American Economic Review 2018, 108(10): 2868–2901
https://doi.org/10.1257/aer.20171676

Why Do Defaults Affect Behavior? Experimental Evidence from Afghanistan[†]

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We report on an experiment examining why default options impact behavior. By randomly assigning employees to different varieties of a salary-linked savings account, we find that default enrollment increases participation by 40 percentage points—an effect equivalent to providing a 50 percent matching incentive. We then use a series of experimental interventions to differentiate between explanations for the default effect, which we conclude is driven largely by present-biased preferences and the cognitive cost of thinking through different savings scenarios. Default assignment also changes employees' attitudes toward saving, and makes them more likely to actively decide to save after the study concludes. (*JEL* C93, D14, D91, O12)

Default assignments impact behavior. This observation is among the most influential and policy-relevant insights from behavioral economics (Madrian 2014). From organ donation (Johnson and Goldstein 2003; Abadie and Gay 2006) and vaccine use (Chapman, Li, and Colby. 2010) to exercise (DellaVigna and Malmendier 2006) and marketing (Johnson, Bellman, and Lohse 2002), and especially in the domain of retirement savings decisions (Madrian and Shea 2001; Choi et al. 2004; Beshears

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[†]Go to https://doi.org/10.1257/aer.20171676 to visit the article page for additional materials and author disclosure statement(s).

et al. 2009; Carroll et al. 2009; Chetty et al. 2014; Samuelson and Zeckhauser 1988), individuals tend to remain at their default assignment. Yet, particularly as relates to retirement savings, economists still have an incomplete understanding of why defaults work.

This paper reports results from a field experiment in Afghanistan designed to identify the reasons why defaults affect behavior. We have several reasons for studying defaults in Afghanistan. First, most of the existing evidence on default savings is from rich countries.[1] Less is known about the potential for defaults to affect savings in poor countries, where most of the world's population resides and where the economic benefits of increasing savings may be higher. Related, in developed countries, it is frequently the poorest and least financially sophisticated who respond most strongly to defaults (Madrian and Shea 2001; Choi et al. 2004; Beshears et al. 2010); this suggests defaults might be particularly effective in poor countries. Finally, while the lack of financial infrastructure has historically limited the relevance of default savings products in poor countries, the recent proliferation of mobile money, which already has more than one-half billion registered accounts worldwide, promises to provide billions of "unbanked" individuals with a financial infrastructure that could support the use of defaults (GSMA 2017).

We therefore worked with Afghanistan's largest mobile phone operator to design and experimentally evaluate a new phone-based default savings account, called "M-Pasandaz."[2] The study took part in two phases. In the first, each of 949 employees was randomly assigned to have either 0 percent or 5 percent of his or her salary automatically directed into a savings account. Separately, each employee was randomly assigned a financial incentive to save, with one-third of employees receiving a 50 percent match on all contributions; one-third receiving a 25 percent match; and the final third receiving no match. This phase makes it possible to compare the effect of "nudging" employees with defaults and of incentivizing them with matches, and to experimentally estimate how defaults affect employee decisions and savings. In the second phase of the study, we implemented a series of interventions designed to unstick employees from their default assignment and experimentally test several prominent explanations for default effects.

The first phase of the study produces three basic results. First, default assignments have large and significant impacts on employee participation and savings, of comparable magnitude to what is reported in the literature on defaults in developed countries (online Appendix Table A1). Two months after the launch of the product and after almost all switching of contribution rates had ceased, employees randomly assigned a default contribution rate of 5 percent were 40 percentage points more likely to contribute to the account than individuals assigned a default contribution rate of zero. We collected several rounds of follow-up surveys with each employee, and while the data are too imprecise to draw firm conclusions, we find no evidence that M-Pasandaz crowded out other savings.

[1] Reviewing the literature, we count six studies on automatic enrollment in savings programs in the United States, along with one in Denmark, one in Australia, and one in Chile. Empirical evidence of default effects on other behaviors is similarly concentrated in rich countries (see a summary of studies in online Appendix Table A1).

[2] "Pasandaz" means savings in Dari, the most common language spoken in Afghanistan.

Second, we "price" the default relative to matching contributions, and estimate the elasticity of participation with respect to the match rate. While prior research examines the effect of matching incentives on savings (Duflo et al. 2006; Engelhardt and Kumar 2007), and more recent work indicates that savings programs incorporating default contributions are more likely to increase participation than monetary incentives alone (Chetty et al. 2014; Madrian 2013), to our knowledge this is the first study to experimentally compare default and incentive effects on the same population for a single product. We find that default assignment increases participation by roughly the same amount as a 50 percent match on employee contributions. We further find that the elasticity of participation with respect to the match rate is about one, independent of default status.

Third, we find that defaults affect employee attitudes and interest in saving, even long after the experiment concludes. Most notably, we removed all financial incentives to contribute at the end of a six-month trial, and asked each employee to make an active decision about whether to continue contributing. Even absent incentives, 45 percent of employees elected to contribute, with participation 25 percent higher in the group that was randomly assigned a positive default contribution rate at the beginning of the trial. Employees defaulted into savings reported significantly higher levels of financial security, and two years later, their savings balances remained larger than those randomly defaulted out of savings during the trial. Such evidence is consistent with the idea that employees might form habits through the experience of saving (Becker and Murphy 1988; Charness and Gneezy 2009), perhaps through better financial planning (Thaler 1999; Schaner 2016). More broadly, these results can inform the larger discussion of whether using defaults to change financial behavior is welfare improving by suggesting that automatic enrollment can cause employees to learn about the costs and benefits of saving (Bernheim, Fradkin, and Popov 2015).

The rest of the paper explores *why* default assignments impact savings. Here, we attempt to differentiate between five explanations offered by the literature; the first three are consistent with rational models, and the latter two with behavioral models. First, defaults may persist because of an employer "endorsement" effect whereby decision makers, unsure of the best course of action, take the default as reflecting a recommendation by a benevolent planner (Madrian and Shea 2001; Choi et al. 2004; Madrian 2014). Second, there may be significant real or perceived costs involved in switching from the default election, due to mechanical frictions in changing one's contribution rate. Third, and closely related, there may be a large mental cost associated with the complexity of forming a financial plan (Lusardi and Mitchell 2011; Cole, Sampson, and Zia 2011; Drexler, Fischer, and Schoar 2014). Fourth, turning to behavioral theories, the possibility of switching may not be salient in the mind of the employee, or the employee may be inattentive (Karlan et al. 2016b; Taubinsky 2013; Kast, Meier, and Pomeranz 2016). Finally, because changing defaults involves some immediate costs with delayed benefits, individuals may not switch, particularly if they are present-biased and naive about their future preferences (O'Donoghue and Rabin 1999).

Our data do not support the first two explanations for why defaults affect behavior. First, our research design eliminates employer "endorsement" effects by construction: the open lottery used to assign default status and matching incentives makes clear to

employees that assignments do not reflect the deliberation of a benevolent planner, and this understanding is clearly visible in follow-up surveys with employees.[3] We also see little evidence that the "default in" assigned rate of 5 percent was perceived as optimal: only 6 of 472 employees (1.3 percent) actively chose to contribute at 5 percent (most people who opted in did so at the maximum of 10 percent). Second, every effort was made to minimize the mechanical cost of switching. For instance, to change their contribution rate, employees simply needed to let someone from their human resources department know. This could be done in person, via a phone call, or by sending an email or text message. Our survey data indicate that employees were clearly aware of their contribution level and knew how to change it if they wanted to.[4]

Similarly, we find that large default effects persist after deploying a series of interventions designed to increase the salience of default assignment. These include randomly assigned text messages as well as randomly assigned financial surveys, neither of which resulted in significant switching. The strongest evidence we can find of inattention occurred three weeks into the study on the first payday, when 22 of our 943 participants (2.33 percent) switched their contribution, which was a modest increase over the number of switches on previous days. Thus, while limited attention clearly affects savings decisions in other contexts and plays a small role here, it is unlikely to explain the default effects observed in our context.

By contrast, there is much in our data to suggest that default effects in savings persist because employees face significant cognitive costs associated with identifying their optimal contribution rate, and that this cost, together with present-biased preferences, creates procrastination. We elicited several measures of present bias—including hypothetical and incentivized behavioral elicitations, as well as through a real-world task over which employees could procrastinate—and find that present-biased employees were significantly more likely to remain at their default assignment (even controlling for their long run discount factor and a broad set of observables). Further, of the experimental interventions we implemented—all of which were designed to encourage employees to choose a non-default contribution rate—the only one that proved effective was to offer employees a thorough financial consultation designed to reduce the cognitive cost of designing a financial plan. This consultation consisted of several modules, and the component that stands out as most associated with switching is one that helped employees calculate how much money they would save under different contribution scenarios.

To summarize, this paper makes several contributions relative to existing research on the impact of default assignment on savings behaviors. First, we provide the first experimental evaluation of a default payroll contribution account, and show that experimental estimates of the default effect in a developing country are comparable to estimates from the United States and western Europe. Afghanistan differs profoundly from most of the countries where defaults have been researched. Forty years

[3] In the end-line survey, for instance, 75 percent of the 816 respondents confirmed their belief that the assignment of matching incentives was random, while 14 percent indicated they did not think it was truly random, and 11 percent indicated that they were unsure.

[4] For instance, 87 percent of employees report fully understanding how the product works, and 96 percent of participants were aware of their match rate.

of civil war have left the country as one of the world's poorest and most unstable.[5] Distrust of financial institutions is high, and only 4 percent of the population saves with a bank (Demirguc-Kunt et al. 2015). There are no income tax considerations related to our product and no asset mixes to choose between. The similarity of our results to those in developed countries provide additional evidence the default effect is a very general phenomena.[6]

Second, our controlled environment makes it possible to investigate outstanding questions about default effects, including the "price" of the default relative to financial incentives and the impact of defaults on savings attitudes future savings decisions. Our design also allows exploration of the mechanisms underlying the default, which together highlight the cognitive cost of deciding how much to save and the role of present-bias in the persistence of default effects. Here, our paper relates most closely to several recent studies showing that whether someone remains in a default assignment is predicted by measures of procrastination (Brown and Previtero 2014; Brown, Farrell, and Weisbenner 2016; Goda et al. 2015). Relative to these efforts, our study benefits from experimental variation in default assignment, as well as a series of cross-randomized interventions designed to compare present bias to other common explanations for default effects.

A key feature of M-Pasandaz is that default salary contributions are passive. Once enrolled, contributions are automatic and do not require any action from the saver (Chetty et al. 2014). This may be particularly important in developing countries where many of the primary obstacles to saving, from simple transactions costs associated with traveling to the bank (Burgess and Pande 2005; Callen et al. 2017), to intra-household disagreements regarding savings (Anderson and Baland 2002; Ashraf 2009; Schaner 2015), behavioral issues of dynamic inconsistency (Ashraf, Karlan, and Yin 2006; Karlan et al. 2016b; Dupas and Robinson 2013), temptation good (including drug and alcohol) consumption (Banerjee and Mullainathan 2010; Schilbach forthcoming), and ego depletion (Shah, Mullainathan, Shafir 2012), all relate to the fact that savings must first pass through the saver's hands, who must then make an active decision to save (Karlan, Ratan, and Zinman 2014; Madrian 2013).

We are optimistic that these insights can create new options for improving the savings prospects of many people historically left out of formal financial ecosystems. For while very few Afghans save with a bank, 90 percent have access to a mobile phone, and a growing share use mobile money. This is emblematic of a global pattern. Only 22 percent of adults in developing countries report saving in formal accounts (Demirguc-Kunt et al. 2015), and in sub-Saharan Africa, the number of mobile money accounts has already surpassed bank accounts (GSMA 2017). In concert, the International Labor Organization estimates that the share of the developing world's households in the middle class or above more than doubled from 1991 to 2011, and was projected to pass 50 percent in 2017, with over 60 percent

[5] According to the 2016 World Development Indicators, Afghanistan has a per capita GDP (PPP-adjusted) of $1,877, ranking 156 out of 175 countries. According to Transparency International's 2016 Corruption Perceptions Index, Afghanistan ranks 169 out of 176.

[6] However, two important caveats are in order. First, we experimentally evaluate a six month commitment product and not a retirement fund. Second, our sample is not representative of the larger Afghan population: these employees are all salaried and tend to be wealthier (nominal GDP per capita in Afghanistan is around US$600 while the median annual salary in our firm is US$5,415.60). However, even amongst the poorer employees in our sample, who are more comparable to the broader population, we find clear default effects.

of these workers in wage employment (Kapsos and Bourmpoula 2013).[7] As the share of wage earners in developing countries increases, and as electronic payment systems become more common, products like M-Pasandaz can provide new options for mobilizing savings.

The rest of the paper proceeds as follows. Section I provides background on the Afghan context. Section II describes the M-Pasandaz product and the experimental design to evaluate its effect on savings. Section III reports the impact of default enrollment and Section IV presents the evidence used to adjudicate between the mechanisms behind the default effects we observe. Section V concludes.

I. Financial Inclusion in Afghanistan

After four decades of political instability and conflict, Afghanistan remains one of the poorest countries in the world. The formal financial sector is small, with only 2.3 banks per 100,000 adults, and only 4 percent of adults reporting any formal savings over the past year (International Monetary Fund 2015; Demirguc-Kunt et al. 2015).[8] Yet a demand for savings exists, as roughly 25 percent of Afghans report saving in the previous year, primarily through cash or in-kind holdings (Demirguc-Kunt et al. 2015; Chipchase et al. 2013). Among our study population, many respondents report keeping US dollars rather than Afghanis, the local currency, and when making long-distance transfers forego wire services in favor of hawalas, a trust-based network of money brokers. While saving money to buy a house or a car seems out of reach for most, saving money in case of death or illness is essential. They often store their money in a metal box at home (a traditional method), or with a trustworthy (often wealthier) relative. They tell stories of themselves or people they know going hungry or reducing food quality after a shock of some kind, and describe the shame of young men unable to marry for lack of money.

While bank presence is limited, mobile phones are prevalent throughout the country, with approximately 75 mobile cellular subscriptions for every 100 Afghan adults (International Telecommunication Union 2015). More recently, several operators in Afghanistan launched "mobile money" platforms, which deliver rudimentary financial services to subscribers over the mobile phone network. We focus on one such mobile money platform, "M-Paisa," which was launched in 2008 by Roshan Telecom, and which, at the time of our study, was the nation's largest mobile money network with 1.2 million unique subscribers. In Afghanistan, as in other countries, mobile money uses SMS-like functionality to enable the exchange and storage of value over a basic mobile phone interface, complemented by a real-world network of agents providing "cash-in" deposit and "cash-out" withdrawal services. As mobile phone penetration rates surge in developing countries, mobile money has emerged as a possible financial instrument for the poor, and there are now more

[7] Demirguc-Kunt et al. (2015) report that 400 million unbanked adults receive wages or government transfers in cash. The payment of salaries via mobile money is now happening in South Asia, sub-Saharan Africa, and Latin America (cf. Karlan et al. 2016a; Aker et al. 2016; Breza, Kanz, and Klapper 2017); phone-based and electronic welfare payments are also becoming increasingly common (Muralidharan, Niehaus, and Sukhtankar 2016).

[8] Afghan banks offer short-term savings accounts with a floating interest rate and long-term "fixed deposit" accounts with a fixed interest and term, though the reported rates often fall below the annual inflation rate, which ranges between 5 percent and 10 percent.

than 500 million registered accounts using 277 mobile money services in 92 countries, with 118 million accounts active in December of 2016 (GSMA 2017). These accounts have historically been used primarily for interpersonal transfers (Jack and Suri 2014; Blumenstock, Eagle, Fafchamps 2016), and in Kenya, the country where mobile money is most widespread, have led to reductions in poverty (Suri and Jack 2016). More recently, however, many mobile operators have begun to offer more sophisticated financial services, including interest-bearing savings accounts, insurance, and credit products.[9]

II. "Mobile-izing" Savings with M-Pasandaz

We worked with Roshan, Afghanistan's largest mobile network operator, to develop a new product for the M-Paisa mobile money system, called "M-Pasandaz." M-Pasandaz facilitates automatic payroll deductions and employer matching contributions using mobile money.[10] Specifically, a Roshan subscriber who owns a mobile money (M-Paisa) account and is paid via mobile money can enable a parallel mobile M-Pasandaz wallet and have a portion of her salary automatically deposited into this wallet during each pay cycle. Consistent with Islamic principles, these contributions do not earn interest, but employers may provide matching incentives.[11]

Through our study, we provided different versions of the M-Pasandaz account to all eligible Roshan employees. Our study population consists of 949 full-time Afghan national employees of Roshan, about 15 percent of whom are women (online Appendix Table A2).[12] Employees hold job titles such as manager, engineer, security guard, and janitor and are located in six major regional offices: Kabul, Kandahar, Mazar, Herat, Ghazni, and Kunduz. Prior to the launch of M-Pasandaz, all of these employees were being paid with M-Paisa direct deposits; that is, each month their monthly wages are deposited into their normal M-Paisa mobile money account.[13] The average tenure in our sample was 5.8 years, and all of Roshan's Afghan employees had received mobile salary payments since 2010, so this population was familiar with the mobile money system.

[9] See Aker and Blumenstock (2014) for a review of recent literature, and GSMA (2017) for a comprehensive report on mobile money in developing countries.

[10] Prior to our collaboration, Roshan had for a number of years aspired to create a defined contribution program for their employees. Automatic payroll deductions are widely used to promote savings in developed countries (Beshears et al. 2009). There are also examples of automatic payroll deductions for savings in developing countries, such as publicly mandated pension (or provident) funds for private sector workers in India, Malaysia, and elsewhere. While Afghanistan does not currently mandate pension plans for private sector employers, several of the larger employers, including telecoms and international NGOs, voluntarily offer such programs. During the study, several private pension and savings schemes were active in Afghanistan, permitting employee contribution rates between 5 and 10 percent of monthly salaries with employer matches of up to 100 percent of deposits, and vesting periods ranging from monthly to annual.

[11] 24 employees (2.5 percent) described the product as un-Islamic when explaining why they chose not to participate.

[12] At the time of our baseline survey in June 2014, Roshan had roughly 1,100 employees, of whom roughly 90 percent were Afghan national staff paid using mobile money. We exclude from our sample a group of 18 employees who participated in qualitative focus groups and pilot product development, as well as those employees who had left Roshan prior to the launch of M-Pasandaz in January 2015, leaving us with an experimental sample of 949 employees.

[13] While there is a withdrawal fee for "cashing out" of the mobile money system, each mobile salary payment includes the cost of one withdrawal to ensure the entire salary was transfered. See Blumenstock et al. (2015) for a more detailed discussion of the extant mobile salary payment technology in Afghanistan.

Several aspects of the M-Pasandaz account were held constant across all employees. Most relevant to our design, deposits into M-Pasandaz could only be made via direct deposit at the time of the regular monthly salary payment; there was no other way to transfer funds into the M-Pasandaz account. Each pay cycle, regardless of the amount contributed by the employee to M-Pasandaz, the employee would receive an SMS confirmation indicating how much had been paid via direct deposit and how much had been placed in the employee's M-Pasandaz account. Employees were free to check the balance on their accounts and to electronically withdraw money at any time; this was done to enable access to liquidity in times of urgent need. However, any withdrawal made during the initial six-month commitment period would forfeit that employee's eligibility for matching incentive payments and eliminate the accrued matches from their employer.[14] All employees were required to attend a 60-minute training session, during which a representative from Roshan Human Resources described M-Pasandaz as a "new benefit offered by Roshan" and explained the details of the account.

Two key features of the M-Pasandaz account were randomized between employees. First, employees were randomly assigned a *default contribution rate*. For half of employees, the default contribution was set to 5 percent of their monthly salary; for the other half, the default contribution was set to 0 percent. To simplify the later exposition, we will occassionally refer to the 5 percent group as the "default in" group, and the 0 percent group as the "default out" group. Note, however, that all employees were given an account and enrolled, the difference between groups was simply their default-assigned contribution rate, which all employees had the option to change at any time.

Subjects were also randomly assigned to one of three different levels of *matching incentive* for M-Pasandaz contributions, creating a 2×3 design. The employer characterized these as three different M-Pasandaz "plans" that are distinguished only by the level of matching incentives: White (0 percent match), Blue (25 percent match), and Red (50 percent match).[15] Thus, for each monthly deposit to M-Pasandaz made by the employee, the employer would make a corresponding deposit at the level specified by the employee's plan. Employees were informed that these matching incentives would be available at the end of the six-month commitment period, but that all accrued incentives would be lost if a withdrawal was made before then. As opposed to the contribution rate, which the employee could change easily, the employee could not change his or her matching incentive. Finally, Roshan paid taxes in advance on the matching incentives, so employees received the exact amount specified by their plan.

Employees were informed of both their matching incentive and their default contribution rate at the end of the HR training session through a personalized card that was distributed by the HR representative. During training, employees were informed that they could change their contribution rate at any time by calling or visiting the HR department, and this contact number was included on the personalized card; the goal

[14] The M-Pasandaz account was similar to a commitment savings account in that withdrawals prior to the six-month deadline forfeited a potential incentive payment, but had key differences in that default enrollment was linked to salary payments and participants could recover their own contributions at any time without penalty.

[15] These incentive levels are similar to those in prior literature from developed country (Duflo et al. 2006) and developing country settings (Carter, Laajaj, and Yang 2015), and were consistent with savings incentives provided by Roshan's competitors in Afghanistan.

was to minimize the friction involved in switching contribution rates. Employees were free to set their contribution rate to any value between 0 percent and 10 percent of their monthly salary. Importantly, this created scope for the default in group to either increase or decrease their contribution, while the default out group could only increase their contribution. Any change in the contribution rate was instantaneous and applied to all future salary payments, with the caveat that each month's contribution was locked in on the fifteenth of the month to give HR sufficient time to prepare monthly payments, which typically occurred on the twentieth of the month.

Both treatments were stratified by employee salary terciles, self-reported perceptions of physical insecurity, and provincial office locations, using data collected in a face-to-face baseline survey of all employees in May and June 2014. We used a "big stick" approach to randomization to ensure that no key characteristics were imbalanced with a p-value of less than 0.1 (Bruhn and McKenzie 2009).[16] Online Appendix Table A2 reports balance tests on a range of observable characteristics across all six resulting combinations of the primary treatments.

In December 2014, employees attended the HR training session and were informed of their default contribution rate and plan assignments. An "open enrollment" period, during which employees could change their contribution rate, began on December 30, 2014 and lasted until January 15, 2015, and the first automatic contributions were made on January 21, 2015. The sixth and final automatic contribution occurred on June 21, 2015, and incentive payments were distributed on July 23, 2015. Over the study period, we conducted four phone-based follow-up survey waves with a randomly selected panel of half the employees. In August 2015 we conducted a final face-to-face end-line survey with all employees participating in the study.

III. The Default Effect

A. *The Default Effect on Participation and Contributions*

During the six-month study window, 459 of the 949 employees (48.3 percent) elected to change their contribution rate from their default assignment; the remaining 490 employees remained at the default. As shown in Figure 1, most of the employees who switched did so in the first three weeks of the study. Employees who switched came from all plan types (online Appendix Figure A1) and cited a variety of reasons for doing so (online Appendix Table A3). While many employees did change their contribution rate, the effect of the default is evident in the large number of employees who never moved from their default (Figure 2). For instance, 39 percent of employees who were assigned a default rate of 0 percent in the Red plan—all of whom would have received significant financial incentives to save—left "cash on the table" by continuing to contribute 0 percent of their salary to M-Pasandaz. Similarly, 36 percent of the employees in the White plan who were

[16] In applying the "big stick" we checked for balance on salary, total savings, and a dummy variables for (i) regularly using a bank; (ii) being confident in paying monthly bills; (iii) expecting violence; (iv) not being satisfied with mobile salary payments; and (v) withdrawing the entire paycheck on payday.

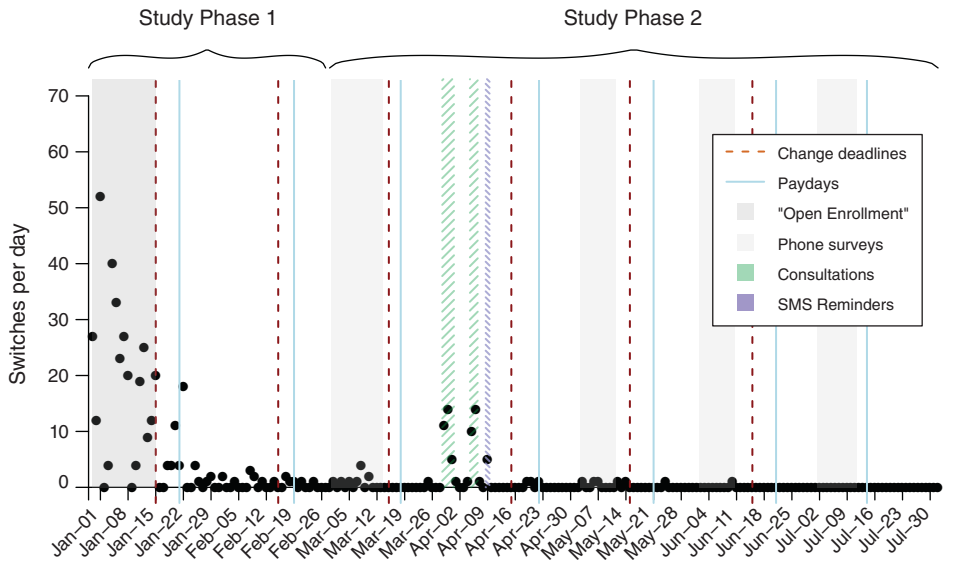

FIGURE 1. SWITCHING BEHAVIOR OVER TIME

Notes: Black dots indicate the number of employees calling in, on each day of the study, to change their contribution rate. Dashed vertical lines indicate the days when employees receive their salary (dashed blue line), and the deadline to make changes for that pay cycle (dashed red line). Shaded regions indicate the experimental interventions of our study.

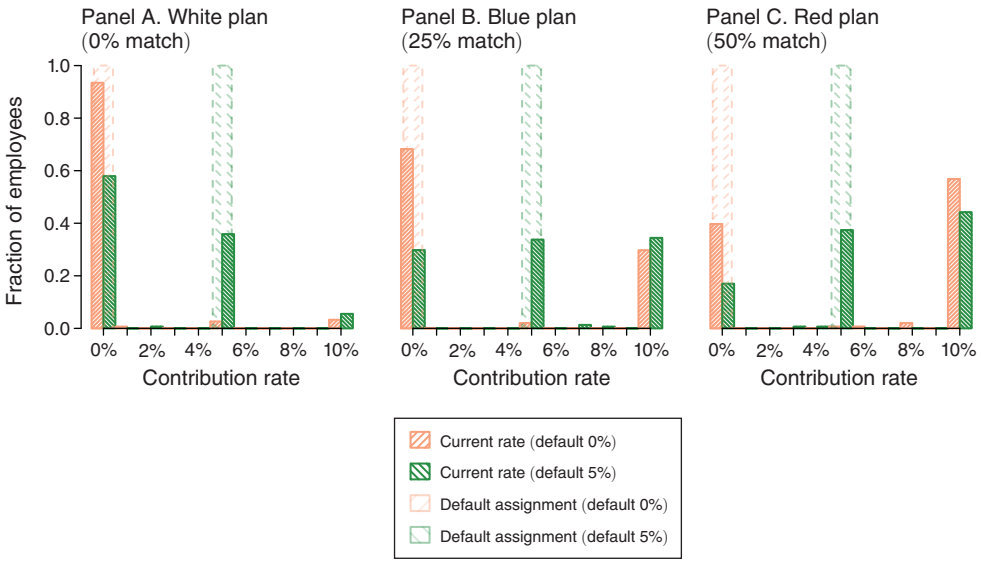

FIGURE 2. EMPLOYEE CONTRIBUTIONS: INITIAL ASSIGNMENTS AND FINAL CONTRIBUTION RATES

Notes: Distribution of final M-Pasandaz contribution levels in July 2015, as a percentage of monthly salary. Individuals were randomized into either a default 0 percent contribution (peach bars, $N = 478$) or a default 5 percent contribution (green bars, $N = 471$). Individuals were further randomized into three different incentive rates: White (0 percent match, $N = 319$), Blue (25 percent match, $N = 316$) and Red (50 percent match, $N = 314$). Semi-transparent bars indicate the original assigned contribution rate, solid bars indicate final contribution rate.

Table 1—The Default Effect on Participation and Contributions

	(1)	(2)	(3)	(4)
Panel A. Dependent variable = participates (non-zero contribution rate)				
Default in (= 1)	0.40	0.47	0.44	0.29
	(0.03)	(0.04)	(0.05)	(0.05)
Constant	0.28	0.01	0.27	0.57
	(0.02)	(0.01)	(0.04)	(0.04)
Sample	Complete	0% Match	25% Match	50% Match
Observations	936	315	312	309
R^2	0.161	0.304	0.190	0.105
Panel B. Dependent variable = contribution rate (percent of salary)				
Default in (= 1)	1.77	2.38	2.22	0.61
	(0.26)	(0.21)	(0.46)	(0.48)
Constant	2.70	0.03	2.61	5.54
	(0.20)	(0.03)	(0.35)	(0.39)
Sample	Complete	0% Match	25% match	50% match
Observations	936	315	312	309
R^2	0.046	0.293	0.071	0.005
Panel C. Dependent variable = total M-Pasandaz contributions (Afs)				
Default in (= 1)	2,426.40	2,244.30	2,996.73	2,052.39
	(750.24)	(656.96)	(1,335.00)	(1,567.93)
Constant	4,724.44	416.75	5,015.57	8,797.03
	(465.52)	(157.60)	(802.11)	(1,040.07)
Sample	Complete	0% match	25% match	50% match
Observations	949	319	316	314
R^2	0.011	0.036	0.016	0.005

Notes: Dependent variable in top panel, participates (= 1), is a binary variable that equals one if the contribution rate is greater than zero, and dependent variable in middle panel, contribution rate (percent of salary), is the monthy contribution rate into M-Pasandaz as a percent of total salary. Participates and contribution rate reflect values observed as of February 28, 2015, following the first two paydays but prior to the rollout of phone surveys or secondary interventions. Dependent variable in third panel is total contributions made by the employee to M-Pasandaz, in Afghanis, as observed in administrative data. Value reflects total contributions net of withdrawals as of July 15, 2015, just prior to the disbursement of matching incentives. Value does not include matching contributions made by the employer. Robust standard errors reported in parentheses.

assigned a default rate of 5 percent continued to contribute 5 percent of their salary to M-Pasandaz, even though they received no financial incentives to do so.[17]

We estimate the causal effect of defaults in Table 1.[18] Employees who are defaulted in at 5 percent are 40 percentage points more likely to contribute to the account than employees defaulted to 0 percent (panel A, column 1).[19] Similarly, random

[17] These percentages reflect behavior after two months, and prior to the launch of several randomized follow-up interventions designed to nudge employees from their default assignment. Behavior over other relevant periods is presented in Table 4.

[18] Because we are interested in interpreting the constant terms in the regressions, Tables 1–4 do not include stratum fixed effects; the versions including stratum fixed effects are provided in online Appendix Tables B1–B4.

[19] In online Appendix Table A4, when participation is defined as making a nonzero contribution and never making a withdrawal, defaulting enrollment increases participation by 31 percentage points. In online Appendix Table A5, we find qualitatively similar effects for participation and contribution rate using the values of these variables at the end of the study on July 15th, instead of February 28th.

assignment to a 5 percent contribution increases six-month contribution rates by 1.77 percentage points (panel B, column 1), equivalent to a 66 percent increase over the control group's average contribution rate of 2.7 percent.[20] Thus, the net effect of default enrollment was to increase monthly employee contributions by 2,426 Afghanis (US$40, panel C), roughly 10 percent of the median monthly wage.

The magnitude of the default effects we observe are remarkably consistent with previous non-experimental estimates of the default effect in developed countries (online Appendix Table A1). And while the employees we study are not representative of the broader Afghan population, they do exhibit considerable heterogeneity in income and other sociodemographic characteristics (online Appendix Table A2). In our sample, we find that the magnitude of the default effect is remarkably consistent across salary quartiles (online Appendix Table A6).

We were naturally interested in understanding whether the increase in M-Pasandaz savings represents a net increase in total savings, or whether employees are instead substituting out of other financial instruments, as has been the case in several studies in the United States and Western Europe.[21] We thus conducted a series of longitudinal follow-up surveys to ask employees about their financial behaviors. Unfortunately, the limited size of our sample, along with the imprecision of the data captured in the recall survey, do not allow us to draw any firm conclusions about whether the increase in M-Pasandaz affected other types of savings. These effects are discussed in greater detail in online Appendix Section A, and summarized in online Appendix Table A7. In sum, we do not see evidence that the default contributions crowded out other types of saving, or reduced food expenditures (a potential concern for the poorer workers in our sample), but we also see no sign of increased net savings for the average employee.

B. *Comparing the Default Effect to Matching Incentives*

Employees also responded strongly to the matching incentives provided by the employer. As can be inferred from the constant terms in columns 2–4 of Table 1 (panel A), among employees initially assigned a contribution rate of 0 percent, the participation rate was 1 percent for employees with no matching contributions, 27 percent for employees with 25 percent matching contributions, and 57 percent for employees with 50 percent matching contributions.

Our design enables us to directly compare the default effect to the effect of matching incentives. Figure 3 relates the default effect to the effect of matching incentives, using the coefficients estimated in Table 1. At all levels of matching incentives, participation and contribution rates are higher for the group of employees with a 5

[20] Whereas the effect on participation is present for all levels of matching incentives (panel B, columns 1–3), the effect on contribution rates is only present in the White (0 percent matching contributions) and Blue (25 percent matching contributions) plans (panel B, columns 2–4), suggesting that the strongest financial incentives may have been sufficient to overcome the default effect.

[21] Prominent examples include Benjamin (2003), Chetty et al. (2012), and Beshears et al. (2017). We are not aware of prior work on automatic contribution programs in developing countries. The closest examples are Brune et al. (forthcoming) and Somville and Vandewalle (2018), who study "default" effects by experimentally manipulating whether beneficiaries are paid in cash or to a bank account. In both studies, beneficiaries paid via bank transfer save more than those paid in cash.

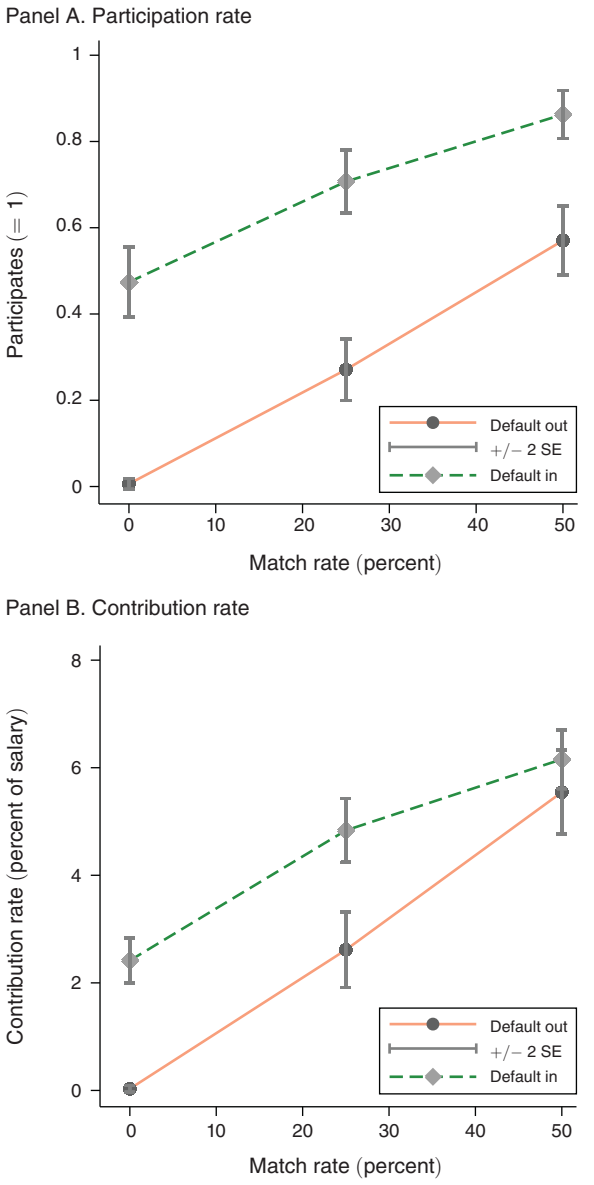

FIGURE 3

Notes: Effect of automatic enrollment and matching contributions on panel A participation rates (non-zero contributions), measured on February 28, 2015, following the first two paydays but prior to the rollout of phone surveys or secondary interventions; and panel B contribution rates, as a fraction of the employee's total salary, measured on February 28, 2015.

percent default than for those with a 0 percent default, and for both groups the elasticity of participation with respect to the employer match rate is approximately one.

These results can inform the broader debate regarding the effectiveness of behavioral nudges relative to traditional incentives (cf. Chetty et al. 2014). In our context, the employer would need to match employee contributions at 50 percent to achieve

Table 2—The Default Effect on Active Decision at Trial End

	Continued M-Pasandaz after program (= 1)			
	(1)	(2)	(3)	(4)
Default In (= 1)	0.10	0.16	0.07	0.08
	(0.03)	(0.06)	(0.06)	(0.06)
Constant	0.40	0.34	0.39	0.48
	(0.02)	(0.04)	(0.04)	(0.04)
Sample	Complete	0% Match	25% Match	50% Match
Observations	811	272	277	262
R^2	0.011	0.025	0.005	0.007

Notes: Dependent variable is a binary indicator that equals one if the employee made an active decision to continued contributing to the M-Pasandaz after the six-month study ended with no matching incentives offered. Robust standard errors reported in parentheses.

the same participation rate as from merely having employees contribute by default. More concretely, we can calculate the implicit value of the nudge to the employer in forgone matching incentives. At the end of the six month pilot, the 159 employees in the 50 percent match plan who were defaulted out received a total payout of 699,323 AFA ($13,986.46 USD). If the employer instead only gave all employees a 50 percent match and defaulted them in at 0 percent, Roshan would need to provide $83,479 USD (or $87.97 USD per employee) in incentives to achieve the same participation rate as from only defaulting employees in at 5 percent with a 0 percent matching incentive.[22]

C. *Active Decision and Long-Run Effects*

Employees who were randomly induced to save more through our interventions also developed an interest in saving that persisted after the termination of the experiment. Most notably, at the conclusion of the six-month study period, all financial incentives were removed, and employees were individually asked whether they would like to have a portion of their future salary automatically deposited into their M-Pasandaz account. We required each employee to make this decision actively, and the decision was the same for all employees independent of their treatment status during the main experiment. As shown in Table 2, the desire to continue contributing was significantly higher for the employees who were exogenously induced to contribute more through a positive default-assigned contribution rate, particularly in the 0 percent matching rate group.[23] Overall, employees defaulted in to participating during the experiment were 10 percentage points (25 percent) more likely to

[22] To generate an equivalent average contribution, rather than an equivalent degree of participation, requires a 25 percent matching incentive. To see this, in panel B of Table 1, defaults increase the average contribution in the 0 percent match group by 2.38 percentage points, which is roughly the average contribution of the group defaulted out with a 25 percent matching contribution.

[23] This, in itself, does not necessarily signal habit formation in the sense of Becker and Murphy (1988). Increased interest in the product may just be, for example, that employees have learned more about how much they can comfortably save each month. Hussam et al. (2017) provide a direct experimental test for rational addiction.

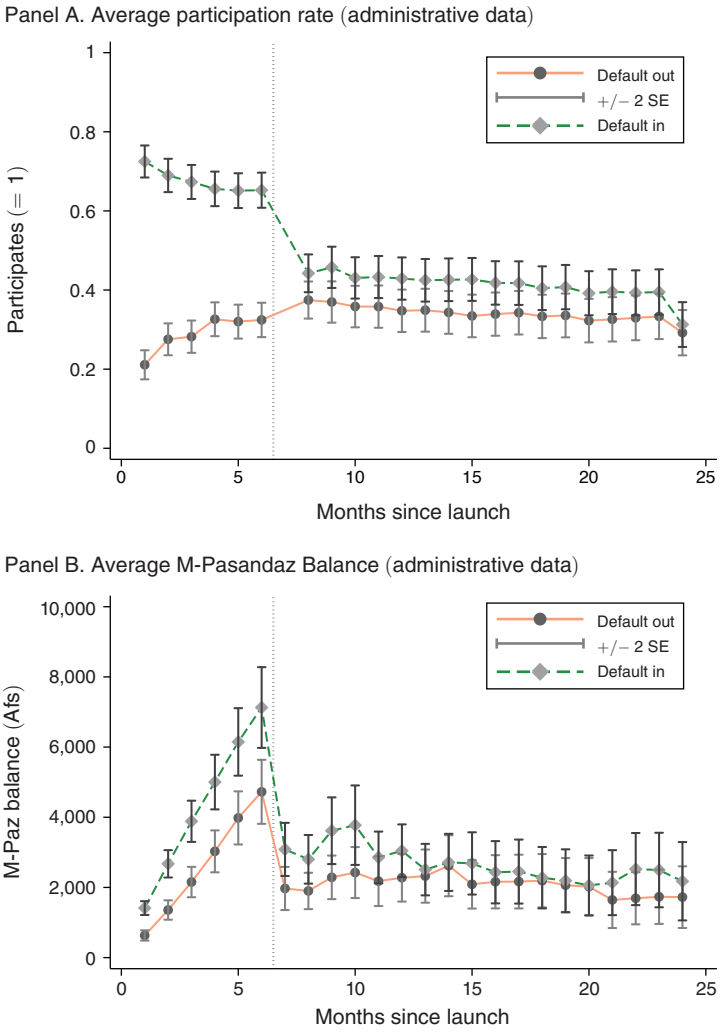

FIGURE 4. M-PASANDAZ PARTICIPATION AND BALANCE DURING AND AFTER RCT

Notes: The randomized trial ran from January 2015 (month 1) until July 2015 (month 7), when bonus payments were paid. Average participation and balance are calculated separately for employees assigned a default contribution of 0 percent of their salary (default out) and those assigned a default contribution of 5 percent. Participation is coded as missing in July 2015 as no automatic contributions were made while endline surveys took place; deposits resumed in August 2015 based on active savings decisions in the endline survey (see text for details).

actively decide to continue to contribute a portion of their salary to M-Pasandaz. We find that matching incentives had similar effects.

Using Roshan's administrative data, which spans one and a half years after the experiment, we can also examine how long default effects persist after matching incentives were removed.[24] Figure 4 shows M-Pasandaz participation rates and balances, separately by default status, for the six months of our study as well as the follow-

[24] Charness and Gneezy (2009), Schaner (2016), and (Hussam et al. 2017) provide other examples of how short-run incentives can affect behavior even after incentives are removed.

Table 3—The Default Effect on Savings Behavior, Financial Security, and Well-Being

Outcome	Control mean (1)	Default effect (2)	Naive p-value (3)	List et al. p-value (4)	Bonferonni p-value (5)
Panel A. Composite indices					
Importance of saving index	−0.004	0.142	0.002	0.012	0.013
Financial security index	0.002	0.111	0.005	0.019	0.033
Well-being index	−0.001	0.025	0.512	0.757	1.000
Panel B. Importance of saving index variables					
Savings is important (= 1)	0.954	0.004	0.756	0.767	1.000
Attempts to save each month (= 1)	0.627	0.074	0.026	0.051	0.078
M-Paz changed desire to save	0.539	0.092	0.009	0.032	0.034
Panel C. Financial security index variables					
Not financially constrained (= 1)	0.639	0.073	0.026	0.100	0.128
Confident meeting current fin. obligations (= 1)	0.929	0.036	0.020	0.091	0.097
Confident meeting future fin. obligations (= 1)	0.798	0.023	0.412	0.663	1.000
Will retire someday (= 1)	0.373	0.001	0.971	0.973	1.000
Financial satisfaction (1–10)	6.443	0.323	0.027	0.083	0.142
Panel D. Well-being index variables					
Nights no one without food	6.616	0.042	0.518	0.892	1.000
Happy overall (= 1)	0.932	0.003	0.853	0.851	1.000
Life satisfaction (1–10)	7.863	0.036	0.810	0.965	1.000
Good physical health (= 1)	0.768	0.072	0.010	0.051	0.055
Healthy last three months (= 1)	0.968	0.010	0.441	0.902	1.000
Panel E. Other variables					
Satisfied at Roshan (= 1)	0.771	0.017	0.548	0.799	1
Left Roshan (= 1)	0.142	0.004	0.850	0.855	1

Notes: This table reports the effects of defaulting employees into the M-Pasandaz automatic salary withdrawal savings account. Indices are created as the covariance-weighted sum of z-scores of the underlying variables, following the technique described in Anderson (2008). List et al. (2016) and Bonferonni p-values are calculated controlling for the family-wise error rate for the first five variables reported in the table, and then for each set of variables underlying the index respectively. Full text of the survey questions used to create indices is available in online Appendix D.2.

ing 18 months. As discussed above, savings increased substantially during the study period, and differentially for employees defaulted in. Participation dropped steeply once financial incentives were removed, but many employees continued to contribute, particularly among those randomly assigned to a 5 percent default. These results are tabulated and disaggregated by matching incentive in online Appendix Table A10.

D. *Why Did Enthusiasm for M-Pasandaz Increase?*

Why were employees initially defaulted in to savings more likely to later make an active decision to save, and to continue to contribute long after financial incentives were removed? Our survey data indicate that part of the explanation is that the experience of saving changed employee perceptions. Employees defaulted in to savings during the experiment were less likely to report feeling too financially constrained to save, more likely to feel that savings is important, and more likely to feel confident in meeting their financial obligations. These results are presented in Table 3, where column 1 indicates the average response among employees assigned a default contribution rate of 0 percent, and column 2 indicates the increase in response for employees assigned a default contribution rate of 5 percent. Since this table includes

several outcomes that were not a part of our pre-analysis plan, we focus on three summary indices in panel A (importance of saving, financial security, and general well-being), and report a set of *p*-values that asymptotically control the family-wise error rate (the probability that any true null is rejected) at 0.05.[25] Panels B–D report the individual survey questions from which the indices are constructed. Online Appendix Table A12 reports the effects of randomly assigned matching rates on financial perceptions.

The impact of the default on financial perceptions can be seen in the first two rows of Table 3, panel A. Default enrollment increased a composite index of the perceived importance of saving by 0.14 standard deviations and a summary measure of perceived financial security by 0.11 standard deviations. Results for each of the survey outcomes that comprise the two composite indices are reported in panels B and C. Most notably, defaulting employees in substantially raised the share of employees who believed that they were not too financially constrained to save. This might reflect the relaxation of a real constraint, where participation in M-Pasandaz moved employees beyond some minimum threshold of savings to begin to feel comfortable saving every month, or might reflect a realization that their prior perception that they were too constrained to save was inaccurate.[26] This seems reasonable in the context of a six-month pilot that meaningfully affected short-run finances, but which ended before more sustained impact could be realized. Modest but significant default effects are likewise observed in employees' attempts to save each month, and in their sense that the M-Pasandaz program itself changed their desire to save. In panels D and E, we examine a broader set of measures of well-being. In general, we do not find evidence that the M-Pasandaz program impacted measures of food security, happiness, or employment outcomes.

Collectively, these data indicate that the M-Pasandaz program—and default assignment in particular—significantly increased enthusiasm for saving during the six-month trial, in part by helping employees change their beliefs about how much they could feasibly save. More broadly, these results suggest that use of the product caused employees' savings behaviors to become more consistent with their own stated long-run preferences. Indeed, prior to the study, participants expressed a strong sense that savings was important to them, but that they simply did not have enough money to save.[27] This is broadly consistent with evidence in more familiar contexts. For instance, Choi et al. (2004) find that many employees report wanting to save more, suggesting that defaults might help them overcome a behavioral issue that is impeding their savings goals. And to the extent that policy makers privilege welfare determined using ex ante preferences (Bernheim et al. 2015), these results suggest that the inducement to save was, on average, welfare improving. This is

[25] This practice follows a growing literature on addressing potential Type I error arising from multiple hypothesis testing in experiments (Casey, Glennerster, and Miguel 2012; Bidwell, Casey, and Glennerster 2016). Romano, Shaikh, and Wolf (2010) provides a review. List, Shaikh, and Xu (2016) describe a technique that simultaneously controls for several sources of Type I error in field experiments. We control for the family-wise error rate for consumption and the three summary indices and then for all of the variables that comprise the indices separately.

[26] In online Appendix Table A11, we find the results on the importance of savings are driven primarily by the 0 percent matching rate group, consistent with updating prior beliefs about their ability to save without incentives.

[27] Only one of the 161 employees defaulted to a 0 percent contribution with no matching incentive opted in during the first two pay periods. Under the active decision, which effectively placed all employees in the White plan with no matching incentives, 45 percent of employees chose to contribute.

important in our setting, where 27 percent of participants reported that at least one family member went without a meal in the week prior to the baseline survey, and there is a concern that defaults may cause employees to "over save."

IV. Understanding the Default Effect

The effect of automatic enrollment—approximately equivalent to a 50 percent employer match—is striking, and consistent with evidence on automatic payroll deductions in wealthier nations. Madrian (2013) and Beshears et al. (2009) review common explanations for this large default effect. First, and prominent in the US literature, is the possibility of an "endorsement" effect. Employees may perceive their initial assignment as a recommendation from the employer, leading the employee to defer to the employer's wisdom and remain at the assigned rate. Second, there may be mechanical frictions involved in switching; when this cost exceeds the benefit from switching, employees will remain at their default. Third and related, employees may face large (real or perceived) cognitive costs of forming a financial plan. Fourth, employees may be aware of their contribution and know how to switch, but the decision may not be salient to the employee, or the employee may be inattentive (Karlan et al. 2016b; Mullainathan and Shafir 2013; Taubinsky 2013; Mani et al. 2013). A final possibility is that employees with present-biased preferences may procrastinate over the decision to change from the default assignment, repeatedly postponing today what they believe they will do tomorrow (O'Donoghue and Rabin 1999; Carroll et al. 2009).

To differentiate between these mechanisms we randomly assigned three additional experimental interventions, conducted a series of behavioral games to elicit employees' time preferences, and asked a battery of pointed questions in our panel surveys. Below, we discuss the extent to which the empirical evidence supports each potential mechanism.

A. *Endorsement Effects*

A priori, we do not think our context is one in which employer endorsement effects are highly relevant. The nature of the individual randomization, whereby each employee knew he or she had an equal chance to be given a 0 percent or 5 percent default contribution rate, largely eliminates the potential that employees would perceive that they were given a default rate for any reason other than random chance.[28]

Further evidence of this lack of perceived endorsement can be seen in the fact that only a few employees actively decided to switch to a 5 percent contribution rate, which was one of the two rates "endorsed" by the employer. This is most evi-

[28] Specifically, all employees were informed during the mandatory training sessions that both their matching rate and initial contribution rate would be randomly assigned by the research team. The HR staff carefully explained that matching rates (represented by the three M-Pasandaz plans: White, Blue, and Red) could not be changed, but that the initial contribution rate could be changed at any time by contacting Human Resources. And at the end of each training, each employee was provided a personalized assignment card with his or her name and position, matching plan assignment, initial contribution assignment, and phone number for HR. These personalized cards further reinforced that both matching rate and initial contribution rates were being randomly assigned, and that employees were free to change the contribution rate.

dent in the right-most panel of Figure 2. There, we see that among the population of employees offered 50 percent matching incentives, a majority of those initially assigned a default contribution rate of 0 percent (the peach colored bars) chose to contribute. However, only one employee increased his contribution rate to the "endorsed" level of 5 percent; the vast majority instead chose to opt in at 10 percent (which was not a default rate).

Qualitatively too, we found no evidence of a perceived endorsement effect. In focus groups, employees expressed gratitude and surprise at observing the truly random assignment of incentives, since past promotions and bonuses had created an expectation of favoritism. When we asked employees who remained at their default why they did not change their contribution rate, none of the employees mentioned employer endorsement, or any factor involving their employer, as influencing their decision.[29] Thus, while endorsement effects are undoubtedly consequential in other settings, we believe that the employees in our study did not perceive such a recommendation from the employer.

B. *Mechanical Frictions*

We similarly find it unlikely that the default effects were driven by superficial transaction costs involved in switching, such as confusion about how the savings account works, ambiguity about how to switch, or mechanical difficulties in executing a switch.[30] Roshan went to great lengths to train all employees on the M-Pasandaz account, and each employee was sent a monthly text message on payday to indicate how much of their salary was being direct deposited into their normal M-Paisa account and how much was being put into M-Pasandaz. In follow-up surveys, we also find strong evidence that most employees understood their plan type and understood what was required to change their contribution rate.[31] We emphasize that this feature of our setting is not particularly novel; switching contributions in many settings is straightforward.

C. *Inattention*

Looking closely at Figure 1, there is some evidence that employees may have initially been unaware of their default assignment. Specifically, we observe a modest increase in switches on January 23rd, the day after the first payday. Some of these employees likely received a paycheck that was different from what they expected,

[29] Specifically, two months after the product launch, we randomly surveyed half of employees about reasons for changing or not changing their contributions ($N = 428$). None of those surveyed mentioned factors involving the employer; rather, the most common reasons for not changing included (i) the inability to save, (ii) not wanting to participate, and (iii) satisfaction with the default.

[30] Prior research on defaults similarly regards such mechanical frictions as an unlikely source of default effects. For instance, DellaVigna (2009) estimates that a worker with a salary of $40,000 and a 50 percent match rate would forgo $1,200 in matching incentives by remaining at the default contribution of 0 percent. Prima facie, such a large frictional cost seems implausible.

[31] For instance, 97 percent of employees (285 of 295) reached for the financial consultation were fully aware of their match rate and their contribution rate. Similarly, in a phone-based survey taken at midline, 87 percent of employees reported fully understanding how the M-Pasandaz product worked, more than 90 percent correctly identified their plan assignment, and over 70 percent knew that they could change their contribution rate by calling the human resources department.

Table 4—Contribution Rate Switches, by Default Contribution and Matching Incentives

				Default out (%)			Default in (%)		
	N	Total	%	0	25	50	0	25	50
Changed in open enrollment	326	943	34.57	0	32	68	75	80	71
Changed after 1st payday	22	943	2.33	0	7	4	3	6	2
Changed by February 28	385	936	41.13	1	42	89	84	89	80
Changed after other payday	2	936	0.21	0	1	0	0	0	1
Changed after survey	3	441	0.68	0	0	0	1	2	0
Changed after SMS reminder	6	224	2.68	0	0	2	2	2	0
Changed after consultation	54	469	11.51	10	7	6	8	11	12
Changed more than once	14	949	1.48	2	2	5	2	3	0
Ever changed contribution	459	949	48.37	11	49	96	100	107	96
Never changed contribution	456	890	51.24	142	101	57	51	50	55
Observations				161	158	159	158	158	155

Notes: N indicates the number of unique employees who changed their contribution rate as a result of the action. "Total" indicates the number of participants that were treated by the specified treatment and is adjusted to account for attrition at the time of calculation. For example, the "ever changed contribution" row includes all 949 employees, while "never changed contribution" includes only 890 employees still present in final month of study. Payday, survey, SMS, and consultation switches are recorded if corresponding to the day of the intervention or the day immediately afterwards.

and this led them to switch. Subsequently, however, we see no more payday effects (row 4 of Table 4), and by February 28, virtually all switching had ceased. Thus, starting in March 2015, we conducted two experimental interventions to see if increasing the salience of the default assignment would induce employees to change their contribution rate.

The first "intervention" was simply a series of monthly phone surveys, in which we asked employees questions about their financial behaviors as well as their understanding of the M-Pasandaz account. While the primary function of these interviews was to collect panel data on employee activities that could not be inferred from the administrative records, we also suspected that the survey itself might impact employee behavior by increasing their awareness of M-Pasandaz and the salience of their financial decisions (cf. Zwane et al. 2011). Panel phone surveys were conducted with a randomly selected half of all employees.

The second intervention was designed to increase awareness and salience by reminding employees how to switch their contribution rate. The treatment consisted of a series of text messages, sent roughly at the halfway point of the study, which reminded the employee of his or her current M-Pasandaz contribution rate, as well as the phone number to call in order to change that rate. These messages were sent in English, Dari, and Pashto, and came from an official Roshan phone number. Messages were sent to a random subset of employees, and were tailored to the current status of the employee. For instance, an example message read, "M-Pasandaz Reminder: Next payday, 5 percent of your salary will be deposited in your M-Pasandaz account. If you want to change your contribution, call 079999-3708" (online Appendix Figure A2).

Neither of these interventions that were designed to increase the salience of M-Pasandaz had much impact on employee switching behavior. This is visibly apparent in Figure 1 (gray and blue shaded regions), is tabulated in Table 4, and is estimated in the regression results shown in online Appendix Table A13. We thus

conclude that, after the initial one-month period during which roughly one third of employees switched into a non-default contribution rate, the remaining default effect was not driven by limited attention on the part of the employee. As we discuss below, we believe this is partially due to the fact that many employees appear to be unable to determine what their optimal contribution should be. This stands in contrast to other settings, such as commitment and group savings (Karlan et al. 2016b; Kast et al. 2016), where subjects understand their preferred course of action but need nudges to behave consistently with those preferences.

D. *Present Bias and Cognitive Costs*

An important insight from O'Donoghue and Rabin (1999) is that when an action involves immediate costs (such as the cognitive cost of determining how much to save) and delayed benefits (such as the payout from M-Pasandaz), then naïve present-biased individuals are likely to procrastinate. Online Appendix B develops a simple model to situate this insight in our setting, focusing on how present bias might cause individuals to remain at their default assignment.

Utility is modeled as

$$U^t(\tau) = \begin{cases} \beta v_\tau - c_\tau & \text{if } \tau = t \\ \beta v_\tau - \beta c_\tau & \text{if } \tau > t \end{cases}$$

where τ is the period when the switch is made, v_τ is the reward (which is always delayed, even in the sixth month of the program), and c_τ is the cost. This cost includes both the cognitive cost of determining how much to save, mechanical frictions, and any other cost that must be borne to change one's contribution rate. Individuals can either be exponential discounters ($\beta = 1$), present-biased sophisticates ($\beta < 1$) who have correct beliefs, denoted as $\hat{\beta}$ about their future preferences ($\hat{\beta} = \beta$), or present-biased naïfs, who incorrectly assume they will not be present-biased in the future ($\hat{\beta} = 1$).

The essential implication, as in O'Donoghue and Rabin (1999), is that while a sophisticate correctly knows that her future self is unlikely to participate (given current non-participation), a naïf incorrectly believes the participation constraint for her future self will be less onerous, because she underestimates the future cost of switching. An additional implication is that individuals who discount the future more heavily, regardless of whether they are present biased, are less likely to participate at all because participation involves immediate costs and delayed rewards.

This section provides three pieces of evidence which favor this characterization of the default effect. First, an experimental measure of present bias strongly predicts remaining at the default. Second, we find that reducing the cognitive cost of working through alternative contribution scenarios leads to significant switching. Finally, we find that employees procrastinate in accepting a financial consultation (which includes an opportunity to switch), and that this is particularly true for present biased employees. We present each of these results in turn.

Present Bias Predicts Remaining at the Default.—Table 5 examines whether an experimental measure of present bias predicts remaining at the default. We find that our measure of present bias (β) robustly predicts whether an employee remains

Table 5—Present Bias and Contribution Changes

	Still at default on February 28		Still at default and no withdrawal on Feb. 28	
	(1)	(2)	(3)	(4)
Present bias parameter (β)	−0.132	−0.132	−0.088	−0.089
	(0.051)	(0.052)	(0.052)	(0.052)
Long run discount factor (δ)		0.028		0.029
		(0.053)		(0.054)
Cognitive reflection test (0–3)		−0.060		−0.069
		(0.025)		(0.025)
Risk preference (1–10)		0.008		0.009
		(0.006)		(0.006)
Salary (1,000 Afs)		0.000		0.000
		(0.001)		(0.001)
Tenure at Roshan (years)		−0.009		−0.004
		(0.007)		(0.007)
Male (= 1)		0.055		0.055
		(0.055)		(0.055)
Education level		−0.002		−0.005
		(0.018)		(0.018)
Uses a bank account (= 1)		−0.041		−0.037
		(0.041)		(0.041)
Withdraws entire salary on payday (= 1)		0.024		0.026
		(0.040)		(0.040)
Capable of fixing phone (= 1)		0.077		0.056
		(0.039)		(0.039)
Constant	0.726	0.679	0.634	0.589
	(0.054)	(0.126)	(0.055)	(0.128)
Control mean	0.72	0.73	0.72	0.73
R^2	0.009	0.032	0.004	0.026
Number of employees	702	678	702	678

Notes: This table reports on the variables that predict whether a participant remains at their default election on February 28, 2015, two months after the start of the experiment. β is a measure of present bias obtained in an experimental elicitation completed at endline with real stakes (see paper text for details). Cognitive reflection test (0–3) is the total of three questions answered correctly using a variant of Frederick's (2005) cognitive reflection test. The remaining variables are described in online Appendix D.2. Robust standard errors reported in parentheses.

at the default assignment (column 1), even when controlling for a broad range of other factors including the long run discount factor δ, employee salary, gender, a proxy for intelligence based on "cognitive reflection" (Frederick 2005), financial sophistication (based on whether the employee has a bank account), salary withdrawal habits, and total baseline savings (column 2).[32] The coefficient indicates that moving from the tenth percentile of β in our sample ($\beta = 0.67$) to the ninetieth percentile ($\beta = 1.36$) is associated with a 9 percentage point decrease in the probability that the employee remains at his default assignment. This result is robust, and persists when we restrict the analysis to employees who are both at their default and who have never made any withdrawals (columns 3 and 4), and when using a simpler, unincentivized measure of present bias collected at baseline (online Appendix

[32] We trim extreme values of the β present bias parameter at the 5 percent and 95 percent level, and extreme outliers of the δ discount factor parameter, as these appear to reflect respondents who did not understand the exercises.

Table A14).[33] The heterogeneity by present bias is evident in both the population defaulted in and defaulted out (online Table A15).[34] Finally, in online Appendix Table A16, we check for heterogeneity in our main effects on participation by interacting default enrollment with a range of potentially relevant covariates including present bias, cognitive reflection (intelligence), risk preferences, salary, tenure, gender, education level and banked status. We find no evidence of heterogeneity by any factor other than present bias.

It is important to distinguish whether the short run or the long run discount factor more robustly predicts remaining at the default. Procrastination, in the O'Donoghue and Rabin (1999) sense, means explicitly failing to accomplish something at the point in time determined in a previous intertemporal plan. An exponential discounter who chooses not to participate does so according to a fully optimal intertemporal plan. A partially naïve present-biased individual, by contrast, experiences a preference reversal, and fails to enroll at a point in time when they had previously decided that they would like to do so. While prior work, including Brown et al. (2016) and Brown and Previtero (2014), correlates individuals' tendency to procrastinate with remaining at a default (in their case, staying in a defined benefit, rather than switching to a defined contribution, plan), it does not allow one to distinguish whether this is due to present bias, or, instead, a low exponential discount factor. By contrast, our setting allows for experimental measures of present bias.

Are Cognitive Costs the Relevant Friction?—The financial consultation was designed to help reduce the employee's cognitive cost of developing a financial plan. Specifically, we had a representative from Human Resources call a random subset of employees to offer them customized consultations that would answer questions about the M-Pasandaz product, estimate the employee's payouts under different contribution rates, and allow the employee to change his or her contribution rate immediately. The consultation script is provided in online Appendix D.1. Relating this exercise to the model, the consultation was intended to reduce c_τ and help identify which of the costs captured by this parameter constrain switching.

As can be seen in Figure 1 (green shaded regions) and Table 4 (row 7), the consultation led a significant number of employees to switch (11.5 percent, versus no more than 3 percent for the other interventions). But what about this consultation—which may have affected employees in several ways—was critical to helping employees

[33] The measurement protocol for the present bias parameter used in the regression in Table 5 was a modified version of the time-dated price list method proposed by Andreoni, Kuhn, and Sprenger (2015) and described in detail in online Appendix D.3. This is an incentivized measure based on actual time-dated monetary payments. One drawback of this approach, especially given recent discussions on the elicitation of present-biased preferences using potentially fungible monetary payments (Cubitt and Read 2007; Chabris, Laibson, and Schuldt 2008; Andreoni and Sprenger 2012; Augenblick, Niederle, and Sprenger 2015; Carvalho Meier, and Wang 2014; Andreoni et al. 2016), is the reliance on monetary payments. Since we had a short window of time to survey each employee, and as surveys were conducted at the employee's place of work, we had limited options for measuring present bias. We also felt that the protocol might be more appropriate in our context, given that a substantial share of our sample is credit constrained. The results reported in online Appendix Table A14 and described in online Appendix D.3 use an unincentivized measure of present bias, and are qualitatively unchanged. An additional advantage of using the baseline measure to test for treatment effect heterogeneity is that it could not have been affected by treatment.

[34] This provides some evidence against alternative explanations that predict a correlation between β and being at the default for only one initial assignment. For example, if having a low β is a signal of being highly credit constrained in a way that is not captured by salary or education, then β would predict remaining at the default only for employees initially assigned to a 0 percent contribution.

switch? In our data, we observe employee response to the consultation at six different stages: (i) whether the consultation offer was accepted and scheduled; (ii) whether the employee answered the phone for the scheduled consultation; (iii) whether she requested a review of the product; (iv) whether she requested a review of her current rate; (v) whether she asked the HR officer to walk her through different contribution scenarios; and (vi) whether she wanted to change her contribution. Importantly, every employee was asked at each distinct stage of the consultation whether he or she would like to skip ahead. This provides scope for exploring which element of the consultation is most strongly associated with switching from the default.

The data indicate that it is the penultimate stage of the consultation (providing assistance with financial calculations) that caused employees to switch their contribution.[35] For instance, Table 6 uses a regression to determine which stage of the consultation most strongly predicts switching. Of the employees who accepted the financial consultations (columns 3 and 4), it is the "calculation assistance" stage that leads to significant switching. This effect is unchanged even after controlling for a broad set of employee characteristics (column 4), and is entirely driven by employees increasing their contribution rates after the consultation. None of the other parts of the consultation correlate significantly with switching. While the decision to solicit assistance is endogenous, the robustness of this correlation to several variables which should be relevant for the decision to seek calculation assistance (e.g., financial sophistication and salary) provides some indication that the cognitive cost of switching is a meaningful obstacle. This appears to be particularly true for those assigned a positive default rate and still at their default (online Appendix Table A17). It may be that for these employees, the loss from not switching is smaller because they are making some positive contribution.

Take Up of the Consultation and Present Bias.—An employee may not switch his election for many reasons. In developed countries, this is a very broad set including confusion related to tax concerns, asset mixes, finding time to complete the process, and so on. While the range of potential frictions in our setting is different, we were interested in testing whether the time and mental effort involved in switching acted as a key friction driving procrastination.

Thus, in implementing our consultation experiment, we randomly varied whether employees were offered a consultation immediately, or with a week's delay. This experiment was intended to mimic the experimental tests of present bias that require the completion of some costly task either immediately, or with a delay, as implemented in the lab in Augenblick, Niederle, and Sprenger (2015) and the field in Andreoni et al. (2016). More specifically, when employees were offered this consultation, they were either told that the consultation would occur immediately following the scheduling call, or that the consultation would occur roughly one week

[35] Of the 927 employees still active in our study, 469 were assigned to be offered a consultation. Of these, 443 employees answered the first call making the initial offer. Of these 443, 327 employees agreed to a full consultation. Of the 327 employees who accepted the consultation, 295 were reached by the second caller offering the consultation. Of the 295 employees who both accepted and who were reached for a consultation, 95 requested assistance with calculating how much money they would earn in different contribution scenarios. Fifty-four employees switched their contribution rate during the consultation (49 switched up and 5 switched down), of which 47 (87 percent) had requested calculation assistance.

Table 6—Which Element of the Consultation is Associated with Switching?

	Changed contribution after February 28 (= 1)			
	(1)	(2)	(3)	(4)
Assigned consultation (= 1)	0.091			
	(0.018)			
Accepted consultation (= 1)		0.154		
		(0.024)		
Did not delay consultation (= 1)			−0.083	−0.090
			(0.270)	(0.273)
Asked for overview of M-Paz (= 1)			0.042	0.070
			(0.047)	(0.051)
Initial questions about M-Paz (= 1)			0.047	0.050
			(0.049)	(0.052)
Aware of M-Paz Plan and rate (= 1)			−0.139	−0.171
			(0.079)	(0.088)
Asked to repeat projected balance (= 1)			0.124	0.114
			(0.066)	(0.069)
Calculation assistance (= 1)			0.377	0.387
			(0.058)	(0.058)
Additional questions about M-Paz (= 1)			0.043	0.034
			(0.058)	(0.064)
Control mean	0.06	0.10	0.15	0.16
Covariates	No	No	No	Yes
R^2	0.027	0.040	0.312	0.332
Number of employees	927	443	295	287

Notes: This table reports which elements of the financial consultation predict whether an employee switches their contribution. 469 of the 927 employees still active in our study at the time of this intervention were assigned to be offered a consultation, establishing the sample for column 1. Of these, 443 employees answered the call making the initial offer, establishing the sample for column 2. Of these 443, 327 employees agreed to a full consultation. Accepted consultation is a dummy variable equal to 1 for these employees. Of the 327 employees who accepted the consultation, 295 were reached by the second caller offering the consultation, forming the sample for column 3. Of the 295 employees who both accepted and who were reached for a consultation, all completed the consultation. 291 were able to talk immediately (did not delay consultation = 1), while 4 could not and were reached later. 259 requested an overview of the M-Pasandaz product (asked for overview of M-Paz = 1), while 36 did not. 91 employees had initial questions about the M-Pasandaz product (initial questions about M-Paz = 1), while 204 did not. 285 confirmed that they were aware of their plan and contribution rate (aware of M-Paz plan and rate = 1), while 10 were not. All were informed of their projected balance after six months including any potential bonus payments, and 52 employees asked for this information to be repeated (asked to repeat projected balance = 1), while 242 did not. All were offered assistance with calculating how much money they would earn in different contribution scenarios, 95 requested assistance (calculation assistance = 1), while 200 did not. Requesting assistance was not required to change the level of contribution to M-Pasandaz during the consultation call. 53 employees had additional questions about the M-Pasandaz product (additional questions about M-Paz = 1), while 242 did not. Sample size in column 1 includes full sample subject to attrition when consultation was offered, column 2 sample includes all employees assigned a consultation, column 3 sample includes all employees who accepted a consultation, and column 4 excludes employees missing covariates. The additional covariates are: cognitive reflection test, risk preference, salary, tenure at Roshan, gender, education level, uses a bank account, withdraws entire salary on payday, and capable of fixing a phone. Robust standard errors are reported in parentheses.

after the scheduling call. Whether the offer was for a consultation now or later was randomized, in order to experimentally vary each subject's ability to procrastinate over developing a financial plan. Importantly, however, in our setting the costly task

TABLE 7—CONSULTATION OFFER RESULTS BY PRESENT BIAS

	Accepted consultation (= 1)				
	(1)	(2)	(3)	(4)	(5)
Consult later	0.063	0.081	0.008	0.056	0.510
	(0.047)	(0.048)	(0.065)	(0.126)	(0.271)
Present biased (= 1)			−0.038	−0.035	0.005
			(0.071)	(0.071)	(0.072)
Consult later × present biased			0.177	0.168	0.119
			(0.093)	(0.093)	(0.094)
Impatient (= 1)				0.018	0.048
				(0.098)	(0.098)
Consult later × cognitive reflection test					-0.054
					(0.068)
Consult later × risk preference					−0.013
					(0.017)
Consult later × salary					−0.004
					(0.002)
Consult later × tenure at Roshan					0.003
					(0.017)
Consult later × male					−0.093
					(0.153)
Consult later × education level					−0.015
					(0.038)
Consult later × uses a bank account					0.068
					(0.103)
Consult later × withdraws entire salary on payday					−0.170
					(0.097)
Consult later × capable of fixing phone					−0.063
					(0.104)
Constant	0.727	0.769	0.801	0.787	0.555
	(0.034)	(0.116)	(0.122)	(0.157)	(0.209)
Control mean	0.77	0.77	0.77	0.77	0.77
Covariates	No	Yes	Yes	Yes	Yes
Number of observations	329	329	329	329	329
R^2	0.005	0.039	0.052	0.052	0.091

Notes: Accepted consultation offer (= 1) is a binary variable that equals one if the employee agreed to participation in a financial consultation regarding their participation in the M-Pasandaz program (see paper text for details). Consult later (= 1) is a binary variable that equals zero if the employee was randomly assigned to receive a consultation on the same day as the consultation offer was made, and equals one if the consultation was assigned to take place one week later. Present biased (= 1) is a binary variable that equals one if an employee is identified as having $\beta < 1$ in an experimental present bias elicitation completed at endline with real stakes and impatient (= 1) is a binary variable that equals one if an employee is identified as having $\delta < 1$ (see paper text for details). Columns 2, 4, and 5 include covariates for cognitive reflection task, risk preference, salary, tenure at Roshan, gender, education level, uses a bank account, withdraws entire salary on payday, and capable of fixing a phone. See online Appendix D.2 for questions. Robust standard errors reported in parentheses.

used to test for present bias is specifically the friction that is potentially relevant to driving present bias (i.e., the cost and mental effort required to switch elections).

Table 7 reports results from this experiment. The consultations were very popular, with 73 percent of employees accepting when offered an immediate consultation and 79 percent accepting when offered a consultation with a week delay. This difference, reported in column 1, suggests slightly more demand for consultations offered with a delay, although this difference is not statistically significant (standard error $= 0.047$, $p = 0.182$). The difference increases slightly when controlling for other

employee characteristics (column 2: standard error $= 0.048$, $p = 0.089$), which suggests that procrastination over the time and mental effort required to switch elections may be an obstacle to switching elections. Interestingly, estimates reported in column 3 indicate that for employees with $\beta < 1$, the difference is 17.7 percentage points, and is significant at conventional levels. In column 4, we additionally interact a dummy variable equal to one for subjects offered the consultation with a week delay with a measure of their long run discount factor (a dummy equal to one when $\delta < 1$). There is no evidence of heterogeneity along this dimension.[36] However, the main interaction of interest loses significance after adding a full set of covariates and their interactions with the consult later treatment dummy (column 5: standard error $= 0.094$, $p = 0.208$), though the point estimate remains comparable.[37] Differential response to the consultation, therefore, should be viewed primarily as a corroboration of our experimental measure of present bias β. Also, while the financial consultation was the most effective approach to induce employees to switch from their default rate, even this very heavy-handed treatment only moves a small fraction of employees.[38]

Relating this observation back to the potential role for (naïve) present bias to create default effects, the consultation—and providing assistance with financial math in particular—can be thought of as removing an important cost to switching. Even for naïve and severely present-biased individuals, in the model of O'Donoghue and Rabin (1999), completely eliminating transaction costs will eliminate procrastination. This is empirically what we observe. This also carries a policy implication: if welfare is evaluated using long run preferences, one welfare-enhancing way to eliminate procrastination would be to eliminate switching costs.[39]

The evidence presented thus far indicates that present-biased employees are most likely to remain at their default-assigned contribution rate, that present-biased employees are more likely to accept a financial consultation when it is offered with a week delay, and that the financial consultation—which we believe reduced the mental costs faced by employees when deciding to switch—was the lone experimental intervention that induced a significant share of employees to switch. The sum total of this evidence lead us to believe that much of the default effect we observe can be explained by present bias exacerbating the cognitive cost associated with calculating alternative savings scenarios.

[36] There is also no evidence of heterogeneity when interacting the delay dummy only with δ.

[37] In online Appendix Table A18 we also find negative effects using the unincentivized baseline measure of present bias, but lack statistical power to reject the null hypothesis.

[38] Online Appendix Table A19 explicitly compares the effect of the financial consultation with the effect of SMS reminders on the employee's decision to switch. While the effect of the text messages is small and statistically indistinguishable from zero, the offer of the financial consultation has a large and significant effect, particularly for subjects still at their default election (column 2). Within this subsample, the effect of offering a financial consultation was even larger for those subjects who were enrolled by default, i.e., who were assigned a default contribution rate of 5 percent (column 3 of online Appendix Table A19).

[39] Of course, the finding that financial consultations reduces the default effect is consistent with alternative explanations. For example, it could just be that an extended consultation is the only action that raises the salience of the decision enough to induce switching. However, such an explanation would be hard to reconcile with other survey-based evidence indicating employees were acutely aware of M-Pasandaz activity. Alternatively, the financial consultation may have influenced employees in other ways as well, for instance by providing information that would help the employee choose an optimal contribution rate. This may be a part of the explanation, but outside of the consultation, very few employees took the initiative to consult an HR representative for such advice.

E. *Alternative Explanations*

Before concluding, we address three alternative explanations for the results we have presented. The first two concern the possibility that the individual-level randomization of default and matching rates may have caused employees to behave differently than they would have had all employees been assigned the same default contribution rate and matching incentives. The final point we discuss is the possibility that loss aversion, or a related form of reference-dependent preferences, might explain the default effects.

One might be concerned that in our context, employees might behave strategically if they believe their actions can impact future policy decisions made by the firm. However, we believe such strategic behavior to be unlikely for several reasons. First, as noted in Section III (Table 2), the default effect persisted even after all employees were standardized onto a single plan, when employees were asked to decide about future contributions to M-Pasandaz. At this point in the study, there was no scope for strategic behavior. Second, we have presented robust evidence in Section IVD that a large share of employees are present biased (roughly 41 percent have $\beta < 1$). The sort of strategic behavior we are concerned with would require making a short-run sacrifice to improve the long-run outcome, which is particularly hard to reconcile with the fact that the company has had very high rates of employee churn: roughly 14 percent of all employees left the company in the year between our baseline and end-line surveys, and two years after the completion of the study, less than 50 percent of employees remained active at the company. Third, while such a motivation could help explain the decision not to opt in among employees who didn't get matching contributions, it does not explain why the employees randomly assigned a 5 percent rate did not opt out. Finally, we raised this concern with our partners at Roshan early in the planning stages of the project, and they considered it a highly implausible proposition. Their perception was that most employees lived paycheck-to-paycheck, and would therefore be unlikely to intentionally forgo salary (or matching incentives) to influence policy. Even in the relatively short six-month window, an employee's contribution decisions had major economic consequences.

Related, it is possible that employees could base their contribution decisions on the plan they were assigned relative to their peers (as in Duflo and Saez 2003; Banerjee et al. 2013; Bursztyn et al. 2014; Beshears et al. 2015), and that they might make different decisions if all employees were assigned a uniform plan. For instance, an employee with no matching incentives and a default contribution rate of 0 percent might choose not to increase his contribution because he feels he got an inferior plan relative to his coworkers who receive a 50 percent match on contributions. We were concerned about this possibility from the project's inception, and therefore worked closely with our partners at Roshan to minimize the possibility that employees would react to their coworker's assignment. Specifically, the M-Pasandaz program was introduced to employees during hour-long training sessions that emphasized the private nature of the individually assigned plan and the importance that each employee make a personal decision about his or her preferred contribution rate. Great care was taken to explain that the study was being run by academic researchers, and that each employee had an equal chance of being assigned to each of the different plans. Plan details were handed out on written information

cards, and employees were instructed not to ask their coworkers about the details of their plans. While we do not believe these efforts eliminated information sharing or possible feelings of jealousy, every effort was made to encourage each employee to make a personal financial decision.[40]

A different sort of strategic behavior may arise if employees believe that their M-Pasandaz decisions send a signal to their employer. For example, employees may hope to signal something positive about themselves by saving in their employer-provided savings account. Such an explanation predicts an asymmetry of the default effect, where employees should either remain at their default or increase their saving. However, as can be seen in Figure 2, default effects exist at all levels of matching incentives and at both default rates, and a substantial share of employees switch their contribution to zero, even when the employer is providing a match.

Finally, we address the possibility that the default effects we observe are due in part to loss aversion. While this explanation features less prominently in the literature (see recent reviews by Madrian 2013; Beshears et al. 2009; and DellaVigna 2009) it is conceivable that the default creates a reference point and employees experience greater disutility from giving up some benefit than the utility they would receive from getting it (Kahneman, Knetch, and Thaler 1991; Tversky and Kahneman 1991). In our setting, reference points could be relevant in four ways. First, employees who are assigned a default contribution rate of zero may not increase their contribution because their reference point is their pre-experiment level of consumption. However, this idea is difficult to reconcile with the substantial default effects we observe for those employees who are initially assigned a default contribution rate of 5 percent and who receive no matching incentive. This characterization predicts that these employees should withdraw. However, as can be seen in panel A of Figure 2, 36 percent of employees with no matching incentives and a default contribution rate of 5 percent still contribute 5 percent at the end of the study (a portion that is almost identical to the portion of employees assigned a default contribution rate of 5 percent who receive 25 percent or 50 percent matching incentives). A second possibility is that employees exhibit reference dependence with regard to the amount of the employer match that they expect to receive. This, also, is challenging to reconcile with the large default effects we observe for employees who do not receive any employer match. A third explanation is that employees base their reference point on the balance in their M-Pasandaz account. However, the design of the account—which ample evidence suggests that employees fully understood—does not penalize employees for changing contributions. All accrued benefits are retained regardless of contribution rate; the only action that causes employees to forfeit matching incentives is if they make an early withdrawal from their account. If an employee provided with a positive balance values it more than an employee provided with no balance, then it is difficult to understand why employees assigned to 5 percent would not be more likely to switch up (the opposite of what we observe in the data). A final explanation is that employees simultaneously set reference points in both the consumption and savings domains as soon as they receive their random assignment,

[40] In results available upon request, we also test explicitly for evidence of peer effects, looking for evidence that employees are more likely to participate if they had a larger fraction of their social network randomly defaulted in to savings. In short, we find no evidence of such effects.

and their utility functions are such that any departure would create greater losses in one domain than the gains in the other. This would need to be true, independent of the size of the matching incentive. In addition, reference points would need to be set shortly after random assignment.[41] While the wealth of evidence affirmatively pointing to present bias leads us to believe that is a more likely candidate mechanism behind the default effects we observe, we cannot conclusively rule out this particular form of loss aversion with our data.

V. Conclusions

Exploiting the carefully planned launch of a new phone-based savings account, we evaluate the role of defaults and financial incentives on the savings decisions of 949 Afghan employees. Both effects are substantial, and together help employees accumulate meaningful savings, with the average participating employee accumulating an M-Pasandaz balance of 12,615 Afghanis, equal to 38.9 percent of the average monthly salary, over the initial six-month evaluation period. Employees receiving no matching incentive accumulated about 18 percent of a month's salary, suggesting automatic enrollment is also potentially cost effective. In exit interviews with the subjects in our study, we were struck by the extent to which employees embraced the new technology. One employee told us that on payday, all of the neighborhood clothing and cosmetics vendors would be excited to see her because they knew she was out to spend a good chunk of her paycheck. M-Pasandaz helped her pre-commit to cutting down on that spending, and she was happy with that change.

This paper also adds nuance to our understanding of why defaults affect behavior. In particular, our results support the notion that default effects exist in part because present-biased employees procrastinate over the task of making a non-default election. Here too the regression results resonate with stories on the ground: one employee in the default in group, when forced to make the active savings decision at the conclusion of our study, reported that he had been meaning to change his rate for each of the prior six months, but had never managed to find the time to think through how a change would impact his monthly budget.

A key benefit to our study was that our implementing partner committed to a close collaboration from the outset. We believe this example is potentially instructive for models of engagement where these questions are most often studied: in firms in developed countries. Our partner allowed us to work on the design and experimental implementation of the product and to conduct a series of experiments and longitudinal surveys with their employees. This added value for the firm. It provided them evidence on whether the default works, the matching incentive they would need to provide to achieve a similar effect, what matching levels they should consider, and, most importantly, whether and how this product affected the lives

[41] At the time of writing, understanding the speed with which reference points adapt is an active area of research. For example, in Kőszegi and Rabin's (2006) original paper, the authors point out: "Our theory posits that preferences depend on lagged expectations, rather than expectations contemporaneous with the time of consumption. This does not assume that beliefs are slow to adjust to new information or that people are unaware of the choices that they have just made—but that preferences do not instantaneously change when beliefs do. When somebody finds out 5 minutes ahead of time that she will for sure not receive a long-expected $100, she would presumably immediately adjust her expectations to the new situation, but she will still 5 minutes later assess not getting the money as a loss."

of their employees. In addition, because we worked with the phone company, this provided them with evidence to determine whether they should add M-Pasandaz to their set of commercial products, which they have done.

Nonetheless, we are still some distance from fully understanding how to characterize the inertia that results from defaults, and in developed countries additional complications arise, for instance, regarding taxes and asset mixes. In our view, comparable projects in developed countries could shed substantial insight on key policy questions related to savings.

Indeed, in rich countries, the use of defaults to encourage retirement savings provides, perhaps, the canonical example of applying behavioral insights to policy design. Appropriately, most academic research on the subject uses data from these settings; this is, by and large, where these programs exist. However, a growing body of research emphasizes the potential for behavioral departures from rationality to be even more damaging in developing countries. The world's poor may face a much greater scarcity of mental resources to think carefully about the long run: they may be credit and resource constrained in ways that exacerbate behavioral tendencies; they often face worse decision environments; and they typically benefit from far fewer institutions for financial protection.

Separately, in our context, Afghanistan, the government faces a rapidly growing financial burden in the form of pension commitments for public sector workers, which is forecasted to grow to as much as one-third of the annual budget in coming decades. It may be that transitioning toward automatic enrollment in defined contribution schemes, as has happened in developed countries, could begin to alleviate some of this burden. Our hope in designing and evaluating this product is to provide an example of how policies and innovations designed to overcome these obstacles in wealthy nations can be applied globally.

REFERENCES

Abadie, Alberto, and Sebastien Gay. 2006. "The Impact of Presumed Consent Legislation on Cadaveric Organ Donation: A Cross-Country Study." *Journal of Health Economics* 25 (4): 599–620.

Aker, Jenny C., and Joshua E. Blumenstock. 2014. "The Economic Impacts of New Technologies in Africa." In *The Oxford Handbook of Africa and Economics*, Vol. 2, edited by Célesin Monga and Justin Yifu Lin. Oxford: Oxford University Press.

Aker, Jenny C., Rachid Boumnijel, Amanda McClelland, and Niall Tierney. 2016. "Payment Mechanisms and Antipoverty Programs: Evidence from a Mobile Money Cash Transfer Experiment in Niger." *Economic Development and Cultural Change* 65 (1): 1–37.

Anderson, Siwan, and Jean-Marie Baland. 2002. "The Economics of Roscas and Intrahousehold Resource Allocation." *Quarterly Journal of Economics* 117 (3): 963–95.

Andreoni, James, Michael Callen, Yasir Khan, Karrar Jaffar, and Charles Sprenger. 2016. "Using Preference Estimates to Customize Incentives: An Application to Polio Vaccination Drives in Pakistan." Unpublished.

Andreoni, James, Michael A. Kuhn, and Charles Sprenger. 2015. "Measuring Time Preferences: A Comparison of Experimental Methods." *Journal of Economic Behavior and Organization* 116: 451–64.

Andreoni, James, and Charles Sprenger. 2012. "Estimating Time Preferences from Convex Budgets." *American Economic Review* 102 (7): 3333–56.

Ashraf, Nava. 2009. "Spousal Control and Intra-Household Decision Making: An Experimental Study in the Philippines." *American Economic Review* 99 (4): 1245–77.

Ashraf, Nava, Dean Karlan, and Wesley Yin. 2006. "Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Philippines." *Quarterly Journal of Economics* 121 (2): 635–72.

Augenblick, Ned, Muriel Niederle, and Charles Sprenger. 2015. "Working over Time: Dynamic Inconsistency in Real Effort Tasks." *Quarterly Journal of Economics* 130 (3): 1067–115.

Banerjee, Abhijit, Arun G. Chandrasekhar, Esther Duflo, and Matthew O. Jackson. 2013. "The Diffusion of Microfinance." *Science* 341 (6144).

Banerjee, Abhijit, and Sendhil Mullainathan. 2010. "The Shape of Temptation: Implications for the Economic Lives of the Poor." Unpublished.

Becker, Gary S., and Kevin M. Murphy. 1988. "A Theory of Rational Addiction." *Journal of Political Economy* 96 (4): 675–700.

Benjamin, Daniel J. 2003. "Does 401(k) Eligibility Increase Saving? Evidence from Propensity Score Subclassification." *Journal of Public Economics* 87 (5-6): 1259–90.

Bernheim, B. Douglas, Andrey Fradkin, and Igor Popov. 2015. "The Welfare Economics of Default Options in 401(k) Plans." *American Economic Review* 105 (9): 2798–837.

Beshears, John, James J. Choi, David Laibson, and Brigitte C. Madrian. 2009. "The Importance of Default Options for Retirement Saving Outcomes: Evidence from the United States." In *Social Security Policy in a Changing Environment*, edited by Jeffrey R. Brown, Jeffrey B. Liebman, and David A Wise, 167–95. Chicago: University of Chicago Press.

Beshears, John, James J. Choi, David Laibson, and Brigitte C. Madrian. 2010. "The Impact of Employer Matching on Savings Plan Participation under Automatic Enrollment." In *Research Findings in the Economics of Aging*, edited by David A. Wise, 311–27. Chicago: University of Chicago Press.

Beshears, John, James J. Choi, David Laibson, Brigitte C. Madrian, and Katherine L. Milkman. 2015. "The Effect of Providing Peer Information on Retirement Savings Decisions." *Journal of Finance* 70 (3): 1161–201.

Beshears, John, James J. Choi, David Laibson, Brigitte C. Madrian, and William L. Skimmyhorn. 2017. "Borrowing to Save? The Impact of Automatic Enrollment on Debt." Unpublished.

Bidwell, Kelly, Katherine Casey, and Rachel Glennerster. 2016. "Debates: Voting and Expenditure Responses to Political Communication." Unpublished.

Blumenstock, Joshua, Michael Callen, and Tarek Ghani. 2018. "Why Do Defaults Affect Behavior? Experimental Evidence from Afghanistan: Dataset." *American Economic Review* https://doi.org/10.1275/aer/.201767.

Blumenstock, Joshua E., Michael Callen, Tarek Ghani, and Lucas Koepke. 2015. "Promises and Pitfalls of Mobile Money in Afghanistan: Evidence from a Randomized Control Trial." In *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development*, edited by Arul Chib, Matthew Kam, and Jenna Burrell.

Blumenstock, Joshua E., Nathan Eagle, and Marcel Fafchamps. 2016. "Airtime Transfers and Mobile Communications: Evidence in the Aftermath of Natural Disasters." *Journal of Development Economics* 120: 157–81.

Breza, Emily, Martin Kanz, and Leora Klapper. 2017. *The Real Effects of Electronic Wage Payments.* London: International Growth Centre.

Brown, Jeffrey R., Anne M. Farrell, and Scott J. Weisbenner. 2016. "Decision-Making Approaches and the Propensity to Default: Evidence and Implications." *Journal of Financial Economics* 121 (3): 477–95.

Brown, Jeffrey R., and Alessandro Previtero. 2014. *Procrastination, Present-Biased Preferences, and Financial Behaviors.* Chicago: National Bureau of Economic Research.

Bruhn, Miriam, and David McKenzie. 2009. "In Pursuit of Balance: Randomization in Practice in Development Field Experiments." *American Economic Journal: Applied Economics* 1 (4): 200–232.

Brune, Lasse, Xavier Gine, Jessica Goldberg, and Dean Yang. 2017. "Savings Defaults and Payment Delays for Cash Transfers: Field Experimental Evidence from Malawi." *Journal of Development Economics* 129 (C): 1–13.

Burgess, Robin, and Rohini Pande. 2005. "Do Rural Banks Matter? Evidence from the Indian Social Banking Experiment." *American Economic Review* 95 (3): 780–95.

Bursztyn, Leonardo, Florian Ederer, Bruno Ferman, and Noam Yuchtman. 2014. "Understanding Mechanisms Underlying Peer Effects: Evidence from a Field Experiment on Financial Decisions." *Econometrica* 82 (4): 1273–301.

Callen, Michael, Suresh de Mel, Craig McIntosh, and Christopher Woodruff. 2017. "What Are the Headwaters of Formal Savings? Experimental Evidence from Sri Lanka." Unpublished.

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): 1639–74.

Carter, Michael R, Rachid Laajaj, and Dean Yang. 2015. "Raising Returns, Managing Risk: A Randomized Experiment on Combining Input Subsidies with Financial Services Interventions." Unpublished.

Carvalho, Leandro, Stephan Meier, and Stephanie Wang. 2014. "Poverty and Economic Decision-Making: Evidence from Changes in Financial Resources at Payday." Unpublished.

Casey, Katherine, Rachel Glennerster, and Edward Miguel. 2012. "Reshaping Institutions: Evidence on Aid Impacts Using a Preanalysis Plan." *Quarterly Journal of Economics* 127 (4): 1755–812.

Chabris, Christopher F., David Laibson, and Jonathon P. Schuldt. 2008. "Intertemporal Choice." In *The New Palgrave Dictionary of Economics*, edited by Steven N. Durlauf and Larry Blume, 3254–60. London: Palgrave Macmillan.

Chapman, Gretchen B., Meng Li, and Helen Colby. 2010. "Opting In vs. Opting Out of Influenza Vaccination." *Journal of the American Medical Association* 304 (1): 43–44.

Charness, Gary, and Uri Gneezy. 2009. "Incentives to Exercise." *Econometrica* 77 (3): 909–31.

Chetty, Raj, John N. Friedman, Soren Leth-Petersen, Torben Nielsen, and Tore Olsen. 2012. "Active vs. Passive Decisions and Crowdout in Retirement Savings Accounts: Evidence from Denmark." National Bureau of Economic Research 18565.

Chetty, Raj, John N. Friedman, Soren Leth-Petersen, Torben Helen Nielsen, and Tore Olsen. 2014. "Active vs. Passive Decisions and Crowd-Out in Retirement Savings Accounts: Evidence from Denmark." *Quarterly Journal of Economics* 129 (3): 1141–219.

Chipcase, Jan, Mark Roston, Cara Silver, and Joshua Blumenstock. 2013. "In the Hands of God: A Study of Risk and Savings in Afghanistan." Unpublished.

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

Cole, Shawn, Thomas Sampson, and Bilal Zia. 2011. "Prices or Knowledge? What Drives Demand for Financial Services in Emerging Markets?" *Journal of Finance* 66 (6): 1933–67.

Cubitt, Robin P., and Daniel Read. 2007. "Can Intertemporal Choice Experiments Elicit Time Preferences for Consumption?" *Experimental Economics* 10 (4): 369–89.

DellaVigna, Stefano. 2009. "Psychology and Economics: Evidence from the Field." *Journal of Economic Literature* 47 (2): 315–72.

DellaVigna, Stefano, and Ulrike Malmendier. 2006. "Paying Not to Go to the Gym." *American Economic Review* 96 (3): 694–719.

Demirguc-Kunt, Asli, Leora Klapper, Dorothe Singer, and Peter Van Oudheusden. 2015. "The Global Findex Database 2014: Measuring Financial Inclusion around the World." World Bank Policy Research Working Paper 7255.

Drexler, Alejandro, Greg Fischer, and Antoinette Schoar. 2014. "Keeping It Simple: Financial Literacy and Rules of Thumb." *American Economic Journal: Applied Economics* 6 (2): 1–31.

Duflo, Esther, William Gale, Jeffrey Liebman, Peter Orszag, and Emmanuel Saez. 2006. "Saving Incentives for Low- and Middle-Income Families: Evidence from a Field Experiment with H&R Block." *Quarterly Journal of Economics* 121 (4): 1311–46.

Duflo, Esther, and Emmanuel Saez. 2003. "The Role of Information and Social Interactions in Retirement Plan Decisions: Evidence from a Randomized Experiment." *Quarterly Journal of Economics* 118 (3): 815–42.

Dupas, Pascaline, and Jonathan Robinson. 2013. "Why Don't the Poor Save More? Evidence from Health Savings Experiments." *American Economic Review* 103 (4): 1138–71.

Engelhardt, Gary V., and Anil Kumar. 2007. "Employer Matching and 401(k) Saving: Evidence from the Health and Retirement Study." *Journal of Public Economics* 91 (10): 1920–43.

Frederick, Shane. 2005. "Cognitive Reflection and Decision Making." *Journal of Economic Perspectives* 19 (4): 25–42.

Goda, Gopi Shah, Matthew R. Levy, Colleen Flaherty Manchester, Aaron Sojourner, and Joshua Tasoff. 2015. "The Role of Time Preferences and Exponential-Growth Bias in Retirement Savings." National Bureau of Economic Research Working Papers 21482.

GSMA. 2017. *State of the Industry Report on Mobile Money: Decade Edition: 2006–2016.* London: GSM Association.

Hussam, Reshmaan, Atonu Rabbani, Giovanni Reggiani, and Natalia Rigol. 2017. "Habit Formation and Rational Addiction: A Field Experiment in Handwashing." Harvard Business School Working Paper 18-030.

International Monetary Fund. 2015. *Financial Access Survey*. Washington, DC: International Monetary Fund.

International Telecommunications Union. 2015. *World Telecommunication/ICT Development Report and Database*. Geneva: International Telecommunications Union.

Jack, William, and Tavneet Suri. 2014. "Risk Sharing and Transactions Costs: Evidence from Kenya's Mobile Money Revolution." *American Economic Review* 104 (1): 183–223.

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* 302 (5649): 1338–39.

Kahneman, Daniel, Jack L. Knetsch, and Richard H. Thaler. 1991. "Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias." *Journal of Economic Perspectives* 5 (1): 193–206.

Kapsos, Steven, and Evangelia Bourmpoula. 2013. "Employment and Economic Class in the Development World." International Labour Office Research Paper 6.

Karlan, Dean, Jake Kendall, Rebecca Mann, Rohini Pande, Tavneet Suri, and Jonathan Zinman. 2016a. "Research and Impacts of Digital Financial Services." National Bureau of Economic Research Working Paper 22633.

Karlan, Dean, Margaret McConnell, Sendhil Mullainathan, and Jonathan Zinman. 2016b. "Getting to the Top of Mind: How Reminders Increase Saving." *Management Science* 62 (12): 3393–411.

Karlan, Dean, Aishwarya Lakshmi Ratan, and Jonathan Zinman. 2014. "Savings by and for the Poor: A Research Review and Agenda." *Review of Income and Wealth* 60 (1): 36-78.

Kast, Felipe, Stephan Meier, and Dina Pomeranz. 2016. "Saving More in Groups: Field Experimental Evidence from Chile." Harvard Business School Working Paper 12-060.

Kőszegi, Botond, and Matthew Rabin. 2006. "A Model of Reference-Dependent Preferences." *Quarterly Journal of Economics* 121 (4): 1133–65.

List, John A., Azeem M. Shaikh, and Yang Xu. 2016. "Multiple Hypothesis Testing in Experimental Economics." Unpublished.

Lusardi, Annamaria, and Olivia S. Mitchell. 2011. "Financial Literacy and Planning: Implications for Retirement Wellbeing." National Bureau of Economic Research Working Paper 17078.

Madrian, Brigitte C. 2013. "Matching Contributions and Savings Outcomes: A Behavioral Economics Perspective." In *Matching Contributions for Pensions: A Review of International Experience*, edited by Richard Hinz, Robert Holzmann, David Tuesta, and Noriyuki Takayama, 289–310. Washington, DC: World Bank.

Madrian, Brigitte C. 2014. "Applying Insights from Behavioral Economics to Policy Design." *Annual Review of Economics* 6 (1): 663–88.

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): 1149–87.

Mani, Anandi, Sendhil Mullainathan, Eldar Shafir, and Jiaying Zhao. 2013. "Poverty Impedes Cognitive Function." *Science* 341 (6149): 976–80.

Mullainathan, Sendhil, and Eldar Shafir. 2013. *Scarcity: Why Having Too Little Means So Much*. New York: Times Books.

Muralidharan, Karthik, Paul Niehaus, and Sandip Sukhtankar. 2016. "Building State Capacity: Evidence from Biometric Smartcards in India." *American Economic Review* 106 (10): 2895–929.

O'Donoghue, Ted, and Matthew Rabin. 1999. "Doing It Now or Later." *American Economic Review* 89 (1): 103–24.

Romano, Joseph P., Azeem M. Shaikh, and Michael Wolf. 2010. "Hypothesis Testing in Econometrics." *Annual Review of Economics* 2 (1): 75–104.

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

Schaner, Simone. 2015. "Do Opposites Detract? Intrahousehold Preference Heterogeneity and Inefficient Strategic Savings." *American Economic Journal: Applied Economics* 7 (2): 135–74.

Schaner, Simone. 2016. "The Persistent Power of Behavioral Change: Long-Run Impacts of Temporary Savings Subsidies for the Poor." National Bureau of Economic Research Working Paper 22534.

Schilbach, Frank. Forthcoming. "Alcohol and Self-Control: A Field Experiment in India." *American Economic Review*.

Shah, Anuj, Sendhil Mullainathan, and Eldar Shafir. 2012. "Some Consequences of Having Too Little." *Science* 338 (6107): 682–85.

Somville, Vincent, and Lore Vandewalle. 2018. "Saving by Default: Evidence from a Field Experiment in Rural India." *American Economic Journal: Applied Economics* 10 (3): 39–66.

Suri, Tavneet, and William Jack. 2016. "The Long-Run Poverty and Gender Impacts of Mobile Money." *Science* 354 (6317): 1288–92.

Taubinsky, Dmitry. 2013. "From Intentions to Actions: A Model and Experimental Evidence of Inattentive Choice." Unpublished.

Thaler, Richard H. 1999. "Mental Accounting Matters." *Journal of Behavioral Decision Making* 12 (3): 183–206.

Tversky, Amos, and Daniel Kahneman. 1991. "Loss Aversion in Riskless Choice: A Reference-Dependent Model." *Quarterly Journal of Economics* 106 (4): 1039–61.

Zwane, Alix Peterson, Jonathan Zinman, Eric Van Dusen, William Pariente, Clair Null, and Edward Miguel. 2011. "Being Surveyed Can Change Later Behavior and Related Parameter Estimates." *Proceedings of the National Academy of Sciences of the United States of America* 108 (5): 1821–26.