The Effect of Gender-Targeted Conditional Cash Transfers on Household Expenditures: Evidence from a Randomized Experiment*

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January 2020

Short title: Gender-Targeted CCTs and Expenditures

Abstract

This paper studies the differential effect of targeting cash transfers to men or women on household expenditures on non-durables. We study a policy intervention in the Republic of North Macedonia that offers cash transfers to poor households, conditional on having their children attending secondary school. The recipient is randomized across municipalities, with payments targeted to either the mother or the father of the child. Targeting transfers to women increases the expenditure share on food by 4 to 5 percentage points. At low levels of food expenditure, there is a shift towards a more nutritious diet.

JEL codes: D12, D13, E21, O12

Keywords: CCT, intra-household, gender, expenditure.

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We would like to thank Ingvild Almås, Martin Browning, Sylvie Lambert, Karen Macours, Marcos Rangel, Alexandros Theloudis, and seminar participants at Paris School of Economics, Oxford University, the 2017 RES Annual Conference, the 2017 Annual Meeting of the Society of Economics of the Household, and the 2018 HCEO Family Inequality Workshop for helpful comments. We acknowledge the funding from the European Research Council (ERC) under grant agreement number 695300 - HKADeC, and from 3ie International Initiative for Impact Evaluation (grant reference OW4-1022). Carneiro acknowledges the support of the Economic and Social Research Council (ESRC) through a grant (ES/P008909/1) to the Centre for Microdata Methods and Practice, and of the European Research Council through grant ERC-2015-CoG-682349.

1 Introduction

When designing cash transfer programs, it is important to understand whether women and men spend their income differently since this directly determines how transfers reach targeted household members. Until now, due to a lack of suitable data, it has been difficult to measure the effect of targeting payments to men or women. Nevertheless, most Conditional Cash Transfer (CCT) programs in developing countries explicitly target payments to women within households (Fiszbein and Schady, 2009). The aim is to improve their well-being, and increase their participation in decision making by enhancing female control over the household's resources. This occurs in spite of there being no consensus on the effects of this practice.

A large body of research supports the idea that control over resources leads to control over decision making (see, e.g., Browning and Chiappori, 1998). Empirically, the income pooling hypothesis (i.e., a restriction on family demand functions, which implies that they are only a function of total income, rather than its distribution across members) has been rejected using both observational and quasi-experimental data. This result is generally based on comparisons of households across whom the contribution to family income of men and women differs. Using data from Brazil, Thomas (1990) shows that a mother's unearned income has a stronger association with her family's health when compared to a father's unearned income. The importance of partners' relative incomes on household decision making is observed in several other settings, including Canada (Browning et al., 1994; Phipps and Burton, 1998), Côte d'Ivoire (Hoddinott and Haddad, 1995), France (Bourguignon et al., 1993), and Thailand (Schultz, 1990). Similar patterns are observed when studying the introduction of policies indirectly affecting the intra-household distribution of income. In South Africa, Duflo (2003) looks at the expansion of a social pension scheme and finds that children's nutritional status is improved when recipients are women, while no effect is observed when the recipients are men. In the United Kingdom, Lundberg et al. (1997) and Ward-Batts (2008) find an effect on expenditure patterns following a change in the Family Allowance policy, which increased mothers' incomes relative to fathers'. Since most income sources are not exogenous to expenditure allocations, focusing on observed variation in relative incomes or on transfer recipiency could bias estimates regarding the importance of control over resources. While these results suggest that targeted transfers could influence expenditure decisions, it is difficult to disentangle the role of relative incomes from other unobservable characteristics.

To overcome this issue, a first wave of experimental studies looks at programs providing cash transfers given to a randomly selected group of mothers. In the case of the Mexican CCT program *Progresa/Oportunidades*, Attanasio and Lechene (2010) document that, although the program substantially increased total consumption, the food share did not decline as expected due to a counterbalancing effect of the program on women's control of household resources. This finding is consistent with other studies focusing on the same program (Angelucci and Attanasio, 2009, 2013; Hoddinott et al., 2000), on *Familias en Acción* in Colombia (Attanasio et al., 2012), on *Bono Solidario* in Ecuador (Schady and Rosero, 2008), and on *Atención a Crisis* in Nicaragua

(Macours et al., 2012). In these settings, it is only possible to compare the spending patterns of recipient households with those of non-recipient households with similar income levels. While these findings are consistent with a model in which mothers and fathers spend income differently, they do not establish this result definitively, nor do they enable us to measure the magnitude of the impact of the identity of the transfer recipient without imposing some structure on the data.

To test whether income is spent differently by men and women, recent field experiments have focused on cash transfer programs in which the gender of the recipient is randomized. This design allows a direct comparison of outcomes between households in which a woman is the recipient of the transfer and households in which the recipient is a man. The existing evidence from such studies shows no impact of targeted transfers on the structure of expenditures. It is problematic to interpret these results as strong evidence that the identity of the transfer recipient is irrelevant. Benhassine et al. (2015) study a cash transfer program in Morocco featuring a degree of randomization in the recipient's gender. They find little or no effect of targeting, but report that husbands were able to fully appropriate the transfer, which means this setting is not suitable to effectively study the question. Haushofer and Shapiro (2016) study the effect of large unconditional cash transfers in rural Kenya, where, among other dimensions, the payment recipients were randomized to be either the wife or the husband. They too do not find any significant difference in the expenditure pattern. However, because this study has multiple experimental arms, the sample size for this comparison is small, and the authors would be able to detect only relatively large effects.[1]

This paper addresses the limitations of these studies by studying whether targeting transfers to women or men affects expenditure patterns. We use data from a nationwide CCT program implemented in North Macedonia from 2010. The program provides cash transfers to poor households, conditional on their children's enrolment in secondary school. The total annual amount of the subsidy, if all conditions are met, corresponds to 8% of household expenditure on non-durables and 16% of food expenditure. Its unique feature is that the gender of the recipient is randomly targeted across the 84 municipalities. In half of the municipalities, the payment is targeted to mothers, and in the other half, it is targeted to fathers.

The design of the CCT program and the richness of the expenditure data allow us to examine whether expenditure patterns differ depending on the transfer recipient's gender. In line with the literature on household demand (see, e.g., Deaton and Muellbauer, 1980b), we focus on budget shares of non-durables, and on food budget shares for different categories within the food basket.[2] Targeting CCT transfers to mothers leads to an increase in the food share by 4 to 5 percentage points, while impacts on other expenditure categories are statistically insignificant. Since the CCT program impacts income levels by providing additional financial resources to enrolled households, we complement these results with an analysis of household demands by estimating Engel curves,

[1] Akresh et al. (2014) study alternative cash transfer delivery mechanisms (among these payment to mothers versus fathers) on household demand for preventative health services in Burkina Faso. However, they do not study the effect on the allocation of household expenditures.

[2] Appendix A.12 discusses results using expenditure levels.

and studying how targeted transfers affect their shape.[3] Targeting payments to mothers leads to an upwards shift of the Engel curve for food, indicating an homogeneous impact across the income distribution. Within the food basket, targeting women leads to a change not only in the intercepts of Engel curves but also in their slopes. In households with low levels of food expenditure (presumably, the poorest), targeting induces a move away from salt and sugar, and towards meat, fish, and dairy. The shift towards a more nutritious diet is in line with the literature highlighting a relationship between female control of resources and improved child investments (Haddad and Hoddinott, 1994; Duflo, 2003; Macours et al., 2012).

Targeted transfers can have large impacts on the intra-household income distribution. The Macedonian CCT provides exogenous variation in the relative income share of either women or men, depending on the payment modality of the program. This setting is uncommon as most of the previous evidence focuses on policy interventions inducing uni-directional changes in relative incomes, generally in favour of women (Lundberg et al., 1997; Ward-Batts, 2008; Attanasio and Lechene, 2014). The program's design, together with detailed information about individual income, allows us to estimate the impact of relative income shares on expenditure choices. An increase in the mother's income share by one percentage point leads to an increase in the food budget share by 0.24 percentage points (Appendix A.8). It is a sizeable effect given that, at follow-up, mothers' income shares were, on average, 17 percentage points higher in municipalities in which payments were targeted to mothers as compared to municipalities in which payments were targeted to fathers.[4] This supports the finding in the literature that the link between transfers paid to women and increases in both expenditure and the food budget share may indeed be due to an increase in the resources controlled by women (Attanasio and Lechene, 2010; Angelucci and Attanasio, 2009, 2013; Attanasio et al., 2012; Schady and Rosero, 2008).

2 The Macedonian CCT program

The Macedonian *Conditional Cash Transfer (CCT) for Secondary School Education* is a social protection program aimed at increasing secondary school enrolment and completion rates among children in the poorest households in the country. It was implemented by the Macedonian Ministry of Labour and Social Policy (MLSP) starting in the 2010/2011 school year across the whole country. It provides transfers to households conditional upon school-age children attending secondary

[3] Mothers' and fathers' Engel curves could have different intercepts and different slopes. For example, food Engel curves for women may have not only a higher intercept, suggesting that they spend a higher fraction of expenditure on food at low levels of income, but also a flatter slope, suggesting that the decline in the food share with income is slower for women than for men. Engel curves for husbands and wives can also cross. When for women the intercept is higher, but the slope is also steeper. In this case, there would be total expenditure values for which a change in household resources would lead to a very little change in the food shares, and others for which the change would be substantial and in either direction.

[4] For *Progresa*, payments represented 20% of household income and were received by women (Attanasio and Lechene, 2010). Assuming the husband's income remains constant, the transfer of *Progresa* corresponds to an increase of 17 percentage points in the wife's income share if the husband is the sole income earner or 8 percentage points if both partners contribute equally.

school at least 85% of the time.[5] The program was offered to beneficiaries of Social Financial Assistance (SFA), a means-tested monetary transfer to people who are fit for work but who cannot support themselves.[6] It targets households in the lowest tail of the income distribution, and is the largest income support program in North Macedonia, accounting for 50% of total spending on social assistance or around 0.5% of the GDP (The World Bank, 2009). Overall, the CCT targets around 12,500 eligible households who were recipients of SFA and simultaneously had at least one child of secondary school age.

The total annual amount of the subsidy provided by the CCT program is, if all conditions are met, 12,000 MKD per student (US$258).[7] The total amount received can be larger if the household has more than one eligible child. Payments are made in four instalments in December, February, May, and July, corresponding to the school terms (September-October, November-December, January-March and April-June). CCT payments are made after a school term is completed and student attendance is checked. Attendance data is then entered in the CCT system by each school's officers, and payments are processed by the MLSP. An internal audit procedure is implemented to guarantee the accuracy of payments. In the first two years of the program, the payment was processed via cheques payable only to the recipient. These payments are thus not anonymous, as the name of the recipient is printed on the cheque. The cheques can be cashed in local post offices or in banks, which excludes the need of a bank account to gain access to the transfer.

The gender of the transfer recipient (i.e., the person named on the cheque) was randomized at the municipality level, allowing payments to be targeted to either the mother or the father of the child. Since the program was implemented in the whole country, a pure control group does not exist. The 84 municipalities composing the Republic of North Macedonia were first stratified into 7 groups depending on population size, and randomized into two groups.[8] In one group of 42 municipalities, the transfer was paid to the mother of the child. We call these *Mother municipalities*. In the other group of 42 municipalities, the payment is transferred to the household head. The household head is the person registered for the SFA benefit at the Social Welfare Centre (SWC), which administers social welfare at the local level, and is generally the father of the child. Across SFA recipients, the household head is the male partner in 87% of two-parent households, which in turn represent 83% of all SFA households.[9] We call municipalities in this group *Father*

[5] In this setting, the conditionality is light. In North Macedonia, enrolment in secondary schooling is mandatory by law, and conditional on enrolment, attendance is well over the 85% set by the program (Armand and Carneiro, 2013; Armand, 2015). Thus, the program is not fundamentally different from an Unconditional Cash Transfer (UCT).

[6] SFA provides a minimum guaranteed income. The benefit is equal to the difference between household income and the social assistance amount determined for the household. It varies from a monthly amount of 1825 Macedonian Denars (MKD, 39 US$) for a one-member household to 4500 MKD (97 US$) for households with 5 or more members. Values in US$ are expressed using the nominal MKD/US$ 2010 exchange rate (OECD, 2018).

[7] The exchange rate used for the US dollar conversion is the 2010 nominal MKD/US$ exchange rate (OECD, 2018). The 2010 purchasing power parity correspondent is 641 US$.

[8] In the final dataset, we observe a total of 83 municipalities (42 Father municipalities and 41 Mother municipalities). While the program was offered with the randomized modalities in all municipalities, at baseline, one municipality among Mother municipalities was found to have no eligible households. This has no effect on baseline balance.

[9] The household head is likely to be the adult male unemployed person representing the household. We do not observe any impact of payment modalities on labour supply or time use for either partner (appendix A.4).

municipalities. In these municipalities there are cases in which the household is headed by a female, who is then the recipient of the transfer in these municipalities (section 4.1). The sample is selected such that the household head is either the mother or the father of the child (section 3.1).

Compliance with local guidelines governing the gender of recipients is easy to ensure. CCT management is computerized, and the payments are processed according to the family composition originally entered in the social protection system. In the administrative data, less than 1% of payments are processed to a man when the payment should have been made to a woman (Armand and Carneiro, 2013). These errors are possibly due to mistakes in the original SFA database that were fixed during the initial implementation of the program. No case is recorded for households in the sample.

3 Data

Data come from two waves of a household survey collected in 2010 and 2012. The surveys include detailed information on a variety of household characteristics and outcomes (demographic characteristics, expenditures on durable and non-durable goods, housing), and individual-level information on household members (education, health, labour supply, and time use).

3.1 Sample structure

The baseline survey was conducted between November and December 2010. This period coincides with the beginning of the school year in which the CCT program became available. Due to delays in the implementation of the program in its first year, the CCT program came into place only after the completion of the baseline data collection, and the first payments were processed only in March–April 2011. At baseline, the population of eligible households was obtained from the MLSP's electronic database of recipients of all types of financial assistance. This was assembled during the summer of 2010 for implementation of the program by digitizing hard-copy archives from the SWCs. A random sample was drawn from households eligible for the CCT program during the summer before the introduction of the program. The follow-up survey was conducted during the fall of 2012, two years after the program began.

In terms of family structure, the sample of eligible households is quite diverse. Households can be composed of a single-parent or two parents, and can be either nuclear or non-nuclear. Table 1 decomposes the full sample in categories based on family type and on whether recipients live in a Mother or Father municipality. In line with the literature on household decision making, a sub-sample of single-family households was selected for the analysis. Multi-family households are dropped from the analysis to avoid further heterogeneity in the household decision process (see, e.g., Browning et al., 2014). The focus is on households with two decision makers being the mother and the father of the child eligible for the CCT program (sub-samples A1, A2, B1, and B2). We do not analyse single parents due to sample size limitations.[10] In addition, we exclude

[10]Selecting only couples in nuclear families excludes 89 households from the follow-up sample, of which 70 house-

Table 1: *Actual recipient of the transfer by type of household and municipality*

Enrolled in CCT	Presence of partners	Identity of the household head	Actual recipient in... FATHER municipalities	Actual recipient in... MOTHER municipalities	Sub-sample	
Yes	Both present	Father	Father	Mother	**A1**	**(N = 606)**
		Mother	Mother	Mother	**A2**	**(N = 79)**
	Father only	Father	Father	Father	A3	(N = 16)
	Mother only	Mother	Mother	Mother	A4	(N = 65)
No	Both present	Father	-	-	**B1**	**(N = 132)**
		Mother	-	-	**B2**	**(N = 35)**
	Father only	Father	-	-	B3	(N = 3)
	Mother only	Mother	-	-	B4	(N = 5)

Note. Father (Mother) municipalities are municipalities in which the transfers are paid to household heads (mothers). The actual recipient differs due to the decision to participate in the program and due to heterogeneity in the household structure. "-" indicates that no one in the household is receiving the transfer since the household does not participate in the program. The sub-samples selected for the analysis are A1, A2, B1, and B2. The column "Sub-sample" presents in parentheses the sample size of each category at follow-up. Non-nuclear households (N = 81) are excluded from the analysis. The overall sample at follow-up is equal to 1,022 households.

non-nuclear households (8% of the sample), in which additional adult household members are part of the family and live in the same dwelling. Selecting only nuclear families also guarantees that in all selected households, the household head is either the father or the mother of the child eligible for the CCT. Results are robust to the inclusion in the analysis of non-nuclear households in which both parents are present.

Among selected households, the combination of household headship and residence determines the actual recipient of the CCT transfer. In Mother municipalities, the mother is always the recipient if a household enrols in the program. In Father municipalities, the recipient depends on who is declared as the household head. This is the father of the child in 87% of cases.

At baseline, we obtain a sample of 766 households with at least one child eligible for the CCT during the first two years of the program. Of these, 74 households were not interviewed at follow-up, resulting in an attrition rate of 9.66%. Attrition is not driven by the treatment modality, and results are robust to attrition correction using inverse probability weighting (Wooldridge, 2010), ANCOVA (see, e.g., McKenzie, 2012), and treatment effects bounds (Lee, 2009). The follow-up sample includes baseline households re-interviewed at follow-up, and a refresher sample of 171 households who were enrolled during the second year of the program, for a total of 852 households. Sample weights are used to account for the fact that at follow-up, households participating in the program were over-sampled (relative to non-compliers, i.e., eligible households who did not receive the transfer). The refresher sample did not introduce any difference between treatment arms, and the results are robust to its exclusion (appendix A.1).[11] Discrepancies between the number of observations in the results tables in section 4 and the total sample size are due to missing

holds had a single female parent and 19 had a single male parent. In this group, a large heterogeneity in family statuses is observed (e.g., divorced, widowed, in relationship but not-cohabiting, etc.), which does not allow drawing conclusions or making comparisons among these sub-groups.

[11] At baseline, in addition to the sample of children eligible for the first year of the CCT program (aged 12-16 the year before, at baseline), an additional sample of households with children in the age group corresponding to the final year of secondary school was collected to study the living standards of the whole population of households in SFA with secondary school children. However, this latter group aged out of the CCT program at the moment of its introduction, and was therefore never eligible. We thus exclude it from the analysis.

values in the outcome variables.

Table 2 presents means and standard deviations for household characteristics at baseline. Column (1) refers to the whole sample, while columns (2)–(3) refer respectively to households living in Father and in Mother municipalities. Households comprise, on average, 4.8 members. The average education of fathers is low, with about 8 years of schooling. However, fathers are more educated than mothers, with an average difference of 1 year of schooling. At the same time, fathers are, on average, 3 years older than their wives. Mothers contribute to 15% of the total household income, with almost 80% of mothers contributing no income to the household (see section 4.1 and appendix A.8 for further details). Fathers also have a larger share of relatives living in the same municipality (71%). When looking at the ethnic composition of the sample, the majority of households are from two main ethnic groups (Macedonian and Albanian), while the remaining 30% is composed of Roma, Turk, and other residual ethnic groups. In terms of location of dwellings, 14% live in the capital city Skopje, 57% in the northern regions of the country, and 27% in municipalities in which the Albanian language is recognized as an official language (in addition to Macedonian).

Column (4) of table 2 presents mean differences between Father and Mother municipalities for all these variables. At baseline, the two groups are balanced on all demographic characteristics reported in the table. A joint test of balance (table 2) and non-parametric tests for the equality of distributions of outcomes across treatment modalities (appendix A.6) confirm that pre-program randomization was effective.

The take-up rate for the program in the first two years is estimated to be 72%. This was computed by merging baseline household survey data with the administrative records of the CCT program. Households are listed in the CCT system if they enrolled a child in school and registered for the CCT program at the local welfare centre. Take-up is slightly higher in Mother municipalities, but the difference is small and statistically insignificant. The compliance rate (i.e., the percentage of classes attended by enrolled students) is also not different across Mother and Father municipalities (Armand, 2015).

3.2 Total expenditure and expenditure shares

Expenditure shares are built using available information about purchases and self-production of a variety of items consumed by households. We consider the main categories of items consumed by households in the sample, including food, tobacco, clothing, schooling, health, utilities, and other goods. Table 3 presents descriptions of each category.

Expenditure data was collected using a recall method (see, e.g., Deaton and Zaidi, 2002). A detailed expenditure section was included in the household questionnaire and divided into subsections depending on the characteristics of the goods and the proposed frequency of purchase. Reference periods are one week for food; one month for expenses related to health, personal hygiene, transportation costs, sport, culture and entertainment, and for meals provided at school; six months for clothing, utensils for the house, toys for children, and house and vehicle maintenance;

Table 2: *Descriptive statistics on household characteristics at baseline, by treatment status*

	Mean and standard deviation			Difference
	All municipalities	Father municipalities	Mother municipalities	[Mother - Father]
	(1)	(2)	(3)	(4)
Household-level outcomes				
Schooling (father)	8.15	8.09	8.21	0.12
	[2.96]	[2.90]	[3.02]	(0.28)
Schooling (mother)	7.08	7.06	7.10	0.03
	[3.40]	[3.21]	[3.57]	(0.36)
Age (father)	44.51	44.61	44.42	-0.19
	[5.21]	[5.08]	[5.34]	(0.44)
Age difference (father - mother)	3.44	3.38	3.50	0.13
	[4.38]	[4.32]	[4.45]	(0.42)
Household members	4.79	4.76	4.82	0.06
	[1.11]	[1.09]	[1.12]	(0.13)
Children 0-12 y.o.	0.73	0.68	0.78	0.10
	[0.86]	[0.76]	[0.95]	(0.07)
Children 13-18 y.o.	1.75	1.74	1.76	0.02
	[0.66]	[0.68]	[0.65]	(0.06)
Head worked in agriculture or breeding	0.27	0.30	0.23	-0.07
	[0.44]	[0.46]	[0.42]	(0.07)
Minority ethnic group	0.30	0.31	0.30	-0.01
	[0.46]	[0.46]	[0.46]	(0.07)
House property holder	0.04	0.03	0.04	0.00
	[0.19]	[0.18]	[0.19]	(0.02)
Mother's income share	14.91	14.00	15.81	1.81
	[33.08]	[32.56]	[33.59]	(2.93)
Father's share of relatives	0.71	0.73	0.69	-0.04
	[0.30]	[0.30]	[0.29]	(0.03)
Municipality-level outcomes				
Part of city of Skopje	0.14	0.13	0.15	0.02
	[0.35]	[0.34]	[0.36]	(0.08)
Albanian is an official language	0.27	0.27	0.26	-0.01
	[0.44]	[0.45]	[0.44]	(0.11)
Unemployment rate	31.53	30.06	32.98	2.91
	[10.12]	[10.50]	[9.53]	(2.27)
Northern region	0.57	0.56	0.57	0.02
	[0.50]	[0.50]	[0.50]	(0.12)
Observations	764	378	386	764
Joint equality test (p-value)	.	.	.	0.91
Program take-up	0.72	0.70	0.75	0.05
	[0.45]	[0.46]	[0.43]	(0.04)

Note. Columns (1)–(3) report sample means (and standard deviations in brackets) for the whole sample and restricted to different treatment modalities. Column (4) reports the difference between (3) and (2) estimated using OLS regressions of the correspondent variable on the treatment indicator and clustering standard errors (reported in parentheses) at the municipality level (*** p<0.01, ** p<0.05, * p<0.1). *Minority ethnic group* includes Roma, Serbs, Turks, and Vlachs. *Father's share of relatives* indicates the share of mother's and father's relatives living in the same municipality that can be attributed to the father's family. The *northern region* comprises the Northeastern, Polog, Skopje, and Eastern administrative regions. To control for joint significance, we run a probit regression of the treatment indicator on the selected variables, and report p-values of an F-test for the joint significance of the coefficients. The treatment indicator is equal to 1 if the household lives in a Mother municipality, and zero otherwise. *Program take-up* refers to the share of households enrolled in the CCT during either of the first two years of the program. This is computed by merging baseline households to the administrative records of the CCT program for the first two years of implementation.

Table 3: *Description of goods and food items*

CATEGORY	**DESCRIPTION**
Food	Cereals, vegetables and fruit, meat, fish and dairy, coffee, tea and other beverages, fats, salt and sugar, and other food items.
Alcohol and Tobacco	Beer, wine, other spirits, cigarettes, and tobacco.
Clothing	Clothing and footwear.
Education	Tuition and fees, uniforms, school supplies, textbooks, additional courses, transportation to school, meals at school, and other school related expenses.
Health	Consultations, hospital services, medicines, surgical appliances, hearing aids, glasses, x-rays, echocardiograms and laboratory tests, transportation to health centres, and other medical expenses.
Utilities and other expenses	Electricity, gas, phone and mobile phone bills, and other non-durable expenditures.
FOOD CATEGORY	**DESCRIPTION**
Starches	Bread, wheat flour, rice, pasta, other cereal products, and potatoes.
Fruit and vegetables	Fresh vegetables and fruit, beans, canned and pickled vegetables, and dried fruit.
Meat, fish, and dairy	Fresh, dried, and smoked meat, fresh and canned fish, eggs, milk, yoghurt, cheese, and butter and other lipids.
Salt and sugar	Salt, sugar, honey, jam, chocolate, sweets and cookies, soft drinks, coffee, and tea.
Other food	All other food items.

Note. The definition of categories is based on the structure of the annual Macedonian Household Budget Survey (SSO, 2010). Food items within categories are defined on the basis of frequency of purchase and familiarity with the item.

and one year for utilities and for school-related costs. The choice of items is based on the Macedonian Household Budget Survey (SSO, 2010), an annual survey conducted by the Macedonian State Statistical Office (SSO) with the purpose of identifying expenditure patterns among Macedonian households.

Using information about expenditure on individual items, we compute an expenditure aggregate for non-durables. We first transform all the expenditures on individual items into a comparable time period, and then sum them. For food items, we consider not only what the household spent on purchases but also what the household actually consumed from self-production. A set of prices built upon a proximity criterion is used to impute the value of self-produced items (see section 3.3 for further details).

At baseline, food is the main component in the budget, accounting, on average, for 56% of household expenditure (appendix table A14). This highlights the focus of the program on the poorest sector of the Macedonian population, as the mean share of food for a representative sample of households was around 34% in 2012 (SSO, 2012). Households allocate, on average, 4% of the total budget to education, 13% to health, 3% to tobacco and alcohol, 5% to clothing, and 19% to utilities and other expenses. Within the food basket, several groups of (aggregated) food categories were identified, reflecting the structure of purchases of a typical Macedonian family. The food items with the highest share is starches, capturing on average 38% of total food expenditure, followed by meat, fish, and dairy, accounting for 36% of total food expenditure.

At baseline, differences in expenditure shares across the two treatment modalities are not statistically different from zero. Because data are based on a recall method, and the identity of the respondent is important, we check whether this dimension varies across payment modalities. Results from appendix A.5 show that this is not a concern. Results are also robust to including indicators for the identity of the respondent as control variables.

3.3 Unit values and prices

Prices for consumed goods are required to compute real expenditure aggregates inclusive of self-produced goods, which are important in rural areas. Since geographically disaggregated prices are unavailable, prices are approximated with unit values using information on expenditure and quantities purchased (Attanasio et al., 2013 follow a similar procedure). This allows approximating prices at household (if the item is purchased), municipality, and regional levels. Unit values can be computed only for food items, since quantities were not collected for non-food items. To proxy for price variation in non-food items, we use regional dummies, a control for whether the household lives in the capital city, and a dummy for rural municipalities in all specifications.

Median unit values are used to compute the value of self-produced goods when a price is not available for the same household. For food items, we compute median unit values starting from the lowest level of geographical clustering (municipality) and substituting for median values at higher levels (region and country) in the case of missing purchases. At each level, when the number of observations is smaller than a minimum (set to 6 observations), we move to a larger geographical cluster. Given the small size of the country and its relative degree of closeness to international markets, it is reasonable to assume that observed unit values are close to farm-gate prices. For these items, it is ideal to use farm-gate prices, since market prices include the intermediaries' mark-up.

Median unit values are also used to adjust total expenditure and food expenditure to real terms by building Stone price indices and subtracting them from their nominal value. Stone price indices are built at the municipality level by weighting median unit values by the sum of all individual household expenditures in a certain municipality and on a certain item, and dividing by total expenditure in the municipality in the food category of the item. Since prices are only available for food, the real adjustment can only be carried out using a food price index. Geographical variation in the price of non-durables is expected to be small due to the limited size of the country.

Prices built using unit values are considered to be exogenous as the CCT program targets only a small part of the population. An issue would arise if households reacted to different payment modalities by differentially substituting expenditure choices towards higher-quality or higher-price goods within the same food category. In this case, household expenditure would rise as a response. At follow-up, we do not observe any effect of payment modalities on aggregate food prices and on household-level price indices (appendix A.3).

4 Results

We use two complementary empirical approaches to study the effect of targeted transfers on the structure of household expenditures. First, we estimate the effect of targeting payments to mothers on expenditure shares (section 4.1). Second, we estimate a demand system and examine how the programme's modality affects the level and the slope of Engel curves for different goods (section 4.2).

4.1 Impacts on expenditure shares

We begin by comparing expenditure shares between households living in municipalities randomized to different payment modalities. Let $mother_j$ be an indicator variable equal to 1 if municipality j is a Mother municipality, and zero otherwise, and denote w_{ij} as an outcome of interest for household i in municipality j (e.g., the share of total expenditure spent on food). To measure the effect of targeting the transfer to mothers we estimate the following relationship using data from the follow-up survey:

$$w_{ij} = \beta_0 + \beta_1 \, mother_j + \mathbf{V}_j'\beta_2 + \mathbf{X}_i'\beta_3 + \epsilon_{ij} \tag{1}$$

where $\mathbf{V}_j$ is a vector of municipality characteristics, and $\mathbf{X}_i$ is a vector of household characteristics. Municipality characteristics include a set of regional dummies, the randomization strata, and indicators for whether the municipality is part of the capital city, and for whether Albanian is an official language in the municipality. Household characteristics include the age and education of both partners, their ethnicity, household size, and a dummy variable to indicate whether the household is involved in farming. The household-specific error term, ϵ_{ij}, is assumed to be clustered at the municipality level.

Columns (1)–(2) in table 4 present, for the two types of municipality, means and standard deviations measured at follow-up for total household expenditure on non-durable goods, for the value of households' durable goods, and for expenditure shares. Columns (3)–(5) present differences between Mother and Father municipalities estimated using equation (1), accounting for different sets of control variables. Column (3) includes only region and stratum indicators, column (4) adds municipality characteristics, and column (5) adds household characteristics. Pre-program differences in expenditure shares across the two treatment modality groups are not statistically different from zero (appendix A.6).

Targeting mothers had a significant effect on the share of total expenditure allocated to food. At follow-up, we find a statistically significant higher food share of 3.91 percentage points for households residing in Mother municipalities. This corresponds to an average increase of 7% in the budget share of food. This result is robust to estimating the difference using ANCOVA, and controlling for the lagged value of the food share (appendix table A2). The impact is also evident by looking at the distributions of the food budget shares. Figure 1 presents the kernel density for the food budget share at baseline and follow-up in Mother and in Father municipalities. At baseline, we cannot reject the null hypothesis that the distribution is equal across municipality types using a two-sample Kolmogorov-Smirnov (K-S) test. At follow-up, the distribution for Mother municipalities is shifted to the right relative to the distribution in Father municipalities. Households driving this difference are those who allocate more than 35% of total expenditure to food, i.e., the poorest households in the sample. A K-S test rejects the null of equality of these distributions in the two samples.

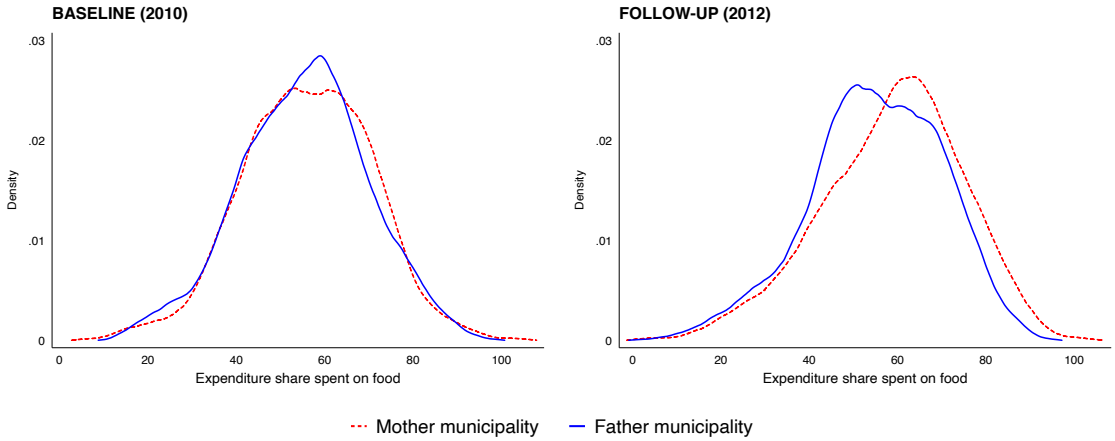
Looking at the effect on expenditure shares for other goods, we observe a marginally signifi-

Table 4: *Expenditure on non-durables, budget shares and food budget shares*

Sub-sample:	Mean and standard deviation		OLS difference [Mother - Father]		
	Father municipalities	Mother municipalities	All municipalities	All municipalities	All municipalities
	(1)	(2)	(3)	(4)	(5)
Expenditure	7.52	7.54	-0.00	-0.00	0.03
	[0.54]	[0.58]	(0.07)	(0.07)	(0.06)
Durables value	10.50	10.55	0.01	0.01	0.05
	[0.88]	[1.22]	(0.11)	(0.11)	(0.10)
Expenditure shares					
Food	55.10	58.73	3.91**	4.01**	3.91**
	[14.95]	[16.51]	(1.76)	(1.68)	(1.55)
Tobacco and alcohol	3.95	2.66	-0.98*	-0.98*	-0.87
	[6.43]	[4.60]	(0.58)	(0.56)	(0.54)
Clothing	5.31	4.24	-0.70	-0.72*	-0.59
	[5.19]	[4.70]	(0.44)	(0.43)	(0.44)
Education	3.86	4.39	0.34	0.32	0.51
	[5.10]	[5.91]	(0.53)	(0.54)	(0.51)
Health	10.67	9.97	-1.14	-1.18	-1.48
	[11.29]	[10.22]	(0.92)	(0.91)	(0.89)
Utilities and other expenses	21.10	20.01	-1.43	-1.46	-1.48
	[10.83]	[11.58]	(1.19)	(1.18)	(1.13)
Food budget shares					
Starches	34.64	35.14	0.71	0.67	0.32
	[16.58]	[16.14]	(1.80)	(1.82)	(1.80)
Meat, fish, and dairy	35.96	35.18	-0.58	-0.63	-0.50
	[15.49]	[15.58]	(1.57)	(1.60)	(1.56)
Fruit and vegetables	13.84	14.90	0.83	0.81	1.01
	[9.87]	[9.12]	(0.74)	(0.74)	(0.77)
Salt and sugar	14.03	13.16	-0.98	-0.89	-0.88
	[8.87]	[7.21]	(0.78)	(0.75)	(0.71)
Other food	0.01	0.07	0.04	0.05	0.06
	[0.21]	[0.77]	(0.03)	(0.03)	(0.04)
Observations	418	429	847	847	847
Municipality controls	-	-	No	Yes	Yes
Demographic controls	-	-	No	No	Yes

Note. Standard deviations are presented in brackets, and standard errors clustered at the municipality level are presented in parentheses (83 clusters in total). *Expenditure* is the total real household expenditure on non-durables (reported in logarithms). *Durables value* is the total value of durables owned by the household (reported in logarithms). *Budget shares* are defined as the ratio between expenditure on a specific category and total household expenditure on non-durables. *Food budget shares* are defined as the ratio between expenditure on a specific category and total food expenditure. *Budget shares* and *food budget shares* are multiplied by 100. Mother (Father) municipalities are municipalities in which the transfer is paid to the mother of the child (household head). In columns (3)–(5), differences are estimated using equation (1). *** denotes significance at 1%, ** at 5%, and * at 10%. All specifications include region and stratum indicators. The full list of controls is presented in section 4.1. The sample is restricted to follow-up observations.

Figure 1: *Non-parametric distribution fit for food budget shares*



Note. The distribution fits are estimated non-parametrically using kernel density estimation assuming an Epanechnikov kernel function. Bandwidths are estimated by Silverman's rule of thumb (Silverman, 1986). The left (right) panel shows the comparison between Mother and Father municipalities at baseline (follow-up). A two-sample Kolmogorov-Smirnov test statistic is equal to 0.06 (p-value 0.51) at baseline, and 0.15 (p-value < 0.01) at follow-up.

cant decrease for clothing and for tobacco and alcohol, although these results become statistically insignificant when we add controls to the model. In terms of the allocation of food expenditures within the food basket, we cannot detect any statistically significant effect (lower panel of table 4).

Observed differences in budget shares are not driven by impacts on overall household expenditure, frequency of purchases, or quality of items purchased. When looking at total expenditure on non-durables, we do observe neither significant mean differences between the two groups nor distributional differences (appendix A.6). This is an expected result as the program did not introduce a pure control group, i.e., the CCT transfer is offered to every eligible household in the country. Second, if the program increases the share allocated to food in the same way across all enrolled households, a differential take-up could also explain differences in food budget shares. While program take-up is slightly higher in Mother municipalities, the difference is not large enough to affect the results (appendix A.15). Third, we find no significant effects of targeting mothers on the proportion of non-zero expenditures for each item or on the frequency of visits to the market by both partners (appendix A.2). In addition, there is no evidence of households shifting to more expensive food items or substituting food away from home production and into manufactured goods (appendix A.3).

Since enrolment in the program is voluntary, estimates produced using equation (1) are intent-to-treat (ITT) estimates of the impact of gender targeting. Among the potential recipients initially sampled, 72% received at least one CCT payment in the first two years of the program, and the remaining decided not to enrol in the program. In addition, whether the mother actually receives the transfer sometimes also depends on the choice of who in the household is declared as head. It is possible that in a Father municipality the transfer is given to the mother if she is declared as head of household (see table 1). Household headship decisions occurred before the introduction

of the CCT as part of the SFA registration, which is a pre-condition for the CCT program.

To account for the endogenous take-up of the program and reconcile the results with the literature discussed in section 1, we exploit the exogenous shifts in the intra-household distribution of income resulting from the CCT payment modality, and we analyse the impact of the parental relative income on budget shares. We compute mothers' income shares using data on several sources of income among the selected households, collected from both self-reported information and administrative data on transfers. Following Almås et al. (2018), we include labour income, income from financial assistance (including CCT transfers), and assistance from family and friends. Assistance from family and friends includes all financial transfers not in the form of debt received by family members (who are not part of the household) or by friends. The effect of the mother's income share on the expenditure share spent on different goods can be estimated by instrumenting the income share with the randomization indicator variable.

At follow-up, residing in a Mother municipality increases the mothers' income share by 17 percentage points (appendix A.8). 2SLS estimates of the effect of the mother's income share on expenditure allocations show that an increase of a one standard deviation in the mother's income share leads to an increase in the food share of around 0.24 percentage points (appendix table A17). Similar results are obtained when replacing the mother's income shares with more direct measures of income transfer. For instance, an increase by 1,000 MKD in the total transfer to the mother leads to an increase in the food budget share by 0.31 percentage points. No significant effect is observed on expenditure shares for the other goods or on budget shares within the food basket.[12] OLS estimates of the relationship between the food budget share and the mother's income share at follow-up show no significant correlation (appendix table A16).

4.2 The demand for food

A main objective of CCT programs is to increase household income, one of the main determinants of expenditure choices. In the case of the Macedonian CCT, the annual transfer is equal to 8% of the average household expenditure on non-durable goods, an increase that would plausibly affect how households allocate expenditures. While, on average, total expenditure is not influenced by the payment modality, the relative importance of the transfer is distinct at different points of the expenditure distribution. In the lowest quartile (the poorest), the transfer is equal to 13% of total expenditure, while in the top quartile it represents only 4%. Therefore, the effect of targeting payments to mothers may be heterogeneous across the distribution of total expenditure.

It is thus important to examine how Engel curves are affected by targeting transfers to mothers rather than to fathers. A shift in the intercept of the Engel curve indicates homogeneous impacts across different expenditure levels, while a change in the slope suggests that impacts are hetero-

[12]This paper addresses the impact of targeting transfers to women on household decisions. A related question is whether women who generate more income in the household, say through their employment, have stronger bargaining power. While the two questions are related, they are different, because the sources of income are quite distinct. It is possible than an increase in women's labour income of the same magnitude as the CCT transfer can have different effects than the ones reported in the paper.

geneous. In line with Attanasio and Lechene (2014), we estimate a demand system for different goods using the following approximation to an Almost Ideal Demand System (Deaton and Muellbauer, 1980a):

$$\begin{aligned} w_{ij}^{n} &= \beta_0 + \beta_1\, mother_{ij} + \delta\, ln\left(\frac{exp_{ij}}{a\,(p)}\right) + \eta\, ln\left(\frac{exp_{ij}}{a\,(p)}\right) * mother_{ij} + \\ &+ \sum_{n=1}^{N} \gamma_{ijn} ln\,(p_{nj}) + \mathbf{V}_j'\beta_2 + \mathbf{X}_i'\beta_3 + \epsilon_{ij} \end{aligned} \tag{2}$$

where w_{ij}^{n} is the expenditure share of good n, exp_{ij} is total household expenditure on non-durables, $a(p)$ is a price index (section 3.3), and p_{nj} is the price of item n in municipality j. β_1 captures the intercept change in the Engel curve induced by the payment modality of the CCT, and η captures the change in the slope of the Engel curve. $\mathbf{V}_j$ and $\mathbf{X}_i$ are vectors of municipality and household characteristics. We use as control variables the same household and municipality characteristics of equation (1), which are also generally used in the literature for the estimation of Engel curves.[13] The household-specific error term, ϵ_{ij}, is assumed to be clustered at the municipality level. Following Browning and Chiappori (1998) and Attanasio et al. (2013), we also experiment with the Quadratic Almost Ideal Demand System (Banks et al., 1997). For the goods categories considered, the coefficient on the quadratic term of total expenditure is never significant, suggesting that a linear relationship is sufficient to fit the data.

In estimating the demand system, we consider the endogeneity of total expenditure. This is due to non-random measurement error related to the infrequency of purchases, recall errors, or taste heterogeneity. Since the demand system in equation (2) introduces the endogenous variable in the model in a non-linear way, we estimate the demand system using a control function (CF) approach.[14] Identification requires an instrument for total expenditure that is excluded from the equations of the demand system. Following a standard procedure in the literature, we use measures of wealth, specifically the value of durable goods and the land owned by the household, as instruments for total expenditure (see, e.g., Dunbar et al., 2013). We use contemporaneous measures of wealth. In a single-time-period analysis (as in a post-intervention estimation), we can assume that households determine consumption expenditures in each period by maximizing the expected value of an additively separable utility function, subject to a budget constraint determined by wealth. True consumption will thus be a function of wealth, which is uncorrelated with consumption allocation errors if allocation decisions within a period are separable from sav-

[13] Since the CCT program provides payments conditional on children attending school, it may be important to control for the number of children enrolled in school. However, this variable can be endogenous to expenditure allocations, even controlling for family structure. The estimates are unaffected by its inclusion as a control variable or by estimating the demand system by instrumenting for it (appendix B.3). We treat it as exogenous to expenditure choices.

[14] In the linear case, estimates from CF and 2SLS are identical. With non-linear functions in endogenous variables, the CF approach is preferred to 2SLS. First, it provides a test of endogeneity of total expenditure by jointly testing the significance of the CF in the estimating equations. Secondly, the CF approach can be more flexibly adapted to non-linear models than 2SLS (Wooldridge, 2010). Appendix B.2 compares 2SLS and CF estimates when no interaction between endogenous variables is considered, and assuming the functional form of the CF used in the main text.

ings decisions across periods. Appendix A.17 shows that results are robust to the selection of instruments using the Post-Double Selection LASSO procedure (Tibshirani, 1996; Belloni et al., 2012).

Following the CF approach, we estimate a first-stage regression of total expenditure on all exogenous variables in the model (appendix B.1). The partial F statistic on all instruments is high, suggesting that selected instruments are good predictors for total expenditure. After computing the residuals from the first-stage regression, we incorporate functions of the residuals as control variables in each equation of system (2). The exact form of the CF depends on the specific assumptions about the probability distribution of the residuals in the model's equations. We rely on a series approximation to the function, using second-order polynomials in the residuals. The equations in the model are jointly estimated, and standard errors are computed using the bootstrap, allowing for clustering at the municipality level. Appendix B provides additional details on the procedure.

Table 5 reports estimates of the Engel curve for food. Columns (1)–(2) present estimates using equation (2). In column (1), the impact of living in a Mother municipality is estimated solely on the intercept of the Engel curve, restricting the interaction term with household expenditure to be equal to zero. In column (2), we allow for a non-zero interaction. Payment modality can thus affect both the intercept and the slope of the Engel curve. In the estimation of the Engel curves, we demean the main independent variables to facilitate the interpretation of the main effect when an interaction term is introduced.

In line with Engel's law, food is a necessity: the share of expenditures allocated to food decreases as total expenditure increases. An increase by 10% in total expenditure is associated with a decrease of 0.8-0.9 percentage points in the food budget share. This corresponds to an expenditure elasticity of food demand (at the mean values in the sample) of 0.84.[15] While food represents a much larger share of household expenditure at lower levels of total household expenditure, offering transfers to women only shifts the intercept on the Engel curve by 4.47 percentage points. The change in the slope is not statistically significant. At baseline, we do not observe any differences in the intercept or slope of Engel curves for food between households in Mother and Father municipalities (appendix A.6). This suggests that targeting payments to mothers results in a higher food budget share throughout the expenditure distribution.

Similar to the analysis in section 4.1, we account for endogenous take-up of the program when estimating the Engel curve for food, by substituting $mother_j$ in equation (2) with the (demeaned) mother's income share. Since this variable is endogenous (as discussed in section 4.1), we use as the exclusion restriction the randomization variable $mother_j$. We expand the CF approach by adding another first-stage regression for the mother's income share to the already described first-stage expenditure equation. The main equation for the Engel curve is then modified to include

[15] Following Green and Alston (1990), the expenditure elasticity of food demand at mean values in the AIDS specification is equal to $(1 + \delta/w^F)$, where δ is estimated using equation (2) and w^F is the average food budget share at follow-up. See estimates in table 5.

Table 5: *Engel curve for food*

	Dep. var.: Food budget share			
	(1)	(2)	(3)	(4)
Mother Municipality	4.47***	4.47***		
	(1.70)	(1.71)		
Mother Municipality x Expenditure		-0.19		
		(3.16)		
Mother's income share			0.30***	0.29***
			(0.09)	(0.10)
Mother's income share x Expenditure				0.06
				(0.06)
Expenditure	-8.49**	-8.38**	-8.66**	-8.78**
	(3.49)	(3.85)	(3.41)	(3.43)
Observations	847	847	847	847
R^2	0.195	0.195	0.205	0.207
Joint significance of main effect and interaction (p-value)	.	0.03	.	0.00
Endogeneity test (p-value)	0.00	0.00	0.00	0.00

Note. Estimates based on the CF approach (equation 2). Bootstrap standard errors (2,000 replications) presented in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variable is the *food budget share*, defined as the ratio between the expenditure on food and the total household expenditure. *Expenditure* is the total (real) household expenditure on non-durables (reported in logarithms). *Mother municipality* is a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. *Mother's income share* is the share (multiplied by 100) of total parental income that can be attributed to the woman in the household, and is instrumented with the *Mother municipality* dummy. *Expenditure* and the *mother's income share* are demeaned. The test of joint significance of the main effect and the interaction is performed with an F-test. The endogeneity test is performed as a joint Wald test for the equality to zero of all coefficients in the polynomial of the first-stage residuals. The full list of controls is presented in section 4.2.

second-order polynomials in first-stage residuals for both expenditure and the mother's income share. Columns (3)–(4) of table 5 present the estimates. An increase in the mother's income share by 1 percentage point shifts the intercept of the Engel curve up by 0.30 percentage points. Again, we do not observe any significant change in the slope.

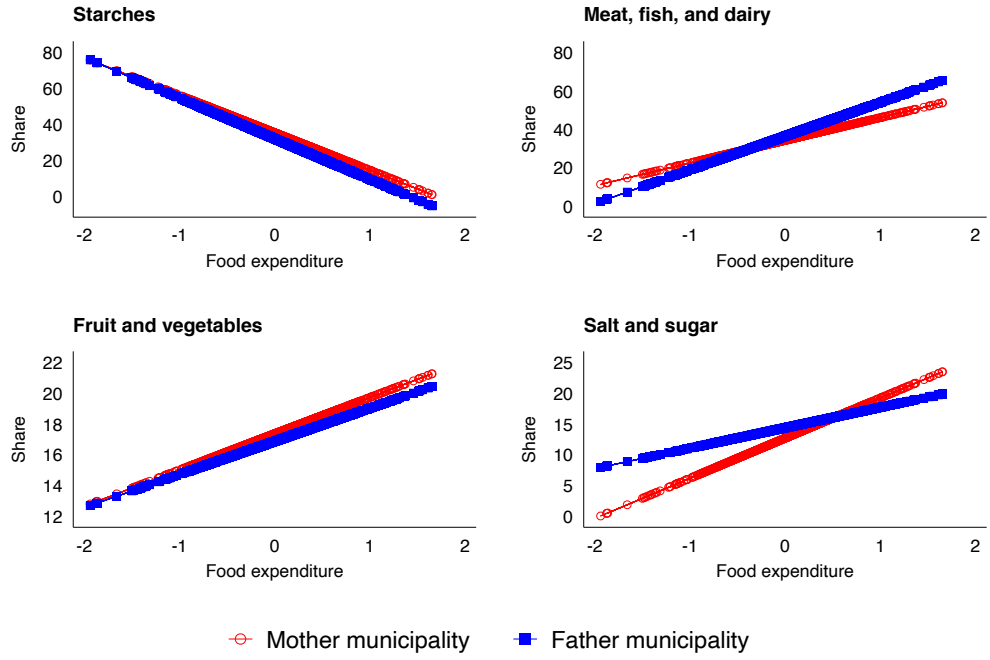
This result helps explaining the finding in the literature that CCT transfers paid to women lead to both a higher total expenditure, and a higher food budget share. Small increases in the mother's income share can offset the reduction in the food budget share induced by an increase in expenditure. Estimates show that compensating for the reduction in the food budget share induced by a 10% increase in total expenditure would require a shift of the income share towards mothers of about 3 percentage points. This is consistent with the findings of Angelucci and Attanasio (2013) and Attanasio and Lechene (2010) for Progresa, a CCT program that offers a transfer (relative to household expenditure) about 2.5 times larger than the transfer in the Macedonian CCT program. Attanasio and Lechene (2010) estimate that an increase of 20% in total expenditure (the average transfer of the program) reduces the food budget share by 4 percentage points. If the husband is the sole income earner and his income is constant, the transfer targeted at wives would increase their income share by about 17 percentage points. We would thus need an increase in the food budget share of 0.24 percentage points per percentage point increase in income share to obtain an overall zero effect of the transfer. We estimate that the effect on the food budget share of targeting mothers would increase to 7 percentage points if the Macedonian CCT transfer were comparable to that of Progresa (appendix A.7).

We extend the demand analysis to items within the food basket. The demand system is estimated using the share of food expenditure allocated to food category m as a dependent variable,

and replacing total expenditure with the (demeaned) food expenditure. We implement a CF approach similar to the one described above to deal with the endogeneity of food expenditure. Table 6 presents the estimated coefficients of the demand system for different items in the food basket. Similar to table 5, columns (1)–(2) show the impacts of residing in a Mother municipality on the demand system, while columns (3)–(4) show the impact of the mother's income share. Figure 2 plots the Engel curves using the estimated coefficients in column (2).

At lower levels of expenditure, households tend to consume mainly starches, while at higher levels, these are substituted with meat, fish, and dairy, vegetables, and salt and sugar. As a consequence of targeting transfers to mothers, we observe statistically significant changes in the intercepts and/or the slopes of the Engel curves for all food categories except fruit and vegetables. Targeting CCT payments to mothers in households with low levels of food expenditure induces a move away from salt and sugars, and towards meat, fish, and dairy. At baseline, Engel curves are not statistically different across treatment groups (appendix A.6). This suggests that, at low levels of food expenditure, targeting payments to mothers leads to a shift towards a more nutritious diet.

Figure 2: *Engel curves for food categories*



Note. The figure presents the estimated Engel curves at follow-up for the different food categories (holding other control variables constant at the average) for households living in Mother and in Father municipalities. Coefficients are reported in column (2) of table 6. *Food expenditure* is the total (real) expenditure on food (reported in logarithms and demeaned). Food categories are defined in table 3.

4.3 Discussion

In line with previous evidence (Thomas, 1990; Browning et al., 1994; Phipps and Burton, 1998; Bourguignon et al., 1993; Schultz, 1990), the results discussed in sections 4.1 and 4.2 highlight

Table 6: *Demand system for the food basket*

	Dep. var.: Food budget share of food category			
	(1)	(2)	(3)	(4)
Starches				
Mother municipality	3.34*	3.34*		
	(2.03)	(2.03)		
Mother municipality x Food expenditure		1.76		
		(2.72)		
Mother's income share			0.21*	0.20*
			(0.12)	(0.12)
Mother's income share x Food expenditure				0.09*
				(0.05)
Food expenditure	-21.47***	-22.57***	-22.26***	-22.17***
	(4.31)	(4.88)	(4.40)	(4.17)
Meat, fish, and dairy				
Mother municipality	-2.18	-2.17		
	(1.83)	(1.77)		
Mother municipality x Food expenditure		-5.73**		
		(2.76)		
Mother's income share			-0.14	-0.13
			(0.11)	(0.11)
Mother's income share x Food expenditure				-0.11**
				(0.05)
Food expenditure	13.95***	17.55***	14.19***	14.08***
	(4.36)	(5.10)	(4.33)	(4.08)
Fruit and vegetables				
Mother municipality	0.50	0.50		
	(0.95)	(0.96)		
Mother municipality x Food expenditure		0.20		
		(1.67)		
Mother's income share			0.03	0.03
			(0.06)	(0.06)
Mother's income share x Food expenditure				-0.02
				(0.03)
Food expenditure	2.28	2.16	2.41	2.39
	(2.52)	(2.88)	(2.63)	(2.65)
Salt and sugar				
Mother municipality	-1.69**	-1.69**		
	(0.86)	(0.85)		
Mother municipality x Food expenditure		3.21**		
		(1.25)		
Mother's income share			-0.10**	-0.10**
			(0.05)	(0.05)
Mother's income share x Food expenditure				0.04*
				(0.02)
Food expenditure	5.34***	3.32	5.77***	5.81***
	(1.99)	(2.39)	(1.88)	(1.91)
Observations	849	849	849	849

Note. Estimates based on the CF approach (equation 2). Bootstrap standard errors (2,000 replications) presented in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variables are the shares of food expenditure spent on each category. Food categories are defined in table 3. *Food expenditure* is the total (real) expenditure on food (reported in logarithms). *Mother municipality* is a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. *Mother's income share* is the share (multiplied by 100) of total parental income that can be attributed to the woman in the household. *Food expenditure* and the *mother's income share* are demeaned. The full list of controls is presented in section 4.2.

the importance of the recipient of the transfer for the allocation of expenditures. Both our results and the literature document that higher income shares associated with women in the household are related to higher expenditures on food (Haddad and Hoddinott, 1994; Attanasio and Lechene, 2010). This paper provides additional evidence against the income pooling hypothesis and the unitary model of household decision making (Becker, 1991). To explain our data, one needs to consider models of intra-household decision making. In general, some of these models assume cooperative behaviour between household members, resulting in efficient outcomes, while others allow for non-cooperative behaviour (see, e.g., Browning et al., 2014).

Assuming a cooperative model, if preferences differ among partners, the observed effects of targeting transfers to mothers could be explained by an increase in the mother's weight in the decision process. A greater control of household resources by mothers translates into a stronger alignment of expenditure allocations with their preferences. As partners' relative income has been used in the literature as a distribution factor (i.e., a variable affecting the decision process but not preferences nor budget constraints), it is reasonable to assume that non-labour income derived from the CCT transfer and targeted at mothers could indeed raise the mother's power in the decision process. This is true even though this is transferred income rather than labour income, and the mechanism linking women's control of resources to their decision-making power could vary depending on the source of income considered.

An increase in the mother's weight in the decision-making process could also be related to an effect on female empowerment. This can be associated with either having the title of holder of the payment, or the experience of being targeted by the program. This hypothesis is in line with Almås et al. (2018), who show that women targeted by payments in this same program experience greater empowerment, defined by their willingness to pay for receiving a cash transfer instead of having her husband receive it.[16]

A non-cooperative model, in which mothers and fathers share the same preferences, but are assumed to have different individual budget constraints, would also be consistent with the observed results. Since the CCT transfer shifts the recipient's budget constraint, independently from any effect on decision power, targeted transfers could result in differential allocation of expenditures. This would be the case if targeting mothers increases the provision of female-provided goods due to specialization in household production (Doepke and Tertilt, 2019). While income-hiding among partners has been shown to be relevant in a non-cooperative setting (Ashraf, 2009), the high level of awareness of the CCT program at follow-up (89% of respondents), not different across treatment arms, suggest it may not be central in this study (appendix A.16). The setting of this paper does not allow us to discriminate between a non-cooperative and a cooperative setting.

Consistent with both model types, we find relevant impact heterogeneities that are related to social and cultural factors. The increase in the food budget share when mothers are targeted is

[16]The increase in empowerment could also reflect a higher level of control of household resources. It is not possible to use the measurement collected in Almås et al. (2018) because it focuses on urban areas only, and fewer households in the sample were part of the study.

mainly driven by households presenting characteristics that the literature associates with lower decision-making power for mothers, such as the mother being younger or less educated than the father (Browning et al., 1994), having weaker family networks (Attanasio and Lechene, 2014), and having never worked for a wage (see, e.g., Alesina et al., 2013). In contrast, in households presenting characteristics associated with higher female decision-making power, we cannot reject the null hypothesis of a zero effect (appendix A.10). To give a specific example, Muslim households and households of non-Macedonian ethnicity are characterized, on average, by less gender-equal values and a more traditional family model when compared to non-Muslim and Macedonian households (appendix A.11). For non-Muslim and Macedonian households, we observe no significant effect on the food expenditure share, while for Muslim households and households of non-Macedonian ethnicity, the effect is positive and statistically significant.

Since CCT transfers can be perceived as compensation for reduced labour income (or contribution to home production) of the child enrolling in school, an alternative mechanism that could explain changes in household consumption relates to individual time allocation among family members.[17] Increased subsidies to women could influence the role of mothers and daughters in the provision of within-household labour services (see, e.g., Morduch, 1999) or the time spent to ensure compliance with the CCT. To examine these hypotheses, we focus on the share of the day spent by both partners sleeping, doing household chores, working, taking care of the elderly, shopping, leisure with and without children, helping children to study, and doing other activities. We find no effect of targeting the CCT payment to women on the amount of time allocated to any of these activities (appendix A.4). We also study parental monitoring of school attendance, by looking at whether parents check school reports, attend parental meetings, and ask children about school. Similarly, we observe no significant effect of targeting the transfer to mothers (appendix A.14). In line with experimental evidence from *Progresa/Oportunidades* (Skoufias and Di Maro, 2008; Skoufias et al., 2001), we also observe no effect on self-reported labour supply among adults (appendix A.4).

The CCT payment modality can induce differential effects related to within-household labour substitutability among children targeted by the program. We therefore check for heterogeneity in the effect of targeting mothers by the gender composition of children in secondary school age (appendix A.13). While we cannot reject the null hypothesis of equality of the effect at 90% of confidence, the food budget share is significantly larger in Mother municipalities if we restrict the sample to households with male children only. However, this is not statistically different for households with female children only or with both male and female children. To understand this result, we estimate the effect of targeting mothers on a series of child-level outcomes related to schooling and labour supply. We observe no significant effect of targeting on secondary school enrolment and school attendance, while we observe a positive effect on CCT enrolment and the CCT transfer among boys only. When looking at labour supply, this effect does not translate in

[17] The framework discussed in section 4.2 does not explicitly look at labour supply decisions. It assumes two-stage budgeting and separability of consumption decisions from labour supply.

a lower propensity to do house chores and work for salary. For most outcomes, we cannot reject equality of the effect between boys and girls. Evidence suggests the CCT payment modality had no effect on time allocation and labour supply decisions among family members.

5 Conclusion

Most social programs in the developing world support poor families with transfers that are mainly channelled towards women. However, the effect of providing additional cash to a specific family member on household consumption allocation is still unclear. One problem in the literature has been the lack of suitable data for such an analysis. Most transfer programs target transfers solely to women, making it impossible to examine outcomes of households in which the recipient of the transfer is a man.

This paper studies the effect of a nationwide transfer program that, in its first years, randomized the gender of the transfer recipient: the Macedonian CCT for Secondary School education. This program provides cash transfers to poor households in Macedonia conditional on their children being enrolled in secondary school. Target recipients were randomized across municipalities to be either the mother or the father of the child, so the program deliberately changed the control of resources in households living in different municipalities. When provided with an additional source of income, mothers and fathers spend income differently. Targeting women increases the share of resources allocated to food and has a significant impact on the shape of Engel curves for different food items. For lower levels of food expenditure, mothers allocate extra resources to a more nutritious diet.

Evidence on the effect of targeting payments to mothers versus fathers is central for the design of future social programs aimed at supporting human capital formation among children. We show that choosing the recipient of the transfer has direct consequences on the way household expenditures are allocated, both in terms of the resources allocated to food consumption and the composition of the food basket, both of which are fundamental for the development of children.

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FOR ONLINE PUBLICATION

ONLINE APPENDIX

"The Effect of Gender-Targeted Conditional Cash Transfers on Household Expenditures: Evidence from a Randomized Experiment"

A Additional analysis

A.1 Attrition and sample selection

We present an analysis of attrition rate at follow-up from baseline household. Columns (1)–(3) in table A1 present probit regressions of attrition under different specifications. The dependent variable is equal to 1 if the household was interviewed at baseline and not re-interviewed at follow-up, and zero if the household was interviewed in both rounds. Similarly, in columns (4)–(6), we check whether the refresher sample was added differentially in different treatment arms. The dependent variable is a dummy variable equal to 1 if the observation is from the refresher sample, and zero if it is from the baseline. In both cases, living in a Mother municipality is not driving the attrition rate, nor the refresher sampling.

Table A1: *Probability of attrition at follow-up*

Dep. var.:	**Household did not respond at follow-up**			**Household is part of refresher sample**		
	(1)	(2)	(3)	(4)	(5)	(6)
Mother municipality (d)	0.009	0.009	0.003	0.009	0.009	0.009
	(0.021)	(0.021)	(0.021)	(0.020)	(0.020)	(0.019)
Observations	766	766	766	852	852	852
Municipality controls	No	Yes	Yes	No	Yes	Yes
Demographic controls	No	No	Yes	No	No	Yes

Note. Estimates based on probit regressions (marginal effects). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. In columns (1)–(3), the dependent variable is an indicator variable equal to 1 if the household was interviewed at baseline and not at follow-up, and zero otherwise. In columns (4)–(6), the dependent variable is an indicator variable equal to 1 if the observation is from the refresher sample, and zero if it is from the baseline sample. All specifications include region and stratum indicators. The full list of controls is presented in section 4.1.

Table A2 presents estimates of the impact of targeting mothers under different sub-samples. For the baseline, column (1) compares food budget shares across treatment arms among all eligible households, while column (2) restricts the sample to households with younger eligible children (12–14 at baseline). For the follow-up, columns (3) and (4) present estimates of equation (1) restricting the sample to only households interviewed at baseline. Columns (5)–(6) present estimates of equation (1) using inverse probability weighting (Wooldridge, 2010). Results are robust to these checks.

Table A3 presents additional robustness tests to attrition. Column (1) shows estimates of treatment effect as presented in the main text, estimated using equation (1). Column (2) shows estimates using an ANCOVA specification by including the lagged value of the dependent variable. This specification maximizes statistical power in experiments, if autocorrelations of outcome variables are low (McKenzie, 2012). Auto-correlation in the food budget share is equal to 0.26,

Table A2: *Treatment effect on food budget share under different sub-samples*

	Dep. var.: Food budget share					
Sub-sample:	All eligible households	Households with younger children	Panel households	Panel households	Panel households	Panel households
	(1)	(2)	(3)	(4)	(5)	(6)
Mother municipality	0.107	0.084	3.912**	3.909**	3.770**	3.838**
	(1.428)	(1.830)	(1.761)	(1.554)	(1.875)	(1.677)
Observations	756	352	847	847	677	677
Municipality controls	Yes	Yes	No	Yes	No	Yes
Demographic controls	Yes	Yes	No	Yes	No	Yes
Weighting	-	-	-	-	IPW	IPW
Time of measurement	BL	BL	FU	FU	FU	FU

Note. Estimates based on OLS regressions (equation 1). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The *food budget share* is the ratio between food expenditure and total household expenditure on non-durables. Budget shares are multiplied by 100. *Mother municipality* is a dummy variable equal to 1 if the transfer is targeted to mothers, and zero otherwise. In column (5) and (6), observations are weighted using inverse probability weighting (Wooldridge, 2010). All specifications include region and stratum indicators. The full list of controls is presented in section 4.1. "BL" ("FU") indicates that the outcome variable is measured at baseline (follow-up).

suggesting this is a preferred method compared to a difference-in-differences estimation. Similarly, in column (3), we control for the municipality average at baseline of the dependent variable, rather than the lagged dependent variable. Columns (4)–(5) present Lee's treatment effects bounds for non-random sample selection (Lee, 2009). These estimates make use of baseline households only, including households with children that would have not been eligible due to age at follow-up. We present conservative estimates by not including any covariate for tightening bounds. Overall, the results are robust to these tests.

Table A3: *Attrition and robustness of main estimates*

	Difference [Mother municipalities - Father municipalities]				
Estimation method:	OLS	ANCOVA	ANCOVA	Lee's lower bound	Lee's upper bound
	(1)	(2)	(3)	(4)	(5)
Expenditure	0.03	0.04	0.03	0.04	0.08
	(0.06)	(0.06)	(0.06)	(0.08)	(0.07)
Durables value	0.05	0.02	0.05	0.03	0.07
	(0.10)	(0.09)	(0.09)	(0.13)	(0.12)
Expenditure shares					
Food	3.91**	3.67**	3.92**	3.46*	4.27**
	(1.55)	(1.64)	(1.53)	(1.96)	(2.04)
Tobacco and alcohol	-0.87	-0.81	-0.89*	-1.32*	-1.14
	(0.54)	(0.51)	(0.53)	(0.73)	(0.74)
Clothing	-0.59	-0.55	-0.55	-1.21**	-1.01*
	(0.44)	(0.46)	(0.43)	(0.60)	(0.60)
Education	0.51	0.53	0.45	0.31	0.62
	(0.51)	(0.51)	(0.50)	(0.67)	(0.61)
Health	-1.48	-1.32	-1.33	-1.15	-0.63
	(0.89)	(1.00)	(0.86)	(1.21)	(1.24)
Utilities and other expenses	-1.48	-1.62	-1.56	-1.85	-1.21
	(1.13)	(1.04)	(1.13)	(1.35)	(1.29)
Food budget shares					
Starches	0.32	0.01	0.81	-0.47	-0.17
	(1.80)	(1.91)	(1.82)	(1.90)	(1.99)
Meat, fish, and dairy	-0.50	-0.06	-0.82	-0.29	-0.01
	(1.56)	(1.62)	(1.55)	(2.03)	(1.97)
Fruit and vegetables	1.01	1.26	0.92	1.32	1.53
	(0.77)	(0.84)	(0.76)	(0.96)	(1.01)
Salt and sugar	-0.88	-1.15	-0.86	-1.18	-1.07
	(0.71)	(0.83)	(0.71)	(1.03)	(1.02)
Other food	0.06	0.05*	0.06	0.02	0.04
	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)
Observations	847	658	847	766	766
Municipality controls	Yes	Yes	Yes	No	No
Demographic controls	Yes	Yes	Yes	No	No
Lagged dep. var.	No	Yes	No	No	No
Lagged dep. var. (municipality)	No	No	Yes	No	No

Note. Depending on the column, the following specifications are used: (1) OLS regression (equation 1); (2) OLS regression (equation 1) controlling for the lagged value of the dependent variable; (3) OLS regression (equation 1) controlling for the municipality average at baseline of the dependent variable; (4)–(5) Lee's bounds with no covariate, and using 500 bootstrap iterations (Lee, 2009). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. *Expenditure* is the total (real) household expenditure on non-durables (reported in logarithms). *Durables value* is the total value of durables owned by the household (reported in logarithms). Budget shares are the ratio between expenditure on a specific category and total household expenditure on non-durables. Food budget shares are the ratio between expenditure on a specific category and total food expenditure. Budget shares and food budget shares are multiplied by 100. Mother (Father) municipalities are municipalities in which the transfer is paid to the mother of the child (household head). Specifications in columns (1)–(3) include region and stratum indicators. The full list of controls is presented in section 4.1. In columns (1)–(3) the sample is restricted to follow-up observations, while in columns (4)–(5) the sample is restricted to all baseline households. The sample is restricted to follow-up observations.

A.2 Effect on the decision to purchase

We focus here on the share of non-zero consumption for each item. We build dummy variables equal to 1 if the item was consumed, and zero otherwise. We start by focusing on budget shares. Table A4 presents descriptive statistics about non-zero expenditures, and mean difference between Mother and Father municipalities for all goods and for food categories within the food basket. For most items there is no difference at follow-up.

Table A4: *Non-zero expenditures*

	BASELINE			**FOLLOW-UP**		
	Mean and std.dev. by municipality group		**Difference (2) - (1)**	**Mean and std.dev. by municipality group**		**Difference (5) - (4)**
	Father	Mother	All	Father	Mother	All
	(1)	(2)	(3)	(4)	(5)	(6)
Food	1.00	1.00	0.00	1.00	1.00	-0.01
	[0.00]	[0.00]	(0.00)	[0.00]	[0.05]	(0.00)
Tobacco and alcohol	0.31	0.34	-0.01	0.45	0.36	-0.08
	[0.47]	[0.47]	(0.05)	[0.51]	[0.49]	(0.06)
Clothing	0.80	0.81	0.03	0.83	0.76	-0.06
	[0.40]	[0.39]	(0.04)	[0.39]	[0.44]	(0.04)
Education	0.83	0.90	0.07	0.90	0.87	-0.05
	[0.38]	[0.30]	(0.04)	[0.31]	[0.36]	(0.04)
Health	0.97	1.00	0.03**	0.98	0.98	-0.01
	[0.18]	[0.05]	(0.01)	[0.15]	[0.15]	(0.01)
Utilities and other expenses	1.00	0.99	-0.00	1.00	0.99	-0.01
	[0.00]	[0.07]	(0.00)	[0.00]	[0.11]	(0.01)
Starches	1.00	1.00	0.00	0.99	1.00	0.01
	[0.00]	[0.00]	(0.00)	[0.10]	[0.05]	(0.00)
Meat, fish and dairy	1.00	0.99	-0.01**	0.98	0.99	0.00
	[0.00]	[0.11]	(0.01)	[0.12]	[0.11]	(0.01)
Fruit and vegetables	0.92	0.92	-0.00	0.92	0.95	0.04*
	[0.27]	[0.28]	(0.03)	[0.28]	[0.21]	(0.02)
Salt and sugars	0.94	0.95	0.01	0.97	0.97	-0.01
	[0.23]	[0.21]	(0.02)	[0.17]	[0.18]	(0.02)
Other food	0.03	0.02	-0.00	0.01	0.03	0.01
	[0.16]	[0.15]	(0.01)	[0.12]	[0.19]	(0.01)
Observations	375	381	756	418	429	847
Demographic controls	-	-	Yes	-	-	Yes

Note. Standard deviations are presented in brackets, standard errors clustered at the municipality level are presented in parentheses (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. Non-zero expenditures are defined as a dummy variable equal to 1 if the household consumed the item, and zero otherwise. In columns (3) and (6), differences are estimated using equation (1), controlling for region and stratum indicators, and municipality controls. The full list of controls is presented in section 4.1. The sample is restricted to follow-up observations.

We then focus on whether the payment modalities affect the frequency of visits to the market. The following question was collected during the survey: "*How frequent do you and your partner go to the market?*". Frequency of visits were collected for both partners. Table A5 presents estimates of ITT effect of payment modalities on the frequency. No significant effect is highlighted.

Table A5: *Frequency of visits to the market*

	Dep. var.: Frequency of visits to the market...					
	for the father of the child			for the mother of the child		
	(1)	(2)	(3)	(4)	(5)	(6)
Mother municipality	-0.06	-0.07	-0.07	0.01	0.00	0.02
	(0.12)	(0.11)	(0.11)	(0.17)	(0.16)	(0.15)
Observations	841	841	841	844	844	844
R^2	0.076	0.082	0.097	0.112	0.132	0.198
Municipality controls	No	Yes	Yes	No	Yes	Yes
Demographic controls	No	No	Yes	No	No	Yes

Note. Estimates based on OLS regressions (equation 1). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variable is the frequency at which fathers and mothers go to the market. The exact question reads as follow: "*How frequent do you and your partner go to the market?*". The variable varies from 1 to 6: 1 - daily, 2 - once per week, 3 - once every two weeks, 4 - monthly, 5 - less frequently than monthly, 6 - never. All specifications include region and stratum indicators. The full list of controls is presented in section 4.1. The sample is restricted to follow-up observations.

A.3 Food quantity versus quality

Table A6 presents a comparison of prices by municipality group. Similarly, table A7 presents a comparison of price indexes computed at household level, without the procedure of aggregation presented in section 3.3. We observe no difference across municipality groups, both at baseline and follow-up. The introduction of different payment modalities for the CCT program did not induce any effect on food prices.

Table A6: *Average Stone price indexes, by treatment status*

	BASELINE			FOLLOW-UP		
	Mean and std.dev. by municipality group		Difference (2)-(1)	Mean and std.dev. by municipality group		Difference (5)-(4)
	Father	Mother	All	Father	Mother	All
	(1)	(2)	(3)	(4)	(5)	(6)
Price index (Food)	2.16	2.17	0.01	2.27	2.27	0.01
	[0.06]	[0.06]	(0.01)	[0.06]	[0.05]	(0.01)
Price index (Starches)	1.69	1.71	0.03	1.74	1.76	0.02
	[0.11]	[0.11]	(0.02)	[0.10]	[0.09]	(0.02)
Price index (Meat, fish, and dairy)	2.82	2.82	-0.00	2.98	2.98	0.00
	[0.06]	[0.05]	(0.01)	[0.08]	[0.07]	(0.02)
Price index (Fruit and vegetables)	1.16	1.15	-0.01	1.24	1.24	-0.01
	[0.11]	[0.11]	(0.02)	[0.10]	[0.10]	(0.02)
Price index (Salt and sugar)	2.37	2.36	-0.01	2.50	2.50	-0.00
	[0.09]	[0.07]	(0.02)	[0.07]	[0.09]	(0.02)
Price index (Other food)	2.73	2.71	-0.03	2.77	2.76	-0.01
	[0.21]	[0.24]	(0.05)	[0.20]	[0.25]	(0.05)
Observations	42	41	83	42	41	83

Note. Standard deviations are presented in brackets, standard errors are presented in parentheses. Price indexes are averaged at the municipality level. Detailed information about the construction of the indexes is reported in section 3.2. In columns (3) and (6) differences are estimated using equation (1) without control variables. *** denotes significance at 1%, ** at 5%, and * at 10%. The sample is restricted to follow-up observations.

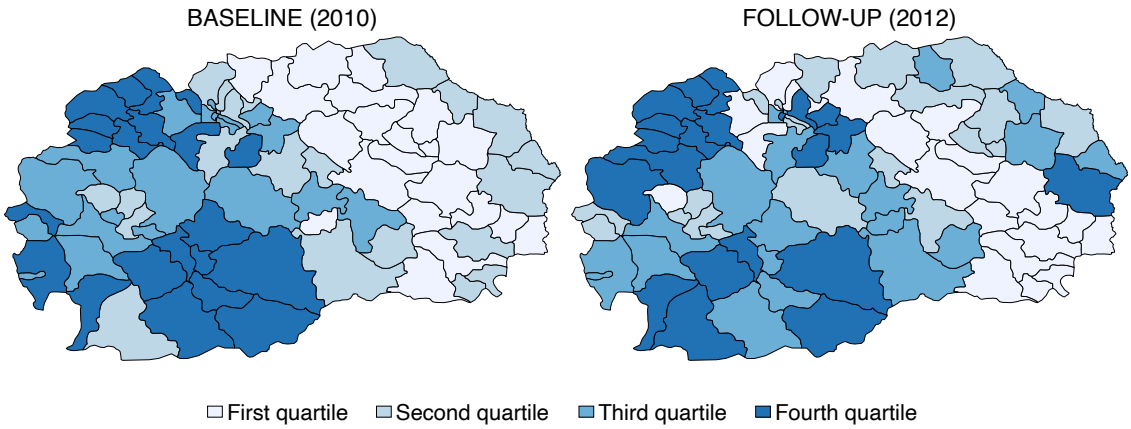
To estimate Engel curves, we exploit a geographic variation in prices. Limited variation could limit the analysis. Figure A1 shows the distribution of the Stone price index across municipalities and across time (for baseline and for the follow-up). While we observe little variation across time, we can observe that variation is substantial across municipalities.

Table A7: *Price indexes at household level, by treatment status*

	BASELINE			FOLLOW-UP		
	Mean and std.dev. by municipality group		Difference (2)-(1)	Mean and std.dev. by municipality group		Difference (5)-(4)
	Father	Mother	All	Father	Mother	All
	(1)	(2)	(3)	(4)	(5)	(6)
Price index (Food)	2.16	2.15	-0.01	2.27	2.26	-0.01
	[0.20]	[0.21]	(0.02)	[0.23]	[0.22]	(0.02)
Price index (Starches)	1.70	1.71	0.00	1.75	1.77	0.01
	[0.11]	[0.09]	(0.01)	[0.10]	[0.09]	(0.01)
Price index (Meat, fish and dairy)	2.83	2.82	-0.01	2.99	2.98	-0.00
	[0.06]	[0.05]	(0.01)	[0.08]	[0.07]	(0.01)
Price index (Fruit and vegetables)	1.15	1.16	0.01	1.26	1.25	-0.02
	[0.11]	[0.11]	(0.02)	[0.11]	[0.11]	(0.02)
Price index (Salt and sugars)	2.36	2.36	0.01	2.50	2.50	0.01
	[0.09]	[0.07]	(0.01)	[0.08]	[0.09]	(0.02)
Price index (Other food)	2.73	2.70	0.01	2.79	2.78	-0.01
	[0.20]	[0.23]	(0.03)	[0.20]	[0.25]	(0.03)
Observations	379	386	765	429	429	847

Note. Standard deviations in brackets, standard errors clustered at the municipality level in parentheses. Prices indexes are computed at household level following the procedure presented in section 3.3, but without aggregation of prices. In columns (3) and (6), differences are estimated using equation (1) using region and stratum indicators, municipality and demographic characteristics as control variables. *** denotes significance at 1%, ** at 5%, and * at 10%. The full list of controls is presented in section 4.1. The sample is restricted to follow-up observations.

Figure A1: *Geographical variation of the Stone price index for food*



Note. The left (right) panel shows the geographical variation of the Stone price index for food computed at baseline (follow-up) at the municipality level. Variation is presented in terms of quartiles of the distribution of the price index (section 3.3). The map detailing the administrative division in municipalities is obtained from GADM (www.gadm.org).

To study how food expenditure is allocated to different food categories, we estimate equation (2) for each food category, and compute its derivatives with respect to food expenditure and to the food price index. Table A8 presents the estimated coefficients and the standard errors.

To understand whether expenditure shifts away from home production of food, table A9 focuses on treatment effect on food and drinks outside the dwelling, and on manufactured food. Columns (1)–(2) show estimates of targeting payments to mothers on the expenditure share of food and drinks outside the dwelling. Columns (3)–(4) focus instead on total manufactured food, including manufactured meat/fish, manufactured vegetables and food and drinks outside

Table A8: *Food budget shares, total food expenditure and food prices*

		Derivative with respect to...			
		Total food expenditure		Food price index	
	(1)	(2)	(3)	(4)	(5)
	Average share	Coefficient	Std.error	Coefficient	Std.error
Bread	17.04	-15.66***	5.00	2.74	3.55
Butter	0.75	-0.09	0.28	0.85***	0.29
Pasta and rice	2.53	0.78	0.58	0.35	0.59
Cheese	3.74	4.27***	1.29	2.53*	1.50
Chocolate and biscuits	1.42	1.62***	0.52	1.73***	0.44
Coffee and tea	4.37	-0.37	0.79	-1.19	0.79
Dry fruit	0.21	-0.40	0.36	-0.01	0.15
Eggs	3.31	-0.65	0.95	-0.30	0.76
Fish	0.95	-0.18	0.59	0.11	0.63
Food and drinks outside	1.20	1.66**	0.81	1.30	1.50
Fresh vegetables	6.41	0.85	1.61	-0.78	1.24
Fruit	3.12	2.77***	0.74	0.22	0.89
Lipids of animal origin	0.13	0.07	0.15	-0.19	0.14
Lipids of vegetable origin	7.05	1.00	1.49	-0.82	1.07
Manufactured meat	2.19	-0.05	1.01	2.16**	1.02
Manufactured vegetables	1.54	-0.21	0.73	2.40***	0.76
Milk and yoghurt	4.97	-1.56	2.26	-1.00	1.87
Meat	11.28	7.44***	1.86	2.39	2.14
Other food items	0.04	0.13	0.14	0.07	0.09
Potatoes	3.16	-2.90*	1.67	-0.96	0.63
Pulses	4.63	-0.48	1.40	-1.74	1.05
Salt and salties	1.60	-0.14	0.43	0.00	0.56
Soft drinks	3.14	1.32	0.88	1.37*	0.74
Sugar and honey	3.06	1.34	1.00	-0.80	0.88
Wheat	12.15	-0.57	3.65	-10.42***	3.91

Note. Column (1) reports the average food budget share for each item reported in column. Food budget shares are the ratio between the consumption deriving from a specific source and the total food consumption. Food expenditure and food prices are reported in logarithms. Columns (2)–(5) report the derivatives of the food budget share with respect to food expenditure and to the food price index. These are estimated using the CF approach (equation 2) separately for each food category. Standard errors are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The full list of controls is presented in section 4.2. The sample is restricted to follow-up observations.

the dwelling. We do not observe any statistically significant different between Mother and Father municipalities for these outcomes.

Table A9: *Targeted payments and processed food*

Dep. var.:	**Food and drinks outside the dwelling**		**Total manufactured food**	
	% expenditure	% food expenditure	% expenditure	% food expenditure
	(1)	(2)	(3)	(4)
Mother municipality	-0.00	-0.20	-0.02	-0.43
	(0.01)	(0.53)	(0.02)	(0.90)
Observations	845	849	845	849
R^2	0.099	0.095	0.118	0.163

Note. Estimates based on OLS regressions (equation 1). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variables are: in column (1), the share of total expenditure spent on food and drinks outside the dwelling; in column (2), the share of food expenditure spent on food and drinks outside the dwelling; in column (3), the share of total expenditure spent on manufactured food; in column (4), the share of food expenditure spent on manufactured food. Manufactured food includes manufactured meat/fish and vegetables, and food and drinks outside the dwelling. All specifications include region and stratum indicators, municipality, and demographic controls. The full list of controls is presented in section 4.1. The sample is restricted to follow-up observations.

A.4 Time use and labour supply

We collected information on time use the day before the interview for both parents. We report the share of the day spent on the following activities: sleeping, doing house chores, working, taking care of elderly, shopping, leisure with children, leisure without children, helping children to study, and doing other activities (with and without children). Table A10 presents differences in time use across treatment groups at baseline and follow-up. No difference is significant at both baseline and follow-up. This provides evidence that the targeting of payments had no impact on time use.

Table A10: *Share of the day spent on different activities by treatment status*

	BASELINE			**FOLLOW-UP**		
	Mean and std.dev. by municipality group		**Difference (2)-(1)**	**Mean and std.dev. by municipality group**		**Difference (5)-(4)**
	Father	Mother	All	Father	Mother	All
	(1)	(2)	(3)	(4)	(5)	(6)
FATHERS						
Sleeping	0.376	0.382	0.013*	0.383	0.383	0.003
	[0.062]	[0.062]	(0.007)	[0.060]	[0.066]	(0.008)
House chores and working	0.226	0.223	-0.009	0.231	0.235	-0.003
	[0.162]	[0.153]	(0.021)	[0.189]	[0.204]	(0.019)
Time with children	0.135	0.143	0.010	0.127	0.144	0.019
	[0.106]	[0.115]	(0.015)	[0.138]	[0.142]	(0.015)
Shopping and leisure	0.142	0.138	0.006	0.142	0.128	-0.013
	[0.127]	[0.131]	(0.014)	[0.125]	[0.123]	(0.015)
Other activities	0.121	0.114	-0.020	0.116	0.110	-0.006
	[0.127]	[0.128]	(0.017)	[0.160]	[0.156]	(0.023)
Observations	309	320	629	406	418	824
MOTHERS						
Sleeping	0.363	0.370	0.009	0.381	0.382	0.002
	[0.057]	[0.062]	(0.007)	[0.060]	[0.060]	(0.008)
House chores and working	0.226	0.223	-0.009	0.231	0.235	-0.003
	[0.162]	[0.153]	(0.021)	[0.189]	[0.204]	(0.019)
Time with children	0.157	0.165	0.014	0.132	0.143	0.006
	[0.115]	[0.112]	(0.012)	[0.110]	[0.122]	(0.013)
Shopping and leisure	0.077	0.080	0.008	0.085	0.087	0.006
	[0.089]	[0.087]	(0.007)	[0.089]	[0.095]	(0.010)
Other activities	0.068	0.070	-0.005	0.058	0.061	0.001
	[0.090]	[0.098]	(0.010)	[0.086]	[0.093]	(0.010)
Observations	327	358	685	405	426	831

Note. Standard deviations in brackets, standard errors clustered at the municipality level in parentheses (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variable is the share of the day spent on different activities by fathers (upper panel) and mothers (lower panel). In columns (3) and (6), differences are estimated using equation (1), controlling for region and stratum indicators. The sample is restricted to follow-up observations.

Table A11 presents estimates of the impact of payment modalities of the probability of both partners to have worked for salary or in agriculture during the week before the interview. We record no significant effect on labour supply.

Table A11: *Labour supply among parents*

Dep. var.:	Worked				Worked in agriculture			
	Father		Mother		Father		Mother	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother municipality	-0.05	-0.05	-0.03	-0.02	-0.03	-0.00	-0.02	0.00
	(0.04)	(0.04)	(0.02)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)
Observations	852	852	852	852	852	852	852	852
R^2	0.049	0.099	0.044	0.065	0.224	0.376	0.226	0.342
Municipality controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	No	Yes	No	Yes	No	Yes	No	Yes

Note. Estimates based on OLS regressions (equation 1). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. I columns (1)-(4), the dependent variable is an indicator variable equal to 1 if the person worked in the week before the interview, and zero otherwise. In columns (5)-(8), the dependent variable is an indicator variable equal to 1 if the person worked in agriculture in the week before the interview, and zero otherwise. All specifications include region and stratum indicators. The full list of controls is presented in section 4.1. The sample is restricted to follow-up observations.

A.5 Presence of partners during the interview

As a standard in the literature, expenditure data is collected with a recall method. If treatment modalities induce differential presence of respondents or different interviewers, we might be facing an issue with non-classical measurement error. To test this possibility, we use available information about whether mothers and fathers are both present during the interview, whether the interviewer is younger than 30, and whether has more than secondary school education. Table A12 presents estimate of the effect of payment modalities on these variables, while table A13 presents instead estimates of the effect of residing in a Mother municipality and of the mother's income share on the food budget share, when controlling for these variables. This provides evidence against non-random measurement error.

Table A12: *Targeted payments, presence of respondents and interviewers' characteristics*

Dep. var.:	Father and mother are present		Interviewer younger than 30 y.o.		Interviewer has more than secondary education	
	(1)	(2)	(3)	(4)	(5)	(6)
Mother municipality	0.03	0.03	-0.05	-0.06	0.02	0.01
	(0.05)	(0.05)	(0.08)	(0.07)	(0.07)	(0.07)
Observations	852	852	852	852	852	852
R^2	0.115	0.131	0.173	0.202	0.158	0.170

Note. Estimates based on OLS regressions (equation 1). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variables are dummy variables for the presence of both partners during the interview, and for the interviewer's age and education. All specifications include region and stratum indicators, municipality and household controls. The full list of controls is presented in section 4.1. The sample is restricted to follow-up observations.

Table A13: *Targeted payments and food budget share, controlling for potential measurement error*

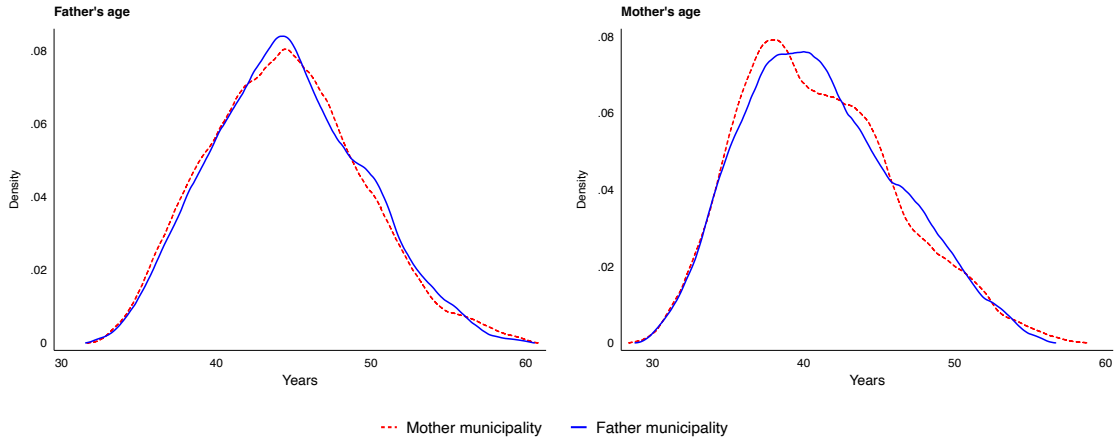
	Dep. var.: Food budget share					
	OLS	OLS	OLS	IV	IV	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Mother municipality	3.90**	3.89**	3.93**			
	(1.55)	(1.55)	(1.56)			
Mother's income share				0.24**	0.24**	0.24**
				(0.11)	(0.11)	(0.11)
Observations	847	847	847	847	847	847
Presence of father and mother	Yes	No	No	Yes	No	No
Interviewer's age	No	Yes	No	No	Yes	No
Interviewer's has university degree	No	No	Yes	No	No	Yes

Note. In columns (1)–(3), estimates based on OLS regressions (equation 1). In columns (4)–(6), estimates based on 2SLS regressions (equation 3). The dependent variable is the *food budget share*, defined as the ration between food expenditure and total household expenditure on non-durables. The mother's income share is instrumented using the Mother municipality indicator variable. Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. All specifications include region and stratum indicators, municipality and household controls. The full list of controls is presented in section 4.1. The sample is restricted to follow-up observations.

A.6 Baseline balance checks

Table 2 in the main text shows that, at baseline, our sample is balanced across treatment groups for a series of observable characteristics. We also perform non-parametric tests to check baseline balance. Figure A2 presents non-parametric distribution fit for both father's and mother's age. Kolmogorov-Smirnov tests cannot reject the equality of the distributions.

Figure A2: *Non-parametric distribution fit for father's and mother's age at baseline*

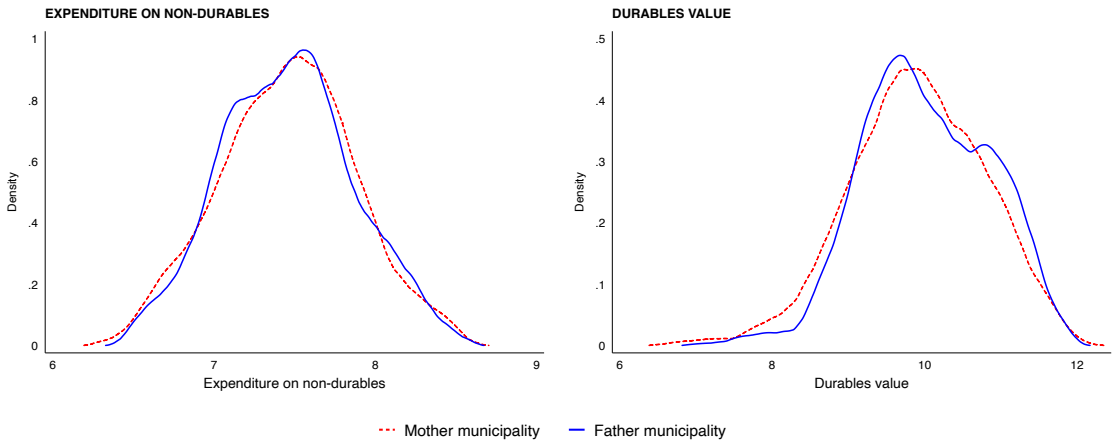


Note. The distribution fits are estimated non-parametrically using kernel density estimation assuming an Epanechnikov kernel function. Bandwidths are estimated by Silverman's rule of thumb (Silverman, 1986). The figure shows the comparison between Mother and Father municipalities for the father's age (left panel) and the mother's age (right panel). The sample is restricted to baseline observations.

Table A14 presents a comparison of total expenditure and durables, of expenditure shares, and of food budget shares at baseline. Columns (1)–(3) presents sample means and standard deviations by municipality group, while columns (4)–(6) estimate the difference between the two group of municipalities using different sets of controls. Total expenditure and wealth are both balanced at baseline. No statistically significant difference is observed at baseline across different treatment

arms. This is also true non-parametrically by comparing their distributions. Figure A3 presents the distributions of the total household (log) expenditure and of wealth for households living in Mother and Father municipalities. A K-S test for these variables cannot reject the equality of the distributions.

Figure A3: *Distribution fit for total household expenditure and durables value at baseline*



Note. The distribution fits are estimated non-parametrically using kernel density estimation assuming an Epanechnikov kernel function. Bandwidths are estimated by Silverman's rule of thumb (Silverman, 1986). The figure shows the comparison between Mother and Father municipalities at baseline for total household expenditure (left panel) and for the value of durables (right panel). *Expenditure on non-durables* is the total (real) household expenditure on non-durables (reported in logarithms). *Durables value* is the total value of durables owned by the household (reported in logarithms). The sample is restricted to baseline observations.

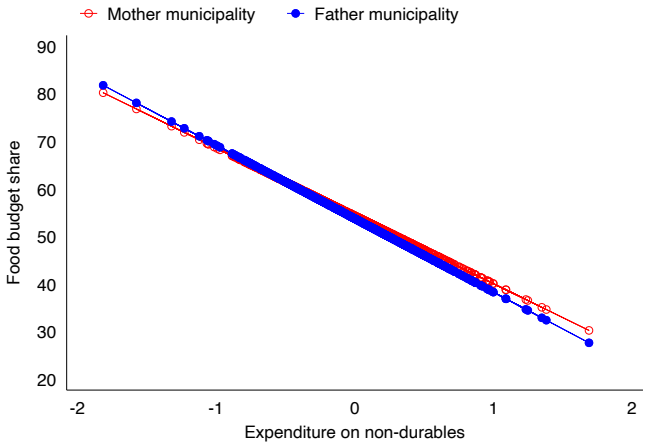
We extend checks related to baseline balance by estimating the Engel curve for food for each treatment modality at baseline (figure A4) and Engel curves for food items at baseline (figure A5). In both cases, estimated Engel curves are not different across treatment modality.

Table A14: *Expenditure on non-durables, budget shares and food budget shares, at baseline*

	Mean and standard deviation by municipality group			OLS difference [Mother - Father]		
Sub-sample:	All	Father	Mother	All	All	All
	(1)	(2)	(3)	(4)	(5)	(6)
Expenditure	7.46	7.46	7.45	0.01	0.01	0.01
	[0.44]	[0.43]	[0.46]	(0.04)	(0.05)	(0.04)
Durables value	9.90	9.92	9.88	-0.08	-0.08	-0.06
	[1.24]	[1.32]	[1.16]	(0.13)	(0.13)	(0.13)
Expenditure shares						
Food	55.70	55.30	56.09	0.32	0.27	0.11
	[14.21]	[14.16]	[14.26]	(1.50)	(1.46)	(1.43)
Tobacco and alcohol	3.22	3.15	3.30	-0.28	-0.28	-0.22
	[6.22]	[5.59]	[6.79]	(0.63)	(0.60)	(0.60)
Clothing	4.93	5.41	4.45	-0.22	-0.20	-0.19
	[4.41]	[4.74]	[4.01]	(0.44)	(0.43)	(0.43)
Education	4.19	3.91	4.47	0.47	0.44	0.50
	[6.64]	[6.68]	[6.59]	(0.66)	(0.65)	(0.60)
Health	12.93	13.52	12.36	-0.60	-0.55	-0.57
	[10.93]	[11.80]	[9.97]	(0.95)	(0.94)	(0.95)
Utilities and other expenses	19.02	18.72	19.32	0.32	0.32	0.36
	[9.15]	[9.41]	[8.88]	(1.06)	(1.03)	(1.03)
Food budget shares						
Starches	38.35	39.54	37.19	-2.30	-2.39	-2.60
	[16.70]	[15.50]	[17.75]	(2.05)	(2.02)	(1.94)
Meat, fish, and dairy	35.60	35.19	36.02	0.94	0.98	1.24
	[14.43]	[13.68]	[15.14]	(1.50)	(1.45)	(1.37)
Fruit and vegetables	12.46	11.99	12.92	0.89	0.90	0.84
	[8.61]	[7.97]	[9.18]	(0.98)	(0.98)	(0.97)
Salt and sugar	12.31	12.08	12.54	0.44	0.47	0.49
	[7.64]	[7.25]	[8.00]	(0.74)	(0.73)	(0.75)
Other food	0.06	0.09	0.02	-0.08	-0.08	-0.08
	[0.59]	[0.81]	[0.21]	(0.05)	(0.05)	(0.05)
Observations	756	375	381	756	756	756
Municipality controls	-	-	-	No	Yes	Yes
Demographic controls	-	-	-	No	No	Yes

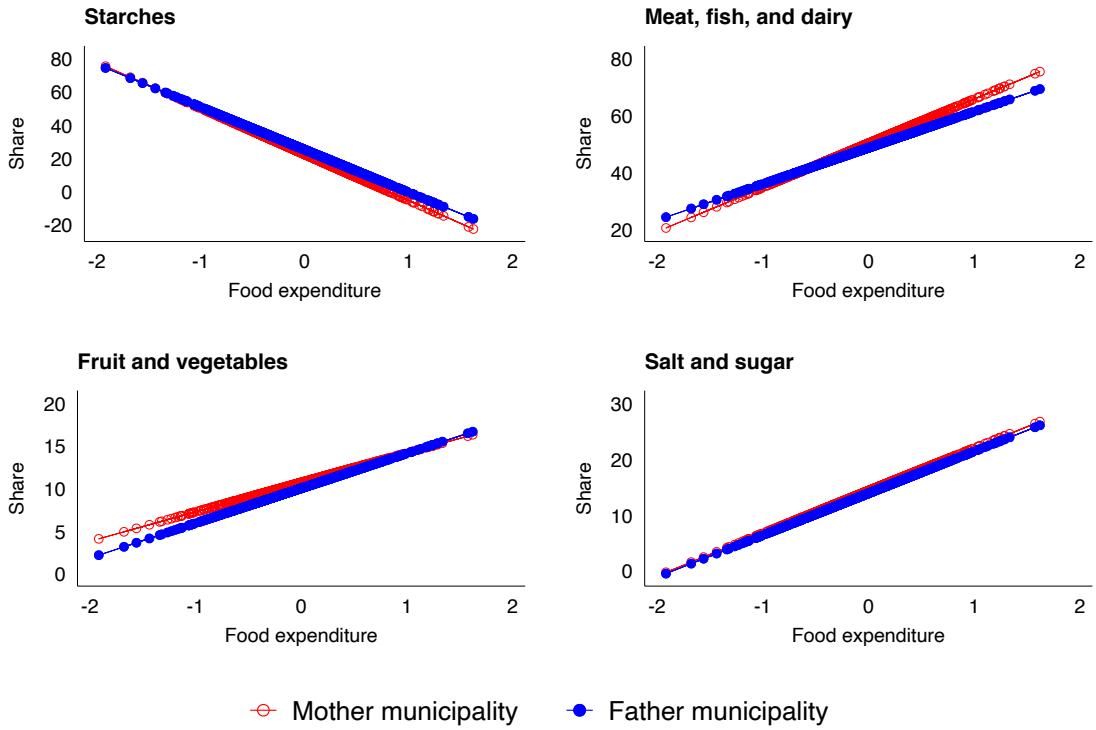
Note. Standard deviations are presented in brackets, and standard errors clustered at the municipality level are presented in parentheses (83 clusters in total). *Expenditure* is the total real household expenditure on non-durables (reported in logarithms). *Durables value* is the total value of durables owned by the household (reported in logarithms). *Budget shares* are defined as the ratio between expenditure on a specific category and total household expenditure on non-durables. *Food budget shares* are defined as the ratio between expenditure on a specific category and total food expenditure. Budget shares and food budget shares are multiplied by 100. Mother (Father) municipalities are municipalities in which the transfer is paid to the mother of the child (household head). In columns (4)–(6), differences are estimated using equation (1). *** denotes significance at 1%, ** at 5%, and * at 10%. All specifications include region and stratum indicators. The full list of controls is presented in section 4.1. The sample is restricted to baseline observations.

Figure A4: *Engel curves for food, at baseline*



Note. The figure presents the estimated Engel curve at baseline for food (holding other control variables constant at the average) for households living in Mother and in Father municipalities. *Expenditure on non-durabales* is the total (real) household expenditure on non-durables (reported in logarithms and demeaned).

Figure A5: *Engel curves for food categories, at baseline*

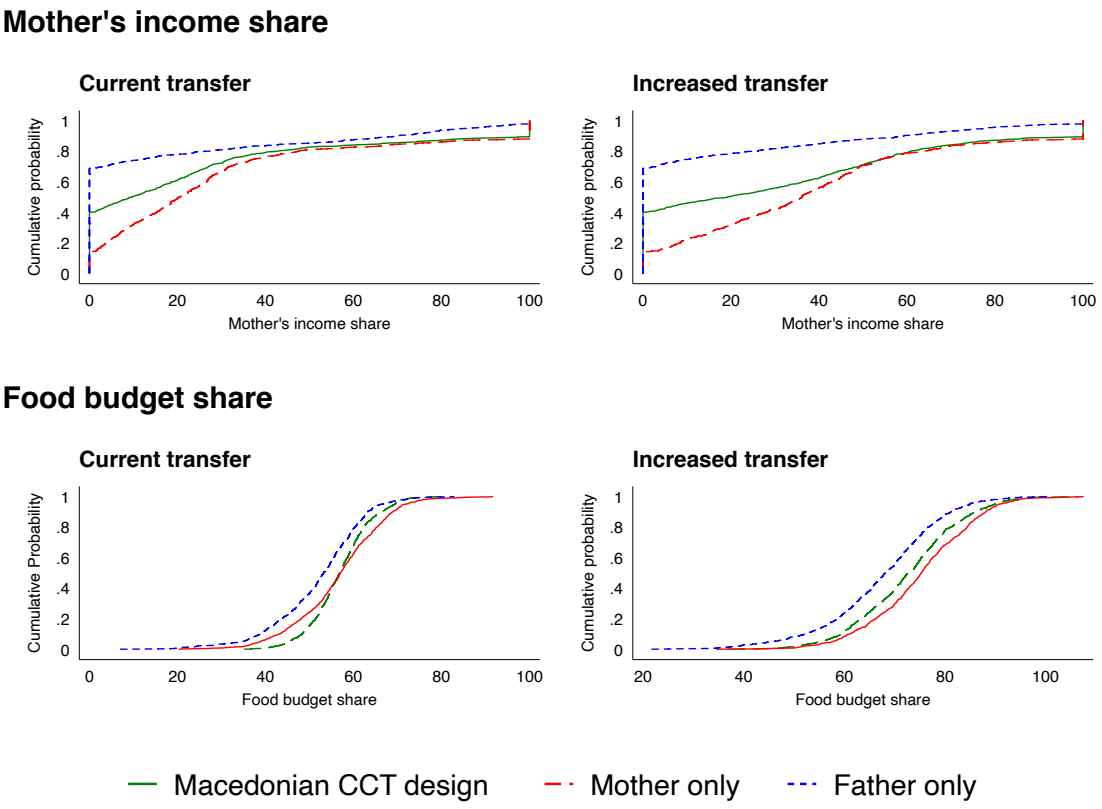


Note. The figure presents the estimated Engel curves at baseline for the different food categories (holding other control variables constant at the average) for households living in Mother and in Father municipalities. *Food expenditure* is the total (real) expenditure on food (reported in logarithms and demeaned). Food categories are defined in table 3.

A.7 Targeted transfers and alternative designs

We use Engel curve estimates for food to compare the current design of the Macedonian CCT (with payments to mothers or fathers), with counterfactual estimates of a design in which all transfers are paid to mothers (similar to most CCTs programs), and a design in which all transfers are paid to fathers. We then consider two levels of payments: the payment in the current design (*current transfer* scenario), and a transfer that is equal to 2.5 times the current transfer (*increased transfer* scenario). The upper panel in figure A6 presents the cumulative distributions of the mother's income share at follow-up under the different scenarios. For each scenario, at follow-up, we predict the cumulative distributions of food budget shares using estimates in column (3) of table 5 (see lower panel in figure A6). The difference in the mean food budget share between the "Mother only" and the "Father only" scenarios is equal to 5 percentage points with the current transfer, and 7 percentage points in the increased transfer.

Figure A6: *Cumulative distributions under different scenarios*

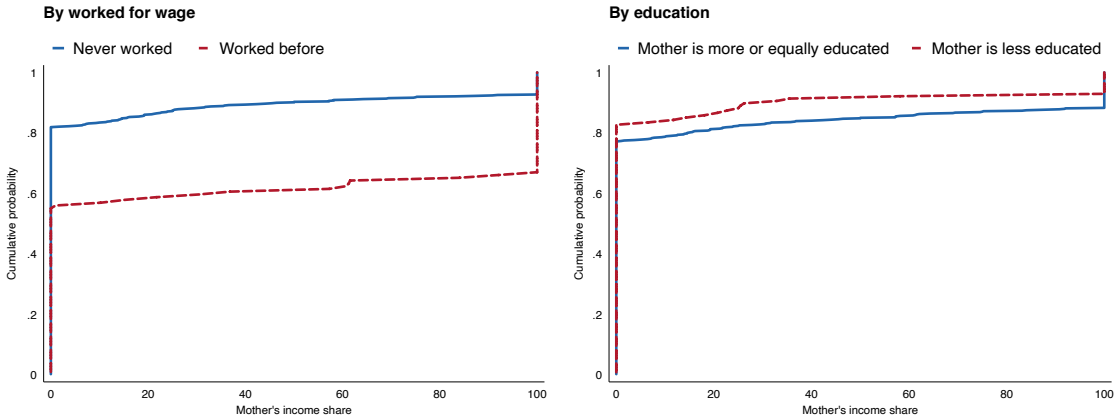


Note. The upper panel shows the cumulative distributions of the mother's income shares under different scenarios at follow-up. The *mother's income share* is defined as the share of total parental income that can be attributed to the woman in the household, and is multiplied by 100. Parental income is computed using all sources of income in the period 2010–2012 using both self-reported and administrative data (section 4.1). The lower panel shows the cumulative distribution of food budget share under different scenarios. CCT income is simulated according to the following rules. In the "mother only" scenario, all transfers are paid to mothers. In the "father only" scenario, all transfers are paid to fathers. In the "increased transfer" scenario, the transfer is multiplied by a factor of 2.5. Simulations are based on estimates presented in column 3 of table 5.

A.8 Income shares and control of household resources

At baseline, the distribution of income within households was not different among households living in the two types of municipalities (table 2). Figure A7 shows the cumulative distributions of the mother's income share at baseline, by whether the mother worked for wage before (left panel), and by education (right panel).

Figure A7: *Cumulative distributions of the mother's income share at baseline*



Note. The figures show the cumulative distribution of the mother's income share at baseline, by sub-samples according to work experience and education. Vertical axes report the share of observations in which the mother's income share is smaller or equal to the corresponding value. The *mother's income share* is the share of total parental income that can be attributed to the woman in the household, and is multiplied by 100. Parental income is computed using all sources of income self-reported at baseline.

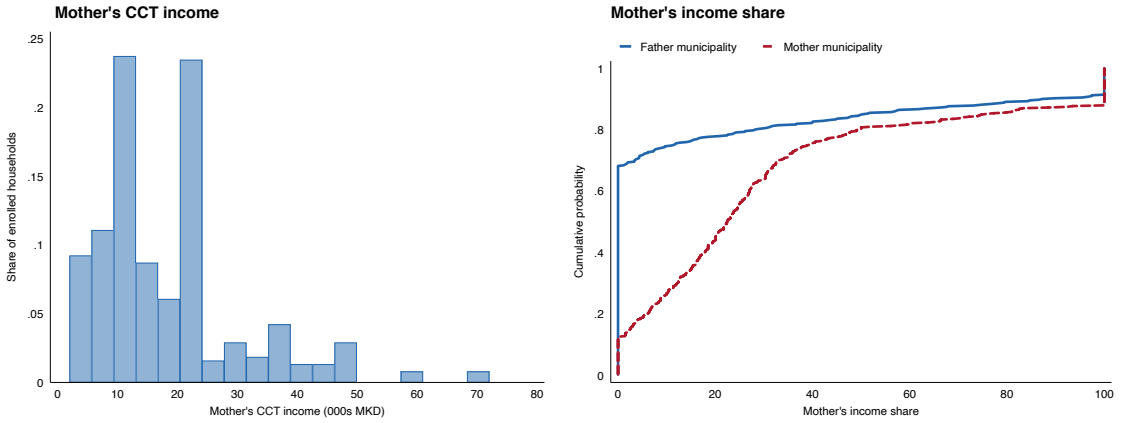
The left panel in figure A8 shows the distribution of the mother's CCT income restricting the sample to households in which at least one CCT transfer was received by the mother in the first two years of the program. The right panel shows the cumulative distribution of the mother's income share in Mother and Father municipalities at follow-up. While in Father municipalities, around 70% of households present a zero-share for the mother, in Mother municipalities, this percentage is reduced to around 10%. At follow-up, in households residing in Mother municipalities, the mother's income share is 17 percentage points higher than in households residing in Father municipalities (table A15). In addition, having a mother received at least one payment leads to an increase in mothers' income share by on average 21 percentage points.

To estimate the effect of income shares, we use the following specification:

$$w_{ij} = \beta_0 + \beta_1 \, share_{ij} + \mathbf{X}_i' \beta_2 + \mathbf{V}_j' \beta_3 + \epsilon_{ij} \tag{3}$$

where $\mathbf{X}_i$ is a vector of household characteristics, $\mathbf{V}_j$ is a vector of municipality characteristics, and ϵ_{ij} is an household-specific error term assumed to be clustered at the municipality level. We estimate equation (3) using 2SLS instrumenting the income share with the randomisation variable. In columns (1)–(2) of table A16 we present OLS estimates and estimates of equation (3) where the main source of variation is captured by the mother's income share. An increase of one standard deviation in the mother's income share leads to an increase in the food budget share of around 0.24

Figure A8: *Mother's CCT income and income share*



Note. The left panel shows the distribution of the CCT income transferred to a mother in the first two years of the program, restricting the sample to households in which at least one CCT transfer was received. The right panel shows the cumulative distribution of the mother's income share in Mother and Father municipalities at follow-up. Vertical axis reports the share of observations in which the mother's income share is smaller or equal to the corresponding value. The *mother's income share* is the share of total parental income that can be attributed to the woman in the household, and is multiplied by 100. Parental income is computed using all sources of income in the period 2010-2012 using both self-reported and administrative data (section 4.1).

Table A15: *Mother's income share, targeted and actual recipient of the transfer*

	Dep. var.: Mother's income share					
Estimation method:	OLS	OLS	OLS	IV	IV	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Mother municipality	16.74***	16.57***	17.02***			
	(2.54)	(2.51)	(2.42)			
Actual transfer to mother				22.04***	21.79***	21.01***
				(2.99)	(2.91)	(2.96)
Observations	852	852	852	852	852	852
Municipality controls	No	Yes	Yes	No	Yes	Yes
Demographic controls	No	No	Yes	No	No	Yes

Note. In columns (1)–(3), estimates based on OLS regressions (equation 1). In columns (4)–(6), estimates based on a linear regression with endogenous treatment effect. *Actual transfer to mother* is a dummy variable equal to 1 if a woman received at least one payment during the first two years of the program, and zero otherwise. It is instrumented with *Mother municipality*, a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise (the lower panel presents first-stage estimates). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variable is the *mother's income share*, defined as the share of total parental income that can be attributed to the woman in the household, and is multiplied by 100. All specifications include region and stratum indicators. The full list of controls is presented in section 4.2. The sample is restricted to follow-up observations.

percentage points. In columns (3)–(4), we present estimates using as main source of variation an indicator variable equal to 1 if, in the first two years of the program, at least one CCT transfer was received by the mother in household i, residing in municipality j, and zero otherwise. If the mother received at least one CCT payment the food budget share was higher by around 5.5 percentage points relatively to households where the mother received no CCT payments. Finally, in columns (5)–(6), we present estimates using as main source of variation the CCT income transferred to the mother in the first two years of the program (reported in 000s MKD). An increase by 1,000 MKD in the total transfer to the mother leads to an increase in the food budget share by 0.31 percentage points.

Table A17 presents a comparison between ITT estimates of the program's impact on budget

Table A16: *Transfer to mothers and the food budget share*

	Dep. var.: Food budget share					
Estimation method:	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Mother's income share	-0.01	0.24**				
	(0.02)	(0.11)				
Actual transfer to mother			1.02	5.54**		
			(1.30)	(2.27)		
Mother's CCT income					0.00	0.31**
					(0.06)	(0.13)
Observations	847	847	847	847	847	847
F-test for excluded instrument	.	42.65	.	602.81	.	192.25

Note. In columns (1), (3) and (5), estimates based on OLS regressions (equation 1). In columns (2), (4) and (6), estimates based on 2SLS regressions (equation 3). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variable is the *food budget share*, defined as the ratio between the expenditure on food and the total household expenditure. *Mother's income share* is the share (multiplied by 100) of total parental income that can be attributed to the woman in the household. *Actual transfer to mother* is a dummy variable equal to 1 if a woman received at least one payment during the first two years of the program, and zero otherwise. *Mother's CCT income* is the total transfer received by a mother during the first two years of the program (reported in thousands MKD). Endogenous variables are instrumented with *Mother municipality*, a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. First stage estimates are presented in table B1. All specifications include the region and stratum indicators. The full list of controls is presented in section 4.1. The sample is restricted to follow-up observations.

shares and food budget shares with IV estimates that take into account the take-up of the program. Column 1 presents ITT estimates using equation (1). Column (2)–(3) present IV estimates using equation (3). The main source of variation is given by the actual transfer to a mother and by the mother's income share, respectively.

Table A17: *Comparison of OLS and IV estimates of program's impact*

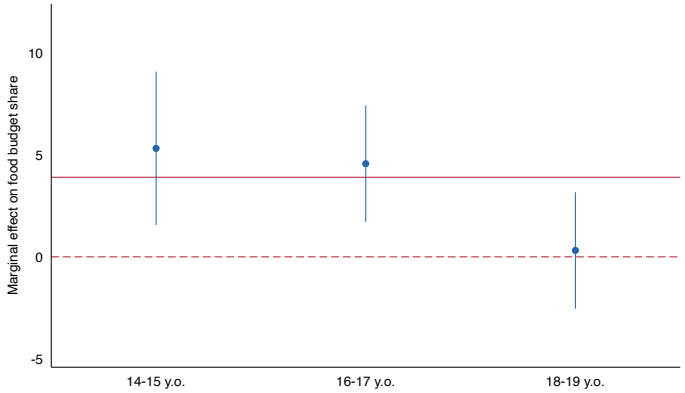
Coefficient reported in column:	Mother municipality	Actual transfer to a mother	Mother's income share
Estimation method:	OLS	2SLS	2SLS
	(1)	(2)	(3)
Expenditure shares			
Food	3.91**	5.54**	0.24**
	(1.55)	(2.32)	(0.11)
Tobacco and alcohol	-0.87	-1.23	-0.05
	(0.54)	(0.76)	(0.03)
Clothing	-0.59	-0.83	-0.04
	(0.44)	(0.63)	(0.03)
Education	0.51	0.72	0.03
	(0.51)	(0.72)	(0.03)
Health	-1.48	-2.10	-0.09
	(0.89)	(1.30)	(0.06)
Utilities and other expenses	-1.48	-2.10	-0.09
	(1.13)	(1.63)	(0.07)
Food budget shares			
Starches	0.32	0.45	0.02
	(1.80)	(2.57)	(0.11)
Meat, fish, and dairy	-0.50	-0.71	-0.03
	(1.56)	(2.22)	(0.10)
Fruit and vegetables	1.01	1.43	0.06
	(0.77)	(1.09)	(0.05)
Salt and sugar	-0.88	-1.25	-0.05
	(0.71)	(1.02)	(0.04)
Other food	0.06	0.08	0.00
	(0.04)	(0.05)	(0.00)
Observations	847	847	847

Note. In column (1), estimates based on OLS regressions (equation 1). In columns (2)–(3), estimates based on 2SLS regressions (equation 3) instrumenting endogenous variables with the Mother municipality dummy. *Actual transfer to mother* is a dummy variable equal to 1 if a woman received at least one payment during the first two years of the program, and zero otherwise. "Mother's income share" is the share (multiplied by 100) of total parental income that can be attributed to the woman in the household. Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variables are reported in column. *Expenditure shares* are the ratio between expenditure on a specific category and total household expenditure on non-durables. *Food budget shares* are the ratio between expenditure on a specific category and total food expenditure. Budget shares ad food budget shares are multiplied by 100. All specifications include region and stratum indicators, municipality and demographic controls. The full list of controls is presented in section 4.1. The sample is restricted to follow-up observations.

A.9 Heterogeneity by age of children

To capture heterogeneity with respect to the age of children present in the household, we estimate equation (1) interacting the Mother municipality indicator with dummy variables for the presence in the household of children in the age groups 13-14, 15-16, and 17-19. Marginal effects are presented in figure A9. The main effect of targeting on the food budget share is driven by households with younger children.

Figure A9: *Marginal effects of targeting on food budget shares, by age of children*



Note. The figure shows marginal effects computed by estimating equation (1) interacting the Mother municipality indicator with dummy variables for the presence in the household of children in the age groups 13-14, 15-16, and 17-19. Standard errors are clustered at the municipality level. Confidence intervals are built using a 90% significance level. The dashed line indicates the value zero, the solid line represents the OLS estimate using the whole sample (table 4). The sample is restricted to follow-up observations.

A.10 Heterogeneity by female empowerment and family values

We focus on available household-level indicators that have been used in the literature to proxy for the intra-household distribution of power between partners: the age and education difference between husbands and wives (see, e.g., Browning et al., 1994), and the extent of relative family networks (Attanasio and Lechene, 2014). Age and education differences are measured by subtracting the mother's age and years of schooling from the father's age and years of schooling. Family networks are computed, for both mothers and fathers, using the total number of parents, brothers, sisters, uncles, and aunts living in the same municipality. The relative share of relatives is used as a measure of family network. We also proxy for family values by looking at whether the mother has never worked for wage in her whole life (see, e.g., Alesina et al., 2013). Table A18 presents baseline estimates of OLS regressions of the mother's income share on these variables.

Figure A10 presents estimates of the impact of targeted payments on the food budget share in different sub-samples. In the left panel, the effect is the ITT impact, estimated using equation (1), while in the right panel, we present the effect of the mother's income share, estimated using equation (3). For each variable, the sample is split in two sub-groups, and the impact on the food budget share is estimated separately. The solid lines represent the estimates using the whole sample. We cannot statistically confirm that the coefficients are different among each of the two sub-groups.

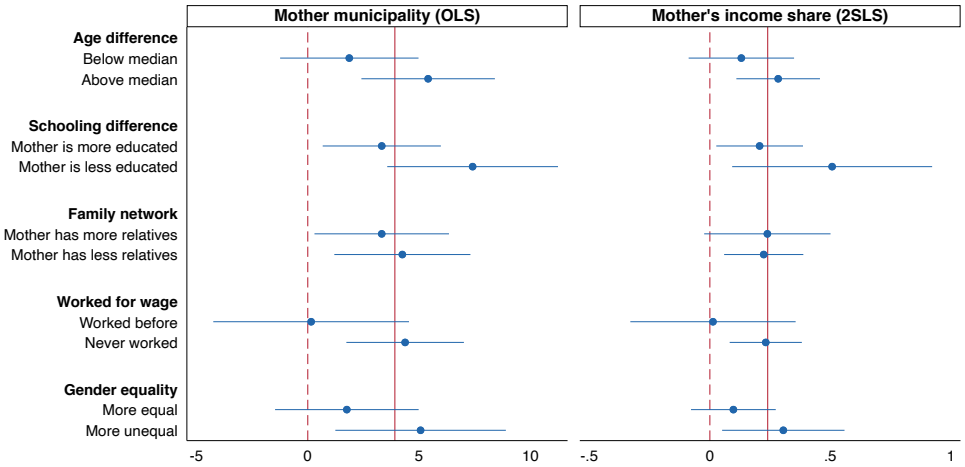
Table A18: *Determinants of mothers' income shares*

	Dep. var.: Mother's income share					
	(1)	(2)	(3)	(4)	(5)	(6)
Age difference	-0.16					-0.10
	(0.38)					(0.35)
Schooling difference		-0.72*				-0.36
		(0.40)				(0.39)
Father's share of relatives			-11.65**			-9.43**
			(4.63)			(4.66)
Mother never worked for wage				-26.10***		-24.96***
				(4.32)		(4.34)
Gender Equality (low)					-7.37	-7.65
					(5.80)	(5.96)
Observations	766	764	763	766	766	761
R^2	0.087	0.092	0.098	0.149	0.088	0.161

Note. Estimates based on OLS regressions (equation 1). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variable is the *mother's income share*, defined as the share of total parental income that can be attributed to the woman in the household. Differences are defined as the measure for the father minus the value for the mother. All specifications include region and stratum indicators, municipality and household controls. The full list of controls is presented in section 4.1. The sample is restricted to follow-up observations.

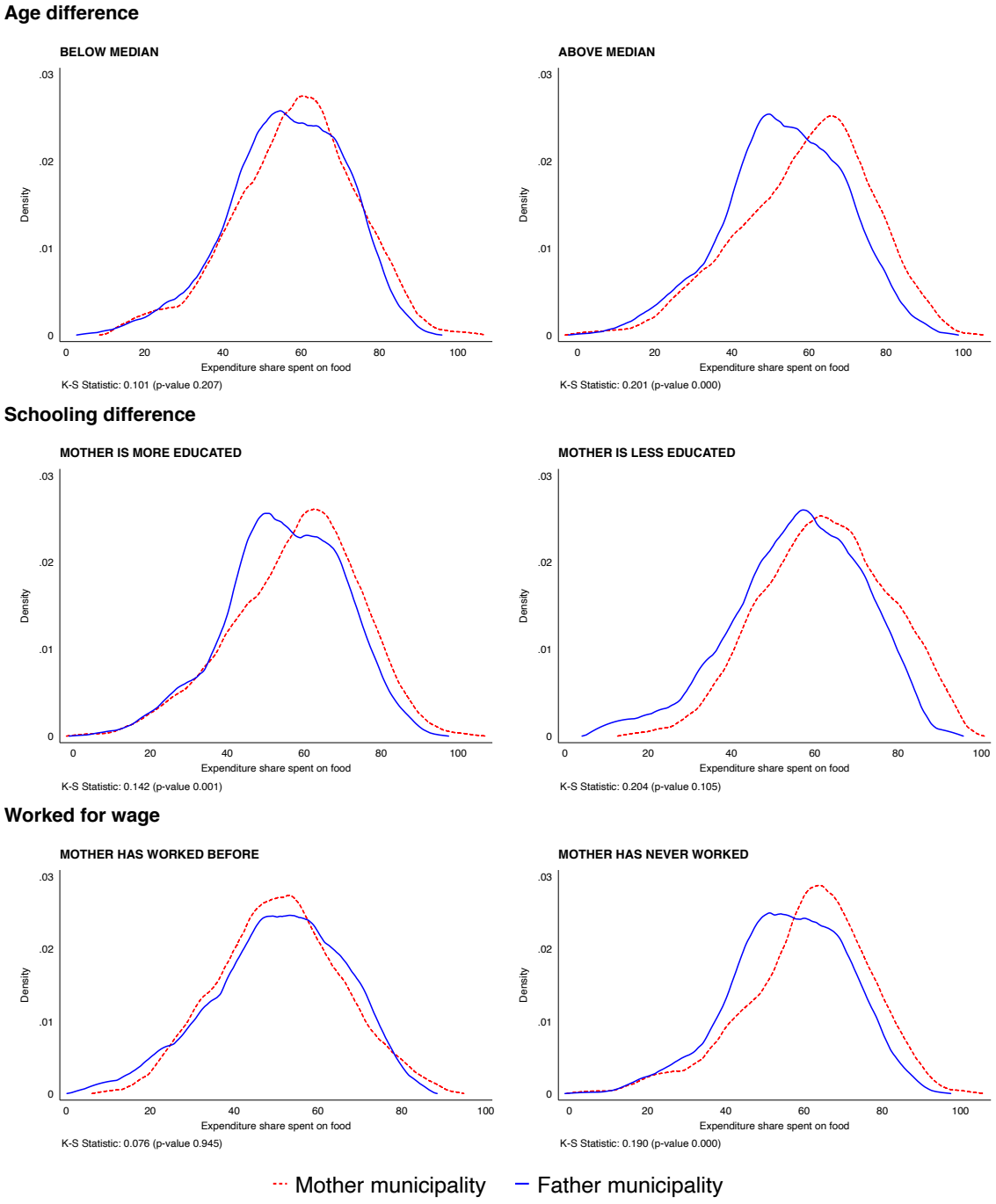
However, most of the estimates are significantly positive in the groups that are related to lower control of the household resources for the mother, such as being younger or less educated than the father, having smaller family networks, and having never worked for wage. On the contrary, for most of the outcomes, we cannot reject the null hypothesis of a zero effect for the sub-groups that proxy higher control of resources. Non-parametric evidence leads to similar conclusions (figure A11).

Figure A10: *Heterogeneous effects of targeted payments on the food budget share*



Note. The figure plots marginal effects of residing in a Mother municipality (left panel) and of the mother's income shares (right panel) on the food budget share. In the left panel, marginal effect are estimated using OLS regressions (equation 1). In the right panel, marginal effect are estimated using 2SLS regressions (equation 3). Each coefficient is computed in separate regressions in which the sample is restricted to the categories reported in the left column. Standard errors are clustered at the municipality level. Confidence intervals are built using a 90% significance level. The dashed lines indicate the value zero, the solid lines represent the OLS and 2SLS estimates using the whole sample (tables 4 and A16).

Figure A11: *Non-parametric heterogeneous treatment effects of targeting on food budget shares*

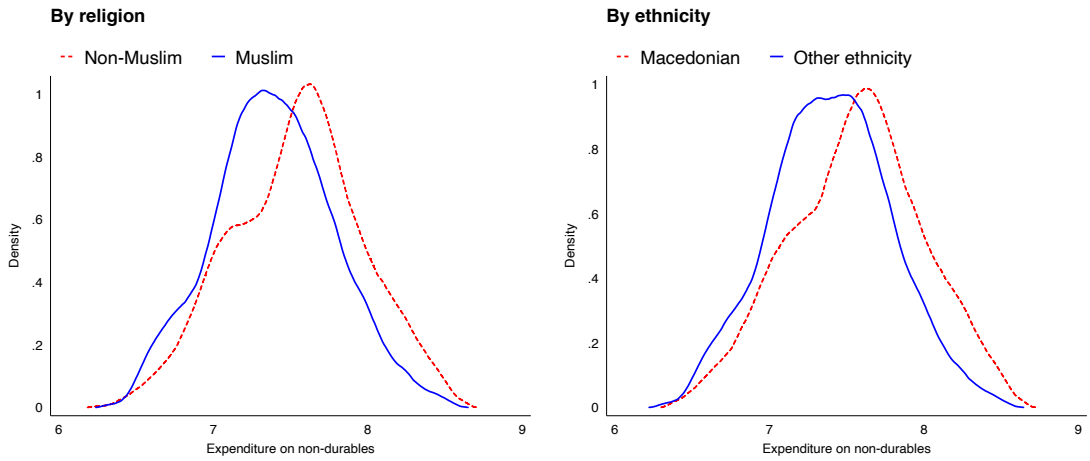


Note. The distribution fits are estimated non-parametrically using kernel density estimation assuming an Epanechnikov kernel function. Bandwidths are estimated by Silverman's rule of thumb (Silverman, 1986). Each figure shows the comparison between Mother and Father municipalities. Differences are defined as the measure for the husband minus the same for the wife. Two-sample K-S test statistics and p-values are presented at the bottom of each figure. The sample is restricted to follow-up observations.

A.11 Heterogeneity by religion and ethnicity

In North Macedonia, the most common *religion* is Orthodox Christianity, followed by Islam. In the sample, around 55% of households are Muslim. While Muslim and non-Muslim households are comparable on most observable characteristics, Muslim households are in general less educated (mothers have on average 6 years of education compared to 8 for non-Muslim and fathers have 8 years of schooling in both groups) and family size is larger (4 members versus 5). In terms of *ethnicity*, the sample is represented by 4 main ethnic groups: Macedonian (36%), Albanian (34%), Turk (11%), and Roma (14%). A remaining 5% is represented by other ethnic groups. Ethnicity and religion are closely related, with Orthodox Christianity being practised mainly by ethnic Macedonians, and Islam being practised mainly by ethnic Albanians, and Turks. We group individuals in two ethnic groups: one representing Macedonians and one grouping other ethnic groups. Note that among Macedonians, only 2% is Muslim, while among other ethnicities 85% is Muslim. In terms of total household expenditure, non-Muslim, and Macedonian households are spending significantly more at baseline, suggesting these groups represent the richer share of the sample (figure A12).

Figure A12: *Total household expenditure at baseline, by religion and ethnicity*

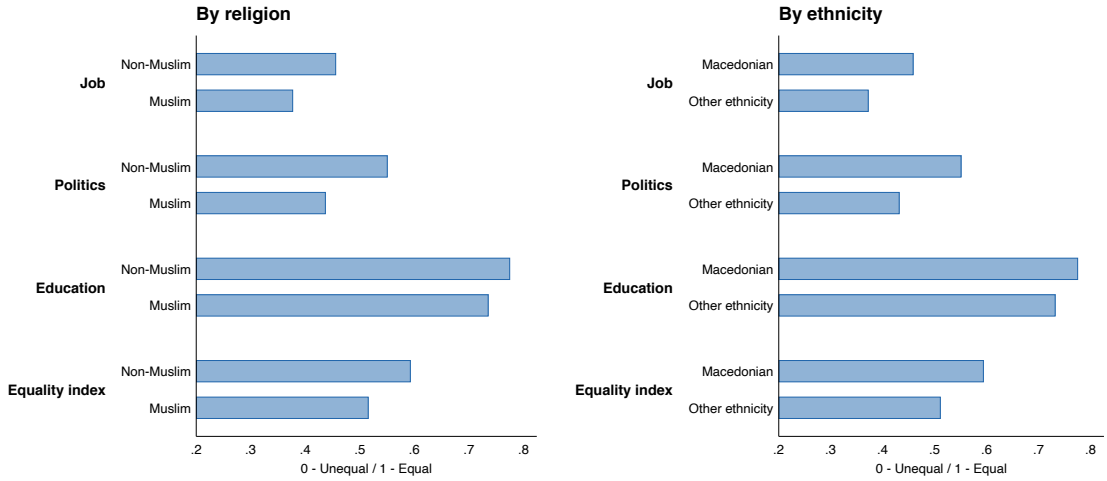


Note. The figure shows the baseline comparison of total household expenditure between non-Muslim and Muslim households (left panel), and between households of Macedonian ethnicity and other ethnicities (right panel). The distribution fits are estimated non-parametrically using kernel density estimation assuming an Epanechnikov kernel function. Bandwidths are estimated by Silverman's rule of thumb (Silverman, 1986). Sample is restricted to baseline observations. *Expenditure* is the total (real) household expenditure on non-durables (reported in logarithms).

Using the Wave 4 of the World Value Survey (Inglehart et al., 2014) for North Macedonia, we can explain how gender equality values differ among different religions and ethnic groups. Figure A13 presents average indicators for gender equality by religion and ethnicity. We focus on equality in the labour market, in politics and in education. We also include an Equality Index that is summarizing these three dimensions. It is straightforward to notice that non-Muslim and Macedonian households are characterized by more gender-equal values as compared to other ethnic groups and

Muslim households.

Figure A13: *Gender equality values in North Macedonia*



Note. The figures report averages for each variable by sub-groups. The left panel compares non-Muslim versus Muslim households, while the right panel compares the Macedonian ethnic group versus other ethnic groups (Albanians, Turks, Roma, and others). Data are obtained from the Wave 4 of the World Values Survey (Inglehart et al., 2014). *Job* refers to the question "When jobs are scarce, men should have more right to a job than women". *Politics* refers to the following question: "On the whole, men make better political leaders than women do". *Education* refers to the following statement: "A university education is more important for a boy than for a girl". *Equality index* is an index averaging the other three indicators.

Table A19 presents estimates of the effect of targeting payments to mothers on expenditure on non-durables, expenditure shares and on food budget shares, by different dimensions of heterogeneity. Columns (1)–(3) refer to religion, while columns (4)–(6) refer to ethnicity. Columns (1)–(2) and (4)–(5) present estimates of the effect of targeting mothers on the different outcome variables using equation (1) and restricting the sample to different sub-groups (non-Muslim, Muslim, Macedonian, and other ethnicity). Columns (3) and (6) present the p-value of a test of differential effect among the two sub-groups considered for religion and ethnicity. The test is performed by estimating equation (1) using the full sample and interacting the Mother municipality dummy with an indicator variable for Muslim religion (column 3) and alternatively with an indicator variable for other ethnicity (column 6). The p-value refers to a test of equality to zero of the coefficient on the interaction term. For Muslim households and households of other ethnicities, we observe a positive significant effect on the expenditure share on food, and a negative effect on the expenditure share on tobacco and alcohol. For non-Muslim and Macedonian households, we observe a negative effect on the expenditure share on health.

Table A19: *Heterogeneous treatment effect by religion and ethnicity*

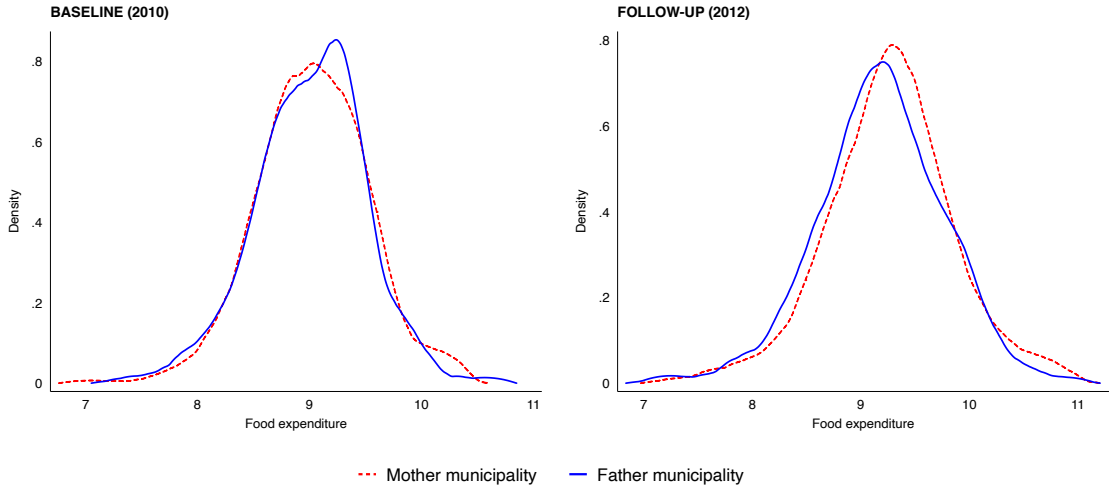
	Heterogeneity by religion			**Heterogeneity by ethnicity**		
	Sub-sample		Test of	*Sub-sample*		Test of
	Non-Muslim	Muslim	differential impact (p-value)	Macedonian	Other ethnicity	differential impact (p-value)
	(1)	(2)	(3)	(4)	(5)	(6)
Expenditure	0.04	-0.03	0.57	0.09	-0.04	0.32
	(0.09)	(0.07)		(0.08)	(0.07)	
Durables value	0.04	-0.00	0.55	0.13	-0.02	0.38
	(0.17)	(0.10)		(0.18)	(0.10)	
Expenditure shares						
Food	2.44	3.87*	0.52	2.07	3.97*	0.49
	(1.71)	(1.99)		(1.64)	(2.05)	
Tobacco and alcohol	0.36	-1.31*	0.46	0.58	-1.40**	0.35
	(0.77)	(0.67)		(0.78)	(0.64)	
Clothing	-0.64	-0.48	0.94	-0.69	-0.47	0.95
	(0.51)	(0.59)		(0.53)	(0.59)	
Education	0.75	0.08	0.14	0.77	0.15	0.18
	(0.77)	(0.61)		(0.78)	(0.62)	
Health	-2.27*	-0.65	0.14	-2.54**	-0.57	0.08
	(1.21)	(1.19)		(1.17)	(1.16)	
Utilities and other expenses	-0.64	-1.50	0.33	-0.18	-1.68	0.20
	(1.54)	(1.30)		(1.48)	(1.33)	
Food budget shares						
Starches	-3.53	2.92*	0.07	-3.85	3.10*	0.05
	(2.51)	(1.69)		(2.40)	(1.73)	
Meat, fish, and dairy	3.21	-3.30*	0.05	4.00*	-3.53**	0.03
	(2.33)	(1.70)		(2.29)	(1.73)	
Fruit and vegetables	2.43	0.66	0.46	1.67	0.84	0.83
	(1.70)	(0.75)		(1.62)	(0.75)	
Salt and sugar	-2.85**	-0.19	0.08	-2.65**	-0.17	0.14
	(1.16)	(0.90)		(1.21)	(0.89)	
Other food	0.12	-0.01	0.10	0.12	-0.01	0.09
	(0.07)	(0.02)		(0.08)	(0.02)	

Note. Columns (1)–(2) and (4)–(5) present estimates of the effect of targeting mothers on the different outcome variables using OLS regressions (equation 1) restricting the sample to different sub-samples, and restricting the sample to follow-up observations. Columns (3) and (6) present the p-value of a test of differential effect among the two sub-groups considered for religion and ethnicity. The test is performed by estimating equation (1) using the full sample at follow-up and interacting the Mother municipality dummy (equal to 1 if the transfer is made to mothers, and zero otherwise) with an indicator variable for Muslim religion (column 3), and alternatively with an indicator variable for other ethnicity (column 6). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. *Expenditure* is the total real household expenditure on non-durables (reported in logarithms). *Durables value* is the total value of durables owned by the household (reported in logarithms). *Budget shares* are defined as the ratio between expenditure on a specific category and total household expenditure on non-durables. *Food budget shares* are defined as the ratio between expenditure on a specific category and total food expenditure. *Budget shares* and *food budget shares* are multiplied by 100. Total expenditure is reported in real terms and computed in logarithms. All specifications include the full list of controls presented in section 4.1, excluding ethnicity controls.

A.12 Analysis of expenditures in levels

Figure A14 presents the kernel density for food expenditure at baseline and follow-up in Mother and Father municipalities. At baseline, we cannot reject the null of equality using a two-sample K-S test. At follow-up, the distribution of food expenditure for Mother municipalities is entirely shifted to the right relative to the distribution in Father municipalities. A K-S test rejects the null of equality of the distributions in the two samples.

Figure A14: *Non-parametric distribution fit for food expenditure*



Note. The distribution fits are estimated non-parametrically using kernel density estimation assuming an Epanechnikov kernel function. Bandwidths are estimated by Silverman's rule of thumb (Silverman, 1986). The left (right) panel shows the comparison between Mother and Father municipalities at baseline (follow-up). *Food expenditure* is the total (real) expenditure on food items (reported in logarithms and demeaned). A two-sample K-S test statistic is equal to 0.05 (p-value 0.67) at baseline, and to 0.10 (p-value 0.02) at follow-up.

Table A20 presents an analysis similar to table 4 in the main text, but instead of using expenditure shares (as standard in the literature), outcome variables are define in log-levels (we add a unit to the expenditure to accommodate for zero expenditures). Columns (1)–(2) present means and standard deviations at follow-up, while columns (3)–(5) present differences between Mother and Father municipalities estimated using OLS regressions accounting for different sets of control variables.

Table A20: *Expenditure on goods and food items*

	Mean and standard deviation by municipality group		**OLS Difference [Mother - Father]**		
Sub-sample:	Father	Mother	All	All	All
	(1)	(2)	(3)	(4)	(5)
Log expenditure					
Food	9.15	9.26	0.08	0.08	0.12^{+}
	[0.66]	[0.63]	(0.08)	(0.08)	(0.07)
Tobacco and alcohol	3.32	2.59	-0.66^{+}	-0.65^{+}	-0.55
	[3.81]	[3.56]	(0.43)	(0.42)	(0.40)
Clothing	5.66	5.11	-0.45*	-0.46*	-0.31
	[2.77]	[3.07]	(0.26)	(0.27)	(0.24)
Education	5.48	5.41	-0.23	-0.23	-0.10
	[2.25]	[2.59]	(0.28)	(0.29)	(0.25)
Health	7.01	7.03	-0.12	-0.12	-0.09
	[1.54]	[1.49]	(0.13)	(0.13)	(0.13)
Utilities and other expenses	8.11	8.02	-0.13^{+}	-0.14^{+}	-0.09
	[0.67]	[1.14]	(0.08)	(0.08)	(0.06)
Log expenditure on food items					
Starches	7.92	8.08	0.13	0.13	0.16*
	[1.05]	[0.83]	(0.10)	(0.09)	(0.09)
Meat, fish, and dairy	7.94	8.04	0.09	0.09	0.14
	[1.30]	[1.16]	(0.15)	(0.15)	(0.14)
Fruit and vegetables	6.58	6.95	0.34*	0.34*	0.39**
	[2.15]	[1.76]	(0.19)	(0.18)	(0.18)
Salt and sugar	6.85	6.90	-0.01	0.01	0.04
	[1.49]	[1.58]	(0.17)	(0.16)	(0.16)
Other food	0.02	0.09	0.05	0.06	0.07^{+}
	[0.33]	[0.80]	(0.04)	(0.04)	(0.04)
Observations	418	427	845	845	845
Municipality controls	-	-	No	Yes	Yes
Demographic controls	-	-	No	No	Yes

Note. Standard deviations in brackets, standard errors clustered at the municipality level in parentheses (83 clusters in total). *Log expenditure* and *log expenditure on food items* are defined as the logarithms of the expenditure on the corresponding category, plus one unit to accommodate for zero expenditures. Mother (Father) municipalities are municipalities in which the transfer is paid to the mother of the child (household head). In columns (3)–(5) differences are estimated using equation (1). *** denotes significance at 1%, ** at 5%, * at 10%, and + at 15%. All specifications include region and stratum indicators. The full list of controls is presented in section 4.1. Sample is restricted to follow-up observations.

A.13 Schooling-labour substitutability among children

To check whether the CCT induces differential effects related to within-household labour substitutability, we present estimates of the effect of residing in a Mother municipality by distinguishing households by the gender composition of children of secondary school age. We highlight three groups of households: with male children only, households with female children only, and household with both male and female children. Columns (1)–(3) and (5)–(7) in table A21 present estimates of the effect of residing in a Mother municipality on on the CCT income and on the food budget share by estimating equation (1) separately for each sub-sample. To test for differences in the effect among different sub-samples, we estimate equation (1) using the full sample, and introducing interaction terms between the Mother municipality indicator variable and indicator variables for the corresponding group (the omitted variable is the indicator for whether the household has both male and female children). Results are presented in columns (4) and (8). P-values are reported at the bottom of the table. When we examine impacts of targeting mothers by type of household, standard errors become quite large, and we cannot distinguish that these impacts vary across groups. When jointly testing for differences in the ITT effects among these groups, we cannot reject the null hypothesis of equality at 90% of confidence. We only reject equality of the effect of targeting mothers on the CCT income among households with only male or with only female children at 85% of confidence. Looking at the point estimates, CCT income and the food budget share are significantly larger in Mother municipalities if we restrict the sample to households with only male children. We find no statistically significant difference between Mother and Father municipalities when restricting the sample to households with female children only or both male and female children. Note that the experiment was not designed to have sufficient statistical power to perform analysis with three sub-groups in addition to the two treatment arms.

We also examine heterogeneity by gender of the child in impacts of targeting mothers on school-aged child-level outcomes related to school and labour participation (table A22). We focus on the following outcomes. Concerning schooling and the CCT program, we focus on secondary school enrolment, CCT enrolment, attendance, and the CCT transfer. These variables are available for the first two years of the CCT program, we thus estimate the effect of targeting mothers by pooling the data for both years and by introducing a school-year indicator variable. Concerning labour supply, we focus instead on whether the child did house chores, and whether the child worked for salary. These variables are available only for the follow-up period. Secondary school enrolment and labour supply variables are obtained from the household survey and are self-reported by the respondent. The other variables are obtained from the CCT administrative data. Panel A presents estimates for all children, while panel B and C focus on boys and girls separately. To test for the difference in the effect between boys and girls, we estimate the effect using the full sample and introducing an interaction term between the Mother municipality indicator variable and an indicator variable for the gender of the child. We test the equality of the effect by gender by testing the null hypothesis that the interaction term is equal to zero (p-values are presented in table A22).

Similar to table A21, performing analysis at sub-group level increases standard errors, and for

Table A21: *Effect on the CCT transfer and the food budget share, by gender of children*

Dep. var.:	**CCT income (000s MKD)**				**Food budget share**			
Sub-sample:	Only male children	Only female children	Both children	All	Only male children	Only female children	Both children	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother municipality	1.577**	-0.433	0.901	0.583	5.838***	2.480	3.489	3.304
	(0.651)	(0.924)	(1.067)	(1.093)	(1.767)	(2.416)	(2.576)	(2.667)
* only male children				0.870				1.954
				(1.285)				(2.909)
* only female children				-0.950				-0.656
				(1.427)				(2.893)
Only male children				-0.871				-2.197
				(0.957)				(2.114)
Only female children				0.406				-1.226
				(1.062)				(2.011)
Observations	322	296	229	847	322	296	229	847
R^2	0.152	0.110	0.139	0.111	0.229	0.150	0.274	0.167
Equality of ITT (p-values):								
Both = only male	.	.	.	0.901	.	.	.	0.799
Both = only female	.	.	.	0.522	.	.	.	0.439
Only male = only female	.	.	.	0.101	.	.	.	0.302

Note. Estimates based on OLS regressions (equation 1). Sub-samples used for the estimation are reported in the column's header. Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. All specifications include region indicators, stratum indicators, and municipality and demographic controls. The full list of controls is presented in section 4.1. In columns (1)–(4), the dependent variable is the *CCT income*, defined as the total transfer received by the household in the first two years of the program (reported in thousands MKD). In columns (5)–(8), the dependent variable is the *food budget share*, defined as the ratio between the expenditure on food and the total household expenditure. *Mother municipality* is a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. *Only male (female) children* is an indicator variable equal to 1 if the household is composed only by male (female) children within the age-group targeted by the CCT program. The excluded category is *Both children*, in which households have both male and female children within the age-group targeted by the CCT program. The test of equality of ITT is performed using Wald tests for the equality of the treatment effects for the corresponding categories. The sample is restricted to follow-up observations.

most outcomes we cannot reject the null hypothesis of equality of the effect of targeting mothers between boys and girls, one exception being CCT enrolment. We find no significant effect of targeting mothers on secondary school enrolment. Among children enrolled in secondary school, we observe a significant effect on CCT enrolment only among boys, while there is no statistically significant effect on attendance. The difference in the CCT enrolment translates into a higher CCT transfer among boys living in a Mother municipality. These results explain the patterns observed in table A21. However, this result is not explained by changes in school monitoring or in CCT awareness when mothers are targeted by the program (appendices A.14 and A.16). Finally, in terms of labour supply, we observe no statistically significant effect of targeting mothers.

Table A22: *Schooling, CCT enrolment and labour supply among chidren in secondary school age*

	SCHOOLING AND THE CCT PROGRAM				LABOUR SUPPLY	
Dep. var.:	**Secondary school enrolment**	**CCT enrolment**	**Attendance**	**CCT transfer**	**Did house chores**	**Worked**
	(1)	(2)	(3)	(4)	(5)	(6)
A. All children						
Mother municipality	0.027	0.041	0.004	0.372	-0.030	0.000
	(0.024)	(0.030)	(0.005)	(0.278)	(0.052)	(0.006)
Observations	2601	1707	1241	1270	1302	1304
R^2	0.115	0.135	0.069	0.126	0.059	0.024
Mean dep.var. (Father mun.)	0.645	0.744	0.951	8.998	0.470	0.012
B. Boys						
Mother municipality	0.026	0.082*	0.005	0.786**	-0.024	-0.006
	(0.032)	(0.042)	(0.006)	(0.325)	(0.064)	(0.011)
Observations	1280	865	623	637	646	646
R^2	0.125	0.147	0.056	0.167	0.091	0.057
Mean dep.var. (Father mun.)	0.668	0.736	0.948	8.932	0.415	0.023
C. Girls						
Mother municipality	0.034	-0.002	0.004	0.061	-0.022	0.002
	(0.039)	(0.035)	(0.007)	(0.383)	(0.056)	(0.003)
Observations	1321	842	618	633	656	658
R^2	0.124	0.151	0.171	0.146	0.070	0.031
Mean dep.var. (Father mun.)	0.625	0.752	0.954	9.063	0.519	0.003
none						
Equality of ITT (p-values):						
Boys = girls	0.943	0.032	0.985	0.145	0.956	0.329
Sample restrictions:						
Enrolled in sec. school	-	Yes	Yes	Yes	-	-
Enrolled in CCT program	-	-	Yes	Yes	-	-
Data source:	Survey	Admin.	Admin.	Admin.	Survey	Survey

Note. Estimates based on OLS regressions (equation 1). The dependent variables are measured at the child level. Observations are pooled for the first two years of the CCT program (2010/11 and 2011/12 school years) in columns (1)–(4), and refer to the follow-up year in columns (5)–(6). The sample is restricted to children in secondary school age (additional restrictions are indicated at the bottom of the table). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. All specifications include region indicators, stratum indicators, municipality and demographic controls, and a school-year indicator. The full list of controls is presented in section 4.1. *Mother municipality* is a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. *Secondary school enrolment* is an indicator variable equal to 1 if the child is enrolled in secondary school, and zero otherwise. For children enrolled in secondary school, *CCT enrolment* is an indicator variable equal to 1 if the child is enrolled in the CCT program, and zero otherwise. *Attendance* is the percentage of classes attended by the child, conditional on being enrolled in the CCT program. *CCT transfer* is the child-level CCT transfer received by the household (reported in thousands MKD). *Did house chores* is an indicator variable equal to 1 if the child did house chores in the week previous to the survey interview, and zero otherwise. *Worked* is an indicator variable equal to 1 if the child worked for salary in the month previous to the survey interview, and zero otherwise. The source of data is the follow-up survey in columns (1), (5)–(6), and administrative data from the CCT program in columns (2)–(4). *Secondary school enrolment*, *Did house chores* and *Worked* are self-reported by the respondent of the survey.

A.14 Monitoring of school attendance

Table A23 presents estimates of the effect of targeting mothers on parental monitoring of school attendance. We focus on whether parents check school reports, attend parental meetings, and the frequency at which they ask children about school. The information is reported by the main respondent of the questionnaire (generally the household head) for the youngest child that attended secondary school in the school year previous to the interview and the youngest child that attended primary school in school-year previous to the interview. We estimate the effect using child-level observations and restricting the sample to children in secondary-school age and enrolled in secondary school. We separately estimate the effect for boys and girls.

Table A23: *Monitoring of school attendance*

	Dep. var.:	**Checked school reports**		**Attended parental meetings**		**Asked the child about school daily**	
	Sub-sample:	Boys	Girls	Boys	Girls	Boys	Girls
		(1)	(2)	(3)	(4)	(5)	(6)
Mother municipality		-0.018	0.002	-0.002	0.006	-0.001	0.000
		(0.048)	(0.055)	(0.009)	(0.013)	(0.054)	(0.064)
Observations		391	306	391	306	390	302
R^2		0.200	0.249	0.061	0.064	0.145	0.141

Note. Estimates based on OLS regressions (equation 1). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. All specifications include region indicators, stratum indicators, municipality and demographic controls. The full list of controls is presented in section 4.1. *Checked school reports* is a dummy variable equal to 1 if during the last school-year parents checked school reports at least once, and zero otherwise. *Attended parental meetings* is a dummy variable equal to 1 if during the last school-year parents attended parental meetings at least once, and zero otherwise. *Asked the child about school daily* is a dummy variable equal to 1 if during the last school-year parents asked children about school daily, and 0 if the never asked or asked at lower frequency. *Mother municipality* is a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. The sample is restricted to follow-up observations for children in secondary school age and enrolled in secondary school.

A.15 Controlling for differential take-up and transfer

Table A24 estimates equation (1) using the food budget share as dependent variable and controlling for different measures of take-up and CCT transfer. Due to the endogeneity of these variables, we do not include these "bad" controls in the main specifications (Angrist and Pischke, 2008). Column (2) controls for household-specific take-up in the first two years of the CCT. Column (3) controls instead for the average value of take-up in the municipality of residence of the household. Column (4) controls for the total CCT transfer received by the household in the first two years of the program. In columns (4)–(7) we control for combinations of these variables. Estimates are robust to these controls.

Table A24: *Effect on food budget share and program take-up*

	Dep. var.: Food budget share						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Mother municipality	3.984**	4.262***	4.032**	4.269***	4.036**	4.324***	4.312***
	(1.539)	(1.540)	(1.539)	(1.539)	(1.532)	(1.534)	(1.533)
Program take-up	-2.250*			-1.347	-1.572		-0.741
	(1.327)			(1.201)	(1.552)		(1.516)
Average program take-up (municipality)		-12.921*		-11.500*		-11.914*	-11.376*
		(6.849)		(6.719)		(6.659)	(6.680)
CCT income (000s MKD)			-0.006		-0.004	-0.004	-0.003
			(0.004)		(0.005)	(0.004)	(0.005)
Observations	847	847	847	847	847	847	847
R^2	0.167	0.172	0.167	0.173	0.168	0.174	0.174

Note. Estimates based on OLS regressions (equation 1). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. All specifications include region indicators, stratum indicators, and municipality and demographic controls. The full list of controls is presented in section 4.1. The dependent variable is the *food budget share*, defined as the ratio between the expenditure on food and the total household expenditure. *Mother municipality* is a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. *Program take-up* is an indicator variable equal to 1 if the household was enrolled in the CCT in the first two years of the program, and zero otherwise. *Average program take-up (municipality)* is the average of take-up at the municipality level. *CCT income* is the total transfer received by the household in the first two years of the program.

A.16 Awareness of the CCT program

We use self-reported awareness of the CCT program to understand whether targeting mothers had any effect. The question about program awareness is answered uniquely by the main respondent, i.e. the household head if present during the interview. Thus we cannot test whether partners have different awareness depending on the municipality of residence. Table A25 presents estimates of equation (1) in which the dependent variable is an indicator variable equal to 1 if the respondent is aware of the CCT program, and zero otherwise. At follow-up, awareness is high, with 88% of respondents being aware of the CCT program. We observe no significant effect of residing in a Mother municipality on awareness about the program. This is also true when restricting the sample to households in which the head is the respondent and in which the father is the respondent.

Table A25: *Awareness of the CCT program*

	Dep. var.: Awareness of the CCT program					
Sub-sample:	All households		Household head is the respondent		Father is the respondent	
	(1)	(2)	(3)	(4)	(5)	(6)
Mother municipality	-0.01	-0.01	-0.00	-0.00	0.00	-0.00
	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
Avg. baseline awareness (municipality)		0.36***		0.29***		0.37***
		(0.09)		(0.10)		(0.10)
Observations	852	852	649	649	598	598
R^2	0.125	0.142	0.118	0.129	0.121	0.139

Note. Estimates based on OLS regressions (equation 1). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. All specifications include region indicators, stratum indicators, and municipality and demographic controls. The full list of controls is presented in section 4.1. The dependent variable, *awareness of the CCT program*, is defined as an indicator variable equal to 1 if the respondent is aware of the CCT program, and zero otherwise. The exact question reads as follows: "*Have you ever heard about the CCT program for secondary school education?*". *Mother municipality* is a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. *Avg. baseline awareness (municipality)* is the municipality-average of the dependent variable at baseline.

A.17 Choice of instruments for total expenditure

As standard in the literature, total expenditure is instrumented with wealth measures. In the main text, we use the total value of durable goods and the squared meters of land owned by the household as measures of wealth. These instruments are generally based on a large number of variables. To show robustness of estimates to the choice of instruments for total expenditure, we rely on Post-Double Selection LASSO (PDSL) procedure for the selection of instruments in presence of large number of instruments (Tibshirani, 1996; Belloni et al., 2012). This provides an important robustness check since it allows comparing estimates under the exclusion restriction assumed in the main text and under the exclusion restriction selected by the procedure. We construct a high-dimensional set of measures related to wealth. Table A26 presents the variables selected. These variables, measured both at baseline and follow-up, are then used as the set of all instruments in the PDSL procedure.

Table A26: *Variables included in the PDS LASSO procedure for instrumental variable selection*

Category	**Description**
Ownership of durable goods	Indicator variable equal to 1 if the household owns a good, and zero otherwise. Indicator variable equal to 1 if the household owns one unit of the good, and zero otherwise. Indicator variable equal to 1 if the household owns more of one unit of the good, and zero otherwise. These indicators are available for 25 goods: solid fuel cooker, electric or gas cooker, solid fuel or oil stove, electric stove, gas stove, boiler, refrigerator, washing machine, dishwasher, iron, sewing machine, vacuum cleaner, air conditioner, radio and hi-fi, television, camera or video recorder, personal computer, telephone, mobile phone, music instrument, bicycle, motorcycle, car, motorbike, auto trailer, and other vehicles.
Total value of durable goods	Sum of the products between quantity owned and their value. The value is self-reported by the respondent for each item by answering the question "*Imagine you find similar items at the local market or shop. How much would you have to pay to purchase them?*". The squared value is also included.
Land owned	Total land owned by the household, reported in squared meters. The squared value is also included.
Interaction terms	Interaction terms between the variables included in the category "Total value of durable goods" and "Land owned". Interaction terms between the total value of durable goods and any other variable in the category "Ownership of durable goods". Interaction terms between the squared meters of land owned by the household with any other variable in the categories "Ownership of durable goods".

Note. Variables are measured at baseline and follow-up. All information is self-reported by the respondent.

Table A27 presents estimates of demand equation (2) for the food budget share under different estimation procedures, encompassing different sets of available instruments. Columns (1)–(4) estimates equation (2) using the Mother municipality dummy as an exogenous intercept shifter, while columns (5)–(8) estimates equation (2) using Mother's income share instrumented with the Mother municipality dummy. Columns (1) and (5) estimates equation (2) using 2SLS using the instrumental variables selected in the main text (total value of durable goods, its squared value and the squared meters of land owned by the household). Columns (2)–(4) and (6)–(8) present estimates based on the PDS LASSO procedure. Columns (2) and (6) make use of all instruments measured at follow-up. Columns (3) and (7) use all the instruments measured at baseline, setting the instrument as missing for households that are interviewed only at follow-up. Columns (4) and (8) use all the instruments at follow-up and baseline, setting missing values for instruments to zero and introducing, for each instrument, a dummy variable equal to 1 if the value of the correspondent

variable is missing, and zero otherwise. The results are robust to the selection of instruments and the time in which instruments are measured.

Table A27: *Contemporaneous versus past instruments*

	Dep. var.: Food budget share							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother municipality	4.55***	4.30**	4.43**	4.30**				
	(1.76)	(1.95)	(2.03)	(1.95)				
Mother's income share					0.30***	0.29**	0.32**	0.29**
					(0.11)	(0.14)	(0.15)	(0.14)
Expenditure	-7.89**	-8.51***	-9.64**	-8.51***	-7.84**	-7.70**	-6.95*	-7.70**
	(3.22)	(2.90)	(3.77)	(2.90)	(3.46)	(2.99)	(3.77)	(2.99)
Observations	847	847	664	847	847	847	664	847
Procedure for selection of IVs	-	PDSL	PDSL	PDSL	-	PDSL	PDSL	PDSL
Instruments for PDSL procedure:								
- Contemporaneous	-	Yes	No	Yes	-	Yes	No	Yes
- Lagged	-	No	Yes	Yes	-	No	Yes	Yes

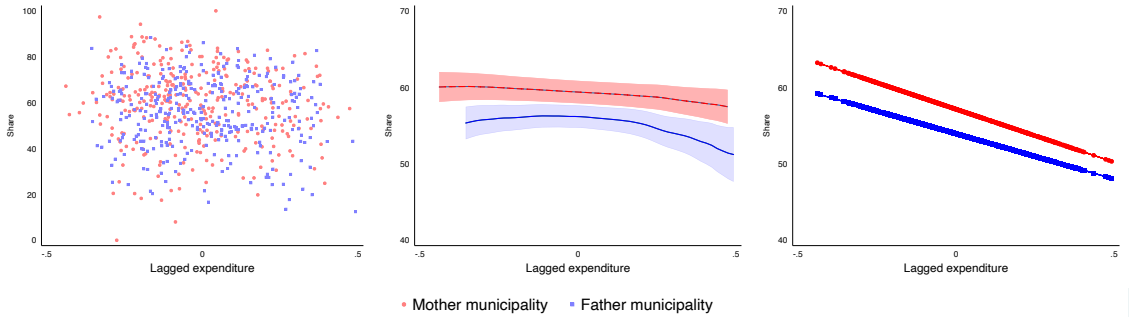
Note. Columns (1) and (5) present estimates of equation (2) using 2SLS instrumenting expenditure with the total value of durable goods, its squared value and the squared meters of land owned by the household. Columns (2)–(4) and (6)–(8) present estimates based on controls and instrumental variables selected through the Post-Double Selection LASSO (PDSL) procedure (Tibshirani, 1996; Belloni et al., 2012). Columns (2) and (6) use of all instruments measured at follow-up. Columns (3) and (7) use of all instruments measured at baseline, setting the instrument as missing for households that are interviewed only at follow-up. Columns (4) and (8) use all the instruments at follow-up and baseline, setting missing values for instruments to zero and introducing, for each instrument, a dummy variable equal to 1 if the value of the correspondent variable is missing, and zero otherwise. The full list of instruments is presented in table A26. Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variable is the food budget share, defined as the ratio between the expenditure on food and the total household expenditure. *Expenditure* and *mother's income share* are demeaned. *Expenditure* is the total (real) household expenditure on non-durable goods. *Mother municipality* is a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. *Mother's income share* is the share (multiplied by 100) of total parental income that can be attributed to the woman in the household, and is instrumented with the *Mother municipality* dummy. Controls include region indicators, stratum indicators, and municipality and demographic controls. In columns (2)–(4) and (6)–(8) included controls are selected by the PDSL procedure. Mother municipality and randomization strata are partialled-out from the PDSL procedure. The full list of controls is presented in section 4.1.

A.18 Non-parametric analysis of expenditure allocations

We perform a reduced-form analysis of expenditure allocation to food by comparing food budget shares at follow-up with a predicted measure of total expenditure at baseline. To predict total expenditure at baseline, we use a linear regression controlling for all variables presented in section 4.1 measured at baseline. Figure A15 presents a comparison between parametric and non-parametric estimates of the relationship between the food budget share and total expenditure on non-durables across Mother and Father municipalities. The left column presents a scatter plot between the two variables. The central column presents kernel-weighted local polynomial regressions performed separately for Mother and Father municipalities. To compare non-parametric with parametric estimates, the right column presents the relationship between the food budget shares and total expenditure estimated using a linear specification in which the dependent variable is the food budget share and independent variables are the Mother municipality indicator, the predicted food expenditure, and an interaction term between the two variables (controlling for regional indicators and the randomization strata). We perform a similar analysis for the expenditure allocation within the food basket using a predicted measure of expenditure on food at baseline. Similar to predicted total expenditure, this is predicted using a linear regression controlling for all variables

presented in section 4.1 measured at baseline. Figure A16 presents a comparison between parametric and non-parametric estimates similar to Figure A15 for expenditure allocations in the food basket. Table A28 presents estimates of the parametric estimates for the allocations within the food basket when sequentially adding control variables interacted with the Mother municipality indicator.

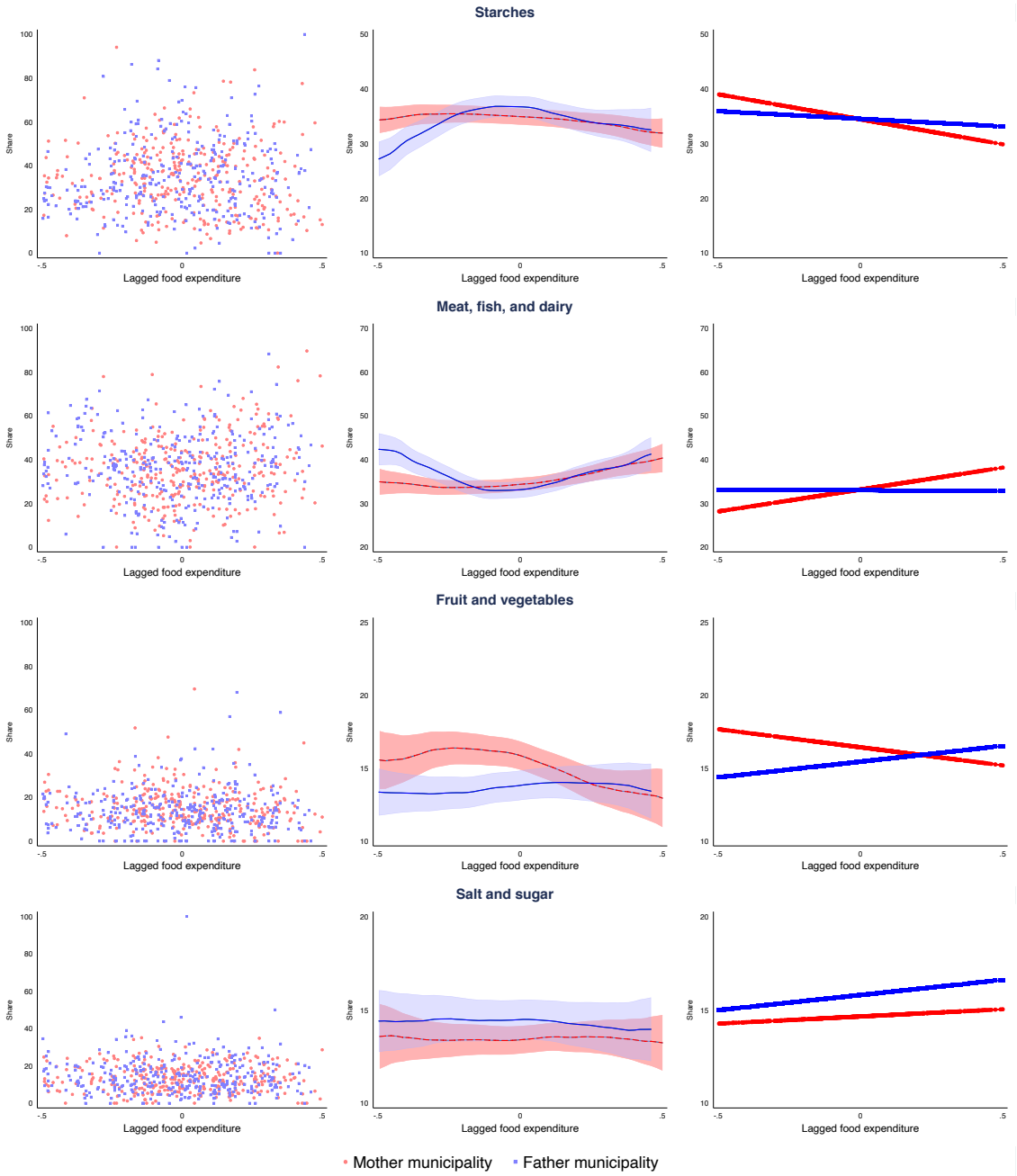
Figure A15: *The food budget share and the lagged total expenditure*



Note. The left figure presents a scatter plot between the food budget share and the predicted total expenditure on non-durables across Mother and Father municipalities. *Lagged expenditure* is the predicted total (real) household expenditure on non-durables at baseline. It is reported in logarithms and is predicted using a OLS regression selecting control variables at baseline only. This variable is demeaned in the analysis. The central figure presents kernel-weighted local polynomial regression performed separately for Mother and Father municipalities. The kernel function is assumed to be an Epanechnikov distribution, confidence level for confidence intervals is set at 90%. The right figure presents the estimated relationship using a linear specification in which the dependent variable is the food budget share and independent variables are the Mother municipality indicator, the predicted total expenditure, and an interaction term between the two variables (controlling for regional indicators and the randomization strata). The sample is restricted to follow-up observations.

While these results complement the analysis presented in the main text, estimates are not directly comparable to demand system estimates presented in tables 5 and 6. There are differences in expenditure levels induced by the CCT between baseline and follow-up (although not across treatment arms) that could lead to a different relationship between the allocation of expenditures across items and total food expenditure at baseline and at follow-up. We should therefore interpret these results as an estimate of heterogeneous treatment effects by expenditure levels measured at baseline, under the assumption that this variable is exogenous to unobserved heterogeneity in the allocation of food expenditures at follow-up. Compared to contemporaneous expenditure, baseline expenditures might not be necessarily more exogenous to the allocation errors, especially if the sources of endogeneity are time invariant (or persistent) household unobservable characteristics. This justifies the use of instruments for expenditure rather than using a lagged value. Considering the choice of instruments, while in the main text we follow a standard practice in the literature on demand estimation by using contemporaneous instruments (see, i.e., Dunbar et al., 2013), estimates are robust to using instruments measured at baseline and to the Post-Double Selection LASSO procedure for the selection of instruments in presence of large number of instruments (appendix A.17).

Figure A16: *Food basket and lagged expenditure on food*



Note. The left column presents scatter plots between food budget shares for food items and the predicted food expenditure across Mother and Father municipalities. *Lagged food expenditure* is the predicted (real) food expenditure at baseline. It is reported in logarithms, and is predicted using a linear regression selecting control variables at baseline only. This variable is demeaned in the analysis. The central column presents kernel-weighted local polynomial regressions performed separately for Mother and Father municipalities. The kernel functions are assumed to be an Epanechnikov distribution, confidence level for confidence intervals is set at 90%. The right column presents estimated relationships using a linear specification in which the dependent variables are the food budget shares spent on the specific food categories and the independent variables are the Mother municipality indicator, the predicted food expenditure, and an interaction term between the two variables (controlling for regional indicators and the randomization strata). The sample is restricted to follow-up observations.

Table A28: *Food basket and baseline expenditure on food*

	Dep. var.: Food budget share of food category				
	(1)	(2)	(3)	(4)	(5)
Starches					
Mother municipality	0.22	0.21	0.20	0.32	0.29
	(1.74)	(1.75)	(1.73)	(1.69)	(1.64)
Mother municipality x Lagged food expenditure	-5.95	-6.60	-4.47	-0.86	0.20
	(6.55)	(6.86)	(6.89)	(7.06)	(6.77)
Lagged food expenditure	-23.26***	-22.70***	-23.69***	-24.42***	-24.37***
	(7.31)	(7.21)	(7.23)	(7.35)	(7.21)
Meat, fish and dairy					
Mother municipality	0.18	0.19	0.21	0.21	0.21
	(1.50)	(1.50)	(1.50)	(1.48)	(1.47)
Mother municipality x Lagged food expenditure	8.78	9.27	8.25	4.58	4.31
	(6.10)	(6.33)	(5.98)	(6.42)	(6.38)
Lagged food expenditure	21.47***	21.04***	21.57***	23.15***	23.13***
	(8.03)	(7.86)	(7.70)	(7.71)	(7.73)
Fruit and vegetables					
Mother municipality	0.87	0.88	0.89	0.76	0.76
	(0.88)	(0.87)	(0.86)	(0.83)	(0.83)
Mother municipality x Lagged food expenditure	-4.22	-3.58	-4.18	-4.30	-4.47
	(3.48)	(3.56)	(3.57)	(3.91)	(3.84)
Lagged food expenditure	1.46	0.91	1.04	0.02	0.01
	(4.59)	(4.65)	(4.59)	(4.66)	(4.63)
Salt and sugars					
Mother municipality	-1.32	-1.33*	-1.35*	-1.35*	-1.33*
	(0.81)	(0.80)	(0.80)	(0.79)	(0.78)
Mother municipality x Lagged food expenditure	-0.72	-1.64	-2.66	-2.19	-2.75
	(3.46)	(3.45)	(3.49)	(3.86)	(3.75)
Lagged food expenditure	2.65	3.44	4.01	3.91	3.89
	(4.59)	(4.59)	(4.47)	(4.77)	(4.70)
Observations	663	663	663	663	663
Interaction terms with Mother municipality:					
Children enrolled in school	No	Yes	Yes	Yes	Yes
Household size indicators	No	No	Yes	Yes	Yes
Parental age and education	No	No	No	Yes	Yes
Ethnicity	No	No	No	No	Yes

Note. Estimates based on the CF approach (equation 2). Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variables are the shares of food expenditure spent on each category, multiplied by 100. Food categories are defined in table 3. *Mother municipality* is a dummy variable equal to 1 if the transfer is targeted to mothers, and zero otherwise. All specifications include region and stratum indicators. *Lagged food expenditure* is the predicted (real) food expenditure at baseline. It is reported in logarithms and is predicted using a linear regression selecting control variables at baseline only including the full list of controls presented in section 4.2. This variable is demeaned in the analysis. The sample is restricted to follow-up observations.

B Demand equation estimation

Similarly to equation (2), let w be the outcome variable, $share$ the mother's income share, and y_3 the total expenditure (or total food expenditure). Assuming $\mathbf{z}$ is the $1 \times L$ vector of all exogenous variables (including a constant), we can write the following specification:

$$w = \alpha_2 share + \alpha_3 y_3 + \gamma_1 share \cdot y_3 + \mathbf{z_1}\delta_1 + u_1 \tag{4}$$

where $\mathbf{z_1}$ is a $1 \times L_1$ strict sub-vector of $\mathbf{z}$ such that $\mathbf{z} = \begin{bmatrix} \mathbf{z_1} & \mathbf{z_{-1}} \end{bmatrix}$ and $\mathbf{z_{-1}}$ is the $1 \times (L - L_1)$ vector of excluded instruments. We address the endogeneity of the variables $share$ and y_3 by following a CF approach and instrumenting endogenous variables with $\mathbf{z_{-1}}$.

B.1 First stage of the demand system

We instrument the *mother's income share* with the indicator variable for treatment modality. Since payment modalities are defined through a lottery, this variable provides exogenous variation in the intra-household distribution of income. In the first stage, the following specification is estimated:

$$share = \mathbf{z}\delta_2 + e_2 \tag{5}$$

where $E\left[\mathbf{z}'e_2\right] = 0$. We instrument *total expenditure* using the value of durable goods and the land owned by the household as measures of wealth. Durable goods are enumerated during the interview using a list of 25 items, and the value is self-reported by the respondent for each item. The exact question reads as follow: "*Imagine you find similar items at the local market or shop. How much would you have to pay to purchase them?*". We alternatively implement a measure of durables by imputing the value of each good using median unit values at regional level (or for the whole country), and an asset index built solely on whether the household own one or more item. Results are unaffected by the choice of the measure. In the first stage, the following specification is estimated:

$$y_3 = \mathbf{z}\delta_3 + e_3 \tag{6}$$

where $E\left[\mathbf{z}'e_3\right] = 0$. Column (3) reports the results for total expenditure on non-durables, while column (5) shows the results for food expenditure. For total expenditure, we include a quadratic term for the durables, while we exclude it for the food expenditure regression since it is not significant. Table B1 shows first stage results. The partial F-statistic on the instruments is high for both endogenous variables.

B.2 CF estimates

Starting from equation (4), we write the projection of u_1 on a function f of (e_2, e_3), i.e. $u_1 = f\left(e_2, e_3\right) + e_1$, where by construction $E[e_2' e_1] = 0$ and $E[e_3' e_1] = 0$. To allow for a flexible form, we approximate $f(.)$ with a non-linear function in the first-stage residuals, specifically a

Table B1: *First stage regressions*

				First stage for FOOD SHARE		**First stage for FOOD DEMAND**	
Dep. var.:	Actual transfer to mother		Mother's CCT income	Expenditure	Mother's income share	Food expenditure	Mother's income share
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Probit	OLS	OLS	OLS	OLS	OLS	OLS
Mother municipality (d)	0.758***		12.903***	-0.007	17.255***	0.103	16.961***
	(0.022)		(0.904)	(0.060)	(2.460)	(0.073)	(2.399)
Mother recipient (predicted)		1.021***					
		(0.031)					
Land owned (hectares)	-0.033	0.002	0.050	0.064**	2.788	0.073**	2.425
	(0.039)	(0.021)	(0.895)	(0.025)	(1.722)	(0.029)	(1.734)
Durables value	0.858**	0.002	3.257**	-0.084	8.584***	0.164***	0.185
	(0.371)	(0.028)	(1.433)	(0.075)	(2.872)	(0.025)	(1.671)
Durables value (squared)	-0.041**	-0.000	-0.203***	0.014***	-0.445***		
	(0.018)	(0.002)	(0.076)	(0.004)	(0.159)		
Observations	852	852	852	847	852	849	852
R^2		0.584	0.371	0.279	0.145	0.214	0.142
F-test for excluded instrument on:							
- CCT transfer / income share	.	1057.996	203.863	0.015	49.211	1.955	49.982
- Expenditure	.	0.004	3.008	35.057	3.725	30.850	1.149

Note. Estimates based on OLS regressions. Standard errors in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. Columns (1) reports marginal effects. Columns (4)–(5) present the first stage estimates for the estimation of food demand, while columns (6)–(7) show the estimates for the food basket demand system. *Actual transfer to mother* is a dummy variable equal to 1 if a woman received at least one payment during the first two years of the program, and zero otherwise. *Mother's CCT income* is the total transfer received by a mother during the first two years of the program (reported in thousands MKD). *Expenditure* is the total (real) household expenditure on non-durables (reported in logarithms). *Mother's income share* is the share (multiplied by 100) of total parental income that can be attributed to the woman in the household. *Food expenditure* is the total (real) expenditure on food (reported in logarithms). *Mother recipient (predicted)* is the predicted dependent variable from a probit regression of actual transfer to mother on the Mother municipality indicator, controlling for all control variables. *Land owned (hectares)* is the self-reported amount of land owned by the household. *Durables value* is the total value of durables owned by the household (reported in logarithms). All specifications include municipality and demographic controls. The full list of controls is presented in section 4.2. The sample is restricted to follow-up observations.

second-order polynomial:

$$f(e_2, e_3) = \rho_2 e_2 + \rho_3 e_3 + \rho_5 e_2^2 + \rho_6 e_3^2 + \rho_8 e_2 e_3$$

In line with a CF standard approach (Wooldridge, 2010), we assume that, once conditioning for all endogenous and exogenous variables, the expected value of e_1 is equal to $f(.)$, i.e. $E[u_1|share, y_3, \mathbf{z}] = f(e_2, e_3)$. This is equivalent to assume that once conditioning for the first stage residuals, the expected value of e_1 is equal to zero. We first derive the first stage residuals from equations (5) and (6), and we substitute for u_1 in equation (4) by writing:

$$w = \alpha_2 share + \alpha_3 y_3 + \gamma_1 share \cdot y_3 + \mathbf{z_1}\delta_1 + f(\hat{e}_2, \hat{e}_3) + e_1 \quad (7)$$

where $\hat{e}_2 = share - \mathbf{z}\hat{\delta}_2$, and $\hat{e}_3 = y_3 - \mathbf{z}\hat{\delta}_3$. The new error e_1 is uncorrelated not only with all endogenous variables, but also with e_2, e_3, and $\mathbf{z}$. Under the specified hypothesis, OLS estimators for for α_2, α_3, and γ_1 in equation (7) are consistent. Standard errors are estimated using a bootstrap estimator allowing for clustering at the municipality level.

We also present results when substituting $share$ with the exogenous payment modality dummy, $mother$. The variable is treated as exogenous and the estimation is based on a similar procedure, but assuming that $f(.)$ is only function of e_3.

B.3 An extension: schooling endogeneity

We extend the main specification by considering schooling decisions endogenous and by estimating the demand system instrumenting for it. We assume the following specification:

$$w = \alpha_2 share + \alpha_3 y_3 + \alpha_4 y_4 + \gamma_1 share \cdot y_3 + \mathbf{z_1}\delta_1 + u_1 \quad (8)$$

where y_4 is the number of children enrolled in school, and $u_1 = f(e_2, e_3, e_4) + e_1$. We instrument this variable using the gender of the first born child, and the expected probability (as expressed by parents) that children will attend university. Table B2 reports estimates of an Engel curve for food using equation (2) by taking into account the endogeneity of total expenditure, the actual transfer to a mother and of schooling by using a CF approach.

A large body of evidence uses the gender of the first-born as exogenous source of variation in household composition (see, e.g., Angrist and Evans, 1998). While the vast majority of children attend primary school, female children among SFA recipients tend to have a higher enrolment rate in secondary school compared to male children. If, after controlling for the number of children, the first born is male, we should expect a lower number of children enrolled in school. The expected probability of attending university is also likely to be correlated with schooling decisions. The probability is reported by the respondent during the interview on a scale from 0 to 10 for the two youngest adolescents aged 12-16 with different gender. We average this probabilities at household level. We assume that, conditional on the detailed set of controls adopted in the models, this

measure is not correlated with other unobservable household attributes affecting expenditures.

Table B2: *Engel curve for food estimated with endogenous schooling*

	Dep. var.: Food budget share			
	(1)	(2)	(3)	(4)
Mother Municipality	4.58***	4.58***		
	(1.65)	(1.67)		
Mother Municipality x Expenditure		-0.99		
		(3.13)		
Mother's income share			0.30***	0.30***
			(0.09)	(0.09)
Mother's income share x Expenditure				0.02
				(0.06)
Expenditure	-8.92**	-8.32**	-8.85**	-8.90**
	(3.63)	(3.96)	(3.64)	(3.64)
Observations	842	842	842	842
R^2	0.224	0.224	0.233	0.233
Joint significance of main effect and interaction (p-value)	.	0.01	.	0.01
Endogeneity test (p-value)	0.00	0.00	0.00	0.00

Note. Estimates based on the CF approach (equation 2). Bootstrap standard errors (2,000 replications) presented in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variable is the *food budget share*, defined as the ratio between the expenditure on food and the total household expenditure. *Expenditure* is the total (real) household expenditure on non-durables (reported in logarithms). *Mother municipality* is a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. *Mother's income share* is the share (multiplied by 100) of total parental income that can be attributed to the woman in the household. It is instrumented with the *Mother municipality* dummy. *Expenditure* and the *mother's income share* are demeaned. The test of joint significance of the main effect and the interaction is performed with an F-test. The *number of children enrolled in school* is considered endogenous and is instrumented using the gender of the first born child, and the expected probability (as expressed by parents) that children will attend university. The endogeneity test is performed as a joint Wald test for the equality to zero of all coefficients in the polynomial of the first-stage residuals. The full list of controls is presented in section 4.2.

B.4 Program impact: ITT versus IV and CF estimates

We can compare CF estimates with 2SLS estimates. Table B3 presents estimates for equation (2) comparing the CF approach and the 2SLS estimation method. CF and 2SLS lead to very similar results under the functional form assumption for the CF.

Table B3: *Food Engel curve: comparison between CF and 2SLS estimates*

	Dep. var.: Food budget share					
	(1)	(2)	(3)	(4)	(5)	(6)
Estimation method:	CF	2SLS	CF	2SLS	CF	2SLS
Mother Municipality	4.47***	4.69**				
	(1.70)	(1.82)				
Mother's income share			0.30***	0.25**		
			(0.09)	(0.10)		
Actual transfer to mother					5.30**	6.59**
					(2.23)	(2.50)
Expenditure	-8.49**	-7.58**	-8.66**	-7.91**	-8.42**	-7.48**
	(3.49)	(3.20)	(3.41)	(3.49)	(3.52)	(3.16)
Observations	847	847	847	847	847	847

Note. In columns (1), (3) and (5), estimates are based on the CF approach (equation 2) with bootstrap standard errors (2,000 replications) clustered at the municipality level (83 clusters in total) presented in parentheses. In columns (2), (4) and (6), estimates are based on 2SLS regressions (equation 3) with standard errors clustered at the municipality level presented in parentheses. *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variable is the *food budget share*, defined as the ratio between the expenditure on food and the total household expenditure. *Expenditure* is the total (real) household expenditure on non-durables (reported in logarithms). *Mother's income share* is the share (multiplied by 100) of total parental income that can be attributed to the woman in the household. *Actual transfer to mother* is a dummy variable equal to 1 if a woman received at least one payment during the first two years of the program. *Mother's income share* and *Actual transfer to mother* are instrumented with the *Mother municipality* dummy, a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. All specifications include region and stratum indicators, municipality and household controls. The full list of controls is presented in section 4.2. The sample is restricted to follow-up observations.

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