Mobile-izing Savings with Automatic Contributions: Experimental Evidence on Dynamic Inconsistency and the Default Effect in Afghanistan*

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Abstract

Automatic payroll deductions represent one of the most effective means of increasing savings in developed countries. We design and experimentally evaluate a mobile phone-based automatic payroll deduction system in Afghanistan, a country with limited formal financial infrastructure. We find that employees initially assigned a default contribution rate of 5 percent are 40 percentage points more likely to contribute to the account than individuals assigned to a default contribution rate of zero. We also randomize employer matches, and estimate that a 50% match would be required to replicate the default effect through financial incentives alone. To better understand why the default effect is so pronounced, we conduct several additional experimental interventions designed to induce employees to make a non-default selection, and use behavioral protocols to elicit measures of time inconsistency. We conclude that the effect of default assignment is driven largely by dynamic inconsistency, and specifically by the tendency to procrastinate over the task of finding an optimal plan.

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1 Introduction

In wealthy nations, defined-contribution accounts can dramatically increase savings and are linked to lasting welfare improvements for participating employees (Thaler and Benartzi, 2004; Benartzi and Thaler, 2007; Bernheim et al., 2015). A key feature of these accounts is that they allow savers to save passively, such that an active decision is not required for savings to accumulate (Chetty et al., 2014). By allowing individuals to automatically contribute a portion of their paycheck to savings, these accounts help overcome self-control issues and improve long-term planning (Thaler and Shefrin, 1981).

In developing countries, many of the primary obstacles to saving, from simple transactions costs associated with traveling to the bank (Burgess and Pande, 2005; Callen et al., 2015), to intra-household disagreements regarding savings (Anderson and Baland, 2002; Ashraf, 2009; Schaner, 2015), behavioral issues of dynamic inconsistency (Ashraf et al., 2006; Karlan et al., 2010; Dupas and Robinson, 2013), and ego depletion (Shah et al., 2012), all relate to the fact that savings must first pass through the saver's hands, who must then make an active and potentially costly decision to save.[1] Automatic savings contributions, by contrast, provide a means of potentially overcoming several of these challenges. This observation, combined with the remarkable success of automatic contributions in the U.S. and Western Europe in mobilizing savings, suggests promise if the innovation can be ported to developing countries.[2] While limited financial infrastructure has historically hindered the implementation of automatic contributions in many developing countries, the rapid expansion of mobile financial systems has created new avenues for enabling this transition.

In this paper, we present experimental evidence on the impact of automatic payroll deductions on savings in Afghanistan, a country where roughly 4 percent of the population saves in a formal financial institution (Demirguc-Kunt et al., 2015). For this study, 967

[1] Madrian (2012) develops this point further.

[2] In developed countries it is the poorest and least financially sophisticated employees who respond most strongly to automatic contributions (Madrian and Shea, 2001; Choi et al., 2004; Beshears et al., 2010). Our results echo the general finding that behavioral interventions represent a highly effective means of promoting financial inclusion in developing countries (World Bank, 2015).

full-time employees of a large Afghan telecom firm were given access to a new mobile phone-based savings account, called "M-Pasandaz." Built into this account is an automatic payroll deduction feature which allows employees to have up to 10 percent of their regular paycheck automatically deposited to the M-Pasandaz savings account. Half of employees were randomly assigned to a treatment in which this feature was by default set to automatically deposit 5 percent of the employee's monthly paycheck to M-Pasandaz. The remaining half of employees had their default contribution rate set to zero. Employees were further given a randomized level of matching incentives, whereby one third of employees received a 50% bonus for all monthly contributions to M-Pasandaz; one third received a 25% match on all contributions; and the final third received no matching incentives. Employees were only eligible to receive this bonus if they made no withdrawals from their M-Pasandaz account over an initial six-month commitment period.

Two months after the launch of the product, we find employees with a default contribution rate of 5 percent are 40 percentage points more likely to contribute to the account than individuals with a default contribution of zero. After six months, and after three additional interventions aimed at increasing contributions among those defaulted to a zero percent contribution, this difference remained at 33 percentage points. This effect is observed at all levels of matching incentives, and persists despite a simple protocol for switching from the default assignment to a non-default contribution rate. While about half of employees did in fact change to a non-default rate, the impact of the initial assignment is striking. Two months after the program launched and after almost all switching had ceased, 47% of employees with no matching incentives but a default 5% contribution were still contributing at the default 5% level. Similarly, 45% of employees given the 50% matching incentive and a default 0% contribution were still "leaving money on the table" by remaining at the default 0% level, despite what by all accounts from employees was a very strong incentive to contribute.

Our research design makes it possible to estimate the elasticity of demand for the M-

Pasandaz account with respect to the match rate, and to compare the impact of matching incentives to the impact of default assignment. Relative to a baseline of no matching incentives, we find that a 50% match on employee contributions increases employee participation by 47 percentage points, and that a 25% match increases participation by 25 percentage points, indicating that the elasticity of participation with respect to the match rate is about one. This elasticity is slightly higher among the group who are assigned a default contribution of 0%, but is only slightly attenuated in the group assigned a default contribution of 5%. Comparing the impact of the cross-randomized matching and default treatments, we note that for the employees in our study, default enrollment increases participation by roughly the same amount as providing a match rate of 50%.

We next turn our attention to understanding why the default assignment has such a large impact on savings. While a several candidate explanations exist (cf. Beshears et al., 2009; Madrian, 2012; Bernheim et al., 2015), our experimental setting makes it possible to rule out several common hypotheses. For instance, follow-up surveys with employees allow us to reject the possibility that employees were unaware of their enrollment status, or that there was any confusion about how to change the assigned contribution level. Similarly, because of the way in which the product was first introduced and the nature of the public lottery that was used to assign employees to plan types, it seems unlikely that employees perceived their assignment to be a sign of employer endorsement, as is common in situations when all employees are assigned a uniform plan and rate (Madrian and Shea, 2001; Beshears et al., 2009). Finally, we use three different sources of experimental and non-experimental variation to rule out the possibility that the default effects are driven simply by inattention on the part of the employee. First, all employees are notified each month of their paycheck amount (which is typically an even number); employees are quite sensitive to this paycheck, and it thus provides a tangible reminder of their enrollment status. Second, we sent text messages to a random subset of employees to remind them of their current rate and provide information on how to switch, and observe only modest effects of these reminders on switching behavior.

Third, because we were worried that our follow-up surveys might impact employee behavior (cf. Zwane et al., 2011), we restricted our post-treatment surveys to a randomly selected half of participants. These surveys, which might have served to remind employees of the M-Pasandaz product and their current status, had no significant impact on rate switches by employees.

Instead, we find evidence that the default effect is driven, at least in part, by time-inconsistent preferences that cause the employee to procrastinate in making a non-default election. In particular, employees who exhibited dynamic inconsistency in both hypothetical and incentivized behavioral elicitations were significantly more likely to remain at their default assignment six months later. In addition, we observe that employees responded strongly to an experimental intervention designed to force employees to think through their financial allocation. Finally, when randomly offered the opportunity to procrastinate in responding to this experimental intervention, it is the time-inconsistent employees who were most likely to respond. To our knowledge, this represents the first experimental evidence linking dynamic inconsistency to the default effect. These results thus complement recent evidence in Brown et al. (2015) that links an employee's self-reported tendency to procrastinate to default effects among employees of the State of Illinois.

Our results have implications for policymakers and other stakeholders seeking to promote financial inclusion in developing countries. Over the decade between 2001 and 2011, the share of the developing world's workforce in the middle class ($4-13/day) or above nearly doubled from 23% to 42%, dramatically expanding the number of regular wage earners who might benefit from automatic payroll deductions to promote savings (ILO, 2013). An automatic contribution option might be similarly relevant to the large number of individuals receiving welfare payments, which are increasingly being disbursed using mobile phones (cf. Aker et al., 2011). Thus, policymakers interested in increasing formal savings could achieve scalable impacts through implementing non-zero default contribution rates to savings accounts in the context of civil servant salaries or private pension plans. And while penetration by formal

banks is often limited in developing countries, the mobile phone-based product evaluated in this paper is potentially applicable to a wide range of country contexts experiencing rapid growth in both mobile network coverage and mobile financial systems.

Our findings are consistent with the behavioral-economics view of poverty, which argues that the poor exhibit the same biases and inconsistencies as their developed country counterparts (Bertrand et al., 2004). Taking this approach to its logical conclusion, we show that one of the most effective means of increasing savings in a developed country context - automatic payroll deductions - also has broad relevance to the emerging middle class in developing countries. Our findings also provide empirical evidence that behavioral mechanisms, and specifically dynamic inconsistency, are a key reason that defaults are so effective.

2 Financial Inclusion in Afghanistan

While Afghanistan remains one of the poorest countries in the world, it has experienced a sustained period of growth over the past decade from increased private investment, contracts and aid flows from international partners. In 2013, the World Bank estimated per capita income at $690 - about the global average for low-income countries - with almost two thirds of the population living above the national poverty line. While the Afghan labor force is largely employed in agriculture and small-scale trading activities, a small but growing middle class has recently emerged, particularly in major urban areas like Kabul.

Afghanistan is characterized by low rates of participation in formal financial institutions, with only 10% of adults reporting ownership of a bank account, and 4% reporting any formal savings over the past year (Demirguc-Kunt et al., 2015). The supply of banks is limited, with approximately 2.5 bank branches per 100,000 adults, less than one-third of the South Asia average (World Bank 2015). 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 an annual inflation rate of between 5-10%. A demand

for savings exists though, with about 25% of Afghans reporting any savings in the previous year - primarily informally through cash or in-kind holdings - with the most common reasons including retirement, school fees, and saving for a farm or business (Chipchase et al., 2013; Demirguc-Kunt et al., 2015).

In contrast to the low rates of formal financial inclusion, mobile phones are prevalent throughout the country, with approximately 75 mobile cellular subscriptions for every 100 Afghan adults (ITU, 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 with more than 200 million active users using over 225 mobile money services in 89 countries (GSMA, 2015). While these accounts historically have been used primarily for interpersonal transfers (Jack and Suri, 2014; Blumenstock et al., 2014), many mobile operators now offer interest-bearing savings accounts, insurance, and credit products. As of December 2014, roughly 10 million individuals possessed mobile savings accounts in 22 different developing countries (GSMA, 2015).[3]

3 "Mobile-izing" Savings with M-Pasandaz

We worked closely with Roshan, Afghanistan's largest mobile phone operator, to develop a new product for the M-Paisa mobile money system, called "M-Pasandaz."[4] M-Pasandaz

[3] See Aker and Blumenstock (2014) for a review of recent literature, and GSMA (2014) for a survey of empirical data on mobile money in developing countries.

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

was designed to facilitate automatic payroll deductions and employer matching contributions using mobile money.[5] Specifically, a Roshan subscriber who owns an M-Paisa account and receives employer direct deposits can enable M-Pasandaz, which will cause a porton of his or her salary to be automatically contributed to the M-Pasandaz account each pay cycle. Consistent with Islamic principles, these contributions do not earn interest, but the employer may provide matching incentives on employee contributions.

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% of whom are women (Table A1). 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. In our sample, the mean monthly wage is approximately $590 and the median monthly wage is $410, compared to an average monthly income per capita in Afghanistan of $57.50 (World Bank 2013). Prior to our study and 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.[6]

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

[5] 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, which require fixed employee contributions from automatic payroll deductions and employer matching contributions. While Afghanistan does not currently mandate pension plans for private sector employers, several of the larger employers, including telecoms and international NGOs, voluntarily offered such programs. During the period of this study, several private pension and savings schemes were active in Afghanistan, permitting employee contribution rates between 5-10% of monthly salaries with employer matches of up to 100% of deposits and vesting periods ranging from monthly to annual.

[6] At the time of our baseline survey in June 2014, Roshan had roughly 1,100 employees, of whom roughly 90% 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.

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 from their employer. 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.

As part of the research design, 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% of their monthly salary (the "default in" group); for the other half, the default contribution was set to 0% (the "default out" group). Employees were informed of 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; the goal was to minimize the friction involved in switching contribution rates. Employees were free to set their contribution rate to any value between 0% and 10% of their monthly salary. Any change in contribution rate was instantaneous and applied to all future salary payments, with the caveat that each month's contribution was locked in on the 15th of the month to give HR sufficient time to prepare monthly payments, which typically occurred on the 20th of the month.

The second randomization, cross-randomized with the first, varied the *matching incentive* provided to employees to contribute to M-Pasandaz. Each employee was randomly assigned into one of three M-Pasandaz "plans" that are distinguished only by the level of matching incentives provided by Roshan: White (0% match), Blue (25% match) and Red (50% match).[7]

[7]These incentive levels are similar to those in prior literature from developed country (Duflo et al., 2006) and developing country settings (Carter et al., 2015), and were consistent with savings incentives provided

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 any such 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 did not have the power to change his or her matching contribution.

Both treatments were stratified by employee salary tercilies, 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. Table A1 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 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. Throughout the study period, we conducted phone-based follow-up surveys with a random subset of employees. In August 2015 we conducted a final face-to-face endline survey with all study participants.

4 The Effect of Automatic Enrollment

During the six-month study window, 460 of the 949 employees (48.5%) elected to change their contribution rate from their default assignment; the remaining 489 employees remained at the default. The employees who switched came from all plan types (0%, 25%, and 50% matching incentives) and from both default rates (0% and 5%). Certain behaviors, shown in Figure 1, are unsurprising: individuals in the White plan (i.e., no financial incentives to contribute) who are assigned a 0% default contribution rate are very likely to remain at 0%

by Roshan's competitors in Afghanistan.

through the duration of the study. Similarly, many of the individuals in the White plan who are assigned a 5% default contribution rate choose to reduce their contribution rate to 0%.

Other choices made by employees are less transparent, though consistent with what has been observed in similar situations in developed countries. For instance, we observe that approximately 35% of the employees in White plan who were assigned a default rate of 5% continue to contribute 5% of their salary to M-Pasandaz, even though they receive no financial incentives to do so. Similarly, roughly 35% (63%) of employees who were assigned a default contribution rate of 0% in the Red (Blue) plan – all of whom are receiving very strong financial incentives to save – are effectively leaving cash on the table by continuing to contribute 0% of their salary to M-Pasandaz.

We estimate the causal effects of default assignment on M-Pasandaz contributions in Table 1. On average, over the course of the 6-month study period, individuals with a 5% default rate contributed an additional 2,426 Afghanis (roughly US$40) to their M-Pasandaz accounts (Panel A). This default effect was comparable across all three incentive levels, though only statistically significant for employees receiving 0% or 25% matching contributions. The increase in total contributions was driven by both the extensive effect of an increase in participation rates (Panel B) and by an intensive increase in the contribution rates of those participating (Panel C). Employees who are automatically enrolled at a 5% contribution rate are 40 percentage points more likely to contribute to the account than employees with a default contribution rate of 0% (Panel B, column 4); automatic enrollment also increases the average contribution rate by 1.77 percentage points (Panel C, column 4), equivalent to a 47% increase over the population average contribution rate of 3.8%. Whereas the extensive effect is present for all levels of matching incentives (Panel B, columns 1-3), the intensive effect is only present in the White (0% matching contributions) and Blue (25% matching contributions) plans (Panel B, columns 1-3).

Employer matching contributions similarly had a large and significant effect on M-Pasandaz contributions. This effect can be inferred from the constant terms in Table 1,

where we observe an increase in the average contribution rate among default-out employees from 417 Afghanis to 5,016 (8,797) Afghanis between employees randomly assigned to plans with 0% and 25% (50%) matching incentives. Among default-in employees, the corresponding increase is from 2,661 Afghanis to 8,012 (10,849) Afghanis.

Cross-randomization of the two experimental arms makes it possible to directly compare the effect of default assignment to the effect of matching incentives. To our knowledge, this comparison has not been made in the existing literature, due to the difficulty of simultaneously observing the default effect and incentive effect in the same population. Figure 2 illustrates this comparison, 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% default than for those with a 0% default, and for both groups participation and contribution increases with financial incentives.

4.1 Impact on Savings and Expenditures

Both automatic enrollment and matching contributions cause employees to accumulate balance in their M-Pasandaz accounts, but what happens to these savings, and where do they come from? In addition to the administrative data on employee deposits and withdrawal, we conducted face-to-face and phone-based surveys with employees to develop a fuller picture of how the M-Pasandaz account affected employees' overall financial portfolios. Given the relatively short 6-month period of the study, and the high degree of measurement error that is typical of such self-reported data, it may be unreasonable to expect to see large shifts in expenditures, but we report the results here, as well as results from subjective interviews conducted after the study had terminated.

In general, we observe that employee self-reports confirm the large increase in contributions to M-Pasandaz observed in the administrative data, but we find no evidence of reductions in savings in other types of savings, or in several measures of consumption and expenditures. Table 2 shows the effect of default assignment and matching contributions on

employees' self-reported contributions to a variety of formal and informal financial instruments. These results estimate the monthly flow into each instrument, using employee fixed effects to isolate within-individual changes over time caused by random plan assignment. The results in Panel A of Table 2 are consistent with the earlier results from administrative data: Employees who were randomly induced to contribute to M-Pasandaz, through both the default contribution rate of 5% and through matching incentives, were significantly more likely to report increases in their M-Pasandaz contributions over time (Column 4 of Panel A). However, employees who were randomly induced to contribute more to M-Pasandaz do not appear to decrease contributions to bank accounts, cash savings, loans given, or M-Paisa savings (Panels B-E).

After the study period had concluded, we conducted follow-up surveys with each employee to understand demand for future participation. We find a strong demand from employees to continue using the M-Pasandaz account, with 45% of employees opting to continue automatic salary deductions even in the absence of matching contributions (Table A2). Rates of continued participation are higher for the employees who were exogenously induced to contribute more, both through a positive default-assigned contribution rate and through matching financial contributions.

This demand for continued use of the M-Pasandaz account is perhaps suprising, since absent M-Pasandaz, the employee's full salary would be deposited into a traditional Mobile Money (M-Paisa) account. In other words, an employee could "save" with M-Paisa simply by opting not to withdraw their full salary. Nonetheless, nearly half of all employees indicate they would prefer to have that decision made for them, through the automatic contribution feature of M-Pasandaz. As we discuss in section 5 below, we interpret this as a desire for committment from employees with sophisticated, time-inconsistent preferences. We also find suggestive evidence of habit formation, as employees self-report that participation in M-Pasandaz has changed their desire to save, with those employees randomly induced to larger contributions being more likely to report an increased desire to save (Table A2).

The survey data also provides insight into employee perceptions of the M-Pasandaz account. Here, we observe that employees perceived M-Pasandaz to be most similar to a savings account at a bank (Figure A2). Indeed, of the 349 employees who made contributions to their M-Pasandaz account, only about half (n=186) had made a withdrawal at the time of the endline survey, with the remainder opting to leave the accrued balance untouched. When asked about their plans for this money, the most common response (after "Don't know") was that employees planned to retain their M-Pasandaz balance as savings for the future (Figure A3).

5 Why Do Defaults Work?

The large and significant effect of the default rate assignment – approximately equivalent to a 50% employer match – is striking, but perhaps not surprising given existing evidence on automatic payroll deductions in wealthier nations. For instance, Madrian and Shea (2001) find that default enrollment increases retirement participation rates by more than fifty percentage points, and Choi et al. (2002, 2004) note that the vast majority of employees keep the contribution rate to which they are assigned. Default effects have also been observed in a wide variety of unrelated decisions, from health club memberships (DellaVigna and Malmendier 2006) to organ donation decisions (Johnson and Goldstein 2003; Abadie and Gay 2004).

Across such settings, there are several plausible mechanisms that might explain why default status can have such a profound impact on later behavior.[8] In the context of defined-contribution accounts in Afghanistan, at least four theoretically distinct explanations might explain the default effect. First, it maybe that employees stick to the initial contribution rate due to a lack of *awareness* or understanding: employees may be unaware of their participation or contribution rate, unaware that they are allowed to change their contribution rate, or

[8]See reviews by Madrian (2012) and Beshears et al. (2009) for a more thorough discussion of possible sources of the default effect.

uncertain about how to make such a change. Second, and closely related, is the issue of *salience*: employees may be aware of their assignment and may even want to switch, but may lack the focus or attention required to complete the task (Karlan et al., 2010; Mullainathan and Shafir, 2013). Third, and prominent in the U.S. literature, is the possibility of an *endorsement effect*: employees may perceive their initial assignment as a signal that the employer chose that rate because it was optimal for the employee, leading the employee to defer to the employer's wisdom and remain at the assigned rate (cf. Madrian and Shea, 2001). Fourth and finally, employees with time-inconsistent preferences may *procrastinate* over the decision 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 alternative possible sources of the default effect, we collected monthly panel survey data, conducted three additional experimental interventions, and played a series of behavioral games to elicit employees' time preferences. The sum total of evidence points squarely toward the latter explanation – dynamic inconsistency and the tendency to procrastinate – as the principal explanation of the default effect among the employees in our study. We describe this evidence first, then discuss evidence related to the remaining three explanations.

5.1 Dynamic Inconsistency and the Default Effect

To fix ideas, we model the problem using the approach in O'Donoghue and Rabin (1999). Consider first the case of exponential discounters. Assume they contribute some fixed amount every month, s, are assigned a match rate r, and can begin contributing in any month $t \in \{0, 1, 2, 3, 4, 5\}$ such that if they begin contributing in month t they receive a total payoff (combining the principal and the employer match) of $(6 - t)(1 + r)s$. Let c be the cost of participating in the program, which includes both the psychic cost of enrolling and the present value of interest from using s every month in an alternative investment. Assuming

linear utility, an exponential discounter will participate in month t if

$$\delta^{(6-t)}(6-t)(1+r)s > c \tag{1}$$

When the above condition is satisfied, the employee should opt to participate.[9] For instance, given a very modest monthly investment of 50 AFs, a monthly discount factor of 0.95, and a 25 percent employer match, then the cost of participation c must be greater than 275 AFs for an employee to not participate. Given that the enrollment protocol is straightforward, elaborately explained at training, and that very few participants have interest-bearing outside options, it is unlikely to be optimal for an exponential discounter to not participate.

Now consider a quasi-hyperbolic discounter with a present-bias parameter $\beta < 1$ who is potentially naive about future preferences such that her belief about the future present bias parameter is $\hat{\beta} \in [\beta, 1]$, where $\hat{\beta} = \beta$ reflects full sophistication and $\hat{\beta} = 1$ reflects full naivete.

At the start of the program ($t = 0$), it is optimal to invest immediately if the present value of doing so is greater than the present value in any future period:

$$\begin{aligned} -c + \beta\delta^6 6s(1+r) &\geq \beta\delta^t(-c + \hat{\beta}\delta^{6-t}(6-t)s(1+r)) \\ \Leftrightarrow -c(1+\beta\delta^t) &\geq \beta\delta^t(\hat{\beta}\delta^{6-t}(6-t)s(1+r)) - \beta\delta^6 6s(1+r) \end{aligned}$$

To simplify, if we assume that $\delta = 1$, then the maximum delay will be

$$t \approxeq \frac{\beta 6s(1+r)(\hat{\beta}-1) + (1+\beta)c}{\beta\hat{\beta}s(1+r)} \tag{2}$$

It is instructive to consider the case of full naivete ($\hat{\beta} = 1$), in which case the maximum

[9] This formulation abstracts from the fact that the present disutility of a payment s into the plan will vary depending on t. Extending the model to allow for this does not change the predictions of the model, but does improve the fit of the model to the data (at the cost of some expositional cleanliness). These results are available on request.

delay is

$$t \approxeq \frac{(1+\beta)c}{\beta s(1+r)}$$

A time-consistent employee should delay switching their contribution by $\frac{2c}{s(1+r)}$, which is less than 1 for many plausible values of c and s. A present-biased, sophisticated employee will delay longer. Thus, a basic prediction of this model is that time-inconsistent employees should be less likely to change their contributions from their randomly assigned default.

Taking this exercise a step further, we can use expression (2) to predict which employees will change from their default. For this, we use estimates of β experimentally elicited from employees (details of this elicitation are provided in section 5.2) and the randomly assigned match rates, and assume reasonable values of c and of $\hat{\beta}$. For instance, restricting ourselves to the 114 employees originally defaulted out who switched during the program, and assuming full naivete and $c = 200AFs$ (4 USD), we find that the correlation between the predicted month t for switching and the actual month is 0.24 ($p < 0.05$). If we instead assume full sophistication, the correlation falls to 0.09 and is no longer significant. This provides some indication that a model of naive present-bias is more appropriate to the employees in our study. We test this prediction in the following section, exploiting heterogeneity in employee behavior and through an experimental treatment designed to overcome the tendency to procrastinate.

5.2 Evidence on Time Inconsistency and the Default Effect

Empirically, among the employees in our study, those with time-inconsistent preferences ($\beta < 1$) are significantly less likely to change their contribution rates from their randomly-assigned default level. This effect, estimated in Table 3, is found using two different measures of dynamic inconsistency. The first measure of time inconsistency was elicited at baseline, roughly six months prior to the launch of the M-Pasandaz program, using a standard, two-

part hypothetical elicitation protocol.[10] Twelve months later, we collected a more thorough measure of time preferences in the endline survey. As opposed to the baseline protocol, the endline elicitation was incentivized, using a modified version of the protocol proposed by Andreoni et al. (2015) and described in Appendix B1.[11] In both cases, we find that time-inconsistent employees are between 6 and 7 percentage points less likely to move from their default-assigned contribution rate. These effects are robust to controlling for a broad range of other factors including employee salary, gender, intelligence, salary withdrawal habits, banked status, and total baseline savings (columns 2 and 4 of Table 3).

The effect of time inconsistency is manifest in both the set of employees who are "defaulted out" (i.e., randomly assigned an initial contribution rate of zero percent), and for those who are "defaulted in" at an initial contribution rate of five percent. In both cases, it is precisely those time-inconsisent employees who would benefit most from switching that fail to move from their default assignment. As can be seen in Table 4, time-inconsistent employees who receive the strongest (50% match) incentives but are defaulted out have contribution rates that are 1.8 percentage points lower than those of time-consistent employees with the same financial incentives (columns 1 and 2). Similarly, time-inconsistent employees who are defaulted in, but receive no financial incentives to contribute, have contribution rates that are .8 percentage points lower than their time-consistent colleagues (columns 3 and 4).[12]

[10]Subjects are asked: "Suppose someone was going to pay you USD 450 1 month from now. He/she offers to pay you a lower amount today. What amount today would make you just as happy as receiving USD 450 in 1 month?" and "Suppose someone was going to pay you USD 450 13 months from now. He/she offers to pay you a lower amount in 12 months time. What amount in 12 months would make you just as happy as receiving USD 450 in 13 months?" We identify someone as present-biased if the response to the first question is a lower amount than the response to the second question. According to this measure, 283 (30%) employees are considered to be time-inconsistent.

[11]According to this measure, 321(34%) employees are considered to be time inconsistent. We lack endline inconsistency measures for 175 employees, or 18.4% of our sample. Of these, 131 (13.8% of sample) did not complete an endline survey - primarily due to leaving Roshan before the end of the experiment. The remaining 44 employees (4.6% of sample) completed endline surveys but did not complete the inconsistency elicitation. By comparison, all employees in our sample completed a baseline survey but 53 employees (5.5% of sample) did not complete the baseline elicitation.

[12]Loss aversion may also be at play, particularly in the set of employees who are randomly assigned a positive default contribution rate (Tversky and Kahneman, 1991). However, the strong default effect that persists even among the employees who have a default contribution rate of zero suggests that loss aversion

5.3 Behind the Default: Experimental Evidence

In the first few weeks after the launch of the M-Pasandaz account, roughly one third of all employees called the Human Resources (HR) department to select a different contribution rate. However, by the end of the first month, the number of employees calling to switch had slowed significantly (see Figure 4), and in the last week of the second month, HR received just a single request. Thus, beginning in March 2015, after two pay cycles had elapsed and virtually all switching had ceased, we implemented a series of experimental interventions to further differentiate between possible sources of the default effect. Treatment assignment for these additional interventions was cross-randomized and stratified across the six primary experimental intervention combinations of default rate and matching contribution.

The first follow-up intervention was designed to help employees overcome the tendency to procrastinate in making a financial decision, by reducing the cost c in model (1). Specifically, we had a representative from HR call a random subset of employees to offer customized consultations to answer questions about the M-Pasandaz product, estimate their payouts under different contribution rates, and provide them to change their contribution rate immediately. An example consultation script is provided in Appendix B2. The second and third interventions were designed to increase the saliency of the monthly contribution rate, and reduce the likelihood that an employee would fail to switch due to a lack of awareness or understanding about the account or how to switch. The first such treatment was 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 to change contribution rates. These messages were sent in English, Dari, and Pashto, and came from an official Roshan phone number.[13] The final source of experimental variation was created through a series of monthly phone surveys, in which we asked employees questions

alone cannot explain our results.

[13] An example message reads, "M-Pasandaz Reminder: Next payday, 5% of your salary will be deposited in your M-Pasandaz account. If you want to change your contribution, call 079999-3708." See Appendix Figure A4.

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 the saliency of financial decisions (cf. Zwane et al., 2011). For this reason, the panel phone surveys were only conducted with half of all employees.

Of these three experimental interventions, the financial consultation was the only one that had a pronounced impact on employee behavior. The results of these experiments are tabulated in Table 5. Less than 1 percent of the employees randomly selected to receive phone surveys changed their contributions immediately afterwards. The SMS treatment also had a small effect, with 2.56% of the employees randomly selected to receive text message reminders changing their contributions immediately afterwards. By contrast, the consultation treatment resulted in a large number of switches, with 11.34% of those offered consultations choosing to change their contribution rates immediately afterwards.

We find further evidence linking the financial consultation to the tendency to procrastinate in the patterns of uptake of the consultation offer. Because the HR department was unable to provide consultations to all employees in a single week, we had an HR representative call all employees and randomly offer half of the employees a consultation on that same day, while the others were offered a consultation one week later. Table 6 shows the effects of these offers on the employees' decision to accept a consultation. As shown in column (1), employees offered consultations one week later were 6.5% more likely to accept a consultation, though the results are not significant at conventional levels. As columns (2)-(5) show, however, employees identified as time inconsistent using the endline incentivized elicitation were significantly more likely to accept later consultation offers - particularly if they had not already switched their default contribution and if they were originally assigned a default contribution of 5%. In other words, the consultation intervention, which was designed to help overcome the tendency to procrastinate, had the highest uptake among those who were

likely to procrastinate in accepting a consultation.[14]

5.4 Alternative explanations

Revisiting the possible alternative explanations for the default effect, we first reject the possibility that it is driven largely by confusion on the part of the employee about how M-Pasandaz works, how to switch rates, or by perceived transaction costs involved in switching. 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. Through our 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. In a May 2015 follow-up survey, 87% of employees reported fully understanding how the M-Pasandaz product worked, with more than 90% correctly identifying their plan assignment and over 70% correctly identifying that they could call HR to change their plan.

We also believe it unlikely that employer endorsement effects were important in determining employee response to the default assignment. The nature of the individual randomization, whereby each employee knew he or she had an equal chance to be given a 0% or 5% default contribution rate, largely eliminated the potential that employees would perceive that they were given a default rate for any reason other than random chance.[15] Qualitatively, employees who participated in focus groups also expressed surprise (and pleasure) at observing that plan assignments appeared to them to be truly random, and not distributed in a manner that favored more senior employees.

[14] 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. However, very few employees sought out an HR representative for such advice of their own accord. And as we discuss in section 5.4, it does not seem as though the consultation served chiefly to increase the salience of the account.

[15] We revisit the possibility that employees behave strategically in Section 5.5, but even then it seems more likely that employees would respond strategically to matching incentives, rather than to default contribution rates.

It is quite plausible that inattention might lead to large default effects, which was a primary motivation for developing the SMS treatment and for administering the phone survey to only half of the total population. However, as is evident in Table 5 and in the regression results shown in Table A4, neither intervention did much to induce employees to switch contribution rates. Similarly, after the first pay cycle completed, we observed little impact of payday effects on rate switches. Given that employees are very sensitive to their salary (which was usually a round number prior to M-Pasandaz contributions being deducted), and that the monthly payday SMS's reinforced any contributions that were being made to M-Pasandaz, we would expect employees to be more likely to switch near payday if they simply needed to be reminded of their current rate. The spike in switches following the first payday (see Figure 4) may indicate that inattention was a factor for the first few weeks after launch, but for the large number of people who remain at the default rate after the first payday, these basic reminders had little effect.

5.5 Internal validity and peer effects

To our knowledge, this study is the first to estimate the effect of default assignments in automatic payroll deduction within the context of a randomized experiment, where employees within a single firm are randomly assigned different default contribution rates and different financial incentives to contribute. This design offers some distinct advantages. It makes it possible to estimate the the elasticity of the default effect with respect to financial incentives, where financial incentives are also randomly assigned to employees. It also reduces the likelihood that employees will perceive an endorsement effect in their default-assigned rate, which is helpful in disentangling the mechanism behind the persistent default effect.

At the same time, within-firm randomization raises concerns about the external validity of the effects we observe. If employees know that their initial contribution rate and their employer-provided matching incentives were determined by pure chance, they could respond differently than they would have if they were all assigned a uniform plan. This could lead

us to overestimate the default effect for certain employees. For instance, an employee with no matching incentives and a default contribution rate of 0% may choose not to increase his contribution because he is aware that many of his coworkers are receiving a 50% match on contributions. If this employee would have changed his contribution rate in a world where everyone received the same 0% match, our estimates of the default effect would be inflated.[16] We address these concerns both qualitatively, and through a novel empirical approach that relies on our ability to observe the complete social network of all Roshan employees.

Qualitatively, we worked closely with Roshan HR on the messaging of the M-Pasandaz program and the framing of the 6-month evaluation period. 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.

In addition, we use a novel source of data on the social ties between employees at Roshan in order to empirically estimate peer effects in the M-Pasandaz program. We are specifically

[16]There is also the possibility that employees might behave strategically if they believe their actions might impact future policy decisions made by the firm. We believe such strategic behavior to be unlikely for several reasons. First, as noted in Section 4, the default effect persisted even after all employees were standardized onto a single plan, when employees were asked to decide about future contribution to M-Pasandaz. Second, the vast majority of Roshan employees are liquidity constrained and live paycheck-to-paycheck, and even in the relatively short 6-month window, an employee's contribution decisions had major economic consequences. The vast majority of Roshan employees are liquidity constrained and live paycheck-to-paycheck; it seems unlikely that such a large portion of employees would intentionally forgo salary (or matching incentives) to influence policy. This is particularly true given the relatively high rates of employee churn: roughly 10% of all employees left the company in the year between our baseline and endline surveys. Particularly given the evidence of present bias discussed earlier, it seems unlikely that a large fraction of employees would intentionally act against their own interests in order to potentially influence the long-run decisions of the employer. We raised this concern with the HR department at the outset of the study, and they considered it a highly implausible proposition.

interested in understanding whether a given employee's decision to contribute to M-Pasandaz is affected by the plans to which her friends and close colleagues are assigned, and whether such peer effects might impact the primary treatment effects of default assignment and matching incentives presented in Table 1.

To measure each employee's connections to other employees, we obtained the original transaction records of all phone calls placed between Roshan employees in October 2014, two months prior to the launch of the M-Pasandaz program. Roshan, the employer in our study, is also Afghanistan's largest mobile phone operator, and provides each Roshan employee with a special phone that allows for free calling to any other Roshan employee. We use these data to model the structure of the social network formed by Roshan employees (Appendix Figure A5), and consider a social tie to exist between two Roshan employees if we observe phone or SMS-based communication between the two employees in that month. We consider several different thresholds of minimum communication that might reasonably be indicative of a social tie.

We find little evidence that employees' financial decisions are influenced by the random assignments of their peers. To estimate these peer effects, we use an estimation framework similar to that of Miguel and Kremer (2004), where we estimate the primary treatment effect (of default assignment) on an individual i, conditional on the treatment assignment of i's peers. The intuition we are testing is that if peer effects exist, we would expect them to appear amongst employees who have an exogenously larger share of their social network assigned to a certain plan type. For instance, a "jealousy" effect might be manifest in lowered contributions among employees who have a larger share of their social network randomly assigned to the largest matching contribution incentive.

Column 1 of Table 7 shows the average treatment effect of i's default assignment, replicated from Table 1. The subsequent columns include controls for the random assignment of i's peers, where "peer" is defined as individuals with whom i had communicated over the mobile phone network on k different occassions, with k increasing from 1 to 10 in columns 2

through 11. Across all of these variants, the main treatment effect never significantly deviates from the original estimate from Table 1. The peer effects themselves are also generally insignificant, with no discernable pattern to the sign or magnitude of the coefficients.

6 Conclusion

We designed and evaluated a phone-based automatic contribution savings account in Afghanistan, a country with extremely low levels of formal financial inclusion. This simple innovation helped employees accumulate substantial savings, with the average participating employee saving 12,270 Afghanis, equal to 37.2% of the average monthly salary, over the initial 6-month evaluation period.

Our experimental design allows us to estimate the default effect of initial contribution rate assignment, and compare it to the effect of providing matching incentives on employee contributions. Both effects are large and significant: two months after the program launch, employees who are automatically enrolled with a 5% contribution rate into the account are 40 percentage points more likely to contribute to the account than individuals with a default contribution rate of zero. This effect of automatic enrollment on participation is approximately equivalent to providing 50% matching incentives.

Through additional experimental and non-experimental tests, we also help distinguish between several leading hypotheses proposed in the literature to explain why defaults are so effective. Our evidence suggests that among the numerous hypotheses, procrastination over the task of changing from the default contribution due to dynamic inconsistency plays a major role.

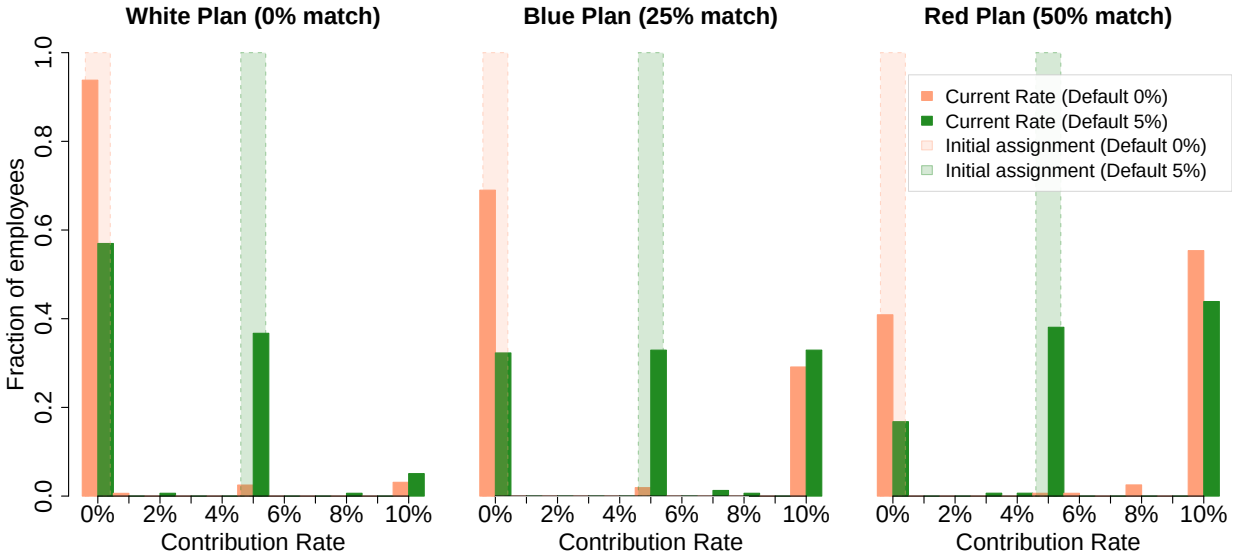
This paper thus makes a number of contributions. First, to our knowledge, this represents the first experimental evaluation of automatic savings contributions in a poor country. Second, this represents, so far as we know, the first adaption of automatic savings withdrawal to mobile salary payments. Third, we do not know of prior work that allows for

the effect of defaults to be directly compared with the effect of matching contributions in a cross-randomized design. Last, we perform a number of tests for why defaults work. So far as we know, this is the first paper to provide experimental evidence on why defaulting individuals into automatic saving withdrawal participation increases savings. As was widely suspected in prior literature, our evidence suggests that procrastination over the specific task of changing the default contribution plays a major role.

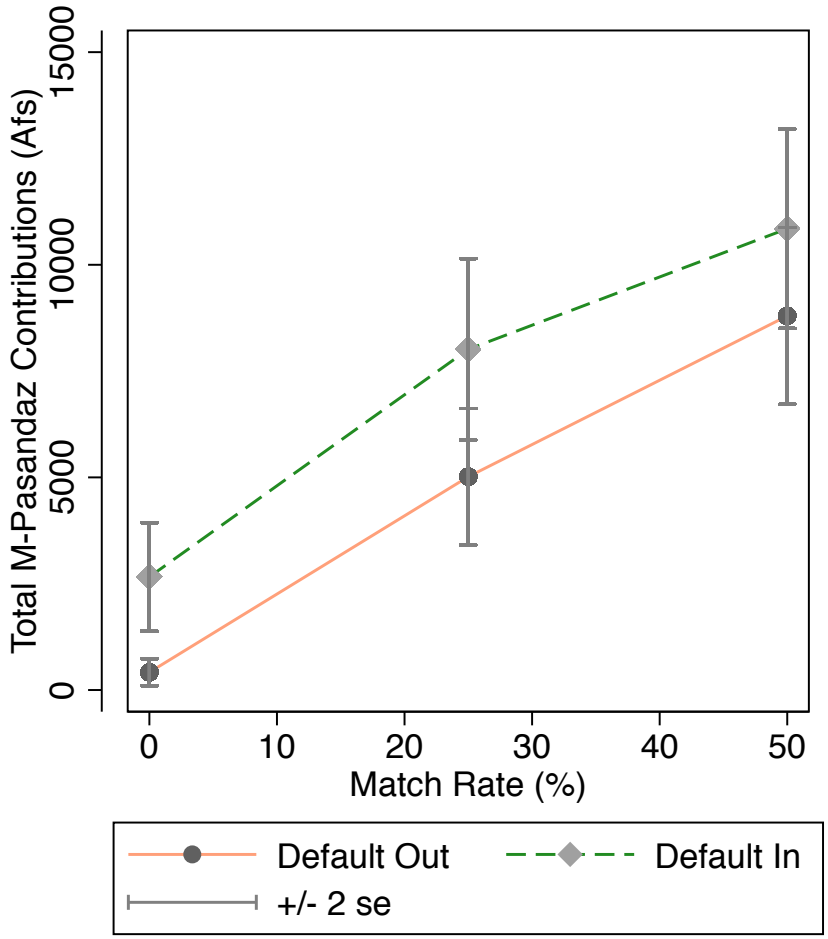
A growing literature has documented the importance of automatic payroll deductions in increasing savings in developed countries. Our experimental results suggest that this approach could have major implications for policymakers and other stakeholders seeking to promote financial inclusion in developing countries. Over the decade between 2001 and 2011, the share of the developing world's workforce in the middle class ($4-13/day) or above nearly doubled from 23% to 42% (ILO, 2013). As a consequence, the number of regular wage earners who might benefit from automatic payroll deductions in poor countries has been rapidly expanding. Our analysis suggest that policymakers interested in increasing formal savings among this emerging middle class could achieve scalable impacts through mandating minimum default contribution rates to savings accounts in the context of civil servant salaries or private pension plans.

Tables and Figures

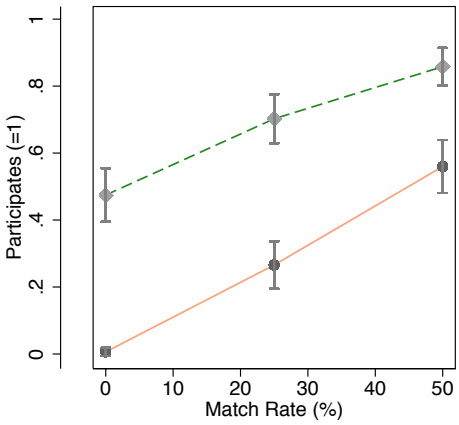
Figure 1: Employee contributions: Inital assignments and final contribution rates



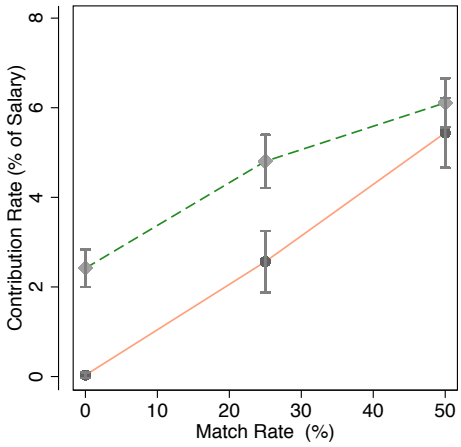
Notes: Distribution of final M-Pasandaz contribution levels in July 2015, as a percentage of monthly salary. Individuals were randomized into either a default 0% contribution (peach bars, N=478) or a default 5% contribution (green bars, N=471). Individuals were further randomized into three different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



(a) Total M-Pasandaz Contributions

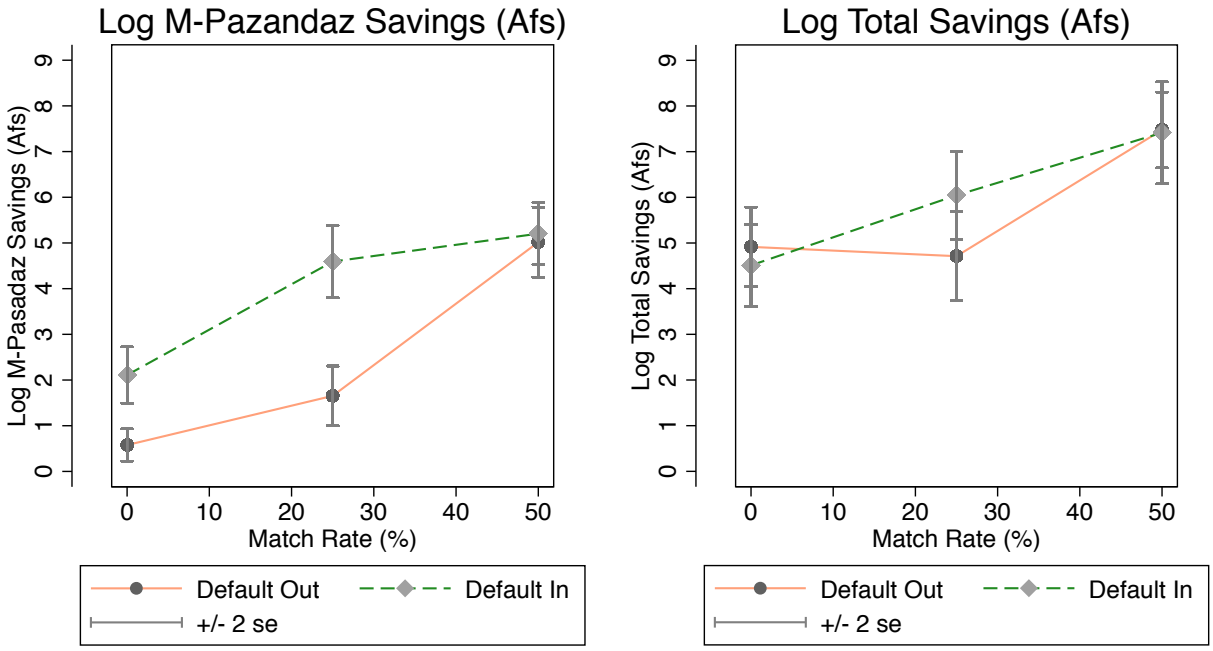


(b) Participation Rate



(c) Contribution Rate

Figure 2: Effect of automatic enrollment and matching contributions on (a) total contributions made to M-Pasandaz by the end of the 6-month study period; (b) 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 (c) contribution rates, as a fraction of the employee's total salary, measured on February 28, 2015.

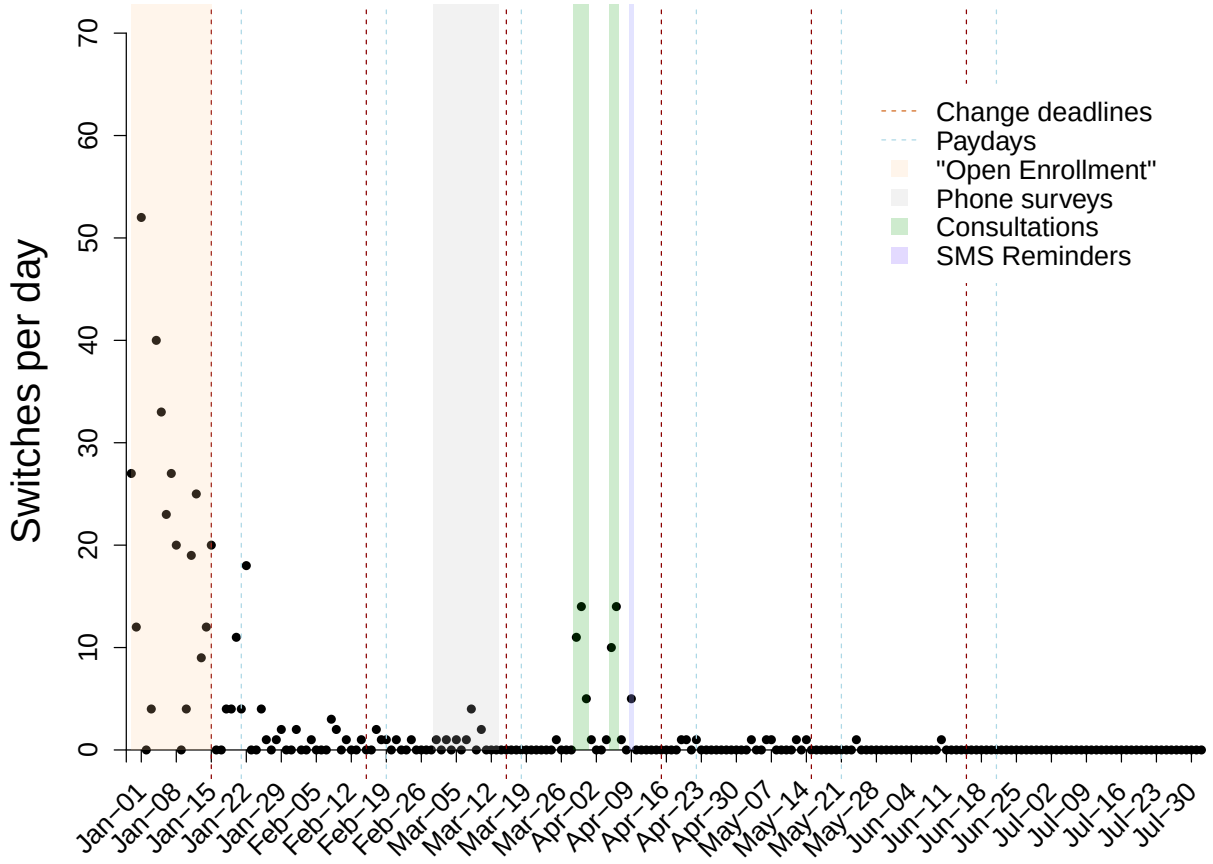


(a) Monthly Contributions (self-report data)

(b) Monthly Total Savings (self-report data)

Figure 3: Effect of automatic enrollment and matching contributions on savings, based on self-reported monthly survey data. Coefficients and standard errors estimated using panel fixed effects regression of (a) Log(M-Pasandaz savings) and (b) Log(Total Savings).

Figure 4: 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 pay cycle, and shaded regions denote experimental interventions.

Table 1: The Effect of Automatic Enrollment - Total Contributions

	(1)	(2)	(3)	(4)
Panel A. Dependent Variable = Total M-Pasandaz Contributions (Afs)				
Default In (=1)	2244.30***	2996.73**	2052.39	2426.40***
	(656.96)	(1335.00)	(1567.93)	(750.24)
Constant	416.75***	5015.57***	8797.03***	4724.44***
	(157.60)	(802.11)	(1040.07)	(465.52)
Panel B. Dependent Variable = Participates (non-zero contribution rate)				
Default In (=1)	0.47***	0.44***	0.30***	0.40***
	(0.04)	(0.05)	(0.05)	(0.03)
Constant	0.01	0.27***	0.56***	0.28***
	(0.01)	(0.04)	(0.04)	(0.02)
Panel C. Dependent Variable = Contribution rate (as % of salary)				
Default In (=1)	2.39***	2.24***	0.67	1.77***
	(0.21)	(0.45)	(0.48)	(0.26)
Constant	0.03	2.56***	5.44***	2.67***
	(0.03)	(0.34)	(0.39)	(0.20)
Sample	0% Match	25% Match	50% Match	Complete
# Observations	319	316	314	949

Notes: Dependent variable in top 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. Dependent variable in middle panel, Participates (=1), is a binary variable that equals one if the contribution rate is greater than zero, and dependent variable in bottom panel, Contribution Rate (% 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.*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Robust standard errors reported in parentheses.

Table 2: Impact of M-Pasandaz on Savings

	(1)	(2)	(3)	(4)
Panel A: Dependent Variable = M-Pasandaz Savings (Afs)				
Default In * Post	748.67***	2834.86***	-1073.78	797.35**
	(261.03)	(729.33)	(776.85)	(385.23)
Constant (Post=1)	123.05	1499.73***	5032.52***	2275.46***
	(158.35)	(480.85)	(966.63)	(400.21)
Panel B: Dependent Variable = Bank Savings (Afs)				
Default In * Post	2574.53	-351.34	-1217.99	321.21
	(3989.97)	(2340.59)	(2553.47)	(1775.75)
Constant (Post=1)	-3505.80	-2374.31	-550.38	-2140.38
	(3096.69)	(2265.58)	(1019.15)	(1333.20)
Panel C: Dependent Variable = Cash Savings (Afs)				
Default In * Post	-1258.67	1345.14	-2154.53	-722.04
	(1638.05)	(1640.08)	(1310.00)	(893.38)
Constant (Post=1)	-2713.75**	-2977.06***	-1365.29**	-2345.73***
	(1210.97)	(1060.42)	(672.52)	(584.13)
Panel D: Dependent Variable = Loans Given (Afs)				
Default In * Post	873.14	682.91	-471.57	351.98
	(1210.82)	(1339.89)	(902.14)	(668.59)
Constant (Post=1)	-1615.74**	-2166.29**	-746.15	-1494.64***
	(769.39)	(942.24)	(730.82)	(471.60)
Panel E: Dependent Variable = M-Paisa Savings (Afs)				
Default In * Post	734.60	3357.03**	-699.07	1078.32
	(1152.23)	(1323.82)	(1577.28)	(790.07)
Constant (Post=1)	-1590.53	-2382.03**	1463.69	-781.07
	(973.62)	(1018.41)	(1887.76)	(805.20)
Employee FE	YES	YES	YES	YES
Wave FE	YES	YES	YES	YES
Sample	0% Match	25% Match	50% Match	Complete

Notes: Dependent variables indicate monthly flow into accounts of different types (in Afghanis, or Afs). Each observation is a respondent-month. Sample includes baseline pre-treatment responses and 4 follow-up surveys. All regressions include employee fixed effects, survey wave fixed effects and a "Post" binary variable that equals one for all waves after the baseline. All variables are trimmed at 0.5%. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Robust standard errors, clustered at employee level, reported in parentheses.

Table 3: Dynamic Inconsistency and Contribution Changes

Dependent Variable:	Changed Contribution Rate (=1)			
	(1)	(2)	(3)	(4)
Time Inconsistent	-0.061*	-0.067**		
(Incentivized Endline Measure)	(0.034)	(0.034)		
Time Inconsistent			-0.071**	-0.064*
(Hypothetical Baseline Measure)			(0.034)	(0.034)
Constant	0.165***	0.242***	0.161***	0.208***
	(0.027)	(0.055)	(0.023)	(0.051)
Covariates	NO	YES	NO	YES
Mean in Time-Consistent Sample	0.433	0.435	0.431	0.430
# Observations	774	763	896	886
R-Squared	0.122	0.133	0.129	0.134

Notes: Dependent variable is a binary variable indicating whether an employee changed his or her contribution rate from the default assignment one or more times. Variables reflect contribution rate values observed as of February 28, 2015, following the first two paydays but prior to the rollout of secondary experimental interventions. Independent variables include two alternate measures of time inconsistency (e.g. $\beta < 1$). The "Incentivized Endline Measure" is an experimental elicitation of time inconsistency completed at endline with real stakes, and the 'Hypothetical Baseline Measure" is based on hypothetical survey responses at baseline (see paper text for details). Covariates include Employee Salary, Gender, Intelligence, Salary Withdrawal Habits, Banked Status, and Total Baseline Savings. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Robust standard errors reported in parentheses.

Table 4: Dynamic Inconsistency and Contribution Changes by Default Assignment

Dependent Variable:	Contribution Rate (% of Salary)			
	(1)	(2)	(3)	(4)
0% Match x Time Inconsistent (Incentivized)	-0.068	-0.248	0.819*	0.849*
	(0.068)	(0.166)	(0.485)	(0.503)
25% Match x Time Inconsistent (Incentivized)	0.701	0.595	-0.647	-0.692
	(0.776)	(0.761)	(0.659)	(0.660)
50% Match x Time Inconsistent (Incentivized)	-1.813*	-1.832**	0.114	0.153
	(0.923)	(0.928)	(0.608)	(0.608)
Match Rate = 0%	0.068	1.390**	2.200***	2.732***
	(0.068)	(0.571)	(0.289)	(0.534)
Match Rate = 25%	2.403***	3.802***	5.184***	5.727***
	(0.477)	(0.742)	(0.431)	(0.588)
Match Rate = 50%	6.185***	7.546***	5.957***	6.483***
	(0.528)	(0.737)	(0.405)	(0.558)
Default contribution rate	0%	0%	5%	5%
Covariates	NO	YES	NO	YES
# Observations	391	384	383	379
R-Squared	0.475	0.500	0.678	0.689

Notes: Dependent variable is the monthy contribution rate into M-Pasandaz as a percent of total salary, and an observation is an employee. All regressions do not include a constant term. Variables reflect contribution rate values observed as of February 28, 2015, following the first two paydays but prior to the rollout of phone surveys or secondary interventions. Time Inconsistent (Incentivized) is a binary variable that equals one if an employee is identified as time inconsistent using an experimental elicitation completed at endline with real stakes (see paper text for details). Covariates include Employee Salary, Gender, Intelligence, Salary Withdrawal Habits, Banked Status, and Total Baseline Savings. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Robust standard errors reported in parentheses.

Table 5: 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	327	949	34.46	0	32	68	76	80	71
Changed After 1st Payday	22	949	2.32	0	7	4	3	6	2
Changed By February 28th	389	949	40.99	1	42	89	86	90	81
Changed After Other Payday	2	949	0.21	0	1	0	0	0	1
Changed After Survey	3	470	0.64	0	0	0	1	2	0
Changed After SMS	6	234	2.56	0	0	2	2	2	0
Changed After Consultation	54	476	11.34	10	7	6	8	11	12
Changed More Than Once	14	949	1.48	2	2	5	2	3	0
Never Changed Contribution	489	949	51.53	150	109	63	57	51	59

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. Payday, Survey, SMS and Consultation switches are recorded if corresponding to the day of the intervention or the day immediately afterwards.

Table 6: Consultation Offer Results by Time Inconsistency

	Accepted Consultation (=1)				
	(1)	(2)	(3)	(4)	(5)
Consult Later (=1)	0.065	-0.004	-0.127	-0.078	-0.200
	(0.042)	(0.060)	(0.082)	(0.109)	(0.123)
Time Inconsistent (Incentivized) (=1)		-0.026	0.021	0.067	-0.060
		(0.068)	(0.081)	(0.116)	(0.110)
Time Inconsistent X Consult Later		0.168*	0.201*	0.128	0.341**
		(0.090)	(0.116)	(0.160)	(0.164)
Constant	0.700***	0.725***	0.750***	0.683***	0.852***
	(0.031)	(0.041)	(0.053)	(0.074)	(0.070)
Default Contribution	Both	Both	Both	0%	5%
Sample	Complete	Complete	Not Switched	Not Switched	Not Switched
# Observations	444	370	222	133	89
R-Squared	0.005	0.018	0.032	0.025	0.059

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. Time Inconsistent (Incentivized) (=1) is a binary variable that equals one if an employee is identified as time inconsistent using an experimental elicitation completed at endline with real stakes (see paper text for details). Not Switched is the sample of employees who had not changed their default contribution rates as of February 28, 2015, following the first two paydays but prior to the rollout of secondary interventions. From column (1) to column (2), the sample size falls by 74 observations; 52 did not complete the endline survey and 22 did not complete the incentized inconsistency elicitation. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Robust standard errors reported in parentheses.

Table 7: Peer Effects - Total M-Pasandaz Contributions (Afs)

	M-Paz Total Contribution at Endline										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Default In (=1)	2426.40***	2210.47***	2330.03***	2375.80***	2408.37***	2423.68***	2462.68***	2476.21***	2447.68***	2447.14***	2410.88***
	(750.24)	(761.11)	(763.93)	(742.59)	(746.15)	(748.88)	(751.48)	(753.39)	(749.38)	(748.91)	(749.25)
Degree Red		-290.50	-205.36	-357.33	-214.46	-187.85	268.34	647.42*	652.59	541.28	273.49
		(204.23)	(235.05)	(268.39)	(295.47)	(332.50)	(378.89)	(377.57)	(425.98)	(465.14)	(508.01)
Degree White		-123.72	-197.29	-323.42	-69.86	-93.39	95.50	204.21	296.45	292.45	229.76
		(209.74)	(254.26)	(285.94)	(305.71)	(357.61)	(419.49)	(425.43)	(448.85)	(473.17)	(523.62)
Degree Default In		135.64	210.01	233.66	118.54	280.76	266.88	493.02	412.32	473.59	489.54
		(154.46)	(197.06)	(242.55)	(275.56)	(307.96)	(340.91)	(359.03)	(387.10)	(403.96)	(415.54)
Degree Total		143.55	145.39	234.30	150.57	98.54	-95.39	-375.61	-354.13	-392.28	-292.81
		(138.44)	(179.12)	(218.15)	(231.91)	(255.61)	(296.74)	(289.01)	(317.94)	(341.70)	(367.55)
Constant	4724.44***	3026.58***	3057.41***	3458.18***	3812.13***	3800.65***	3868.02***	4002.85***	4057.53***	4305.63***	4400.56***
	(465.52)	(618.95)	(639.13)	(640.59)	(661.14)	(654.70)	(676.11)	(676.53)	(662.89)	(688.13)	(666.95)
Degree Cutoff	N/A	1	2	3	4	5	6	7	8	9	10
P-Value of Equality		0.76	0.89	0.94	0.98	1.00	0.96	0.94	0.98	0.98	0.98
Mean Degree Total		23.75	14.60	10.30	8.01	6.40	5.31	4.53	3.90	3.37	2.92
# Observations	949	949	949	949	949	949	949	949	949	949	949
R-Squared	0.011	0.025	0.022	0.019	0.015	0.015	0.015	0.017	0.016	0.014	0.013

Notes: Dependent variable 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. Column 1 replicates results from Table 1. Remaining columns control for the number of social network contacts the employee has which were randomly assigned to each plan type. For instance, "Degree Red" indicates the number of social contacts the employee has who were randomly assigned to the Red plan (50% matching incentives). A social contact is defined as an coworker of the employee with whom the employee was observed to communicate k or more times over the mobile phone network in October 2015 (two months prior to the study period), where k is the "Degree Cutoff" and varies from 1 to 10. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Robust standard errors reported in parentheses.

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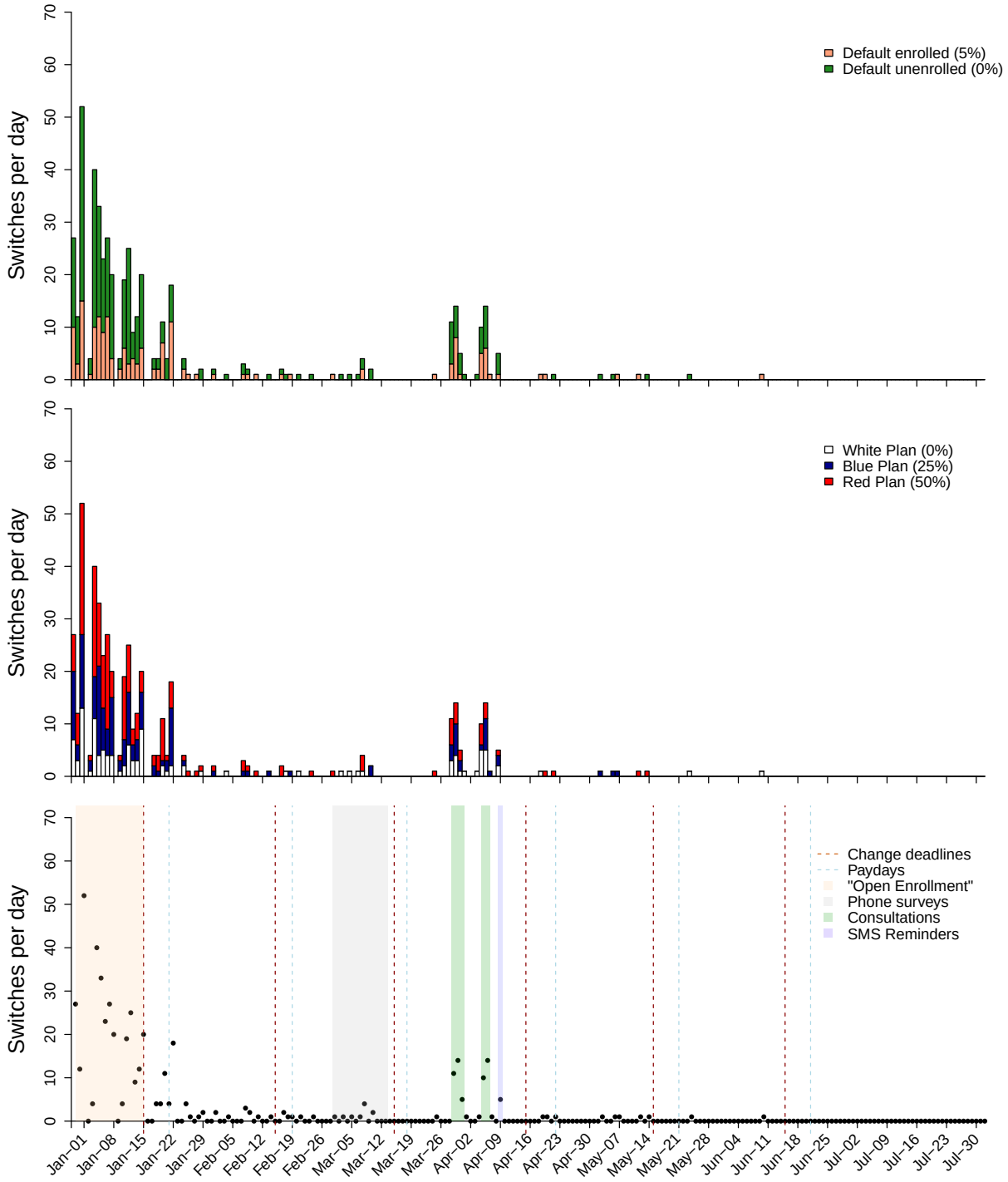
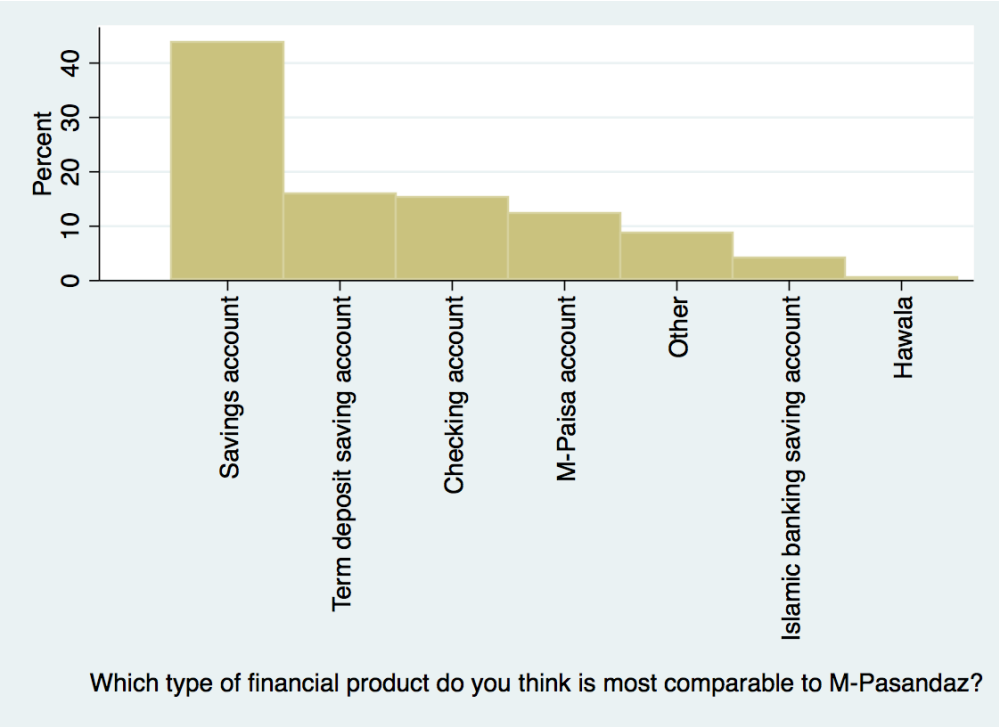
Appendix A

Figure A1: Switching behavior over time



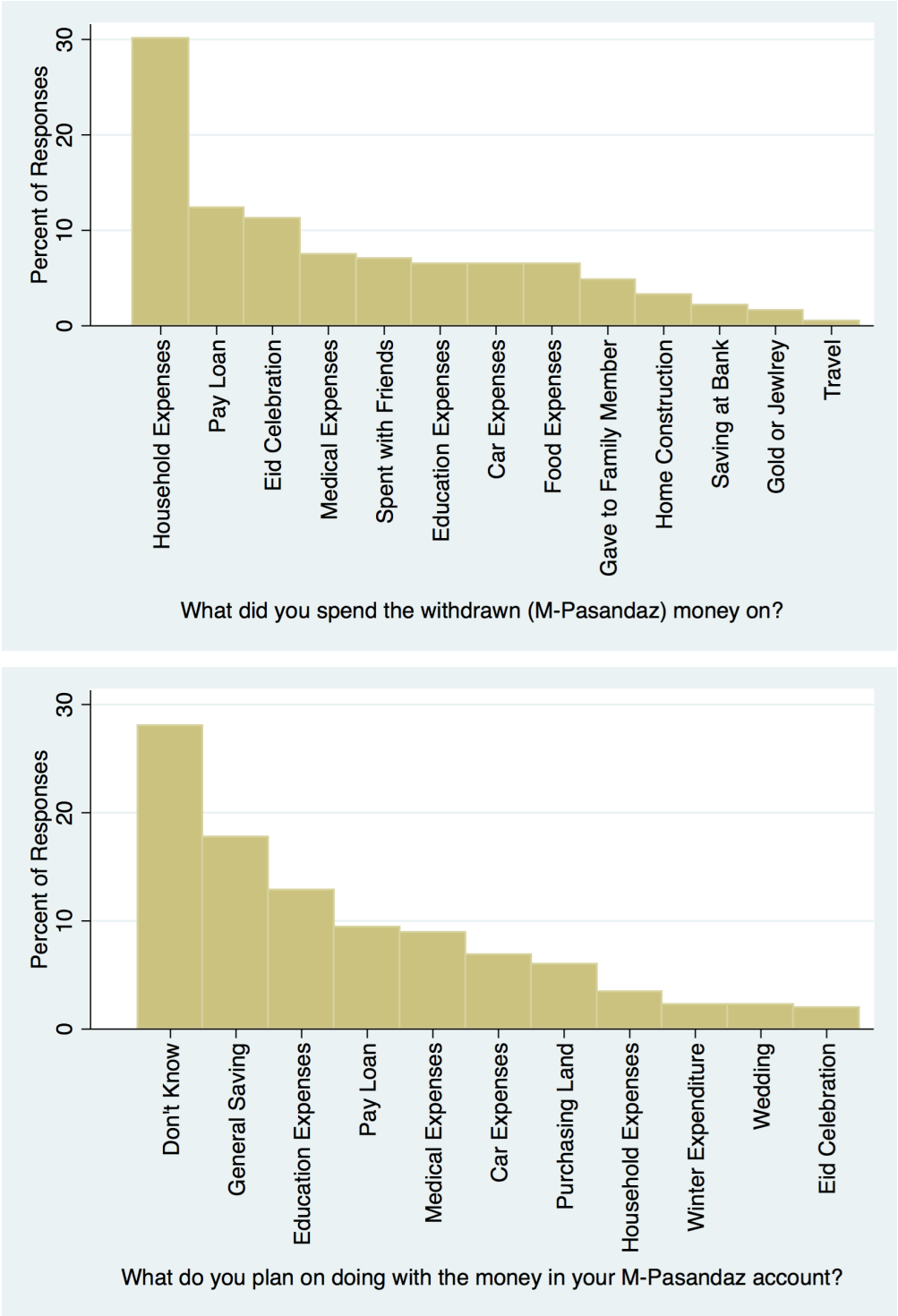
Notes: Dots indicate the number of individuals calling in, on a given day, to change their contribution rate. Top figure shows number of switches by default enrollment status; middle figure shows switches by plan assignment; bottom figure shows these switches in the context of the treatments that were administered to random subsets of the population over the course of the study.

Figure A2: Employee perceptions of M-Pasandaz



Notes: Responses collected in the endline survey, after the termination of the study period. Bars indicate the percent of employees who chose each option. Employees could only choose one option.

Figure A3: Employee uses and plans for M-Pasandaz savings



Notes: Responses collected in the endline survey, after the termination of the study period. Employees could give multiple responses to each question. Bars indicate the fraction of employees who answered in the affirmative to each expenditure category.

Figure A4: M-Pasandaz reminder message

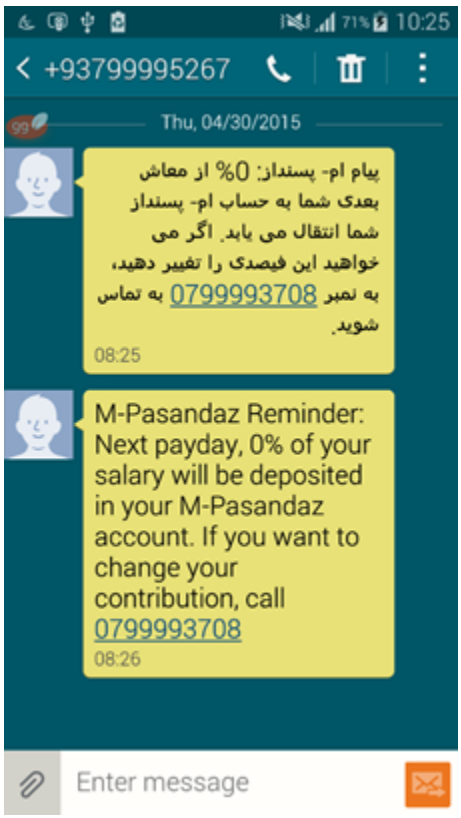
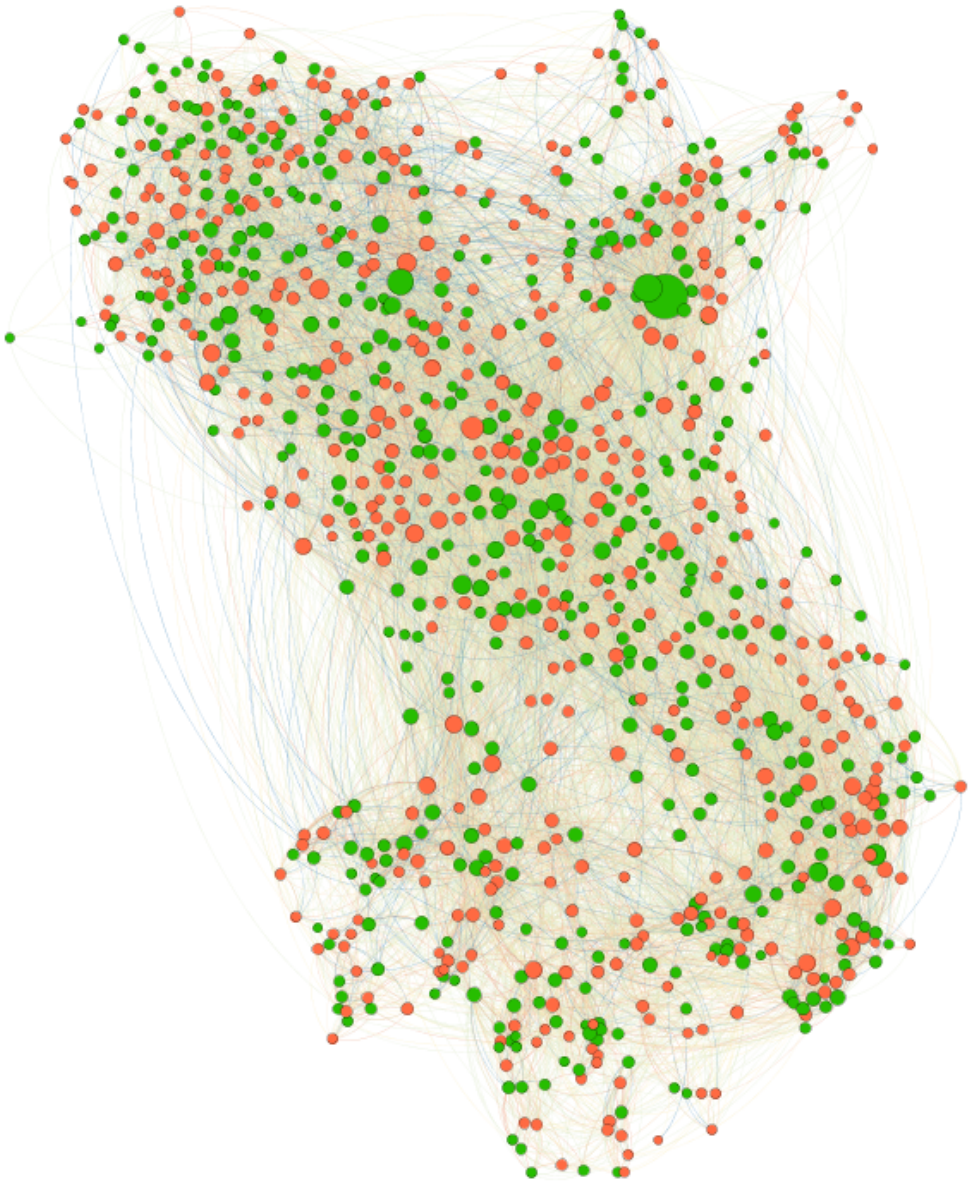


Figure A5: Roshan employee social network



Notes: Each dot represents an employee. Red dots indicate employees who were assigned a contribution rate of 5%; green dots indicate employees assigned a default contribution rate of 0%. Dots are sized proportional to the degree centrality of the employee (i.e., the number of unique contacts in the employee's network). Edges indicate the presence of one or more phone calls between a pair of employees; edge color is shaded by the number of calls, ranging from one call (blue) to many calls (red). The layout of the graph is determined by an algorithm that places connected nodes close to each other on the 2-dimensional plane (Jacomy et al., 2014).

Table A1: Summary Statistics

		Default Out			Default In			
	All	0% Match	25% Match	50% Match	0% Match	25% Match	50% Match	P-Value of F-Test
Gender (Male = 1)	0.85	0.85	0.87	0.85	0.84	0.81	0.88	0.59
	(0.36)	(0.36)	(0.33)	(0.36)	(0.37)	(0.39)	(0.33)	
Head of Household (=1)	0.52	0.43	0.56	0.58	0.51	0.52	0.54	0.11
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	
Married (=1)	0.64	0.66	0.64	0.62	0.66	0.64	0.65	0.98
	(0.48)	(0.47)	(0.48)	(0.49)	(0.48)	(0.48)	(0.48)	
Age (Years)	30.82	30.30	30.87	31.30	30.87	29.98	31.61	0.60
	(9.27)	(7.51)	(9.76)	(10.48)	(9.31)	(7.63)	(10.54)	
Hazara (=1)	0.46	0.42	0.43	0.44	0.49	0.50	0.48	0.73
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	
Monthly Salary (1000 Afs)	32.43	30.41	31.20	33.86	34.39	31.72	33.04	0.84
	(30.79)	(25.01)	(24.12)	(38.68)	(34.84)	(26.25)	(33.27)	
Monthly Savings (1000 Afs)	21.09	13.05	45.47	12.01	17.10	12.47	26.79	0.33
	(127.55)	(28.84)	(256.84)	(26.39)	(35.96)	(25.34)	(168.68)	
Has Bank Account (=1)	0.41	0.42	0.39	0.38	0.41	0.44	0.40	0.88
	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.50)	(0.49)	
Delayed a Bill Payment (=1)	0.41	0.43	0.36	0.47	0.41	0.37	0.42	0.40
	(0.49)	(0.50)	(0.48)	(0.50)	(0.49)	(0.48)	(0.50)	
Withdraws Entire Salary (=1)	0.41	0.37	0.42	0.42	0.41	0.44	0.40	0.82
	(0.49)	(0.48)	(0.49)	(0.50)	(0.49)	(0.50)	(0.49)	
Interested in M-Pasandaz (=1)	0.85	0.85	0.87	0.84	0.83	0.89	0.84	0.63
	(0.35)	(0.36)	(0.33)	(0.37)	(0.38)	(0.31)	(0.37)	
Expects Violence (=1)	0.57	0.56	0.57	0.56	0.57	0.56	0.58	1.00
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.49)	
Experienced Violence (=1)	0.57	0.63	0.56	0.61	0.52	0.53	0.56	0.28
	(0.50)	(0.49)	(0.50)	(0.49)	(0.50)	(0.50)	(0.50)	
Observations	949	161	158	159	158	158	155	

Notes: Standard deviations reported in parentheses.

Table A2: Employee perceptions of M-Pasandaz at endline

Question Text	% Responding Yes					
Do you want to continue to contribute to your M-Pasandaz account (after incentives are removed)?*	45.26	40.24	50.37	41.18	42.60	52.27
Has your participation in M-Pasandaz changed your desire to save?	58.62	54.18	63.14	51.34	59.85	64.73
Was the reduction in your monthly paycheck caused by your contributions to M-Pasandaz noticeable?	52.62	58.65	48.82	43.64	54.76	53.99
Employee subset: Default contribution rate	(All)	0%	5%	(All)	(All)	(All)
Employee subset: Matching incentives	(All)	(All)	(All)	0%	25%	50%

Notes: * Full text of question reads, "*Roshan leadership is reviewing the results of the M-Pasandaz pilot program, and will be making a decision in the next few months about its future. In the meantime, we would like to offer you the opportunity to continue to have a portion of your salary deposited automatically in the M-Pasandaz account each month. For deposits made starting in August there will be no matching incentive paid, but you are welcome to continue to have part of your salary deducted and placed in savings if you find this useful. For these deposits, you will be free to make withdrawals at any time without penalty. Would you enroll now to have part of your salary deposited each month starting in August?*

Table A3: Self-reported Reasons for Switching Contribution Rates

				Default Out			Default In		
	N	Total	%	0%	25%	50%	0%	25%	50%
Panel A: Reasons for increasing contribution rate									
Increased - Savings Important	189	285	66.32	7	32	59	9	36	46
Increased - Wanted Incentives	107	285	37.54	0	15	46	0	18	28
Increased - Support Roshan	10	285	3.51	1	1	1	1	3	3
Increased - Demand Commitment	8	285	2.81	0	3	3	0	2	0
Increased - Thought Automatic	5	285	1.75	0	3	2	0	0	0
Panel B: Reasons for decreasing contribution rate									
Decreased - Salary Too Low	52	170	30.59	0	0	0	22	17	13
Decreased - Incentives Too Low	49	170	28.82	0	0	0	48	0	1
Decreased - Expenses Too High	35	170	20.59	0	0	0	10	19	6
Decreased - Un-Islamic Product	24	170	14.12	0	0	0	5	10	9
Decreased - Better Options	4	170	2.35	0	0	0	3	1	0

Notes: Total in column 2 reports number of participants that either decreased their contribution rate (rows 1-5) or increased their contribution rate (rows 6-10). Reasons were not mutually exclusive and respondents were asked to report all relevant reasons for changing their contribution. "Decreased - Salary Too Low" indicates that respondents felt their salary was not sufficiently large to allow for savings. "Decreased - Incentives Too Low" indicates that respondents felt the incentives were not sufficiently high for savings. "Decreased - Expenses Too High" indicates that respondents felt their other expenses were too high for savings. "Decreased - Un-Islamic Product" indicates that respondents felt the M-Pasandaz product did not conform with Islamic practices. "Decreased - Better Options" indicates that respondents reported having better alternative savings options available. "Increased - Savings Important" indicates that respondents said savings was an important goal for them. "Increased - Wanted Incentives" indicates that respondents mentioned the incentives as important to their decision. "Increased - Support Roshan" indicates that respondents mentioned wanting to support Roshan's development of a new product. "Increased - Demand Commitment" indicates that respondents mentioned needing commitment devices to help save. "Increased - Thought Automatic" indicates that respondents mentioned thinking they were automatically enrolled in the program when they were not.

Table A4: "Top of the Mind" Treatments

Dependent Variable:	Changed After Phone Survey (=1)			Changed After SMS Reminder (=1)		
	(1)	(2)	(3)	(4)	(5)	(6)
Phone Survey (=1)	0.006*	-0.000	0.006			
	(0.004)	(0.000)	(0.006)			
Default * Phone Survey		0.013*				
		(0.007)				
25% Match * Phone Survey			0.007			
			(0.011)			
50% Match * Phone Survey			-0.006			
			(0.006)			
SMS Reminder (=1)				0.026**	0.017	0.026
				(0.010)	(0.012)	(0.018)
Default * SMS Reminder					0.018	
					(0.021)	
25% Match * SMS Reminder						-0.001
						(0.025)
50% Match * SMS Reminder						-0.000
						(0.026)
Default In (=1)		-0.000			-0.000	
		(0.000)			(0.000)	
Match Rate = 25%			0.000			-0.000
			(0.000)			(0.000)
Match Rate = 50%			0.000			-0.000
			(0.000)			(0.000)
# Observations	949	949	949	473	473	473
R-Squared	0.003	0.010	0.008	0.013	0.016	0.013

Notes: Changed After Phone Survey equals one if an employee changed their contribution rate either on the day they received a phone survey or the day immediately following. Changed After SMS Reminder is a binary variable that equals one if an employee changed their contribution rate either on the day they received a sms reminder or the day immediately following. Phone Survey is a binary variable if the employee was randomly assigned to receive a phone survey. SMS Reminder is a binary variable if the employee was randomly assigned to receive an sms reminder. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Robust standard errors reported in parentheses.

Online Appendix B - Experimental Scripts

B1 Present Bias Elicitation

TODAY and 4 WEEKS from today				
For each decision number (1 to 5) below, decide the AMOUNTS you would like for sure today AND in 4 weeks by checking the corresponding box. *Example: In Decision 1, if you wanted AFN 250 today and AFN 0 in four weeks you would check the left-most box. Remember to check only one box per decision!*				
1. Would you like to receive	Payment TODAY *and* payment in 4 WEEKS	AFN 250 AFN 0 ☐	AFN 125 AFN 125 ☐	AFN 0 AFN 250 ☐
2. Would you like to receive	Payment TODAY *and* payment in 4 WEEKS	AFN 225 AFN 0 ☐	AFN 113 AFN 125 ☐	AFN 0 AFN 250 ☐
3. Would you like to receive	Payment TODAY *and* payment in 4 WEEKS	AFN 200 AFN 0 ☐	AFN 100 AFN 125 ☐	AFN 0 AFN 250 ☐
4. Would you like to receive	Payment TODAY *and* payment in 4 WEEKS	AFN 175 AFN 0 ☐	AFN 88 AFN 125 ☐	AFN 0 AFN 250 ☐
5. Would you like to receive	Payment TODAY *and* payment in 4 WEEKS	AFN 150 AFN 0 ☐	AFN 75 AFN 125 ☐	AFN 0 AFN 250 ☐

4 WEEKS *and* 8 WEEKS from today

For each decision number (6 to 10) below, decide the **AMOUNTS** you would like for sure **in 4 weeks AND in 8 weeks** by checking the corresponding box.

Example: In Decision 6, if you wanted AFN 250 in four weeks and AFN 0 in eight weeks you would check the left-most box. Remember to check only one box per decision!

6. Would you like to receive	payment in 4 WEEKS… *and* payment in 8 WEEKS	AFN 250 AFN 0 ☐	AFN 125 AFN 125 ☐	AFN 0 AFN 250 ☐
7. Would you like to receive	payment in 4 WEEKS… *and* payment in 8 WEEKS	AFN 225 AFN 0 ☐	AFN 113 AFN 125 ☐	AFN 0 AFN 250 ☐
8. Would you like to receive	payment in 4 WEEKS… *and* payment in 8 WEEKS	AFN 200 AFN 0 ☐	AFN 100 AFN 125 ☐	AFN 0 AFN 250 ☐
9. Would you like to receive	payment in 4 WEEKS… *and* payment in 8 WEEKS	AFN 175 AFN 0 ☐	AFN 88 AFN 125 ☐	AFN 0 AFN 250 ☐
10. Would you like to receive	payment in 4 WEEKS… *and* payment in 8 WEEKS	AFN 150 AFN 0 ☐	AFN 75 AFN 125 ☐	AFN 0 AFN 250 ☐

B2 Financial Consultation

Hello XXX. I am calling on behalf of the M-Pasandaz research team department. I am calling because you recently requested that a representative call you to provide you with additional information about M-Pasandaz, and determine how to use M-Pasandaz in the way that is best for you. This consultation will last roughly 5-10 minutes. Are you able to speak to me now? [RECORD RESPONSE]

Thank you for taking the time to speak with me. As you know, M-Pasandaz is a new benefit that is being offered to Roshan employees. In this call, you will have the opportunity to ask questions about M-Pasandaz. I will provide information about how much savings you would have for different levels of monthly contribution. At the end of the call, you will also have the opportunity to change the level of your contribution if you would like.

First of all, would you like me to give you a brief overview of the M-Pasandaz account? [YES/NO]

If YES: M-Pasandaz is a new benefit for all Roshan employees that was designed to help increase your savings. It is a mobile savings account that is linked to your M-Paisa account. A portion of your monthly salary - up to a maximum of 10% - can be automatically deposited into your M-Pasandaz account each month. Participating in the M-Pasandaz account is voluntary and you may receive benefits from Roshan to encourage you to save for the future. You can access the money in your M-Pasandaz account at any time, but if you contribute and dont make any withdrawals for 6 months, you may be eligible for a bonus from Roshan as a reward for savings.

To begin, we would like to ask if there are any questions we might answer about M-Pasandaz. [YES/NO]

Now, since every person has a different situation, I would like to explain several different scenarios, to help you understand how different levels of M-Pasandaz contributions would work for you. According to our records, you are in the [WHITE/BLUE/RED] plan, and you currently have a monthly contribution rate of [XX%]. Were you aware that this was your

plan and contribution rate? [YES/NO]

According to our records, you have a monthly salary of XXX. Since you are in the [WHITE/BLUE/RED] plan, you are eligible to receive a matching contribution Roshan of [0/25/50] percent for all money that you save in your M-Pasandaz account. Our records also show that you [HAVE/HAVE NOT] made a withdrawal from your M-Pasandaz account, meaning that you [ARE NOT/ARE] still eligible to receive your matching contribution. Therefore, if you continue to contribute at your current rate and make no withdrawals, at the end of the trial period in July, you would have a total value of MMM in your M-Pasandaz account. This reflects both your contribution and the contribution of Roshan to the account on your behalf. Would you like me to repeat this information for you? [YES/NO]

Thank you. Of course, you are always free to change your monthly contribution rate. If you like, I can explain to you exactly what would happen if you decided to change your match to a different amount. Would you like me assist you by explaining what would happen if you changed your contribution rate to a different amount? [YES/NO]

If YES: What scenario would you like me to explain? The contribution rate can be anywhere between 0% and 10% of your monthly salary. [RECORD ANSWER]

Do you have any additional questions about how M-Pasandaz works, or can I provide any additional information that can help you determine how to use M-Pasandaz in the way that is best for you? [YES/NO]

Thank you. Now, I would like to offer you the opportunity to change your contribution rate. If you wish, you can tell me your preferred rate, and I will change it for you. Alternatively, you always have the opportunity to call HR at a later date and change the contribution. Would you like me to change your contribution rate? [YES/NO]

If YES: What would you like your new rate to be: [RECORD RESPONSE]

Thank you very much for your time. Goodbye.

Online Appendix C - Additional Robustness Tables

Table C1: The Effect of Automatic Enrollment - July 15 Values

Panel A: The effect on participation				
Dependent Variable:	Participates (=1)			
	(1)	(2)	(3)	(4)
Default In (=1)	0.37***	0.37***	0.24***	0.33***
	(0.04)	(0.05)	(0.05)	(0.03)
Constant	0.06***	0.31***	0.59***	0.32***
	(0.02)	(0.04)	(0.04)	(0.02)
Sample	0% Match	25% Match	50% Match	Complete
R-Squared	0.184	0.135	0.071	0.106
# Observations	319	316	314	949
Panel B: The effect on contribution rate				
Dependent Variable:	Contribution (% of Salary)			
	(5)	(6)	(7)	(8)
Default In (=1)	1.96***	2.07***	0.53	1.52***
	(0.28)	(0.49)	(0.49)	(0.28)
Constant	0.44***	3.01***	5.81***	3.07***
	(0.15)	(0.36)	(0.39)	(0.21)
Sample	0% Match	25% Match	50% Match	Complete
R-Squared	0.135	0.055	0.004	0.031
# Observations	319	316	314	949

Notes: Participates (=1) is a binary variable that equals one if the contribution rate is greater than zero, Contribution (% of Salary) is the monthy contribution rate into M-Pasandaz as a percent of total salary, and an observation is an employee. Variables reflect contribution rate values observed as of July 15, 2015, just prior to the disbursement of matching incentives. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Robust standard errors reported in parentheses.

Table C2: The Effect of Matching Incentives - Participation and Contribution Rates

Dependent Variable:	Participates (=1)			Contribution Rate (% of Salary)		
	(1)	(2)	(3)	(4)	(5)	(6)
Match Rate = 25%	0.26***	0.23***	0.25***	2.53***	2.39***	2.47***
	(0.04)	(0.05)	(0.04)	(0.35)	(0.36)	(0.27)
Match Rate = 50%	0.55***	0.38***	0.47***	5.41***	3.69***	4.56***
	(0.04)	(0.05)	(0.04)	(0.39)	(0.34)	(0.27)
Constant	0.01	0.47***	0.24***	0.03	2.42***	1.21***
	(0.01)	(0.04)	(0.02)	(0.03)	(0.21)	(0.12)
Sample	Default Out	Default In	Complete	Default Out	Default In	Complete
# Observations	478	471	949	478	471	949
R-Squared	0.257	0.113	0.147	0.258	0.179	0.206

Notes: Participates (=1) is a binary variable that equals one if the contribution rate is greater than zero, Contribution Rate (% of Salary) is the monthy contribution rate into M-Pasandaz as a percent of total salary, and an observation is an employee. Variables reflect contribution rate values observed as of February 28, 2015, following the first two paydays but prior to the rollout of phone surveys or secondary interventions. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Robust standard errors reported in parentheses.