Price and Control Elasticities of Demand for Savings*

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ABSTRACT

Assumptions about individual demand for savings underlie workhorse models of intertemporal choice and intra-household bargaining, banking strategy, and financial inclusion policy. A Philippine bank tested sensitivity to interest rates and account ownership requirements in 10,000 randomized door-to-door solicitations for a commitment savings account. Take-up is substantial (23%), but price elasticity of saving in this account is not significantly different from zero in either the full sample or sub-groups of plausibly marginal savers. The upper bound is less than 0.5 in the full sample, and exceeds 1.0 in only 1 of 22 sub-groups. Nor do we find sensitivity to ownership requirements.

Keywords: savings elasticities, elasticity of intertemporal substitution, microsavings, microfinance

JEL Codes: D12, D91, E21, G21, O12

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Assumptions about the individual demand for saving underlie workhorse models in intertemporal choice and intrahousehold bargaining. They also underlie policy design on asset-building, capital mobilization, and financial security around the world. For financial institution strategy, savings instrument pricing and product design are critical for maximizing profits and managing liquidity and risks.[1]

One key intersection of modeling, public policy, and business practice is efforts to expand access to formal savings products in developing countries. Several recent randomized evaluations estimate the effects of newly introduced savings accounts, often highly subsidized, by comparing those offered access to an untreated control group (Brune, Lasse et al. 2013; Dupas and Robinson 2013a; Dupas and Robinson 2013b; Prina 2012; Schaner 2013). These studies mostly find large impacts on savings and downstream outcomes like household expenditures and income. Given these impacts, it is important to examine whether unsubsidized optimization of savings account pricing and/or product features is an effective strategy for expanding usage of formal savings devices. The answer may be yes if households have elastic demand with respect to the relevant margins. Yet there is relatively little empirical evidence on how demand responds to market-driven variation in savings account yields and features.

We present evidence from a field experiment where First Valley Bank in the Philippines, a for-profit institution, made over 10,000 door-to-door savings commitment savings account offers, with randomized pricing and individual/joint ownership options, in rural and peri-urban Philippines. 23% of individuals took-up an offer. The sample frame, although not explicitly randomly sampled from a census, is effectively a representative sample of rural and peri-urban households, and includes both middle class and poor neighborhoods. We estimate the price sensitivity of demand for saving in this account using the bank's randomization, at the individual offer level, of potential clients into one of three price conditions: (1) the Bank's "normal" rate (e.g., 1.5% APY on balances up to $200 over 3-11 months), (2) a "high" rate that the Bank was considering offering, that was 1.5% APY above its normal rate, (3) the high rate, but only conditional on the client meeting her self-set goal amount (ranging from $40 to $2,000), within

[1] For small balance accounts, fixed costs of servicing accounts are often considered first-order cost drivers, yet interest rate elasticities may matter as well, particularly for an analysis of costs for mobilizing savings (see Maisch, Tarazona, and Westley 2006).

her self-set time period (ranging from 1 to 24 months). These prices are unsubsidized and within the range offered in the market.

The economics of banking literature in the United States has examined this question, using market variation to estimate conditional correlations between deposit market share and yields paid at the bank level (Adams, Brevoort, and Kiser 2007; Dick 2008). These studies find elastic demand but rely on yield variation that is likely correlated with unobserved determinants of market share. Another closely related literature uses randomized variation in government or otherwise-subsidized policies, with much larger but heavily subsidized yield ranges.[2] These studies are helpful for assessing government policies, but the magnitude of their identifying price variation is far outside the range of most financial institutions' choice sets.

Our setup uses unsubsidized and marginal variation in prices (and account features) to estimate demand sensitivities. Other strengths/novelties of our setup include clean identification of a price (i.e., a substitution) effect that is not confounded by potential income or wealth effects (since the interest rate differential is too small to generate an income effect in one treatment arm, and both too small and paid out too late in the other treatment arm). Furthermore, door-to-door marketing provides for a fairly representative sample frame; thus we include those who already have savings accounts, as well as those likely to be credit constrained.

Our setup also has some methodological weaknesses. We only capture partial equilibrium and micro effects, not general equilibrium and aggregate effects (e.g., see Karlan and Zinman 2014). We lack data on savings outside the experimenting bank, although this does not end up affecting our inferences given the lack of demand sensitivity to the prices and features tested by the experimenting bank (conversely, if we found sensitivity, one would wonder about crowd-out). Furthermore, few people in our setting have relationships with multiple financial institutions, hence any substitution in savings would likely be from informal savings to formal savings, not from one formal account to another. The external validity of our results to other populations of interest is uncertain, although we can use within-sample variation in baseline savings, income,

[2] Kast et al (2012) compares a market rate, 0.3%, to 5.0%. Schaner (2012) compares a market rate, 0%, to 4%, 12%, and 20%. Mills et al. (2008) and Grinstein-Weiss et al. (2011) compare a market rate to 100%-200% (1:1 or 2:1 matches) in Individual Development Accounts. Duflo et al. (2006) compare a market rate (no match) to 20% and 50% matches in Individual Retirement Arrangement accounts. Cole et al. (2011) and (Dupas and Robinson 2013a) randomize account-opening subsidies, but not interest rates.

wealth, education, etc. to engage in some informed speculation. The external validity of our results to other savings/investment vehicles may be limited, given that the bank only experiments on a commitment savings account.[3] But commitment products are interesting in and of themselves, given their increasing prevalence in the developing world and longstanding prominence in richer countries (certificates of deposit, 401k's, etc.)

Our results suggest price-inelastic demand for this commitment savings product within the price range tested, regardless of specification. Even the upper bounds of our confidence intervals imply price elasticities < 0.5. And these upper bounds are themselves upper bounds of elasticity with respect to aggregate savings, assuming some substitution across savings vehicles, since we measure savings only in a single account (using the bank's administrative data), rather than net savings from the household's complete balance sheet or income statement.

A key question is whether other features of the bank, product or financial system studied here render marginal price variation irrelevant. For example, we would hesitate to infer much about price sensitivity from a savings product that had very low take-up due to other features that were unattractive. But the take-up rate of 23% here is on par with take-up rates from studies that introduce new unsubsidized savings accounts to individuals in developing countries (Karlan, Ratan, and Zinman 2013). We also note that demand correlates strongly with marketer fixed effects and offer timing. This suggests that at least some inputs to the bank's optimization problem affect demand, and from the consumer's perspective, that some factors do predict demand, just not price (similar to the results found in Bertrand et al (2010), in which marketing treatments were more influential than price in determining demand for credit).

Besides non-price product characteristics, we also consider whether characteristics of our *sample* (e.g., liquidity constraints) drive the finding of price inelasticity. We do not find evidence of such heterogeneity. Households who are plausibly marginal savers in this account, as measured using a short baseline survey, are also unresponsive to the variation in price and

[3] Clients set a goal amount and target date and face withdrawal restrictions until both the goal amount and target date have been reached. First Valley Bank allows emergency withdrawals in cases of documented "severe emergency—defined only as 1) hospitalization of immediate family member; or 2) death of immediate family member. The only other case allowing early withdrawal is if the client moves to a barangay where there is no 1st Valley Bank branch." 0.8% of the commitment accounts opened during this study took early withdrawals.

ownership requirements. Of particular note, we find no significant responses among those with (or without) savings at baseline; prior savings;[4] relatively high wealth, income, or education; present-bias as elicited using standard survey questions; or relatively high intra-household decision power.

We also estimate elasticities with respect to the account ownership requirement, which the bank randomly assigned among married individuals to: individual account only, joint only, or the choice of individual or joint (the standard option).[5] The demand for financial control is important to pro-savings female-focused policy efforts (Hashemi et al., 1996), to financial institutions interested in the optimal design of savings products, and to models of intra-household decision making (e.g., Anderson and Baland (2002), Anderson and Eswaran (2009), Ashraf (2009), Schaner (2012)). In such models, requiring joint ownership can strictly reduce savings demand if there are bargaining failures due to, e.g., limited commitment.

We do not find significant ownership requirement elasticities in the full sample, despite the fact that when offered the choice between individual and joint accounts in the "choice" arm, 89% choose individual. So it seems that people (very) weakly prefer individual accounts, but not to the extent that a take-it-or-leave-it offer of joint account discourages them from saving. Nor do we find strong evidence of significant ownership elasticities across two dozen different sub-groups. In particular, we find no evidence that ownership requirement sensitivity varies with baseline measures of intra-household decision making power. It may be the case that a commitment account itself increases decision power (Ashraf et al. 2010) and/or mitigates the underlying bargaining inefficiency—by, e.g., making it easier to monitor withdrawals—in a way that a more liquid account would not. For instance, the external validity of our finding (to more liquid accounts) is uncertain, and a topic for future research.

In all, we do not find strong evidence that savings demand responds significantly to either price (yield) or to account ownership requirements. Note that it is not simply the case that demand was low: the take-up rate was 23%. Nor is the case that demand is completely unresponsive to all observables; rather, we find strong conditional correlations between demand

[4] We find some evidence consistent with heterogeneity by asset market participation a la Vissing-Jorgensen (2002) and Guvenen (2006), in that those who have saved before are more elastic demand than those who have not, but even the upper bounds of the larger elasticities are economically small.
[5] Account offers were made privately to individuals.

and several types of variables—baseline individual characteristics, marketer fixed effects, and offer timing.

The paper proceeds as follows. The next section describes the experimental design and implementation, including the setting/sample. Section II presents our results, first on take-up and usage, and then on price and ownership sensitivity/elasticities, for both full samples and sub-groups. Section III concludes.

I. Experimental Design and Implementation

First Valley Bank (FVB), a for-profit bank operating in Western Mindanao, Philippines, worked with us to randomize interest rates and account ownership requirements as part of the rollout of its Gihandom (Dream) Savings product.

A. Product Terms, Marketing, Sample Frame, and Baseline Surveys

Gihandom allows a client to set her own savings goal amount (US$50 or above, $1 ≈ 40 Philippine pesos during our sample period) and goal term (from three months to two years). Once the client opens the account with a minimum deposit of US$2.50, there is no fixed deposit schedule to fulfill. The client receives a savings lockbox and is encouraged at sign-up to make small deposits on a daily basis. When the lockbox is full, the client goes to the bank to deposit the money. The account is designed to be illiquid, as a commitment device: money can be withdrawn only after both the goal amount and the goal date have been reached, except in hardship cases.[6] In this sense the Gihandom accounts are similar to other types of accounts with provisions that make early withdrawal costly, like certificates of deposit (CDs) and retirement accounts (e.g., IRAs, 401(k)s). The Gihandom account is also similar to the SEED account, tested by Ashraf et al. (2006) by a different bank but also in Mindanao, in the Philippines. For SEED, the goals were *either* amount *or* date based, whereas the Gihandom account requires both an amount and date goal be set.

Between April and August 2007, bank employees conducted door-to-door marketing in rural and small urban areas and offered 9,992 individuals the opportunity to open one or more Gihandom accounts. Marketers conducted a brief five to ten minute "baseline" survey prior to

[6] 0.8% of account holders withdrew balances early.

making an offer (the Appendix details the survey questions), and used the survey to screen out unpromising prospects: they were instructed by FVB management to only offer the accounts to people with regular income, and without an existing FVB savings account.[7] Marketers used personal digital accessories (PDAs) for the baseline survey and random assignment to treatments.

B. Experimental Design and Implementation

Marketers used PDAs to independently randomize, for each individual to which they offered an account, both the interest rate and the account ownership requirement.[8]

The interest rate randomization has three arms, each assigned with 1/3 probability: (a) a normal interest rate of 1.5% APY, (b) a high interest rate of 3% APY, (c) the normal interest rate of 1.5% APY if a client does not achieve their goal, and a 3% APY if a client achieves her goal. FVB was considering offering the higher rate and the reward rate on a permanent basis, and wanted to test the impact these more generous yields would have on take-up (customer acquisition), balances, and profits. Experimental compliance, as measured by the congruity between the interest rate assigned versus actually applied to opened accounts, was strong: only 8 of 2,265 have a rate that differed from their assigned rate offer.

The account ownership randomization also has three arms, each assigned with 1/3 probability in cases where the individual offered the account is married: (a) individual account only; (b) joint account only; (c) option of individual or joint account. Unmarried individuals were not randomized and offered only an individual account. Experimental compliance, as measured by the congruity between the ownership requirement assigned versus actually applied to opened accounts, was strong: only 11 of the 1523 accounts opened by married individuals or couples have ownership that is inconsistent with their assigned ownership offer.

Table 1 performs additional checks on the validity of these randomizations, and also describes some baseline characteristics of our sample.

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[7] In a credit setting one might worry about the accuracy of baseline survey measures that were elicited by a bank employee (e.g., respondents distorting their replies to make themselves appear more creditworthy), but the savings accounts here were not subject to underwriting.

[8] The bank reported no complaints about interest rate offers; e.g., there does not seem to have been any gossip that might have induced reference point effects or jealousy effects.

Starting with orthogonality checks in Panel A, out of 28 tests, for only 2 covariates can we reject equality across treatment assignments (Columns 5 and 9). This frequency is about what one would expect to find by chance. Panel B reports estimates of whether the baseline survey variables jointly predict either treatment assignment, using multinomial logits. They do not. Panel C confirms that the two treatments were assigned independently: the p-value from a likelihood ratio chi-square-test of whether one treatment assignment is correlated with the other in a multinomial logit is 0.48.

C. Sample Characteristics

As noted above with respect to the marketing filters, our sample is comprised of people with (self-reported) regular income, and without a pre-existing account with FVB. Mean (median) individual income during the last seven days is about $25 ($17). 66% of the sample owns their dwelling, and we classify 25% of the sample as relatively high wealth (defined as owning one's dwelling and having high-quality building materials).

Our sample is primarily female (67%); women tend to be the head of household with respect to financial matters in the Philippines.[9] 64% of the sample is married, and the mean age is 34 (both typical for the Philippines). 44% of the sample have attended college (the national average is 29%, per the 2008 World Development Indicators).

75% report having saved before informally (primarily at home; only 4% report informal savings group participation), and 30% report having saved before in a formal financial institution. Mean (median) reported savings at the time of the survey is about $220 ($24). 54% of individuals say they are ≥ "somewhat satisfied" with their current amount of savings.

18% of the sample appears present-biased in response to standard hypothetical questions designed to measure time-inconsistency (choosing smaller-sooner instead of larger-later for today versus one month from today, but then choosing larger-later for six months versus seven months from today), and 41% of the sample is "impatient" (choosing 200 pesos today instead of 250 or 300 pesos one month from today). Respondents have a moderate degree of decision power in their households, as measured by three questions about who decides: whether to make

[9] Indeed, our measure of intra-household decision power shows that married women have higher mean decision power (3.9) than married men (3.3). This measure sums three survey responses regarding who makes household decisions (appliance acquisition, personal things acquisition, and family support), with two points given if answer is the respondent; one point if both; and zero points otherwise.

purchases of appliances and of personal things, and whether and how much to support family members financially.

II. Results

A. Account Take-up and Usage

We start by describing take-up and usage of the commitment accounts, in order to provide some context re: the non-experimental correlates of savings decisions and their stakes.

Of the 9,992 offers, 23% "took-up": opened an account.[10,11] Table 2 shows conditional correlations between various measures of take-up or subsequent savings balances, and individual characteristics measured from the baseline survey. The correlations are estimated using an OLS model that includes fixed effects for marketer, the individual's neighborhood, and week-of-offer, as well as the individual variables shown in the table. Column 1 shows that take-up is significantly correlated with being female, married, more-educated, wealthier, higher-income, patient, and having more decision power and relatively high savings at baseline.[12] The marketer and week-of-offer fixed effects are also strongly correlated with take-up: they are strongly jointly significant. We see similar correlations with our other measures of bank savings (Columns 2-8).

Account openers had a mean (median) balance and high balance of 841 (102) pesos and 1252 (102) pesos, respectively, over their first 12 months. The correlation between mean balance and high balance is 0.92; such a high correlation is expected given the withdrawal restrictions. The

[10] Account openers could open more than one Gihandom account at their randomly assigned terms, and 6% of openers did open multiple accounts. Our measures of savings below span all Gihandom accounts.

[11] 92% account openers set goal terms of one year or less (Figure 1), with 17% in the 1-3 month range, 27% in the 3-6 month range, and 48% in the 6-12 month range. 65% of account openers set the minimum goal amount of 2,000 pesos ($50). Another 28% set goals of <10,000 (Figure 2).

[12] Interestingly, as compared to Ashraf et al. (2006), we do not find that present-biasedness predicts take-up of the commitment savings account studied here (Table 2). We consider several potential explanations for the lack of replication. First, the questions in the Ashraf et al (2006) study were spaced further apart, in a longer survey. In contrast, our shorter survey might generate more (artificial) time-consistency if participants recognize the similarity between the smaller-sooner vs. larger-later choices. Indeed, our subjects exhibit less time-inconsistency (18%) than Ashraf et al.'s (26%). Second, the professional surveyors in Ashraf et al. may have elicited more informative responses than the marketers here, due to differences in training and/or in respondent perceptions of how the enumerator might use the information. One way of exploring the validity of our present-bias measure is to see how it correlates with other baseline characteristics in a multivariate regression. We find that it is strongly negatively correlated with income and wealth (as expected), but not with satisfaction with current savings (surprising). Third, Ashraf et al.'s sample included only prior savers at a particular bank, whereas the product studied here was offered more broadly. Fourth, one of the studies may simply have generated an outlier statistically and thus be drawing the wrong inference.

full distribution of balances shows substantial right-skewness (Figures 3a and 3b), with skewness statistics of 16.8 in the full sample and 8.8 among account-openers. This motivates concerns about the influence of outliers on OLS estimates of treatment effects. We address these by estimating treatment effects on different functional forms of savings balances.

98% of account openers started with the only the minimum opening deposit of 100 pesos. 61% never made additional deposits after the opening deposit; mean (median) balance of these stranded accounts is 107 (101). Among those who made more than one deposit, the mean (median) number of deposits over the entire 20-month period, March 2007 – November 2008, for which we have transaction data is 5 (4).

19% of account holders had reached their goal as of November 24, 2008, the last date for which we have balance data. The mean (median) high balance over our 20-month sample was 4391 (3000) pesos for those who reached their goal, and 669 (101) pesos for those who did not.

B. Price Elasticities

Our estimates of price elasticities of demand for saving start with the following OLS equation on the full sample of 9,992 offers:

$$(1)\quad Y_i = \alpha + \beta^1 HighRate_i + \beta^2 RewardRate_i + \eta L_i + \delta M_i + \Phi T_i + \Gamma X_i + \varepsilon$$

Where Y is a measure of saving (various measures are detailed below) for individual i, and β^1 and β^2 are the coefficients of interest (with *NormalRate* as the omitted category). L is a vector of fixed effects for i's barangay (neighborhood), M is a vector of fixed effects for each marketer, T is a vector of fixed effects for the week in which the offer was made, X is a vector of categorical variables for amount saved at baseline,[13] and ε is the error term. We calculate Huber-White standard errors.

We then calculate point estimates and upper bounds on the price elasticity of demand using the formula:

$$(2)\quad \text{Elasticity} = (f(\beta^1))/\text{mean}(Y_{NormalRate})*100/100$$

[13] Including additional variables from the baseline survey as controls does not change the results (unsurprisingly, given the orthogonality results in Table 1).

When $f(\beta^1)$ is simply β^1 from (1), then equation (2) is a point estimate of the price elasticity. We also report results using the upper bound of the 95% confidence interval of β^1, to estimate whether even a very generous estimate implies elastic demand.

We use β^1 instead of β^2 because of the conditionality of the high rate in the *Reward* treatment; in practice this assumption does not matter because we find that β^1 and β^2 generally have similar, precisely estimated null results. Scaling $f(\beta^1)$ by the mean of the outcome in the control group, and then multiplying by 100, translates the treatment effect estimate into a percentage change in savings (or take-up). The most rightward term in (2) is 100 because the *HighRate* treatment (3%) represents a 100% increase over the normal rate (1.5%).

We calculate nominal elasticities because real elasticities are not clearly defined in our setting: the annual inflation rate of 2.5% produces a negative real rate in the normal (base) rate group: 1.5%-2.5% = -1.0%). Saving at negative real rates is common in developing country settings, presumably due to strong self- and/or other-control motives (including security) that outweigh the often relatively large transaction costs (Karlan, Ratan, and Zinman 2013).[14] With a negative base rate the standard formula in (2) is difficult to interpret quantitatively. However, the estimated elasticity with respect to the real interest rate, rather than normal, would be even lower, since the percent change in price is even higher as the rate approaches zero. Thus any correction for real interest rates rather than nominal would push even further towards our conclusion of zero elasticity.

Table 3 presents price sensitivity results for eight different outcome measures. Only one of sixteen estimated treatment effects is statistically significant with >90% confidence. The first outcome is take-up, which does not respond significantly to either of the higher interest rates. Column (2) sets Y = (average balance over 12 months subsequent to treatment assignment) and again finds no significant effects. The point elasticity is 0.16, with an upper bound of 0.41. Column (3) winsorizes (censors) at the 95th percentile, Column (4) winsorizes at the 99th percentile, and Column (5) uses log(balances), conditioning on takeup. None of these six treatment effects are significant, and the largest upper bound elasticity is 0.22. Columns (6)-(8)

[14]In fact, all but one of papers cited earlier that use interest rate or price subsidies of 20 percentage points or less include interest rates that are negative, in real terms, even after the subsidy (Dupas and Robinson 2013a, about -10% real; Dupas and Robinson 2013b, about -15% real; Kast, Meier, and Pomeranz 2012 range from 0.3% real to 5.0% real; Prina 2012, about -4.5% real; Schaner 2013, ranged from -10% real to +10% real). This is not unusual in developing countries, particularly for small-value accounts.

find one significant effect (out of six) on three different discrete measures of saving: average 12-month balance >= 1,000 pesos, reached goal, or made a deposit after the initial deposit. Appendix Tables 1-3 show similar results using a 6-month (instead of at 12-month) horizon, high balance (instead of average balance), or 12-month total deposits. Results are also similar if we condition on take-up (results available upon request).

In all, we find little evidence of significant price elasticities of demand for saving in the full sample. Even the largest upper bound estimate of the price elasticity implied by our confidence intervals, 0.41, indicates strictly less than elastic demand for saving in the Gihandom account.

Is the lack of price elasticity merely a symptom of overall low demand for the product, or of demand that is difficult to predict along any observable dimension? Results reported above suggest that the answer to both of these questions is "no". The overall take-up rate of 23% is comparable to take-up rates in other settings. Demand is in fact correlated strongly with consumer characteristics, and with non-price efforts undertaken by the bank (namely marketing). Thus, baseline characteristics and other observables help predict savings demand, but price does not (nor do account ownership requirements, as we see in the next sub-section).

Perhaps the lack of price sensitivity in the full sample masks substantial heterogeneity by pooling marginal savers with those for whom marginal yield variation is irrelevant? Table 4 Column 1 explores heterogeneity by estimating price elasticities for sub-groups measured using baseline characteristics. We estimate separate regressions for each characteristic Z (but each of Table 4's columns presents results for several different regressions, to save space), of the form:

$$(3)\ Y_i = \alpha + \beta^3 HighRate_i * Z{=}1_i + \beta^4 HighRate_i * Z{=}0_i + \beta^5 (RewardRate_i) * Z{=}1_i + \beta^6 (RewardRate_i) * Z{=}0_i + \xi Z{=}1_i + \eta L_i + \delta M_i + \Phi T_i + \Gamma X_i + \varepsilon$$

Where Z is one of baseline savings, ever saved in formal institution, ever saved informally, relative wealth, relative income, satisfied with current savings, gender, education, present-bias, impatience, or one of two measures of intrahousehold decision power. The coefficients on the interaction terms identify sub-group point estimates that we use to calculate elasticities per equation (2), substituting the sub-group outcome mean in the *NormalRate* group for the full sample mean. We present results only for Y = level average balances over 12 months post-treatment assignment, but results are similar for our other savings measures. We also summarize the results visually in Figure 4.

The results suggest fairly homogenous and very price-inelastic demand across sub-groups (Table 4, Column 1; Figure 4). None of the 24 mean point estimates—one for each sub-group--reject zero with 90% confidence (to conserve space we only show upper bounds in Table 4, but one can see the point estimates in Figure 4), and none of these estimates exceeds 0.5. Only 1 upper bound estimate exceeds 1.0. Figure 4 also shows the lack of significant differences across mutually exclusive sub-groups: there is overlap in each pair of confidence intervals among the 12 baseline characteristics.

Of particular note is the lack of significant differences between sub-groups that plausibly parse the sample into marginal vs. infra-marginal savers. And even the plausibly marginal savers-- those with: present bias (given that the commitment account might only appeal to those with present bias), baseline savings, prior formal or informal savings experience, higher wealth, higher income, or dissatisfaction with their baseline savings—have statistically insignificant point elasticities that are uniformly < 0.5.

One challenge to interpreting the sub-group treatment effects is that the sub-group classifications rely on baseline data that may be low quality, due to the survey's linkage to the account offer.[15] Although we do not see any reason to suspect that survey responses are biased differentially across study arms, we do think it is sensible to wonder whether nonzero measurement error attenuates estimates of differences between sub-groups. We cannot rule out this possibility but do think it is noteworthy that many baseline characteristics are strongly correlated with take-up and account usage (Table 2). We would not see these strong correlations between saving and the sub-group main effects if the baseline data were very noisy; e.g., if the baseline survey could not actually distinguish higher-income from lower-income respondents, we would see zeros on the income variable in Table 2.

C. Account Ownership Elasticities

Table 5 estimates the (non-)response of six outcome measures to account ownership requirements. The only difference in specification from Table 3 (and equation (1)) is that we limit the sample here to married individuals. We do not find any significant ownership sensitivities, and the point estimates are uniformly small in magnitude. Appendix Tables 4 and 5

[15] One might worry about marketers rushing respondents through the survey to focus on the marketing, and/or respondents biasing answers they incorrectly assumed might influence the bank's offer with some probability.

show similar results for the 6-month instead of the 12-month horizon, and for high-balance instead of average balance.

Returning to Table 4, Columns 2 and 3 explore heterogeneity in the impact of account ownership requirements (Figure 5 summarizes the results visually). The analysis follows equation (3) for interest rates, except here we present coefficients instead of the elasticity upper bounds (there being no natural way to define an elasticity with respect to account ownership requirements). As in Column 1, Columns 2 and 3 present results for many different regressions, with each regression containing the interactions and main effect for a different baseline characteristic *Z*.

Overall we find no evidence of statistically significant sensitivity to account ownership requirements. It is particularly noteworthy that we do not find any significant heterogeneity with respect to baseline decision making power in the household (bottom rows of Table 4; top rows of Figure 5). It may be that the illiquidity provided by the Gihandom account dampened the impact of control rights by increasing the decision power of those offered the account and/or making it easier for spouses to monitor the use (or at least withdrawal) of joint funds.

Interestingly, the lack of sensitivity to account ownership requirements comes despite a clear preference for the individual account: among those given a choice of a joint or an individual account, 89% chose individual. This preference is ultimately (quite) weak in the sense that the take-it-or-leave-it offer of "joint only" does not depress take-up or savings. Nor does having the choice seem to change the composition of who takes up, in the observable sense: Appendix Table 6 reports estimates of our take-up regressions separately for each ownership arm, and shows that correlations between observables (e.g., decision power, gender, marital status) and take-up are stable across arms.

III. Conclusion

We worked with a for-profit bank to study determinants of demand for a new commitment savings product. 10,000 door-to-door solicitations produced a 23% take-up rate. The bank randomized both the yield (within a range offered in the market) and account ownership requirement it offered, at the individual level. We find strikingly small demand sensitivities on both dimensions. These results do not appear to be driven by liquidity constraints: we find null

elasticities, and small upper bounds, even among plausibly marginal savers (e.g., those with: savings at baseline, prior savings experience, relatively high wealth or income, present-bias).

Policy and practical interest in expanding access to savings products is growing, as large banks attempt to expand to the unbanked, and as MFIs look for ways to self-finance. Simultaneously, evidence is mounting on the substantial impacts of savings account access on household outcomes and behavior, as well as demand for specific types of accounts, such as commitment savings accounts.

Evidence on price and ownership sensitivities also informs models of household behavior and intertemporal choice, and our evidence does not square easily with other recent estimates. Much of the intra-household bargaining literature suggests that the joint ownership requirement tested here should depress take-up and savings among married individuals, but we do not find that is the case (despite that fact that people exhibit a clear preference for individual accounts when given the choice). Turning to price, our results suggest substantially less sensitivity than the most comparable studies, all of which have used subsidized price variation that generates plausibly greater variation in economic stakes.

The external validity of our results is of course uncertain, highlighting the value of replication with other products and in other settings. Business, not just mere researchers, have incentives to replicate and understand optimal pricing in their markets.

But replication alone may not suffice to interpret and apply the range of intertermporal price sensitivities found in various studies. Why, for example, does microcredit demand respond nontrivially, and even quite strongly, to marginal variation in interest rates (Karlan and Zinman 2008; Karlan and Zinman 2014), while microsavings demand does not (at least in the current study)? And why do other studies find strong sensitivity to savings account-opening fees (Cole, Sampson, and Zia 2011; Dupas and Robinson 2013a; Prina 2012)? Nonlinearities may be important, and future studies would do well to identify more complete pictures of demand curves.[16]

A closely related line of inquiry is building bridges between micro and macro estimates of intertemporal elasticities. Micro experimental variation in short-term interest rates can, in principle, map nicely into macro models where the relevant margin for consumption versus savings decisions is a short-term interest rate. For example, one can use a finding such as ours--

[16] See, e.g., Karlan and Zinman (2008) on credit, and Kremer and Holla (2009) on education and health.

price insensitivity to offers from a single bank-- to make inferences about the elasticity of intertemporal substitution (EIS) in our sample, if one is willing to make several additional, nontrivial assumptions. One is no crowd-in; i.e., that different savings vehicles are at least weak substitutes rather than complements on the margin. (Conversely, if we found *strong* price sensitivity with our experimenting bank, we would need to make a more difficult assumption about the magnitude of crowd-out to infer anything about the EIS.) A second is that price sensitivity is not materially bank- or product-specific; e.g., that price sensitivity is not mediated by non-price features of the bank or commitment product that are unrepresentative of the broader constellation of investment vehicles. A third is that optimization frictions are small enough to permit extrapolation from the smaller stakes involved in a single account to the level of household portfolios.[17] If one grants these assumptions, our point estimates imply an EIS of zero and our confidence intervals rule out elastic demand. Identifying whether these assumptions are reasonable, and if they are not how to incorporate more realistic assumptions into models and applications, are fruitful topics for future research.

[17] Chetty (2012) considers the importance of optimization frictions for reconciling micro and macro estimates of labor supply elasticities, and highlights the opportunity for kindred work on consumption/savings.

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Appendix 1: Baseline Survey Questions

Basic Information	
(1) Sex of respondent	(a) Male (b) Female
(2) Civil status	(a) Single (b) Married (c) Separated (d) Widowed
(3) How old were you at your last birthday?	Specify number of years
(4) What is the highest grade you obtained?	(a) No schooling (b) Some elementary (c) Elementary graduate (d) Some high school (e) High school graduate (f) Some college (g) Completed college
(5) What is your primary occupation?	(a) Government official (b) Professional or technical (non-production) (c) Administrative or clerical (d) Sari-sari store owner (e) Tricycle, jeepney, taxi, or other transport (f) Farmers, fisherman, hunters, loggers and related workers (g) Miners, quarrymen and related workers (h) Craftsman or production-process (i) Plant and machine operators and assemblers (j) Wage laborers (k) Entrepreneur Service (l) Microentrepreneur Service (m) Retired personnel (government and private organizations) (n) Houseworker (without wage) and unemployed student
(6) What was your own total income in the past seven days?	Specify number of pesos
(7) What is the source of your drinking water?	(a) Bottled water (b) Community water system (piped) - own use (c) Community water system (piped) - shared with other households (d) Deep/artesian well, own use (e) Deep/artesian well, shared with other households (f) River, stream, lake, or spring water
(8) What is the ownership status of your residence?	(a) Own house and lot (b) Rent house/room and lot (c) Own house and rent lot (d) Rent-free house/room and lot (e) Own house and rent-free lot; (f) Other (specify)
Household Wealth Indicators (answered by marketer based on his or her observation)	
(9) Construction materials used on the wall	(a) Strong materials (concrete, brick, stone, wood, galvanized iron, asbestos): 1 point (b) Light materials (bamboo, sawali, cogon, nipa): 2 points (c) Salvaged and makeshift materials: 3 points (d) Mixed but predominantly strong materials: 4 points (e) Mixed but predominantly light materials: 5 points (f) Mixed but predominantly salvaged materials: 6 points

(10) Construction materials used on the roof	(a) Strong materials (concrete, brick, stone, wood, galvanized iron, asbestos): 1 point (b) Light materials (bamboo, sawali, cogon, nipa): 2 points (c) Salvaged and makeshift materials: 3 points (d) Mixed but predominantly strong materials: 4 points (e) Mixed but predominantly light materials: 5 points (f) Mixed but predominantly salvaged materials: 6 points
(11) Construction materials used on the floor	(a) Strong materials (concrete, brick, stone, wood, galvanized iron, asbestos): 1 point (b) Light materials (bamboo, sawali, cogon, nipa): 2 points (c) Salvaged and makeshift materials: 3 points (d) Mixed but predominantly strong materials: 4 points (e) Mixed but predominantly light materials: 5 points (f) Mixed but predominantly salvaged materials: 6 points
Time Discounting I: Following hypothecial situation was presented: *"Suppose you win the barangay raffle today. The lottery administrator gives you options for how you would like to accept your cash prize. One option will be to accept your cash prize today; the other option would be to accept a larger cash prize, but with a one month delay. You will be asked to pick the option you prefer. Please make your decisions based on how you expect you would answer if the choice were actual and not hypothetical."*	
(12) Do you prefer a 200 pesos prize guaranteed today or a 250 pesos prize guaranteed 1 month from now?	(a) 200 pesos today (b) 250 pesos in 1 month
(13) Would you prefer to receive 200 pesos guaranteed today, or 300 pesos guaranteed in 1 month?	(a) 200 pesos today (b) 300 pesos in 1 month
(14) If answer is (a) to both Questions (12) and (13), how much would the prize have to be for you to choose to wait?	Specify number of pesos
Savings Habit	
(15) Have you ever saved at home or at any (in)formal institution regularly before?	(a) Yes (b) No
(16) Where have you saved your money?	(a) Formal financial institution (b) Informal financial institution/ROSCAs (c) At home (d) Other (specify)
(17) Were you able to save as much as you wanted?	(a) Yes (b) No
(18) If not, why?	(a) Income went down (b) Family/relatives asked for my money (c) I spent before I saved (d) There was unexpected expenditures (e) Other (specify)
(19) How much savings do you have?	Specify number of pesos
(20) Are you satisfied with your current amount of savings?	(a) Very satisfied (b) Somewhat satisfied (c) Somewhat unsatisfied (d) Very unsatisfied
(21) Do you agree with the following statement: *"I often find that I regret spending money. I wish that when I had cash, I was better disciplined and saved it rather than spent it."*	(a) Strongly agree (b) Somewhat agree (c) Feel neutral (d) Somewhat disagree (e) Strongly disagree
Household Decision Making	

(22) In your household, who decides when and what expensive things to buy for the household such as radio and TV?	(a) Myself (b) Spouse (c) Both
(23) During quarrels or conflicts, who initiates reconciliation first?	(a) Myself (b) Spouse (c) Both
(24) Who decides when and what to give as assistance and support to parents, in-laws, siblings?	(a) Myself (b) Spouse (c) Both
(25) Who decides what items to buy for your personal use (e.g. clothing, etc.)?	(a) Myself (b) Spouse (c) Both
Time Discounting II Following hypothetical situation was presented: *"Now the option will be to accept the raffle cash prize six months from now, or to accept a larger cash prize seven months from now. Please make your decisions based on how you expect you would answer if the choice were actual and not hypothetical."*	
(26) Do you prefer a 200 pesos prize guaranteed 6 months or a 250 pesos prize guaranteed 7 months from now?	(a) 200 pesos in 6 months (b) 250 pesos in 7 months
(27) Would you prefer to receive 200 pesos guaranteed in 6 months, or 300 pesos guaranteed in 7 months?	(a) 200 pesos in 6 months (b) 300 pesos in 7 months
(28) If answer is (a) to both Questions 26 and 27, how much would the prize have to be for you to choose to wait for 7 months?	Specify number of pesos

Table 1: Baseline Sample Characteristics, and Orthogonality of Treatment Assignments

		Interest Rate Treatment				Account-Ownership Treatment			
	Full Sample	Regular	High	Reward	P-value from F-test of joint significance of (2) and (3) relative to (4)	Single	Joint	Option	P-value from F-test of joint significance of (6) and (7) relative to (8)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Baseline Survey Variables - Means and Standard Errors									
Female	0.673	0.673	0.663	0.683	0.229	0.669	0.664	0.685	0.142
	(0.005)	(0.008)	(0.008)	(0.008)		(0.008)	(0.008)	(0.008)	
Married	0.640	0.644	0.640	0.636	0.761	0.634	0.639	0.646	0.574
	(0.005)	(0.008)	(0.008)	(0.008)		(0.008)	(0.008)	(0.008)	
Age	34.076	34.287	34.080	33.860	0.385	34.089	34.005	34.133	0.914
	(0.126)	(0.219)	(0.217)	(0.217)		(0.220)	(0.217)	(0.216)	
Education >= some college	0.443	0.443	0.444	0.443	0.994	0.452	0.432	0.445	0.254
	(0.005)	(0.009)	(0.009)	(0.009)		(0.009)	(0.009)	(0.008)	
High wealth (owns home with high quality materials)	0.252	0.254	0.251	0.250	0.943	0.260	0.242	0.252	0.207
	(0.004)	(0.008)	(0.007)	(0.008)		(0.008)	(0.007)	(0.007)	
Income >= median (in-sample)	0.503	0.507	0.510	0.492	0.276	0.492	0.496	0.520	0.051*
	(0.005)	(0.009)	(0.009)	(0.009)		(0.009)	(0.009)	(0.009)	
Ever saved at home or (in)formal institutions	0.746	0.739	0.752	0.746	0.472	0.748	0.738	0.750	0.495
	(0.004)	(0.008)	(0.007)	(0.008)		(0.008)	(0.008)	(0.007)	
Ever saved formally	0.300	0.298	0.299	0.304	0.830	0.307	0.301	0.294	0.506
	(0.005)	(0.008)	(0.008)	(0.008)		(0.008)	(0.008)	(0.008)	
Satisfied with current savings	0.537	0.530	0.552	0.527	0.074*	0.525	0.542	0.542	0.260
	(0.005)	(0.009)	(0.009)	(0.009)		(0.009)	(0.009)	(0.009)	
Current savings amount (pesos)	8808.58	8562.62	8561.00	9308.97	0.845	7923.40	9788.58	8716.54	0.353
	(539.76)	(868.64)	(739.15)	(1156.0)		(579.43)	(1228.1)	(885.23)	
Present-bias	0.182	0.183	0.178	0.184	0.823	0.182	0.176	0.187	0.530
	(0.004)	(0.007)	(0.007)	(0.007)		(0.007)	(0.007)	(0.007)	
Impatient	0.408	0.410	0.411	0.403	0.753	0.406	0.404	0.414	0.675
	(0.005)	(0.009)	(0.008)	(0.009)		(0.009)	(0.009)	(0.008)	
Intra-household decision power v1 (possible range is [0,6])	2.417	2.449	2.399	2.403	0.543	2.392	2.406	2.451	0.463
	(0.021)	(0.036)	(0.035)	(0.036)		(0.036)	(0.036)	(0.035)	
Intra-household decision power v2 (possible range is [0,3])	1.713	1.733	1.703	1.703	0.591	1.703	1.706	1.729	0.709
	(0.014)	(0.024)	(0.024)	(0.024)		(0.024)	(0.024)	(0.024)	
Panel B: Multinomial Logit of Treatment Assignment on Survey Variables									
P-value from Likelihood Ratio Chi-Square Test of joint significance of survey variable coefficients for interest rate treatment					0.793				
P-value from Likelihood Ratio Chi-Square Test of joint significance of survey variable coefficients for account-ownership treatment					0.259				
Panel C: Multinomial Logit of Interest Rate Treatment on Account-Ownership Treatment									
P-value from Likelihood Ratio Chi-Square Test of joint significance of interest rate treatment coefficients					0.475				
Number of Observations	9992	3329	3367	3296		3275	3283	3434	

Notes: *p<.10 **p<.05 ***p<.01. Huber-White standard errors are shown in parentheses. Present-bias is a binary variable indicating whether respondent is less patient, in hypothetical sooner-lesser vs. larger-later choices, when making a choice between today or 1 month from today than when making a choice between 6 months from today or 7 months from today. Impatient is a binary variable indicating if respondent chooses the sooner-lesser amount when faced with choice of today vs. 1 month from today. "Intra-household decision power v1" is a sum of three survey responses on who makes household decisions (appliance acquisition, personal things acquisition, and family support), with two points given if answer is myself; one point if both; and zero point otherwise. "Intra-household decision power v2" gives one point if answer is myself or both and zero point otherwise. In multinomial logits, base outcomes are regular interest rate and single account only treatments. The multivariate logits in Panel B include the v1 but not the v2 variable. $1 ≈ 40 Phillipine pesos during our sample period.

Table 2: Is Demand Correlated with Observables?

		Average Balances Over 12 Months Post-Treatment Assignment						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Take-up	Balance	Balance (censored at 95th percentile)	Balance (censored at 99th percentile)	Balance >= 1000 pesos	Log(Balance)	Reached goal	Opened account and made any transaction beyond opening
Mean of dependent variable	0.227	190.630	107.848	158.053	0.062	5.642	0.044	0.095
Female	0.117***	91.346***	64.523***	89.713***	0.040***	0.115	0.029***	0.057***
	(0.008)	(21.256)	(6.113)	(10.703)	(0.005)	(0.075)	(0.004)	(0.006)
Education >= some college	0.053***	41.320*	24.486***	27.545*	0.015**	-0.043	0.005	0.025***
	(0.009)	(20.550)	(6.973)	(12.033)	(0.005)	(0.061)	(0.005)	(0.007)
High wealth (owns home with high quality materials)	0.040***	14.158	29.166***	43.261**	0.020**	0.104	0.009	0.025**
	(0.011)	(26.788)	(8.767)	(15.692)	(0.007)	(0.069)	(0.006)	(0.008)
Income >= median (in-sample)	0.080***	90.262***	39.596***	63.135***	0.021***	0.075	0.022***	0.038***
	(0.009)	(22.746)	(6.812)	(11.575)	(0.005)	(0.070)	(0.005)	(0.006)
Ever saved at home or (in)formal institutions	0.018	-7.888	10.748	18.429	0.010	0.083	0.039	-0.010
	(0.037)	(57.528)	(30.993)	(48.765)	(0.024)	(0.291)	(0.022)	(0.028)
Ever saved formally	-0.025*	-8.677	7.307	11.347	0.004	0.145	0.006	0.018
	(0.012)	(37.410)	(9.890)	(17.509)	(0.008)	(0.077)	(0.007)	(0.009)
Baseline savings amount - quintile 1	0.014	-11.214	-12.738	-31.328	-0.016	-0.272	-0.039	0.009
(omitted category: amount = 0)	(0.038)	(57.271)	(31.494)	(49.175)	(0.024)	(0.296)	(0.023)	(0.028)
Baseline savings amount - quintile 2	0.058	62.939	22.832	24.148	0.008	-0.045	-0.025	0.039
	(0.038)	(57.844)	(31.544)	(49.547)	(0.024)	(0.289)	(0.023)	(0.028)
Baseline savings amount - quintile 3	0.080*	134.044	34.482	46.726	0.020	-0.064	-0.014	0.042
	(0.038)	(75.885)	(31.784)	(50.233)	(0.025)	(0.288)	(0.023)	(0.029)
Baseline savings amount - quintile 4	0.092*	108.277	22.466	38.015	0.010	-0.159	-0.029	0.031
	(0.038)	(61.183)	(31.764)	(50.399)	(0.025)	(0.289)	(0.023)	(0.028)
Baseline savings amount - quintile 5	0.147***	286.530***	69.498*	135.584*	0.038	0.061	-0.010	0.069*
	(0.039)	(81.412)	(33.144)	(53.869)	(0.026)	(0.295)	(0.024)	(0.030)
Baseline savings amount - missing values	0.076	-16.461	-12.265	-41.544	-0.020	-0.676*	-0.036	0.003
	(0.048)	(66.294)	(36.352)	(55.225)	(0.028)	(0.344)	(0.026)	(0.034)
Satisfied with current savings	-0.014	-34.366	-5.107	-14.060	-0.003	0.050	-0.005	-0.006
	(0.009)	(24.121)	(7.165)	(12.275)	(0.006)	(0.074)	(0.005)	(0.007)
Present-bias	-0.001	-29.591	6.282	2.943	0.005	0.009	0.005	0.007
	(0.012)	(36.278)	(9.575)	(16.687)	(0.007)	(0.100)	(0.006)	(0.009)
Impatient	-0.063***	-37.502	-30.757***	-40.006**	-0.018**	-0.013	-0.014**	-0.030***
	(0.010)	(32.627)	(7.841)	(14.162)	(0.006)	(0.087)	(0.005)	(0.007)
Intra-household decision power v1	0.006*	7.143	3.606*	6.287*	0.003	0.009	0.001	0.004*
	(0.002)	(4.614)	(1.737)	(2.958)	(0.001)	(0.014)	(0.001)	(0.002)
P-value from F-test of joint significance of baseline savings amount coefficients	0.000	0.000	0.000	0.000	0.000	0.012	0.017	0.000
P-value from F-test of joint significance of marketer coefficients	0.000	0.000	0.000	0.000	0.000	0.034	0.000	0.000
P-value from F-test of joint significance of week of offer coefficients	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000
P-value from F-test of joint significance of neighborhood coefficients	0.000	0.517	0.109	0.406	0.303	0.000	0.000	0.008
R-squared	0.163	0.043	0.084	0.069	0.055	0.056	0.043	0.079
Observations	9992	9992	9992	9992	9992	2265	9992	9992

Notes: *p<.10 **p<.05 ***p<.01. Each column reports results from a single OLS regression of a demand measure on the baseline variables shown or summarized in the rows. Robust standard errors are shown in parentheses. Present-bias is a binary variable indicating whether respondent is less patient, in hypothetical sooner-lesser vs. larger-later choices, when making a choice between today or 1 month from today than when making a choice between 6 months from today or 7 months from today. Impatient is a binary variable indicating if respondent chooses the sooner-lesser amount when faced with choice of today vs. 1 month from today "Intra-household decision power v1" is a sum of three survey responses on who makes household decisions (appliance acquisition, personal things acquisition, and family support), with two points given if answer is myself; one point if both; and zero point otherwise.

Table 3: Is Savings Demand Price-Sensitive? Full Sample Estimates

		Average Balances Over 12 Months Post-Treatment Assignment						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Take-up	Balance	Balance (censored at 95th percentile)	Balance (censored at 99th percentile)	Log(Balance)	Balance >= 1000 pesos	Reached goal	Opened account and made any transaction beyond opening
Mean of dependent variable	0.227	190.630	107.848	158.053	5.642	0.062	0.194	0.095
High interest rate (3%)	0.008	27.335	4.070	8.479	-0.003	0.002	-0.032	0.010
(omitted category: Regular interest rate (1.5%))	(0.010)	(22.508)	(7.430)	(12.978)	(0.071)	(0.006)	(0.020)	(0.007)
Reward interest rate (3% if goal reached, 1.5% if not)	0.013	16.232	9.705	10.731	0.046	0.006	0.011	0.015*
	(0.010)	(21.476)	(7.581)	(13.014)	(0.071)	(0.006)	(0.021)	(0.007)
Mean elasticity	0.034	0.156	0.039	0.056	0.000	0.039	-0.729	0.118
Upper bound elasticity	0.120	0.408	0.181	0.224	0.024	0.228	0.178	0.274
P-value from F-test of joint significance of baseline savings amount coefficients	0.000	0.000	0.000	0.000	0.001	0.000	0.527	0.000
P-value from F-test of joint significance of marketer coefficients	0.000	0.000	0.000	0.000	0.002	0.000	0.015	0.000
P-value from F-test of joint significance of week of offer coefficients	0.000	0.000	0.000	0.000	0.005	0.000	0.057	0.000
P-value from F-test of joint significance of neighborhood coefficients	0.000	0.551	0.071	0.372	0.000	0.337	0.000	0.004
R-squared	0.127	0.037	0.065	0.056	0.051	0.043	0.054	0.061
Observations	9992	9992	9992	9992	2265	9992	2265	9992

Notes: *p<.10 **p<.05 ***p<.01. Each column reports results from a single OLS regression of a demand measure on interest rate treatment variables and control variables. Robust standard errors are shown in parentheses. We calculate the point elasticity by dividing the point estmate for *HighRate* treatment effect by the mean of the outcome for the *LowRate* group (the % change in yield from *LowRate* to *HighRate* is 100, so no further scaling is needed). The upper bound elasticity uses the upper endpoint of the *HighRate* 95% confidence interval instead of the point estimate of the mean effect.

Table 4: Heterogeneity in Price and Account Ownership Sensitivities?
Dependent variable: Average Balances Over 12 Months Post-Treatment Assignment

Treatment:	Price Sensitivity	Account ownership sensitivity	
Sample Frame:	Full	Married individuals only	
Estimate:	Upper bound interest rate elasticity for each subgroup	Individual accounts only (versus choice)	Joint accounts only (versus choice)
	(1)	(2)	(3)
Baseline savings > 0	0.471	-26.525	10.772
		(38.600)	(41.197)
Baseline savings = 0	0.273	40.278	40.783
		(26.317)	(25.569)
Ever saved formally	0.415	-10.401	86.285
		(47.429)	(65.254)
Never saved formally	0.607	-4.291	-24.488
		(34.927)	(30.894)
Ever saved at home or (in)formal institutions	0.467	-23.918	5.847
		(36.628)	(39.901)
Never saved at home or (in)formal institutions	0.247	55.567*	43.705
		(27.992)	(26.212)
High wealth (owns home with high quality materials)	0.353	-21.447	-5.564
		(61.632)	(58.676)
Not high wealth	0.580	-2.573	20.822
		(32.006)	(36.245)
Income >= median (in-sample)	0.401	0.437	12.372
		(42.389)	(44.947)
Income < median (in-sample)	0.779	-13.353	18.024
		(31.149)	(35.889)
Not satisfied with current savings	0.592	29.977	89.267
		(44.540)	(55.601)
Satisfied with current savings	0.429	-34.972	-43.344
		(36.438)	(36.755)
Female	0.392	0.914	19.873
		(36.509)	(39.250)
Male	1.055	-17.833	11.560
		(43.121)	(47.009)
Education >= some college	0.455	-25.481	-17.775
		(62.635)	(68.907)
Education < some college	0.598	2.396	34.255
		(26.711)	(29.313)
Present-bias	0.835	36.886	8.383
		(45.355)	(42.460)
No present-bias	0.409	-16.008	14.743
		(33.463)	(36.513)
Impatient	0.844	-3.882	-27.139
		(55.829)	(51.347)
Not impatient now	0.338	-8.049	38.203
		(31.023)	(38.958)
Intra-household decision power v1 >= 3	0.591	-16.759	17.931
		(31.685)	(34.862)
Intra-household decision power v1 < 3	0.348	65.882	-2.536
		(60.208)	(44.834)
Intra-household decision power v2 >= 2	0.591	-16.512	15.442
		(30.029)	(33.022)
Intra-household decision power v2 < 2	0.328	116.527	0.416
		(91.020)	(51.577)

Notes: *p<.10 **p<.05 ***p<.01. Point estmates for elasticities are computed from separate OLS regressions, on the full sample, of a demand measure on a single binary variable (e.g., Female), each value of that variable interacted with interest rate variables (e.g., Female*HighRate, Female*LowRate, Male*HighRate, Male*LowRate) and control variables. We calculate the point elasticity for each sub-group of our baseline characteristics by dividing the point estmate for HighRate treatment effect by the mean of the outcome for the LowRate group (the % change in yield from LowRate to HighRate is 100, so no further scaling is needed). The upper bound elasticity uses the upper endpoint of the HighRate 95% confidence interval instead of the point estimate of the mean effect.

Columns 2 and 3 report results from separate OLS regressions, on the sub-sample of married individuals, of a demand measure on a binary baseline variable (e.g., Female), interactions between both values of that variable and the account ownership treatment variables (e.g., Female*Individual Account Only, Female*Joint Account Only, Male*Individual Account Only, Male*Joint Account Only, and control variables.

Present-bias is a binary variable indicating whether respondent is less patient, in hypothetical sooner-lesser vs. larger-later choices, when making a choice between today or 1 month from today than when making a choice between 6 months from today or 7 months from today. Impatient is a binary variable indicating if respondent chooses the sooner-lesser amount when faced with choice of today vs. 1 month from today "Intra-household decision power v1" is a sum of three survey responses on who makes household decisions (appliance acquisition, personal things acquisition, and family support), with two points given if answer is myself; one point if both; and zero point otherwise. "Intra-household decision power v2" gives one point if answer is myself or both and zero point otherwise.

Table 5: Is Demand Sensitive to Account Ownership Requirements?

		Average Balances Over 12 Months Post-Treatment Assignment				
	(1)	(2)	(3)	(4)	(5)	(6)
	Take-up	Balance	Balance (censored at 95th percentile)	Balance (censored at 99th percentile)	Balance >= 1000 pesos	Made more than one deposit
Mean of dependent variable	0.238	207.946	114.825	0.823	0.067	0.102
Individual accounts only	-0.003	-6.589	3.468	-3.006	-0.002	0.015
(omitted category: choice of individual or joint account)	(0.012)	(28.809)	(9.543)	(16.498)	(0.007)	(0.009)
Joint accounts only	-0.013	14.111	3.043	10.611	0.001	0.009
	(0.012)	(30.854)	(9.547)	(17.247)	(0.007)	(0.009)
P-value from F-test of joint significance of baseline savings amount coefficients	0.000	0.000	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of marketer coefficients	0.000	0.000	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of week of offer coefficients	0.000	0.001	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of neighborhood coefficients	0.000	0.279	0.033	0.212	0.065	0.007
R-squared	0.152	0.046	0.076	0.066	0.051	0.072
Observations	6396	6396	6396	6396	6396	6396

Notes: *p<.10 **p<.05 ***p<.01. Each column reports results from a single OLS regression of a demand measure on account ownership treatment variables. Sample size is lower than in interest rate tables, because account ownership requirements are only relevant for married individuals, and hence we restrict the sample here to married individuals only. Robust standard errors are shown in parentheses.

Appendix Table 1: Is Savings Demand Price-Sensitive? Full Sample Estimates for 6-Months Instead of 12 Months

	Average Balances Over 6 Months Post-Treatment Assignment			
	(1)	(2)	(3)	(4)
	Balance	Balance (censored at 95th percentile)	Balance (censored at 99th percentile)	Balance >= 1000 pesos
Mean of dependent variable	201.494	117.325	167.959	0.065
High interest rate (3%)	38.085	5.200	13.388	0.003
(omitted category: Regular interest rate (1.5%))	(23.911)	(8.204)	(13.889)	(0.006)
Reward interest rate (3% if goal reached, 1.5% if not)	19.381	10.496	12.517	0.006
	(22.002)	(8.362)	(13.789)	(0.006)
Mean elasticity	0.209	0.046	0.084	0.046
Upper bound elasticity	0.467	0.190	0.255	0.231
P-value from F-test of joint significance of baseline savings amount coefficients	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of marketer coefficients	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of week of offer coefficients	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of neighborhood coefficients	0.595	0.095	0.346	0.318
R-squared	0.038	0.064	0.056	0.045
Observations	9992	9992	9992	9992

Notes: *p<.10 **p<.05 ***p<.01. Each column reports results from a single OLS regression of a demand measure on interest rate treatment variables and control variables. Robust standard errors are shown in parentheses. We calculate the point elasticity by dividing the point estmate for *HighRate* treatment effect by the mean of the outcome for the *LowRate* group (the % change in yield from *LowRate* to *HighRate* is 100, so no further scaling is needed). The upper bound elasticity uses the upper endpoint of the *HighRate* 95% confidence interval instead of the point estimate of the mean effect.

Appendix Table 2: Is Savings Demand Price-Sensitive? Full Sample Estimates for High Balance Instead of Average Balance

	High Balances Over 12 Months Post-Treatment Assignment			
	(1)	(2)	(3)	(4)
	Balance	Balance (censored at 95th percentile)	Balance (censored at 99th percentile)	Balance >= 1000 pesos
Mean of dependent variable	283.871	158.777	231.680	0.069
High interest rate (3%)	44.309	6.849	13.776	0.002
(omitted category: Regular interest rate (1.5%))	(33.285)	(11.715)	(19.782)	(0.006)
Reward interest rate (3% if goal reached, 1.5% if not)	31.824	15.917	23.407	0.006
	(31.445)	(11.976)	(19.984)	(0.006)
Mean elasticity	0.171	0.045	0.063	0.037
Upper bound elasticity	0.424	0.197	0.239	0.215
P-value from F-test of joint significance of baseline savings amount coefficients	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of marketer coefficients	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of week of offer coefficients	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of neighborhood coefficients	0.680	0.170	0.640	0.361
R-squared	0.040	0.059	0.055	0.046
Observations	9992	9992	9992	9992

Notes: *p<.10 **p<.05 ***p<.01. Each column reports results from a single OLS regression of a demand measure on interest rate treatment variables and control variables. Robust standard errors are shown in parentheses. We calculate the point elasticity by dividing the point estmate for *HighRate* treatment effect by the mean of the outcome for the *LowRate* group (the % change in yield from *LowRate* to *HighRate* is 100, so no further scaling is needed). The upper bound elasticity uses the upper endpoint of the *HighRate* 95% confidence interval instead of the point estimate of the mean effect.

Appendix Table 3: Is Savings Demand Price-Sensitive? Full Sample Estimates for Total Amounts Deposited Instead of Average Balance

	Total Deposits Over 12 Months Post-Treatment Assignment				
	(1)	(2)	(3)	(4)	(5)
	Total Amounts Deposited	Total Amounts Deposited (censored at 95th percentile)	Total Amounts Deposited (censored at 99th percentile)	Total Amounts Deposited >= 1000 pesos	log(Total Amounts Deposited)
Mean of dependent variable	310.798	161.757	256.057	0.070	5.829
High interest rate (3%)	41.423	6.599	9.943	0.002	-0.004
(omitted category: Regular interest rate (1.5%))	(35.969)	(11.831)	(22.473)	(0.006)	(0.082)
Reward interest rate (3% if goal reached, 1.5% if not)	44.343	17.663	26.999	0.008	0.085
	(35.088)	(12.128)	(22.892)	(0.006)	(0.083)
Mean elasticity	0.147	0.043	0.041	0.032	-0.001
Upper bound elasticity	0.397	0.194	0.221	0.209	0.027
P-value from F-test of joint significance of baseline savings amount coefficients	0.000	0.000	0.000	0.000	0.002
P-value from F-test of joint significance of marketer coefficients	0.000	0.000	0.000	0.000	0.001
P-value from F-test of joint significance of week of offer coefficients	0.000	0.000	0.000	0.000	0.015
P-value from F-test of joint significance of neighborhood coefficients	0.621	0.163	0.517	0.355	0.000
R-squared	0.042	0.061	0.056	0.048	0.052
Observations	9992	9992	9992	9992	2265

Notes: *p<.10 **p<.05 ***p<.01. Each column reports results from a single OLS regression of a demand measure on interest rate treatment variables and control variables. Robust standard errors are shown in parentheses. Amounts deposited measured over 12 months post-random assignments. We calculate the point elasticity by dividing the point estmate for *HighRate* treatment effect by the mean of the outcome for the *LowRate* group (the % change in yield from *LowRate* to *HighRate* is 100, so no further scaling is needed). The upper bound elasticity uses the upper endpoint of the *HighRate* 95% confidence interval instead of the point estimate of the mean effect.

Appendix Table 4: Is Savings Demand Sensitive to Account Ownership Requirements? Married-Sample Estimates for 6 Months Instead of 12 Months

	Average Balances Over 6 Months Post-Treatment Assignment			
	(1)	(2)	(3)	(4)
	Balance	Balance (censored at 95th percentile)	Balance (censored at 99th percentile)	Balance >= 1000 pesos
Mean of dependent variable	220.762	124.953	181.680	0.070
Individual accounts only	-13.865	2.940	-5.075	-0.002
(omitted category: choice of individual or joint account)	(31.073)	(10.533)	(17.648)	(0.008)
Joint accounts only	8.333	3.257	9.538	0.002
	(32.791)	(10.574)	(18.415)	(0.008)
P-value from F-test of joint significance of baseline savings amount coefficients	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of marketer coefficients	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of week of offer coefficients	0.007	0.000	0.000	0.000
P-value from F-test of joint significance of neighborhood coefficients	0.469	0.048	0.306	0.064
R-squared	0.046	0.075	0.066	0.053
Observations	6396	6396	6396	6396

Notes: *p<.10 **p<.05 ***p<.01. Each column reports results from a single OLS regression of a demand measure on account ownership treatment variables. Sample size is lower than in interest rate tables, because account ownership requirements are only relevant for married individuals, and hence we restrict the sample here to married individuals only. Robust standard errors are shown in parentheses.

Appendix Table 5: Is Savings Demand Sensitive to Account Ownership Requirements? Married-Sample Estimates for High Balance Instead of Average Balance

	High Balances Over 12 Months Post-Treatment Assignment			
	(1)	(2)	(3)	(4)
	Balance	Balance (censored at 95th percentile)	Balance (censored at 99th percentile)	Balance >= 1000 pesos
Mean of dependent variable	309.109	169.349	248.165	0.073
Individual accounts only	-13.279	8.857	3.210	0.002
(omitted category: choice of individual or joint account)	(42.888)	(15.143)	(25.245)	(0.008)
Joint accounts only	25.995	7.504	17.403	0.002
	(45.963)	(15.060)	(25.812)	(0.008)
P-value from F-test of joint significance of baseline savings amount coefficients	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of marketer coefficients	0.000	0.000	0.000	0.000
P-value from F-test of joint significance of week of offer coefficients	0.006	0.000	0.000	0.000
P-value from F-test of joint significance of neighborhood coefficients	0.584	0.074	0.482	0.162
R-squared	0.049	0.069	0.064	0.053
Observations	6396	6396	6396	6396

Notes: *p<.10 **p<.05 ***p<.01. Each column reports results from a single OLS regression of a demand measure on account ownership treatment variables. Sample size is lower than in interest rate tables, because account ownership requirements are only relevant for married individuals, and hence we restrict the sample here to married individuals only. Robust standard errors are shown in parentheses.

Appendix Table 6: Take-up Regressions by Each Account Ownership Requirement

	Take-up		
	Individual Accounts Only	Joint Accounts Only	Choice of Individual or Joint Account
	(1)	(2)	(3)
Female	0.125***	0.099***	0.118***
	(0.014)	(0.014)	(0.014)
Married	-0.087**	-0.066*	-0.066*
	(0.030)	(0.029)	(0.028)
Education >= some college	0.061***	0.039*	0.051**
	(0.016)	(0.015)	(0.015)
High wealth (owns home with high quality materials)	0.036	0.045*	0.039*
	(0.019)	(0.019)	(0.018)
Income >= median (in-sample)	0.103***	0.078***	0.069***
	(0.016)	(0.016)	(0.015)
Ever saved at home or (in)formal institutions	-0.014	0.004	0.060
	(0.066)	(0.069)	(0.059)
Ever saved formally	-0.027	-0.016	-0.032
	(0.021)	(0.021)	(0.021)
Baseline savings amount - zero amount	Omitted	Omitted	Omitted
Baseline savings amount - quintile 1	0.073	-0.013	-0.011
	(0.068)	(0.069)	(0.062)
Baseline savings amount - quintile 2	0.123	0.043	0.023
	(0.068)	(0.070)	(0.061)
Baseline savings amount - quintile 3	0.121	0.054	0.068
	(0.067)	(0.070)	(0.061)
Baseline savings amount - quintile 4	0.105	0.093	0.077
	(0.068)	(0.070)	(0.062)
Baseline savings amount - quintile 5	0.197**	0.110	0.148*
	(0.070)	(0.072)	(0.065)
Baseline savings amount - missing values	0.131	0.066	0.043
	(0.087)	(0.083)	(0.080)
Satisfied with current savings	-0.009	-0.011	-0.019
	(0.017)	(0.016)	(0.016)
Present-bias	0.003	-0.013	0.001
	(0.023)	(0.021)	(0.022)
Impatient	-0.062***	-0.065***	-0.058***
	(0.018)	(0.017)	(0.017)
Intra-household decision power v1 (range is 0 to 6)	0.017*	0.023***	0.020**
	(0.007)	(0.007)	(0.007)
P-value from F-test of joint significance of baseline	0.011	0.005	0.001
P-value from F-test of joint significance of marketer	0.000	0.000	0.000
P-value from F-test of joint significance of week of	0.000	0.000	0.000
P-value from F-test of joint significance of	0.030	0.000	0.000
Mean of dependent variable	0.242	0.211	0.228
R-squared	0.178	0.185	0.163
Observations	3275	3283	3434

Notes: *p<.10 **p<.05 ***p<.01. Each column reports results from OLS regression of a demand measure on the baseline variables shown or summarized in the rows. Robust standard errors are shown in parentheses. Present-bias is a binary variable indicating whether respondent is less patient, in hypothetical sooner-lesser vs. larger-later choices, when making a choice between today or 1 month from today than when making a choice between 6 months from today or 7 months from today. Impatient is a binary variable indicating if respondent chooses the sooner-lesser amount when faced with choice of today vs. 1 month from today. "Intra-household decision power v1" is a sum of three survey responses on who makes household decisions (appliance acquisition, personal things acquisition, and family support), with two points given if answer is myself; one point if both; and zero point otherwise.

Figure 1: Goal amount in pesos

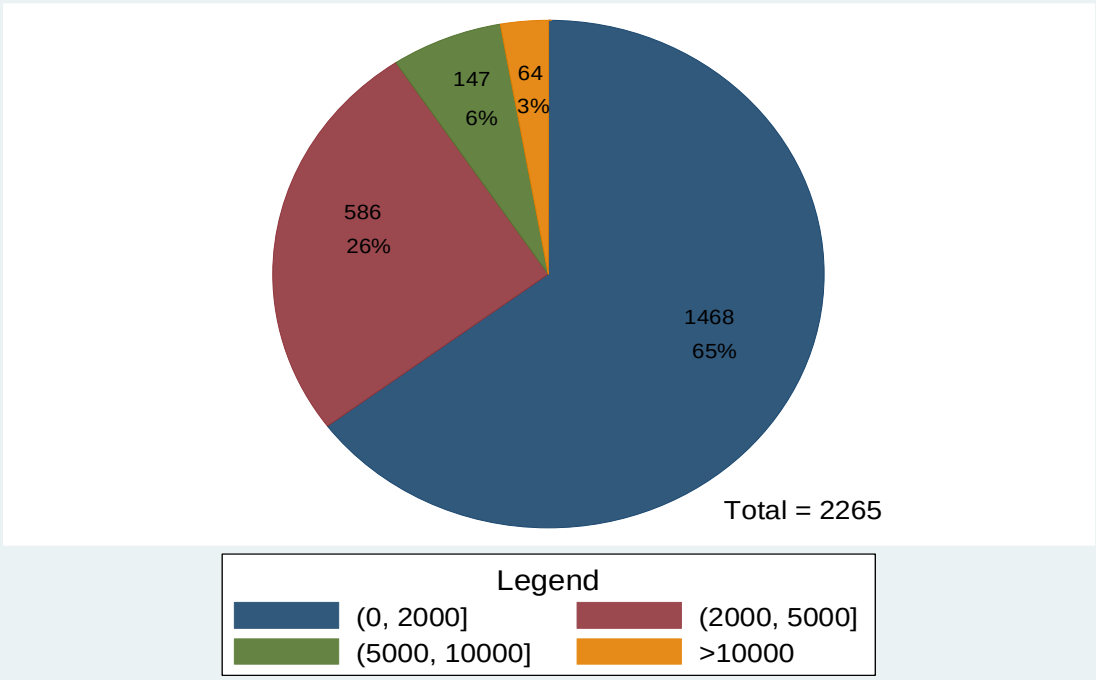
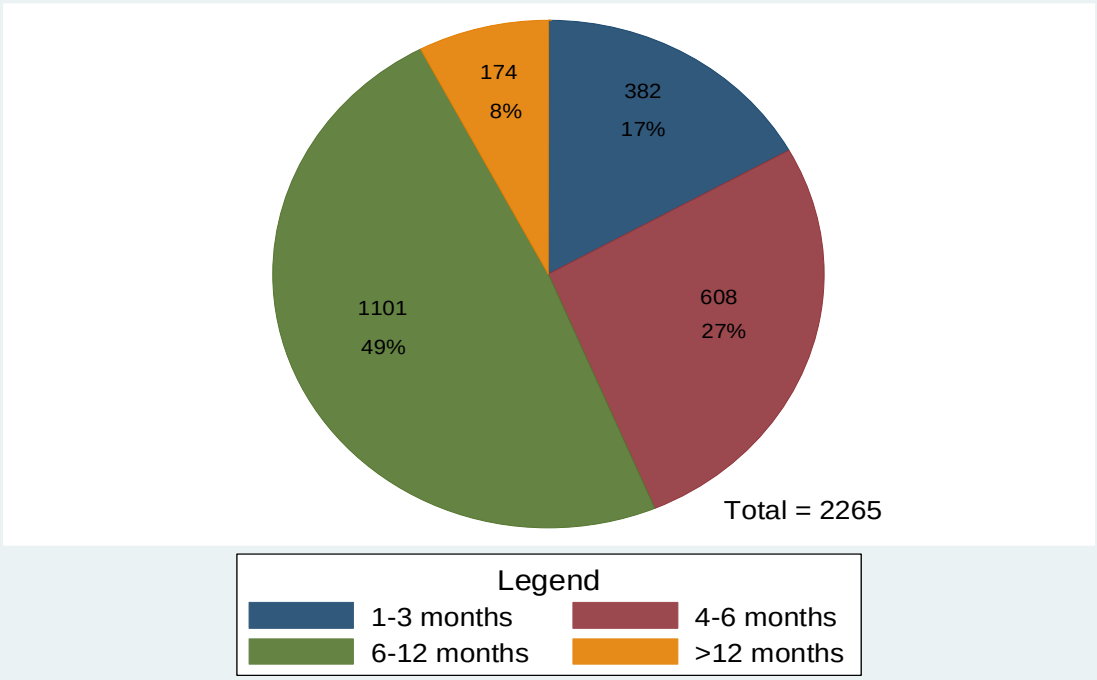


Figure 2: Goal term in months



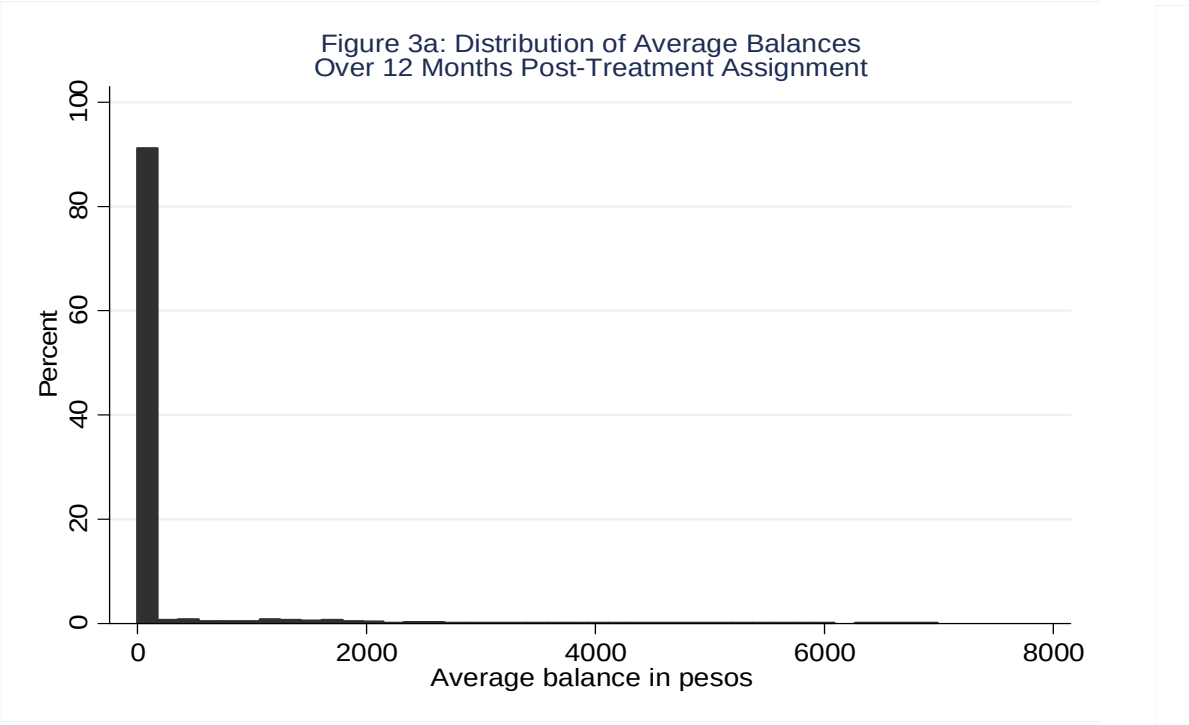


Figure 3a: Distribution of Average Balances
Over 12 Months Post-Treatment Assignment
Percent
0
20
40
60
80
100
0
2000
4000
6000
8000
Average balance in pesos

Figure 3b: Distribution of Average Balances
Over 12 Months Post-Treatment Assignment
In Sub-sample That Opened Accounts

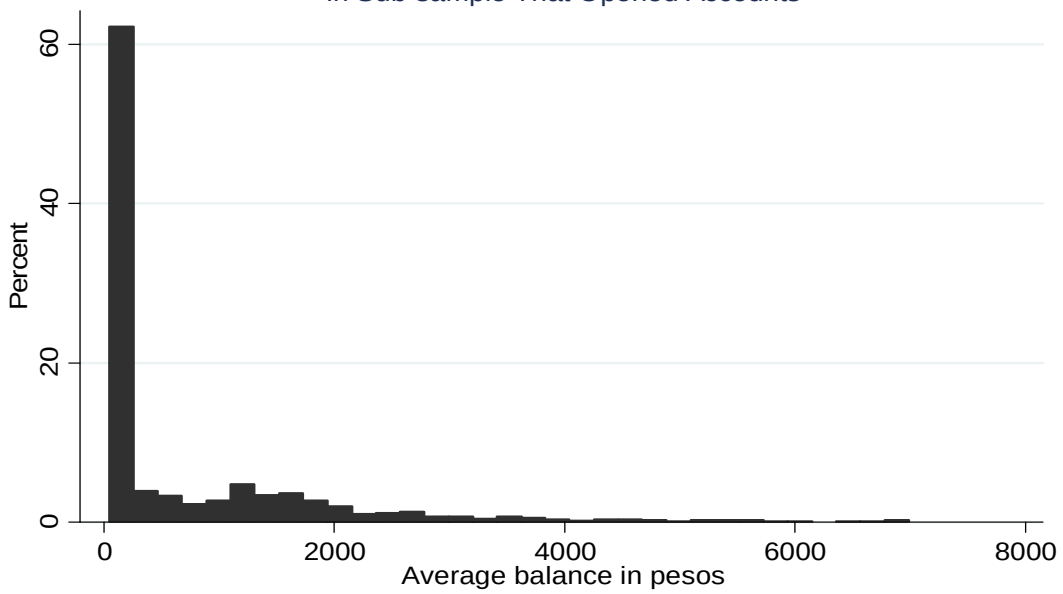
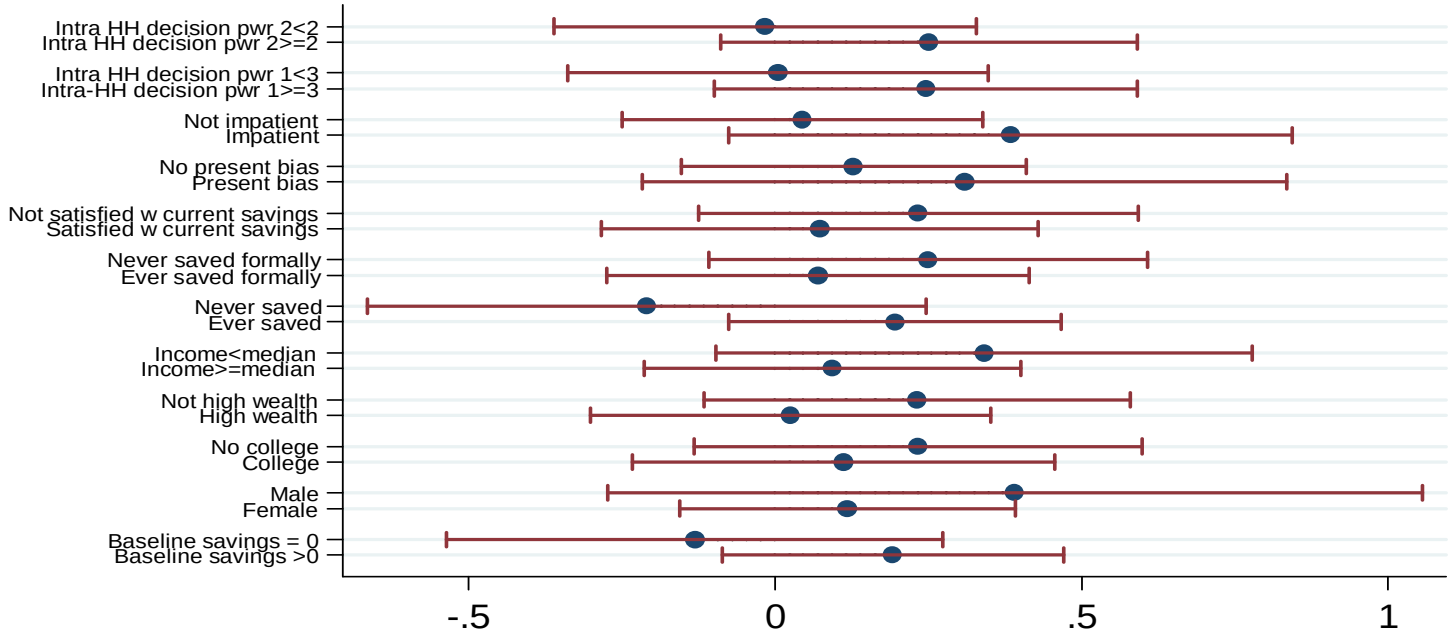
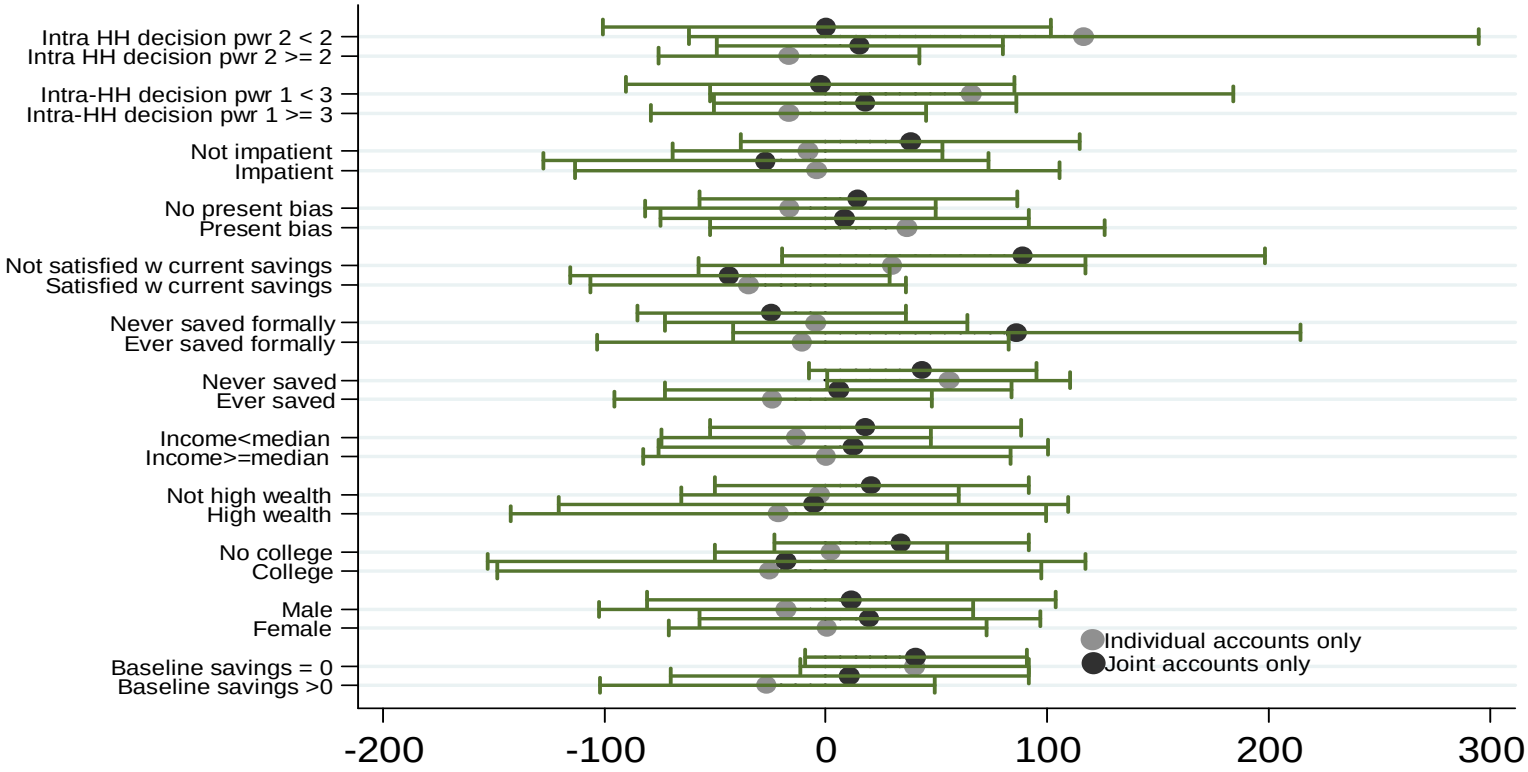


Figure 4: Heterogeneity in Price Sensitivities
Mean and Upper and Lower Bound Elasticities
of Average Balances Over 12 Months Post-Treatment Assignment



Notes: Point estmates for elasticities are computed from separate OLS regressions, on the full sample, of a demand measure on a single binary variable (e.g., Female), each value of that variable interacted with interest rate variables (e.g., Female*HighRate, Female*LowRate, Male*HighRate, Male*LowRate) and control variables. We calculate the point elasticity for each sub-group of our baseline characteristics by dividing the point estmate for HighRate treatment effect by the mean of the outcome for the LowRate group (the % change in yield from LowRate to HighRate is 100, so no further scaling is needed). Upper and lower bound elasticities use upper and lower endpoints of the HighRate 95% confidence interval instead of the point estimate of the mean effect.

Figure 5: Heterogeneity in Account Ownership Sensitivities of Average Balances Over 12 Months Post-Treatment Assignment



Notes: Estimates of account ownership sensitivities are results from separate OLS regressions, on the sub-sample of married individuals, of a demand measure on a binary baseline variable (e.g., Female), interactions between both values of that variable and the account ownership treatment variables (e.g., Female*Individual Account Only, Female*Joint Account Only, Male*Individual Account Only, Male*Joint Account Only, and control variables.