Information, Preferences and Public Benefit Participation: Experimental Evidence from the Advance EITC and 401(k) Savings

By Damon Jones*

Within a field experiment, I present a treatment group with reductions in information, administrative, stigma and procrastination costs associated with the Advance EITC. The treatment only increases Advance participation from 0.3 to 1.2 percent. Another treatment simultaneously encourages 401(k) savings, increasing 401(k) participation from 46 to 50 percent. However, there is no additional increase in Advance participation when coupled with the 401(k) treatment, casting doubt on a long-term forced savings motive. The results indicate that EITC recipients actively forgo the Advance. Further work is needed to identify what underlies these preferences. Possible explanations include uncertainty and/or short-term forced savings motives.
JEL: H00, H24, H30

The Earned Income Tax Credit (EITC) has emerged as the largest cash transfer program in the US. This credit constitutes a significant share of income for many recipients: as much as 40 percent for some households. At the same time, the EITC is generally administered in a one-time payment at the end of the year. The lumpy nature of the payment may prove costly for low income tax filers who commonly use EITC refunds to repay debt (Timothy Smeeding, Katherine Ross-Phillips and Michael O'Connor 2000, Sherrie L. W. Rhine, Sabrina Su, Yazmin Osaki and Steven Y. Lee 2005). According to the 2004 Survey of Consumer Finances (SCF), households within the EITC-eligible range of income held on average $2,700 in credit card debt and qualified on average for $1,536 in Advance EITC payments. At an annual percentage rate (APR) of 15 percent, the benefit of receiving, say monthly payments instead of annual payments, is $124 per year, or about 3 days of work, and at an APR of 20 percent, this figure rises to about 4 days of work.[1] There may be an even greater benefit of more frequent payments for credit

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[1] Credit card debt figures are for households in the bottom 20% of incomes, as reported in the 2004 SCF. The median household in this group qualifies for the maximum Advance EITC, $1,536. The benefit of more frequent payments is calculated as the potential savings in compounded, monthly interest on credit card debt.

constrained households that are unable to smooth consumption throughout the year.

The Advance EITC option allows EITC recipients to receive a portion of the credit early, in incremental payments with each paycheck during the tax year. Given the evidence on credit constraints among those claiming the EITC (Nicholas S. Souleles 1999, Lisa Barrow and Leslie McGranahan 2000, Alan Berube, Anne Kim, Benjamin Forman and Megan Burns 2002, Gregory Elliehausen 2005), the Advance would appear to be an attractive option for low income taxpayers. However, estimates of Advance EITC participation range from 0.5 percent to 3 percent.[2] Previous research has struggled to explain why take-up for this program is so low (U.S. Government Accountability Office GAO 1992). It may be possible that the Advance EITC is not welfare enhancing. The costs of signing up and figuring out one's eligibility may be prohibitive. Furthermore, if the tax filer turns out to be ineligible for the EITC at the end of the year, the Advance payments must be paid back to the IRS. Finally, if individuals have time-inconsistent preferences (David Laibson 1997, e.g.) or hold multiple "mental accounts" (Richard H. Thaler 1999), then the smaller Advance payments may be spent in very different ways than the one-time EITC payment. These factors notwithstanding, it is still surprising that the Advance option is met with nearly universal nonparticipation.

In order to gain greater insight into this question, I conduct a randomized field experiment involving the Advance EITC and a large employer. The first component of the experiment is designed to jointly test the significance of four explanations of low Advance EITC take-up. First, informational barriers may hinder participation: potential recipients may lack awareness of the Advance or may not understand how to receive payments (GAO 1992). To address this, I present a treatment group of stores with informational materials and the necessary forms for enrollment. There are a second set of administrative costs that arise because the Advance EITC is administered through the employer (Internal Revenue Service, National Research Office IRS 1999). Accordingly, I train the store managers to present the informational materials to employees in the context of the workplace.

Third, individuals may procrastinate in filling out the necessary Advance EITC paperwork. To address the possibility of procrastination, I impose a soft deadline on the decision to enroll. Fourth, the employees may not enroll for fear of stigma. Therefore, I also require all employees to submit a decision, using the so-called "Active Decision" mechanism (Gabriel D. Carroll et al. Forthcoming). Requiring everyone to hand in paperwork regardless of their interest in the program makes it harder to infer which employees are actually participating, thus reducing stigma. Because the first treatment simultaneously addresses these four explanations, I am only able to analyze their collective effect, or lack thereof, on Advance EITC take-up.

Individuals may also avoid Advance payments as a form of forced savings; the "lump-sum" EITC payment might be viewed as an illiquid savings vehicle, and therefore, a

[2] When using IRS tax return data for 2003, about 100,000 filers, or 0.5 percent of EITC recipients report receiving an Advance. However, the GAO uses W-2 forms from employers to estimate an additional 400,000 recipients that do not report the Advance on their tax return (U.S. Government Accountability Office GAO 2007). The GAO also adjusts for the fact that only 4 out of 5 EITC recipients would have qualified for the Advance.

commitment device (Jennifer L. Romich and Thomas Weisner 2000). To address this, I offer a second group of treatment stores the option of channeling their Advance payments into an arguably superior savings vehicle, the company-matched, 401(k) savings plan.

The experimental treatment results in a very small increase in Advance EITC participation. I precisely estimate increases in participation among all employees from a base of 0.3 percent to about 1.2 percent. Taking into account the fact that not all employees are eligible raises this estimate to an approximate 1.6 percentage point increase. In a previous experiment, the IRS (1999) employed a mailing to notify EITC recipients of the Advance option. Similar to the results presented here, the IRS only increases participation from 0.5 percent to 1.27 percent. My experiment shows that increasing the intensity of the information treatment by approaching subjects in the workplace does not increase the effect.

As a result of the additional 401(k) treatment, there is a 4 to 4.5 percentage point increase in participation in the company-provided savings plan from a baseline participation rate of 46 percent. However, there is no detectable difference in the increase in Advance EITC take-up in the presence of the 401(k) savings treatment. These results together suggest that information, administrative costs, stigma, procrastination and long-term forced savings motives do not play a major role in explaining low Advance EITC take-up rates. The presence of an effect on 401(k) savings further rules out the explanation that this population is simply unresponsive to informational interventions. Conditional on being made aware of the Advance, EITC recipients actively forgo it. As expressed by the IRS (1999), there seems to be limited scope for increasing participation in the Advance EITC option in its current form, at least with short run interventions.

Further work should seek to disentangle remaining theories of low Advance take-up and their implications for the optimal timing of EITC payments. There are at least three other explanations that are not directly addressed by the experimental design. First, individuals may be uncertain about their EITC eligibility, and thus avoid Advance payments for fear of having to pay them back at the end of the year (Lynn M. Olson and Audrey Davis 1994, GAO 2007). Second, the experimental design only partially accounts for a forced savings motive. Should individuals deem the 401(k) account too illiquid, they may still reject the Advance EITC option, even though they have forced savings motives. Thus, a short-term forced savings motive remains untested. Finally, the importance of institutional defaults should not be overlooked. Below I briefly compare institutions and outcomes between the major US and UK income tax credits.

The remainder of this paper proceeds as follows. Section I describes the rules for the Advance EITC and 401(k) savings plans. Section II explains the experimental design and methodology and also includes a data description. Section III presents the results of the experiment and Section IV concludes with discussion and suggestions for future research.

I. Program Descriptions

A. Advance EITC

Introduced in 1975, the EITC is a refundable tax credit for low income workers that may comprise as much as 40 percent of income. The maximum benefit is $5,657 for the year 2009. In order to be eligible for the credit a tax filer must earn income at some point during the tax year. The subsidy is characterized by a "phase-in" range over which the credit increases in earned income, a "plateau" over which the credit is constant and a "phase-out" range over which the credit decreases with earnings. The maximum earnings thresholds are $43,279 for single filers with three or more children, $40,295 for single filers with two children, $35,463 for single filers with one child and $13,440 for single filers with no children. For married couples, the earnings threshold is relaxed by an additional $5,000. A more thorough history and description of the EITC schedule as well as a review of its behavioral effects is provided by V. Joseph Hotz and John Karl Scholz (2003).

The Advance EITC has been in existence since 1979. For 2009, the maximum allowed Advance is 60 percent of the maximum credit for a family with one child, or $1,826. After receiving Advance payments, the remainder of the credit is received when taxes are filed at the end of the tax year. However, if the tax filer turns out to be ineligible for the credit, the Advance must be paid back to the IRS, possibly with an interest penalty. To receive Advance payments, an individual must submit a W-5 form to their employer, which the employer is legally obligated to process. The IRS provides guidelines to employers for calculating payments.

When signing up for Advance payments, individuals must accurately predict that they will indeed be eligible for the EITC at the end of the year. Eligibility requires that one qualify for the general EITC and also claim at least one child. Changes in income or family status are factors that may affect this. If an individual believes that she will no longer be eligible, she must submit another W-5 form canceling Advance payments. In addition, individuals may receive Advance payments from only one employer at a time. If a recipient changes employers, she must fill out another W-5 form with her new employer. If taxes are filed jointly, both members of the couple must submit W-5 forms to their respective employers. Finally, the Advance EITC must be renewed each year.

B. 401(k) Plans

Established in 1978, 401(k) plans allow individuals to make tax deductible contributions to a retirement savings account through the employer. The returns to these contributions are taxed upon withdrawal, with penalties levied on savings withdrawn prior to retirement. Thus, savings in these accounts are given preferential treatment, as taxes on interest are deferred and marginal tax rates are relatively low at the time of retirement. Laurence J. Kotlikoff and David Rapson (2006) argue that retirement accounts can earn $0.06, $0.07 and $1.84 on the dollar for an individual earning $30,000 per year at ages of

30, 45 and 60 respectively. Many employers partially match 401(k) contributions. Employees in the current study are offered a 25 percent match on a maximum of 5 percent of earnings, which translates into an increase of about 1.25 percent in annual earnings, or $150 on average. Additional matching of up to 25 percent of the employee contribution is provided at the end of each year via profit sharing. The match becomes fully vested after four months of employment.

An additional benefit of the 401(k) plan is identified once one recognizes possible psychological barriers to retirement saving. For individuals who pay little attention to the need for retirement savings or face significant discipline problems, the automation of savings that is afforded by a 401(k) savings plan may be of great benefit. On the other hand, early withdrawal penalties may reduce liquidity, which can be especially costly to low-income workers who face a negative income shock.

II. Experimental Design, Data Description and Methodology

A. Participating Firm

This field experiment was made possible by the collaboration of a large-scale, nationwide firm in the retail sector. The nature of prevailing wages in this sector suggests that I have an advantage in reaching a target population of EITC-qualifying households. The firm's hierarchy flows down from a parent company to sub-companies. These subcompanies are then divided into regions and further into districts. Districts are comprised of about 20 stores. I focus on hourly employees at a subset of retail outlets within the Southern and Western regions of the firm. Each of the two regions is a part of a different sub-company, though the two are very similar in scope.

Many of the employees at this company work less than 40 hours per week. Employees work in overlapping shifts, and each store has a team of approximately four managers. Store sizes range from 22 to 124. Prior to the experimental intervention, the company regularly notified its employees of opportunities such as the EITC, Advance EITC, food stamps, and the like through posters in the workplace. In addition, the company runs an annual 401(k) enrollment campaign during the spring, which coincides with the field experiment. The outreach campaign amounts to sending out all necessary 401(k) forms to eligible employees who are not yet enrolled.

B. Experimental Design

The experiment consists of varying the costs of enrollment for the Advance EITC and 401(k) Savings benefit across districts of stores. There are two treatment groups that received either the "Advance EITC Only" treatment or the "Advance EITC and 401(k)" treatment and a control group that received no intervention. The first treatment jointly reduces four types of costs associated with the Advance EITC: information costs, administrative costs, procrastination and stigma. Since I am addressing these four types of costs simultaneously, I am only able to test the null hypothesis that these costs collectively do not affect take-up. I will not, for example, be able to disentangle the relative contribution

of each cost to Advance take-up. The second treatment separately addresses the issue of time inconsistency.

First, a high cost of figuring out how to enroll may explain low participation. To address this issue, I present the first treatment group of stores with information in the form of a color flier and short video presentation, encouraging them to sign up for the Advance. The fliers tell employees that they may increase their take home pay by signing up for the Advance and receiving the EITC earlier. The flier also explains the eligibility requirements, the procedure for enrolling in the program and additional details, including the fact that ineligible employees will have to repay Advance payments.[3] The use of a flier and video helps to maintain consistency in treatment across different sites. In addition, these employees are given the IRS W-5 form needed to begin Advance payments.

Second, there may be additional administrative obstacles to enrollment driven by the fact that the Advance EITC is disbursed through the employer (IRS 1999). Therefore, I administer the treatment through the Human Resources department and engage the employee within the workplace setting. I train managers either in person or over conference calls, and also provide information packets to aid in determining the eligibility of employees. Managers distribute the Advance EITC information during routine group meetings. Those employees who are both interested and eligible can then sign up for the program at their work site.

Third, individuals who desire to enroll may procrastinate in filling out paperwork, and fourth, they may be reluctant to submit their forms due to stigma. I therefore incorporate the so-called "Active Decision" mechanism, which was previously used by Carroll et al. (Forthcoming) to promote 401(k) savings. Employees are given a soft deadline of two weeks to hand in a form indicating their preference, even if they are not interested in the program. The deadline forces procrastinators to hand in paperwork. Both employees who select the Advance option and those who decline must submit a form. This makes it harder to infer who is enrolling in the program and thus reduces a stigma effect.

Yet another explanation cites low Advance EITC take-up as evidence of forced savings. Time-inconsistent preferences may create barriers to saving incremental Advance payments, and mental accounting may make it preferable to receive the EITC as one large payment in order to facilitate particular types of purchases or savings (Thaler 1999, Romich and Weisner 2000). Within this framework, a sophisticated individual will seek out illiquid savings vehicles to use as commitment devices. To explore this hypothesis, I introduce a second treatment group in which employees receive the same Advance EITC intervention as above and are also encouraged to contribute to the company provided 401(k) savings plan.

The informational materials given to these employees suggest that additional payments received from the Advance EITC may be channeled into a 401(k) plan. They are told via a video presentation, "Now you can take the extra $30 per week from the Advance EITC and put it into your 401K plan." Managers are given an additional table outlining the 401(k) contribution level needed to roughly offset Advance payments. In addition to Advance EITC forms, the employees also receive the necessary forms for 401(k) enrollment. Those

[3] Copies of the printed treatment materials are presented in an online appendix.

in the second treatment group are likewise subject to a soft deadline of two weeks to make a decision. If individuals believe that they lack the discipline to receive Advance payments with their paycheck, they can use 401(k) contributions to automatically put the funds toward retirement. However, if individuals only wish to put the money away for a short period of time, then the 401(k) account may prove too illiquid. Therefore, this test only addresses a forced savings motive that includes long-term savings goals.

The experiment takes place during the spring of 2006. Store managers are given training on the Advance EITC and the materials to be used for the experiment. Materials are shipped out to the stores, and the treatment is administered over the span of two weeks to all current employees.[4] Figure 1 depicts the hierarchical structure of the firm and regions involved in the experiment. Randomization of the treatment takes place at the district level, with 6 districts assigned to the "Advance EITC Only" treatment, 6 districts assigned to the "Advance EITC and 401(k)" treatment and 7 districts assigned to the control group. This is the finest level of randomization feasible for the company, given its management and operation structure. Figure 1 provides the sample size of the experiment at the different levels of operation. In the "Advance EITC Only" treatment group there are 58 stores and 2,227 employees. In the "Advance EITC and 401(k)" treatment group there are 66 stores and 2,519 employees. Finally, there are 61 stores and 2,231 employees in the control group.

[INSERT FIGURE 1]

C. Data and Descriptive Statistics

The data consist of weekly, payroll data for all employees, hourly and salaried, in the treatment and control stores. The data span February 2006 to May 2007, and newly acquired employees are added as time passes, resulting in a panel of about 25,000 individuals and over 600,000 individual-by-week observations. I restrict analysis to hourly employees, who comprise roughly 94 percent of all employees, also drop all new employees hired after the treatment implementation. Included in this data are the outcome variables of Advance EITC participation, Advance payment, 401(k) eligibility, 401(k) participation, and weekly 401(k) contribution. In addition to the key variables of interest, there is data on tenure, wages, number of allowances for tax withholding purpose, weekly hours worked, sub-company, region, district, store, and hourly or salary status. Finally, there are demographic variables, including age, gender, marital status, and race/ethnicity. I am also able to identify the geographical location of each store.

A key missing variable in the data set is EITC eligibility. I cannot observe number of children nor earnings outside of the firm. In addition, eligibility is not officially determined until the year's end, when annual income is known with certainty. This precludes me from estimating the Advance EITC participation rate among EITC-eligible employees. Thus,

[4] Because materials are not shipped to all stores on exactly the same date, some stores lag a couple of weeks in administering the treatment. Thus, the treatment implementation period spans about 6 weeks. Nevertheless, at any given store, materials are only distributed over a two week period.

my estimates serve as a lower bound to the true participation rate. I will discuss a possible adjustment for this below.

Table 1 presents the baseline characteristics of hourly wage earners in the treatment and control groups one week prior to the experiment. As can be seen, I am successful in achieving balance between the treatment and control groups despite the coarse level of randomization. One may notice that the pre-existing Advance EITC participation rate in the "Advance EITC Only" treatment group is nearly double that of the control group. However, this difference is insignificant, with a p-value of 0.226.

The baseline Advance EITC participation rate is less than 0.3 percent, though this rate does not exclude ineligible employees. The 401(k) participation rate among eligible employees is over 40 percent, which is relatively high given the makeup of the population. Most employees work only part-time, averaging 25 hours per week and earning a median wage of $7.50 per hour. I have a diverse population that is roughly 30 percent Hispanic, 20 percent Black and 8 percent Asian. A large portion, 80 percent, of the sample is female, and only 30 percent are married. I do not observe number of dependents, which is needed to determine EITC eligibility. Nevertheless, the sample is well suited for studying the EITC, which is concentrated among single, female-headed households and minorities (Steve Holt 2006).

[INSERT TABLE 1]

D. Empirical Methodology

I aim to measure the effect of the experimental treatment on Advance EITC participation, 401(k) participation and possible interactions between the two. I begin with simple graphical analysis, which provides evidence that the treatments increased Advance EITC and 401(k) participation. Next, I run a series of panel regressions of the following form:

$$y_{st} = \eta_s + \eta_t + \beta T_{st} + \Gamma \mathbf{X}_{st} + \varepsilon_{st}, \tag{1}$$

where y_{st} is average participation in the Advance EITC program or 401(k) savings plan in district s at week t. Here η_s and η_t are district and time fixed effects, $\mathbf{X}_{st}$ is a vector of control variables, and T_{st} is the treatment, which is varied at the district-by-week level. Control variables include W-4 allowances, weekly hours, wage, tenure, age, store size, and dummy variables for gender, race/ethnicity, marital status, and southern region. Cubic polynomials of all continuous variables, interactions between all continuous variables and interactions between each dummy variable and all continuous variables are included in the full specification.

The treatment effects on Advance EITC and 401(k) participation are separately estimated for each treatment group. An estimate, $\hat{\beta}$, from (1) is the intent-to-treat (ITT) effect on participation and signifies the importance of the bundle of costs addressed by the treatment. In addition, a comparison of the $\hat{\beta}$ for Advance EITC participation across

the two treatment groups identifies any additional effect on Advance EITC enrollment driven by the coupling of the 401(k) savings plan.

E. Serial Correlation Correction

In this experiment I have both a dependent variable, Advance EITC enrollment or 401(k) participation, and an explanatory variable, treatment group, that are highly serially correlated. This may cause a downward bias on traditionally estimated standard errors. This problem is compounded by the small number of districts and potentially long time series allowed by the data. Following Marianne Bertrand, Esther Duflo and Sendhil Mullainathan (2002) I consider two approaches to correct for serial correlation. First, I collapse the data to the district–by-week level and cluster the standard errors at the district level. This approach allows for a flexible variance covariance structure for the error terms over time, within the districts. A second approach uses randomization inference to estimate standard errors. To implement this I randomly reassign treatment status at the district level and estimate a placebo ITT effect as in (1). I repeat this procedure 1,000 times and compare my actual estimated treatment effect to the empirical distribution of the placebo treatment effects. I can then test the null hypothesis that my actual treatment effect is drawn from this distribution.

III. Main Results

A. Graphical Evidence

The main results of the experiment are presented in Figures 2 and 3. Figure 2 displays Advance EITC participation rates among all hourly employees during the course of the experiment. Rates are reported separately for each treatment group and the control group. The shaded region identifies the period over which the treatment is administered. Figure 3 plots 401(k) participation rates in each of the treatment groups during the same period. The difference between each treatment group and control group is also plotted to adjust for seasonal variation in 401(k) eligibility[5].

[INSERT FIGURE 2]

Four major findings are apparent in Figure 2. First, the pre-existing level of Advance EITC participation is low in both groups, though slightly higher in one treatment group. Second, there is marked growth in participation in the treatment groups relative to the flat control group. Third, the overall magnitude of the treatment effect is modest: Advance EITC participation rates peak at about 1 percent in the treatment stores. Fourth, the increase in Advance EITC enrollment is very similar across the different treatment groups, suggesting no additional effect of coupling the treatment with a 401(k) intervention.

[5]Employees become eligible for the 401(k) savings plan in the first quarter following 1,000 hours of work. Thus, there is a quarterly influx of newly eligible employees that causes a mechanical dip in the participation rate.

Figure 3 presents the results of the 401(k) treatment. From a baseline of 46 percent, savings plan participation increases by 4 to 4.5 percentage points for the "Advance EITC and 401(k)" treatment group relative to the "Advance EITC Only" treatment and control groups. The treatment effect on 401(k) participation is more gradual than that of the Advance EITC. This is in part due to increasing eligibility over time and/or different administrative processes for activating 401(k) payments. Finally, the presence of a sizeable 401(k) effect reassures us that a lack of implementation is not the explanation for small treatment effects on Advance EITC participation.

[INSERT FIGURE 3]

B. Regression Analysis

I now turn to regression analysis, which largely reinforces the insights from Figures 2 and 3. Panel A of Table 2 presents points estimates for the treatment effect on Advance EITC participation. The treatment effects are estimated as described in Equation (1). The data are grouped at the district level and include all observations prior to the first week and following the last week of treatment implementation. In Columns (1) and (4) I report the estimates without any control variables. Columns (2) and (5) include the full set of observed control variables: W-4 allowances for tax withholdings, hours worked in the past week, wage, tenure, age, store size, and a set of dummies for Hispanic, Black, Asian, Native American, gender, marital status and region. Finally, in Columns (3) and (6) I also include a cubic polynomial in each continuous control variable, interactions between all continuous control variables and interactions between each dummy and all continuous control variables.

I precisely estimate a small effect on Advance EITC participation. Point estimates range between a 0.5 and 0.8 percentage point increase in participation for the "Advance EITC Only" and "Advance EITC and 401(k)" treatment groups respectively. Importantly, the treatment effects are statistically indistinguishable across the two groups. The Advance EITC treatment effects are statistically significant and relatively constant across the different specifications. The results remain significant after clustering or using randomization inference to account for serial correlation within districts. These findings are consistent with the aforementioned experiment conducted by the IRS (1999).

[INSERT TABLE 2]

Panel B of Table 2 reports the analogous treatment effect on 401(k) participation. Save for the outcome variable, the specifications in Panel B are identical to those in Panel A. The data are similarly grouped and cover the same time period, but are now restricted to 401(k) eligible employees. In Columns (10) through (12) I estimate a 4 to 4.5 percentage point increase in 401(k) participation for the "Advance EITC and 401(k)" treatment group. This is approximately a 10 percent increase relative to a baseline participation rate of 46 percent. As expected, there is no comparable increase for the "Advance EITC Only" treatment group, as these stores did not receive any 401(k) treatment. The estimates are fairly robust to controls, though not as stable as the Advance EITC results,

and remain statistically significant after clustering and randomization inference. These findings are qualitatively similar to previous work by Carroll et al. (Forthcoming) on the determinants of 401(k) savings, in which deadlines and the use of an "Active Decision" mechanism significantly increases take-up. However, I estimate a much smaller increase in participation: 4.5 percentage points versus 28 percentage points. As compared to the Carroll et al. (Forthcoming) study, my sample is drawn from a lower segment of the income distribution, where the benefit of participating in a 401(k) savings plan is smaller. This may partially explain the discrepancy in treatment effects.

C. Adjusting for EITC Eligibility

I have thus far reported the treatment effect on participation among all employees, though I would ideally wish to report the effect among EITC-eligible employees. Though I lack data on EITC eligibility, I can impute eligibility using an auxiliary data set. I use the 2006 March Supplement of the Current Population Survey (CPS) in conjunction with the National Bureau of Economic Research (NBER) TAXSIM model.[6] First, I use the TAXSIM model to calculate EITC eligibility for hourly workers in the CPS. Next, I impute EITC eligibility using a set of variables that overlap in the CPS data and in my administrative data: wage, age, marital status, race/ethnicity and geographic region. This method generates an estimated eligibility rate of 48 percent for my sample during the first week following the treatment implementation. Thus, the treatment effect is scaled up from increases of 0.5 and 0.8 to 1 and 1.6 percentage points in the "Advance EITC Only" and "Advance EITC and 401(k)" treatment groups respectively.

IV. Discussion

Given the results in Table (2), I can rule out an increase of participation greater than 1.6 percentage points. The makeup of the experimental population, the scope of the treatment and in particular, the participation of the employer arguably gave the Advance EITC its best chance at succeeding. The results imply that low participation in the Advance EITC option is not simply due to a lack of information, administrative costs, stigma, procrastination nor long-term forced savings motives. One may further conclude that the small increases in Advance enrollment are not the result of deficiencies in the design or implementation of the field experiment. I observe a treatment effect on 401(k) participation of 4 to 4.5 percentage points, which is an order of magnitude larger than that of the Advance EITC. It is therefore reasonable to presume that subjects were exposed to the Advance EITC materials and actively chose not to enroll. Further work is needed to disentangle remaining hypotheses of low Advance EITC take-up.

Alternative explanations for low Advance EITC take-up include a concern of having to pay back the payments at the end of the year and/or a short-term forced savings motive.

[6] For more on the TAXSIM model see (Daniel Feenberg and Elizabeth Coutts 1993) or visit the NBER website at `http://www.nber.org/~taxsim/`. Stata code used in preparing the CPS for TAXSIM was based on code written by Judith Scott-Clayton, available at `http://www.nber.org/~taxsim/to-taxsim/`.

Distinguishing between these two theories is important, as they have different policy implications. If risk aversion is driving behavior, then EITC recipients may be taking costly precautionary measures due to uncertainty and complexity of income tax liability. Taking measures to reduce confusion regarding eligibility or adjusting the manner in which underwithholding is resolved may alleviate these costs. I have already shown that information has only modest effects on overall take-up. This leaves altering the resolution of overpayments (e.g. offering a special payment plan) as a possible avenue for increasing Advance EITC take-up.

On the other hand, if individuals use the lumpiness of the EITC as a form of forced savings, then products that allow for short-term, illiquid savings options may be of benefit to EITC recipients. My test of force savings is limited due to the long-term horizon of a 401(k) savings plan and the possibility that EITC-eligible employees are not likely to be 401(k) eligible. An alternative test of this theory would be to see if employees welcome additional withholdings from their paychecks that are repaid at the end of the year by the employer. With the help of an employer, it would be possible to design a field experiment that investigates whether such demand exists in the field.

One final explanation of low Advance take-up is that behavior may be heavily influenced by institutional defaults. This can be illustrated by a comparison of tax credits in the US to those in the UK. The UK analog of the EITC is the Working Tax Credit (WTC).[7] WTC payments are disbursed by Her Majesty's Revenue and Customs (HMRC) on a monthly or bi-weekly basis, though not as a part of the paycheck. Initially, the refundable credit is based on prior year income, and recipients must report changes to marital status, number of dependents, earnings and other factors throughout the year that may affect the level of the credit. At the end of the year, overpayments or underpayments are resolved. Thus, the mandatory timing of tax credits in the UK is much more frequent than the default, annual cycle of payments of the EITC in the US.

In each case, a lack of adjustment on the part of taxpayers results in very different outcomes. In the UK, 73 percent of WTC recipients received throughout the year overpayments *from the government* in 2004 as a result of not adjusting reported income. This group had to pay back on average 12 percent of their entitled credit at the end of the year (Brewer 2006). In stark contrast, 95 percent of EITC recipients in the US overpaid taxes *to the government* throughout the year in 2004, in part due to a lack of reducing tax withholdings via the Advance EITC. These tax filers received refunds that were on average in excess of 100 percent of their entitled credit at the end of the year (IRS 2004). Thus, passive behavior interacted with differing institutional defaults are associated with vastly different patterns of over- and underwithholding. In addition, the UK taxpayers interestingly do not exhibit a demand for the option to delay payments until the end of the year, as would be predicted, for instance, by a forced savings hypothesis. Instead, they often complain about the lack of timeliness of their WTC payments (Brewer, Saez and Shephard 2008). More investigation into the differences between the US and UK systems may yield further insights into the preferences over the timing of tax credits and

[7]For more details on the WTC, see Mike Brewer (2006) , Cormac O'Dea, David Phillips and Alexei Vink (2007) and Mike Brewer, Emmanuel Saez and Andrew Shephard (2008) .

the effects of these timing decisions.

This last explanation of low take-up has implications from a public finance standpoint. If individuals exhibit inertia when choosing between receiving Advance payments and receiving the "lump sum" form of the EITC, changing the default does little to change the underlying economic incentives, but may alter behavior significantly. This phenomenon must be taken into account when calculating the excess burden of an income tax and also when designing an optimal income tax. This is especially the case if specific subgroups are more influenced by defaults, which adds another dimension to the distributional impact of the income tax.

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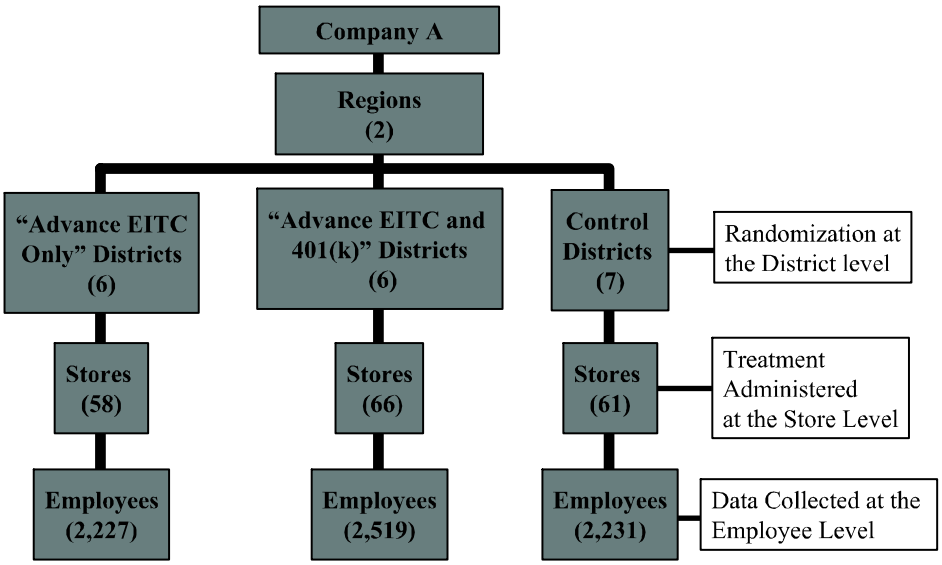

FIGURE 1. COMPANY STRUCTURE AND EXPERIMENTAL DESIGN

Note: Structure of participating firm for the subset of stores that participated in the experiment. All stores within two of the company's regions participated in the experiment. Due to operational constraints, randomization took place at the district level. Nevertheless, data is collected at the individual level.

Table 1—Baseline Descriptive Statistics

	Control	Advance EITC Only Treatment	Advance EITC & 401(k) Treatment		Control	Advance EITC Only Treatment	Advance EITC & 401(k) Treatment
Advance EITC Participation	0.179 (0.097)	0.359 (0.106)	0.159 (0.073)	Hispanic	30.524 (6.848)	32.749 (11.215)	28.027 (5.936)
401(k) Participation (Among those eligible)	43.202 (1.015)	44.712 (3.275)	46.747 (3.652)	Black	19.632 (9.947)	19.766 (5.631)	25.883 (6.481)
401(k) Contribution Rate	5.942 (0.478)	6.102 (0.444)	6.094 (0.257)	Asian	8.247 (2.023)	6.334 (2.964)	9.369 (1.825)
401(k) Eligibility Rate	44.509 (3.010)	42.902 (2.917)	46.368 (3.147)	Native American	0.448 (0.104)	0.854 (0.506)	0.834 (0.123)**
Tenure	2.622 (0.190)	2.727 (0.216)	2.741 (0.192)	Married	31.197 (1.940)	30.503 (1.778)	29.655 (1.875)
Median Wage	7.646 (0.041)	7.257 (0.028)***	7.634 (0.101)	Female	80.457 (1.710)	77.448 (2.082)	80.945 (1.351)
Weekly Hours	24.766 (1.022)	25.374 (0.914)	25.772 (0.587)	Southern Region	40.879 (19.268)	67.026 (19.752)	66.217 (20.250)
W-4 Allowances	1.291 (0.160)	1.676 (0.461)	1.441 (0.262)	Store Size	42.019 (3.064)	44.753 (3.074)	44.251 (2.051)
Age	34.368 (0.780)	33.669 (0.505)	34.782 (0.569)	Weekly Turnover Rate	0.270 (0.078)	0.361 (0.103)	0.398 (0.113)
N	2,231	2,226	2,519	*N*	2,231	2,226	2,519
Districts	7	6	6	Districts	7	6	6

Note: Descriptive statistics for sample one week prior to the treatment implementation. Shares are reported in percentage terms (i.e. Advance EITC participation for the control group should be interpreted as 0.18 percent, while 401(k) participation for that group should be interpreted as 43.2 percent). Standard errors, clustered at the district level, are reported in parentheses. Standard errors for median wages are calculated via the bootstrap method.
*Significantly different from the control group at the 10-percent level.
**Significantly different from the control group at the 5-percent level.
***Significantly different from the control group at the 1-percent level.

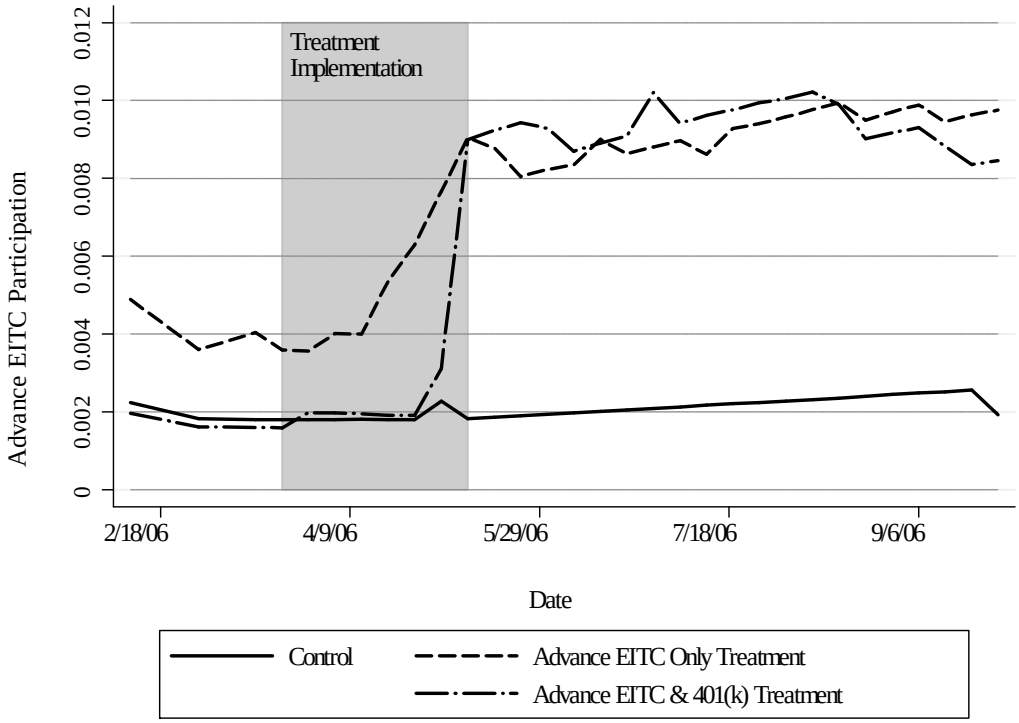

FIGURE 2. ADVANCE EITC PARTICIPATION BY TREATMENT GROUP

Note: Advance EITC participation rates by treatment group, among all hourly employees, including non-eligible employees. Shaded area denotes the treatment implementation period.

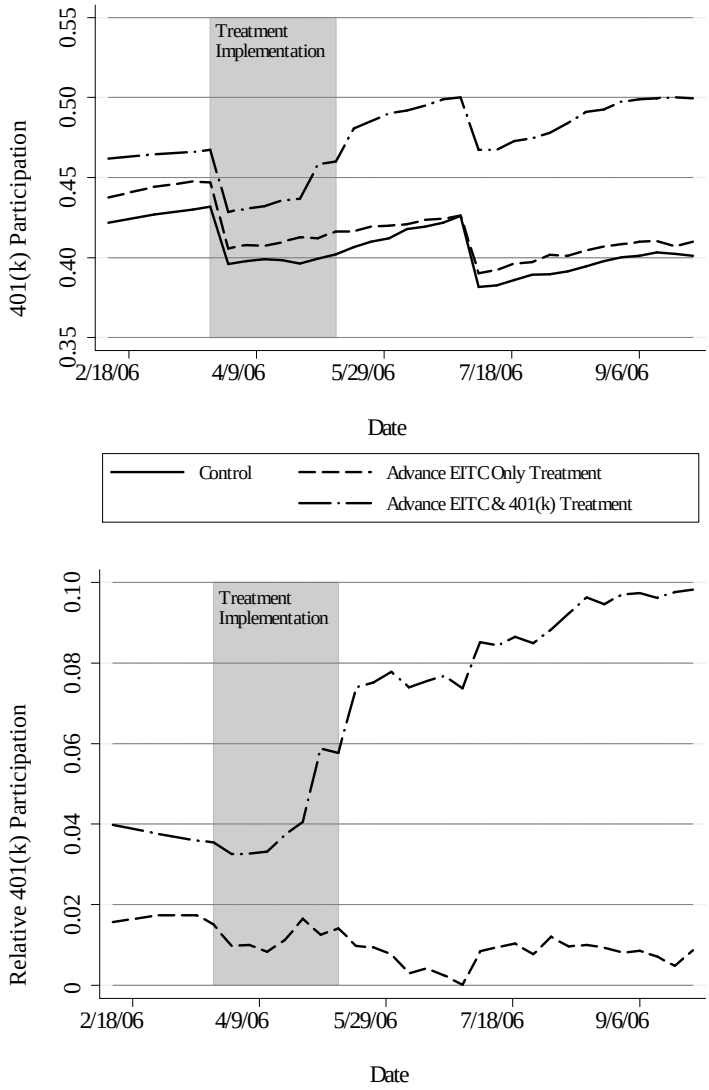

FIGURE 3. 401(K) PARTICIPATION BY TREATMENT GROUP

Note: 401(k) participation rates by treatment group, among all eligible, hourly employees. The top graph presents the raw participation rates, while the bottom graph presents the difference between each treatment group and the control group. Shaded area denotes the treatment implementation period. Employees become eligible for the 401(k) savings plan in the first quarter following 1,000 hours of work. Thus, there is a quarterly influx of newly eligible employees that causes a mechanical dip in the participation rate.

Table 2—Treatment Effect on Advance EITC and 401(k) Participation

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Advance EITC						
Advance EITC Only Treatment Effect	0.503	0.529	0.542	–	–	–
Advance EITC & 401(k) Treatment Effect	–	–	–	0.726	0.743	0.753
Clustered Standard Error	(0.245)*	(0.233)**	(0.221)**	(0.311)**	(0.312)**	(0.319)**
p-value	0.063	0.042	0.030	0.038	0.035	0.036
Randomization Inference Standard Error	{0.265}**	{0.261}**	{0.253}***	{0.344}***	{0.347}***	{0.353}**
p-value	0.022	0.010	0.006	0.006	0.006	0.014
Controls	No	Yes	Yes	No	Yes	Yes
Interactions and Polynomials	No	No	Yes	No	No	Yes
N	429	416	416	429	416	416
	(7)	(8)	(9)	(10)	(11)	(12)
Panel B: 401(k)						
Advance EITC Only Treatment Effect	−0.857	−0.966	−1.318	–	–	–
Advance EITC & 401(k) Treatment Effect	–	–	–	4.480	4.324	3.968
Clustered Standard Error	(1.409)	(1.101)	(1.135)	(1.875)**	(1.643)**	(1.591)**
p-value	0.554	0.398	0.268	0.034	0.022	0.028
Randomization Inference Standard Error	{1.365}	{1.096}	{1.158}	{2.120}**	{1.923}***	{1.838}***
p-value	0.568	0.440	0.312	0.012	0.004	0.004
Controls	No	Yes	Yes	No	Yes	Yes
Interactions and Polynomials	No	No	Yes	No	No	Yes
N	429	416	416	429	416	416

Note: Estimated treatment effects for Advance EITC and 401(k) participation as described in the text. Point estimates are reported in terms of percentage points (i.e. the estimate from Column (1) should be interpreted as an increase in Advance EITC participation of 0.5 *percentage points*). Standard errors clustered at the district level are reported in parentheses, while standard errors in braces are estimated by randomization inference.
*Significantly different from 0 at the 10-percent level.
**Significantly different from 0 at the 5-percent level.
***Significantly different from 0 at the 1-percent level.