Money or Power? Choosing Covid-19 Aid in Kenya

Susanna Berkouwer[a] Pierre Biscaye[b] Eric Hsu[c] Oliver Kim[d]
Kenneth Lee[e] Edward Miguel[f] Catherine Wolfram[g]

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Abstract

In response to the Covid-19 crisis, 186 countries implemented direct cash transfers to households, and 181 introduced in-kind programs that lowered the cost of utilities such as electricity, water, transport, and mobile money. During times of crisis, do people prefer in-kind transfers or cash, and why? In this paper, we compare electricity transfers against a benchmark of cash transfers (mobile money) among 2,000 rural and urban residents of Kenya with pre-paid electricity meter connections. We offer participants an incentivized choice between electricity transfers or mobile money, totalling approximately USD 10 to 15, and then implement their choice over three months. We generate three main findings. First, participants overwhelmingly prefer cash, with three-quarters of participants opting for mobile money even when offered electricity tokens with a cash value that is 40 percent higher, possibly due to the flexibility in expenditures or credit constraints. Second, despite relatively low baseline electricity consumption, preference for cash is slightly lower in rural areas, possibly due to higher transaction costs for purchasing electricity, lower mobile money penetration, or savings constraints. Third, electricity tokens transfers generate a larger increase in electricity consumption than equivalent cash transfers, suggesting a role for mental accounting; however, we estimate no impact of either electricity or cash transfers on a broad set of socioeconomic outcomes. These patterns suggest that mobile money transfers generate larger welfare gains than electricity credit, at least in settings with high mobile money penetration.

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[a]The Wharton School, University of Pennsylvania; [b]Department of Agricultural and Resource Economics, University of California, Berkeley; [c]Department of Economics, Yale University; [d]Department of Economics, University of California, Berkeley; [e]The Pharo Foundation; [f]Department of Economics, University of California, Berkeley and NBER; [g]U.S. Department of the Treasury, on leave from Haas School of Business, University of California, Berkeley and NBER. We thank the IGC and the DFID EEG initiative for generous financial support. This document is an output from PEDL, managed by CEPR, funded by the Foreign, Commonwealth and Development Office in collaboration with CDC, contract reference PEDL_LOA_7842_Wolfram. Oliver Kim acknowledges support from NSF Graduate Research Fellowship under Grant No. 1752814. We thank Joaquin Fuenzalida Bello and Nachiket Shah for excellent research assistance. We thank Dennis Egger, three anonymous referees, and seminar participants at the World Bank and the FCDO for helpful comments. We thank Jane Adungo, Carolyne Nekesa, and Joseph Otieno for superbly implementing field activities. A Pre-Analysis Plan is pre-registered with the AEA RCT Registry (ID: 5941). This study has IRB approval in Kenya (MUERC/27/13) and the U.S. (Berkeley CPHS 2016-11-9365; CPHS 2017-12-10599). To prevent any increased risk of Covid-19 transmission, all surveys conducted by this research team between April 1 and December 31, 2020 were conducted over the phone. The views, opinions, findings, conclusions, or recommendations, expressed in this article do not necessarily represent the views of the U.S., the U.S. Department of the Treasury, the National Science Foundation, CEPR, the FCDO, or the CDC. Data are available upon request.

1 Introduction

Many countries expanded social programs in response to the Covid-19 pandemic. For example, 186 countries introduced or expanded cash transfer programs, which are utility-maximizing in theory and have been shown to produce positive impacts on welfare (Egger et al. 2021; Banerjee et al. 2020). But nearly the same number of countries, 181 in total, responded to Covid-19 with programs to lower or postpone payments for utilities, such as electricity, water, transport, and mobile money transactions (Gentilini et al. 2021a). In-kind transfers may be preferable over cash if they circumvent savings constraints or reduce transaction costs, especially when transfers are infra-marginal, but they may also be chosen for non-economic reasons, like private interests, political economy considerations, and paternalism (Southworth 1945; Bruce and Waldman 1991; Currie and Gahvari 2008; Cunha 2014; Gadenne et al. 2021; Hirvonen and Hoddinott 2021). The variety of government responses to the pandemic raises the question: during times of crisis, do people in developing countries prefer cash or in-kind transfers and why?

Two of the most common forms of government pandemic social protection programs in African countries are pre-paid electricity credit and mobile money transfers. This study employs incentivized decision elicitation to compare demand for, and causal impacts of, mobile money transfers and electricity subsidies. Between May and November 2020 we surveyed 2,000 urban and rural respondents in Kenya as part of a randomized field experiment. A random subset of participants was offered three pre-paid electricity token transfers with a total value of approximately USD 15. Two additional treatment groups were offered the (binding) choice between three mobile money transfers or three pre-paid electricity token transfers, with varying total values approximately between USD 10 to 15. After the relevant transfers were made, respondents participated in an endline survey.

Participants overwhelmingly prefer cash via a mobile money transfer. In urban Kenya, 95% of respondents prefer mobile money to an electricity transfer of equal cash value. The preference for mobile money is slightly lower in rural Kenya, where 87% of respondents prefer it to electricity credit. Respondents are willing to forego significant value to receive mobile money rather than electricity: 82% of urban and 64% of rural Kenyan respondents prefer a mobile money transfer to electricity credit whose cash value is 40% greater. This result aligns with Lee et al. (2020) who find low demand for new electricity connections in rural Kenya, and suggests that Kenyan households do not value electricity very much on average which is not surprising given low average electricity consumption.

An important driver of the strong preference for mobile money over electricity credit in this setting is mobile money penetration. In Kenya, 97% of households have at least one mobile money account, 75% of adults regularly use mobile money, and mobile money is almost universally accepted for commercial transactions (Suri et al. 2021). Cash transfers disbursed as mobile money can thus be used flexibly in Kenya. Mobile money transactions are common: in the past 90 days more than 85% of mobile money account owners had used their accounts (Central Bank of Kenya 2019). Kenya's mobile money infrastructure is also well-integrated with the utility payments system. Among adults who pay utility bills, 82% in Kenya had used mobile money to do so (World Bank

2018). Moreover, the 2009 integration of the payment system of Kenya Power (Kenya's utility) with Safaricom significantly lowered the transaction costs of buying electricity (Safaricom 2019), even with a feature phone (non-smartphone). Transactions costs are particularly low in urban areas with a high density of mobile money agents. Mobile money transfers in Kenya thus give recipients the flexibility to spend money on goods and services with the highest marginal utility, which could include electricity.

In line with economic theory, mobile money transfers weakly dominate in-kind transfers in this context. Lower preference for mobile money in rural areas compared to urban areas of Kenya is consistent with lower mobile money penetration in rural areas, where consumers also more commonly purchases electricity credit in person. In such settings the value of mobile money is reduced and the transaction costs for buying electricity are greater. Berkouwer et al. (2022) find that in urban Ghana, where mobile money penetration is lower than in Kenya and most utility customers buy electricity tokens in person, households on average prefer prepaid electricity over a mobile money transfer of the same value.

We do not find much evidence that credit constraints are important drivers of the strong preference for mobile money. Electricity tokens are tied to a specific electricity meter and cannot be converted back into cash through refund or resale, so for most households in our sample, the token transfers also implicitly include a delay in benefits. Even if electricity transfers are inframarginal for recipients over a particular time period, they may still have more pressing expenses in the short-term. USD 5 in electricity credit represents 42 days of average spending for urban respondents and 85 days for rural respondents at baseline. But we find no significant relationship between electricity spending and preferences for cash vs. electricity. Even among respondents spending over USD 5 on electricity in the past 14 days, over 80% prefer mobile money to electricity credit.

The majority of respondents who choose pre-paid electricity tokens over mobile money of an equivalent amount cite their savings constraints as a reason: storing electricity prevents the money for being used on other expenditures, either from internal temptation or social pressures. We thus emphasize the importance of investigating the local context when policy makers decide between cash transfers, utility subsidies, or other in-kind transfer programs.

Finally, we analyze impacts of electricity and mobile money transfers on electricity spending and consumption. In theory, given that prepaid electricity can be stored indefinitely but cannot be resold, electricity and cash transfers should generate identical increases in electricity consumption by fully rational agents in an efficient market. However, prepaid electricity transfers generate significant increases in electricity consumption and meter balance while cash transfers do not, suggesting a role for inattention or mental accounting. Given the importance of basic benefits of electricity such as lighting and cell phone charging for modern life, this increased electricity consumption likely represents an increase in welfare. At the same time, we find no impacts of electricity transfers on a wide range of socioeconomic outcomes. This is consistent with other work which finds limited social and economic impacts of rural electrification (Lee et al. 2020; Burlig and Preonas 2016). We find no impacts of the cash transfers on any of the socioeconomic outcomes, though it is worth emphasizing that transfer sizes are small here.

Financial infrastructure should be centrally considered in public economics debates on the optimal form of government aid, such as the choice between cash versus in-kind transfers. The GSM Association (2021) reports that, during the Covid-19 pandemic, "many governments and NGOs turned to mobile money providers to distribute income support and emergency payments rapidly and efficiently." The same report also recognizes the potential expediency of subsidizing electricity costs: "as of 2020, digital utility payments were available in 75 per cent of all countries worldwide, and as such utility payments can function as an additional bridge to increased financial inclusion." However, this expediency has not yet translated to changes in policy recommendations. In a recent World Bank report, Gentilini et al. (2021b) provide a detailed analysis of cash transfers in urban Africa, but they omit the role electric utilities can play in improving expediency and reach.

The choice to implement cash or electricity transfers may depend on policy objectives: if the key goal is expediency, for example, then electricity transfers through utilities might be preferred in contexts where governments do not have existing mobile money relationships with citizens. In Kenya there is no expediency or transaction cost advantage to an electricity transfer relative to mobile money, so other than paternalistic arguments there is little reason to provide relief through electricity rather than cash. While electricity transfers may be effective in other settings (e.g., Berkouwer et al. 2022), our results indicate that in settings where mobile money is ubiquitous and utility transaction costs are low, people prefer cash.

2 Background

Kenya confirmed its first Covid-19 positive patient on March 12, 2020. Three days later, Kenya's President Uhuru Kenyatta announced a broad set of physical distancing measures which eventually included bans on social gatherings in crowded places, closures of schools, universities, and congregations in places of worship, and significant travel restrictions both domestically and internationally. The economic impacts of the Covid-19 public health crisis and its accompanying policies were substantial. Egger et al. (2021) find that "50% to 80% of sample populations in [Kenya] report income losses during the COVID-19 period." Firm profits and revenues in Kenya fell by 51 and 44% respectively.

Most governments worldwide introduced or expanded cash transfer programs to help alleviate Covid-19 related economic downturns. In many African countries mobile money was an important tool for providing cash transfers, particularly for populations excluded from formal financial institutions. At the same time, many countries implemented in-kind transfer programs. These can be attractive to governments lacking infrastructure to distribute cash broadly.

In March 2020 the Government of Kenya expanded its existing social safety net, *Inua Jamii*, which provides mobile money transfers to society's most vulnerable populations—including the elderly, orphaned children, survivors of sexual violence, people with disabilities, and pregnant mothers—and launched urban public works employment schemes (Gentilini et al. 2021a). These relief efforts did not reach most of the population (Doyle 2022). In our sample of urban and rural Kenyans, fewer than 10% of respondents reported receiving any cash, food, or other aid from the government or an NGO in the past 1-2 weeks.

A rich and growing literature has explored the impacts of government relief during the Covid-19 pandemic. In a randomized trial in Kenya, Banerjee et al. (2020) find that unconditional cash transfers significantly reduced hunger, illness, and depression, and enabled profitable risk-taking entrepreneurship during the pandemic. Berkouwer et al. (2022) find that electricity transfers allowed government relief to expediently reach a large share of the population, and despite implementation challenges were associated with increased support for the ruling party ahead of national elections.

Cash transfers are a natural policy option in Kenya as the use of mobile money is almost universal. In 2007, Safaricom launched one of the first mobile money products in the world: M-PESA. Today, 97% of Kenyan households have at least one M-PESA account, 75% of adults use mobile money at least somewhat regularly, and 68% of households live within 1 km of an M-PESA agent (Suri et al. 2021). USD 40 billion was transacted via mobile money in Kenya in 2018, representing almost half of its USD 88 billion GDP that year (IMARC Group 2019). Other countries in East Africa are rapidly catching up, with 51% and 39% of adults having a mobile money account for example in Uganda and Tanzania, respectively. However, adoption is not as widespread elsewhere in Africa. In Ghana for example, only 39% of adults use mobile money (World Bank 2019). The usage gap is even starker: in the past 90 days only 32% of Ghanaian mobile money accounts had transacted, whereas in Kenya more than 85% of mobile money account owners had used their accounts (BoG 2019, CBK 2019).

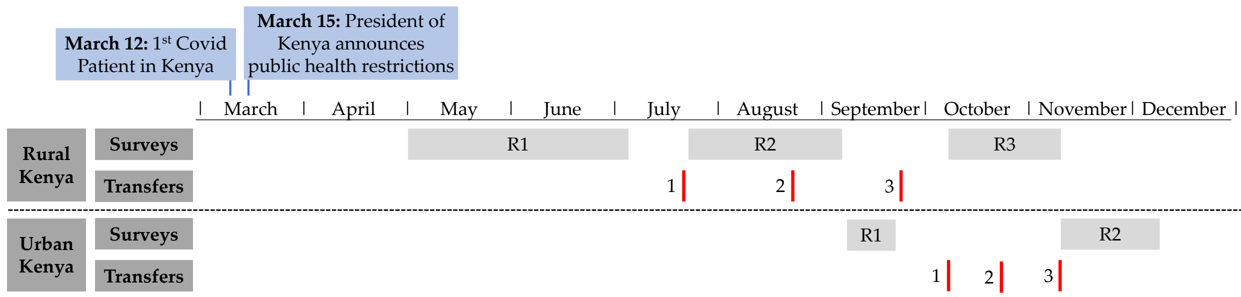
As mobile money integrates with a country's economy, its value can increase significantly. In 2010, Safaricom launched *Nunua na MPESA* ('Buy with MPESA'), enabling mobile money transactions at supermarkets (Safaricom 2019). The 2013 launch of Lipa-na-MPESA ('Pay-with-MPESA') further facilitated the nationwide use of mobile money for commercial transactions in Kenya.

Mobile money also affects utilities' payment infrastructure. As of 2019, 91% of urban households in Kenya had access to electricity (World Bank 2019). In 2009, Safaricom partnered with Kenya Power to let utility customers pay their electricity bills and buy electricity credit easily using mobile money (though some customers may still choose to purchase credit in person), reducing transaction costs. Among adults who pay utility bills, 82% in Kenya had used mobile money to do pay for electricity (World Bank 2018). Most respondents in our Kenya sample can use this service.

All participants in the experimental sample for this research are connected to pre-paid meters, and must purchase credits in advance in order to consume electricity.[1] Kenya uses an increasing block tariff structure, with the lowest unit costs offered to the lowest consumers. This 'lifeline' threshold is 32 kWh per month in Kenya, which is roughly equivalent to operating four light bulbs, a television, a cell phone charger, and perhaps an iron under average usage patterns.

[1] Around two-thirds of Kenyan households are on pre-paid meters, which Kenya Power continues to roll out to new customers and to replace post-paid meters.

Figure 1: Timeline



Timeline of 2020 study components. Vertical red lines represent experimental cash or electricity transfers in Kenya.

3 Study Design

The main study sample includes 983 respondents in urban Kenya and 1,070 in rural Kenya. Participants were enrolled in a randomized field experiment offering electricity or mobile money transfers. Electricity transfers in Kenya within this study's timeframe were logistically feasible only among households with a pre-paid electricity connection.[2] Inclusion in the study was therefore conditional on being connected to electricity through a pre-paid meter.

The 983 respondents located in urban Kenya were recruited through a mobile survey firm and are located in Nairobi (39%), Eldoret (11%), Mombasa (9%), and other urban areas. These urban respondents come from an existing respondent pool used for academic and market research that was recruited to reflect diversity in gender, age, socioeconomic status, and geographic location within Kenya. The 1,070 respondents located in rural Kenya were located in Western Kenya, Nyanza, and Rift Valley in communities recently electrified through the Last Mile Connectivity Project, and had previously participated in Lee et al. (2020) or Wolfram et al. (2021). They include all respondents from these studies with a pre-paid electricity meter.[3]

Despite being selected for connection to a pre-paid meter, the experimental participants are broadly similar to other households in the study areas based on observable characteristics from nationally-representative surveys (Table A1). The samples skew slightly younger than census data, likely because mobile phones were used to recruit respondents and conduct surveys. Rates of appliance ownership are higher in the study samples, especially in rural areas, presumably because an electricity connection was required to participate in our study.

Study participants completed between one and three phone surveys between May and November 2020. Figure 1 displays a timeline. All participants completed a baseline and an endline survey, and rural respondents completed an additional midline survey. All surveys were conducted over the phone.

[2] Households with post-paid meters have higher average income and education.

[3] The full sample of 2,228 respondents from Lee et al. (2020) and Wolfram et al. (2021) also includes 355 respondents with post-paid meters and 803 respondents with no electricity connection. In addition to these rural households excluded from the experimental sample are 143 urban households used to pilot the survey and recruited in the same way as the experimental urban households. Figure A1 illustrates the distribution of the full sample. Non-experimental respondents still completed the socioeconomic surveys as part of this study.

The experimental design had two objectives: to estimate the impact of electricity transfers, and to measure respondent preferences between electricity transfers and cash transfers. The design centers around the random assignment of each participant into one of four groups:

[C] Control group (33.3%) Participants are surveyed but do not receive any transfers.

[T1] Token transfer (33.3%): Participants receive three transfers of pre-paid electricity tokens valued at USD 5 each.

[T2A] Token vs high cash choice (16.7%): Participants are given a choice between USD 5 worth of electricity tokens or USD 5 in cash, transferred via mobile money. Whichever option they choose, they receive each transfer three times within a two month period.

[T2B] Token vs low cash choice (16.7%): Participants are given a choice between USD 5 worth of electricity tokens or USD 3.50 in cash, transferred via mobile money. Whichever option they choose, they receive each transfer three times within a two month period.

Random assignment was implemented separately for the urban and rural samples. To avoid spillover contamination, treatments for the rural sample were randomly assigned at the village level, stratified by the number of respondents in each village and the study each village was originally a part of. Given the low likelihood of urban spillovers, randomization for the urban sample was done at the individual level. Figure 2 displays the sample size for each treatment.

All experimental transfers were transmitted remotely. Cash was transferred using Safaricom's M-Pesa mobile banking service to a mobile money account tied to a phone number provided by the respondent. Electricity tokens were purchased at a local Kenya Power office, and then the token ID was sent by SMS to respondents, who could then enter it into their meter to activate the credit. To prevent fraud, each token is tied to a respondent's Kenya Power account number.

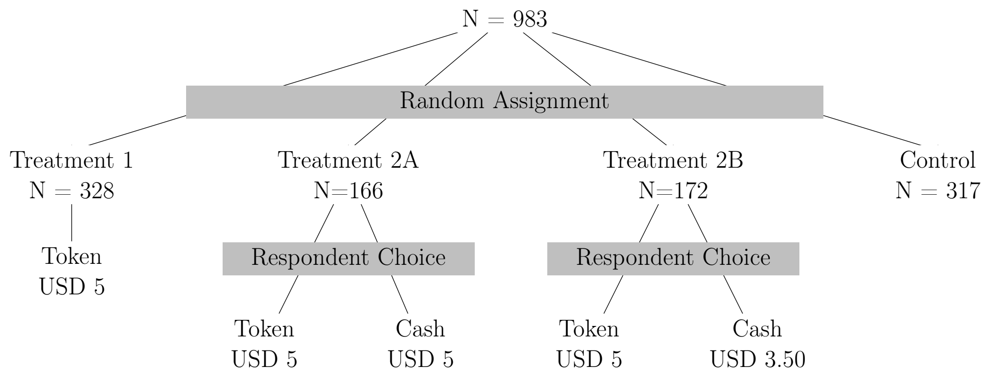
For 70% of respondents (including all urban respondents), the USD 5 transfer bought around 32 kWh in pre-paid electricity, however the exact amount may vary. Kenya Power's tariff changes slightly month-to-month. In addition, rural respondents connected through the government's Last Mile Connectivity Project (LMCP)—including most respondents from Wolfram et al. (2021) and those not connected through Lee et al. (2020)—were paying monthly installments for their connections. In these cases, part of each top-up is applied to debt repayment before being used to buy kWh of electricity, meaning respondents received between 10 and 30 kWh per transfer. Respondents connected through Lee et al. (2020) did not have debt outstanding and generally received around 32 kWh. USD 5 represents 42 days of average electricity spending for urban respondents and 85 days for rural respondents at baseline (round 1).

We elicit willingness to pay (WTP) for electricity credit using the treatment arms offering participants a choice between cash and electricity. 349 experimental respondents were given a choice between transfers of USD 5 in electricity tokens or USD 5 in mobile money ('T2A'), and another 353 were given a choice between USD 5 in electricity and USD 3.5 in mobile money ('T2B'). This WTP elicitation is incentive compatible since respondents received their selected transfer. [4]

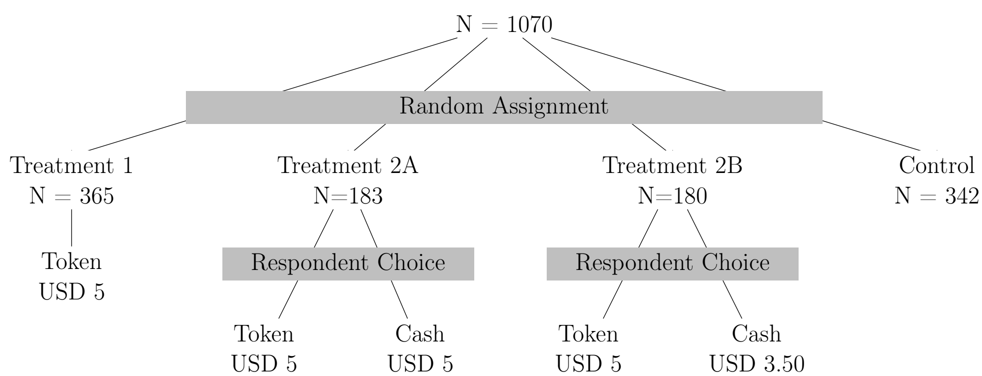
[4] A subset of 1,019 households from the full sample (including 798 experimental households, 143 urban pilot

Figure 2: Experimental design and sample sizes

Panel A: Urban Sample



Panel B: Rural Sample



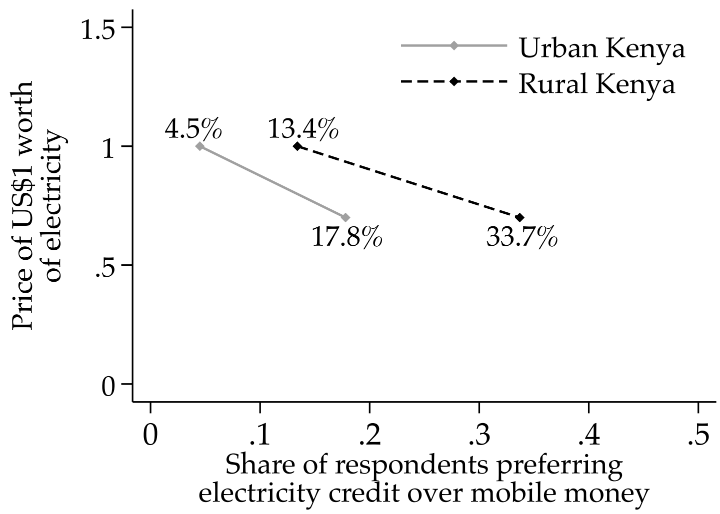
The figure shows treatment assignment within the experimental samples (Figure A1 shows non-experimental samples alongside the experimental samples). All experimental sample participants are connected to electricity via pre-paid meters. Participants in Control were surveyed but did not receive any transfers. Participants in Treatment 1 (T1) received three transfers of pre-paid electricity tokens worth USD 5 each. Participants in T2A (T2B) were given a choice between USD 5 worth of electricity tokens or USD 5 (USD 3.50) in mobile money. Whichever option they chose, they received each transfer three times within a two month period.

4 Results: Preferences over transfer mode

Figure 3 presents electricity take-up at different implicit prices (the ratio of the mobile money offer to the electricity transfer offer), by context. At an implicit price of USD 1 (i.e. facing choice between USD 5 in electricity tokens and USD 5 in cash), 95.5% of urban respondents and 86.6% of rural respondents prefer mobile money. When participants were offered the choice between USD 5 in tokens and USD 3.50 in cash (i.e. an implicit price of USD 0.70 for USD 1 worth of electricity),

households, and 70 post-paid rural households) were asked about their WTP using a contingent valuation approach, using a sequence of hypothetical dichotomous choices. 'Non-incentivized' WTP for electricity credit is calculated as the highest cash transfer amount the respondent rejected in favor of the electricity transfer. This approach is commonly used to elicit WTP (Alberini and Cooper 2000), including for electricity in different African countries (Abdullah and Jeanty 2011; Deutschmann et al. 2021; Sievert and Steinbuks 2020).

Figure 3: Demand for Electricity Transfers by Context



Demand for USD 1 of electricity expressed in USD of mobile money. The horizontal line represents the point where USD 1 of electricity costs USD 1 in mobile money. The numbers shown indicate the share of respondents who prefer electricity to mobile money at particular prices, by context. The solid lines indicate incentivized elicitation as part of a randomized field experiment. Dashed lines indicate non-incentivized elicitation over hypothetical tradeoffs.

take-up of the electricity tokens increased, but to just 17.8% for urban respondents and 33.7% for rural respondents. Most respondents are therefore willing to forego over 40% of the cash value to receive mobile money instead of an electricity transfer. [5]

Kenya has a well-developed and widely adopted mobile money system in M-PESA, making mobile money transfers more attractive. In Kenya, 75% of households regularly use a mobile money account and mobile money can purchase a broad set of goods and services (Suri et al. 2021). In particular, most Kenyan households can use mobile money to purchase electricity credits through Lipana-MPESA; 82% of Kenyan adults paying utility bills had used mobile money to do so (Demirguc-Kunt et al. 2018). Among households paying for electricity using mobile money, a mobile money transfer weakly dominates an electricity transfer.

The ability to top up electricity remotely using mobile money and widespread mobile money adoption and infrastructure in Kenya imply that transaction costs for purchasing electricity credit are likely small for most households. This is not the case for households in other African countries such as Ghana, where most customers must purchase electricity in-person at a vendor, and these transaction costs may explain why a larger share prefer electricity to mobile money transfers (Berkouwer et al. 2022). Transaction costs from purchasing electricity credit may also be higher for some Kenyan households. Households less experienced with mobile money or farther away from mobile

[5] While more respondents choose electricity over cash in non-incentivized elicitation in both rural and urban Kenya (Figure A2), we still observe a strong preference for mobile money: 70.7% of urban Kenyans and 72.5% of rural Kenyans prefer a hypothetical mobile money transfer to an equivalent electricity transfer. We focus on incentivized WTP elicited through the randomized experiment in this paper as non-incentivized measures may not accurately represent preferences.

money vendors may choose to buy electricity tokens in person; in rural areas, this can mean long travel times to the nearest authorized Kenya Power token vendor. For such households an electricity transfer implemented remotely allows them to circumvent these transaction costs.

Figure 3 shows that the preference for cash is slightly lower among rural Kenyan respondents. This would make sense given that Lipa-na-MPESA penetration is lower in rural Kenya, lowering the value of mobile money. Further, if accessing or using mobile money imposes transaction costs—such as transfer fees or costs of traveling to a mobile money agent—households may prefer to receive electricity credit, which has no associated costs and therefore accrues fully to the recipient while also potentially reducing any costs associated with acquiring electricity tokens. 19% of respondents who prefer electricity cite mobile money transaction costs as a reason, while 10% cite effort or time needed to top up electricity. Lower density of mobile money agents and Kenya Power vendors in rural areas relative to urban areas increases may thus also help explain the gap between urban and rural preferences. Even among rural respondents, however, the preference for cash is strong.

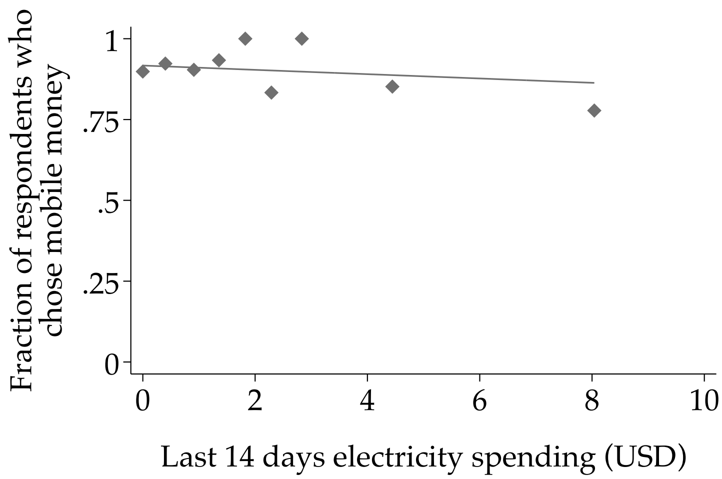
Another reason many households may prefer mobile money to electricity is short-term liquidity constraints, which may be exacerbated during an economic crisis as in the context of this study. Since electricity credit cannot generally be converted back to cash through refund or resale, large electricity transfers could take weeks or months to consume, implying a delay in benefits. The electricity transfers offered are large relative to typical consumption: USD 5 in electricity credit represents 42 days of average spending for urban respondents and 85 days for rural respondents at baseline.[6] Cash would instead provide households with potentially needed short-term liquidity without delay and with greater flexibility. Households may choose cash as a form of precautionary savings to help smooth consumption in the face of current or possible near-future negative shocks. Respondents who face credit constraints or who have present-biased preferences may also prefer mobile money to electricity credit. Individuals who prefer electricity to cash appear to be those who do not face major liquidity constraints: 46% of respondents who prefer electricity state that they "would use the money for electricity anyway." For these households, electricity is the marginal expenditure.

If credit constraints drive household preferences for mobile money, we would expect this preference to depend on whether the electricity transfer is inframarginal in the short term, but we do not find much evidence for this. Figure 4 shows the correlation between preference for mobile money and electricity expenditures in the last 14 days. There is a slight negative association but preferences are relatively constant regardless of electricity expenditure.[7] The association is not significant when controlling for other household characteristics (Table A2). Even among respondents spending over USD 5 on electricity in the past 14 days (for whom the electricity transfer is inframarginal over a short time frame), over 80% prefer mobile money to electricity credit.

[6] These estimates are based on reported electricity spending in the last 14 days; 24.6% of urban respondents and 62.4% of rural respondents in treatment arms T2A and T2B report 0 electricity spending in this period.

[7] The trend is similar when considering the choice between USD 5 in electricity and USD 3.50 in mobile money from treatment arm T2B, though there is a level shift downward in the share choosing cash at each level of electricity spending (Figure A3).

Figure 4: Correlation between transfer mode preference and electricity expenditures



The share of respondents in treatment arm T2A choosing cash (disbursed via mobile money) over the same amount of electricity credit at different levels of electricity spending, along with a line of best fit. Among this sample, electricity spending in the last 14 days for the median respondent is USD 0.92 such that a USD 5 electricity transfer would last approximately 10.9 weeks.

Given the many advantages of a mobile money transfer over an electricity transfer in the Kenyan context, what might explain a preference for electricity credits over an equivalent amount of cash for some households? Individuals with sophisticated present-biased consumption preferences may opt to constrain themselves by allocating more resources to electricity credit: pre-paid electricity generally does not expire and can thus be a useful savings device. Households may recognize that their future selves will benefit more from having electricity credit than from whatever they might spend cash on in the present. Among respondents who preferred electricity, 73% state that they worry they "will spend the money on something else." For such households having a transfer go directly to their electricity meter would help them optimize spending, protecting the money from either internal temptation or social pressures. This response reflects a degree of sophistication among respondents, who seek a commitment to allocating money to electricity credit for future use rather than allowing their present selves to spend cash on something besides electricity.

Differences at the individual level can explain some of the variation in preferences. Ownership of electric appliances—of a refrigerator in particular—is positively associated with a preference for electricity over mobile money. Transfer preferences are not significantly associated with household spending on electricity, food, or other socioeconomic variables (Table A2).

5 Results: Impact of transfers

Next, we use the randomly assigned treatments to estimate the causal impacts of electricity and mobile money transfers on energy and other outcomes. The following equation estimates the effects of each randomly assigned treatment:

$$y_{si} = \beta_0 + \beta_1 T^1_{si} + \beta_2 T^{2A}_{si} + \beta_3 T^{2B}_{si} + X_{si}\Gamma + \varepsilon_{si} \quad (1)$$

where y_{si} is the outcome of interest for respondent i at village s, $T^1_{si} = 1$ if the respondent is assigned to the direct USD 5 electricity transfer arm (T1), $T^{2A}_{si} = 1$ for the USD 5 electricity / USD 5 cash arm (T2A), and $T^{2B}_{si} = 1$ for the USD 5 electricity / USD 3.50 cash arm (T2B). X_{si} is a vector of controls, pre-specified in Berkouwer et al. (2020).[8] ε_{si} are clustered by village for the rural sample but allowed to vary by individual for the urban sample.

Table 1 estimates equation 1 for the urban and rural samples separately. Given that the rural sample began receiving transfers before their second (midline) survey, we pool together the survey round 2 and round 3 observations for the rural sample to increase statistical power.[9] For the urban sample we include data from the endline survey. The 'Token Treatment' column gives the effects of an electricity transfer while the '500 Ksh vs Tokens' column can be interpreted as impacts of a cash transfer, given that most respondents opted for mobile money when given this choice. The '350 Ksh vs Tokens' column is presented for completeness; coefficients represent a combination of electricity and cash transfer impacts weighted by the share selected electricity or mobile money.

We find limited impacts of the transfers on socioeconomic outcomes. Electricity transfers increased electricity usage despite decreased electricity spending in both contexts, which suggests electricity transfers also free up some resources for other uses. Households in rural Kenya that receive an electricity transfer significantly increase non-energy spending in the last 7 days. Other than this, the electricity and mobile money transfer treatments had no significant effects on a wide range of socioeconomic outcomes.

Electricity transfers increased electricity usage by 29 kWh (worth roughly USD 4.2) for the rural sample and 43 kWh (worth roughly USD 6.3) for the urban sample. These effects are large: relative to the control group, treated households increased electricity usage by 62% in the rural sample and 105% in the urban sample. Transfers also led to higher electricity meter balances at endline for both groups, and to decreases in recent electricity spending. Recipients thus appear to be storing some portion of their transfers, in addition to increasing their consumption. The more than doubling of meter balance relative to the control group suggests that part of the transfers were retained by households. This behavior is consistent with the meter balance being used as a kind of informal savings device.

Urban participants received 29.2 kWh for each of the three transfers on average while rural participants received 27.9 kWh per transfer. The average increases in electricity usage and meter

[8] The rural regressions include baseline (2014 for the Lee et al. (2020) sample, 2018-20 for the Wolfram et al. (2021) sample) controls for respondent gender, education level, a dummy variable for if they had a bank account, a housing quality index, as well as the COVID survey baseline value for each outcome. As a newly collected sample recruited over SMS, the urban data lack the same detailed set of outcomes as for the rural samples, so the urban regressions instead include indicator variables for each of the eight Living Standard Measure (LSM) scores as controls. Results are broadly unchanged when not including these controls. For both samples, we include the Covid-19 survey baseline value for the outcome variable.

[9] The results are robust to excluding either round rather than pooling both rounds (Table A3).

Table 1: Impact of transfers on energy and other consumption

Panel A: Urban Sample

	N	Control Mean (SD)	T1 Token Treatment (SE)	T2B 350 Ksh vs Tokens (SE)	T2A 500 Ksh vs Tokens (SE)
Electricity usage since baseline (kWh)	651	40.88	42.58***	9.93*	3.26
		(40.06)	(4.35)	(5.23)	(4.06)
Electricity usage since baseline (approx value in USD)	651	5.99	6.24***	1.46*	0.48
		(5.87)	(0.64)	(0.77)	(0.60)
Prepaid electricity expenditure in the past 2 weeks in USD	897	1.39	-0.58***	0.18	0.27
		(1.92)	(0.14)	(0.18)	(0.18)
Meter balance (kWh)	690	10.03	15.48***	3.93**	-1.41
		(13.86)	(1.69)	(1.85)	(1.21)
Meter balance (approx value in USD)	690	1.47	2.27***	0.58**	-0.21
		(2.03)	(0.25)	(0.27)	(0.18)
Energy spending in the past 7 days in USD (excl. electricity)	894	0.72	0.17	0.10	0.10
		(1.66)	(0.14)	(0.16)	(0.18)
Energy spending in the past 7 days in USD (excl. electricity and charcoal)	891	0.17	-0.02	-0.02	0.05
		(0.54)	(0.04)	(0.04)	(0.06)
Non-energy spending in the past 7 days in USD	887	32.89	-1.07	-0.77	-2.94
		(25.66)	(2.00)	(2.34)	(2.36)
Dissaving (pc) in the past 14 days in USD (assets sold + loans - assets bought)	908	7.17	2.24	-0.13	3.41
		(38.69)	(2.75)	(2.71)	(5.69)
Total spending in the past 7 days in USD	887	34.32	-0.92	-0.39	-2.45
		(26.35)	(2.06)	(2.40)	(2.44)

Panel B: Rural Sample

	N	Control Mean (SD)	T1 Token Treatment (SE)	T2B 350 Ksh vs Tokens (SE)	T2A 500 Ksh vs Tokens (SE)
Electricity usage since baseline (kWh)	1305	47.47	28.81***	6.10	18.08***
		(46.29)	(3.62)	(4.60)	(5.63)
Electricity usage since baseline (approx value in USD)	1305	6.96	4.22***	0.89	2.65***
		(6.78)	(0.53)	(0.67)	(0.82)
Prepaid electricity expenditure in the past 2 weeks in USD	1803	1.05	-0.41***	-0.25**	0.06
		(1.49)	(0.09)	(0.11)	(0.13)
Meter balance (kWh)	1413	11.64	12.95***	7.73***	1.19
		(20.88)	(1.56)	(2.11)	(1.84)
Meter balance (approx value in USD)	1413	1.71	1.90***	1.13***	0.17
		(3.06)	(0.23)	(0.31)	(0.27)
Energy spending in the past 7 days in USD (excl. electricity)	1814	0.66	0.31**	0.14	-0.21*
		(1.64)	(0.12)	(0.17)	(0.12)
Energy spending in the past 7 days in USD (excl. electricity and charcoal)	1812	0.48	0.02	-0.02	-0.03
		(1.27)	(0.08)	(0.10)	(0.11)
Non-energy spending in the past 7 days in USD	1847	24.43	3.49**	0.99	0.29
		(23.04)	(1.63)	(2.04)	(1.78)
Dissaving (pc) in the past 14 days in USD (assets sold + loans - assets bought)	1850	1.86	-1.50	-2.35*	-3.09*
		(24.14)	(1.22)	(1.39)	(1.74)
Total spending in the past 7 days in USD	1847	25.54	3.73**	1.04	0.07
		(23.82)	(1.71)	(2.13)	(1.84)

Estimates of Equation 1 for urban (Panel A) Kenya at endline and rural (Panel B) Kenya pooling midline and endline. From left to right, the columns show the number of observations, the control mean, and the treatment effects of T1, T2A, and T2B (all relative to control). Regressions include baseline controls for sex, education, banking status, and housing quality (from Lee et al. (2020) or Wolfram et al. (2021)) for the rural sample and indicator variables for each of the eight Living Standard Measure scores for the urban sample, as well as the Covid-19 survey baseline value for each outcome for both samples. For the rural sample, all covariates that are statistically significant at $\alpha = 0.05$ also have FDR q-values less than 0.05, with the exception of T2B when prepaid electricity expenditure is the outcome (which has FDR q-value=0.08). For the urban sample, all covariates that are statistically significant at $\alpha = 0.05$ also have FDR q-values less than 0.05, with the exception of T2B when meter balance is the outcome (which has FDR q-value=0.17). Electricity usage since baseline (kWh) is the sum of (1) the difference between baseline and endline meter balance, (2) household top-ups since baseline, (3) kWh received through treatment (if any). *** p<0.01, ** p<0.05, * p<0.1

balance for households receiving electricity credit therefore account for 66.5% of the total transfers received for urban participants, and 49.9% for rural participants. This implies that urban and rural households decreased their total electricity spending since baseline by the remaining amount. Based on average electricity transfers received and impacts of the T1 treatment on electricity usage and meter balance, we calculate that treated households reduced their electricity spending by 29.4 kWh (approximately USD 5.0) in urban areas and 41.9 kWh (approximately USD 7.5) in rural areas.

Decreases in electricity spending in the past 2 weeks for T1 treatment households are consistent with these calculations. The magnitude of the coefficients (USD 0.58 for urban and 0.41 for rural households) suggests that more of the reduction in electricity spending occurred closer to when the first transfers were received rather than in the two weeks preceding the endline survey. This could explain why we do not observe a significant impact of electricity transfers on non-electricity spending in the past 7 days for urban households.

Reduced electricity spending among rural households following the transfers appears to have allowed them to reallocate money towards other consumption. Rural recipients of electricity transfers increased total consumption in the past 7 days by USD 3.73 (mostly on non-energy spending). Significant positive impacts among rural recipients may reflect that rural households were more likely than urban recipients to use electricity transfers to reduce their electricity spending, rather than consuming or storing the transfers, but may also reflect the timing of data collection. The effect in the pooled sample is driven by a USD 5.47 increase in round 2, while electricity transfers were being distributed (Table A3). The time between the first electricity transfers and the endline survey was longer for urban households.

Turning to the other treatments, the T2A treatment arm had no effect on electricity use or storage among urban respondents—95% of whom chose mobile money. The T2B treatment arm—when the offered mobile money amount is less than the offered electricity transfer—does significantly increase electricity use and storage for urban respondents, consistent with more respondents (17.8%) choosing electricity in this treatment. Interestingly, among rural households we find stronger effects on electricity usage for T2A than for the T2B, even though just 13% of rural T2A households chose electricity over cash compared to 34% for T2B. Reductions in electricity spending and increases in meter balance, however, are larger and only significant for T2B.

Even where the other treatment arms increased electricity usage, the magnitudes of the impacts are much lower than for T1. Given that electricity is storable and transaction costs for using mobile money to purchase electricity tokens are low, there is no reason *ex ante* for the electricity transfers in T1 to generate larger increases in electricity usage. Instead, mental accounting, or increased attention to electricity usage due to the treatment, might account for increased electricity consumption for the T1 treatment arm.

As with electricity transfers, we find no impacts on non-electricity spending for the other two treatment arms among urban respondents. The treatments reduce dissaving (the difference between assets sold and loans and assets bought) among rural respondents, but the increase in total consumption observed in the T1 arm is not replicated in the T2A or T2B arms, despite transfers in those arms primarily coming through mobile money. Respondents in these arms may be saving rather than spending their mobile money transfers, as we observe for the electricity transfers through their meter balance, but we do not have data on savings on mobile money platforms. Recipients may also have spent their transfers immediately upon receipt. Such spending would not be captured in the endline survey, which followed the third transfer with a lag and only asks about spending in the last 7 days. Such rapid spending of transfers may be particularly likely in the context of this study where the pandemic economic crisis may have exacerbated household liquidity constraints. Impacts of the T2A and T2B arms on consumption remain insignificant even when solely considering the round 2 rural midline survey while the transfers were being disbursed, however, suggesting this does not drive the result and some of the transfers are being saved (Table A3).

In addition to measures of electricity use and household spending, we also consider impacts of the treatment arms on additional socioeconomic outcomes including household income, labor supply, food security, COVID knowledge, and in-person interactions (Table A4). We find minimal effects across all treatment arms, and no coefficients are statistically significant after accounting for the multiple testing adjustment.

In summary, while the electricity transfer had a significant impact on electricity usage but no other outcomes besides consumption for rural households, the cash transfers had no to little impact on any of the measured outcomes. The lack of detectable impacts outside of electricity use may be the result of limited statistical power, especially considering the modest transfer size.[10] Given the existing literature finding large positive effects of cash transfers (Haushofer and Shapiro 2016; Handa et al. 2018), we therefore interpret these results cautiously.

6 Conclusion and policy implications

During times of crisis, do people prefer cash transfers or in-kind transfers like electricity subsidies? We run a randomized experiment in urban and rural Kenya enabling respondents with pre-paid electricity meters to choose between transfers of electricity credit and a varying amount of mobile money in an incentive-compatible manner. 95% of urban and 86% of rural respondents prefer mobile money to the same amount in electricity credit, and a large majority still choose cash even when offered prepaid electricity tokens worth 40% more.

The preference for mobile money seems reasonable given low levels of electricity consumption and Kenya's advanced mobile money infrastructure. Mobile money is almost ubiquitous in Kenya and is well-integrated with Kenya Power's payment system, increasing its value and reducing the transaction costs of buying electricity, limiting the advantages of a direct electricity transfer. The electricity credit also exceeds most households' monthly electricity consumption, implying delayed benefits from an electricity relative to a mobile money transfer.

These contextual and design factors matter for preferences, as Berkouwer et al. (2022) find that in urban Ghana, where mobile money is less widespread and purchasing electricity involves

[10]Each 5 USD transfer is around 7% of last 14 days total income for urban households and 27% for rural households.

significant transaction costs, households prefer inframarginal electricity transfers to mobile money transfers. In this vein, the greater relative preference for electricity in rural relative to urban areas of Kenya in this study may be due to lower penetration of mobile money and higher electricity transaction costs for some households in rural areas. Respondents who prefer electricity to an equal amount of cash cite a desire to commit savings to electricity and the inframarginality of electricity transfers to consumption as additional reasons.

Electricity transfers increased household electricity use and storage and also allowed them to reallocate spending from electricity to other forms of consumption. Limited effects of cash transfers on electricity use suggests that effects of the electricity transfer may result from mental accounting or increased attention to electricity use. Electricity or cash transfers had no to little on other socioeconomic outcomes, potentially due to the modest transfer size.

For governments, mobile money infrastructure provides a channel to transfer funds cheaply and quickly. It may also alleviate financial pressures that electricity subsidies impose on utilities. In theory the mode of transfer should not affect the fiscal source of funding, but in practice, the cost of electricity transfers is often borne by utilities, whereas cash transfer programs are often paid for by other government agencies. This is an important concern. Electric utilities in 37 out of 39 Sub-Saharan African countries are currently operating at a cost that exceeds the revenue recovered through existing tariffs (Kojima and Trimble 2016). In contexts where utilities are majority government-owned, they may receive a mandate of providing subsidized electricity without financial compensation for the additional cost this would incur. This added social responsibility may increase financial strain on a utility's ability to provide reliable electricity. Fiscal and financial responsibilities will vary by context and may also affect optimal policy.

In contexts with rapid mobile money adoption, cash transfers will likely become a cheaper and more effective channel of disbursing government aid, as shown by the expansion of social assistance in some African settings during the pandemic (Gentilini et al. 2021a; GSM Association 2021). If other countries reach the high levels of mobile money adoption seen in Kenya, households may develop stronger preferences for mobile money transfers versus in-kind transfers, making mobile money a more desirable way to disburse government aid. The COVID-19 pandemic has accelerated the adoption of mobile money and financial products in many countries (GSM Association 2021), likely hastening this transition. At the same time, mobile money penetration may remain persistently low in some communities—including those with low financial literacy, those where intended recipients are too poor or lack the technological know-how to own a cellphone, and the ultra-poor, for whom mobile transaction fees can be prohibitive. In these contexts, in-kind transfers may remain preferred. Governments responding to economic crises, including the ongoing COVID-19 pandemic, should adapt policies to reflect the level of mobile money adoption and its integration with payment systems.

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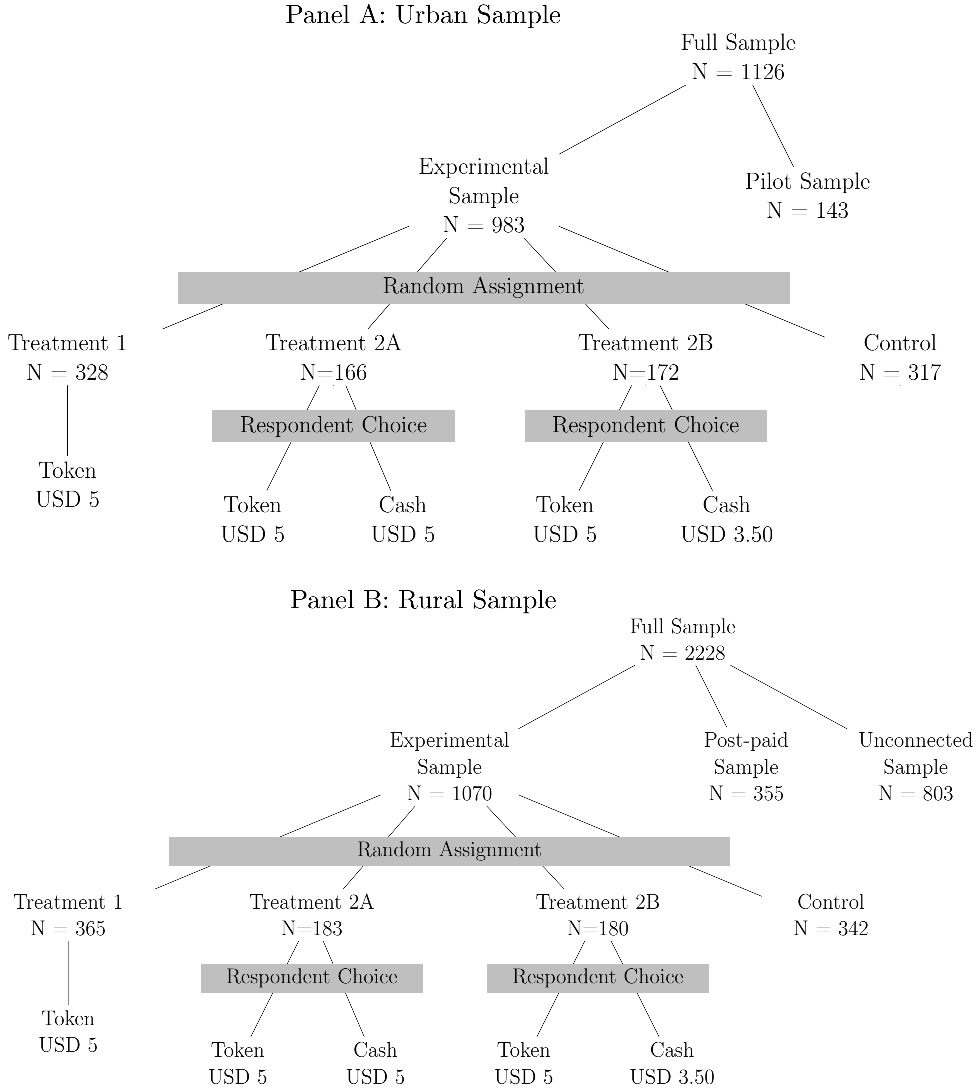
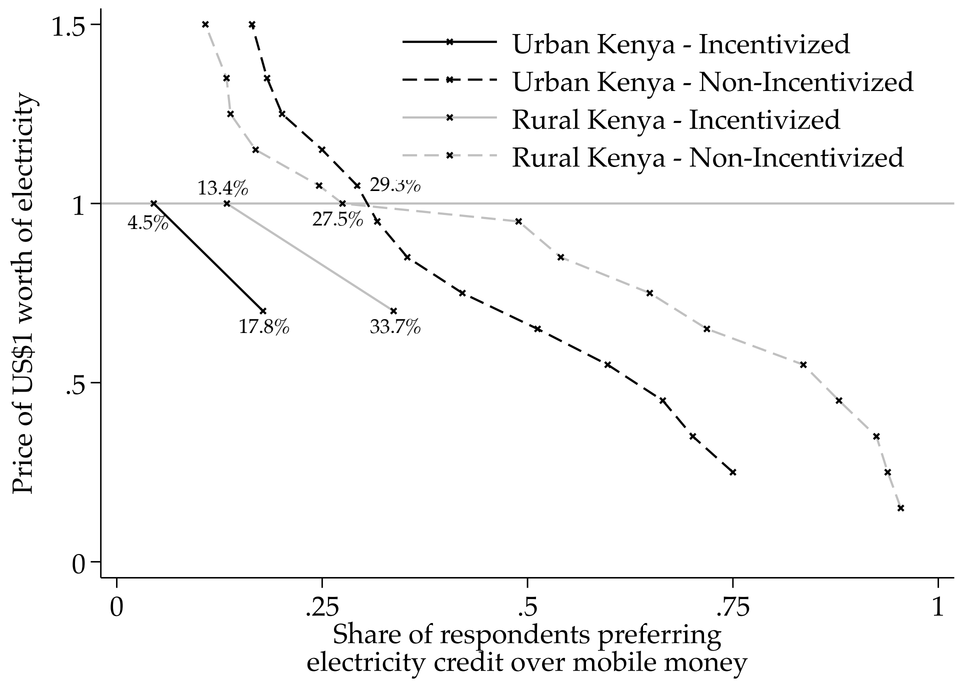
Appendix A: Additional Figures

Figure A1: Full study sample sizes



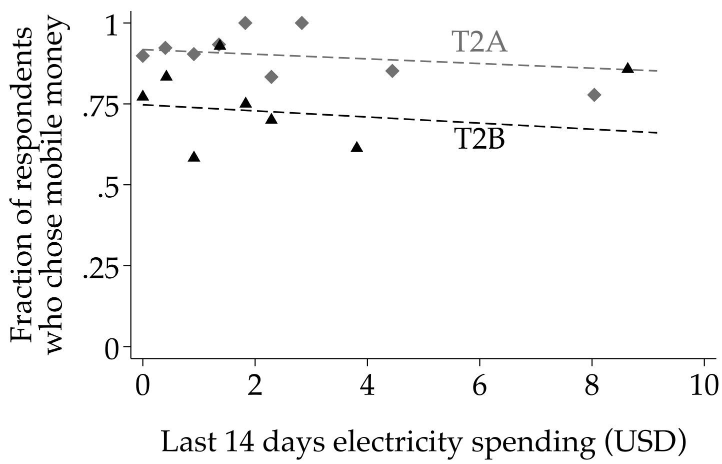
The figure shows treatment assignment within the experimental samples, along with non-experimental samples. All experimental participants are connected to electricity via pre-paid meters. Participants in the experimental Control group and the non-experimental samples were surveyed but did not receive any transfers. Participants in Treatment 1 (T1) received three transfers of pre-paid electricity tokens worth USD 5 each. Participants in T2A (T2B) were given a choice between USD 5 worth of electricity tokens or USD 5 (USD 3.50) in mobile money. Whichever option they chose, they received each transfer three times within a two month period.

Figure A2: Demand for Electricity Transfers by Context and Incentivization



Demand for USD 1 of electricity expressed in USD of mobile money. The horizontal line represents the point where USD 1 of electricity costs USD 1 in mobile money. The numbers shown indicate the share of respondents who prefer electricity to mobile money at particular prices, by context. The solid lines indicate incentivized elicitation as part of a randomized field experiment. Dashed lines indicate non-incentivized elicitation over hypothetical tradeoffs.

Figure A3: Correlation between transfer mode preference and electricity expenditures, by treatment arm



For each treatment arm T2A and T2B, the figure shows share of respondents choosing cash (disbursed via mobile money) over the electricity credit at different levels of electricity spending, along with a line of best fit. Respondents in arm T2A chose between USD 5 in electricity and USD 5 in mobile money, while respondents in arm T2B chose between USD 5 in electricity and USD 3.50 in mobile money. Among this sample, electricity spending in the past 14 days for the median respondent is USD 0.46 such that a USD 5 electricity transfer would last approximately 21.7 weeks.

Appendix B: Additional Tables

Table A1: Summary statistics

Panel A: Urban Sample

	N	Mean	SD	Min	25^{th}	50^{th}	75^{th}	Max	Kenya Pop Mean (Urban)
Number of adults in the household	995	2.32	1.33	1.00	1.00	2.00	3.00	10.00	1.94
Number of children	993	1.10	1.47	0.00	0.00	1.00	2.00	8.00	1.21
Respondent age	992	28.16	59.82	18.00	23.00	25.00	28.00	1901.00	34.00
Has TV	995	0.73	0.44	0.00	0.00	1.00	1.00	1.00	0.62
Has Refrigerator	995	0.14	0.35	0.00	0.00	0.00	0.00	1.00	0.19
Consumption per capita in past 7 days (USD)	977	17.71	20.49	0.07	5.73	11.87	21.53	258.77	9.20
Food spending per capita in past 7 days (USD)	981	6.63	9.31	0.00	2.29	4.58	8.02	192.36	4.46
Electricity spending in past 2 weeks (USD)	983	1.63	2.65	0.00	0.00	0.92	1.83	45.80	.
Meter balance (kWh)	807	9.29	21.78	0.00	2.15	4.50	10.00	300.00	.
Received any gov't or NGO assistance in past 14 days	985	0.02	0.13	0.00	0.00	0.00	0.00	1.00	0.07

Panel B: Rural Sample

	N	Mean	SD	Min	25^{th}	50^{th}	75^{th}	Max	Kenya Pop Mean (Rural)
Number of adults in the household	1014	3.10	1.49	1.00	2.00	3.00	4.00	11.00	2.22
Number of children	1014	2.93	2.10	0.00	1.00	3.00	4.00	15.00	2.18
Respondent age	913	46.63	17.62	18.00	33.00	45.00	60.00	102.00	38.60
Respondent is male	1024	0.39	0.49	0.00	0.00	0.00	1.00	1.00	0.50
Completed Secondary School	997	0.16	0.37	0.00	0.00	0.00	0.00	1.00	0.21
High quality roof material	1023	0.95	0.21	0.00	1.00	1.00	1.00	1.00	0.87
High quality wall material	1023	0.29	0.45	0.00	0.00	0.00	1.00	1.00	0.26
High quality floor material	1023	0.41	0.49	0.00	0.00	0.00	1.00	1.00	0.37
Has TV	890	0.57	0.50	0.00	0.00	1.00	1.00	1.00	0.27
Has Refrigerator	890	0.02	0.15	0.00	0.00	0.00	0.00	1.00	0.02
Consumption per capita in past 7 days (USD)	1008	4.82	4.12	0.16	2.30	3.81	5.71	31.06	9.20
Food spending per capita in past 7 days (USD)	1011	3.32	2.92	0.05	1.56	2.60	3.90	29.77	4.46
Electricity spending in past 2 weeks (USD)	1009	0.82	1.60	0.00	0.00	0.00	0.92	18.32	.
Meter balance (kWh)	864	11.86	42.03	0.00	2.00	5.00	12.00	1077.00	.
Received any gov't or NGO assistance in past 14 days	1013	0.09	0.28	0.00	0.00	0.00	0.00	1.00	0.07

This table presents summary statistics for the Kenya rural (panel A) and urban (panel B) samples from the baseline survey. The Kenyan rural sample is from Western Kenya, Nyanza, and Rift Valley. The Kenyan urban sample is from Nairobi, Mombasa, Kisumu, Eldoret, Nakuru, and other major cities. Rural and urban population means are taken from the 2019 Kenyan Census.

Table A2: Correlates of choosing electricity credit over a cash transfer of equal value

	(1)
	Prefer electricity
Number of electric appliances owned	-0.006
	(0.016)
Has TV	0.004
	(0.051)
Has Refrigerator	0.126*
	(0.071)
Non-food expenditure in the past 7 days in USD	-0.001
	(0.001)
Food spending in past 7 days	0.000
	(0.002)
Electricity spending in past 2 weeks	0.026
	(0.024)
Received any gov't or NGO assistance in past 14 days	0.027
	(0.084)
Respondent age	0.002*
	(0.001)
Number of adults in the household	-0.008
	(0.014)
Number of children	-0.002
	(0.010)
Constant	0.041
	(0.077)
Observations	251

This table presents estimates of the correlations between respondent characteristics and preference for electricity relative to cash. The dependent variable is a dummy for preferring an electricity credit transfer to a mobile money transfer of equal value. The sample includes rural and urban households in Kenya in the experimental treatment arm T2A that were offered an incentivized choice between a transfer of electricity or mobile money of the same value.

Table A3: Energy and consumption outcomes, by rural survey round

Panel A: Rural Round 2 (midline) only

	N	Control Mean (SD)	T1 Token Treatment (SE)	T2B 350 Ksh vs Tokens (SE)	T2A 500 Ksh vs Tokens (SE)
Electricity usage since baseline (kWh)	704	31.64	10.66***	2.00	7.17
		(32.27)	(3.09)	(3.52)	(4.56)
Electricity usage since baseline (approx value in USD)	704	4.64	1.56***	0.29	1.05
		(4.73)	(0.45)	(0.52)	(0.67)
Prepaid electricity expenditure in the past 2 weeks in USD	912	1.03	-0.34***	-0.25*	-0.01
		(1.44)	(0.12)	(0.14)	(0.15)
Meter balance (kWh)	714	12.31	12.58***	7.70***	3.19
		(23.71)	(2.00)	(2.72)	(3.19)
Meter balance (approx value in USD)	714	1.80	1.84***	1.13***	0.47
		(3.48)	(0.29)	(0.40)	(0.47)
Energy spending in the past 7 days in USD (excl. electricity)	916	0.80	0.36**	0.12	-0.25
		(1.82)	(0.18)	(0.24)	(0.17)
Energy spending in the past 7 days in USD (excl. electricity and charcoal)	915	0.55	-0.03	0.05	0.05
		(1.33)	(0.10)	(0.14)	(0.14)
Non-energy spending in the past 7 days in USD	937	26.67	5.01**	2.51	-1.25
		(25.81)	(2.40)	(3.03)	(2.46)
Dissaving (pc) in the past 14 days in USD (assets sold + loans - assets bought)	933	1.81	-0.29	-0.91	-1.47
		(11.02)	(0.85)	(0.95)	(1.08)
Total spending in the past 7 days in USD	937	27.87	5.47**	2.55	-1.54
		(26.73)	(2.50)	(3.15)	(2.54)

Panel B: Rural Round 3 (endline) only

	N	Control Mean (SD)	T1 Token Treatment (SE)	T2B 350 Ksh vs Tokens (SE)	T2A 500 Ksh vs Tokens (SE)
Electricity usage since baseline (kWh)	601	66.33	50.09***	11.60*	31.57***
		(52.96)	(5.21)	(6.62)	(8.11)
Electricity usage since baseline (approx value in USD)	601	9.72	7.34***	1.70*	4.63***
		(7.76)	(0.76)	(0.97)	(1.19)
Prepaid electricity expenditure in the past 2 weeks in USD	891	1.08	-0.49***	-0.24*	0.13
		(1.54)	(0.12)	(0.13)	(0.17)
Meter balance (kWh)	699	10.97	13.33***	7.70***	-0.78
		(17.57)	(1.86)	(2.16)	(1.48)
Meter balance (approx value in USD)	699	1.61	1.95***	1.13***	-0.11
		(2.58)	(0.27)	(0.32)	(0.22)
Energy spending in the past 7 days in USD (excl. electricity)	898	0.53	0.26*	0.15	-0.17
		(1.42)	(0.15)	(0.17)	(0.13)
Energy spending in the past 7 days in USD (excl. electricity and charcoal)	897	0.42	0.06	-0.08	-0.09
		(1.21)	(0.10)	(0.11)	(0.10)
Non-energy spending in the past 7 days in USD	910	22.13	1.78	-0.42	2.00
		(19.57)	(1.61)	(1.63)	(2.03)
Dissaving (pc) in the past 14 days in USD (assets sold + loans - assets bought)	917	1.91	-2.74	-3.75	-4.70
		(32.40)	(2.33)	(2.56)	(3.32)
Total spending in the past 7 days in USD	910	23.17	1.80	-0.38	1.87
		(20.17)	(1.69)	(1.72)	(2.08)

Estimates of Equation 1 for the rural sample, separately considering impacts at midline (Panel A) and endline (Panel B). From left to right, the columns show the number of observations, the control mean, and the treatment effects of T1, T2A, and T2B (all relative to control). Regressions include baseline controls for sex, education, banking status, and housing quality (from Lee et al. (2020) or Wolfram et al. (2021)), as well as the Covid-19 survey baseline value for each outcome for both samples. All covariates that are statistically significant at $\alpha = 0.05$ also have FDR q-values below 0.05.

*** p<0.01, ** p<0.05, * p<0.1

Table A4: Socioeconomic Outcomes

Panel A: Urban Sample

	N	Control Mean (SD)	T1 Token Treatment (SE)	T2A 500 Ksh vs Tokens (SE)	T2B 350 Ksh vs Tokens (SE)
Total household income (pc) in the past 14 days in USD	914	19.54	-5.08*	-2.22	-2.49
		(41.10)	(2.97)	(4.13)	(3.47)
Total labor supply in hours	848	25.48	-1.71	-0.42	1.18
		(32.87)	(2.63)	(3.34)	(2.99)
Total earnings from enterprises in the past 14 days in USD	908	13.52	-2.12	-2.52	-10.29***
		(48.53)	(3.79)	(5.12)	(3.92)
Food security index (SD)	902	0.06	-0.19**	0.02	-0.11
		(0.92)	(0.09)	(0.09)	(0.09)
Child education index (SD)	225	0.01	0.10	0.10	0.88***
		(1.05)	(0.16)	(0.18)	(0.25)
COVID knowledge index (SD)	878	-0.01	0.01	0.08	-0.07
		(1.02)	(0.08)	(0.10)	(0.10)
Number of COVID-19 symptoms in the past 14 days (out of 11)	900	0.20	-0.01	-0.03	0.06
		(0.62)	(0.05)	(0.06)	(0.07)
Number of in-person interactions in the last 14 days	888	33.45	-4.68	-4.33	-1.12
		(48.82)	(4.03)	(4.72)	(4.73)
CES-D-10 index	900	8.12	0.60	0.57	0.66
		(5.23)	(0.44)	(0.51)	(0.54)

Panel B: Rural Sample

	N	Control Mean (SD)	T1 Token Treatment (SE)	T2A 500 Ksh vs Tokens (SE)	T2B 350 Ksh vs Tokens (SE)
Total household income (pc) in the past 14 days in USD	1860	3.11	0.22	-1.47**	-0.63
		(8.87)	(0.65)	(0.64)	(0.74)
Total labor supply in hours	1372	44.72	1.16	3.58	0.62
		(40.46)	(2.83)	(4.08)	(3.57)
Total earnings from enterprises in the past 14 days in USD	1821	9.42	0.31	-2.17	2.72
		(36.15)	(1.97)	(2.06)	(2.98)
Food security index (SD)	1821	0.06	-0.02	0.04	-0.01
		(1.09)	(0.08)	(0.10)	(0.09)
Child education index (SD)	1354	0.01	-0.08	-0.06	-0.03
		(1.10)	(0.08)	(0.10)	(0.09)
COVID knowledge index (SD)	1777	-0.01	0.11*	0.05	0.06
		(1.03)	(0.06)	(0.07)	(0.07)
Number of COVID-19 symptoms in the past 14 days (out of 11)	1821	0.49	-0.03	-0.05	0.01
		(1.01)	(0.06)	(0.07)	(0.06)
Number of in-person interactions in the last 14 days	1817	17.74	2.18	0.86	3.47*
		(24.53)	(1.37)	(1.50)	(1.82)
CES-D-10 index	1868	8.97	0.12	-0.21	-0.60
		(5.23)	(0.30)	(0.36)	(0.44)

Estimates of Equation 1 for urban (Panel A) Kenya at endline and rural (Panel B) Kenya pooling the midline and endline. From left to right, the columns show the number of observations, the control mean, and the treatment effects of T1, T2A, and T2B (all relative to control). Regressions include baseline controls for sex, education, banking status, and housing quality (from Lee et al. (2020) or Wolfram et al. (2021)) for the rural sample and indicator variables for each of the eight Living Standard Measure scores for the urban sample, as well as the Covid-19 survey baseline value for each outcome for both samples. All covariates that are statistically significant at $\alpha = 0.05$ also have FDR q-values below 0.05, with the exception of the effort of T1 on food security in the urban sample.
*** p<0.01, ** p<0.05, * p<0.1