Cash *and* Food? Tackling Poverty with Conditional Transfers

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Abstract: Economic theory says that a cash transfer is weakly superior in terms of the recipients' utility than an equal-value in-kind transfer, as it allows recipients to switch the composition of their expenditures from food to non-food more easily. The most common explanation provided for in-kind transfer is a form of "paternalism", that is, to constrain spending on consumption of undesirable items, like tobacco and alcohol, which may be more likely with cash transfers. In this paper I analyze the relative impacts of cash versus food conditional transfers on household vulnerability to poverty, expenditure on temptation goods and prices, to get a holistic picture of how wealth should be redistributed to the poor. Using evidence from a natural experiment in Ethiopia, where public works households are eligible for different types of transfers, food grains and cash, I address this question using kebele and time fixed effects. A cash transfer reduces the average household's probability of becoming poor within the next year by 6% over an equal valued in-kind transfer. However, households receiving the cash transfer do spend marginally more on less socially desirable goods, like alcohol and tobacco. Cash transfers also have a significantly larger impact on prices in areas located close to the market. These side effects of cash transfers suggest that food may have a balancing role to play.

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1 Introduction

A significant amount of redistribution through social welfare programs in the developing world takes place in-kind, even though governments are increasingly investing in cash transfer programs. Worldwide, over 90% of low-income countries have in-kind transfer programs, while only about 50% have a cash transfer program (Gentilini et al. 2014). Cash transfers have some major advantages of having lower transaction costs and being possibly easier to monitor in terms of reducing leakages. While certain design issues are common to all social transfer interventions (including who should receive benefits, how much should be given), the welfare impacts on the beneficiaries depend critically on how the transfers are utilized by them. Economic theory predicts that a program recipient will at least weakly prefer a cash transfer as compared with an equal-valued in-kind transfer as it gives them more choices. However, if beneficiaries end up spending the cash indiscriminately on temptation goods[1], then the long term program objectives of improving living standards may not be realized.

The debate over the relative merits of cash as compared with in-kind transfers as a form of food security has a long history in economics. Economic theory apart, there are several reasons why in-kind transfers might be preferred to cash (Aker 2015). First, there is the "paternalistic" argument that governmental or non-governmental organizations might be able to guide program recipients to purchase and consume particular food or non-food items through in-kind transfers which could result in better outcomes for them. Second, in-kind transfers may facilitate "self-targeting" among rich and poor recipients resulting in a more efficient transfer system. Third, in-kind distributions can increase the local supply of items that are not readily available on local markets and act as a check on inflation. Fourth,

[1] As per Banerjee and Mullainathan (2010), "Temptation goods give us utility in the moment but it is not utility we care for when considering future selves." For instance, we would spend money a donut or cigarette in the moment, but we would like future selves to not spend money on it. This is in contrast to other goods, like a good education for our child, where present and future selves agree: in the moment we spend on them and we would like future selves to spend on them as well. In this paper, I use the term "temptation goods" to refer to alcohol and tobacco.

assuming cash is easier to steal, providing in-kind transfers could be less risky for program recipients. Lastly, in-kind transfers may be more politically viable, particularly if large lobby groups like grocery stores prefer in-kind programs, like in the USA. Hence, it is not clear at the outset which type of transfer is more beneficial for the welfare of the poor.

How should wealth be redistributed to the poor? This is the question addressed in this paper through an empirical analysis of the Productive Safety Net Programme (PSNP) in Ethiopia. Ethiopia's PSNP is an international flagship program both in its scope and in its partnership approach. It serves as an example of a large-scale social safety net that reaches a large number of dispersed, low-income rural residents with diverse livelihoods and creates productive investments to underpin rural economic growth and environmental rehabilitation. Under the PSNP, the government provides regular cash and/or in-kind transfers to food insecure households in chronically food insecure woredas.[2] Households with able-bodied adult members are required participate in labour-intensive public works to build community assets in exchange for these transfers, while households without able-bodied members receive unconditional "direct support" transfers. In 2009, the PSNP supported 7.6 million people in 290 chronically food insecure woredas in 8 of the country's 10 regions. This is equivalent to roughly 10% of the national population, covering over 40% of the country's woredas. The annual budget in 2009 was approximately $360 million or about 1.2% of Ethiopia's GDP (Coll-Black et al 2009). Although rising inequality is a global phenomenon, Ethiopia is one of the most equal countries in the world, with a Gini coefficient consistently below 30%. The share of people living in poverty in Ethiopia fell by 33% between 2000 and 2011 - a progress driven by agricultural growth, investments in basic services and effective safety nets. The PSNP alone has pushed 1.5 million people out of poverty (World Bank 2014).

The combination of cash and food transfers that is provided under the PSNP provides an exogenous source of variation in payment type across households and regions and creates an

[2]Districts, or woredas, are the third-level administrative divisions of Ethiopia. They are further subdivided into a number of wards (kebele) or neighborhood associations, which are the smallest unit of local government in Ethiopia.

ideal natural experimental setting for evaluation of the two types of transfers. In a randomized evaluation study in Burkina Faso, Akresh et al (2016) et al find that conditional cash transfers outperform unconditional cash transfers. Hence, in my paper I concentrate on a comparison of a conditional cash transfer versus in-kind transfer rather than unconditional transfers. Specifically, I use data from two waves of the Ethiopia Socioeconomic Survey(ESS) to examine the impacts of a cash versus equal valued in-kind conditional transfer on household vulnerability to poverty, expenditure on temptation goods and prices. My sample is households eligible for public works under PSNP. In my preferred empirical specification, I use kebele and time fixed effects, where the treatment (household receives a cash transfer) is at the household level, with controls for geographic location. My control group, thus, comprises households eligible for public works under the PSNP which receive food transfers. Unlike other studies, this implies I can directly compare groups receiving the two types of transfers rather than through comparison with a group which does not receive any transfer. While we can expect some differences between households receiving different types of transfers, these are likely to be much less than differences with groups which are not receiving transfers. Moreover, the panel data structure allows for controlling of unobserved heterogeneity through fixed effects. Further, even though my data is a nationally representative longitudinal survey of households, it contains information on market prices, which means I can provide a more complete analysis on the cash versus food transfers debate.

My empirical results corroborate economic theory. They indicate that a household's ability to mitigate risk and cope with shocks is enhanced with a cash transfer as compared to an equal valued in-kind transfer. A cash transfer reduces overall household vulnerability to poverty by around 6% for a sample of households eligible for public work under PSNP. However, households receiving the cash transfer do spend marginally more on temptation items, like alcohol and tobacco. I also find a positive and significant impact of cash versus in-kind transfer on the average price in locations close to the market. Thus, a combination of cash and food transfers under the same program framework seems to hold considerable

potential: a rightly-calibrated mix of transfers could help protect households from being "myopic" about the future and also, high and volatile food prices.

My paper adds to a small but growing literature on cash versus in-kind transfers in the context of food security. There is extensive literature on the impacts of in-kind and cash transfers separately (see summaries in Margolies and Hoddinott 2012 and Bastagli et al 2016). The majority of the microeconomic evidence on the cash versus in-kind debate builds upon the United States national food assistance programmes, especially food stamps (Whitmore 2002, Hoynes and Schazenbach 2009, Fraker et al 1995, Yen 2010). While this literature is rich in lessons to be learned, caution is also needed in interpreting the results given the administrative sophistication in developed countries as compared to less developed countries. The empirical evidence of the relative impacts of cash versus food transfers in the context of developing countries is more limited and there is mixed evidence. The comparison between cash and food transfers has been all the more challenging due to differences in program design between the two modalities (Cunha 2014, Skoufias et al. 2008, Gentilini 2014, Sivakul 2012), which I eliminate by concentrating on PSNP. There have been a few randomized controlled trials testing this question where the conditions of obtaining the transfer were as similar as possible under the two modalities (Aker 2015, Hidrobo et al 2014, Hoddinott et al 2014). Skoufias et al (2013) is the closest to this paper in terms of outcome variable as they look at impacts on the poverty gap ratio. However, the PSNP is a very large program affecting millions of people in the context of a large developing country, and hence the results in this paper have greater external validity. Also, while consumption measures of outcome are simple summary measures, vulnerability to poverty captures a relatively longer term objective of social welfare programs. My paper is also one of the few to test for price effects under a cash transfer program which Cunha et al (2011) find evidence for.

2 Background

For more than a decade, between 1993 and 2004, the Government of Ethiopia followed a system where they annually identified the depth of food shortages in traditionally vulnerable areas and made emergency appeals for international food aid and other forms of assistance. Though this system succeeded in preventing mass starvation, it was not efficient and failed to avert famines or asset depletion among the food-insecure population (Jayne et al 2002).

Starting in 2005, the government and a consortium of donors implemented a large-scale social safety net programme called the Food Security Programme (FSP), which was targeted initially at the 282 most chronically food-insecure woredas in rural Ethiopia. The Productive Safety Net Programme (PSNP) was the flagship program of the FSP, established with the aim to provide predictable and reliable transfers (cash or food) to the food-insecure population in chronically food-insecure woredas, in a way that prevents asset depletion at the household level and creates assets at the community level (Berhane et al 2016). Under the program, poor and food insecure households that have able bodied adult labour engage in public works and receive transfers for 6 months of the year. Households without labour capacity, like those whose primary income earners are elderly or disabled, qualify for direct support and receive 12 months of unconditional transfers.

The balance between cash and food transfers is finalised at the central level. Regions and woredas are informed in writing each season what the arrangements will be for that year. The PSNP has a cash-first principle. Cash is the preferred mode of transfer in areas which: are near food surplus areas (in the same or a neighboring woreda), have active food markets, and have cash management capacity (presence of finance officers, cashiers, safes, transport, security at woreda level). Food is chosen as a mode of payment when: food markets function poorly and availability of food and prices are unpredictable, price of food in markets are so high as to make cash transfers the higher cost option, and there is lack of experience in cash

management and better food management capacity. The daily wage rate of the cash transfer is calculated based on the cost of buying 3 kg of cereal and 0.8 kg of pulses per day (15 kg of cereal and 4 kg of pulses per person per month) in the market. The PSNP provides a cash transfer to households that can purchase 3 kgs of the cheapest cereal and 0.8 kg of the cheapest pulses available in the market. PSNP clients receive the same transfer regardless of whether they are a permanent direct support client or a public works and links to social services client (GFDRE 2014).

Actual performance evaluation of the PSNP (Berhane et al 2014a, 2014b) indicates that there is considerable heterogeneity in its implementation across the highlands and lowlands of Ethiopia. In the highland regions evaluated(Tigray. Amhara, Oromia, SNNP) the PSNP is well targeted and participation is higher for poorer households than for rich households. In 2014, the average payment (in cash or kind) to a household doing Public Works was 1,578 birr over a 5 month period, which is over 50% of the consumption expenditure of actual PSNP participants. Hence, this is a relatively large transfer. In 2014, only 29 out of 89 woredas surveyed were providing food transfers. This translates into about 67% of the sample surveyed receiving cash transfers. The average time taken to process cash and food payments were equivalent at about a month and beneficiaries get at least 90% of their entitlement. By contrast, in the lowland regions surveyed, Afar and Somali, targeting is poor and payments are not predictable, and beneficiaries get only about 60% of their entitlement. In addition, in these lowland regions, all payments are in food because, in many of these localities, households are far from food markets.

Thus, in my analysis I consider only the highland regions of Tigray. Amhara, Oromia and SNNP, where there is evidence that the PNSP is well implemented and there is combination of cash and food transfers. While the criteria for disbursing food or cash transfers on the ground deviated from the intended implementation given in the instruction manual, my method of capturing food versus cash transfers (detailed in section 4.2) should give a potential lower

bound of the actual impact.

3 Theory & Measure

3.1 Economic Intuition

In this section I outline the basic theory of consumer demand underlying cash and in-kind transfers, with some simplifying assumptions. Assume a household with a well behaved utility function over 2 goods, food and a composite good, representing all other goods. The household acts as a single unit and maximizes its utility with respect to a linear budget constraint ($\overline{AB}$ in Figure 3.1) .

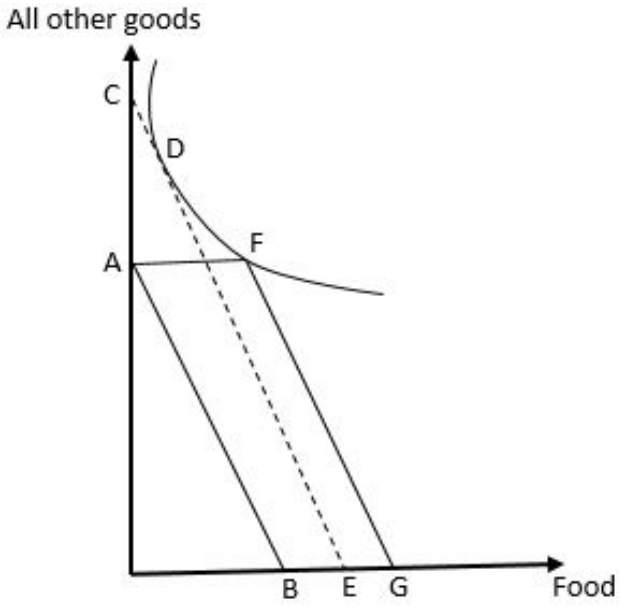

Figure 1: Cash versus In-kind Transfer

Now assume that the household receives an in-kind transfer which: (a) it is not allowed to resell and (b) is extra-marginal.[3] Then the budget line shifts outward to $\overline{FG}$ and the utility maximizing consumption point is given by F. As we can see, the household can achieve the

[3]For the purpose of simplification. The results remain unchanged if we relax these two assumptions (see Cunha 2014).

same level of utility with a lower cash transfer (represented by $\overline{CE}$) by consuming at point D. This illustrates that a cash transfer is weakly superior in terms of the recipients' utility (and hence welfare) than an equal-value in-kind transfer, as it allows recipients to switch the composition of their expenditures from food to non-food more easily. However, as mentioned earlier, distorting in-kind transfers are preferred over cash transfers in a lot of cases due to paternalism and other reasons.

3.2 Vulnerability to poverty

Vulnerability is the prospect that an individual will fall below some norm or benchmark of welfare at a given time in the future, where the time period and welfare measure are sufficiently general. It is an ex-ante measure of a household's well-being (unlike poverty, which is an ex-post measure).[4] I refrain from using the usual measures of poverty and concentrate on a relatively broader and more dynamic measure of deprivation - vulnerability to poverty, which incorporates the destitution of individuals from future shocks. This is a more appropriate measure of relatively long term well being of households. The literature proposes three alternative approaches to assessing vulnerability (Hoddinott and Quisumbing 2003): vulnerability as expected poverty (VEP), vulnerability as low expected utility (VEU) and vulnerability as uninsured exposure to risk (VER). VEP and VEU approaches measure vulnerability at the individual level as a probability and summing up over all households gives a measure of aggregate vulnerability. VER measures do not construct probabilities, but rather assess ex post whether observed shocks generate welfare losses at the aggregate level. VEU approaches are problematic because the unit of measurement is units of utility, which many policymakers might not be familiar with and may be difficult to understand. The appropriate measure for this paper would be an ex-ante individual measure of poverty

[4]Poverty and vulnerability, though correlated, are conceptually different as depending on whether a household has secure income sources, a household above the poverty line may be vulnerable, or one just below the poverty line may not be vulnerable. The presence of risk or uncertainty about the future distinguishes the two concepts. A household faces multiple sources of risk which makes its future uncertain, like weather shocks, health shocks, e.t.c. Without this risk, the two concepts would be identical.

that is easy to understand. Also, a measure of vulnerability that takes account of poverty levels seems preferable. Hence, following the VEP approach in Chaudhuri et al. (2002), I define vulnerability as "the ex-ante risk that a household will, if currently non-poor, fall below the poverty line, or if currently poor, will remain in poverty."

Formally, the vulnerability level of a household h at time t is defined as the probability that the household will find itself consumption poor[5] at time t+1:

$$v_{ht} = Pr(c_{h,t+1} \leq z)$$

where $c_{h,t+1}$ is the household's per-capita consumption level at time t+1 and z is the appropriate consumption poverty line. The procedure for estimating household vulnerability follows from Chaudhuri et al. (2002) (see Appendix). The covariates to estimate v_{ht} include:
A: A set of variables indicating household characteristics, such as (i) Family size and squared (ii) Dependency ratio - child (0-14), teen (15-20) and old (60+) (iii) Proportion of adults (21-60) (iv) Age of head and squared (v) Proportion of adults illiterate (vi) Proportion of adults with primary education (vii) Proportion of adults with secondary education (viii) Proportion of adults with some higher education (ix) Dummy for male head, whether head is married, single or separated (x) Per capita land area owned and squared (xi) Dummy for whether household has access to a flush toilet, tap water in all seasons, electricity
B: A set of variables indicating community characteristics (at enumeration area level), such as (i) road condition (ii) distance to nearest - bus station, woreda / town, urban center, weekly market, phone, government primary school, government secondary school, private primary schools, private secondary schools, shop for common medicines, health post, hospital, commercial bank, microfinance institution (iii) electricity at - government primary school,

[5]According to the World Bank (2000), "poverty is pronounced deprivation in wellbeing." The main focus here is on whether households have enough resources to meet their consumption needs. Poverty is then measured by comparing households' consumption with some defined threshold below which they are considered to be poor. Poverty is largely seen in monetary terms, via consumption expenditure.

government secondary school, health post (iv) Availability of nurse / doctor at health post and hospital (v) presence of social welfare programs - programs providing bed nets, programs providing support for chronically ill (vi) water service.

An advantage of this vulnerability measure is that it can be estimated with cross-sectional data and the possibility of poverty traps and other non-linear dynamics are implicitly built in. However, it assumes that the distribution of consumption across households, given the household characteristics at time t, represents time-series variation of household consumption. Thus, a large sample is required for this measure in which some households experience positive shocks and others negative shocks. It also assumes economic stability and does not incorporate the possibility of aggregate shocks.

4 Data & Identification Strategy

4.1 Data

The analysis uses the Ethiopia Socioeconomic Survey (ESS) wave two (ESS2, 2013/2014) and wave three (ESS3, 2015/2016) data. The ESS is a collaborative project between the Central Statistics Agency of Ethiopia (CSA) and the World Bank Living Standards Measurement Study - Integrated Surveys of Agriculture (LSMS-ISA) project. Ethiopia is one of seven countries being supported by the World Bank, through funding from the Bill and Melinda Gates Foundation (BMGF), to strengthen the production of household-level data on agriculture. The objective of the LSMS-ISA is to collect multi-topic panel household level data with a special focus on improving agricultural statistics and the link between agriculture and other household income activities. The ESS data files also include additional geospatial data computed for data users. ESS began as ERSS (Ethiopia Rural Socioeconomic Survey) in 2011/12. The first wave of data collection in 2011/12 included only rural and small town areas. The survey name dropped the word “Rural” in the second wave of data collection

when the sample was expanded to include all urban areas. The urban supplement was done in such a way to ensure that the ESS data can provide nationally representative estimates.

The ERSS/ESS sample is a two-stage probability sample. The first stage of sampling entailed selecting enumeration areas (ie. the primary sampling units) using simple random sampling (SRS) from the sample of the AgSS enumeration areas (EAs). The AgSS EAs were selected based on probability proportional to size of population (PPS). For the rural sample, 290 EAs were selected from the AgSS EAs. For small town EAs, a total of 43 EAs were selected by PPS. Similarly, for the newly added urban areas, a total of 100 EAs were selected (PPS). ESS2 and ESS3 together gives me a panel of 4,882 households.

4.2 Sample & Variable Construction

The simplest way of assessing the impact of the cash versus in-kind conditional transfers would be to compare mean outcomes for households that receive cash salaries versus those that receive in-kind salaries. So, for example, we could calculate the mean vulnerability for cash payment workers and that for in-kind payment workers. The problem, however, with this approach is that households that receive payments in cash for work could be systematically different from those that receive payments in kind for many reasons (like income) and these also affect vulnerability, leading to biased impact estimates. Hence I restrict my sample to only households eligible for PSNP, which gives me a valid in-kind transfer recipients counterfactual group to cash transfer beneficiaries.[6] I could then compare the mean vulnerability for cash beneficiaries and that for in-kind beneficiaries.

The data bulks in-kind and cash payments together and does not distinguish between the two. Hence I use a proxy to identify households which receive salary in-kind versus cash

[6] An alternative to using potential beneficiaries of PSNP would be to use actual PSNP public works participants. However, in the data, the take up rate is only 6%, leading to a sample size of only 434 households, which gives me low power to detect effects. Hence I use the actual PSNP participants as a robustness check instead.

for PSNP work. As per the PSNP implementation manual, households are classified as receiving salary in cash if they can afford to purchase 3 kgs of the cheapest cereal and 0.8 kg of the cheapest pulses available in the market (i.e., if their consumption expenditure in a day exceeds the cost of buying this bundle), and food otherwise. This implies that the same woreda would have recipients of both types of transfers, rather than being restricted to just one type of transfer. This procedure makes the two groups more comparable.

I identify households eligible for the public works component of PSNP based on Berhane et al (2016). I use a probit model to predict program participation following Berhane et al (2016) targeting criteria. These are: household livestock holdings 12 months prior to the survey, household land holdings, age, sex and grade attainment of household head, number of males aged 16–60 resident in the household and number of females aged 16–60 resident in the household. I categorize a household as participating if the probability score is greater than the average. This gives me an intent-to-treat (ITT) sample of 2,980 households. The prediction success rates[7] for the sample comes out to be 70%.

The estimated proportion of households receiving cash transfers for the ITT sample is about 57% (Table 1), which is well below the surveyed 67% reported by Berhane et al (2014a). This implies the impacts estimated in this paper should provide an underestimate of the "true" impact for the treated population.

4.3 Empirical Specification

To investigate the effect cash versus in-kind conditional transfers, I estimate models of the form:

$$y_{ijt} = \alpha_j + \pi_t + \gamma cash_{ijt} + \delta dist\_mrkt_{ijt} + \beta X_{jt} + \text{f(geographic location}_{jt}) + \epsilon_{ijt} \qquad (1)$$

[7]Proportion of actual PSNP participants who are also predicted as eligible for PSNP

where the subscripts refer to household i in enumeration area j at time t, y is an outcome variable of interest, *cash* is an indicator variable for whether a household receives a cash transfer (so takes a value of 1 if the household receives a cash transfer and 0 if the household receives an in-kind transfer), *dist_mrkt* is the household distance from the nearest market, X is a vector of covariates that includes mean temperature, precipitation, elevation and potential wetness index, *f(geographic location)* is a cubic polynomial in household latitude and longitude[8]. The coefficient of interest is γ, the intent-to-treat effect of the conditional cash transfer (as compared with an equal valued in-kind transfer). In addition, in my preferred specification, I include year and kebele fixed effects.

I show the results are robust to the inclusion of different types of fixed effects - household, kebele and time. The panel data is at household level, with multiple households within each kebele. Hence, using a fixed effects approach allows me to control for certain types of unobserved heterogeneity. Though using household fixed effects assists in controlling for the average differences across households in any observable or unobservable predictors, and is usually preferable, it might be too restrictive in this case if there is not enough variation in *cash* within households from one year to the next. In my sample, I observe that only 18% of households (522 households) show change in payment type between the years. The mean vulnerability of this group is 0.634, which is lower than the average vulnerability of the ITT sample. Hence, with this approach, I would not be picking up the most vulnerable households, where we would expect the type of transfer to make the maximum difference. With kebele and time fixed effects, there is variation in *cash* across as well as within households, while I am controlling for kebele-specific time-invariant characteristics and year-specific shocks. This implies I would be comparing two different households in different years and kebeles with the fixed effects ensuring that these are valid counterfactuals with differing values of payment type. Additionally, the geographical polynomial is picking up systematic differences in household characteristics that are related to distances

[8]These would be the same for households within an enumeration area

from markets / the capital. It is also unlikely that household level vulnerability would affect payment type, since whether a household receives a cash payment is determined by price levels in a woreda, which is not within the household's control. Thus, we can be reasonably confident that the independent variable, *cash*, is exogenously determined and simultaneity is not a concern.

4.4 Summary Statistics

Table 1 gives the descriptive statistics for three groups - the ITT sample (column 1), actual PSNP participants (column 2) and the full sample (column 3). The mean vulnerability for all households (PSNP and non PSNP) is about 60%. The highest vulnerability is for the actual PSNP participants (67%), which is to be expected. The mean vulnerability for the PSNP eligible sample lies between these two, at about 64%. Average expenditure on food ranges between \$6 - 8 per week, for all samples. Average expenditure on non food items ranges between \$3 - 5 per week. Actual PSNP participants have the lowest consumption expenditure, about 40% lower than the average for the full sample. This is perhaps an indication of the fact that the program is taken up only by very poor households, which have limited income over and above food consumption. Only a marginal 6% of the sample are actual PSNP public works participants, whereas, according to the World Bank, the poverty headcount ratio stands at 29.6% as of 2010 in Ethiopia. In the data, over 50% of households receive cash transfers for all samples. Households in the ITT sample are located furthest from the market on average.

Table 2 gives the profiles for cash and food transfer recipients for the ITT sample. Households receiving food transfers are on average 10% more vulnerable, spend about \$13 less per week, and are located in more remote areas. These indicate that cash transfers should be lowering vulnerability of households.

5 Results

5.1 Main Results

Tables 3 and 4 give the results for the impact of a cash transfer versus an equal valued in-kind transfer on vulnerability. My analysis concentrates on a parametric form of geographic location which is a cubic polynomial in latitude and longitude. The results are robust to linear and quadratic functions of geographic location as well.

Table 3 gives the impacts of cash versus in-kind transfers for the different types of fixed effects and demonstrates that a cash transfer has a relatively large impact on household vulnerability to poverty: the typical estimate is negative, large in magnitude and statistically significant. Column 1 looks at the estimate for a Pooled OLS estimation strategy and the coefficient in row 1 indicates that a cash transfer leads to a reduction of household vulnerability by 0.071 percentage points compared to an equal-value in-kind transfer. This suggests that receiving a cash transfer reduces the average household's probability of becoming poor within the next year by approximately 7%. This translates into a reduction of 11% in poverty since mean household vulnerability for the ITT sample is 0.638, and the effect is statistically significant at the 1% level. Though I include geographic controls in my OLS estimation, there might still be omitted variables that vary over region and year and affect both the payment type and vulnerability, such that there would be bias in the estimate. To circumvent this issue, I augment my model with different types of fixed effects.

First I introduce time fixed effects. Column 2 looks at the estimate for a time fixed effects estimation strategy and the coefficient in row 1 indicates that a cash transfer leads to a reduction of household vulnerability by 0.068 percentage points compared to an equal-value in-kind transfer and the effect is statistically significant at the 1% level. This suggests that receiving a cash transfer reduces the average household's probability of becoming poor within

the next year by approximately 7%, which is the same as my Pooled OLS estimate. Second I introduce kebele fixed effects. Column 3 looks at the estimate for a kebele fixed effects estimation strategy and the coefficient in row 1 indicates that a cash transfer leads to a reduction of household vulnerability by 0.060 percentage points compared to an equal-value in-kind transfer. This suggests that receiving a cash transfer reduces the average household's probability of becoming poor within the next year by approximately 6%. This translates into a reduction of 9% in poverty and the effect is statistically significant at the 1% level. Third I combine kebele and time fixed effects. Column 4 looks at the estimate for a kebele and time fixed effects estimation strategy. The coefficient in row 1 indicates that a cash transfer leads to a reduction of household vulnerability by 0.058 percentage points compared to an equal-value in-kind transfer, which is very similar to the impact of only kebele fixed effects.

As a fourth check, I introduce household fixed effects, even though there is not much variation in *cash* as I outlined before. Column 5 looks at the estimate for a household fixed effects estimation strategy and the coefficient in row 1 indicates that a cash transfer leads to a reduction of household vulnerability by 0.019 percentage points compared to an equal-value in-kind transfer. This suggests that receiving a cash transfer reduces the average household's probability of becoming poor within the next year by approximately 2%. This translates into a reduction of 3% in poverty and the effect is statistically significant at the 1% level. Finally, I move onto my most restrictive model, where I introduce both household and time fixed effects. Column 6 looks at the estimate for a household and time fixed effects estimation strategy and the coefficient in row 1 indicates that a cash transfer leads to a reduction of household vulnerability by 0.009 percentage points compared to an equal-value in-kind transfer and the effect is statistically significant at the 10% level, which translates into a reduction of 1% in poverty.

Row 3 in Table 3 gives the R^2 of the respective models, and as we can see, this is highest for kebele and time fixed effects at 0.418, which is my preferred model. There is a significant

drop in the R^2 between columns 4 and 5, indicating that household fixed effects might be too restrictive, as I had gauged. What is important to note from the different specifications tested in this table is that the coefficient on *cash* remains negative and significant even with my most restrictive specification. This indicates that my main result using kebele and time fixed effects, an impact of 6%, is robust.

As an additional robustness check, in Table 4, I look at the impact on actual PSNP participants using kebele and time fixed effects, which would basically give me the treatment-on-the-treated (TOT) estimate. The coefficient in row 1 indicates that a cash transfer leads to a reduction of household vulnerability by 0.033 percentage points compared to an equal-value in-kind transfer. This suggests that receiving a cash transfer reduces the average household's probability of becoming poor within the next year by approximately 3%. This translates into a reduction of 5% in poverty and the effect is statistically significant at the 1% level.

An important point to note is that the ITT impacts are larger than the TOT impact. This implies there is a possibility that there are considerable spillover effects from a cash based public works program. For example, public works may provide a bridge to more permanent employment in the formal sector. As Andrews and Kryeziu (2013) note, public works programs may have an important role in promoting social cohesion through three main pathways: promoting voice and participation through program processes; improving social inclusion and equality through temporary labor market participation; smoothing social tension and building trust in response to sudden shocks, as well as longer term fragility.

5.2 Temptation Spending

The income effect of transfers, whether in cash or kind, will increase expenditures if alcohol and tobacco are normal goods, but this may be offset by other effects, particularly for cash transfers. Conditional transfers may induce a substitution effect by increasing the value of schooling and health investments relative to all other goods, which may reduce consumption

of temptation goods. Next, there might be a flypaper effect if transfer programs are accompanied with strong social messaging, even if there aren't explicit spending restrictions. For example, Ecuador's unconditional cash transfer program (Bono de Desarrollo Humano) was accompanied by an advertising campaign encouraging households to invest in their children's human capital, which may make households more likely to use the resources for expenditures related to education and health than on temptation goods. Finally, there might be a household bargaining effect, if transfer income is targeted at women and men are more likely to purchase temptation goods, then providing transfer income to women could reduce spending on those goods (Evans and Popova 2014). The net effect is unclear, particularly when comparing cash versus in-kind transfers.

Table 5 gives the impacts of cash versus in-kind transfers on undesirable items, like alcohol and tobacco and finds evidence for a paternalistic justification for in-kind transfers. Cash transfers lead to statistically significant (at 1% level) higher consumption of alcohol among beneficiaries. Compared to in-kind transfer recipients, cash transfer recipients, consume about 6 Birr ($0.26) more of alcohol per week. Considering the weekly average food budget of the ITT sample, this comes to about an increase of 3% over in-kind recipients. Cash transfer recipients also spend about 0.32 Birr ($0.01) more on tobacco in a month, though this effect is statistically insignificant. As Banerjee and Duflo (2011) observe, decisions to save require a certain amount of self control from rich and poor alike. However, while the rich have a variety of tools at their disposal, like banks and financial advisors, to aid them in the process, the poor have to do a much harder job from their limited resources. Hence, providing them with in-kind transfers might make it easier for the poor to forgo "temptation" spending and force them not to be "myopic" about the future.

The impact on alcohol spending is not very different when disaggregated by distance from market. In remote areas, about 43% of the sample of households receive cash transfers, compared to 65% in nearby areas. Yet, surprisingly, cash transfer households in remote

areas spend 0.44 Birr ($0.02) more on alcohol than cash transfer households in areas located close to the market (Table 6). This is likely due to the reason that the substitution effect of cash transfers in remote areas is likely to be low. Households in remote areas are more isolated from the global economy and as a result may be less aware of the facilities available to them (like schools for their children), such that they are more myopic about the future and end up spending more on temptation items. This implies that in-kind transfers have a particularly important role to play in remote areas in this respect.

5.3 Prices

When governments inject cash or food into a community, these can cause supply / demand shifts, which might affect prices. Both cash and in-kind transfers increase the demand for normal goods through an income effect and assuming supply is not perfectly elastic, prices of these goods would rise. However, in-kind transfers also lead to an increase in local supply, which should cause prices to fall, so the net effect is ambiguous. Cunha et al (2014) find evidence that in-kind transfers cause prices of the transferred goods to fall relative to cash transfers, especially in remote villages.

Hence I test for future price effects of a cash transfer in the data, the result for which is given in Table 7. For this part of the analysis, I use payment type information from the 2013 data and average price from 2015 data, to address the issue of endogeneity of prices. I find a positive and significant impact of cash versus in-kind transfer on the average price. A cash transfer leads to an increase in price by about 12 Birr ($0.44) compared to an equal-value in-kind transfer and this effect is statistically significant at the 5% level. This translates into an increase of 21% in prices over a 2 year period (and hence, a 10.5% annual inflation rate), as the average price in 2015 is about 56 Birr ($2.07). The yearly rate of 10.5% is higher than the average inflation rate of 8.5% prevalent in Ethiopia between 2013 and 2015.

I further disaggregate the impact on prices by distance from market, the results for which

are given in Table 8. Column 1 looks at the estimate for remote households (with distance from market greater than the average of the sample) and the coefficient in row 1 indicates that a cash transfer leads to an increase in price of approximately 2 Birr ($0.07) compared to an equal-value in-kind transfer and this effect is statistically insignificant. This translates into an increase of 8% in prices over a 2 year period (and hence, a 4% annual inflation rate), as the average price in 2015 for this group is about 32 Birr ($1.19). This compares favorably with the annual inflation rate prevalent during this time.

Column 2 looks at the estimate for households located closer to the market (with distance from market less than the average of the sample) and the coefficient in row 1 indicates that a cash transfer leads to an increase in price of approximately 18 Birr ($0.67) compared to an equal-value in-kind transfer and this effect is statistically significant at the 5% level. This translates into an increase of 29% in prices over a 2 year period (and hence, a 14.7% annual inflation rate), as the average price in 2015 for this group is about 61 Birr ($2.26). This is significantly higher the annual inflation rate prevalent during this time and seems to be the driving factor behind the price impact seen for the whole sample.

As I have indicated before, due to the way the PSNP program is structured, the proportion of cash transfers in locations closer to the market is considerably larger. Hence, it seems that in remote areas, where the proportion of food transfers is more, the supply side effect balances out the demand side effect, such that the net impact on prices is insignificant. This suggests that using a combination of food and cash transfers may act like automatic stabilizers on prices. There are various emerging options to deal with marked seasonal price fluctuations, like index-linking cash transfers to food prices, or deliver transfers half in cash and half in food, or distributing cash or food by season (Gentilini 2014). The last approach is similar to that of PSNP where food is provided in remote areas with unpredictable food prices. These methods of combining cash and food transfers are likely to have a number of advantages, although it may also entail considerable costs in terms of analytical planning

and logistical coordination among modalities.

6 Conclusion

Using a kebele and time fixed effects, this paper has analyzed the impacts of cash versus in-kind transfers on households eligible for PSNP in Ethiopia on vulnerability to poverty. The results suggest that the impacts of a cash transfer on poverty reduction are positive and significant, but there are associated increases on spending on undesirable items. Hence, food might have a role to play as well, especially in controlling prices. Thus, a combination of cash and food transfers under the same program framework seems to hold considerable appeal: as demonstrated by the PSNP Ethiopia, a rightly-calibrated mix of transfers could help manage implementation and livelihood risks posed by high and volatile food prices, as well as by more predictable but marked seasonal patterns. However, in choosing the "winner", there is need for more nuanced and rigorous cost-effectiveness analyses. Gentilini (2014) reviews costs of cash and food transfer programs and only in two cases finds it possible to examine a fuller measure of program efficiency that accounts for food procurement costs.

The validity of the results reported in this paper depend critically on the correct estimation of PSNP public works samples and the payment type variable. Berhane et el (2016) based their PSNP criteria on official targeting criteria, along with their own assessment of how these have been implemented in localities. The 70% prediction success rate that I get for ITT sample alleviates fears that the government didn't follow their own rules but also tells us that a number of people who should have been eligible for the program may not have taken it up. Also, I am underestimating the proportion of cash transfer households. This suggests that the effects for a more representative group should be larger. The ITT estimates, thus, gives us a potentially substantial lower bound of the results.

Finally, a word should be said about what the beneficiaries themselves want. Regarding the

PSNP, Berhane et al (2014a) find that most beneficiaries prefer a payment that is at least 50% food. In most regions less, than 20% of households prefer all their payments in cash and this proportion has been falling over time. Even Khera (2011) in her survey on a study of India's Public Distribution System reports large majority of the respondents preferred to receive in-kind food transfers rather than cash transfers.

The literature on the cash versus food debate has largely been fueled by randomized controlled trials which are short term interventions. In contrast, this paper has looked at the impacts of cash versus food in the context of a long standing program. Also, the evidence till date has been largely based on food consumption, calories and dietary diversity data, whereas I look at the actual objective of a transfer program, poverty reduction. This research suggests that conditional cash transfers may be most successful in improving households' living standards, but at the same time food may act like an important gatekeeper.

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Table 1: Summary Statistics

Variable	ITT Sample	PSNP Participants	All
Vulnerability	0.638	0.672	0.599
Consumption of food last 7 days (Birr)	184.691	148.741	224.422
Consumption of non food last 7 days (Birr)	115.872	72.513	141.781
Households	2,980	434	7,310
Proportion receiving cash transfers (%)	57.21	51.61	61.46
Distance from Market (km)	66.45	62.93	61.47

Table 2: Summary Statistics for Cash Versus Food Transfers: ITT Sample

Variable	Cash Transfers	Food Transfers
Vulnerability	0.594	0.697
Consumption of food last 7 days (Birr)	278.795	58.851
Consumption of non food last 7 days (Birr)	170.109	43.344
Households	1,705	1,275
Distance from Market (km)	56.04	80.37

Table 3: Impact of Cash versus In-kind Transfers: Vulnerability

	(1)	(2)	(3)	(4)	(5)	(6)
cash	-0.071*** (0.009)	-0.068*** (0.009)	-0.060*** (0.009)	-0.058*** (0.008)	-0.019*** (0.007)	-0.009* (0.005)
N	2,980	2,980	2,980	2,980	2,980	2,980
R^2	0.261	0.308	0.381	0.418	0.089	0.161
Geographic Controls	x	x	x	x	x	x
Household Fixed Effects					x	x
Kebele Fixed Effects			x	x		
Time Fixed Effects		x		x		x

Note: Impacts given for ITT sample of PSNP participants. Robust standard errors, adjusted for clustering by enumeration area, are reported in parentheses. ***,**,* indicates significance at the 1%, 5%, 10%-level, respectively.

Table 4: Impact of Cash versus In-kind Transfers: Vulnerability

	(1)
cash	-0.033*** (0.011)
N	434
R^2	0.390

Note: Impacts given for actual PSNP participants. Regression includes geographic controls and Kebele and time fixed effects. Robust standard error, adjusted for clustering by enumeration area, is reported in parentheses. ***,**,* indicates significance at the 1%, 5%, 10%-level, respectively.

Table 5: Impact of Cash versus In-kind Transfers: Temptation Spending

	Alcohol	Tobacco
	(1)	(2)
cash	6.029***	0.315
	(1.194)	(0.527)
N	2,980	2,980
R^2	0.060	0.042

Note: Regressions include geographic controls and Kebele and time fixed effects. Robust standard errors, adjusted for clustering by enumeration area, are reported in parentheses. ***,**,* indicates significance at the 1%, 5%, 10%-level, respectively.

Table 6: Impact of Cash versus In-kind Transfers: Alcohol Spending by Remoteness

	Remote	Near
	(1)	(2)
cash	6.143***	5.700***
	(1.641)	(1.891)
N	1,308	1,672
R^2	0.095	0.080

Note: Remote = distance from market > average, Near = distance from market <= average. Regressions include geographic controls and Kebele and time fixed effects. Robust standard errors, adjusted for clustering by enumeration area, are reported in parentheses. ***,**,* indicates significance at the 1%, 5%, 10%-level, respectively.

Table 7: Impact of Cash versus In-kind Transfers: Prices

	Average Price (Birr)
cash	11.649**
	(5.360)
R^2	0.103
N	1,437

Note: Regression includes geographic controls. Robust standard error, adjusted for clustering by enumeration area, is reported in parentheses. ***,**,* indicates significance at the 1%, 5%, 10%-level, respectively.

Table 8: Impact of Cash versus In-kind Transfers: Prices by Remoteness

	Remote	Near
	(1)	(2)
cash	2.385	17.894**
	(4.258)	(8.305)
N	628	809
R^2	0.083	0.104

Note: Remote = distance from market > average, Near = distance from market <= average. Regressions include geographic controls and Kebele and time fixed effects. Robust standard errors, adjusted for clustering by enumeration area, are reported in parentheses. ***,**,* indicates significance at the 1%, 5%, 10%-level, respectively.