WHEN A NUDGE ISN'T ENOUGH: DEFAULTS AND SAVING AMONG LOW-INCOME TAX FILERS

Erin Todd Bronchetti, Thomas S. Dee,
David B. Huffman, and Ellen Magenheim

This study discusses a field experiment on default options and savings decisions by low-income households at the time of federal tax filing. In the treatment, a fraction of the tax refund was automatically directed to U.S. Savings Bonds unless filers actively chose another allocation. We find that this opt-out default had no impact on savings, and our treatment estimate is sufficiently precise to reject effects as small as 20 percent of those found in the literature on defaults and 401(k) plans. Our results have implications for understanding when default interventions will be effective and when their influence will be limited.

I. INTRODUCTION

Low-income households are significantly less likely to participate in employer-sponsored retirement savings plans or to accumulate savings, and they face a multitude of barriers to saving, including a lack of access to bank accounts, as well as immediate spending needs that have them living "paycheck to paycheck" (Barr and Blank, 2009). In recent years, policymakers from both political parties have viewed encouraging savings among low-income households as an important goal.

Tax time, when low-income households file federal income taxes and often receive large refunds, has been seen as a "savable moment," an opportunity for interventions focused on encouraging asset accumulation (Tufano, Schneider and Beverly, 2005;

Erin Todd Bronchetti**:** Department of Economics, Swarthmore College, Swarthmore, PA, USA (ebronch1@ swarthmore.edu)

David B. Huffman: Department of Economics, University of Oxford, UK, and IZA (david.huffman1@me.com)

Thomas S. Dee: Graduate School of Education, Stanford University, Stanford, CA, USA, and NBER (tdee@ stanford.edu).

Ellen Magenheim: Department of Economics, Swarthmore College, Swarthmore, PA, USA (emagenh1@ swarthmore.edu).

Duflo et al., 2006).[1] A recent savings innovation advocated by the Obama administration was clearly motivated by the unique policy opportunities thought to exist at tax time. Specifically, during the 2010 tax-filing season, the IRS implemented new procedures that gave tax filers the option of receiving some or all of their refunds in the form of low-risk, relatively liquid U.S. Series I Savings Bonds.[2] A previous three-year pilot study of the program, however, conducted at Volunteer Income Tax Assistance (VITA) sites, found the take-up rate of U.S. Savings Bonds among low-income tax filers to be quite low, only about 6 percent (D2D Fund, Inc., 2009).[3]

This paper describes a field experiment testing an approach for encouraging saving at tax time through the new program: a "nudge" towards buying savings bonds with tax refunds. The experiment was conducted at VITA sites during the 2010 tax-filing season, and tested whether presenting the option to direct some of one's refund to U.S. Savings Bonds as a default choice (so that individuals would have to "opt out" to avoid the purchase) increased bond purchases, relative to when the decision was presented as a conventional "opt-in" choice. Our intervention had the essential feature of all default interventions, which is to change which outcome happens *automatically* if an individual remains passive. The policy value of experimentally testing such an intervention is high, given that manipulating the default provides a simple and low-cost alternative to other interventions that have been tried at tax time, such as matching grants (Duflo et al., 2006). Importantly, default manipulations also have the attractive feature of allowing those who are strongly opposed to the default (i.e., for whom saving is not optimal) to opt out.

Defaults have been shown to have meaningful impacts on a number of individual decisions ranging from organ donation (Abadie and Gay, 2000; Johnson and Goldstein, 2003; Goette and Grassi, 2011) to internet marketing (Johnson, Bellman and Lohse, 2002), to 401(k) contributions (Madrian and Shea, 2001). Defaults have been hypothesized to work through multiple possible mechanisms, including by counteracting present-biased preferences, regret aversion, or cognitive inertia, and harnessing endorsement effects (Madrian and Shea, 2001). Yet it remains an open question which of these mechanisms might be crucial. Our study contributes to the growing body of evidence on the effects of default manipulations on savings behavior. In particular, it differs in two key ways from past studies.

---

[1] During the 2009 tax-filing season over 50 million tax returns had adjusted gross income of $30,000 or less but generated positive federal refunds that averaged approximately $2,000 (IRS, 2010). The widespread receipt of such large (but also somewhat uncertain and comparatively irregular) payments implies that low-income tax filers may be particularly responsive to policy interventions that seek to promote savings.

[2] These bonds are available in denominations of $50, $100, $200, $500, and $1,000, and they accrue interest for 30 years. The rate of return is based on the inflation rate combined with a fixed return. The purchase of a Series I bond implies some illiquidity, particularly for the first 12 months of ownership. A bond that is cashed in within two to five years forfeits three months of interest. Bonds can be redeemed without penalty after five years.

[3] The available evidence, from an earlier survey, suggests that low-income tax filers were enthusiastic about bonds per se (Beverly, Tufano and Schneider, 2006), but this apparently did not translate into a willingness to purchase bonds with tax refunds.

First, almost all previous evidence has involved the population of individuals offered 401(k)s by their employers, whereas we study low-income individuals at tax time. As we discuss in detail, there are arguments why defaults might be more or less powerful in our setting. On the one hand, lower-income households might be relatively more susceptible to recommendation effects (Bertrand, Mullainathan and Shafir, 2006). On the other hand, greater distance between the default and an individual's optimum can in theory increase the likelihood of opting out (Carroll et al., 2009), and a default to save might be farther from the optimum for our tax filers than it is for typical 401(k) holders.[4]

Second, our default intervention rules out one channel through which present-biased preferences or hyperbolic discounting (O'Donoghue and Rabin, 1999) can make defaults especially powerful. Specifically, with automatic contribution defaults for 401(k)s, individuals are made aware that they do not have to decide about opting out immediately; if there is an immediate decision cost of opting out, hyperbolic discounting may cause someone to postpone the opt-out decision, or never opt out at all. As dictated by the tax preparation setting, however, filers cannot accept the default of buying bonds, and then reverse this decision later. This removes one channel that might make defaults in the 401(k) setting especially powerful, but leaves other potentially important mechanisms.[5]

Consistent with the prior pilot data, we find that savings bond participation is fairly low (roughly nine percent in our control group) but is plausibly related to several observed traits of filers. However, our main finding is that random assignment to the default manipulation had no detectable effect on the decision to allocate a portion of the tax refunds to U.S. Savings Bonds. Furthermore, our estimates are sufficiently precise that we can reject participation effects as small as 20 percent of those found in studies of 401(k) defaults.

We also use available data on the tax filers in our study and an ex-post survey of participating tax preparers to shed light on possible explanations. We find that many tax filers in this study indicated having strong pre-existing intentions to spend their refunds, and many also mentioned difficulties paying bills. The tax preparers who participated in this study also identified pre-existing intentions to spend as the leading explanation when asked why they thought filers often actively resisted the default. Thus, remaining with the default would have required contradicting prior intentions, and may have been far from the optimum for the typical tax filer in our study. For example, facing high-interest credit card debt, individuals may have wanted to pay down this debt rather than invest in bonds.[6] Our results add a new dimension to the policy debate about encouraging saving among low-income households, particularly at tax time.

---

[4] Several 401(k) studies find that defaults are particularly effective among lower-income individuals (Choi et al., 2004; Beshears et al., 2010), perhaps due to higher decision costs. However, it may be that modest savings for retirement are in line with baseline intentions for those populations, and hence the nudge is more effective.

[5] Another difference with respect to some 401(k) defaults is the absence of a matching grant.

[6] There is also evidence that low- and moderate-income (LMI) filers may use tax withholding as a commitment device in the presence of present-biased self-control challenges (Barr and Dokko, 2008; Jones and Mahajan, 2011). This implies that the tax-filing setting is one where filers actually anticipate making effective savings *withdrawals* rather than further contributions.

Finally, our findings are also informative for understanding the mechanisms underlying default effects. Recall that our default eliminated the option of delaying the decision to opt out. Furthermore, to the extent that the participants in our control condition were effectively required to make an active choice, our control condition may already have counteracted procrastination in saving to some extent.[7] The treatment contrast in our experiment thus provides a test of the effects of remaining default mechanisms, such as regret aversion, endorsement effects, and cognitive inertia. Our results provide suggestive new evidence on how defaults influence decision-making, indicating these mechanisms alone may be weak. They also point to institutional features that may matter uniquely for policy effectiveness, namely constraints that limit the possibility for procrastination.

The paper proceeds as follows. The next section presents a brief review of the relevant literature on defaults and savings decisions. Details of the experimental design and implementation are explained in Section III. In Section IV we present the results of our experiment. Section V provides a discussion and conclusions.

II. DEFAULTS AND ECONOMIC DECISION-MAKING

Interventions that change the default are one of the most appealing approaches in the arsenal of policy "nudges," as they involve low implementation costs and the possibility of influencing behavior without restricting choice. The essential feature of a default intervention is that it changes which action is taken automatically, unless the individual actively chooses to do something different (Baron and Ritov, 1994). As such, defaults may have an impact by counteracting a variety of biases in decision-making. In this section we first discuss the potential mechanisms underlying default effects in general, and then discuss some features that are specific to defaults in the 401(k) setting.

One channel through which defaults may address biases in decision-making is by counteracting present-biased preferences or hyperbolic discounting (O'Donoghue and Rabin, 1999).[8] Such preferences involve an individual being relatively impatient between today and tomorrow, but more patient when planning for the more distant future. This dynamic inconsistency can cause someone to be unwilling to incur small immediate costs, planning to make the decision in the future. When the future becomes the present, however, he once again prefers to delay. To the extent that a default can lower or eliminate the immediate cost of taking an action by making the action automatic, it may eliminate the key barrier preventing this beneficial outcome for someone with present-

---

[7] For example, Carroll et al. (2009) found that a setting which forced individuals to make an active choice increased 401(k) participation. However, despite the active choice aspect of decisions in our experiment, it should be noted that the tax-filing experience of the clients in our participating VITA sites was a comparatively passive one. They had their taxes prepared for them by trained volunteers using computer software. The tax filers were not directly completing forms, making calculations, or using the software themselves.

[8] This benefit of defaults can also be seen in the context of other "multiple selves" models, where the default automatically implements the preferred action of a self that is strategically disadvantaged, e.g., benefiting future selves when current selves tend to overspend (Thaler and Shefrin, 1981).

biased preferences. Furthermore, if opting out of a default involves some immediate decision-making cost, present bias also tends to reinforce sticking with the default.

Another mechanism behind default effects may be that the choice of default conveys an implicit or inferred expert recommendation (Madrian and Shea, 2001; Beshears et al., 2008). This tends to reduce the complexity of the decision at hand (e.g., whether or not to save and, if so, how much to save). The power of the endorsement effect could, of course, depend on the perceived credentials of the source of the recommendation.

A related mechanism hypothesized to encourage sticking with the default is the tendency for acts of commission to be psychologically more costly than acts of omission (Kahneman and Tversky, 1982). Deviating from the default can raise concerns about making a bad decision and suffering regret. But by accepting the default, agents incur, at worst, costs associated with an error of omission (Choi et al., 2003). Defaults may also work because decision makers are not paying attention to the decision at hand; inattention leads to sticking with the default (Samuelson and Zeckhauser, 1988). This is likely most relevant for decisions about which decision makers do not have strong preferences (Slovic, 1995). The influence of defaults may also reflect the inertia that results from an unwillingness to undertake cognitive and logistical adjustment costs.[9]

The bulk of the evidence on the success of defaults in financial settings is based on decisions about 401(k) plans, made by the middle-to-upper class workers most likely to be offered such plans. Two important characteristics of the default manipulations in this literature are the possibility to postpone decisions about opting out and the tendency for the default to be closely aligned with intentions.

In the case of 401(k) contribution decisions individuals typically have the option to opt out of the default later. In that case, a tendency to procrastinate arising from present-biased preferences may reinforce the power of the default, as discussed above. While opting out involves only a small transaction cost, this cost is immediate, and present bias may induce sticking with the default. If, by contrast, individuals are presented with a choice about whether or not to opt out that must be made immediately, this eliminates the potential for the cost of opting out to induce delay, since the choice is forced upon them.

A second consideration is the alignment of automatic contribution defaults in the 401(k) setting with pre-existing intentions. As shown in the theoretical framework of Carroll et al. (2009), the tendency to opt out of a default can increase with distance of the default from what an individual would choose to do in the absence of the default (the individual's optimum). Automatic contribution defaults, which are typically about two to three percent of income, are often argued to be powerful in the 401(k) setting precisely because they coincide with the pre-existing intentions to save of relatively affluent individuals. Such individuals express a desire to save for retirement but have trouble initiating even modest savings contributions, perhaps due to a tendency to procrastinate or other biases (Madrian and Shea, 2001). A recent study by Beshears et

---

[9] Jones (2012) presents evidence that adjustments costs and the resulting inertia do meaningfully influence the refund behavior of tax filers. Specifically, he finds that plausibly exogenous changes in tax liability lead to limited adjustments in tax withholding, particularly among low-income filers.

al. (2010) reinforces the importance of the alignment of defaults with the optimum, by examining retirement savings at a U.K. firm with an unusually high default contribution rate (i.e., 12 percent of before-tax income). They find that comparatively few employees (only 25 percent) remain with this default and conclude that defaults are less powerful when linked to more extreme decisions.[10]

These automatic enrollment defaults also have in common a variety of other features, which may matter for the effectiveness of defaults. The particular asset being offered is obviously the 401(k), which is special in various respects, including the possibility of an employer match as well as rules about withdrawing funds before retirement. The fact that the 401(k) is a relatively complicated asset in terms of the match and rules for withdrawal could enhance the value of expert advice inferred from the default. The credibility of advice from an employer about retirement savings is presumably high, but empirical evidence on what factors make the advice component of defaults powerful or weak is scarce.

The evidence that nudges are effective in some settings is strong and compelling. However, important questions remain unanswered regarding the exact mechanisms behind their effectiveness and what this might imply about the generalizability of default effects to other policy-relevant settings.

In particular, how low-income tax filers might respond to defaults is an open question, one that is highly policy relevant in light of the enthusiasm for leveraging the possibilities embedded in the "savable moment" at tax time. One reasonable conjecture is that defaults would be more effective in a low-income population where decision-makers may have less complete information about their alternatives (Bertrand, Mullainathan and Shafir, 2006). For example, low-income households may be particularly responsive to the expert advice inferred from the presence of a default choice. However, low-income individuals' attitudes towards saving their tax refunds might lead to an optimum that does not involve saving, raising obstacles to using defaults in this setting. Indeed, if low-income individuals tend to have substantial debts, such as high-interest-rate credit card debt, the optimal decision might be to treat the tax refund as a savings withdrawal, rather than investing in bonds. Furthermore, the institutional feature of tax time — that decisions cannot be postponed — means that the default intervention must rely on mechanisms like regret aversion or implicit recommendation to influence behavior. Alternatively, a higher-cost intervention would have to be designed, adding the logistics necessary to allow postponing choices. Our research provides direct evidence on whether a low-cost default influences the saving behavior of low-income individuals at a policy-relevant time.

III. THE SAVINGS BOND EXPERIMENT

We conducted a randomized field experiment at eight VITA sites during the 2010 tax-filing season, the first year in which the Obama administration's new policy allowing the

---

[10] Even though most employees at this firm opted out of the extreme default, Beshears et al. (2010) also find that most chose to stay with the default investment allocation, suggesting that the limited effect of the default was not due to the subjects aggressively managing their finances.

purchase of savings bonds with tax refunds was implemented nationwide. Eligible tax filers at these sites were presented with either a conventional opportunity to purchase U.S. Savings Bonds with some of their tax refund (i.e., an opt-in) or with a scenario in which a fixed percentage of their tax refund would be directed by default to U.S. Savings Bonds unless they actively decided otherwise (i.e., an opt-out).

A. Field Setting and Training

The participating VITA sites were located in Delaware and Montgomery counties just outside of Philadelphia, Pennsylvania. Tax filers who had annual household income lower than $50,000 were eligible to receive free tax-preparation services from an IRS-certified tax preparer. We educated the participating tax preparers about both the key features of U.S. Savings Bonds and the protocol for this study. We complemented this training with additional site-based oversight and feedback to tax preparers.

In addition to the training and oversight of tax preparers, we also implemented an informational and marketing campaign similar to those used in the previous pilot programs (D2D, Inc., 2009). Each VITA site was decorated with posters and flyers designed to motivate interest in U.S. Savings Bonds and provide information about their key features (e.g., the guaranteed rate of return). We also included Spanish-language versions of some posters. Furthermore, we placed one of our most informative savings bond flyers on every tax preparation station so tax filers could read the flyer during the session and when being asked to make a decision about savings bonds. Each tax preparer was provided with a "Frequently Asked Questions (FAQ)" sheet that would allow him to address any queries.

B. Study Eligibility and Participants

The VITA tax-filing season began in early February and concluded on April 15, 2010. Upon arrival at VITA sites, clients completed a brief intake procedure, and then went to a tax-preparation station where a volunteer prepared their taxes using TaxWise software. Near the end of the tax-preparation process, the preparer would determine whether the tax filer was eligible for study participation. Only tax filers receiving federal tax refunds of at least $50 were eligible because that is the smallest denomination of Series I savings bonds. Furthermore, by IRS design, only those respondents receiving their refunds through direct deposit were eligible to purchase bonds (and, by implication, were eligible for the study).[11]

Table 1 presents mean characteristics of the study participants (n = 259) using data collected as part of the experimental procedures and participant responses to a site survey completed at the end of the tax-preparation session. The results indicate that participants received, on average, federal tax refunds of roughly $1,900, an amount equal to more

---

[11] The IRS implemented the option to purchase savings bonds through Form 8888, which allows a tax filer to split the refund into two or three direct deposit accounts. To purchase bonds with a refund, the tax preparer used a specific IRS routing number and the account number "BONDS" on this form, treating savings bonds as another direct deposit account.

Table 1

Mean Characteristics of Low-Income Tax Filers at Study VITA Sites

Variable	Filers Included in Study	Filers Not Included in Study	P-values on Test that Means are Equal
Federal refund amount ($)	1,906 (2,014)		
Adjusted gross income (AGI) ($)	17,990 (14,382)		
Amount of savings bonds purchased ($)	9.27 (37.497)		
Any savings bonds purchased?	0.093 (0.291)		
Female	0.683 (0.466)	0.562 (0.497)	**0.0008**
Sex missing	0.085 (0.279)	0.110 (0.313)	0.2604
Age	36.9 (21.6)	41.3 (22.4)	**0.0067**
Age missing	0.131 (0.338)	0.117 (0.321)	0.5433
Black	0.444 (0.498)	0.490 (0.500)	0.209
Race missing	0.108 (0.311)	0.126 (0.332)	0.4532
Any dependents	0.378 (0.486)	0.356 (0.479)	0.5335
Any dependents missing	0.139 (0.347)	0.149 (0.356)	0.7140
HS dropout/Education missing	0.154 (0.362)	0.188 (0.391)	0.2292

Table 1 (continued)

Mean Characteristics of Low-Income Tax Filers at Study VITA Sites

Variable	Filers Included in Study	Filers Not Included in Study	P-values on Test that Means are Equal
HS/GED completer	0.375	0.462	**0.0174**
	(0.485)	(0.499)	
Some college	0.363	0.252	**0.0008**
	(0.482)	(0.435)	
Bachelor's degree	0.108	0.097	0.6317
	(0.311)	(0.297)	
Filing status single	0.571	0.605	0.3489
	(0.496)	(0.489)	
Filing status missing	0.120	0.126	0.7898
	(0.325)	(0.332)	
Early filer (2/1-2/28)	0.375	0.319	0.1150
	(0.485)	(0.467)	
Mid-season filer (3/1-3/21)	0.386	0.297	**0.0010**
	(0.488)	(0.457)	
Late filer (3/22-4/15)	0.239	0.332	**0.0063**
	(0.428)	(0.471)	
Having trouble with any bills?	0.691	0.688	0.9301
(N=207, N=586) and	(0.463)	(0.464)	
Plans to save some of refund	0.168	0.119	0.2710
(N=107, N=138)	(0.376)	(0.324)	
Number of observations	259	675	

Notes: Filers were eligible for the study if they had positive federal refunds greater than $50 and were using direct deposit to receive their refunds. Filers were not included if they did not meet these criteria or if they were served by a preparer who was not trained to participate in the study.

than 10 percent of their average AGI of $17,990. The mean age of study participants was 37 years, over 68 percent were female, 38 percent reported having dependents, and over 44 percent were black. And, interestingly, nearly 70 percent stated that they had trouble paying bills, while only 17 percent stated they had plans to save some of their refund.

Inferences based on this study population may not have good "external validity" in terms of identifying how other low-income tax filers might respond to a default. The participants in this study are a select sample in that they chose to use VITA services and had to arrive at the sites when participating tax preparers were there. Furthermore, the use of direct deposit for receiving tax refunds was a requirement for having the option to choose U.S. Savings Bonds. Yet several factors suggest that our findings have policy relevance despite these caveats. For example, though clients at VITA sites could conceivably respond differently to policy interventions than other low-income tax filers, they are also a uniquely important population both because of their prevalence and because interventions that seek to exploit the "savable moment" are likely to be implemented in similar settings.[12] Moreover, relying only on tax filers using direct deposit is a policy-relevant screen because it is a binding requirement for this type of saving. And in fact, the use of direct deposit in this population is fairly high (60 percent), perhaps because VITA sites encourage its use.[13]

We also examine this question by looking for key differences between participants and non-participants in our data. We find that the average AGI and refund amounts of study participants were quite similar to site-level averages for the other VITA clients. The survey data for VITA clients who did not participate in the study (Table 1) indicate that study participants were also similar to non-participants with regard to traits like race, the presence of dependents, and whether they had trouble paying bills. Key differences are that participants tended to be younger, female, and were more likely to have attended (though not completed) college than non-participants. These distinctions may reflect how observables that predict lower-income employment also drive receipt of the Earned Income Tax Credit (EITC) and receipt of non-trivial refunds, and thus eligibility for this study. Study participants were also less likely to file their returns during the last few weeks of the season, perhaps because filers anticipating larger refunds (who were therefore eligible to purchase savings bonds) tend to file early. We later evaluate our treatment estimates among subgroups defined by key observed traits such as having filed late in the season.

C. Permuted Block Randomization and Treatment Balance

Once clients' tax refunds and study eligibility were determined, tax preparers presented them with either a control or treatment version of a "Your Refund/Savings

---

[12] During the 2010 tax year, over 3 million tax returns were filed at VITA sites (IRS, 2010).

[13] One might expect that our study population of VITA site clients using direct deposit would be more responsive to the default than the general population of low-income filers (many of whom do not have bank accounts), because saving might not be so far out of line with their intentions. However, we find no evidence of a default effect among this population.

Bond Worksheet" (available upon request from the authors). We randomized clients to either the control (i.e., opt-in) or treatment (i.e., opt-out) version of the worksheet using a straightforward procedure that could be understood as a version of the permuted block randomization strategies commonly used in clinical trials in medicine (Schulz and Grimes, 2002). Specifically, each tax preparer used a glued pad of worksheets that alternated between treatment and control versions. Preparers were instructed to use the top worksheet for consecutive clients.

This approach ensured that, within each site, day, and preparer station, every consecutive pair of tax clients would include one treatment and one control. By varying treatment status within each site on a rolling basis throughout the tax-filing season, we sought to balance across treatment and control conditions the unobserved subject traits that are potential internal-validity threats. Table 2 reports the results of auxiliary regressions in which treatment status is the dependent variable and observed subject traits are the regressors.

This evidence suggests that the randomization procedure effectively balanced subjects across the treatment and control conditions. F-tests from these regressions consistently indicate that the observed subject traits are jointly insignificant determinants of treatment status. Furthermore, observed subject traits have statistically insignificant "effects" on treatment status. One exception is the weakly significant relationship suggesting that mid-season filers (March 1 to March 21) were more likely to receive the treatment worksheet than early filers. The explanation for this pattern is mechanical: Each VITA site had multiple worksheet pads, and each pad began with a control worksheet. Therefore, filers assigned the control worksheet are overrepresented among the first third of filers, while those in the treatment are more prevalent mid-season. This irregularity does not appear to threaten the internal validity of our estimates; mid-season filers were not more likely to purchase bonds than early filers, nor did they differ meaningfully with respect to outcome-relevant traits, like refund size, race, and female with dependents.

D. The Treatment Contrast

In introducing the "*Your Refund / Savings Bond Worksheet,*" preparers were trained not to mention savings bonds in their introduction and to hand the worksheet to the filer, allowing the filer time to complete it.[14] Preparers were told not to give advice to tax filers, offer a sales pitch, overemphasize the possibility of opting out of the default, or influence a filer's savings decision in any way. Throughout the tax season, we continuously monitored the tax preparation procedures at our study sites to ensure that preparers implemented the experiment in accordance with this design.

In the control version of the worksheet, the tax filer was presented with her adjusted gross income (AGI), the amount of her federal tax refund, and a brief introductory statement about U.S. Series I Savings Bonds. The filer was then offered the chance to fill out the amount of her refund she wished to direct to savings bonds.

---

[14] Tax preparers were also given reminder cards that included this language and some basic reminders about the experiment protocol. These cards remained at the tax preparation stations for tax preparers to refer to as needed.

Table 2
Treatment-Control Balance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Federal refund (1000s)	0.0175	−0.0273	−0.0301	−0.0333	−0.0328	−0.0300	−0.0425	−0.0383
	(0.0157)	(0.0353)	(0.0420)	(0.0432)	(0.0434)	(0.0438)	(0.0434)	(0.0441)
Federal refund (1000s) squared		0.0048	0.0049	0.0050	0.0051	0.0046	0.0057	0.0051
		(0.0037)	(0.0040)	(0.0040)	(0.0040)	(0.0041)	(0.0040)	(0.0041)
AGI (1000s)	−0.0015	0.0049	−0.0003	−0.0005	−0.0005	−0.0004	0.0002	0.0003
	(0.0022)	(0.0051)	(0.0024)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)
AGI (1000s) squared		−0.0001						
		(0.0001)						
Female			−0.0001	−0.0322	−0.0224	−0.0404	−0.0351	−0.0464
			(0.0787)	(0.0850)	(0.1034)	(0.0863)	(0.0847)	(0.1056)
Age			−0.0001	−0.0003	−0.0003	−0.0001	−0.0007	−0.0005
			(0.0022)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)
Black			0.0415	0.0466	0.0466	0.0419	0.0566	0.0524
			(0.0678)	(0.0714)	(0.0716)	(0.0720)	(0.0714)	(0.0721)
Any dependents			0.1125	0.1288	0.1513	0.1333	0.1372	0.1444
			(0.0922)	(0.0963)	(0.1660)	(0.0970)	(0.0960)	(0.1674)
HS/GED completer			−0.1104	−0.1358	−0.1368	−0.1357	−0.1352	−0.1335
			(0.1230)	(0.1262)	(0.1266)	(0.1271)	(0.1257)	(0.1270)

Defaults and Saving Among Low-Income Tax Filers 621

Some college			−0.1068	−0.1435	−0.1433	−0.1471	−0.1545	−0.1608
			(0.1266)	(0.1314)	(0.1317)	(0.1324)	(0.1311)	(0.1322)
Bachelor's degree			−0.1052	−0.1127	−0.1153	−0.1189	−0.1573	−0.1666
			(0.1496)	(0.1532)	(0.1543)	(0.1541)	(0.1548)	(0.1568)
Filing status single			0.0775	0.0817	0.0821	0.0904	0.0607	0.0699
			(0.0850)	(0.0870)	(0.0872)	(0.0882)	(0.0875)	(0.0887)
Female with dependents					−0.0301			−0.0006
					(0.1803)			(0.1830)
High fidelity tax preparer						0.0873		0.1118
						(0.1061)		(0.1067)
Preparer: Bonds a good idea						−0.0087		−0.0004
						(0.0824)		(0.0824)
Mid-season filer (3/1–3/21)							0.1540*	0.1637**
							(0.0796)	(0.0815)
Late filer (3/22–4/15)							0.0691	0.0750
							(0.0909)	(0.0929)
Site dummies?	No	No	No	Yes	Yes	Yes	Yes	Yes
Observations	259	259	259	259	259	259	259	259
R-squared	0.0057	0.0174	0.0368	0.0458	0.0459	0.0489	0.0609	0.0656
F-test	0.7332	1.1260	0.5779	0.4903	0.4691	0.4589	0.6047	0.5542
Prob > F	0.4814	0.3447	0.8990	0.9775	0.9849	0.9898	0.9325	0.9703

Notes: Results are from LPM/OLS regressions, with standard errors in parentheses. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels. All regressions include controls for missing age, gender, race, filing status, dependent information and missing preparer data, where applicable.

In the treatment version of the savings bond worksheet, the filer was again presented with her AGI, estimated tax refund, and a brief statement about U.S. Savings Bonds. The treatment worksheet, however, also included a small chart, in which the default amount of savings bonds, approximately 10 percent of the filer's refund, was circled by the tax preparer. The worksheet instructed the filer that "the circled amount below — approximately 10 percent of your refund — will be automatically directed to U.S. Series I Savings Bonds in your name unless you decide to change that amount." Further down the page, the worksheet gave the filer the opportunity to opt out with this text: "(Optional) If you would want a different amount of U.S. Savings Bonds, indicate the amount here."

One fundamental distinction between the treatment and control worksheets involves what would happen if the filer took no action. Filers in the control condition who took no action purchased no U.S. Savings Bonds. Filers in the treatment condition who took no action would purchase the default amount of savings bonds circled in the chart (approximately 10 percent of their refund). However, the default manipulation did not limit the available choice set: Filers were always free to choose to receive zero savings bonds (or any other amount). The other fundamental distinction is the implicit recommendation in the treatment condition, involving a specific savings amount of 10 percent of the refund, which was circled on the form.

The fact that varying the default varies which decision is the passive decision has been hypothesized to play a role in default effects, through the channel of regret aversion. To the extent that decision costs — cognitive and psychological (e.g., regret) — are lower for passive decisions than for active decisions, the treatment condition should favor buying bonds relative to the control condition. The recommendation aspect of default interventions has also been hypothesized to play a role in default effects, by lowering decision costs. In our setting, the subjects received the treatment on an official looking worksheet. The source of the recommendation was presumably perceived to be the tax assistance organization, a credible expert in tax preparation and by extension financial decisions. Given that individuals had sought out advice from the tax site, this should have helped make the default more powerful, all else equal.

We attempted to encourage saving along the participation margin by choosing a default amount (approximately 10 percent of the refund) equal to the average amount that was purchased by those in the earlier pilot study who purchased any savings bonds (D2D Fund, Inc., 2009).[15] This amount was neither trivially small nor prohibitively large. Explicitly listing filers' incomes and refund amounts on the worksheet before introducing the default amount of roughly 10 percent of the refund should have reduced the likelihood of mental accounting biases, whereby filers imagined the default bond contribution to be larger than it was. The average default bond amount in our sample

---

[15] The smallest available Series I bond is $50, so filers receiving refunds of less than $500 faced a default bond purchase amount of $0; 19 percent of the treatment group received refunds less than $500. That is, for the remaining 81 percent of filers in the treatment, the default differed from that faced by control group filers. Our findings are unchanged when we restrict the sample to filers with refunds of at least $500.

actually reflected only 6.5 percent of the tax refund and only 1.1 percent of adjusted gross income.[16] In contrast, the default contribution rate in 401(k) studies is typically at least 2 percent to 3 percent of income and, in two prominent studies, 6 percent of income (Choi et al., 2002, 2004). The comparatively low amount of our default might tend to increase its influence, ceteris paribus. However, if filers perceive uniquely high fixed costs of managing bond ownership, this nudge into one-time saving could be less effective than 401(k) nudges that are more financially onerous.

E. Survey of Volunteer Tax Preparers

Shortly after the end of the tax-filing season, we conducted a brief survey of the volunteer tax preparers who had participated in the study.[17] This survey asked preparers for their impressions of the tax filers they served (e.g., whether tax filers were generally able to read and understand their savings bond worksheets without assistance), as well as for observed differences between the client experiences in the opt-in and opt-out settings (e.g., whether the opt-out worksheet was met with more questions from filers). We also surveyed tax preparers about the extent to which they complied with the intended implementation of the worksheet and the extent to which they felt that savings bonds were a good idea for filers. Finally, we asked preparers to rate the importance of several factors in explaining why filers were sometimes reluctant to buy bonds (from "not at all important" to "extremely important"). While the survey responses reflect merely the opinions and impressions of volunteer tax preparers, they provide suggestive evidence as to why the default was not more effective. We discuss the results of this survey in Section V.

IV. RESULTS

A. Effect of the Default on Tax Filers' Savings Bond Purchases

The default manipulation in our study may affect the savings decisions of low-income tax filers along the extensive margin, by increasing participation in the savings bond program, or at the intensive margin, by increasing the *amount* of bonds purchased among those who participate.[18] Table 3 presents evidence on the participation effect. The results are from regressions of an indicator for having purchased any savings bonds on treatment status and a number of controls for observable characteristics that may impact savings decisions. The parsimonious model (column 1) includes as controls only the amount of

---

[16] The reason the average default amount was only 6.5 percent of the refund is that the default was set to 10 percent of the refund, *rounded down* to the nearest $50 increment.

[17] Exactly 58 preparers responded to the survey, including preparers from all eight VITA sites in our study. These 58 volunteers prepared 195 of the 258 returns in our sample.

[18] Likewise, this default could decrease bond purchases among those who might have otherwise saved more than 10 percent. Our empirical analysis explored this possibility but found no evidence of such an effect.

Table 3

Effect of Default on Savings Bond Participation Among Low-Income Tax Filers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	-0.0054	0.0005	-0.0019	-0.0051	-0.0043	-0.0076	-0.0066	-0.0093
	(0.0362)	(0.0362)	(0.0365)	(0.0366)	(0.0364)	(0.0362)	(0.0368)	(0.0361)
Federal refund (1000s)	0.0208**	0.0582***	0.0460*	0.0457*	0.0421*	0.0429*	0.0471*	0.0411*
	(0.0091)	(0.0204)	(0.0239)	(0.0243)	(0.0242)	(0.0242)	(0.0244)	(0.0241)
Federal refund (1000s) squared		-0.0044**	-0.0039*	-0.0040*	-0.0041*	-0.0037	-0.0039*	-0.0037
		(0.0021)	(0.0022)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)
AGI (1000s)	-0.0014	-0.0022	-0.0013	-0.0011	-0.0009	-0.0011	-0.0013	-0.0010
	(0.0013)	(0.0030)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)
AGI (1000s) squared		5.320e-06						
		(4.550e-05)						
Female			0.0134	0.0113	-0.0551	0.0159	0.0085	-0.0599
			(0.0446)	(0.0478)	(0.0576)	(0.0476)	(0.0476)	(0.0577)
Age			-0.0006	-0.0008	-0.0007	-0.0007	-0.0011	-0.0009
			(0.0012)	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0013)
Black			0.1020***	0.1170***	0.1169***	0.1137***	0.1221***	0.1202***
			(0.0385)	(0.0402)	(0.0399)	(0.0397)	(0.0402)	(0.0395)
Any dependents			0.0126	0.0209	-0.1320	0.0264	0.0199	-0.1361
			(0.0525)	(0.0543)	(0.0926)	(0.0537)	(0.0542)	(0.0916)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HS/GED Completer			0.0133	−0.0058	0.0012	−0.0170	−0.0047	−0.0070
			(0.0699)	(0.0711)	(0.0707)	(0.0703)	(0.0708)	(0.0696)
Some College			0.0058	−0.0178	−0.0191	−0.0283	−0.0173	−0.0310
			(0.0719)	(0.0740)	(0.0735)	(0.0732)	(0.0739)	(0.0725)
Bachelor's degree			−0.0175	−0.0296	−0.0115	−0.0408	−0.0215	−0.0145
			(0.0850)	(0.0861)	(0.0860)	(0.0852)	(0.0872)	(0.0859)
Filing status single			−0.0004	0.0002	−0.0020	−0.0022	0.0028	−0.0020
			(0.0483)	(0.0490)	(0.0487)	(0.0488)	(0.0492)	(0.0485)
Female with dependents					0.2040**			0.2172**
					(0.1004)			(0.1000)
High fidelity tax preparer						0.0283		0.0392
						(0.0586)		(0.0584)
Preparer: Bonds a good idea						0.0970**		0.1024**
						(0.0455)		(0.0450)
Mid-season filer (3/1–3/21)							0.0192	0.0304
							(0.0451)	(0.0449)
Late filer (3/22–4/15)							0.0939*	0.1102**
							(0.0511)	(0.0508)
Site dummies?	No	No	No	Yes	Yes	Yes	Yes	Yes
Observations	259	259	259	259	259	259	259	259
R-squared	0.0216	0.0379	0.0895	0.1155	0.1309	0.1497	0.1289	0.1804

Notes: Results are from LPM/OLS regressions, with standard errors in parentheses. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels. All regressions include controls for missing age, gender, race, filing status, dependent information, and preparer survey data, where applicable.

the filer's federal tax refund and the filer's AGI. Subsequent models introduce quadratics in the filer's federal refund amount and AGI (2); controls for basic demographic traits like age, gender, and race, educational attainment, dependents, and filing status (3); site dummies (4); an interaction term for females with dependents (5); indicators for having a "high fidelity tax preparer" or a preparer who felt savings bonds were a good idea for filers (6); and dummies for filing mid-season or late in the season (7).[19]

Regardless of the model, we find treatment status to have no statistically significant effect on the probability that filers in our sample purchased a positive amount of savings bonds with their refunds.[20] Moreover, 95 percent confidence intervals around our point estimates suggest a maximum treatment effect of approximately 8 percentage points, which is far smaller than the range of estimates from the literature on default effects on savings participation in the context of 401(k) contributions; for example, Madrian and Shea, 2001, report a 50 percentage point increase in participation rates for new hires. Our finding that introducing a default of positive savings has no effect on low-income tax filers' participation may be surprising in light of the existing literature showing large default effects on savings decisions in the context of 401(k) contributions among middle-to-upper class workers offered 401(k) accounts by their employers. We discuss potential explanations for the differing results below.

We also examine savings decisions at the intensive margin, but again our findings suggest no treatment effect. Results from both Tobit and ordinary least squares (OLS) specifications show that treatment status does not significantly impact the amount of savings bonds purchased, conditional on participation.[21] Moreover, the treatment did not appear to cause filers who saved to be more likely to choose the default amount of savings bonds associated with their refunds. Indeed, the percentage of treatment-group savers who chose the default amount of bonds did not differ significantly from the fraction of control-group savers who did so.

B. Treatment Effect Heterogeneity

While we find no evidence of a treatment effect on savings bond take-up, the results in Table 3 indicate that some observable characteristics do predict savings bond participation among low-income tax filers in our sample. For example, our estimates suggest that having a larger federal refund increases the likelihood of purchasing savings bonds; the coefficient on the square of the federal refund amount is negative, suggesting concavity

---

[19] Specifically, a "high fidelity tax preparer" is a preparer who responded to our tax preparer survey and answered "agree" or "strongly agree" (6 or 7 on a 7-point scale) to the statement, "I prepared and presented the savings-bond worksheets according to the procedures." Tax preparers who felt savings bonds were a good idea were those who responded to our tax preparer survey and responded "agree" or "strongly agree" to the statement, "It is a good idea for filers to put some of their tax refunds into savings bonds."

[20] The results from estimation of analogous probit and logit models are qualitatively similar and find no significant effect of treatment status on savings bond participation.

[21] These results are available from the authors.

in this relationship. Black filers in our sample were about 10 percentage points more likely to buy savings bonds with their refund, while being a female with dependents increased the likelihood of savings bond take-up by about 18–20 percentage points. Filers who had a tax preparer who reported feeling that savings bonds were a good idea for the filers were about 9–10 percentage points more likely to buy savings bonds.

Finally, those who filed during the last 3 weeks of the tax season were significantly more likely to buy savings bonds than those who filed during the first four weeks of the season. This may suggest that late filers did not have the same pressing needs as early filers to spend their refunds paying bills or reducing debt and thus were better able to save. Therefore, while the default manipulation had no effect on savings, it was not the case that savings decisions at tax filing time were completely insensitive to characteristics or situation (see also Duflo et al. (2006) for evidence that financial incentives can induce saving a portion of tax refunds).

That savings bond participation is predicted by filer characteristics like refund amount, race, motherhood, time of filing, and tax preparer traits suggests possible heterogeneity in treatment effects. For instance, the default manipulation may increase savings among certain subgroups of taxpayers, such as those who file late in the season or those with large refunds. Accordingly, in Table 4 we present estimated treatment effects for various subgroups of low-income tax filers, splitting our sample first by filer traits, including race, gender, dependents, education, filing status, AGI (greater than or less than median), refund amount (greater than or less than median), whether filers reported currently having trouble with any bills, and whether filers had their taxes prepared by the same VITA site in the previous year. These results are consistent with our previous findings. We find no evidence of a treatment effect among any of these subgroups, nor do we find significant differences in estimated treatment effects across the relevant subgroups.[22]

Next, we consider whether treatment effects differed among clients in our sample depending on when in the tax season they filed. We find no statistically significant treatment effect among filers who filed early in the tax season (during the month of February), midway through the season (between March 1 and March 21), or late in the season (March 22 through April 15). However, recall from Table 3 that clients who file late (in the last three weeks of tax season) are more likely to purchase savings bonds than those who file early. In short, while intentions to save (spend) appear to be stronger among late (early) filers, our default manipulation does not nudge late filers to save more often.

Finally, perhaps the default increased savings bond participation among filers who had a certain type of tax preparer, e.g., if some preparers implemented the experiment with the desired treatment-control contrast and others did not. Similar results have been found in other experiments implemented by tax preparers during tax preparation sessions

---

[22] The results are qualitatively unchanged when we estimate regressions that include interactions between the treatment and the relevant characteristics using the full sample.

Table 4

Effect of Default on Savings Bond Participation Among Low-Income Tax Filers, by Filer and Preparer Characteristics

		Treatment Effect	Standard Error	Number of Observations
By Filer Traits:				
(1)	Full sample	−0.0051	(0.0366)	259
(2)	Black	0.0131	(0.0748)	115
(3)	Not black	−0.0270	(0.0381)	144
(4)	Female	0.0016	(0.0486)	177
(5)	Male	0.0455	(0.0600)	82
(6)	Dependents	−0.0285	(0.0754)	98
(7)	No dependents	0.0217	(0.0408)	161
(8)	High school or less	0.0198	(0.0630)	114
(9)	Some college or more	0.0227	(0.0732)	94
(10)	Single filer	0.0067	(0.0493)	148
(11)	Not a single filer	0.0123	(0.0638)	111
(12)	AGI < Median	−0.0484	(0.0531)	129
(13)	AGI > Median	0.0118	(0.0580)	129
(14)	Refund < Median	0.0265	(0.0514)	129
(15)	Refund > Median	0.0304	(0.0604)	129
(16)	Bill trouble	0.0527	(0.0506)	143
(17)	No bill trouble	−0.0117	(0.0722)	64
(18)	Taxes prepared here last year	0.0188	(0.0602)	93
(19)	Taxes prepared somewhere else last year	−0.0015	(0.0489)	166
By Time of Filing:				
(20)	Early filer (February 1–28)	0.0809	(0.0550)	97
(21)	Mid-season filer (March 1–21)	−0.0191	(0.0653)	100
(22)	Late filer (March 22–April 15)	−0.1092	(0.1116)	62
By Preparer Traits:				
(23)	Preparer responded to survey	−0.0245	(0.0458)	197
(24)	High fidelity tax preparer	−0.0096	(0.0541)	154
(25)	Thought bonds were a good idea	−0.0633	(0.0674)	124
(26)	Preparer was a student volunteer	−0.0390	(0.0703)	109
(27)	Preparer was a non-student volunteer	0.0069	(0.0693)	88

Notes: Results are from LPM/OLS regressions with standard errors in parentheses. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels. All regressions take the form of model (4) in Table 3, and include controls for refund amount and its square, AGI, gender, age, race, education, filing status, dependents, site dummies. Each regression also includes controls for missing age, gender, race, filing status, or dependent information.

(Chetty and Saez, 2009; Duflo et al., 2006). Interestingly, our initial results suggested that having a tax preparer who felt that savings bonds were a good idea for filers raised the probability a filer bought savings bonds by about 9 to 10 percentage points.

The bottom panel of Table 4 displays estimated effects of the default on savings bond participation among tax filers with preparers who responded to our preparer survey, who felt confident that they followed the experimental protocol, or who were enthusiastic about savings bonds as being a good idea for low-income tax filers. The final two rows compare estimated treatment effects for filers served by student and non-student tax preparers. Again our evidence suggests that the default had no significant impact on savings participation decisions among low-income tax filers, even those served by high-quality, enthusiastic, or non-student tax preparers.

In short, our results indicate that the default manipulation in our experiment had no discernable impact on low-income tax filers' savings decisions. Moreover, 95 percent confidence intervals around our key treatment effect estimates (Table 3) suggest that the treatment raised savings bond participation by no more than approximately 8 percentage points. That is, the upper bound on our estimate of the treatment effect is far smaller than the estimated default effects on savings participation found in the 401(k) literature. We compare our default manipulation to those in the literature on 401(k) defaults below.

V. DISCUSSION AND CONCLUSIONS

This study is the first to examine the use of a default manipulation as a way to influence savings decisions of low-income tax filers. More generally, we provide new evidence on how defaults affect savings behavior outside of the particular setting of decisions about 401(k) contributions, with a policy-relevant default intervention that differs in important ways from 401(k) defaults. The fact that we find no discernible effect of the default manipulation indicates that particular features of the choice setting and of the default intervention may matter in predicting the effectiveness of defaults.

One potential explanation for our findings is a divergence between the default and what the typical individual intended to do with the tax refund. Our survey of tax preparers provides some additional, ancillary evidence on this point. We asked about several potential reasons for the weak effect of the treatment, and one explanation emerged as the clear favorite: 79 percent of preparers observed that filers seemed to resist the savings default due to strong prior plans to use the refund for consumption (Table 5). Our survey of tax filers provides corroborating evidence, indicating that 75 percent of filers had the expectation that they would spend the refund.

In terms of the sources of intentions to spend the refund, one candidate is a plan to reduce debt. Low-income tax filers, many of whom may have substantial debts (which may carry high interest rates, e.g., credit card debts), may prefer to pay down debt rather than buying bonds (which offer a relatively low rate of return). For filers in this situation, the default may be particularly far from the optimum, causing them to opt out of buying bonds. This explanation is broadly consistent with our survey data, which

Table 5

Tax Preparers' Impressions of Why Filers Were Sometimes Reluctant to Buy Bonds
Observations: 197

Reason	Percentage Who Thought Reason was "Important" or "Very important"
Filers did not trust the government.	7.1
Filers did not know enough about bonds, or understand bonds well enough, to feel comfortable buying them.	49.7
Filers had specific plans for how to spend their refund, and thus did not save.	79.2
Filers were not opposed to saving, but did not like bonds because in the short run (the first year) they would not be able to access the funds if they wanted to.	31.0
Filers did not have enough experience with saving to evaluate the attractiveness of the interest rate offered by bonds.	47.7

Notes: The 58 preparer responses are weighted by the number of filers for whom they prepared taxes. Preparers were asked, "Please indicate how important each of the following factors was, in your opinion, in explaining why filers were sometimes reluctant to buy bonds." Possible responses were "not at all important," "a little important," "somewhat important," "important," or "very important."

indicate that nearly 70 percent of filers had trouble paying bills.[23] But we do not observe directly how tax filers end up spending the refund, and it is also quite possible that they have some other plan for spending the money, even if they do have outstanding debt with high interest rates.

---

[23] An alternative explanation is that the decision-cost advantages of accepting the default were outweighed by the psychological costs associated with deviating from pre-existing plans. The tendency for people to dislike deviating from the status quo, or prior expectations, is well documented (Kahneman and Tversky, 1979; Samuelson and Zeckhauser, 1988; Kőszegi and Rabin, 2006; Abeler et al., 2011). However, a recent study by Saez (2009) found that providing EITC-eligible filers with advance notification of tax-time savings opportunities (making the option to save part of their status quo or expectations) did not influence savings. This suggests that the difference between the default and filers' optimal savings is a more likely explanation for the high rate of opting out in our sample.

In short, a nudge is not a shove: As discussed above, 401(k) defaults may be powerful precisely because they coincide with the pre-existing intentions to save of relatively affluent individuals (Carroll et al., 2009), whereas in our case pre-existing intentions to spend a tax refund mean that a nudge is not sufficient to induce saving. This characterization does not, however, preclude the possibility that other, more expensive interventions, such as matching grants, may be effective at promoting tax-time savings.

We have also discussed that a difference between 401(k) automatic enrollment defaults and our default manipulation is the limited scope for procrastination to strengthen the effect of savings defaults. The limited effectiveness of our default could indicate that the procrastination channel plays a crucial role in savings defaults. This may be of broader relevance than just for policies focused on tax time. For any type of choice that policy makers would like to influence, but which cannot be postponed and must be made at a particular point in time, the impact of defaults may be weaker than otherwise.

Finally, there are also other factors that may help explain why the results from 401(k) default interventions (and active choice interventions) do not generalize to our setting. These include the various differences between 401(k) assets as compared to savings bonds, different demographics of the subject populations, and different financial circumstances. Disentangling the interaction of default interventions with type of asset and subject pool characteristics is an important direction for future research.

In summary, our findings raise important questions about the applicability and optimal design of default interventions for policy measures. Further research is needed to assess the power of defaults for different populations, and to open the black box of the mechanisms underlying default effects.

ACKNOWLEDGEMENTS

REFERENCES

Abadie, Alberto, and Sebastien Gay, 2000. "The Impact of Presumed Consent Legislation on Cadaveric Organ Donation: A Cross-Country Study." *Journal of Health Economics* 25 (4), 599–620.

Abeler, Johannes, Armin Falk, Lorenz Goette, and David Huffman, 2011. "Reference Points and Effort Provision." *American Economic Review* 101 (2), 470–492.

Baron, Jonathan, and Ilana Ritov, 1994. "Reference Points and Omission Bias." *Organizational Behavior and Human Decision Processes* 59, 475–498.

Barr, Michael S., and Rebecca M. Blank, 2009. "Savings, Assets, Credit, and Banking Among Low-Income Households: Introduction and Overview." In Blank, Rebecca M., and Michael S. Barr (eds.), *Insufficient Funds: Savings, Assets, Credit and Banking Among Low-Income Households*, 1–22. Russell Sage, New York, NY.

Barr, Michael S., and Jane Dokko, 2008. "Paying to Save: Tax Withholding and Asset Allocation among Low- and Moderate-Income Taxpayers." Finance and Economics Discussion Series, 2008–11, Divisions of Research and Statistics and Monetary Affairs. Federal Reserve Board, Washington, DC.

Bernheim, B. Douglas, Andrey Fradkin, and Igor Popov, 2012. "The Welfare Economics of Default Options: A Theoretical and Empirical Analysis of 401(k) Plans." NBER Working Paper No. 17587. National Bureau of Economic Research, Cambridge, MA.

Bertrand, Marianne, Sendhil Mullainathan, and Eldar Shafir, 2006. "Behavioral Economics and Marketing in Aid of Decision Making among the Poor." *Journal of Public Policy and Marketing* 25 (1), 8–23.

Beshears, John, James J. Choi, David Laibson, and Brigitte C. Madrian, 2010. "The Limitations of Defaults." Unpublished manuscript. Stanford University, Stanford, CA.

Beshears, John, James J. Choi, David Laibson, and Brigitte C. Madrian, 2008. "The Importance of Default Options for Retirement Savings Outcomes: Evidence from the United States." In Stephen J. Kay and Tapen Sinha (eds.), *Lessons from Pension Reform in the Americas*, 59–87. Oxford University Press, Oxford, UK.

Beverly, Sondra, Daniel Schneider, and Peter Tufano, 2006. "Splitting Tax Refunds and Building Savings: An Empirical Test." In James M. Poterba (ed.), *Tax Policy and the Economy*, 111–162. MIT Press, Cambridge, MA.

Carroll, Gabriel D., James J. Choi, David Laibson, Brigitte C. Madrian, and Andrew Metrick, 2009. "Optimal Defaults and Active Decisions." *Quarterly Journal of Economics* 124 (4), 1639–1674.

Chetty, Raj, and Emmanuel Saez, 2009. "Teaching the Tax Code: Earnings Responses to an Experiment with EITC Recipients." NBER Working Paper No. 14836. National Bureau of Economic Research, Cambridge, MA.

Choi, James J., David Laibson, Brigitte C. Madrian, and Andrew Metrick, 2002. "Defined Contribution Pensions: Plan Rules, Participant Decisions, and the Path of Least Resistance." In James Poterba (ed.), *Tax Policy and the Economy*, 67–113. MIT Press, Cambridge, MA.

Choi, James J., David Laibson, Brigitte C. Madrian, and Andrew Metrick, 2004. "For Better or for Worse: Default Effects and 401(k) Savings Behavior." In David A. Wise (ed.), *Perspectives on the Economics of Aging*, 81–121. University of Chicago Press, Chicago, IL.

Choi, James J., David Laibson, Brigitte C. Madrian, and Andrew Metrick, 2003. "Passive Decisions and Potent Defaults." NBER Working Paper 9917. National Bureau of Economic Research, Cambridge, MA.

D2D Fund, Inc., 2009. "Yes We Can: Inclusive Saving at Tax Time." D2D Fund, Roxbury, MA, http://www.d2dfund.org/files/publications/D2D_Yes We CanReport4_070809_FINALFINAL.pdf.

Duflo, Esther, William Gale, Jeffrey Liebman, Peter Orszag, and Emmanuel Saez, 2006. "Savings Incentives for Low- and Middle-Income Families: Evidence from a Field Experiment with H&R Block." *Quarterly Journal of Economics* 121 (4), 1311–1346.

Goette, Lorenz, and Simona Grassi, 2011. "A Field Experiment on Defaults and Organ Donations." Unpublished manuscript. University of Laussane, Laussane, Switzerland.

Internal Revenue Service, 2010. *Statistics of Income—2008 Individual Income Tax Returns.* Publication 1304 (Rev. 07-2010). Internal Revenue Service, Washington, DC.

Johnson, Eric J., Steven Bellman, and Gerald L. Lohse, 2002. "Defaults, Framing, and Privacy: Why Opting In-Opting Out." *Marketing Letters* 13 (1), 5–15.

Johnson, Eric J., and Daniel Goldstein, 2003. "Do Defaults Save Lives?" *Science* 21 (302), 1338–1339.

Jones, Damon, 2012. "Inertia and Overwithholding: Explaining the Prevalence of Income Tax Refunds," *American Economic Journal: Economic Policy* 4 (1), 158–185.

Jones, Damon, and Aprajit Mahajan, 2011. "Time-Inconsistency and Savings: Experimental Evidence from Low-Income Tax Filers." Center for Financial Security Working Paper 2011-CFS.6. University of Chicago, Chicago, IL.

Kahneman, Daniel, and Amos Tversky, 1979. "Prospect Theory: An Analysis of Decision under Risk." *Econometrica* 47 (2), 263–292.

Kahneman, Daniel, and Amos Tversky, 1982. "The Psychology of Preferences." *Scientific American* 246 (1), 160–173.

Kőszegi, Botond, and Matthew Rabin, 2006. "A Model of Reference-Dependent Preferences." *Quarterly Journal of Economics* 121 (4), 1133–1165.

Laibson, David, 1997. "Golden Eggs and Hyperbolic Discounting." *Quarterly Journal of Economics* 62 (2), 443–477.

Madrian, Brigitte C., and Dennis F. Shea, 2001. "The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior." *Quarterly Journal of Economics* 116 (4), 1149–1187.

O'Donoghue, Ted, and Matthew Rabin, 1999. "Doing It Now or Later." *American Econoimc Review* 89 (1), 103–124.

Saez, Emmanuel, 2009. "Details Matter: The Impact of Presentation and Information on the Take-up of Financial Incentives for Retirement Saving." *American Economic Journal: Economic Policy* 1 (1), 204–228.

Samuelson, William, and Richard Zeckhauser, 1988. "Status Quo Bias in Decision Making." *Journal of Risk and Uncertainty* 1 (1), 7–59.

Schulz, Kenneth F., and David A. Grimes, 2002. "Generation of Allocation Sequences in Randomised Trials: Chance, Not Choice." *Lancet* 359 (9305), 515–519.

Slovic, Paul, 1995. "The Construction of Preference." *American Psychologist* 50 (5), 364–371.

Thaler, Richard H., and Hersh M. Shefrin, 1981. "An Economic Theory of Self-Control." *Journal of Political Economy* 89 (2), 392–406.

Tufano, Peter, Daniel Schneider, and Sondra Beverly, 2005. "Leveraging Tax Refunds to Encourage Saving," Retirement Security Project Policy Brief 2005-8. Pew Charitable Trusts, Washington, DC.