The Cost of Convenience? Transaction Costs, Bargaining Power, and Savings Account Use in Kenya*

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Abstract

This paper studies the impact of reducing bank account transaction costs via ATM cards in a developing country. The ATM card reduced withdrawal fees by over 50 percent (from $0.78 to $0.38), enabled account holders to make withdrawals from their accounts at any time of the day, and enabled accounts to be accessed without the in-person verification of a national identity card. Targeting ATM cards to joint accounts and accounts owned by men substantially increased savings rates (by 40 percent) and average daily balances (by 16 percent) in the bank accounts. In contrast, the intervention had an insignificant (but negative-signed) impact on account use and savings when targeted to individual accounts owned by women. This gender difference appears to be driven at least in part by differences in bargaining power within the household: the positive treatment effect for men is concentrated in households where men score above-median on a demographic proxy of bargaining power, whereas the negative treatment effect for women is concentrated in households where women score below-median on the bargaining power measure. Simply accounting for differences in bargaining power reduces the gender gap in treatment effects by 77 percent.

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1 Introduction

The vast majority of the world's poor do not have access to formal financial services. Recent estimates suggest that nearly three quarters of individuals in developing countries are unbanked (Kendall et al. 2010), and in Sub-Saharan Africa, this estimate reaches 80 percent (Chaia et al. 2009). This lack of access does not reflect an inability or unwillingness of individuals to save. Indeed, Collins et al. (2009) document that low-income households in developing countries save resources in a wide variety of informal and semi-formal savings devices, even though saving in these devices can be quite costly. Furthermore, evidence from bank expansions in developing countries suggest that increasing access to the formal financial sector increases savings, investment, and income.[1] Although micro-level evidence on the impact of formal savings accounts is scant, Dupas and Robinson (2011) find that these accounts substantially boosted the business investment of female Kenyan microentrepreneurs. In part due to these positive results, policymaker interest has begun to shift away from microcredit towards microsavings. For example, in November 2010 the Bill and Melinda Gates Foundation announced a $500 million pledge to expand access to formal savings accounts to the world's poor, with an emphasis on transactions cost reducing technologies such as mobile money (Bill and Melinda Gates Foundation 2010).

Yet it is not obvious that reduced transactions costs will always result in increased savings. Certainly, traditional economic theory dictates that making formal accounts cheaper and more readily available would result in increased adoption by low income households. However, a growing body of literature documents that individuals, particularly in developing countries, face important internal and external constraints to building savings balances. Furthermore, these constraints are often such that fees or restrictions on access to liquidity may actually help *increase* stores of savings. First, individuals may have to contend with time inconsistent preferences – if the temptation to spend out of readily accessible savings is too great, individuals may prefer to store resources in an account that is costly (in terms of time or money) to access (Banerjee and Mullainathan 2010; Laibson 1997). Second, individuals in developing countries face frequent demands on their resources from the community and extended family members. Savings devices that are difficult or expensive to access may aid individuals in protecting their resources from these demands (Baland et al. 2007). Finally, demands on savings may come from within the household, driving individuals to use savings technologies that make resources difficult to access or observe (Anderson and Baland 2002; Schaner 2011). For example, a wife may have difficulty denying her husband a few

[1] See, for example, Aportela (1999), Bruhn and Love (2009), Burgess and Pande (2005), and Kaboski and Townsend (2005).

shillings for a drink if he knows she has a store of savings under the mattress. However, if the funds are stored at the bank and withdrawals incur a fee, she may be able to avoid having to make such a transfer. Indeed, many informal savings arrangements (such as ROSCAs)[2] are characterized by commitment and/or security features, and a growing body of empirical evidence suggests that individuals in developing countries behave in ways consistent with these concerns (for a review, see Karlan and Morduch (2010)).

These observations raise a number of unanswered questions about the savings behavior of the unbanked: Would making formal sector accounts cheaper (by reducing fees) and more convenient (by reducing non-monetary transaction costs) substantially increase use of these accounts? Does this impact vary by account type (individual versus joint) or identity of the account owner (husband or wife)? Is there evidence that the above-described internal and external constraints limit the benefits of reduced fees and transaction costs? The primary contribution of this paper is to answer these questions by presenting the results of a field experiment that we conducted with a set of newly-opened formal bank accounts owned by low-income, rural Kenyans in the summer of 2009.

In the experiment, 748 couples were given the opportunity to open up to three accounts with a formal bank: a joint account, an individual account for the husband, and an individual account for the wife. Each account was randomly assigned a temporary 6-month interest rate, which ranged from zero percent to 10 percent. Altogether, these couples opened 1,121 accounts. As is typical in Kenya, the bank accounts featured nontrivial withdrawal fees of \$0.78, and accounts were only accessible during bank hours. However, the bank also offered ATM cards for the accounts: these cards reduced withdrawal fees by over 50 percent (to \$0.38) and also enabled card holders to make withdrawals outside of bank hours. These cards were costly to obtain (ordinarily, account holders would have to pay \$3.75 to acquire an ATM card). We randomly selected a subset of opened accounts to receive an ATM card for free – given the card's high cost, the intervention increased ATM card takeup by nearly 89 percentage points.

Overall, we find relatively low usage of formal accounts. Even though all couples included in the study reported that they were interested in opening a savings account with the bank, just 27 percent of the couples had saved in at least one of their new accounts after six months. ATM card provision had a significant impact on account use – overall, couples' use of formal accounts increased by 0.15 standard deviation units relative to the control, savings rates increased by 28 percent (7 percentage points), and average daily account balances increased

[2]ROSCA stands for "rotating savings and credit association". ROSCAs consist of a group of individuals who meet at predetermined intervals (e.g. weekly, monthly) to put a fixed amount of money into a common pot. At each meeting, a different member of the group receives the pot. ROSCAs are by nature illiquid and often quite risky, as group members can defect before the ROSCA cycle is completed.

by 9 percent. However, this net positive impact masks a striking heterogeneous treatment effect by account type. In particular, ATM card provision to joint and men's accounts substantially increased usage (standardized account use, savings rates, and average daily balances increased by 0.24 standard deviations, 40 percent, and 16 percent respectively). This overall impact is equivalent to making 8 additional percentage points of interest available to couples. In contrast, providing ATM cards to women's accounts resulted in *lower* levels of account use that are not significantly different from zero.

We find evidence that this heterogeneous treatment effect may be driven at least in part by the intrahousehold resource allocation concerns described earlier. The key insight is that an ATM card not only makes an account cheaper to access, but it also makes an account less secure (if a husband knows his wife's passcode and can obtain the ATM card, he can access her account without her consent). When an individual has insufficient bargaining power, ATM card provision could result in more resources transferred out of accounts, making the account less attractive *ex ante*. We proxy the relative bargaining power of husbands and wives by using demographic characteristics collected during our baseline survey and find that women with below-median bargaining power had a large and significantly negative response to the ATM card treatment. In contrast, women with above-median power exhibited a small positive response that is not statistically significant from zero. Furthermore, men with below-median bargaining power did not respond to the ATM treatment, while men with above-median bargaining power exhibited a very large, significant, positive response to the ATM card treatment.

These results suggest that both transaction costs and security are important determinants of formal account adoption and use. This implies that transaction cost saving technologies that also make account balances easier to view and access may favor individuals who have more bargaining power within the household, and that incorporating additional security features into transaction-cost reducing technologies (such as biometric scanning) may be a promising way of both reducing costs and making accounts more attractive to individuals with weaker bargaining positions in the household.

The remainder of the paper is structured as follows: Section 2 describes a simple model of individual savings behavior that highlights the role of transaction costs and security in the decision to make use of formal bank accounts. Section 3 describes the experimental design and the data, Section 4 presents the results, and Section 5 concludes.

2 Theoretical Framework

This section presents a simple model of individual savings behavior to motivate the empirical analysis. The primary goal of the model is to highlight two mechanisms by which ATM cards might impact savings behavior: First, the cards reduce transaction costs associated with formal accounts by reducing withdrawal fees and enabling account owners to make withdrawals outside of usual bank hours. Second, ATM cards may make formal accounts less secure, for reasons discussed in the introduction.

Individuals in the model exponentially discount utility, where the per-period utility function is given by $u(c_t)$. We assume that $u(\cdot)$ is well behaved in that it is concave, twice continuously differentiable, and $u'(c) \to \infty$ as $c \to 0$. There are T periods in the world, so at time t, individual utility is expressed as $U_t = \sum_{\tau=t}^{T} \delta^{(\tau-t)} u(c_\tau)$. For simplicity, we assume that there is no uncertainty, and that in each period individuals receive an endowment, y_t. In order to capture intrahousehold bargaining, we can think of y_t as the share of resources allocated to a given individual after transfers to and from others and the bargaining process.

Individuals cannot borrow, but they can save. Specifically, there are two different savings technologies available at any time. First, agents may store resources at home (denoted by h_t). Saving at home has the advantage of having no transaction costs, but it also makes cash more easily appropriated by other members of the household and the community – we capture this by denoting the return (net of transfers) on home savings as R_h, where $R_h < 1$. Alternatively, individuals may save at the bank (denoted by b_t). The key advantage of saving with the bank is that fewer resources are appropriated by outside agents, so the rate of return on bank savings exceeds the rate of return on home savings: $R_b \geq R_h$. However, bank accounts also have transaction costs – in particular, an individual must pay a fee $w > 0$ every time he or she makes a withdrawal.

Then the the individual's optimal consumption and savings allocation is given by the solution to the following constrained maximization problem:

$$\arg \max_{\{c_t, b_t, h_t\}_{t=0}^{T}} \sum_{t=0}^{T} \delta^t u(c_t)$$

subject to

$$c_t + h_t + s_t \leq y_t + R_h h_{t-1} + R_b b_{t-1} + 1(b_t < R_b b_{t-1})\, w \ \forall t$$

$$b_t \geq 0,\ h_t \geq 0 \ \forall t$$

where $1(\cdot)$ is the indicator function. As a result of the lumpy withdrawal fees, this problem is not convex – some individuals will save at home rather than with the bank to avoid

withdrawal fees even when $R_b > R_h$. Individuals will be particularly averse to saving formally when desired savings levels are small (this is due to the fact that w is fixed in absolute terms) and when R_h and R_b are not very different.

The tradeoff between a higher rate of return and lumpy fees versus a lower rate of return and no fee is not new, as illustrated by the canonical work of Baumol (1952) and Tobin (1956). We now use this setup to consider the impact of reducing transactions costs on a variety of outcomes that we observe in our field experiment (savings rates, the number of deposits and withdrawals, average account balances, and withdrawal fees paid). Consider a population of agents with different income streams. When the withdrawal fee is reduced, the number of deposits into and withdrawals from formal bank accounts will increase. Individuals who were already using bank accounts will make more deposits and withdrawals, and other individuals who were not using bank accounts will start to use them. However, the impact on balances in bank accounts is ambiguous, as there are different effects on the intensive and extensive margins. This is easily seen by studying the $T = 2$ case. Consider an agent who was already saving at the bank. Since $R_b > R_h$ she will not save at home, and period 1 and 2 consumption will be governed by

$$u'(y_1 - b_1) = R_b \delta u'(y_2 + R_b b_1 - w)$$

differentiating implicitly, we see that $\frac{\partial b_1}{\partial w} = \frac{R_b \delta u''(c_2)}{R_b^2 \delta u''(c_2) + u''(c_1)} > 0$ (so decreasing w will decrease the amount deposited). The intuition is straightforward – to an inframarginal saver, reducing w is akin to increasing income in future periods. The agent spreads this increase over both periods when allocating consumption, so b_1 must decrease for first period consumption to increase. However, the reduction in the balance must necessarily be small, since consumption in the second period must also go up: $\Delta b_1 < \frac{1}{R_b} \Delta w$. Therefore, particularly in a multiperiod setting, it seems likely that this effect will be outweighed by an extensive margin effect – pre-existing savers will deposit and withdraw from their accounts more frequently (increasing the average daily balance) and individuals who did not save at the bank at all given the higher withdrawal fee will begin to save. As such, we expect a decrease in withdrawal fees to increase formal account savings rates, deposits, withdrawals, and balances. However, the impact of the withdrawal fee on total fees paid is ambiguous. Although the fee goes down, more transactions will occur (among both pre-existing savers and new savers who are brought into the formal sector by the fee reduction) – as such, the net effect will depend on the elasticity of the number of withdrawals with respect to the withdrawal fee. If the elasticity is less than -1, then total fees paid will increase.

However, as discussed earlier, ATM cards may also make bank accounts less secure. We

capture this by assuming that an ATM card reduces R_b (with an ATM card saved resources are more easily appropriated by others, so the net of transfers return on savings goes down). Holding w constant, reducing R_b will reduce the number of deposits and withdrawals. As before, the net impact on the average balance is ambiguous – if the income effect is very large, it could theoretically outweigh the substitution effect *and* the extensive margin effect (though reducing security to the point that $R_b = R_h$ will unambiguously reduce formal account use to zero). In practice, it seems likely that average balances would decline, all else equal.

Overall, the net impact of ATM card provision on formal account use is an empirical question – if the impact of the fee reduction dominates, account use will increase, but if the security effect dominates, account use will decrease. This discussion also suggests the possibility of heterogeneous treatment effects: the impact of ATM cards is more likely to be negative when security effects are important. In the Kenyan context, where women generally have less bargaining power than their spouses, but are often tasked with ensuring that the household saves enough of its income, this suggests that the importance of security effects be greater for women. Our field experiment enables us to empirically estimate the impact of ATM card provision on bank account use. Furthermore, we will exploit features of the experimental design and baseline data to study the empirical relevance of the security effect. The next section describes the experimental context and design, as well as our data. Following this, we present the results.

3 Experimental Design and Data

3.1 Experimental Context

The experiment was conducted in Western Province, Kenya, in areas surrounding the town of Busia. Busia is a commercial trading center straddling the Kenya-Uganda border. The town is well served by the formal banking sector, hosting over six banks at the time of field activities. It is only recently, however, that formal banks have begun to offer products suitable for low income individuals. Traditionally, Kenyan bank accounts required opening balances upwards of Ksh 1,000 (approximately equal to $12.50 at an exchange rate of Ksh 80 per $1, or $19.23 using a PPP exchange rate of Ksh 52 per $1) and charged monthly maintenance fees around Ksh 50 ($0.63).[3] However, recently banks have begun to target lower income individuals, and several banks currently offer lower fee alternatives to traditional

[3]For comparison, the median household in our sample reported Ksh 1,200 in combined income in the week before the survey.

bank accounts.

The financial partner for this study is Family Bank of Kenya. At the time of field activities the bank had over 600,000 customers, 50 branches throughout the country, Ksh 13 billion ($167 million) in assets, and actively targeted low and middle income individuals as part of its corporate strategy. All study participants were offered Family Bank's *Mwananchi* account7733610133. This account can be opened with any amount of money, though a minimum operating balance of Ksh 100 (approximately $1.25) cannot be withdrawn. The account pays no interest, but deposits are free of charge and there are no recurring maintenance fees. The only fees associated with the account are withdrawal fees, which are Ksh 62 ($0.78) over the counter and Ksh 30 ($0.38) with an ATM card.[4] Account holders may purchase an ATM card for Ksh 300 ($3.75), though this is not mandatory.

3.2 Experimental Design

3.2.1 Targeted Population

We examine the impact of providing free ATM cards to a randomly selected subset of 1,113 newly opened Family Bank accounts. These accounts included both joint and individual accounts opened by 748 married couples living in the vicinity of Busia town who did not have a pre-existing account with Family Bank but stated that they were potentially interested in opening one. At the outset of the study, we identified communities surrounding 19 local primary schools, which served as group meeting grounds to implement baseline surveys, complete account opening paperwork, and conduct randomization. These schools were located between 0.2 and 7.7 miles from Family Bank's Busia branch, which is situated in the town's commercial center. Targeted communities were located either on the outskirts of Busia town or in nearby rural areas.

Trained field officers recruited households in communities surrounding a study school the day before each meeting. With the help of a local guide, they made door-to-door visits to homes in the area and issued meeting invitations to eligible households. To be eligible for invitation, a household had to be headed by a married couple, with both spouses present and able to attend the meeting. Couples were targeted jointly in order to study strategic savings behavior in the household (see Schaner (2011) for details) and to study gender differences in savings behavior and savings account use absent a selection effect.[5] In addition, only

[4]These accounts therefore offered both a negative nominal and real rate of return on savings. Year-on-year inflation averaged around 9 percent for the first 6 months of the study period (July-December 2009) and dropped to around 5.5 percent for the remaining 3 months covered by the study (January-March 2010) (Central Bank of Kenya 2009; Central Bank of Kenya 2010).

[5]I.e, it is difficult to answer the question "would targeting men or women for savings accounts lead to

households where both spouses had a valid Kenyan national ID card were admitted to the meetings, as Family Bank requires this document of all account holders.[6]

In order to compensate respondents for their time and to provide an additional incentive to attend the meetings, each individual who participated in the study received Ksh 100 in cash at the end of the meeting. Approximately 29 percent of issued invitations were redeemed over the course of the study. While far from universal, takeup rates are high enough that our sample represents a nontrivial fraction of targeted married couples in our catchment area.

3.2.2 ATM Cards

All couples attending the group meetings were given the opportunity to open up to three Family Bank accounts: an individual account in the name of the husband, an individual account in the name of the wife, and a joint account. To maximize takeup, we funded each opened account with the Ksh 100 ($1.25) minimum operating balance (this amount could not be withdrawn by participants – it simply made opening an account costless). Each newly opened, ATM-eligible account was randomly allocated to either the ATM treatment group (in which case the account received an ATM card for free) or the control group.[7] The free ATM selection probability was 0.15 for the first six experimental sessions (193 open accounts, or 17 percent of all open accounts) and 0.25 for the remaining 27 experimental sessions (920 accounts). Making ATM cards free could impact observed account use through both a direct effect (account use with the card differs relative to the counterfactual) and a composition effect (the pool of open accounts changes). In order to study the direct effect absent the composition effect, the ATM card treatment was assigned conditional on account opening.

Since the majority of respondents did not have prior experience with bank accounts (or ATM cards), enumerators carefully explained how the bank accounts and ATM cards

greater total savings in formal accounts?" if selection into study participation is different for men and women. Our sampling strategy eliminates this selection problem, so that we can look at gender differences between men and women belonging to the same population of households.

[6]This requirement is common to all banks in Kenya. The majority of individuals in Kenya have a national ID card as it is legally required of all adult citizens and necessary in order to vote, buy or sell land, and seek formal employment.

[7]Respondents were given the choice between two types of joint accounts. The first, dubbed "either to sign" required the consent of either spouse to make withdrawals. These accounts were eligible for ATM cards. The second, dubbed "both to sign" required that both spouses appear in person, together at the bank in order to make withdrawals – as such, these accounts were not eligible for ATM cards. Overall, "either to sign" accounts were much more popular with respondents – 93 percent of couples opening a joint account opted for this type of joint account. We exclude all couples who only opened a "both to sign" joint account from the analysis, and we exclude 8 "both to sign" joint accounts from our account-level analysis of the impact of ATM cards. Results are unchanged if we simply drop these 8 couples altogether. A subset of individual accounts were also randomly selected to be eligible for an information sharing intervention. The details of this intervention are described in Schaner (2011). We do not discuss this intervention further here, as it has no impact on our results.

worked, as well as the withdrawal fees associated with the accounts and cards. When an opened account was randomly chosen to receive a free ATM card, respondents were informed that the Ksh 300 ATM card fee would be paid on their behalf, and that they could retrieve their card at the bank branch. Due to technical constraints on the part of Family Bank, only one free ATM card was issued for both individual and joint accounts. In the case of joint accounts, it was up to the couple to decide how to allocate the card between spouses.

3.2.3 Interest Rates

Additionally, each potential account was randomly assigned a temporary 6-month interest rate of either 0, 2, 6, or 10 percent (unlike the ATM treatment, couples were informed of their interest rate assignment before deciding which accounts to open).[8] Joint accounts could earn 2, 6, or 10 percent interest with equal probability while individual accounts could earn 0, 2, 6, or 10 percent interest with equal probability. This design, illustrated in Figure 1, created random variation in the maximum interest rate available to couples participating in the study. In particular, 7 percent of couples had a maximum interest rate of 2 percent, 31 percent of couples had a maximum interest rate of 6 percent, and 62 percent of couples had a maximum interest rate of 10 percent.

3.3 Data

We use two data sources for this project – survey data from one-on-one baseline questionnaires administered during the group sessions (spouses were separated for the interviews) and administrative data on account use from the bank. The baseline survey collected basic demographic information, as well as information on individual discount rates and time inconsistency, decision making power in the household, income, and current use of a variety of savings devices. The discount rate elicitation procedure warrants special mention here: as detailed in the Appendix, the baseline survey asked individuals to choose between different amounts of money at different times in order to directly elicit time preferences. To incentivize the questions, each respondent was given a 1 in 5 chance of winning one of his choices. The majority of respondents winning a cash amount chose to have it deposited into a newly opened bank account. As a result, cash prize selection resulted in higher rates of account use – we will explicitly control for this throughout the analysis. The administrative data provided by the bank includes the first six months' transaction history of all accounts

[8]These percentages are 6-month yields. Annualized yields are approximately double the quoted rates. Interest was paid on the first six months' average daily balance and balances earned no interest thereafter. Respondents were aware of the temporary nature of these interest rates from the outset of the study.

opened under the auspices of the project. Each entry in the transaction history includes the deposit or withdrawal amount, any fees, and the type and time of the transaction.

3.4 Sample Characteristics and Randomization Verification

The sample consists of 1,113 ATM card-eligible joint and individual bank accounts opened by 748 married couples who had valid national ID cards and no pre-existing accounts with Family Bank. Table 1 presents summary statistics for these couples. Respondents are of relatively low socioeconomic status – husbands average 8 years of schooling, and their wives average just under 6 years. While most men are literate (85 percent), one third of women cannot read and write. On average, men reported earning Ksh 1,662 (about $21) in the past week, while women reported earning Ksh 815 ($10). However, median reported weekly incomes are substantially lower, at Ksh 700 and Ksh 300 for husbands and wives respectively.

Almost all (98 percent) of respondents reported using at least one savings device at baseline, with use of informal devices much more common than use of formal or semi-formal devices. Most common was saving cash at home, reported by 85 and 90 percent of husbands and wives respectively. Reported savings levels at home were substantial and approximately equal to average weekly earnings. ROSCAs were also very popular, with 49 percent of men and 66 percent of women reporting belonging to at least one group. Savings accounts with formal banks were less common, particularly for women – while 32 percent of men reported owning a savings account (and those men reported substantial savings in their accounts), just 12 percent of women reported owning a savings account. These numbers are very similar to reported use of mobile phone money storage technologies, though bank accounts have much larger balances. Least common was ownership of a SACCO account – just 7 percent of men and 1 percent of women reported belonging to a SACCO at baseline.[9] The large savings balances in bank accounts and SACCO accounts in part reflect higher incomes of these account owners. However, the secure and formal nature of these devices may also make them more appealing for storing large sums of money: the average home saver stored 1.5 weeks of his income at home, while bank account owners stored 7.8 weeks of their income at the bank and SACCO accounts were used to store 38 weeks of income.

Although women in developing countries are generally thought to have less bargaining power than their husbands, questions regarding savings decision making power reveal that both genders frequently reported that women made savings decisions (49 percent of women and 43 percent of men). This may also reflect social norms: women in developing countries

[9]This is not surprising given the low incidence of formal sector employment in our sample. SACCO stands for "Savings and Credit Co-Operative". In Kenya they function much like credit unions and are organized around higher paying formal occupations such as teaching and commercial farming.

are often tasked with investing in the needs of the family and household (Bruce 1989). Still, a substantial share of respondents reported that men were responsible for deciding how much to save (28 percent of women and 37 percent of men). In contrast, few individuals reported joint or independent decision making regarding savings.

Table 2 checks that the randomization of free ATM cards, of cash payments made to incentivize discount rate elicitation, and of the maximum interest rate available to the couples was successful. Since randomization was conducted in the field, with respondents drawing folded envelopes from tins, we check that (1) proportions treated do not differ from their theoretical selection probabilities and (2) treatment status is uncorrelated with observable demographic characteristics. Panel A of the table displays the results of the first exercise. P-values from a binomial test that realized proportions are equal to theoretical proportions are reported in braces. Overall, realized probabilities for ATM cards and cash prizes are slightly lower than, though not significantly different from, theoretical probabilities. Theoretical and actual probabilities are also very close for the maximum interest rate.

Panel B presents the results of separate regressions of demographic characteristics on treatment indicators. All regressions use both husband and wife demographic characteristics and cluster standard errors at the couple level.[10] Since ATM card and cash prize receipt are binary treatments, we report coefficients and standard errors on treatment indicators in the first four columns. Since the maximum interest rate could take on values of 2, 6, or 10 percent, we regress demographic characteristics on dummy variables for 6 and 10 percent interest, and then present results of an F-test that these dummy variables are jointly equal to zero.

Overall, the randomization appears to have functioned well, with significant differences appearing at a rate approximately equal to that which would appear due to chance. We do note that cash prize provision for women is significantly (and negatively) correlated with ATM card provision for women's accounts, and also correlated with the maximum interest rate. Since cash prizes could be deposited into bank accounts, and since the majority of individuals chose to do so, prize provision significantly increased measures of bank account use. For this reason, we control for cash prize receipt throughout our analysis (results are also unchanged when controlling for the laundry list of demographic characteristics on Table 2).

We are now prepared to discuss our results. We begin by briefly characterizing account use in the absence of ATM cards. We then report how ATM card provision impacted account

[10]The exception is when the outcome is the interest rate. Here we regress the free ATM indicators on the interest rate of the relevant account. For the cash prize column, we use the interest rate of the husband/wife's individual account, if it is open, and the interest rate on the joint account otherwise.

use, and close the section by presenting evidence that the positive impact of the ATM card treatment is concentrated among individuals with relatively more bargaining power within the household.

4 Results

4.1 Summary of Account Use

Table 3 presents account use summary statistics. We present summary statistics for the entire sample (Panel A) and for the subset of couples where neither spouse was randomly selected to receive a cash prize (Panel B). Columns 1-3 present means and standard deviations of a variety of account use measures by account type. In these columns we drop individual accounts randomly selected to receive zero percent interest – this equalizes the interest rate distributions for joint and individual accounts. For each account type, we present the share of potential accounts that were actually opened, and then limit the sample to open accounts that were not randomly selected for the ATM treatment and present averages for measures of account use including savings rates, the average daily balance, the number of deposits and withdrawals, and transaction fees paid. Columns 4-6 present differences (and associated standard errors) in account use measures between account types. Finally, in order to give a picture of *overall* use of Family Bank accounts by couples in the study, the last column presents a summary of aggregate account use at the couple level. This column includes all couples and accounts, and displays the average number of accounts opened by a couple, the share of couples who saved in any account at all, the average daily balance stored in all accounts, and so on.

Overall, joint accounts were much more popular than individual accounts – the first row of each panel illustrates that two thirds of couples opened a joint account, whereas 45-47 percent of couples opened individual accounts, with no significant difference in the rate opening for men's and women's accounts. Even though we targeted a sample of individuals who stated that they were interested in opening a bank account, rates of actual account use were relatively low. Column 7 illustrates that just 45 percent of couples saved in any one of the three accounts, and this number drops to 27 percent when we exclude couples who won at least one cash prize.

These usage rates are notably lower than those documented by Prina (2011) (among a sample of Nepalese women in urban slums) and Dupas and Robinson (2011), among a sample of Kenyan small-scale entrepreneurs.[11] Inspection of columns 4-6 of Table 3 also reveals that

[11]The contrast with Prina (2011) likely reflects very different contexts and savings products (the accounts

even conditional on opening, joint accounts were substantially more likely to be used for saving than individual accounts. Joint accounts also appear to be used by more small-scale savers – despite the higher savings rates, joint accounts do not have higher average daily balances when compared to individual accounts. Men and women are equally likely to save in their individual accounts, and also have very similar average daily balances.[12] One reason baseline usage was so low could be the substantial transaction costs associated with using the accounts. We now ask whether substantially reducing these costs through ATM card provision can meaningfully increase account activity.

4.2 ATM Cards and Account Use

We study several measures of account use that, in the model absent security concerns presented in Section 2, should increase when withdrawal fees fall. These include a dummy variable indicating that an account was used for saving, the average daily balance in the account, the number of deposits, and the number of withdrawals.[13] Given the large number of outcomes, we will also study the impact of the ATM treatment on a measure of standardized account use, where we follow the methodology of Kling, Liebman, and Katz (2007). We standardize each variable relative to the subset of the control group that did not receive a cash prize (pooling all accounts). Since the net effect of the ATM card on total fees paid is theoretically ambiguous in even the standard model, we present estimates for this outcome separately.

First we illustrate the impact of the treatment graphically. Figure 2 graphs the CDFs of the standardized account use measure by account type and treatment group. For both joint and husband's accounts (Panels A and B), the CDF for accounts that received a free ATM card is everywhere below the control group CDF, suggesting that the ATM card substantially impacted a variety of quantiles (of course, given the large share of couples who did not save

in her study bore 10 percent nominal interest, had no use fees, and had lower time and travel costs to go to the bank branch). In contrast, Dupas and Robinson (2011) conducted their study in a similar part of Kenya, and the bank accounts offered to both study populations had similar fees. In this case the difference in use is likely because Dupas and Robinson exclusively targeted small-scale entrepreneurs, who may have had a greater need for formal bank accounts. Furthermore, we offered each individual Ksh 100 in compensation for participating in our baseline sessions. This may have selected some couples who had limited interest in bank accounts but low opportunity costs of time.

[12]Though many savers use their accounts infrequently and store small sums, a small number of the couples in our sample used their new accounts very intensively. For example, while the median couple who saved (in the absence of cash prizes) accrued an average daily balance of just Ksh 844 ($10.55) in all its Family Bank accounts, the 75th percentile couple saved Ksh 1,584 ($19.80), and the 99th percentile couple saved Ksh 14,439 ($180.49).

[13]Since all open accounts had a positive average daily balance and a small number of accounts had very large average daily balances, we use the log of the average daily balance in this and all subsequent analysis. Results are similar, though less precisely estimated, if we use the level instead.

at all in both treatment and control, the treatment effect must necessarily be concentrated at upper quantiles). In contrast, inspection of Panel C reveals that the CDF for women's accounts that received the free ATM treatment is everywhere above the CDF of the control group. This is not driven by the correlation between cash prize and ATM card selection – the pattern is essentially unchanged when only studying accounts owned by women who were not randomly selected for a cash prize.

Table 4 tests for significance of these observed differences by estimating the impact of ATM card provision on our full range of account use measures. All regressions are of the following form:

$$y_{ac} = \beta_0 + freeatm'_{ac}\gamma + x'_{ac}\delta + \epsilon_{ac} \quad (1)$$

where y_{ac} is the outcome of interest (as measured 6 months after account opening) for account a owned by couple c, $freeatm_{ac}$ is a vector of dummy variables indicating free ATM card receipt, and x_{ac} is a vector of controls. These controls include a dummy variable for the first six experimental sessions (since ATM selection probability was lower for these sessions), account type dummy variables, separate dummy variables for husband and wife's cash prize receipt, and the interaction of these dummies with the account type dummies. In all regressions we limit our attention to open accounts, since ATM cards were randomly allocated conditional on account opening.

The first column of Table 4 reports the first stage – the impact of the free card treatment on whether or not an account had an active ATM card. ATM card fees are quite significant given the low incomes of our study population: in the control group, respondents purchased ATM cards for just 7 percent of their accounts. Since the free card treatment ensured that an account received an ATM card, the first stages are very substantial. As such, we focus on the reduced form impact of free ATM card provision for the remainder of the analysis.

Panel A of Table 4 studies the impact of the ATM treatment separately by account type (here the ATM treatment dummy is interacted with account type dummies). Inspection of Panel A reveals positive impacts of ATM card provision on use of joint and men's accounts. These impacts are large relative to dependent variable means – in particular, column 2 illustrates that ATM card provision resulted in a 0.302 standard deviation increase in joint account use and a 0.265 standard deviation increase in husbands' account use. Given the very large elasticities of withdrawals with respect to the fee (-4.1 for joint accounts and -4.6 for husbands' accounts), total fees paid on both types of accounts more than doubles, though these estimates are imprecise. Furthermore, the impacts of the ATM treatment on joint and husband's accounts are strikingly similar, and never significantly different from one another. In contrast, point estimates for wives' accounts are much smaller and almost always negative. Though we cannot reject that any of them are equal to zero (or positive), we can reject that

the impact on standardized use of wives' accounts is equal to the impact on joint (at the 95 percent level) and husbands' accounts (at the 90 percent level).

Panel B illustrates that when studying all accounts together, the ATM card treatment significantly increased account use by 0.19 standard deviations. However, the negative estimates for women are quite striking, especially given that the patterns and magnitudes are so different from those observed for joint and men's accounts. To economize on power, Panel C constrains the ATM treatment effect for joint and men's accounts to be the same and tests whether impacts for women are significantly different by including an interaction between the free ATM indicator and the wife's account indicator. When pooling accounts this way, we estimate large, significant impacts for joint/husbands accounts. The treatment increased aggregate account use by 0.29 standard deviations, increased savings rates by 40 percent (7.7 percentage points), and increased average daily balances by 23 percent. We strongly reject that the treatment effect for women's accounts is equal to the treatment effect for other accounts.

The estimated impacts on the use of joint and men's accounts are large – however, an account-level analysis cannot determine whether the ATM effect reflects an *aggregate* increase in couples' use of bank accounts, or if the impact is driven by *substitution* between multiple accounts owned by the same couple. Table 5 studies substitution directly by presenting results of the following specification:

$$y_c = \beta_0 + \beta_1 freeJ_c + \beta_2 freeH_c + \beta_3 freeW_c + x_c'\delta + \epsilon_c \tag{2}$$

where y_c is the outcome of interest (a measure of use for either joint, husbands' or wives' accounts), $freeJ_c$, $freeH_c$, and $freeW_c$ indicate selection for the ATM treatment for the joint, husband's and wife's account respectively, and x_c is a vector of controls. We use this specification to see whether receiving an ATM card on an account other than the one of interest decreased use of the account of interest. One complication is that the vast majority of couples did not open all three accounts, and ATM cards were randomized conditional on account opening. To account for this, x_c includes dummy variables that fully saturate every combination of account opening choices as well as a dummy variable for the first 6 experimental sessions and two separate dummy variables indicating husband and wife cash prize selection.[14] The first panel presents results for joint accounts. Here we see that couples did not reduce use of joint accounts if they received an ATM card on an individual account –

[14]The combination of account opening choices separately accounts for the 8 joint accounts that were opened but not eligible to receive a free ATM card because they were "both to sign". In total, 10 different account opening combinations were realized, though most couples either opened just an "either to sign" joint account (53 percent of the sample) or two individual accounts (31 percent of the sample).

in fact, point estimates are large and positive, though generally insignificant. This is partly because coefficients on individual ATM card provision are only identified off of those couples who opened both a joint account and the individual account of interest, and only 72 couples opened both a joint and husband's account, while 66 couples opened both a joint and wife's account. We therefore expect that the observed positive impact of ATM cards on joint accounts largely reflects increased use of Family Bank accounts.

Panels B and C examine husbands' and wives' accounts respectively. Here, we do find evidence that ATM card receipt on joint accounts crowded out individual account use, despite the small sample sizes cited above. In Panel B, we also find evidence that when women received a free ATM card, their husbands decreased use of their own individual accounts. This result is somewhat unexpected, since women do not respond to the ATM treatment on their own accounts. One possibility is that men reduced their own account use, expecting that their wives would save more in response to the ATM treatment. Indeed, the magnitudes of the wife's and husband's ATM treatments in Panel B are very similar but opposite in sign, suggesting that men may have adjusted their account use downwards, anticipating that their spouses would respond to the ATM treatment the same way they would have. A more troubling possibility is that those couples who received the wife's ATM treatment just so happened to be less likely to save regardless. Though we cannot rule this out, the balance on observables between the wife's ATM treatment and control groups in Table 2 and the lack of a similar pattern for joint accounts in Panel A of Table 5 suggest that this possibility is unlikely.

Given that couples did substitute between accounts, what was the impact of ATM cards on overall use of Family Bank accounts? Table 6 studies this question by analyzing couple-level aggregates of account use as outcomes (i.e. whether or not a couple saved in any account, the average daily balance in all Family Bank accounts etc.). This analysis also allows us to compare the impact of ATM card provision to the impact of the maximum interest rate available to the couple.

Panel A of Table 6 studies each ATM treatment separately by presenting results of a specification given by equation 2. Panel B presents results of a specification where the account-specific treatment indicators are replaced with a dummy variable that is equal to one if the couple was selected for *any* free ATM card. Panel C presents a specification where two treatment dummy variables are included – one indicating that a couple received a free ATM card on the joint or husband's account, and one indicating that a free ATM card was given to the wife's account. We standardize aggregate account activity relative to couples who were not selected for any free ATM cards and did not receive any cash prizes.

Panels A-C demonstrate that the substantial account level impacts in Table 4 largely

reflect increases in aggregate account use at the couple level. The first column of Panel C illustrates that receipt of a joint or husband's ATM card resulted in an increase in a 0.239 standard deviation unit increase in overall account useage. The F-tests reported in Panel C clearly reject that the impact of wives' ATM cards and joint/husbands' ATM cards are the same. However, an important caveat is in order – although we can state whether or not the ATM treatment increased saving in Family Bank accounts, we cannot tell if this savings represents crowd-out from other savings devices, or if this represents mostly new savings. This is a limitation of our data collection strategy, which did not include an endline survey.

Panel D studies the impact of the maximum interest rate available to the couple on aggregate account use. Note that in this case, it is not appropriate to control for combinations of open accounts (since account-specific interest rates had a robust impact on the decision to open a given account), so we estimate the impact of interest rates in a separate regression of the following form:

$$y_{ac} = \beta_0 + \beta_1 max6_c + \beta_2 max10_c + x_c'\delta + \epsilon_c \tag{3}$$

where $max6_c$ and $max10_c$ indicate that the maximum interest rate available to couple c was 6 percent and 10 percent respectively and x_c includes a dummy variable for the first 6 experimental sessions and separate dummy variables for cash prize selection of men and women.[15] For the aggregate effect, we use the same standardization (treating couples not selected for any free ATM card or cash prize as the reference group) in order to ensure that magnitudes are comparable across panels in the table.

Panel D illustrates that aggregate account use responded robustly to the maximum interest rate – in particular, couples who received a maximum rate of 10 percent had aggregate account activity 0.232 standard deviations above that of those couples who received a maximum rate of 2 percent. This impact of 8 additional percentage points of interest is nearly identical to the impact of providing a free ATM card to the joint or husband's account. The relative cost-effectiveness of these two different ways of encouraging account use (interest or ATM card subsidies) depends on the cost structure of the bank. At one extreme, if the marginal cost of additional transactions is close to zero (so fee revenue represents profit) then ATM card provision would be more attractive. At the other extreme, if the fees charged by the bank are equal to the marginal costs then interest rate subsidies would be more attractive.

[15] One concern is that the maximum interest rate is correlated with the type of accounts opened and therefore ATM treatment status. However, our results are virtually unchanged if we account for this by including "synthetic" free ATM treatment indicators which are equal to actual ATM treatment status for open accounts and a randomly assigned hypothetical ATM treatment status for unopened accounts.

The heterogeneous treatment effect with respect to account type is striking: while women's accounts respond to the ATM treatment quite differently than joint/men's accounts, both men and women have remarkably similar rates of saving and average balances in the control group (recall Table 3). The gender difference is unlikely to be driven by selection on *couple* level unobservables, since couples generally opened both individual accounts together: 86 percent of couples who opened an account for the husband also opened an account for the wife and 89 percent of couples who opened an account for the wife also opened an account for the husband. The question then becomes, what is it about women that makes their response to the ATM treatment so different? As illustrated by Section 2, if women generally have less bargaining power than their husbands and the ATM treatment had an important security effect, then this could generate the patterns that we observe. The primary focus of the next subsection is discussing and testing this hypothesis. However, Table 1 highlights that women differ from men on a wide variety of important demographic characteristics. For example, women have lower educational attainment and literacy levels – if they did not understand the benefits of the ATM cards while their husbands did, this could explain the zero impact of cards on women's accounts. They also have smaller stores of savings, particularly in bank accounts and SACCOs – if the observed positive treatment effect is driven by substitution between previously owned formal accounts and new Family Bank accounts, this could generate the patterns in our data. Women are also more likely than men to be time inconsistent, which could generate the patterns we observe for reasons discussed in the introduction. Given this, we will explicitly account for these competing hypotheses in the subsequent analysis.

4.3 Bargaining Power and ATM Card Treatment Effects

A growing body of literature documents that individuals make financial decisions strategically in order to manipulate intrahousehold resource allocation in their favor. In a lab experiment in the Philippines, Ashraf (2009) documents that spouses who report that they do not have control over savings decisions allocate experimental winnings so as to increase their own personal consumption. In India, Mani (2010) finds that individuals in married couples are willing to sacrifice experimental earnings in order to ensure that these earnings are deposited in their own individual bank account rather than a spouse's account. In Kenya, Anderson and Baland (2002) show that ROSCAs are most popular among women with intermediate levels of proxied bargaining power – the authors hypothesize that at these levels of bargaining power, women can use ROSCAs to tilt household consumption towards goods that they favor. Finally, using a sample including many of the couples considered in

this paper, Schaner (2011) presents evidence that couples who are badly matched in terms of rates of time preference strategically use bank accounts to manipulate household savings levels.

In all these studies, choices with strategic value enable the decision maker to securely sequester or hide resources from his or her spouse. In our context, individual bank accounts are useful for this reason because they can only be accessed by the account owner. However, ATM cards may dilute the strategic value of individual accounts – suppose a husband learned his wife's ATM passcode – then he would be able to make withdrawals from (and learn the balance of) her account through the ATM. Absent the ATM card, he would have to force the wife to make withdrawals herself, in person, at the bank. Furthermore, when the withdrawal cost is reduced, it may be more difficult for an account holder to refuse to make a withdrawal for her spouse (or for another member of her family or the community). If spouses make use of individual accounts strategically and value these accounts for security, then making an ATM card available could make the individual account less attractive. ATM cards may be particularly unattractive to spouses with low bargaining power, since they already have difficulty resisting demands made by their partners.[16] Of course, one may ask "if the ATM card harmed the security of an individual's account, why wouldn't she just throw it away?". Our ATM card randomization was conducted when the couples were sitting together, so card receipt was public information. This may have made it difficult for an individual to simply dispose of the card if it was of interest to the spouse. Since women generally have less bargaining power than men in Kenya, this theory could explain why, on average, women do not respond to the ATM treatment. To test this hypothesis, we study whether the response to the ATM card treatment among individual accounts varies with the relative bargaining power of the account owner.

Unfortunately, spousal bargaining power is unobservable, so we use intrahousehold differences in demographic characteristics to measure women's relative power. We follow a large body of theoretical and empirical literature in assuming that demographic and economic characteristics that improve an individual's utility outside the marriage (or in a non-cooperative equilibrium within the marriage) lead an individual to have greater household bargaining power.[17] In particular, we assume that having higher income, having more years of education, being more literate, and being older than a spouse correlate with greater relative

[16] As highlighted by Anderson and Baland (2002), It is not obvious that this relationship should be monotonic in bargaining power. Women with very low bargaining power may simply forfeit control of accounts to their husbands regardless of the ATM card. However, there is no evidence of such a nonlinear relationship in our data, so we focus on the distinction between high and low bargaining power.

[17] Examples include Anderson and Baland (2002), Angrist (2002), Browning and Chiappori (1998), Chiappori, Fortin, and Lacroix (2002), Lafortune (2010), Lundberg and Pollak (1993), Lundberg, Pollak, and Wales (1997), Manser and Brown (1980), McElroy and Horney (1981), and Thomas (1994).

bargaining power.[18] First, we standardize each of these four variables at the individual level by subtracting the sample mean and dividing by the sample standard deviation. We then proxy the wife's relative bargaining power by the average difference between her values for these variables and her husband's values for these variables:

$$power_c = \frac{1}{4}\sum_{x \in X}\left(x_c^w - x_c^h\right)$$

Figure 3 plots the histogram of $power_c$ among the 698 couples where both spouses had nonmissing values for the four characteristics included in the index. As expected, husbands have more proxied bargaining power than wives – just 17 percent of women have greater proxied power than their husbands and the median difference between wives and husbands is -0.34 standard deviation units.

To check if that bargaining power index is correlated with baseline savings behavior, Figure 4 presents results of local linear regressions of baseline self-reported account use on the bargaining power index. Indeed, savings device use for husbands (Panel A) and wives (Panel B) is generally correlated with the index and results are symmetric across genders. When men have relatively more bargaining power, they are less likely to save at home and more likely to save at the bank/SACCO and on the phone. In contrast, women are more likely to save in the bank/SACCO and on the phone and less likely to save at home when *they* have more bargaining power.[19] These correlations are consistent with the idea that spouses with more bargaining power are more economically empowered, and runs counter to the possibility that the proxy is picking up characteristics that are common to both members of the couple (in which case we would expect similar, rather than symmetric but opposed, patterns of baseline individual savings device use). On the other hand, if individuals with less bargaining power differentially value security, it is surprising that they are also more likely to save at home.

Since so few women have greater absolute proxied bargaining power when compared

[18]The reasoning for the first three is clear. It is less clear that being older than a spouse should increase bargaining power (for example, younger spouses may have a greater chance of meeting another high quality match if they reenter the marriage market). However, in many developing countries, including Kenya, women are often substantially younger than their husbands (the average gap in our sample is 7 years). Younger wives may have difficulty challenging the authority of their husbands, who can assert that they have more practical and life experience and are therefore better qualified to make decisions (Jensen and Thornton 2003).

[19]The correlations in Figure 4 are generally significant: when regressing savings device use on bargaining power and its square, we reject that the bargaining power terms are jointly equal to zero at the 90 percent level for husbands' ROSCAs and at the 95 percent level for husbands' home savings and all measures for wives. We also note that we do not find the patterns with respect to bargaining power and ROSCA use that are highlighted by Anderson and Baland (2002), even though relative income is an important input into our proxy.

to their husbands, we define a woman to be "relatively advantaged" in terms of bargaining power if $power_c$ is above the sample median. The following account-level specification studies heterogeneous impacts of ATM cards by bargaining power:

$$y_{ac} = \beta_0 + \beta_1 freeatm_{ac} + \beta_2 freeatm_{ac} \times wifeadv_c + \beta_3 wifeadv_c + x'_{ac}\delta + \epsilon_{ac} \qquad (4)$$

where all variables are as defined in equation 1 and $wifeadv_c$ is an indicator that the wife's relative bargaining power in couple c is above the sample median.[20]

Table 7 presents the results when the standardized measure of account use is the outcome of interest. Panel A of Table 7 presents the results of this specification for men's and women's accounts only. Panel B presents results from a couple-level specification where equation 2 is augmented to include interactions of each ATM card treatment with the bargaining power variable (coefficients for the joint account are omitted from the table for clarity). We also limit the sample in this specification to those couples who opened at least one individual account, since we are interested in studying the impact of ATM cards on individual accounts. In the first column we present a specification in which we only allow the account-specific treatment effect to vary by the bargaining power proxy. One issue with the bargaining power proxy is that individuals with greater proxied relative bargaining power also have higher levels of income and human capital. To account for this in the second column we include controls for age, education, literacy, and income of the account owner, as well as interactions with the ATM treatment, thereby identifying the "wife advantaged" heterogeneous treatment effect off of intrahousehold differences in these variables.[21] To test to see if our results are driven by time inconsistency, we also allow for treatment effect heterogeneity with respect to impatient now-patient later and patient now-impatient later time preferences.

Figure 4 made it clear that the bargaining power index is correlated with baseline savings behavior, which could well mediate individuals' responses to ATM cards. To check the robustness of our results, the third specification allows for treatment effect heterogeneity with respect to baseline savings device use, including formal accounts (here, we define both bank accounts and SACCO accounts as formal accounts, since they have similar features and are often used to store large amounts of savings at baseline), mobile money, ROSCA,

[20]Results are similar using an absolute threshold of $power_c \geq 0$ or the continuous index value, though they are less precise. Results are also very similar for women when we aggregate the demographic differences using principal components analysis instead of a simple average. Overall the results are very robust for wives and less so for husbands, suggesting that bargaining power may be a greater concern for women. Proxied bargaining power is missing for 50 of 748 couples due to missing input variables. For these couples, we set $wifeadv_c = 0$, dummy them out separately, and include an interaction of the missing dummy with the free ATM card dummy.

[21]In the couple-level specification, we control for averages values of these variables across husband and wife.

and home savings. However, we caveat that it is not obvious that these controls should be included, namely if baseline account use is an outcome of relative bargaining power in the household. The fourth column allows for heterogeneous treatment effects with respect to both the demographic and savings device control sets.

Note that the interpretation of the free ATM main effect therefore changes from specification to specification and it is not unexpected for its sign and significance change dramatically. For example, in the first column it is the ATM treatment effect for households in which the wife has below median bargaining power. In the second specification, it is the treatment effect for households in which the wife has below median bargaining power *and* in which the individual is illiterate, has no income or education, and is age zero. Clearly no individuals actually meet this criterion (this is also true for the specifications in columns three and four), so we do not focus on the main effect in the latter three specifications.

Panel A reveals that men's positive response to free ATM cards is concentrated among households where men have above median proxied bargaining power. In contrast, when women have relatively more bargaining power, the treatment effect for men is -0.043 standard deviation units, which is not significantly different from zero. Although the coefficient on the ATM×bargaining power interaction is only marginally significant in the first two specifications and loses significance upon controlling for baseline account ownership (though in column three the p-value is a still small 0.12), it remains very large in magnitude. In contrast, the opposite pattern emerges for wives' accounts. In particular, women with below median proxied bargaining power displayed a sizable negative response to ATM cards, while women who have more bargaining power responded positively to the ATM treatment (though the estimated treatment effect of 0.093 is not significantly different from zero). The coefficient on the interaction term is quite robust, and actually increases in magnitude and significance upon adding demographic and baseline savings controls. The asymmetry by gender is striking: the same set of households that respond *negatively* to the ATM treatment on women's accounts respond *positively* to the ATM treatment on men's accounts.

We also note that the specifications in columns 2 and 4 also provide no evidence that financial literacy/education and time inconsistency are responsible for the gender difference in ATM card treatment effects – the coefficients on the interactions of these variables with the ATM card treatment, which are omitted for clarity, are not significantly different from zero. Another notable pattern present in Panel A is that in the absence of ATM cards, women and men make somewhat less use of their individual accounts when they have relatively more bargaining power. This may be because individuals with relatively little bargaining power make excessive use of their secure individual accounts in order to manipulate household consumption and/or savings allocations. Alternatively, individuals with more bargaining

power were also more likely to have a bank account at baseline – it may be that these men and women only use their new bank accounts when they offer better terms (e.g. withdrawals at the discounted ATM card price). However, the robustness of our results to the inclusion of heterogeneous treatment effects with respect to baseline account ownership imply that this sort of substitution is not driving the bargaining power results.

Panel B demonstrates that these patterns persist when examining aggregate couple-level account use, though significance of the results is attenuated. Overall, our results are consistent with the hypothesis that security concerns are an important mediator of individuals' responses to ATM cards. Of course, since we rely on a demographic proxy of bargaining power, and because true bargaining power may well be correlated with a host of other individual- and couple-specific traits that could influence bank account use, we cannot rule out that our results are driven by a correlation between the demographic proxy and other determinants of account use. As a robustness check, we exploit the fact that our experimental design included the provision of both interest rates and ATM cards. Specifically, we observe that use of all three types of accounts significantly increased when the account was randomly assigned a higher interest rate. However, unlike ATM cards, higher interest rates do not change the security or accessibility of accounts. If our bargaining power proxy is simply identifying couples who have differential sensitivities to improved account terms, we should see similar heterogeneous treatment effects for interest rates and ATM cards.

Table 8 repeats the analysis in Table 7 for interest rates.[22] For ease of interpretation, we study a dummy variable for "high interest", set equal to one when an account was randomly selected to receive 6 or 10 percent interest. Results are similar using alternative measures, such as the interest rate itself. Table 8 reveals that higher interest rates on both husbands' and wives' accounts increased account use, but that this treatment effect is not significantly different in households where the wife is relatively advantaged. Moreover, the point estimates on the interaction terms are much smaller in magnitude than the ATM estimates and actually point in the *opposite* direction of the ATM interaction effects. This is comforting, and suggests that our bargaining power proxy is not simply identifying couples who are differentially sensitive to improved terms on their bank accounts.

The results in Table 7 suggest that bargaining power could be driving at least part of the gender difference in treatment effects documented earlier. We now test this more directly,

[22]Since interest rates were randomized unconditional on account opening, we include all potential individual accounts in Panel A and all couples in Panel B. If an account was not opened, we coded the average daily balance to Ksh 100 and the number of deposits to 1 (equivalent to values for couples who opened an account but never used it). Results are qualitatively the same if we code the number of deposits and average daily balance in unopened accounts to 0. It should be noted that since accounts earning higher interest were more likely to be opened, higher interest rates are correlated with ATM card provision – however, this will bias us towards finding similar treatment effect patterns for interest rates and ATM cards.

by again focusing only on individual accounts and running an account-level specification of the following form:

$$\begin{aligned} y_{ac} &= \beta_0 + \beta_1 freeatm_{ac} + \beta_2 \left(freeatm \times wife\right)_{ac} + \beta_3 wife_{ac} + \\ &\quad \gamma_1 \left(freeatm \times bp\right)_{ac} + \gamma_2 bp_{ac} + x'_{ac}\delta + \epsilon_{ac} \end{aligned}$$

where $wife_{ac}$ indicates that the individual account is owned by the wife and bp_{ac} is the average difference (in standard deviation units) in age, education, literacy, and income between the owner of account a and his or her spouse. The vector x_{ac} includes the usual cash prize and experimental session controls. We also phase in controls for the demographic and baseline savings device variables included in Tables 7 and 8, as well as interactions of these variables with the ATM treatment. The odd columns of Table 9 present the results without the terms involving proxied bargaining power.

The first column illustrates that without allowing for any other heterogeneous treatment effects, the gender gap in response to the ATM treatment across men's and women's individual accounts is -0.32 standard deviation units, which is significantly different from zero. The second column illustrates that allowing the treatment effect to vary by bargaining power reduces the gender gap by 77 percent. Furthermore, individuals who have relatively more bargaining power have a significantly larger, more positive response to the ATM treatment. The coefficient is also robust in magnitude across specifications, though it loses significance when allowing for heterogeneity with respect to demographic characteristics. However, the next three pairs of columns show that after allowing for heterogeneous treatment effects across other dimensions, there is no significant gender gap in the response to the ATM treatment, even without accounting for differences in bargaining power. The single largest driver of this reduction, other than the bargaining proxy, is individual income (if we eliminate income from the demographic control set, the coefficient on the ATM×female term in column 3 is -0.231). Overall, these results suggest that bargaining power is an important mediator of the response to the ATM treatment, but that other demographic and economic differences between men and women may also bear responsibility for the strikingly different treatment effects for husbands and wives.

5 Conclusion

We present results from a field experiment conducted in Western Kenya with a low-income, mostly rural sample of married couples. A subset of newly opened formal bank accounts belonging to these couples were randomly selected to receive a free ATM card. ATM cards

reduced withdrawal fees by over 50 percent and also made the accounts easier to access and less secure. Overall formal account use in our sample is relatively low – 27 percent of couples used at least one newly opened account for saving and the median saving couple had a 6-month average daily balance of $10.55. The free ATM treatment significantly increased overall account use. However, inspection of impacts by account type reveals a striking heterogeneous treatment effect. When joint or husband's accounts were selected for the free ATM treatment, aggregate account use by couples increased by 0.24 standard deviations. This impact is substantial, and equivalent to offering the couple 8 more percentage points of interest on their accounts. When the wife's account was selected for the free ATM treatment, aggregate account use *decreased* by 0.13 standard deviations, though this impact is not statistically different from zero.

We hypothesize that this heterogeneity is driven in part by a security effect: when individuals in the household have weak bargaining power, the ATM treatment may do more harm than good because the card makes it more difficult for individuals to guard their savings from appropriation by other members of the household. When women have less bargaining power than men on average, this could generate the patterns that we observe in the data. To test this, we proxy relative bargaining power between men and women by intracouple differences in demographic characteristics. We find that the positive response to ATM cards among men's accounts is concentrated among couples where men have above median bargaining power, while the negative response to women's ATM cards is concentrated among couples where women have below median bargaining power. Furthermore, accounting for differences in bargaining power reduces the estimated "gender gap" in ATM treatment effects by approximately 77 percent. These results suggest that security of savings is very important to individuals with poor bargaining positions within the household.

Our results add to a small but growing literature that studies the use of formal bank accounts by low-income individuals in developing countries (Dupas and Robinson 2011; Prina 2011; Ashraf et al. 2006; Ashraf et al. 2010; Brune et al. 2010). They also add to the literature demonstrating that issues of control mediate the use of different savings technologies in large and important ways (Anderson and Baland 2002; Ashraf 2009; Ashraf et al. 2010; Chin et al. 2010; Schaner 2011). Finally, our results have implications for the design of formal savings products targeted to poor households. First, reducing transaction costs substantially increases the use of formal sector bank accounts. At the same time, making formal accounts more easily accessible may actually decrease use of formal accounts by individuals with poor bargaining positions within the household. In our sample, and in developing countries more generally, this often means women. This is particularly important to keep in mind given the recent policy interest in mobile money. In many ways, this technology is easily appropriated

by other members of the household – a husband may be able to learn a wife's savings balance by simply catching a glimpse of her phone. Our study cannot determine whether women's account use was depressed due to the withdrawal fee reduction, or due to the fact that the ATM card made the account easier to access and possible to access remotely, or both. Better understanding how these factors mediate formal account use is an important area for future research and will provide useful insights for designing formal accounts that best meet the needs of the poor, poor women in particular.

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A Appendix

A.1 Survey Questions on Rates of Time Preference

As part of the baseline, each respondent was asked a series of questions designed to elicit discount factors. We chose to elicit time preferences using choices between different amounts of money at different times, as opposed to different amounts of goods at different times. We made this choice for two reasons. First, Ashraf, Karlan, and Yin (2006) find that while time preference parameters estimated using choices between money, rice, and ice cream were all correlated, only the parameters estimated using money choices significantly predicted takeup and use of a commitment savings product. Second, cash lotteries made intuitive sense to respondents given that the group meetings revolved around bank accounts and savings.

We framed all questions as a choice between a smaller amount of money at a nearer time t (x^t) and a larger amount of money at a farther time $t+\tau$ ($x^{t+\tau}$).[23] In order to make choices salient, respondents were given a 1 in 5 chance of winning one of their choices. Enumerators also used calendars to visually show respondents the number of days they would have to wait for both the smaller and larger amount of money.

In total, participants responded to 10 tables of monetary choices, with each table consisting of 5 separate choices between a smaller Ksh $x^t \in \{290, 220, 150, 80, 10\}$ and larger $x^{t+\tau}$ = Ksh 300. This was a sizable amount of cash for the study participants. (For comparison, median reported daily earnings in our sample were Ksh 100 for men and Ksh 43 for women). The 10 $(t, t+\tau)$ pairs were: $\left(\frac{1}{7}, 1\right)$, $\left(\frac{1}{7}, 2\right)$, $\left(\frac{1}{7}, 3\right)$, $\left(\frac{1}{7}, 4\right)$, $\left(\frac{1}{7}, 8\right)$, $\left(\frac{1}{7}, 12\right)$, $(2, 3)$, $(2, 4)$, $(4, 8)$, and $(4, 12)$ weeks. We chose to set the lowest near term t to "tomorrow" $\left(\frac{1}{7}\right)$ instead of "today" (0) to avoid confounding our discount factor estimates with differences in transaction costs of obtaining the funds in the near versus far term, or degrees of trust as to whether the money would be delivered (Harrison, Lau, Rutstrom, and Sullivan 2004).

We can measure preference reversals (of both the hyperbolic, impatient-now, patient-later type, as well as the anti-hyperbolic patient-now impatient-later type) by comparing responses to the last four tables of questions to their analogues that involves choices between cash tomorrow and cash at a later date. (An important drawback of using "tomorrow" instead of "today" as the nearest choice is that we will not be able to detect hyperbolic discounting that discounts all future consumption relative to immediate consumption – this will lead us to underestimate the degree of hyperbolic discounting in our sample). If a respondent won one of her choices, she had the option of having the funds deposited directly in her bank

[23] This method is common to most empirical studies that attempt to measure rates of time preference in developing countries. Examples include Ashraf, Karlan, and Yin (2006), Bauer and Chytilová (2009), Dupas and Robinson (2011), Shapiro (2010), and Tanaka, Camerer, and Nguyen (2010).

account, or picking the cash up at our field office, also located in Busia town.[24]

For the purposes of this study, we define an individual to have "hyperbolic" preferences if he or she exhibited impatient-now, patient-later preference reversals on at least 2 out of 4 of the relevant pairs of tables. Similarly, we define an individual to have "anti-hyperbolic" preferences if he or she exhibited patient-now, impatient later preference reversals on at least 2 out of 4 of the relevant pairs of tables (under this definition, 32 individuals are coded as both hyperbolic and anti-hyperbolic).

[24]Despite the fact that the field office and Family Bank were proximately located, and that accessing cash deposited in an account would entail paying a withdrawal fee, the majority of cash winners (77 percent) chose to have their payments deposited in a bank account. The bank account may have been attractive because the respondents did not have to remember to pick up the funds at any specific time, because the bank was more conveniently located (in the commercial center of town), because the withdrawal fee was seen as a commitment device not to spend the money frivolously, or because the individuals intended to use their new accounts for saving anyway.

Table 1. Demographic Characteristics of Study Sample

	Husbands	Wives	Difference	N
Age	44.0	36.9	7.10***	1496
	[14.1]	[12.1]	(0.678)	
Education	7.88	5.82	2.06***	1489
	[3.70]	[3.99]	(0.199)	
Literate	0.845	0.660	0.184***	1496
	[0.362]	[0.474]	(0.0218)	
Polygamous	0.192	0.209	-0.0162	1486
	[0.395]	[0.407]	(0.0208)	
Number Children	5.82	4.58	1.24***	1493
	[4.13]	[2.47]	(0.176)	
Subsistence Farmer or No Job	0.415	0.462	-0.0477*	1491
	[0.493]	[0.499]	(0.0257)	
Income Last Week	1662	815	847***	1452
	[5474]	[1781]	(213)	
Owns Mobile Phone	0.464	0.413	0.0512**	1490
	[0.499]	[0.493]	(0.0257)	
Participates in ROSCA	0.487	0.664	-0.178***	1496
	[0.500]	[0.473]	(0.0252)	
Has Bank Account	0.318	0.120	0.198***	1496
	[0.466]	[0.326]	(0.0208)	
Savings in Bank Account (Among Savers)	10853	5967	4886**	271
	[17994]	[14629]	(2134)	
Has SACCO Account	0.0668	0.0121	0.0547***	1492
	[0.250]	[0.109]	(0.00998)	
Savings in SACCO Account (Among Savers)	54706	44444	10261	56
	[53736]	[64293]	(22039)	
Saves at Home	0.845	0.896	-0.0509***	1494
	[0.362]	[0.306]	(0.0174)	
Savings at Home (Among Savers)	1344	887	457***	1266
	[2993]	[2761]	(162)	
Saves on Mobile Phone	0.304	0.142	0.162***	1251
	[0.460]	[0.350]	(0.0231)	
Mobile Phone Savings (Among Savers)	581	557	23.9	266
	[1670]	[1286]	(187)	
Savings - I Decide	0.367	0.487	-0.119***	1488
	[0.482]	[0.500]	(0.0255)	
Savings - Spouse Decides	0.430	0.275	0.155***	1488
	[0.495]	[0.447]	(0.0245)	
Savings - Decide Together	0.101	0.0957	0.00485	1488
	[0.301]	[0.294]	(0.0154)	
Savings - Decide Alone	0.0791	0.120	-0.0409***	1488
	[0.270]	[0.325]	(0.0155)	
Impatient Now-Patient Later	0.149	0.191	-0.0423**	1475
	[0.356]	[0.394]	(0.0196)	
Patient Now-Impatient Later	0.167	0.198	-0.0314	1475
	[0.373]	[0.399]	(0.0201)	
Distance from Family Bank (Miles)	3.73	3.73	--	1496
	[2.19]	[2.19]	--	

Notes: Standard deviations in brackets, robust standard errors in parentheses. ***, **, and * indicate significance at the 99, 95, and 90 percent levels respectively.

Table 2. Randomization Verification

	Free ATM Card				Maximum
	Husband	Wife	Joint	Cash Prize	Interest Rate
Panel A. Adherence to Theoretical Probabilities					
Free ATM/Cash Prize/2 Percent	0.190	0.217	0.214	0.183	0.0749
	{0.115}	{0.636}	{0.309}	{0.106}	{0.428}
6 Percent					0.307
					{0.355}
10 Percent					0.618
					{0.678}
Panel B. Correlation with Demographic Characteristics					
Age	-1.03	0.754	0.993	0.676	0.576
	(1.69)	(1.61)	(1.41)	(0.902)	{0.562}
Education	0.152	-0.292	0.294	-0.0507	1.59
	(0.484)	(0.476)	(0.371)	(0.256)	{0.205}
Literate	0.0354	-0.0884*	0.0335	-0.000500	0.912
	(0.0414)	(0.0461)	(0.0371)	(0.0289)	{0.402}
Polygamous	0.0309	-0.000314	-0.0276	0.0232	0.407
	(0.0638)	(0.0576)	(0.0396)	(0.0276)	{0.666}
Number Children	-0.101	-0.163	-0.0325	-0.0618	0.326
	(0.452)	(0.379)	(0.322)	(0.211)	{0.722}
Subsistence Farmer/Unemployed	-0.130***	-0.0617	0.00809	-0.0683**	1.89
	(0.0522)	(0.0541)	(0.0432)	(0.0324)	{0.152}
Income Last Week	127	-274	27.8	-367**	0.00225
	(313)	(311)	(427)	(168)	{0.998}
Owns Mobile Phone	0.0774	0.0639	-0.0334	0.0289	3.22**
	(0.0588)	(0.0555)	(0.0460)	(0.0327)	{0.0403}
Participates in ROSCA	-0.0354	-0.0586	-0.0244	0.0143	1.06
	(0.0498)	(0.0503)	(0.0418)	(0.0330)	{0.346}
Has Bank Account	0.0172	0.00245	-0.0160	0.00437	1.89
	(0.0480)	(0.0445)	(0.0333)	(0.0278)	{0.151}
Has SACCO Account	0.0151	-0.00116	-0.0166	-0.00370	0.813
	(0.0277)	(0.0233)	(0.0142)	(0.0127)	{0.444}
Saves at Home	0.00896	0.00417	0.0185	0.0370*	0.666
	(0.0341)	(0.0361)	(0.0238)	(0.0203)	{0.514}
Saves on Mobile Phone	0.0235	-0.0721	-0.00823	-0.0303	4.15**
	(0.0528)	(0.0468)	(0.0343)	(0.0290)	{0.0162}
Savings - I Decide	0.0812	-0.0166	-0.0366	0.0157	0.783
	(0.0538)	(0.0507)	(0.0381)	(0.0325)	{0.457}
Savings - Spouse Decides	-0.0755*	-0.00696	0.0306	-0.0204	0.124
	(0.0454)	(0.0421)	(0.0364)	(0.0318)	{0.883}
Savings - Decide Together	0.00669	-0.00132	-0.00246	-0.0209	1.30
	(0.0290)	(0.0257)	(0.0263)	(0.0195)	{0.273}
Savings - Decide Alone	-0.00148	0.0264	0.0222	0.0184	0.531
	(0.0376)	(0.0357)	(0.0239)	(0.0209)	{0.588}
Impatient Now-Patient Later	-0.0313	0.0522	-0.0311	-0.0197	0.990
	(0.0377)	(0.0355)	(0.0311)	(0.0239)	{0.372}
Patient Now-Impatient Later	-0.0285	-0.0191	0.00875	0.0324	0.121
	(0.0365)	(0.0367)	(0.0323)	(0.0264)	{0.886}
Distance from Family Bank (Miles)	-0.622**	-0.00445	-0.0553	0.00389	1.51
	(0.289)	(0.295)	(0.250)	(0.137)	{0.221}
Interest Rate	0.478	-0.0480	0.284	0.221	
	(0.407)	(0.392)	(0.354)	(0.228)	
Cash Prize - Husband	0.0276	-0.0496	0.0299		1.35
	(0.0593)	(0.0493)	(0.0440)		{0.259}
Cash Prize - Wife	-0.0194	-0.101**	0.0419		3.35**
	(0.0603)	(0.0496)	(0.0440)		{0.0357}

Notes: P-values in braces, standard errors clustered at the couple level in parentheses. The first four columns present regression coefficients and standard errors on treatment dummies. The last columns presents the test statistic and p-value of an F-test that demographics are equal across all treatments. For the cash prize, the interest rate is the individual interest rate when open, and the joint interest rate otherwise. ***, **, and * indicate significance at the 99, 95, and 90 percent levels respectively.

Table 3. Account Use Summary Statistics

	Joint	Husband	Wife	Husband-Joint	Wife-Joint	Husband-Wife	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. All Couples							
Opened	0.659	0.463	0.446	-0.197***	-0.213***	0.0167	1.50
	[0.474]	[0.499]	[0.497]	(0.0353)	(0.0351)	(0.0194)	[0.596]
Saved	0.404	0.260	0.308	-0.144***	-0.0955***	-0.0481	0.448
	[0.491]	[0.440]	[0.463]	(0.0390)	(0.0409)	(0.0415)	[0.498]
Average Balance	338	341	236	2.91	-102	105	569
	[1364]	[1352]	[724]	(118)	(86.1)	(109)	[2871]
Number Deposits	1.96	1.75	1.65	-0.214	-0.312*	0.0985	1.24
	[2.34]	[2.06]	[1.57]	(0.187)	(0.162)	(0.171)	[2.70]
Number Withdrawals	0.352	0.530	0.308	0.178	-0.0441	0.222	0.698
	[1.43]	[2.30]	[1.12]	(0.178)	(0.107)	(0.163)	[2.61]
Fees	25.7	32.8	19.0	7.08	-6.71	13.8	43.0
	[110]	[134]	[73.6]	(11.0)	(7.61)	(9.82)	[155]
N (Open Accounts)	389	200	198	589	587	398	748
B. Couples Without Cash Prizes (N=495)							
Opened	0.665	0.472	0.455	-0.193***	-0.210***	0.0172	1.51
	[0.473]	[0.500]	[0.499]	(0.0434)	(0.0432)	(0.0253)	[0.603]
Saved	0.243	0.163	0.144	-0.0805**	-0.0994***	0.0190	0.271
	[0.430]	[0.371]	[0.353]	(0.0402)	(0.0408)	(0.0413)	[0.445]
Average Balance	269	223	208	-46.0	-61.8	15.8	409
	[1158]	[1271]	[758]	(130)	(97.9)	(128)	[1532]
Number Deposits	1.80	1.48	1.49	-0.320	-0.313	-0.00652	1.01
	[2.57]	[1.51]	[1.67]	(0.203)	(0.217)	(0.178)	[2.75]
Number Withdrawals	0.356	0.348	0.232	-0.00766	-0.124	0.116	0.655
	[1.57]	[1.37]	[0.824]	(0.152)	(0.121)	(0.134)	[2.60]
Fees	26.1	23.4	14.9	-2.65	-11.1	8.49	41.2
	[120]	[90.8]	[51.9]	(10.7)	(8.68)	(8.80)	[153]
N (Open Accounts)	267	135	125	402	392	260	495

Notes: Robust standard errors in parentheses, standard deviations in brackets. Columns 1-6 limited to accounts with 2 percent interest or better and no free ATM card. All outcomes (except for account opening) are presented conditional on account opening. Final column reports couples' aggregate activity across all three accounts.

Table 4. Impact of Free ATM Cards on Account Use

	Has ATM Card	Standardized Use	Saved	Average Balance	Number Deposits	Number Withdrawals	Fees (Ksh)
Panel A. By Account Type							
Free ATM × Joint	0.863***	0.302**	0.071	0.295**	0.311	0.721*	32.4
	(0.019)	(0.153)	(0.051)	(0.142)	(0.323)	(0.409)	(21.5)
Free ATM × Husband	0.883***	0.265*	0.086	0.127	0.433	0.643	31.3
	(0.022)	(0.157)	(0.054)	(0.126)	(0.312)	(0.424)	(23.2)
Free ATM × Wife	0.930***	-0.056	-0.036	-0.044	-0.198	0.012	-0.468
	(0.017)	(0.094)	(0.050)	(0.117)	(0.145)	(0.139)	(8.38)
F: Joint=Husband	0.535	0.030	0.041	0.783	0.074	0.018	0.001
	{0.465}	{0.863}	{0.839}	{0.376}	{0.786}	{0.894}	{0.972}
F: Wife=Joint	7.53***	3.94**	2.15	3.42*	2.06	2.68	2.00
	{0.006}	{0.048}	{0.143}	{0.065}	{0.152}	{0.102}	{0.157}
F: Wife=Husband	2.99*	3.04*	3.08*	1.09	3.29*	1.89	1.57
	{0.084}	{0.082}	{0.080}	{0.297}	{0.070}	{0.169}	{0.210}
Panel B. Pooled Impact							
Free ATM	0.887***	0.191**	0.045	0.153*	0.202	0.501**	22.9**
	(0.012)	(0.085)	(0.031)	(0.081)	(0.171)	(0.216)	(11.6)
Panel C. Is Impact for Wives Different?							
Free ATM	0.871***	0.288***	0.077**	0.230**	0.358	0.691**	32.0**
	(0.014)	(0.112)	(0.038)	(0.100)	(0.232)	(0.299)	(16.0)
Free ATM×Wife	0.059***	-0.344***	-0.112*	-0.274*	-0.555**	-0.680**	-32.5*
	(0.021)	(0.147)	(0.061)	(0.150)	(0.275)	(0.338)	(18.4)
DV Mean (No ATM, No Cash Prize)	0.068	0.000	0.194	4.95	2.62	0.301	21.0
N	1113	1113	1113	1113	1113	1113	1113

Notes: Robust standard errors (clustered at the couple level when relevant) in parentheses. All regressions include dummy variables for the first 6 experimental sessions, cash prize receipt for each spouse, and account type and cash prize×account type interactions when relevant. ***, **, and * indicate significance at the 99, 95, and 90 percent levels respectively.

Table 5. Does ATM Card Provision Induce Substitution Between Open Accounts?

	Standardized Use	Saved	Average Balance	Number Deposits	Number Withdrawals	Fees (Ksh)
A. Joint Accounts						
Free ATM - Joint	0.318**	0.0823	0.313**	0.342	0.716*	32.5
	(0.154)	(0.0503)	(0.142)	(0.323)	(0.407)	(21.6)
Free ATM - Husband	0.289	0.0491	0.279	1.74	-0.157	1.07
	(0.377)	(0.118)	(0.295)	(1.28)	(0.724)	(33.9)
Free ATM - Wife	0.542	0.223*	0.301	1.86	0.491	37.2
	(0.374)	(0.134)	(0.308)	(1.32)	(0.532)	(30.9)
DV Mean (No ATM, No Cash Prize)	0.178	0.264	5.10	2.91	0.590	37.4
N	493	493	493	493	493	493
B. Husbands' Accounts						
Free ATM - Joint	-0.359*	-0.0918	-0.258	-0.829***	-0.677**	-41.6**
	(0.190)	(0.118)	(0.219)	(0.332)	(0.324)	(19.1)
Free ATM - Husband	0.266*	0.0778	0.125	0.440	0.674	33.1
	(0.159)	(0.0539)	(0.124)	(0.309)	(0.437)	(23.7)
Free ATM - Wife	-0.224**	-0.0582	-0.201	-0.308	-0.492**	-31.8***
	(0.109)	(0.0522)	(0.140)	(0.197)	(0.227)	(12.3)
DV Mean (No ATM, No Cash Prize)	-0.0296	0.160	4.88	2.52	0.415	25.7
N	319	319	319	319	319	319
C. Wives' Accounts						
Free ATM - Joint	-0.429**	-0.179	-0.557***	-0.742*	-0.369	-30.2
	(0.193)	(0.114)	(0.209)	(0.382)	(0.288)	(20.0)
Free ATM - Husband	-0.0263	0.0515	-0.0929	-0.0280	-0.154	-9.82
	(0.0918)	(0.0562)	(0.106)	(0.200)	(0.114)	(7.00)
Free ATM - Wife	-0.0886	-0.0543	-0.0809	-0.249*	-0.00849	-2.12
	(0.0925)	(0.0481)	(0.114)	(0.148)	(0.142)	(8.73)
DV Mean (No ATM, No Cash Prize)	-0.0875	0.145	4.90	2.42	0.203	12.8
N	309	309	309	309	309	309

Notes: Robust standard errors in parentheses. Additional controls (all panels) include cash prize dummies for both the husband and wife, a dummy for the first 6 experimental sessions, and a set of dummy variables that saturate possible combinations of open accounts. ***, **, and * indicate significance at the 99, 95, and 90 percent levels respectively.

Table 6. Impact of Free ATM Card Provision on Total Savings by Couples

	Standardized Use	Saved (Any Account)	Average Balance	Number Deposits	Number Withdrawals	Fees (Ksh)
A. Impact of ATM Card by Type						
Joint ATM Card	0.194	0.0740	0.233*	0.0810	0.546	20.9
	(0.131)	(0.0494)	(0.135)	(0.338)	(0.417)	(22.3)
Husband's ATM Card	0.262*	0.137***	0.0141	0.951*	0.527	26.8
	(0.158)	(0.0574)	(0.111)	(0.529)	(0.521)	(27.9)
Wife's ATM Card	-0.127	-0.0479	-0.151	-0.0552	-0.363	-22.6
	(0.122)	(0.0557)	(0.117)	(0.418)	(0.294)	(16.8)
DV Mean (No ATM, No Cash Prize)	0.000	0.255	5.33	2.27	0.440	30.6
B. Pooled Impact of ATM Cards						
Any ATM Card	0.152*	0.0716**	0.0944	0.261	0.386	16.1
	(0.0863)	(0.0359)	(0.0873)	(0.241)	(0.253)	(14.4)
DV Mean (No ATM, No Cash Prize)	0.000	0.255	5.33	2.27	0.440	30.6
C. Impact by Card Type - Is Impact for Wives Different?						
Joint or Husband's ATM Card	0.239***	0.101***	0.161*	0.464*	0.597**	26.0
	(0.0987)	(0.0387)	(0.0964)	(0.282)	(0.304)	(17.0)
Wife's ATM Card	-0.126	-0.0449	-0.166	-0.00888	-0.371	-22.6
	(0.124)	(0.0556)	(0.118)	(0.435)	(0.289)	(16.6)
F Test - Joint/Husband=Wife	5.13**	4.46**	4.27**	1.01	4.30**	3.43*
	{0.0238}	{0.0351}	{0.0391}	{0.316}	{0.0384}	{0.0643}
DV Mean (No ATM, No Cash Prize)	0.000	0.255	5.33	2.27	0.440	30.6
D. Impact of Interest Rates						
Max Interest is 6 Percent	0.160	0.0479	0.274***	0.276	0.221	13.5
	(0.109)	(0.0604)	(0.110)	(0.302)	(0.248)	(13.6)
Max Interest is 10 Percent	0.232**	0.0589	0.316***	0.578**	0.378*	25.2**
	(0.100)	(0.0567)	(0.0991)	(0.288)	(0.202)	(12.2)
DV Mean (2 Percent Interest, No Cash Prize)	-0.132	0.190	5.06	2.12	0.357	18.5
N	748	748	748	748	748	748

Notes: Robust standard errors in parentheses, p-values in braces. Additional controls (all panels) include cash prize dummies for both the husband and wife and a dummy for the first 6 experimental sessions. The first three panels also include a set of dummy variables that saturate possible combinations of open accounts. ***, **, and * indicate significance at the 99, 95, and 90 percent levels respectively.

Table 7. Impact of ATM Cards Interacted with Bargaining Power in the Household

Panel A. Account Level				
Free ATM×Husband	0.569**	0.473	-0.661*	-0.502
	(0.266)	(0.680)	(0.357)	(0.933)
Free ATM×Husband×Wife Advantaged	-0.612*	-0.561*	-0.469	-0.473
	(0.321)	(0.338)	(0.302)	(0.380)
Free ATM×Wife	-0.255***	-0.721*	-0.667**	-0.820
	(0.109)	(0.386)	(0.317)	(0.527)
Free ATM×Wife×Wife Advantaged	0.348*	0.568***	0.474***	0.647***
	(0.181)	(0.204)	(0.187)	(0.219)
Husband×Wife Advantaged	0.093	0.263**	0.103	0.308**
	(0.117)	(0.129)	(0.123)	(0.142)
Wife×Wife Advantaged	-0.224**	-0.346***	-0.229**	-0.333***
	(0.102)	(0.124)	(0.103)	(0.124)
DV Mean (No ATM, No Cash Prize)	-0.058	-0.058	-0.058	-0.058
N	628	628	628	628
Panel B. Couple Level Impact				
Husband's ATM	0.407*	0.190	-0.540	-1.38
	(0.243)	(0.711)	(0.792)	(1.21)
Husband's ATM×Wife Advantaged	-0.295	-0.506	-0.544	-0.622
	(0.334)	(0.370)	(0.338)	(0.429)
Wife's ATM	-0.343**	0.395	-0.639	-0.331
	(0.159)	(0.540)	(0.545)	(0.778)
Wife's ATM×Wife Advantaged	0.412	0.566**	0.428*	0.507
	(0.258)	(0.275)	(0.237)	(0.309)
Wife Advantaged	-0.082	-0.062	-0.064	-0.093
	(0.133)	(0.144)	(0.145)	(0.152)
DV Mean (No ATM, No Cash Prize)	0.245	0.245	0.245	0.245
N	354	354	354	354
Additional Heterogeneity Controls	No	Demo.	Account	All

Notes: Robust standard errors (clustered at the couple level when relevant) in parentheses. Baseline control set for panel A matches that in Table 5. Baseline control set for panel B includes those for couple-level ATM regressions in Table 6. "Demo." controls include, for account level regressions, the age, education, income, and time inconsistency of the account owner, as well as interactions with the ATM treatment. Couple-level averages are used in Panel B. The "Account" control set includes dummy variables for use of formal account, MPESA, ROSCA, and home savings and interactions with the ATM treatment. "All" controls include both the Demo. and Account control sets. ***, **, and * indicate significance at the 99, 95, and 90 percent levels respectively.

Table 8. Specification Check: Impact of Interest Interacted with Bargaining Power in the Household

Panel A. Account Level				
Free ATM×Husband	0.160**	0.026	0.071	0.022
	(0.076)	(0.329)	(0.158)	(0.339)
Free ATM×Husband×Wife Advantaged	0.005	0.026	0.007	0.016
	(0.112)	(0.111)	(0.110)	(0.112)
Free ATM×Wife	0.132**	0.213	0.125	0.210
	(0.060)	(0.152)	(0.128)	(0.194)
Free ATM×Wife×Wife Advantaged	-0.073	-0.163	-0.080	-0.177*
	(0.086)	(0.103)	(0.085)	(0.104)
Husband×Wife Advantaged	0.002	0.006	0.008	0.014
	(0.054)	(0.062)	(0.054)	(0.064)
Wife×Wife Advantaged	0.007	-0.040	0.012	-0.016
	(0.053)	(0.062)	(0.054)	(0.065)
DV Mean (No ATM, No Cash Prize)	-0.166	-0.166	-0.166	-0.166
N	1496	1496	1496	1496
Panel B. Couple Level Impact				
Husband's ATM	0.070	-0.351	0.295	-0.069
	(0.136)	(0.479)	(0.476)	(0.685)
Husband's ATM×Wife Advantaged	-0.036	-0.033	-0.048	-0.033
	(0.207)	(0.230)	(0.209)	(0.227)
Wife's ATM	0.119	0.210	0.610	0.475
	(0.132)	(0.477)	(0.477)	(0.598)
Wife's ATM×Wife Advantaged	-0.267	-0.426*	-0.326	-0.472**
	(0.207)	(0.232)	(0.214)	(0.238)
Wife Advantaged	0.386*	0.394	0.389*	0.403*
	(0.218)	(0.240)	(0.211)	(0.213)
DV Mean (No ATM, No Cash Prize)	0.273	0.273	0.273	0.273
N	748	748	748	748
Additional Heterogeneity Controls	No	Demo.	Account	All

Notes: Robust standard errors (clustered at the couple level when relevant) in parentheses. Baseline control set for panel A matches that in Table 5. Baseline control set for panel B includes those for couple-level ATM regressions in Table 6. "Demo." controls include, for account level regressions, the age, education, income, and time inconsistency of the account owner, as well as interactions with the ATM treatment. Couple-level averages are used in Panel B. The "Account" control set includes dummy variables for use of formal account, MPESA, ROSCA, and home savings and interactions with the ATM treatment. "All" controls include both the Demo. and Account control sets. ***, **, and * indicate significance at the 99, 95, and 90 percent levels respectively.

Table 9. Can Observables Account for the Gender Difference in Treatment Effects?

Free ATM	0.264*	0.123	-0.389	-0.263	-0.807***	-0.915***	-1.08**	-0.902*
	(0.157)	(0.172)	(0.370)	(0.351)	(0.268)	(0.292)	(0.484)	(0.479)
Free ATM×Wife	-0.323*	-0.0739	-0.0473	0.107	-0.154	0.0793	0.0139	0.160
	(0.185)	(0.229)	(0.172)	(0.212)	(0.187)	(0.223)	(0.165)	(0.209)
Wife	0.0604	-0.00836	0.124	0.0311	0.0650	-0.00427	0.115	0.0160
	(0.0763)	(0.0841)	(0.0808)	(0.0857)	(0.0817)	(0.0887)	(0.0887)	(0.0944)
Free ATM×Advantaged		0.360*		0.309		0.356*		0.313
		(0.197)		(0.220)		(0.185)		(0.224)
Advantaged		-0.112		-0.185**		-0.119		-0.197**
		(0.0745)		(0.0824)		(0.0756)		(0.0871)
DV Mean (No ATM, No Cash Prize)		-0.0729		-0.0729		-0.0729		-0.0729
N		628		628		628		628
Baseline Account Ownership Controls?	No	No	Demo.	Demo.	Acct.	Acct.	All	All

Notes: Standard errors clustered at the couple level in parentheses. Baseline controls include cash prize receipt for each spouse and interactions with account type and a dummy indicating experimental sessions 6 and higher. "Demo." control set includes contols for age, education, income, literacy, time inconsistency, and their interactions with the ATM treatment. The "Acct." control set includes controls for formal account, ROSCA, MPESA, home savings, and their interactions with the ATM treatment. "All" includes both the Demo. and Acct. control sets. ***, **, and * indicate significance at the 99, 95, and 90 percent levels respectively.

Figure 1. Interest Rate Design

R_J=2				
	R_M=0	R_M=2	R_M=6	R_M=10
R_F=0	2	2	6	10
R_F=2	2	2	6	10
R_F=6	6	6	6	10
R_F=10	10	10	10	10

R_J=6				
	R_M=0	R_M=2	R_M=6	R_M=10
R_F=0	6	6	6	10
R_F=2	6	6	6	10
R_F=6	6	6	6	10
R_F=10	10	10	10	10

R_J=10				
	R_M=0	R_M=2	R_M=6	R_M=10
R_F=0	10	10	10	10
R_F=2	10	10	10	10
R_F=6	10	10	10	10
R_F=10	10	10	10	10

Notes: The maximum interest rate available to the couple is illustrated in interior cells.

Figure 2. CDFs of Standardized Account Use by Account Type and ATM Treatment

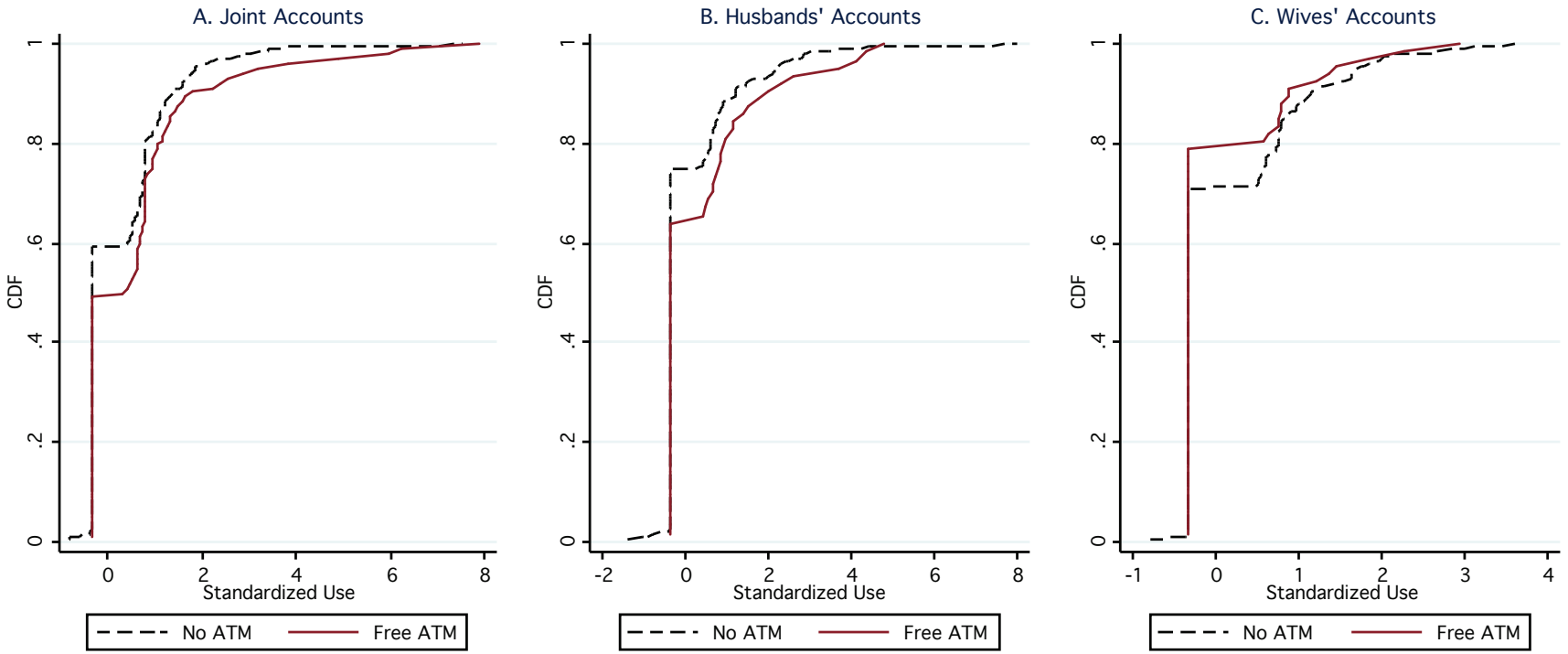


Figure 3. Distribution of Husband's Relative Bargaining Power

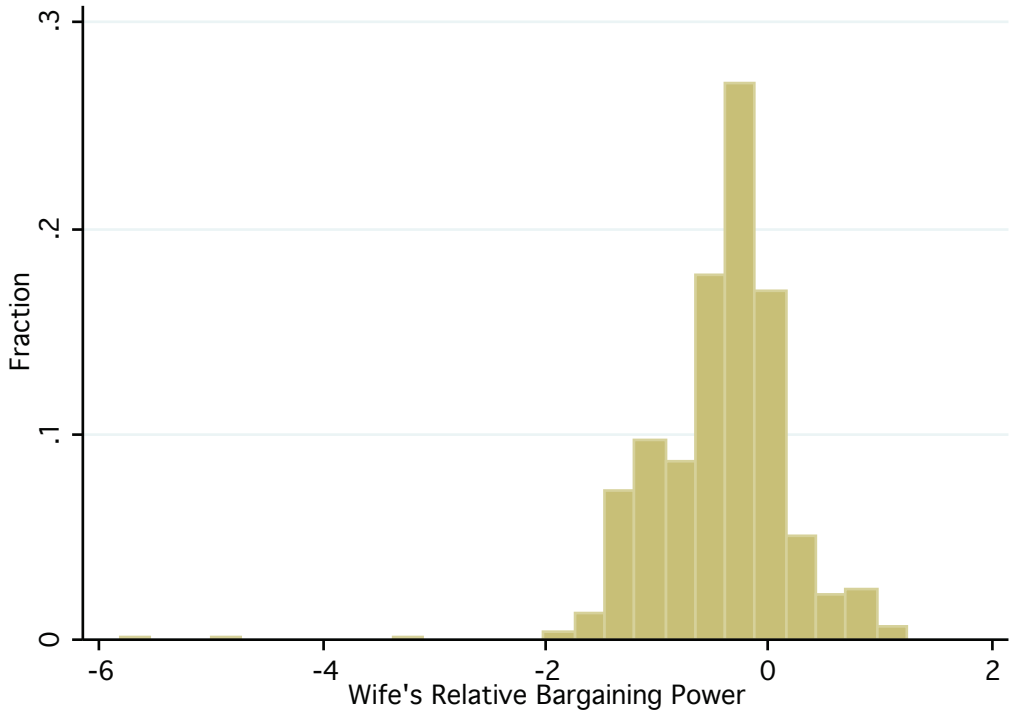
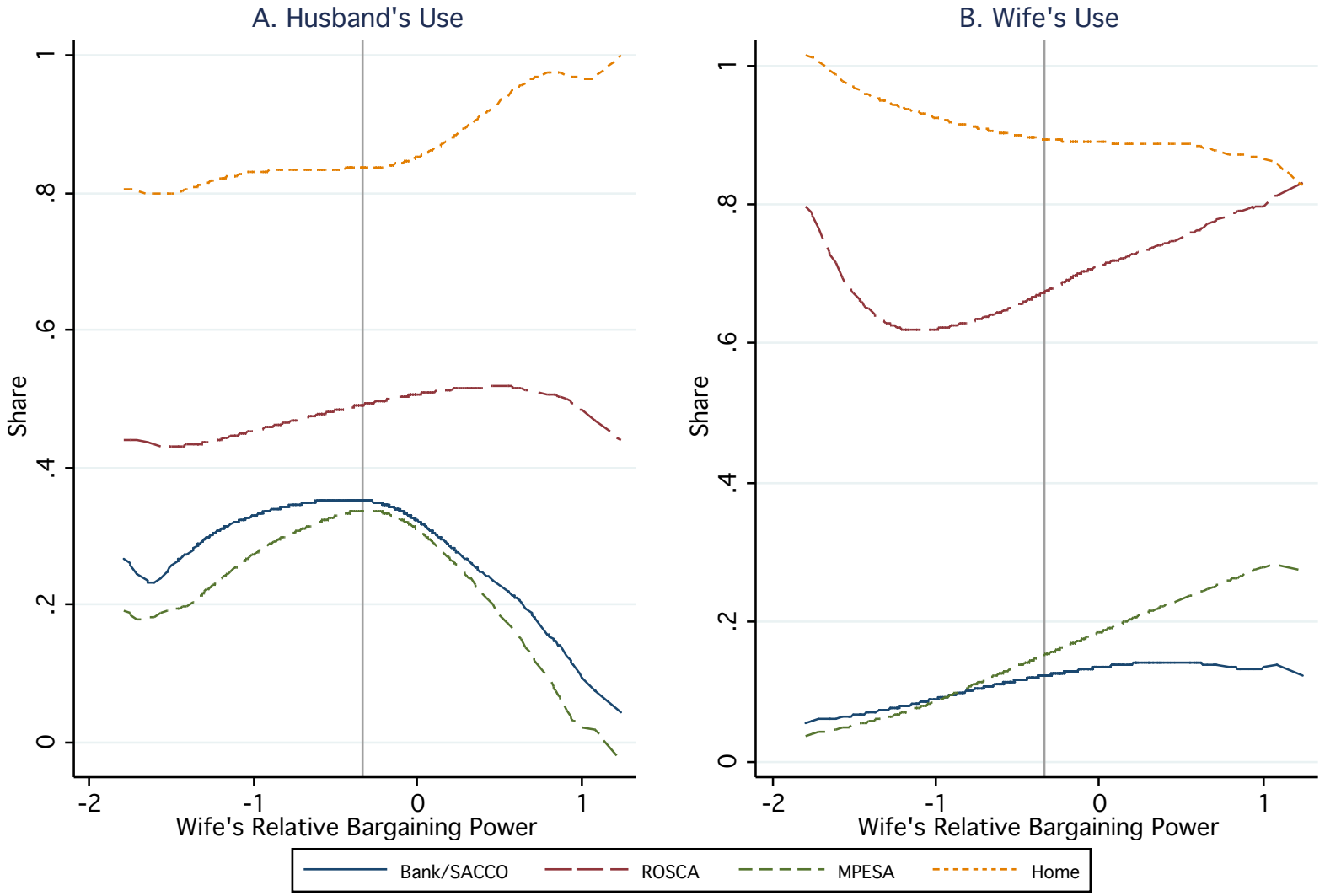


Figure 4. Baseline Savings Device Use and Proxied Bargaining Power



Notes: Gray vertical line denotes the sample median of the wife's relative bargaining power.