The Effect of Social Pressure on Expenditures in Malawi*

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Abstract

I vary the observability of windfall payments to 291 members of agricultural clubs in rural Malawi in order to study the effect of redistributive pressure on the timing of expenditures. While other studies have documented that social pressure affects the quantity of income and consumption, I focus on timing because spending money quickly may be a strategy for reducing obligatory transfers. Respondents who receive money in the presence of their agricultural club anticipate spending an extra 14 percent (0.28 standard deviations) in the week immediately following the payment than those who receive equivalent transfers in private settings. There are limited changes in the composition of spending, but some evidence that social pressure to share windfall income has a larger effect on poorer households.

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1 Introduction

Social pressure to share income has been documented in developing and developed-country settings. This redistributive pressure can be embodied in mutually-beneficial informal insurance networks (Townsend 1994) or generate unilateral contributions that reduce the welfare of net donors (Platteau 2000, Comola & Fafchamps 2010). In either case, though especially in the latter, there are incentives to hide income that can distort consumption (Kinnan 2014), investment (Jakiela & Ozier 2016), and borrowing (Baland, Guirkinger & Mali 2011). These distortions can affect timing as well as quantity of consumption and investment. Kinnan (2014) notes that consumption time-paths that would be suboptimal with perfect information can be used by households to hide income and therefore increase private utility when information is imperfect. Social anthropologists document similar a phenomena; for example, Maranz (2001) writes that pressure to share income means that individuals "often made wasteful or ill-considered expenditures just to keep friends from borrowing," and Foster (1965) notes that in peasant societies, "[a] person who improves his position is encouraged...to restore the balance through conspicuous consumption in the form of ritual extravagance," which is "a redistributive mechanism which permits a person or family that potentially threatens community stability to gracefully restore the status quo."

I test whether recipients of unanticipated windfall income alter the composition or timing of their spending in order to evade redistributive pressure using an experiment with members of Malawian agricultural clubs. In each of 154 clubs, one member is randomly selected to receive a windfall transfer in a public raffle, where all group members know the value of the transfer and the identity of the recipient. Another group member receives an equal-value transfer in private; the group is not informed of the second transfer. Relative to the private recipients, then, public raffle winners are potentially exposed to greater social pressure to share income.

I survey recipients about how they plan to and actually spend their windfalls, with attention to the timing of purchases and to the identity of the intended consumer. While the composition of spending is similar for recipients whose windfall was observed and those who received money secretly, the timing of spending is not. Public recipients anticipate spending 14 percent (0.28 standard deviations) more of their prize money in the week immediately following the transfer than private recipients, and among those who are reinterviewed four months after the raffles, public recipients recall actual spending that is 24 percent (0.24 standard deviations) greater than reported by private recipients in period immediately following the raffles. This accelerated spending is consistent with a framework in which individuals face a time limited opportunity to evade redistributive pressure by reducing their cash-on-hand. It clearly demonstrates that public information imposes a constraint on the consumption patterns that individuals would choose if they were able to maintain privacy about their incomes, with a response along the timing of spending rather than the compositional measures that have been the focus of previous research.

In the framework of informal insurance, income observability may have positive welfare implications. A number of investigations of the extent of informal insurance find that idiosyncratic shocks to household income affect consumption, even after controlling for aggregate consumption (Townsend 1994, Udry 1994, Lund & Fafchamps 2003). If information asymmetries about income contribute to limited commitment, then full information might increase the insurance provided through informal insurance networks.

While a growing literature recognizes the importance of social pressure as distinct from voluntary contributions to informal insurance networks, there are few direct estimates of how such pressure affects individuals' expenditures, and no previous experimental estimates that test strategies for evading redistributive pressure outside of the experimental lab. Well-identified estimates of the effects of social pressure are difficult to obtain, because it is a cause and consequence of complex and often unobservable relationships between individuals and institutions. Baland, Guirkinger & Mali (2011) rely on observational data about borrowing and savings at Cameroonian credit cooperatives and surveys asking members about reasons for simultaneous borrowing and saving. Kinnan (2014), the only previous paper to consider the timing of expenditures in response to redistributive pressure, documents auto-correlation in observational consumption data that is consistent with the predictions of a model of imperfect information and hidden income.

Previous studies experimentally vary observability of financial decision-making in order to study behavior under different information conditions. Ashraf (2009) studies intra-household bargaining by varying whether Filipino spouses' allocations of one day's wages are observed by their partners. Jakiela & Ozier (2016) offer Kenyan participants the opportunity to choose between stylized investment opportunities with different returns, when their decisions are either secret or announced to an audience including members of their extended family. Information matters in both contexts. Filipino husbands allocate more money to their private accounts when their decisions are secret, and Kenyan women forego profitable investments in order to hide returns from their extended families.

To my knowledge, only two other studies combines experimental variation in the observability of income with data about spending or consumption outside the lab. In urban Senegal, Boltz, Marazyan & Villar (2015) measures willingness-to-pay (WTP) to hide income in the lab and sharing of income outside the lab. Wealthier men and women with higher positions in their extended family have higher WTP for income hiding. When given the opportunity to hide some income, personal expenditures rise, and, for those with positive WTP for privacy, transfers to kin fall. Castilla & Walker (2013) use an experiment with public and private lotteries to study intra-household bargaining in Ghana, and find non-cooperative behavior by husbands and wives. In addition to adding to the evidence about the existence of redistributive pressure, my experiment highlights the role that the timing of expenditures may play in evading such pressure.

I describe my experiment in Section 2 and the data in Section 3. I discuss the conceptual framework and the analysis in Section 4, and discuss the results in detail in Section 5. Section 6 concludes.

2 Experimental Design

Individuals are exposed to pressure to share when income or consumption is observable. I manipulate the observability of income by making public and private windfall income payments in the form of raffle prizes to members of 154 agricultural clubs in four districts in the Central region of Malawi.[1] These clubs of approximately 10 members each were formed by extension agents employed local agribusiness Cheetah Paprika Limited in mid 2007 for the purpose of providing extension services and joint liability loans for agricultural inputs to farmers interested in growing paprika during the 2007-2008 growing season.[2] Club members are drawn from a single village to facilitate regular meetings, and grow maize (a staple crop) as well as paprika (a cash crop). The sample includes only one club per village.

In contrast to the samples in Jakiela & Ozier (2016) and Boltz, Marazyan & Villar (2015), these clubs do not include more than one member of the same extended family. This restriction is imposed by the local microfinance institution that provides loans for agricultural inputs, because of the challenges and correlated risks of including kin in joint liability borrowing groups. The experiment described in this paper took place in April 2008.

Members who assembled for regularly scheduled meetings (typically, at local primary schools) were given the opportunity to participate in a raffle that would award a cash prize to one winner. In this "public" raffle, the opportunity and value of the prize are announced to the group. Each member draws a ticket from a bag, and the member whose ticket is marked with a star is declared the winner. A staff member records the winner's name and awards the cash prize in front of the whole group. In this way, everyone present knows that there was a raffle; the identity of the winner; and the value of the prize. The public raffles potentially induce redistributive pressure from individuals outside the winners' households.

The full protocol for administering the raffles is included in Appendix 6. The Institutional Review Board at the University of Michigan, which reviewed and approved the experimental

[1] The experiment took place in Dedza, Dowa, Kasungu, and Lilongwe.

[2] Club members are participants in an experiment about using dynamic incentives to increase loan repayment rates (Gine, Goldberg & Yang 2012).

procedures, required the inclusion of strong language cautioning participants about the risks of winning money in the script used to introduce the lottery: "Everyone at todays meeting can enter a drawing for a chance to win a prize of MK 2500. You don't have to enter the drawing, but you can if you want to. If you are the winner, the money is yours to do anything you want with it. The risk to you for participating in the lottery is that if you win, people will know you have money. Just like any other time that people know you have money, they could ask you for some of the money, try to steal it from you, or use witchcraft or some other method to get the money."

Immediately after the awarding of the public prize and conclusion of the club meeting, all club members are interviewed by our field team in private locations near the meeting spot. These private interviews provide the opportunity to award the second, private prize. The recipient of this prize is determined in advance, by computer randomization based on club rosters.[3]

Other club members are not told about the second prize, and instead of awarding the money publicly, the private winner is given his cash while responding to the baseline survey out of view of others in the community. He is told that no one else in the community has received money in secret, and that no one will be told that he (the private winner) received money. A short supplemental survey[4] about expected use of the prize money is administered to both public and private raffle winners. Because the supplemental survey is brief and completing the baseline survey takes longer for some group members than others, it is unlikely that the time to complete the raffle questionnaire signals anything out of the ordinary to other group members.

Both the public and private raffle winners receive MK 2500 ($US 17.86, at an exchange rate of MK 140 = $1 US) paid in cash and on the same day. That sum is roughly equivalent to one-tenth of average annual per capita cash income in Malawi, and at the time would have purchased 25 kg of fertilizer or five chickens. Since the public and private raffle winners are randomly chosen, any differences between how they choose to use the money can be attributed to the effect of their communities' awareness – or lack thereof – of their windfall. Because the experiment provides variation in the observability of unearned and unanticipated income, results cannot be generalized to the effect of redistributive pressure on expenditures from earned and/or anticipated income. The analysis of heterogeneous effects in Section 5.1 explores the interaction between position in the distribution of wealth, which may be correlated with pressure to redistribute earned or permanent income, and pressure

[3]For each club, I randomly choose a private winner and an alternate, in case the designated private prize recipient was absent or was independently drawn to receive for the public prize. The private prize is always awarded to the secret winner if he is present and not chosen by raffle for the public prize. Otherwise, the secret prize is awarded to the alternate.

[4]Median time to complete the supplemental survey was 11 minutes.

to redistribute windfall income.

3 Data

My final sample is of 291 raffle winners, half of whom won in "public" settings and the other half of whom won under "private" conditions. All prize recipients were surveyed in April 2008. Field teams returned to 77 of the initial 154 clubs in August 2008, and raffle winners were successfully resurveyed in 72 of those clubs.[5] There was attrition among winners in clubs that were reinterviewed. In total, 108 prize recipients, or 74 percent of those the survey teams attempted to contact, participated in follow-up surveys about their actual use of the prize money.

The April surveys include time-invariant baseline characteristics and the first set of outcome data, respondents' plans for how and when they would spend the windfall income. Public and private raffle winners were asked to enumerate each purchase they planned to make with the prize money, and these items were categorized and coded by survey staff in the field, at the time of data collection. I aggregate purchases up to seven broad categories: non-durables (including food), durables (clothing, household implements), health and education, investment (including farm inputs and stock for businesses), sharing (money lent or given to others), savings,[6] and other. Respondents were asked about the timing of each purchase (today, within a week, within a month, or later than a month), and who was the intended recipient or beneficiary of the purchase (the respondent him or herself, another member of the household, or someone outside the household). Note that this gives rise to two different potential definitions of redistribution, one based on the categorization of expenditures and the other based on the categorization of recipients. I report results for both measures.

August surveys are structured similarly, but ask respondents to report their realized use of the prize money. As in the April survey, respondents were asked to list their purchases and report the timing and beneficiary of each expenditure, and the survey team attempts to interview all club members, not just winners, which protects the secrecy of the private raffle.

Table 1 presents summary statistics and balancing tests for time-invariant baseline characteristics of the public and private raffle winners collected in the April survey. Panel A reports data for the full sample of 291 winners, and Panel B is restricted to the 108 individ-

[5] The raffle experiment was embedded within the Gine, Goldberg & Yang (2012) study, and because of budget considerations, an exploratory follow-up to that project revisited only a subset of the initial clubs in August 2008. These clubs were not randomly chosen; they were clubs whose members expressed interest in opening savings accounts.

[6] The savings variable is the amount that respondents themselves classified as savings (without specifying a duration). It is not a constructed residual category.

uals included in the follow-up survey. Public and private winners do not differ significantly in their gender, age, years of education, land owned, household size, number of children, or house quality score. Forty percent of public winners were resurveyed at endline, compared to 34 percent of private winners; the difference in the likelihood of being resurveyed is not statistically significant, and 80 percent of winners not present at endline belong to clubs that were not revisited in August.

Table 2 tests for selective attrition. The top panel includes the full baseline sample. Therefore, of the 183 respondents who are recorded as "not in follow-up," no follow-up interviews were attempted for the 146 individuals who were members of clubs that were not revisited. Panel B includes only the 145 members of clubs that were revisited; of those, 108 individuals, or 74 percent of the sample, were successfully interviewed in August. In total, the follow-up survey includes 58 public winners and 50 private winners. Thus, public winners are somewhat overrepresented in the August data, though the difference in the probability that public and private winners are resurveyed is not statistically significant at conventional levels (p=0.275).

Those raffle winners who did respond to the August survey were not observably different from the attritters in their gender, age, land ownership, household size, number of children, or house quality score. They do have an average of one year less schooling (p=0.143) and report an average of 1.6 children, compared to 2.2 in the sample of attritters (p=0.017).

Differential attrition could affect the interpretation of results using the August data. In particular, higher attrition among private raffle winners could indicate fear of exposure: private winners might have been concerned that, despite earlier assurances, their windfall would be revealed to the group during subsequent encounters with the survey team. Table 3 examines this hypothesis by regressing an indicator for being included in the follow-up survey on anticipated spending as reported in the April survey. The sample includes all respondents in clubs that were revisited in August. Column (1) indicates that public winners in clubs that were revisited were 8 percentage points more likely to be resurveyed than private winners in the same clubs, a difference that is not statistically significant at conventional levels. Column (2) indicates that there is no correlation in anticipated spending in the first week after receiving the prize and the probability of appearing in the August survey. Column (3) tests for a differential correlation between the probability of being resurveyed and anticipated first week spending for public compared to private lottery winners. The last row of the table reports the p-value for the test that public lottery winners and private lottery winners have the same probability of being in the August survey, at the median value of anticipated spending. For planned spending within a week of the raffles, this p-value is 0.63. Column (4) illustrates a marginally significant and positive relationship between anticipated spending on oneself and the probably of being in the August survey; an MK 1000 increase (approximately one standard deviation) in planned spending on oneself corresponds to a 0.06 percentage point increase in the probability of being surveyed in August. As reported in column (5), the p-value for the test that public and private winners with median anticipated spending on themselves have equal probabilities of being in the August survey is 0.24. The remainder of the table follows the same format. The correlation between the probability of being surveyed in August and anticipated spending on the household is negative and marginally significant; we fail to reject the hypothesis that public and private lottery winners with median anticipated spending on their households have equal probabilities of being resurveyed.

While the small sample size, 26% attrition among respondents targeted for endline interviews, and overrepresentation of public lottery winners in the August sample are concerning, these results provide some reassurance that differential attrition is unlikely to drive results using data from the endline survey. There is not a statistically significant difference in the rate of attrition for public compared to private winners, and there is no evidence that anticipated spending of the prize money is differentially correlated with the probability of attrition for public compared to private winners.

4 Analysis

Public distribution of windfall income potentially exposes recipients to greater redistributive pressure than private distribution of an equal-value transfer. Recipients can respond along three margins. The most commonly discussed margin is the intended beneficiary: those who receive public transfers may spend more of their windfall on others in their social network, in direct response to social pressure to share income. I investigate this margin directly, by comparing spending on prize recipients themselves, members of their households, and others outside the household.

Another potential margin for adjustment is in the composition of spending. While any difference in the composition of spending by public and private winners is evidence that public information about income receipt constrains choices, we may expect specific responses to redistributive pressure. For example, public prize winners may purchases so-called merit goods, signaling that they are using their windfall responsibly or pro-socially. Or, they may purchase items that are hard to share or liquidate, in an attempt to evade pressure to share. If they anticipate difficulty in resisting pressure to share when they have cash on hand, public winners may purchase durables instead of saving in cash. Private winners may adjust their spending towards unobservable purchases. Because winners spend small amounts of money on many different categories of goods, my study is likely underpowered to detect changes in the composition of spending. I do test for differential spending on seven mutually exclusive categories of purchases as described in the previous section. I include purchase of agricultural inputs such as fertilizer and pesticides, purchase of livestock, and purchase of building materials in the "investment" category. Results for analysis of these categories are not sensitive to alternative definitions of investment, such as removing livestock.

Finally, prize recipients can adjust the timing of their expenditures. While this margin has not received much attention in the literature about redistributive pressure, it may be important in a setting where sharing norms are asymmetric around cash versus other assets, and where close social ties make it difficult to maintain privacy about wealth in the long run. Randomizing whether raffle winners in my experiment received cash privately or in a public setting generates variation in the social pressure they initially face over sharing their windfall with others. Over time, however, information about the private lotteries may become public, as private winners either reveal information to others or are observed spending in excess of their usual habits. Therefore, spending money quickly – in the interval between when others come to know about it and when they make redistributive requests – may be a strategy for controlling expenditures and maximizing private welfare. If spending money quickly allows public prize recipients to evade the redistributive pressure they face in the immediate aftermath of the raffles, then over short horizons, we may observe a response on the timing margin and no change along the other margins. Over longer horizons, both spending and exposure to social pressure will converge.

Accelerated expenditures by public winners are both an indication that social pressure is a binding constraint on the consumption patterns otherwise favored by prize recipients, and a potential reduction in public winners' welfare. Spending money more quickly mechanically reduces consumption smoothing, which in turn lowers utility for agents with convex utility functions who discount future utility. Even if items are purchased but not immediately consumed, rapid spending eliminates the option value of choosing a different mix of goods after future uncertainty is resolved. Recipients who are pressured to spend quickly may also forego the opportunity to search for better prices or higher quality goods.

To study timing, I aggregate spending by date: the same day as the raffle, within one week of the raffle, within the same month, and in each of the three subsequent months. My primary measure of "immediate" spending is money spent within one week of the raffle, since the lotteries, surveys, and related activities occupied most of the day and gave prize recipients little time to spend. Also, market days happen once per week in most villages, so the week is a natural interval for measuring expenditure. Results are not sensitive to using the narrower same-day time frame.

For each set of outcomes, I run OLS regressions of the outcome on an indicator for whether the respondent received the prize in a public setting:

$$Y_{ic} = \alpha + \beta \text{Public}_i + \mathbf{X}_i + \epsilon_{ic} \tag{1}$$

Y_{ic} are individual spending outcomes in levels of Malawian kwacha; these are either anticipated spending as measured in the April survey, or realized spending from the August survey. Public_i is an individual-level indicator that is equal to one for respondents who received public prizes and zero for those who received private prizes. $\mathbf{X}_i$ is a vector of individual-level characteristics measured at baseline.

Specifications include these baseline measures of the variables included in the balance tests from Table 1 unless otherwise indicated, and standard errors are clustered at the club level. Since the sample is comprised entirely of raffle winners, the coefficient β measures the effect of receiving the prize in a public setting relative to in private. Results from specifications including club fixed effects are available in the Online Appendix.

5 Results

Table 4 compares the intended beneficiary of spending by public and private winners. Panel A reports anticipated spending by all 291 raffle winners on three populations: private consumption for themselves, public goods within their households or for other members of their households, and people outside the household. Private winners anticipate spending MK 748, or about 30 percent, of the prize on their own private consumption. Public winners anticipate an extra MK 171 of spending on themselves; the difference is not statistically significant. Private winners anticipate spending MK 1643 of their prize on household goods, or on consumption by other members of their household. This figure is lower by MK 186 for public winners, but the difference is not significant. Finally, private winners anticipate sharing MK 81, or three percent of the total windfall. Public winners anticipate sharing an extra MK 91, and though the difference is large relative to the mean for private winners, it is not statistically significant.

Panel B limits the analysis of anticipated spending to the subsample of 108 respondents who were subsequently resurveyed in August. Public and private winners in this subsample anticipate spending nearly identical amounts on themselves. Public winners anticipate slightly lower spending on their households and slightly higher spending on individuals outside of their households, but neither difference is statistically significant.

Panel C includes the same sample as Panel B, but uses data about realized expenditures, from the August survey. While private winners spent MK 1007, or 40 percent, of the windfall on themselves, public winners spend an additional MK 451 on private consumption. This difference is significant at the 95 percent confidence level. The increased private spending is offset somewhat by MK 318 less spent on household consumption, significant at the 90 percent confidence level. The experiment is designed to test redistributive pressure from outside the household, by revealing windfall income to other members of the club, so this result is not intended to represent a test of the unitary household model.

In all three panels and in subsequent tables, the sum of spending across mutually exclusive categories does not sum to precisely MK 2500 (the value of the prize) because respondents report anticipated or realized spending with error. Total spending across all categories and time periods is not statistically different between public and private winners. Results are similar in specifications that define the outcome variable as the share of the total prize variable allocated to each category of beneficiary.[7] I report the share of beneficiaries with any spending in a given category alongside summary statistics in each table; that share is as high as 77 percent who anticipate spending on their households and as low as 14 percent who anticipate spending on non-household members. Winners of public raffles are marginally more likely to anticipate and realize spending on themselves. They anticipate that they are more likely to share money or give gifts than private winners, which is consistent with the idea that public raffles were perceived to induce redistributive pressure.[8]

Private winners ultimately shared MK 192, more than twice as much as they anticipated. There is no excess sharing by public winners; on average, they shared MK 21 less. Note that limited income sharing in anticipation or ex post is not evidence against redistributive pressure if individuals are aware that they can evade such pressure. I test two possible margins for evasion – changes in the composition or timing of spending – in the subsequent tables. While any differences between the composition patterns of public and private winners indicates that income observability constrains consumption choices, recall that shifts away from holding liquid assets and towards more rapid spending are the hypothesized channels of evasion.

Table 5 reports estimates of the effect of public prize distribution on the composition of spending. The outcome variables are the amount of anticipated (realized) spending in each of seven categories; the percentage of winners who report any spending in each category is reported beneath the estimates. For example, 63 percent of the 291 winners anticipated spending some of their prize on non durable goods. On average, those who won private lotteries anticipated spending MK 701 of their MK 2,500 windfall on non durables. Receiving the prize in public increased anticipated non durable spending by MK 13, a change that is neither economically nor statistically significant. In fact, only the amounts shared with others and saved or invested are affected by public information about the raffle prize, and

[7] Results available upon request.
[8] Results available upon request.

these changes are identified off of spending by a small fraction of the total sample. Only 10 percent of the total sample anticipates giving or lending money to others. However, the average effect of receiving the windfall in public, an increase of MK 61, is statistically different from zero and large relative to the mean of MK 32 among private winners. This result is of similar magnitude to the effect on spending on people outside the household reported in Table 4.

Twenty two percent of the sample anticipates saving or investing some of their prize money. Public winners anticipate significantly lower savings than private winners, and the reduction of MK 161 is meaningful relative to the private winners' mean of MK 379. These findings are suggestive of redistributive pressure affecting some of the respondents. On average, receiving money in a public setting causes people to anticipate sharing more of it with others in their network, and to anticipate greater difficulty saving or investing their windfall.

While the effect sizes on anticipated spending in these two categories are similar when the sample is restricted to those 108 raffle winners who are resurveyed in August, as in Panel B, the standard errors of the estimates are 1.5 to two times as large, and no differences between public and private winners are significant at conventional levels in the subsample.

Finally, Panel C reports effects on realized spending, as measured in the August follow up survey. Only 8 percent of all respondents report saving prize money (perhaps because any short term savings had been depleted by August), and the difference between savings by private and public recipients is not significant. The difference in sharing by public and private winners has also vanished by August (as did the similar but not statistically significant effect using the alternate definition of sharing in Table 4). If anything, public winners shared somewhat less than private winners. Overall, 25 percent of August respondents shared some money compared to 15 percent of this subsample who anticipated sharing; both public and private winners shared more than anticipated. There are two statistically significant differences between public and private winners in realized expenditures, among the seven categories tested: public winners spend MK 208 less on health and education, and MK 238 more on other miscellaneous expenses, relative to private winners.

Table 6 reports total spending of the raffle income in three time windows: within a week of receipt, within a month of receipt, and in total. These estimates provide a test of the hypothesis that income observability causes windfall income recipients to adjust the timing of their spending. Recall that if income receipt will eventually become public – either because spending is observed, or because information is eventually disclosed and spread in small communities – then spending is a time-limited opportunity for evading social pressure to share, so the biggest difference in total spending is expected in the interval immediately following the raffles.

Table 6 is structured slightly differently than the previous results to highlight robustness to the inclusion of baseline covariates. The first four columns refer to anticipated spending measured in the April survey, and columns (5) and (6) refer to realized spending, from the August survey.[9] Public winners anticipate spending more money immediately after receiving their prizes than do private winners; the difference of MK 232 (without covariates, column 1) is significant at the 95 percent confidence level. The magnitude of the result is robust to the inclusion of covariates (MK 262, column 2), and corresponds to an increase of 0.28 standard deviations or 14 percent of average spending in the first week .

When the sample is limited to the 108 respondents reinterviewed in August, the magnitude of the difference in immediate spending is similar (MK 246, column 3) but, with less than half the original sample size, no longer significant at conventional levels. Similarly, the magnitude of the effect is stable in the realized data in column (5), though the extra MK 270 (or MK 262, from the specification including covariates) spent by public winners in the week following the raffles is not statistically different from zero in the August survey subsample. The estimated effect on realized spending is 0.24 standard deviations or 24 percent of average report spending, though as noted, this effect is estimated imprecisely.

Note that the outcome variable in Table 6 is the total of all expenditures reported by raffle winners, the sum of the sum of the seven categories in Table 5. This definition is used for consistency and to facilitate comparisons with results in other tables, and because actively moving money into a savings vehicle may represent an effort to make it unavailable for sharing purposes. The effect of income observability is somewhat larger when the outcome is defined to exclude savings (column 6 in Table 5). As reported in Appendix Table A1, the effect of public prize distribution is to increase anticipated spending in the first week by MK 348 (significant at the 95 percent confidence level) in both the full sample and the subsample. In the August survey, immediate spending is higher by MK 316 (MK 302, including covariates) by public winners than private winners.

Returning to the primary definition of the outcome variable (which includes money the household has actively allocate to saving) in Panel B of Table 6, the effect of income observability on anticipated spending persists for a month after in the raffle in the full sample, where public winners anticipate spending MK 279 (MK 296, with covariates) more than private winners over this interval. However, the difference is smaller among those resurveyed in August (MK 156, or MK 161 in specifications with covariates), and no longer statistically significant. The realized difference between public and private winners considering a month's expenditures is MK 149 (MK 109 with covariates), only 55 percent as large as the effect on

[9]In principle, total anticipated spending reported in columns (1) to (4) of Panel C could extend beyond August. Total realized spending reported in columns (5) and (6) of Panel C is limited to expenditures between the raffle and the August survey. In practice, respondents account for virtually all of the MK 2,500 windfall, suggesting that the money was spent in full by the time the follow up survey was conducted.

immediate spending in Panel A, and not statistically significant at conventional levels. This is consistent with a time-limited opportunity to avoid social pressure to share income by making the money unavailable through spending.

Finally, Panel C reports total spending over an unrestricted time horizon. Of course, we expect public and private winners' patterns to converge given sufficient time; eventually, everyone will spend their full prize. This is exactly the pattern we observe in Panel C. None of the coefficients on the "public" treatment are significantly different from zero, and all are less than a third the magnitude of the coefficient from the corresponding specification in Panel A.

Public and private winners anticipate smoothing consumption from prize money: 87-89 percent of raffle winners anticipate spending some money within a week and ex post, 69 percent report that they did spend money within a week. The prevalence of spending within a month and in total is even higher. There are no differences between public and private winners in the probability of spending some money in any of the three time frames, reflecting the high overall propensity to spend in each interval and suggesting that the margin of adjustment in the timing of spending was along the intensive margin.[10]

5.1 Heterogeneity

Social pressure to share income may have differential effects that depend upon position in the community wealth distribution. One possibility is that social pressure to share income is opportunistic – exerted when the expected benefit is positive because the target is expected to have resources that can be redistributed. While wealthier individuals will always face greater pressure to share under this hypothesis, awarding money in public rather than secretly may disproportionately affect behavior of poorer individuals. Since wealthy individuals are always presumed to have money that could be shared, winning a sum that is small relative to permanent income or wealth (though meaningful relative to short term consumption) may not change the spending or sharing patterns of the wealthy. For poor individuals, however, the raffle may create a different social dynamic. In equilibrium, these individuals face less pressure to share simply because in expectation, they have less to contribute. If they receive windfall income in public, however, they are known to have liquidity, and therefore become targets for social pressure.

Land ownership is a proxy for long-term wealth. Therefore, I test for evidence of this sort of heterogeneity by estimating the effect of the public raffle treatment on winners whose land ownership is strictly above the median for their farming club, compared to those whose land

[10] Results available upon request.

ownership is below their club median:[11]

$$Y_{ic} = \alpha + \beta_1 \text{Public}_i + \beta_2 \text{Above median land}_{ic} + \beta_3 \text{Public}_i \times \text{Above median land}_{ic} + \mathbf{X}_i + \epsilon_{ic} \quad (2)$$

The coefficient β_1 measures the effect of income observability on households with below-median land ownership. The difference between the effect of income observability on poorer and wealthier households is captured by β_3, and the total effect on wealthier households equals $\beta_1 + \beta_3$.

Table 7 reports estimates of β_1 and β_3 from equation (2), following the same format as Table 6. Public winners with below median land ownership anticipate spending significantly more the week (MK 694, from Panel A, column 1) after the lotteries than private winners. However, the effect of income observability on on wealthier winners is close to zero, and the difference between the effects on below- and above-median wealth winners is significant at the 90 percent confidence level in the full sample and the August resurvey subsample.

The realized effect of income observability on immediate spending is somewhat smaller and not statistically significant, though the same pattern of coefficients holds in columns (5) and (6) as in columns (1) to (4). As in Table 6, the effect of income observability dissipates over time. While the pattern of coefficients is the same for anticipated spending in the month after the raffle (Panel B) as in Panel A, neither treatment effects nor interaction terms are significant at conventional levels. In the specification that includes covariates (Panel B, column 6), public winners with below median incomes apparently spend less than private winners with similar incomes in the month following the lotteries, though the difference is imprecisely estimated.

There is no clear pattern to the results in Panel C. In the full sample, wealthy public winners anticipate the same average spending as private winners. Ex post, public winners report spending less by the time of the survey than private winners, but the effect of income observability is again completely offset (though in the opposite direction) for wealthy prize recipients. Higher marginal utility of consumption or lower discount rates for poor households cannot not explain these results, since both public and private raffle winners received the same windfall. Instead, the results are consistent with a model in which a modest unanticipated windfall exposes poor households to redistributive pressure from which they are otherwise exempt, but does not affect the pressure faced by wealthier households.

[11] I use baseline data from the full sample of club members, not just raffle winners, to calculate club medians.

6 Conclusion

Observed income-sharing is low for Malawian farmers who received $18 in windfall income, but the timing of expenditures depends on the observability of the prize. Those who received the prize in public – and consequently were exposed to greater pressure to share income – spent more of their money in the week immediately following the transfer than peers in the same communities whose prize was awarded secretly. In this experiment, subjects may have spent their windfall quickly to evade sharing obligations. Previous studies have documented that sharing norms can affect investment (Jakiela & Ozier 2016) and consumption (Kinnan 2014, Boltz, Marazyan & Villar 2015), and this study adds evidence that such pressure may change the timing of consumption even when it does not shift its composition.

There is suggestive evidence of opportunistic social pressure that responds to the expected availability of funds. First, social pressure in this experiment is triggered by the observability of income. Second, the pressure generated by public information has a bigger effect on expenditure timing and private consumption for poor individuals, who may face increased pressure to share when they are known to have cash compared to periods when they are less likely to have resources to share. In Malawi, many payments, especially those that target poor households, are easily observable. Wages for employment and the national public works scheme are made via highly visible "pay parades." Agricultural clubs often disburse loans or proceeds from cash crops sold through club accounts in group meetings. These results suggest that the information environment for payments is a constraint to the timing of expenditures. While asymmetric information generates inefficiencies and reduces welfare in most contexts and could have negative effects on informal insurance arrangements in this setting, my results also raise the possibility that changes that protect the confidentiality of income, such as utilizing mobile money for payments, could generate benefits to payment recipients through improved privacy.

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Tables

Table 1: Summary statistics and balance tests

	Public	Private	P-value: Public v.s. Private
Panel A: All winners in April			
Male	0.945	0.932	0.639
	(0.019)	(0.021)	
Age	43.703	44.842	0.462
	(1.124)	(1.065)	
Years of education	5.924	6.185	0.535
	(0.314)	(0.279)	
Land owned (acres)	6.708	6.969	0.733
	(0.465)	(0.605)	
HH size	5.883	5.795	0.709
	(0.167)	(0.166)	
Number of Children	1.600	1.603	0.986
	(0.106)	(0.108)	
House quality score (PCA)	0.075	-0.016	0.450
	(0.088)	(0.082)	
Animal ownership score (PCA)	0.182	0.071	0.513
	(0.128)	(0.112)	
Household durable score (PCA)	0.025	0.023	0.992
	(0.086)	(0.085)	
Farm asset score (PCA)	0.150	0.174	0.870
	(0.100)	(0.109)	
Number of days of insufficient food in Jan 2007	8.572	7.384	0.347
	(0.912)	(0.872)	
Number of days of insufficient food in July 2007	1.552	1.219	0.592
	(0.451)	(0.425)	
Interviewed at follow-up survey	0.400	0.342	0.311
	(0.041)	(0.039)	
N	145	146	
p-value for the joint significance of all covariates as regressors			0.918
Panel B: Winners in follow-up sample			
Male	0.948	0.960	0.775
	(0.029)	(0.028)	
Age	44.862	45.460	0.819
	(1.870)	(1.785)	
Years of education	5.586	5.880	0.678
	(0.484)	(0.514)	
Land owned (acres)	6.922	7.190	0.812
	(0.602)	(0.984)	
HH size	5.828	5.840	0.973
	(0.246)	(0.282)	
Number of Children	1.672	1.560	0.649
	(0.168)	(0.181)	
House quality score (PCA)	-0.004	0.022	0.894
	(0.132)	(0.145)	
Animal ownership score (PCA)	0.246	0.047	0.488
	(0.243)	(0.128)	
Household durable score (PCA)	0.068	0.103	0.881
	(0.152)	(0.176)	
Farm asset score (PCA)	0.150	0.136	0.953
	(0.159)	(0.168)	
Number of days of hunger in Jan 2007	6.862	6.600	0.889
	(1.180)	(1.472)	
Number of days of hunger in July 2007	1.931	1.220	0.529
	(0.849)	(0.705)	
N	58	50	
p-value for the joint significance of all covariates as regressors			0.999

Table 2: Test of differential attrition

	In follow-up	Not in follow-up	P-value: differential attrition
Panel A: All winners in April			
Public	0.537	0.475	0.311
	(0.048)	(0.037)	
Male	0.954	0.929	0.399
	(0.020)	(0.019)	
Age	45.139	43.765	0.392
	(1.295)	(0.964)	
Years of education	5.722	6.251	0.223
	(0.351)	(0.261)	
Land owned (acres)	7.046	6.717	0.677
	(0.556)	(0.511)	
HH size	5.833	5.842	0.973
	(0.185)	(0.152)	
Number of Children	1.620	1.590	0.848
	(0.123)	(0.097)	
House quality score (PCA)	0.008	0.042	0.788
	(0.097)	(0.076)	
Animal ownership score (PCA)	0.154	0.110	0.803
	(0.143)	(0.106)	
Household durable score (PCA)	0.084	-0.011	0.446
	(0.115)	(0.068)	
Farm asset score (PCA)	0.143	0.173	0.848
	(0.115)	(0.096)	
Number of days of hunger in Jan 2007	6.741	8.705	0.133
	(0.926)	(0.837)	
Number of days of hunger in July 2007	1.602	1.257	0.591
	(0.560)	(0.365)	
N	108	183	
p-value for the joint significance of all covariates as regressors			0.764
Panel B: Winners in resurveyed clubs			
Public	0.537	0.432	0.275
	(0.048)	(0.083)	
Male	0.954	0.919	0.427
	(0.020)	(0.045)	
Age	45.139	42.189	0.230
	(1.295)	(1.785)	
Years of education	5.722	6.703	0.143
	(0.351)	(0.495)	
Land owned (acres)	7.046	7.512	0.700
	(0.556)	(1.273)	
HH size	5.833	6.189	0.341
	(0.185)	(0.337)	
Number of Children	1.620	2.243	0.017
	(0.123)	(0.258)	
House quality score (PCA)	0.008	0.063	0.777
	(0.097)	(0.174)	
Animal ownership score (PCA)	0.154	-0.022	0.497
	(0.143)	(0.143)	
Household durable score (PCA)	0.084	0.021	0.775
	(0.115)	(0.170)	
Farm asset score (PCA)	0.143	-0.045	0.383
	(0.115)	(0.148)	
Number of days of insufficient food in Jan 2007	6.741	9.703	0.133
	(0.926)	(1.984)	
Number of days of insufficient food in July 2007	1.602	1.108	0.626
	(0.560)	(0.557)	
N	108	37	
p-value for the joint significance of all covariates as regressors			0.308

Table 3: Correlation between anticipated spending and attrition

Dependent variable: Interviewed at follow-up survey	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Public	0.080		0.144		0.114		0.011		0.073
	(0.073)		(0.145)		(0.096)		(0.124)		(0.077)
Anticipated spending in 1st week		0.003	0.005						
		(0.003)	(0.005)						
Public * Anticipated spending in 1st week			-0.004						
			(0.007)						
Anticipated spending on self				0.006*	0.008*				
				(0.003)	(0.005)				
Public * Anticipated spending on self					-0.005				
					(0.007)				
Anticipated spending on household						-0.006*	-0.008		
						(0.003)	(0.005)		
Public * Anticipated spending on household							0.004		
							(0.007)		
Anticipated spending on non-household								0.011	0.009
								(0.012)	(0.024)
Public * Anticipated spending on non-household									0.000
									(0.028)
Observations	145	145	145	145	145	145	145	145	145
Number of clubs	77	77	77	77	77	77	77	77	77
R-squared	0.01	0.01	0.02	0.02	0.03	0.02	0.03	0.01	0.01
Mean anticipated spending (MKW) for relevant category		1810.76	1810.76	894.69	894.69	1510.34	1510.34	95.03	95.03
p-value: public = private at median of anticipated spending for relevant category			0.63		0.24		0.29		0.34

Note: Sample includes respondents from clubs resurveyed in August. Anticipated spending is in 100s of MKW. The p-value is for a test of whether public and private winners at the median anticipated spending (of each spending category) are equally likely to be interviewed at follow-up survey.
OLS regressions. Robust standard errors are clustered at the club level. * p<0.10, ** p<0.05, *** p<0.001.

Table 4: Effect of income observability on beneficiary of spending

	(1)	(2)	(3)
Dependent variable:	Self	Household	Non Household
Panel A: Anticipated (all winners)			
Public	171.087	-186.326	91.476
	(116.408)	(122.988)	(79.704)
Observations	291	291	291
Number of clubs	154	154	154
R-squared	0.08	0.07	0.05
Mean of dep. var.	748.08	1642.53	80.68
SD of dep. var.	1021.72	1068.97	310.03
Dep. var is positive	0.47	0.77	0.14
Panel B: Anticipated (resurveyed winners)			
Public	58.467	-143.817	77.849
	(189.742)	(208.909)	(61.339)
Observations	108	108	108
Number of clubs	72	72	72
R-squared	0.12	0.12	0.13
Mean of dep. var.	970.60	1481.00	66.40
SD of dep. var.	1117.47	1119.38	240.49
Dep. var is positive	0.53	0.73	0.16
Panel C: Realized			
Public	450.853**	-317.679*	-21.162
	(184.859)	(173.021)	(95.410)
Observations	108	108	108
Number of clubs	72	72	72
R-squared	0.17	0.21	0.04
Mean of dep. var.	1007.40	1080.00	192.00
SD of dep. var.	1051.92	1077.17	478.45
Dep. var is positive	0.69	0.61	0.20

"Self" refers to private consumption by the raffle winner. "Household" includes public goods within the winner's household and private consumption of other HH members. "Non household" is money spent for or given to individuals outside the winner's household. Data include spending from the MK 2,500 windfall only. Panel A includes all raffle winners and uses data from the April survey. Panel B is restricted to raffle winners who are subsequently resurveyed in August. Panel C uses data from the August survey. All regressions include the baseline variables reported in Table 1 and 2. OLS regressions. Robust standard errors are clustered at the club level. * $p<0.10$, ** $p<0.05$, *** $p<0.001$.

Table 5: Effect of income observability on composition of spending

Dependent variable:	(1) Non Durable (including food)	(2) Durable (including clothes)	(3) Health and education	(4) Investment (including farm inputs, business)	(5) Sharing (including loans and gifts	(6) Saving	(7) Other and uncategorized
Panel A: Anticipated (all winners)							
Public	13.031	5.266	31.073	60.159	60.599**	-160.779**	66.887*
	(89.226)	(64.793)	(86.300)	(109.742)	(26.698)	(70.458)	(38.411)
Observations	291	291	291	291	291	291	291
Number of villages	154	154	154	154	154	154	154
R-squared	0.04	0.04	0.07	0.06	0.08	0.06	0.06
Mean of dep. var.	700.89	205.27	209.59	885.89	31.85	378.56	59.25
SD of dep. var.	799.85	515.42	496.34	991.37	166.60	726.93	190.19
Dep. var is positive	0.63	0.19	0.21	0.53	0.10	0.22	0.12
Panel B: Anticipated (resurveyed winners)							
Public	144.922	12.952	-79.188	-123.074	77.762	-150.200	109.324
	(155.844)	(109.007)	(80.223)	(178.410)	(49.707)	(119.163)	(77.362)
Observations	108	108	108	108	108	108	108
Number of villages	72	72	72	72	72	72	72
R-squared	0.15	0.07	0.12	0.16	0.22	0.15	0.25
Mean of dep. var.	658.60	224.00	219.60	919.40	64.00	370.40	62.00
SD of dep. var.	736.17	514.11	407.95	1006.17	260.89	731.83	226.68
Dep. var is positive	0.63	0.21	0.22	0.49	0.15	0.22	0.11
Panel C: Realized							
Public	-50.888	68.085	-208.299*	34.094	-58.702	34.360	237.622**
	(183.120)	(80.104)	(108.472)	(183.789)	(85.031)	(121.366)	(100.553)
Observations	108	108	108	108	108	108	108
Number of villages	72	72	72	72	72	72	72
R-squared	0.13	0.08	0.19	0.09	0.09	0.07	0.12
Mean of dep. var.	822.80	172.00	347.80	630.20	209.60	154.00	57.00
SD of dep. var.	906.21	368.69	685.85	880.04	472.38	551.51	255.95
Dep. var is positive	0.60	0.23	0.22	0.44	0.25	0.08	0.14

See Table 4 for notes.

Table 6: Effect of income observability on timing of spending

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Anticipated	Anticipated	Anticipated	Anticipated	Realized	Realized
Panel A: Within a week						
Public	232.110**	261.836**	245.745	289.526	269.510	261.627
	(114.857)	(117.132)	(198.638)	(194.412)	(191.248)	(200.171)
Baseline controls		X		X		X
Observations	291	291	108	108	108	108
Number of clubs	154	154	72	72	72	72
R-squared	0.01	0.09	0.01	0.16	0.02	0.10
Mean of dep. var.	1815.96	1815.96	1729.60	1729.60	1094.80	1094.80
SD of dep. var.	943.21	943.21	1012.02	1012.02	1081.68	1081.68
Dep. var is positive	0.89	0.89	0.87	0.87	0.69	0.69
Panel B: Within a month						
Public	279.170**	295.963**	156.228	161.747	148.841	108.772
	(88.449)	(89.008)	(146.343)	(128.654)	(207.589)	(204.363)
Baseline controls		X		X		X
Observations	291	291	108	108	108	108
Number of clubs	154	154	72	72	72	72
R-squared	0.03	0.09	0.01	0.21	0.01	0.16
Mean of dep. var.	2159.59	2159.59	2203.60	2203.60	1868.40	1868.40
SD of dep. var.	726.59	726.59	687.18	687.18	1035.36	1035.36
Dep. var is positive	0.97	0.97	0.96	0.96	0.84	0.84
Panel C: Total						
Public	62.837	76.236	-28.345	-7.502	54.876	56.272
	(67.540)	(66.403)	(101.961)	(79.321)	(97.959)	(102.925)
Baseline controls		X		X		X
Observations	291	291	108	108	108	108
Number of clubs	154	154	72	72	72	72
R-squared	0.00	0.06	0.00	0.28	0.00	0.11
Mean of dep. var.	2471.30	2471.30	2518.00	2518.00	2393.40	2393.40
SD of dep. var.	271.65	271.65	142.41	142.41	584.35	584.35
Dep. var is positive	0.99	0.99	0.98	0.98	0.97	0.97

Outcome is total spending in the interval following the raffle. Total savings is equal to the sum of the categories included in Table 5.
Data in columns (1)-(3) come from the April survey conducted immediately after the lotteries, and refer to anticipated spending in the next week. Data in columns (4) and (5) come from the follow up survey administered in a subset of villages in August, and are respondents' recollection of their actual spending in the week after the raffle. The sample in columns (1) and (2) includes all raffle winners surveyed at baseline. The sample in columns (3) to (6) includes only those winners resurveyed at endline. When covariates are included, they are the variables included in Table 1. OLS regressions. Robust standard errors are clustered at the club level. * p<0.10, ** p<0.05, *** p<0.001.

Table 7: Heterogeneous effects of income observability on timing of spending

Dependent variable:	(1) Anticipated	(2) Anticipated	(3) Anticipated	(4) Anticipated	(5) Realized	(6) Realized
Panel A: Within a week						
Public	379.424**	406.913**	562.829**	551.198**	440.865*	468.658*
	(154.253)	(157.933)	(256.445)	(239.680)	(263.846)	(272.809)
Public * Land above median	-409.410*	-406.794	-841.638**	-713.677*	-465.198	-554.723
	(245.082)	(253.713)	(402.922)	(367.148)	(469.010)	(492.006)
Baseline controls		X		X		X
Observations	291	291	108	108	108	108
Number of clubs	154	154	72	72	72	72
R-squared	0.02	0.09	0.05	0.19	0.03	0.11
Mean of dep. var.	1815.96	1815.96	1729.60	1729.60	1094.80	1094.80
SD of dep. var.	943.21	943.21	1012.02	1012.02	1081.68	1081.68
Dep. var is positive	0.89	0.89	0.87	0.87	0.69	0.69
Panel B: Within a month						
Public	395.969**	411.919**	307.964	311.559*	99.144	15.840
	(131.018)	(138.330)	(199.718)	(172.494)	(237.314)	(257.890)
Public * Land above median	-324.182*	-327.909	-415.345	-404.312	99.737	227.848
	(190.624)	(205.713)	(317.649)	(305.082)	(403.110)	(428.585)
Baseline controls		X		X		X
Observations	291	291	108	108	108	108
Number of clubs	154	154	72	72	72	72
R-squared	0.04	0.09	0.04	0.22	0.03	0.17
Mean of dep. var.	2159.59	2159.59	2203.60	2203.60	1868.40	1868.40
SD of dep. var.	726.59	726.59	687.18	687.18	1035.36	1035.36
Dep. var is positive	0.97	0.97	0.96	0.96	0.84	0.84
Panel C: Total						
Public	129.878	149.959	57.387	20.506	-12.072	-27.023
	(100.484)	(109.450)	(141.739)	(118.063)	(52.569)	(80.270)
Public * Land above median	-183.633	-204.248	-231.197	-71.522	155.239	203.882
	(121.246)	(144.341)	(192.226)	(158.501)	(233.005)	(200.150)
Baseline controls		X		X		X
Observations	291	291	108	108	108	108
Number of clubs	154	154	72	72	72	72
R-squared	0.01	0.07	0.01	0.28	0.05	0.14
Mean of dep. var.	2471.30	2471.30	2518.00	2518.00	2393.40	2393.40
SD of dep. var.	271.65	271.65	142.41	142.41	584.35	584.35
Dep. var is positive	0.99	0.99	0.98	0.98	0.97	0.97

See notes for Table 6. “Above club median (land owned)” is an indicator that equals 1 when a respondent’s land owned is strictly above the median calculated for all surveyed individuals in his/her farming club, including those who did not win raffle prizes. 187 out of 291 April winners have land above their club median, and 67 out of 108 resurveyed winners have land above their club median.

Online Appendix A (not for publication)

Table A1: Effect of income observability on timing of spending (excluding savings)

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Anticipated	Anticipated	Anticipated	Anticipated	Realized	Realized
Panel A: Within a week						
Public	348.041**	364.311**	348.228*	388.027**	316.407	301.912
	(117.944)	(119.902)	(195.007)	(193.346)	(193.057)	(199.804)
Baseline controls		X		X		X
Observations	291	291	108	108	108	108
Number of clubs	154	154	72	72	72	72
R-squared	0.03	0.11	0.03	0.19	0.02	0.11
Mean of dep. var.	1815.96	1815.96	1729.60	1729.60	1094.80	1094.80
SD of dep. var.	943.21	943.21	1012.02	1012.02	1081.68	1081.68
Dep. var is positive	0.89	0.89	0.87	0.87	0.69	0.69
Panel B: Within a month						
Public	382.065***	387.639***	223.193	233.022	187.117	139.997
	(103.749)	(106.139)	(158.405)	(148.901)	(220.980)	(212.504)
Baseline controls		X		X		X
Observations	291	291	108	108	108	108
Number of clubs	154	154	72		72	72
R-squared	0.04	0.10	0.02	0.18	0.01	0.19
Mean of dep. var.	1904.45	1904.45	2005.60	2005.60	1778.40	1778.40
SD of dep. var.	870.18	870.18	819.90	819.90	1075.58	1075.58
Dep. var is positive	0.95	0.95	0.95	0.95	0.82	0.82
Panel C: Total						
Public	231.709**	237.015**	132.917	142.698	36.462	21.911
	(95.763)	(96.005)	(146.933)	(141.397)	(150.002)	(153.121)
Baseline controls		X		X		X
Observations	291	291	108	108	108	108
Number of clubs	154	154	72		72	72
R-squared	0.02	0.08	0.01	0.18	0.00	0.09
Mean of dep. var.	2092.74	2092.74	2147.60	2147.60	2239.40	2239.40
SD of dep. var.	754.11	754.11	731.81	731.81	782.38	782.38
Dep. var is positive	0.97	0.97	0.96	0.96	0.94	0.94

Outcome is total spending in the interval following the raffle. Total savings is equal to the sum of the categories included in Table 6.
Data in columns (1)-(3) come from the April survey conducted immediately after the lotteries, and refer to anticipated spending in the next week. Data in columns (4) and (5) come from the follow up survey administered in a subset of villages in August, and are respondents' recollection of their actual spending in the week after the raffle. The sample in columns (1) and (2) includes all raffle winners surveyed at baseline. The sample in columns (3) to (6) includes only those winners resurveyed at endline. When covariates are included, they are the variables included in Table 1. OLS regressions. Robust standard errors are clustered at the club level. * p<0.10, ** p<0.05, *** p<0.001.

Table A2: Effect of income observability on beneficiary of spending (within club)

	(1)	(2)	(3)
Dependent variable:	Self	Household	Non Household
Panel A: Anticipated (all winners)			
Public	204.610	-181.508	20.039
	(188.123)	(199.163)	(56.095)
Observations	291	291	291
Number of clubs	154	154	154
R-squared	0.59	0.60	0.90
Mean of dep. var.	748.08	1642.53	80.68
SD of dep. var.	1021.72	1068.97	310.03
Dep. var is positive	0.47	0.77	0.14
Panel B: Anticipated (resurveyed winners)			
Public	67.202	-34.401	0.801
	(378.897)	(467.886)	(130.748)
Observations	108	108	108
Number of clubs	72	72	72
R-squared	0.78	0.74	0.84
Mean of dep. var.	970.60	1481.00	66.40
SD of dep. var.	1117.47	1119.38	240.49
Dep. var is positive	0.53	0.73	0.16
Panel C: Realized			
Public	646.138**	-402.763	-43.814
	(290.333)	(359.306)	(204.014)
Observations	108	108	108
Number of clubs	72	72	72
R-squared	0.92	0.89	0.75
Mean of dep. var.	1007.40	1080.00	192.00
SD of dep. var.	1051.92	1077.17	478.45
Dep. var is positive	0.69	0.61	0.20

"Self" refers to private consumption by the raffle winner. "Household" includes public goods within the winner's household and private consumption of other HH members. "Non household" is money spent for or given to individuals outside the winner's household. Data include spending from the MK 2,500 windfall only. Panel A includes all raffle winners and uses data from the April survey. Panel B is restricted to raffle winners who are subsequently resurveyed in August. Panel C uses data from the August survey. All regressions include the baseline variables reported in Table 1 and 2. OLS regressions. All specifications include club fixed effects. Robust standard errors are clustered at the club level.
* p<0.10, ** p<0.05, *** p<0.001.

Table A3: Effect of income observability on composition of spending (within club)

Dependent variable:	(1) Non Durable (including food)	(2) Durable (including clothes)	(3) Health and education	(4) Investment (including farm inputs, business)	(5) Sharing (including loans and gifts)	(6) Saving	(7) Other and uncategorized
Panel A: Anticipated (all winners)							
Public	37.312	2.165	-32.864	80.514	58.301	-168.352	66.064
	(139.859)	(99.600)	(78.351)	(175.916)	(40.147)	(115.418)	(63.099)
Observations	291	291	291	291	291	291	291
Number of clubs	154	154	154	154	154	154	154
R-squared	0.62	0.58	0.84	0.64	0.64	0.59	0.58
Mean of dep. var.	700.89	205.27	209.59	885.89	31.85	378.56	59.25
SD of dep. var.	799.85	515.42	496.34	991.37	166.60	726.93	190.19
Dep. var is positive	0.63	0.19	0.21	0.53	0.10	0.22	0.12
Panel B: Anticipated (resurveyed winners)							
Public	158.309	-46.514	-71.492	-20.358	87.909	-171.226	96.974
	(424.308)	(214.628)	(192.794)	(448.756)	(102.623)	(289.743)	(212.898)
Observations	108	108	108	108	108	108	108
Number of clubs	72	72	72	72	72	72	72
R-squared	0.76	0.83	0.70	0.79	0.89	0.78	0.77
Mean of dep. var.	658.60	224.00	219.60	919.40	64.00	370.40	62.00
SD of dep. var.	736.17	514.11	407.95	1006.17	260.89	731.83	226.68
Dep. var is positive	0.63	0.21	0.22	0.49	0.15	0.22	0.11
Panel C: Realized							
Public	-135.156	-60.066	-158.677	207.824	-16.058	-79.460	358.166
	(443.360)	(100.859)	(222.227)	(364.054)	(201.447)	(293.110)	(254.870)
Observations	108	108	108	108	108	108	108
Number of clubs	72	72	72	72	72	72	72
R-squared	0.80	0.90	0.81	0.79	0.74	0.69	0.74
Mean of dep. var.	822.80	172.00	347.80	630.20	209.60	154.00	57.00
SD of dep. var.	906.21	368.69	685.85	880.04	472.38	551.51	255.95
Dep. var is positive	0.60	0.23	0.22	0.44	0.25	0.08	0.14

All regressions include club fixed effects. See Table A2 for additional notes.

Table A4: Effect of income observability on timing of spending (within club)

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Anticipated	Anticipated	Anticipated	Anticipated	Realized	Realized
Panel A: Within a week						
Public	190.667	199.526	114.444	115.000	273.056	312.379
	(160.360)	(165.955)	(410.401)	(463.652)	(386.083)	(450.515)
Baseline controls		X		X		X
Observations	291	291	108	108	108	108
Number of clubs	154	154	72	72	72	72
R-squared	0.64	0.67	0.72	0.80	0.75	0.80
Mean of dep. var.	1815.96	1815.96	1729.60	1729.60	1094.80	1094.80
SD of dep. var.	943.21	943.21	1012.02	1012.02	1081.68	1081.68
Dep. var is positive	0.89	0.89	0.87	0.87	0.69	0.69
Panel B: Within a month						
Public	253.481**	269.850**	308.889	303.742	35.278	110.356
	(107.703)	(108.626)	(319.847)	(329.816)	(447.619)	(510.105)
Baseline controls		X		X		X
Observations	291	291	108	108	108	108
Number of clubs	154	154	72	72	72	72
R-squared	0.74	0.77	0.68	0.83	0.60	0.72
Mean of dep. var.	2159.59	2159.59	2203.60	2203.60	1868.40	1868.40
SD of dep. var.	726.59	726.59	687.18	687.18	1035.36	1035.36
Dep. var is positive	0.97	0.97	0.96	0.96	0.84	0.84
Panel C: Total						
Public	33.630	43.141	27.778	33.602	129.722	116.574
	(66.155)	(61.639)	(256.447)	(231.528)	(233.001)	(298.339)
Baseline controls		X		X		X
Observations	291	291	108	108	108	108
Number of clubs	154	154	72	72	72	72
R-squared	0.81	0.83	0.59	0.79	0.54	0.69
Mean of dep. var.	2471.30	2471.30	2518.00	2518.00	2393.40	2393.40
SD of dep. var.	271.65	271.65	142.41	142.41	584.35	584.35
Dep. var is positive	0.99	0.99	0.98	0.98	0.97	0.97

Outcome is total spending in the interval following the raffle. Total savings is equal to the sum of the categories included in Table 6.
Data in columns (1)-(3) come from the April survey conducted immediately after the lotteries, and refer to anticipated spending in the next week. Data in columns (4) and (5) come from the follow up survey administered in a subset of villages in August, and are respondents' recollection of their actual spending in the week after the raffle. The sample in columns (1) and (2) includes all raffle winners surveyed at baseline. The sample in columns (3) to (5) includes only those winners resurveyed at endline. When covariates are included, they are the variables included in Table 1.
OLS regressions. Robust standard errors are clustered at the club level. * p<0.10, ** p<0.05, *** p<0.001.

Online Appendix B (not for publication)

Directions for Public Lottery

First, read the following statement to the group: *Everyone at todays meeting can enter a drawing for a chance to win a prize of MK 2500. You don't have to enter the drawing, but you can if you want to. If you are the winner, the money is yours to do anything you want with it. The risk to you for participating in the lottery is that if you win, people will know you have money. Just like any other time that people know you have money, they could ask you for some of the money, try to steal it from you, or use witchcraft or some other method to get the money.*[12]

Next, walk around with the bag with pieces of paper, held closed and above eye level. Everyone who wants to be entered in the raffle should take one piece. When everyone has a piece of paper, tell them to open their paper. The person whose piece of paper has the star is the winner. That person should come to the front. You hand MK 2500 to that person, and have him sign a receipt.

Directions for Private Lottery

We have designated a "private lottery winner" and an alternate in advance. If the "private lottery winner" is the same person who won the public lottery, then the alternate becomes the "private lottery winner." Similarly, if the designated private lottery winner is not present, then the alternate becomes the private lottery winner.

Keep the "lottery questionnaires" out of view. Begin each questionnaire by asking the persons name. When the public lottery winner comes for his turn to complete the survey, administer the lottery questionnaire as well as the main questionnaire. Be sure that the public lottery winner does NOT see that there are two lottery questionnaires and two receipts, and that no one else in the group sees the receipts or questionnaires at all.

When the private lottery winner comes, read him the following statement BEFORE asking any of the survey questions on the baseline OR lottery questionnaire:

I have a surprise for you. Are you ready to hear it? We gave away MK 2500 in the lottery that we held with the group. We also held a secret lottery that no one knows about. You were the winner of that lottery. You also get MK 2500. No one else knows that there was a second lottery or that you won any money today. There was only one secret lottery you are the only other person to win money today. I will not tell anyone that you won money, and no one can see or hear us. You can keep it a secret or tell other people; its up to you. The risk to

[12]This list of potential risks to participants, including witchcraft, was specifically required by the IRB Committee at the University of Michigan.

you of taking the money is that even if you don't tell anyone, someone could find out, such as by noticing that you are spending a lot of money. If someone finds out you have money they didn't know about, they could be angry with you. If you dont want to take the money, you can say "no" right now. I wont give the money to anyone else if you turn it down, and no one will know that you turned it down.

Give the private lottery winner MK 2500. Have him sign a receipt. Ask him the questions from the lottery questionnaire after completing the main questionnaire.