refunds. Others are "ineligible."

A tax credit at rate t is economically equivalent to a matching rate of $t/(1 - t)$. For example, a tax filer facing the 50 percent credit rate and contributing $1000 would receive a $500 tax credit, so that her out-of-pocket cost for a $1000 contribution is only $500, which is effectively a 100 percent match rate. Therefore, the Saver's Credit generates effective *matching* rates of 100 percent, 25 percent, and 11 percent.

To study the Saver's Credit, we use national H&R Block data for tax season 2005, including all returns with X-IRA contributions (about 180,000 returns) and a 9 percent random sample of other returns (about 1,400,000 returns). We weight the data by the inverse of the sampling probabilities. We exclude taxpayers with earnings below $300 (the minimum X-IRA contribution). We also exclude taxpayers aged less than 18 as of January 1, 2005, and those claimed as a dependent on a different return, since such taxpayers cannot claim the credit. We define "normalized AGI" by multiplying the incomes of single and married filing

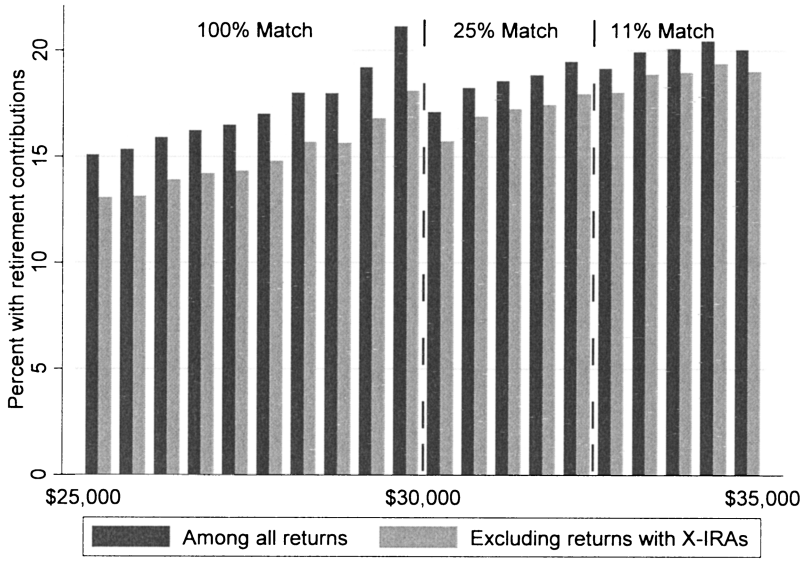

FIGURE II
Percent of Saver's Credit Eligible Returns with Positive Retirement Contributions (401(k), IRA, etc.)

The figure displays the percentage of tax returns receiving a positive Saver's Credit by $500 bands of normalized AGI among all eligible returns and among all eligible returns excluding returns with X-IRAs. Normalized AGI = AGI for married joint filers, 133 percent of AGI for heads of households, 200 percent of AGI for singles and others. The "all returns" sample is limited to eligible returns defined as all tax returns with positive tax liability net of credits (before any retirement contributions if any), positive earnings, tax filers aged 18 and above, and tax filers not claimed as dependents on somebody else's return. Those tax returns benefit from the Saver's Credit if they make a retirement contribution. The sample excluding returns with X-IRAs excludes all returns making any X-IRA contribution for the year 2004. The vertical dashed lines display the location of the AGI cliffs where the savers' credit rate changes. The data extract consists of 100 percent of H&R Block retail returns with positive X-IRA contributions and a 9 percent random sample of other returns, filed for year 2004 during tax season 2005. Observations are weighted to reflect this sampling scheme.

separately tax filers by 2 and incomes of heads of households by 4/3. This allows the boundary points where the credit rate changes to be aligned for all types of tax filers (see Table VI).

Because the credit applies to contributions to all retirement accounts, we begin in Figure II by plotting participation in any retirement account among filers eligible for the Saver's Credit. Several aspects of the figure demonstrate that the credit has little effect on ongoing contributions to retirement accounts, but may affect X-IRAs. First, participation in any retirement account dis-

plays a 5 percentage point spike just below normalized AGI of $30,000, where the effective match rate falls from 100 percent to 25 percent. Most of this spike, however, is due to X-IRA participation. Excluding X-IRA contributors, the spike falls to 2 percentage points. Second, there is a small spike in retirement account participation at normalized AGI of $32,500, which disappears when X-IRA contributors are excluded. Third, among filers who do not contribute to X-IRAs, participation in retirement accounts is lower in the normalized AGI range of $28,000–$29,500 than it is in the range of $30,500–$32,000, despite the effective match rate being 100 percent in the lower income range and just 25 percent in the higher income range.

It should not be surprising that taxpayers find it hard to exploit variations in the Saver's Credit rate via ongoing contributions to retirement accounts. The rate varies significantly over a narrow range of income, the calculation is complex, and taxpayers may not be able to fine-tune their AGI until the time of tax preparation. When the tax return is completed, however, the relevant information becomes available. Thus, X-IRA contributions at the time the return is completed offer a way to exploit variation in the Saver's Credit rate, much like our experiment gave people the opportunity to make IRA contributions to take advantage of a matching offer. Accordingly, we narrow our focus to how the Saver's Credit affects X-IRA participation and contributions.

Figure III displays the share of eligible and ineligible tax filers making X-IRA contributions. The Saver's Credit appears to have a real, but small, effect on eligible households. In contrast to the data for all retirement account participation in Figure II, X-IRA take-up is *higher* among low-income households, who face higher effective match rates, than among those with higher income, and take-up rates spike at normalized AGI just below $30,000, with a smaller spike at $32,500. The effects are relatively small, though, in the range of 1–2 percentage points. In contrast, there are no spikes for the ineligible households and the take-up is about the same across the match brackets.

Table VII displays information about X-IRA take-up rates and contributions. The first panel shows that changes in the effective match rates have small but precisely estimated effects among eligible filers, consistent with Figure III. Raising the effective match rate from 25 percent to 100 percent increases take-up by 1.4 percentage points and contributions conditional on

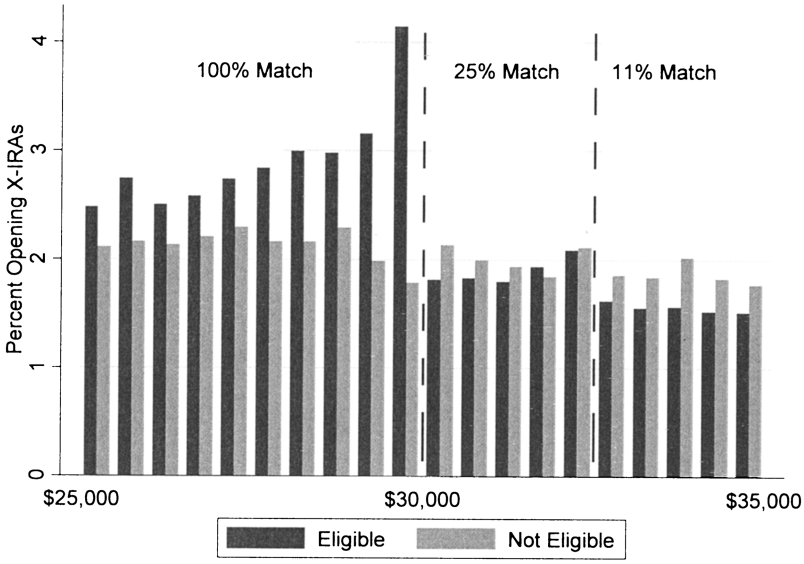

FIGURE III
X-IRA Take-up by Saver's Credit Eligibility Status

The figure displays the percentage of tax returns contributing to an X-IRA (for tax year 2004) by $500 bands of normalized AGI and Saver's Credit eligibility status. Eligible returns defined as tax returns with positive tax liability net of credits (before any X-IRA contribution if any), positive earnings, tax filers aged 18 and above, and tax filers not claimed as dependents on somebody else's return. Those tax returns benefit from the Saver's Credit if they make an X-IRA contribution. Not eligible returns defined as all tax returns with zero tax liability net of credits (before X-IRA contributions if any), positive earnings, tax filers aged 18 and above, and tax filers not claimed as dependents on somebody else's return. Not eligible returns do not benefit from the Saver's Credit because they have no tax liability (net of credits) to offset.

take-up by $65. In contrast, for eligible households in our experiment, the corresponding figures (from Table II) are 6.3 percentage points and $310 for a smaller change in the match rate, from 20 percent to 50 percent.[14]

These estimates may overstate the effect of the credit because the propensity to save may vary with AGI. A simple but admittedly imperfect way to control for this is to consider the same AGI groups for filers who are ineligible for the Saver's

14. The $310 figure is the difference between $1280 and $1590, both of which include the matching contribution. This is appropriate because the X-IRA amounts contributed in the Saver's Credit data are implicitly inclusive of the equivalent match rate, since the Saver's Credit is formally a credit that reduces taxes rather than a matching contribution that is placed in the account.

Credit. Panel B shows that for ineligible taxpayers the effects are much smaller (and insignificant), suggesting that the effects in Panel A were indeed caused by the Saver's Credit.[15]

Panel C displays the differences between the first two panels. The difference-in-difference estimates in columns (6) and (7) are unbiased estimates of the effect of the Saver's Credit assuming that, absent the program, the difference in X-IRA behavior between eligible and ineligible filers would be the same across the two AGI groups. The estimates suggest that raising the effective match rate from 25 percent to 100 percent raises take-up by 1.3 percentage points and contributions conditional on take-up by $81. Raising the match rate from 11 percent to 25 percent has smaller and insignificant effects.

Although these estimated effects are small, they may still overstate the impact of differences in match rates in the Saver's Credit. In the Saver's Credit (unlike our experiment) the match rate can depend on the amount contributed, so taxpayers whose AGI is just above a "cliff" have incentives to increase contributions. This implies that some taxpayers have an AGI below the threshold precisely because they contributed, generating an upward bias in the impact of the saver's credit. We do not correct for this effect, since our estimates are already small compared with the matching experiment.[16]

One reason the Saver's Credit generates a smaller response than our experiment may be that the credit is a multiyear program whereas our matching offer was presented as a one-time offer. We believe, however, that the smaller response is due in large part to tax filers' confusion or ignorance about how the credit works. Three additional pieces of evidence support this view. First, taxpayers with 401(k) contributions and with income just above the 100 percent match cliff have very strong incentives to make modest X-IRA contributions in order to increase the credit rate on their preexisting retirement contributions. In some of those cases, an X-IRA contribution can even increase the tax

15. Almost all tax filers around the third cliff of the saver's credit (above which the effective credit rate falls to zero) have positive tax liability and are therefore eligible, making it impossible to obtain control groups large enough for statistical analysis.

16. The small effects of the Saver's Credit are not due to taxpayers who filed earlier than those in the matching experiment. If we restrict our analysis of the Saver's Credit to those filing between March 5 and April 5, the effects are virtually identical. Likewise, the pattern of responses to the Saver's Credit by tax filer characteristics (marital status, having a refund above $500, tax pro characteristics, etc.) is similar to what we find in the matching experiment.

TABLE VII
THE EFFECTS OF THE SAVER'S CREDIT ON X-IRA BEHAVIOR

	Mean					Difference		
Match rate	100%	25%	11%	11%	0%	100% vs. 25%	25% vs. 11%	11% vs. 0%
Credit rate	50%	20%	10%	10%	0%	50% vs. 20%	20% vs. 10%	10% vs. 0%
Normalized AGI	$27.5K–$30K	$30K–$32.5K	$32.5K–$35K	$45K–$50K	$50K–$55K	$27.5K–$32.5K	$30K–$35K	$45K–$55K
	(1)	(2)	(3)	(4)	(5)	(1)–(2) (6)	(2)–(3) (7)	(4)–(5) (8)
A. Saver's credit eligible taxpayers								
X-IRA take up rate (%)	3.28	1.87	1.55	1.31	0.89	1.41**	0.32**	0.42**
	(0.083)	(0.063)	(0.058)	(0.043)	(0.040)	(0.104)	(0.086)	(0.058)
X-IRA average contributions	$19.2	$9.8	$7.9	$9.0	$6.4	$9.5**	$1.8**	$2.6**
(unconditional)	(0.67)	(0.48)	(0.45)	(0.47)	(0.45)	(0.82)	(0.66)	(0.65)
X-IRA average contributions	$587	$522	$513	$690	$722	$65**	$9	−$32*
(conditional on take-up)	(4.8)	(6.2)	(7.0)	(8.9)	(12.7)	(7.9)	(9.4)	(15.1)
Number of observations	45,747	45,721	44,508	71,052	61,388	91,468	90,229	132,440
B. Savers' credit ineligible taxpayers (no tax liability)								
X-IRA take up rate (%)	2.09	2.00	1.86			0.09	0.14	
	(0.110)	(0.145)	(1.640)			(0.182)	(0.220)	
X-IRA average contributions	$9.5	$9.4	$9.0			$0.1	$0.4	
(unconditional)	(0.64)	(0.90)	(1.05)			(1.09)	(1.38)	
X-IRA average contributions	$455	$472	$485			−$17	−$13	
(conditional on take-up)	(6.3)	(9.7)	(12.0)			(11.2)	(15.4)	
Number of observations	17,041	9,301	6,831			26,342	16,132	

TABLE VII
(CONTINUED)

	Mean					Difference		
Match rate	100%	25%	11%	11%	0%	100% vs. 25%	25% vs. 11%	11% vs. 0%
Credit rate	50%	20%	10%	10%	0%	50% vs. 20%	20% vs. 10%	10% vs. 0%
Normalized AGI	$27.5K–$30K	$30K–$32.5K	$32.5K–$35K	$45K–$50K	$50K–$55K	$27.5K–$32.5K	$30K–$35K	$45K–$55K
	(1)	(2)	(3)	(4)	(5)	(1)–(2) (6)	(2)–(3) (7)	(4)–(5) (8)
C. Difference between eligible and ineligible taxpayers (A-B)						Difference-in-differences		
X-IRA take up rate (%)	1.19	−0.14	−0.31			1.33**	0.18	
	(0.148)	(0.156)	(0.164)			(0.220)	(0.228)	
X-IRA average contributions (unconditional)	$9.7	$0.3	−$1.1			$9.4**	$1.4	
	(1.13)	(1.16)	(1.23)			(1.67)	(1.70)	
X-IRA average contributions (conditional on take-up)	$132	$51	$28			$81**	$23	
	(10.0)	(14.2)	(17.3)			(17.2)	(22.3)	
Number of observations	62,788	55,022	51,339			117,810	106,361	

This table shows X-IRA take-up rates, average contributions (unconditional, including zeros, and conditional on take-up, excluding zeros) for five AGI groups as well as differences and difference-in-differences. Standard errors are reported in parentheses. The sample consists of 100 percent of H&R Block retail returns with X-IRAs, and a 9 percent random sample of all other returns. All results are reweighted to account for this sampling scheme. Taxpayers aged below 18 or who are claimed as dependents on somebody else's return are excluded (since they do not qualify for the Saver's credit). Taxpayers with less than $300 in earnings are also excluded (because they cannot make the minimum $300 X-IRA contribution). In columns (1) to (5) taxpayers are separated by normalized AGI (Normalized AGI = 100 percent of AGI for married taxpayers, 133.33 percent for heads of household, and 200 percent for singles and others). Columns (1) to (5) display the levels for those five groups and columns (6) to (8) the differences across groups. Panel A shows results for eligible taxpayers, defined as taxpayers whose X-IRA contributions (actual or potential) would benefit from the Saver's Credit. Panel B shows results for ineligible taxpayers, defined as taxpayers whose X-IRA contributions (actual or potential) would not benefit from the savers' credit because their tax liability net of other nonrefundable tax credits (excluding the child tax credit) and net of (full tax credit less potentially refundable additional tax credit) is zero or negative. There is no group B for columns. (4) and (5) because almost all taxpayers in that AGI range have positive tax liability. Panel C displays the difference between group A and group B. The bottom right panel displays the difference-in-differences. Standard errors are in parentheses. * and ** denote significance at the 5 percent and 1 percent levels, respectively.

refund *net* of the contribution. However, the X-IRA take-up rate among taxpayers facing this situation is only about 6 percent, showing that the vast majority of those taxpayers fail to exploit this opportunity to be paid to save. Second, in our experiment, 50 percent of those who participated contributed exactly at the matching cap, $1000. In the Saver's Credit data, however, only 3 percent of contributors exactly maximized their Saver's Credit, and most contributed less than half of the maximum amount eligible for the credit. Third, some filers with income just above the 100 percent match cliff contribute to a Roth X-IRA when contributing the same amount to a traditional X-IRA would have pushed them below the boundary and given them the higher credit rate. This suggests their choice is not optimal, since it is implausible that differences in the tax treatment of Roth and Traditional IRAs would overwhelm the effects of the higher credit rate under the Saver's Credit. (For further discussion, see Duflo et al. [2005]).

V. Discussion

In this section we discuss interpretations of the results and directions for future research. Part of the discussion uses findings from focus groups that H&R Block conducted on May 4 and 5, 2005, with tax professionals and clients. The focus groups were professionally moderated using a question guide developed in conjunction with our research team. The sessions were observed through a one-way mirror by a member of our research team and by H&R Block personnel. The small sample sizes and the possibility of nonrandom selection of participants imply that the focus group results are only suggestive. Nonetheless, the results can help frame and flesh out the discussion.

V.A. Why Didn't People Game the System or Accept the 50 Percent Match?

Although there is substantial evidence that tax filers understood and responded to the incentives in our experiment, the simple fully informed rational model cannot fully explain contribution or withdrawal patterns. Taxpayers were very far from taking full advantage of what could have been perceived as a "free lunch" opportunity. In a model with fully informed, rational individuals, filers who were not credit constrained should have taken up the 20 percent and the 50 percent matching offers,

especially since the contributions could have been cashed out penalty-free in at most seven weeks. Clearly, filers either did not understand the gaming possibilities or rejected them out-of-hand. Our sense is that tax filers were simply unaware that such behavior was possible. In most cases, the match offer was a surprise, and there was no easy way for a tax filer who was told that there were "penalties for early withdrawal" to figure out on the spot that these penalties could be negligible.

Even without the prospect of gaming, though, one might reasonably have expected take-up rates to be higher, especially in the 50 percent match group, and for households who had high income, who saved in other forms, and who received refunds. Focus group participants offered several reasons for not taking up the 50 percent match: they had already decided to use their tax refund for a different purpose (paying off credit card debt or property taxes, buying a car); they were suspicious about an offer coming from a private firm, particularly one that they did not perceive to be in the investment business; they did not like the investment options; they were scared off by restrictions and penalties on early withdrawals; they were temporarily poor; they wanted to get their tax return done as fast as possible (particularly people who brought their children with them to the Block office); or they had never heard of an IRA or were generally uncomfortable with the idea of owning financial assets.

V.B. How Would the Effects of a Federal Matching Program Differ?

Several caveats apply to using our results to infer the effects of a federal matching program. First, our results may reflect "excitement effects" for people who felt they "won the lottery" by receiving a 50 percent match offer. If so, our findings overstate the impact of a national program. According to tax pros in the focus group and our own field observations, control group members rarely knew that they had missed out on receiving a match. This suggests that excitement effects may not have been very large, but is by no means decisive. Other factors suggest take-up could be higher in a federal program. Filers in our experiment had no advance notice of the program and therefore could not set aside money ahead of time in order to take advantage of it. Filers who were suspicious of an experimental offer from a private firm may be less suspicious of a federal program. The short duration of

our program limited the extent of social learning among filers as well as tax professionals' comfort with the matching program.

V.C. Were the Added Contributions Net Additions to Saving?

A central policy issue is the extent to which targeted tax incentives for saving serve to raise the overall level of net worth or are simply substitutes for other forms of wealth accumulation. Bernheim [2003], Engen, Gale, and Scholz [1996] and Poterba, Venti, and Wise [1996] review the issues and evidence. In the focus groups, X-IRA contributors were asked what they would have done with their tax refund had they not received the match. While some described scenarios that sounded as if they would have consumed the tax refund instead, others made it sound like the IRA contributions were not net new saving. Some of the formal evidence presented above may be considered suggestive that the contributions are not new saving: for example, households that tend to save more (those with positive investment income) also tend to contribute more to the accounts. Other evidence, in particular the absence of gaming, may be considered suggestive that the contributions were net additions to saving. In our view, however, neither observation is very informative about the net saving effects, and this is clearly a topic that merits further study.

V.D. Information, Structural Parameters, and Public Policy

Our results are consistent with a broader literature that shows that, holding incentives constant, framing can significantly affect economic choices in general and saving choices in particular (see Bertrand et al. [2005], Madrian and Shea [2001], and Thaler and Benartzi [2004]). The effect of tax professionals on IRA take-up suggests that individual decisions about savings are affected by external cues. The differential behavioral responses to the essentially similar incentives in our experiment and in the Saver's Credit suggest that complexity and salience can affect the impact of a given incentive. These differences may reflect a lack of information, which the tax professional can help clarify, or simply the importance of the tax professional, who is both close to being a peer and in a position to give advice (see Duflo and Saez [2003] for evidence of the role of information and peer effects in financial decisions). In either case, the results cast doubt on the notion of a stable behavioral response, or "deep structural parameter," that depends only on the pure underlying economic incentives and

imply instead that behavioral responses can depend on economic agents' information sets as well. Since optimal policy-making depends on behavioral responses, future research should go beyond merely estimating the size of behavioral responses in specific contexts and explore the factors that influence the different behavioral responses to equivalent economic incentives. An additional task is to broaden the very notion of what constitutes public policy to include not only the underlying economic incentives but also the manner in which the incentives are publicized, explained, and delivered.[17]

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REFERENCES

Bernheim, B. Douglas, "Taxation and Saving," in Alan Auerbach and Martin Feldstein, eds., *Handbook of Public Economics,* Vol. 3 (Amsterdam: North-Holland, 2003), pp. 1173–1249.

Bertrand, Marianne, Dean Karlan, Sendhil Mullainathan, Eldar Shafir, and Jonathan Zinman, "What's Psychology Worth? A Field Experiment in the Consumer Credit Market," NBER Working Paper No. 11892, December 2005.

Beverly, Sondra, Daniel Schneider, and Peter Tufano, "Splitting Tax Refunds and Building Savings: An Empirical Test," Working Paper, Harvard Business School, 2005.

Boshara, Ray, "Individual Development Accounts: Policies to Build Savings and Assets for the Poor," Brookings Institution Policy Brief: Welfare Reform and Beyond No. 32, March 2005.

Burman, Leonard E., William G. Gale, Matthew Hall, and Peter R. Orszag, "Distributional Effects of Defined Contribution Plans and Individual Retirement Arrangements," *National Tax Journal*, LVII (2004), 671–701.

Choi, James J., David Laibson, and Brigitte C. Madrian, "Plan Design and 401(k) Saving Outcomes," NBER Working Paper No. 10486, May 2004.

Choi, James J., David Laibson, and Brigitte C. Madrian, "$100 Bills on the Sidewalk: Suboptimal Saving in 401(k) Plans," NBER Working Paper No. 11554, August 2005.

Duflo, Esther, William Gale, Jeffrey Liebman, Peter Orszag, and Emmanuel Saez, "Saving Incentives for Low- and Middle-Income Families: Evidence from a Field Experiment with H&R Block," NBER Working Paper No. 11680, October 2005.

Duflo, Esther, and Emmanuel Saez, "The Role of Information and Social Interactions in Retirement Plan Decisions: Evidence from a Randomized Experiment," *Quarterly Journal of Economics,* CXVIII (2003), 815–842.

Engelhardt, Gary V., and Anil Kumar, "Employer Matching and 401(k) Saving:

17. Glaeser [2005] notes there is no guarantee that the government will act in the best interest of imperfectly informed individuals. Liebman and Zeckhauser [2004] discuss cases where the government can take advantage of tax filer ignorance to raise social welfare.

Evidence from the Health and Retirement Study," Center for Retirement Research Working Paper 2004-18, Boston College, 2004.
Engen, Eric M., William G. Gale, and John Karl Scholz, "The Illusory Effects of Saving Incentives on Saving," *Journal of Economic Perspectives*, X (1996), 113–138.
Even, William E., and David A. MacPherson, "The Effects of Employer Matching in 401(k) Plans," *Industrial Relations*, XLIV (2005), 525–549.
Gale, William G., J. Mark Iwry, and Peter R. Orszag, "The Saver's Credit: Expanding Retirement Savings for Middle-and Lower-Income Americans," Retirement Security Project Policy Brief No. 2005-2, 2005.
General Accounting Office, "401(k) Pension Plans: Loan Provisions Enhance Participation But May Affect Income Security for Some," GAO/HEHS-98-5, 1997.
Glaeser, Edward L., "Paternalism and Psychology," NBER Working Paper No. 11789, 2005.
Huberman, Gur, Sheena S. Iyengar, and Wei Jiang, "Defined Contribution Pension Plans: Determinants of Participation and Contribution Rates," Columbia Business School, 2004.
Koenig, Gary, and Robert Harvey, "Utilization of the Saver's Credit: An Analysis of the First Year," Joint Committee on Taxation, 2005.
Kusko, Andrea, James M. Poterba, and David W. Wilcox, "Employee Decisions with Respect to 401(k) Plans: Evidence from Individual-Level Data," in Olivia Mitchell and Sylvester Schaefer, eds., *Living with Defined Contribution Pensions: Remaking Responsibility for Retirement* (Philadelphia, PA: University of Pennsylvania Press, 1998).
Liebman, Jeffrey, and Richard Zeckhauser, "Schmeduling," Harvard University, 2004.
Madrian, Brigitte, and Dennis F. Shea, "The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior," *Quarterly Journal of Economics*, CXVI (2001), 1149–1187.
Mills, Gregory, William G. Gale, and Rhiannon Patterson, "Effects of Individual Development Accounts on Household Saving Behavior: Evidence from a Controlled Experiment," Abt Associates and the Brookings Institution, 2005.
Papke, Leslie E., "Participation in and Contributions to 401k Pension Plans: Evidence from Plan Data," *Journal of Human Resources*, XXX (1995), 311–325.
Papke, Leslie E., and James M. Poterba, "Survey Evidence on Employer Match Rates and Employee Saving Behavior in 401(k) Plans," *Economics Letters*, XLIX (1995), 313–317.
Poterba, James M., Steven F. Venti, and David A. Wise, "How Retirement Saving Programs Increase Saving," *Journal of Economic Perspectives*, X (1996), 91–112.
Sherraden, Michael, *Assets and the Poor: A New American Welfare Policy* (Armonk, NY: M.E. Sharpe, Inc, 1991).
Thaler, Richard, and Shlomo Benartzi, "Save More Tomorrow: Using Behavioral Economics to Increase Employee Saving," *Journal of Political Economy*, CXII (2004), S164–S187.