Lebanon Cash Consortium (LCC)

Impact Evaluation of the Multipurpose Cash Assistance Programme

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The Lebanon Cash Consortium (LCC) brings together six leading international NGOs to deliver multi-purpose cash assistance to socio-economically vulnerable refugee households living in Lebanon. Members of the LCC are Save the Children (Consortium Lead), the International Rescue Committee (Monitoring and Evaluation and Research Lead), ACTED, CARE, Solidarités International and World Vision International.

Executive Summary

Introduction

The Syrian crisis is currently in its sixth year, with over one million Syrians still living in Lebanon as refugees. Nearly 60% of all financial resources pledged by UN agencies and INGOs were to secure basic assistance for Syrian refugees, mainly to support them in meeting food and healthcare needs. In the context of this protracted crisis, humanitarian actors continuously face resource shortages to help affected populations meet their basic needs. Therefore, donors look for cost-efficient yet effective solutions, and rely on the available evidence to make their funding decisions. In the Lebanese context, multipurpose cash assistance (MCA) has been used extensively to meet refugees' basic needs, ranging from food, shelter, health and hygiene and other items, in a manner that allows refugees' choice of spending priorities.

The Lebanon Cash Consortium (LCC) brings together six international NGOs, including Save the Children (Consortium Lead), the International Rescue Committee (Monitoring, Evaluation, and Research Lead), Solidarités International, CARE, ACTED, and World Vision International. The mandate of the Consortium is to provide MCA to economically vulnerable Syrian households, whose eligibility is determined based on the inter-agency Proxy Means Test (PMT) score that seeks to measure economic vulnerability. During 2015, 20,000 household had been assisted with MCA out of 25,000 that were found eligible for MCA. The remaining 5,000 were not enrolled in the MCA program reportedly due to lack of funding. This study aims to measure the impact of the MCA delivered by LCC at a six-month midline of assistance on several proxies of physical and material wellbeing, encompassing food security, health, hygiene and housing.

Methodology

The study uses a quasi-experimental design called Regression Discontinuity Design (RDD) to compare indicators of the physical and material wellbeing of households that receive cash assistance versus households who do not. The RDD shares similarities to Randomized Controlled Trials (RCT) and can establish the causal effect of an intervention. The key difference between RDD and RCT lays in the modality of forming the two groups to be compared.
Without having to randomize those who will receive or not receive cash assistance, which is considered unethical in humanitarian programs, in this RDD study the intervention and control households have been chosen in proximity of the PMT cutoff point. Hence, they are supposedly similar from a socio-economic and demographic perspective, as if they were randomly chosen. The only difference that is assumed between them is in the receipt of cash assistance. In turn, this allows establishing and measuring the causal effect of LCC intervention.
The study compared a group of 247 recipient- and 261 non-recipient households, most of which are male-headed households (76% recipient and 77% non-recipient), with an average age of around 39 years old. Households in the two groups were found very similar, except for the fact that non-recipient households possessed a greater variety of basic household assets, had smaller size and received a lower amount of cash assistance from sources other than the LCC.

Key Findings

- LCC cash aid increases refugees' consumption of living essentials, including food and gas for cooking. Their total monthly expenditures, which includes food, water, health, hygiene, and other consumables, are on average, 21% higher than those of non-beneficiaries. In particular, LCC beneficiaries spend around 32% more on food and 12% more on gas for cooking compared to non-beneficiary households.

- Regarding food, LCC beneficiaries have a higher intake of dairy products and lower engagement in several coping strategies related to a previous lack of money to buy food. More specifically, they resort less frequently to borrowing food or to sending household members to eat elsewhere in order to meet food consumption needs.

- LCC beneficiaries are better off also because they are less reliant on debt for paying their rent. More precisely, non-beneficiary households are 1.8 times more likely than beneficiary households to borrow money in order to rent the place where they live.

- LCC cash transfers make households' economies "healthier"; in fact, recipients are more likely to count on work as their main source of income as opposed to negative and unsustainable coping strategies, such as debt, remittances, gifts and sale of assets or food.

- Overall, LCC beneficiaries were found to be four times happier than non-beneficiaries as a result of being able to meet their households' basic needs. However, they are also under greater stress for financial issues, which may be a consequence of the sense of precariousness and dependency on cash aid, and of the awareness that assistance may be discontinued.

- From a social cohesion perspective, LCC beneficiaries feel eight times more secure, as compared to non-beneficiaries. In addition, LCC cash assistance appears to increase by five times their sense of trust of the community hosting them.

Limitations

When considering the findings of this study, two major methodological limitations should be kept in mind. Information collected at baseline and midline was self-reported, hence of limited accuracy and reliability. In addition, the two groups were not entirely similar, which violates a core RDD assumption; although the analysis addressed this issue, some degree of bias should be expected.

Conclusion

In absence of more durable alternatives for Syrians in displacement, such as access to income-generation opportunities, and despite the variety in assistance, the LCC multipurpose cash assistance continues to be a necessary and appropriate aid modality for helping refugees in meeting their basic needs, in accordance with households' priorities.

Furthermore, the LCC Multipurpose cash aid appears to be effective as a modality to deliver supplementary assistance because it is versatile. In turn, the support the LCC provides is reducing beneficiaries' vulnerability, on different levels. Nevertheless, no evidence from this study would support using it to replace specialized assistance, such as food aid and health services.

The LCC MCA is particularly effective to address access barriers in situations where markets are functioning and are more elastic to demand increase, such as that of food items. Specific interventions are needed, aimed at strengthening services and expanding delivery capacity and outreach, in order to not create disparities in the status of affected peoples.

Acknowledgments

Contents

List of Illustrations

List of Tables

List of Acronyms

ATM	Automated Teller Machine
CSI	Coping Strategy Index
FAO	Food and Agriculture Organization
FCS	Food Consumption Score
IRC	International Rescue Committee
LCC	Lebanon Cash Consortium
LBP	Lebanese pounds (Lebanese lira)
NGO	Non-Governmental Organization
OR	Odds Ratio
PMT	Proxy Means Test
RCT	Randomized Controlled Trial
RDD	Regression Discontinuity Design
MCA	Multipurpose Cash Assistance
UNHCR	United Nations High Commissioner for Refugees
WFP	World Food Programme

1. Introduction

1.1   Context of the Intervention

As of June 2015 and as a result of the Syrian conflict, Lebanon is hosting around 1.18 million refugees, more than a fourth of its own population (UNHCR, 2015a). The conflict in Syria started in 2011 and there is no end in sight for the ongoing crisis and the displacement of affected populations, within the country and outside its borders.

The right to access humanitarian assistance in times of armed conflict is mentioned and guaranteed by international law through a multitude of legal instruments. Affected people have the right to protection, food, shelter, healthcare and medication, water and hygiene, and clothing, among other supplies that are essential to physical and material wellbeing (Haider, 2013; Ziegler, 2012). This implies that in the ongoing conflict and emergency situation in Syria, it is the Syrian State's obligation to ensure that the right to access such supplies is fulfilled. In the case of refugees, instead, the responsibility falls mainly on the hosting country and humanitarian agencies and donors provide support as necessary.

In Lebanon, humanitarian aid to Syrian refugees is organized and delivered by ten sectors, including basic assistance, food, health, shelter, water and sanitation (WASH), and protection, among others.[1] Funding is for the greatest part provided by foreign States. In 2015, 60% of the total amount of financial resources pledged by UN agencies and NGOs were to secure basic assistance for the affected populations and to address their food and healthcare needs (UNHCR, 2015b; UNHCR, 2015c; UNHCR, 2015d; UNHCR, 2015e). These needs are covered, respectively, by the Basic Assistance Sector, the Food Security Sector and Health Sector.

The Basic Assistance Sector alone accounted for around 15% of the total amount pledged for Lebanon (UNHCR, 2015b; UNHCR, 2015c). Basic assistance encompasses clothing, shelter, water and hygiene items that recipients can procure in markets, as well as heating supplies to keep warm during winter months (UNHCR, 2015b). In mid-2015, 81% of the year's funding requirements for basic assistance were still unmet (UNHCR, 2015b).

Food and essential medications and healthcare accounted, respectively, for 26% and 19% of the total pledges for Lebanon (UNHCR, 2015a; UNHCR, 2015c; UNHCR, 2015d; UNHCR, 2015e). Similarly to the Basic Assistance Sector, the Food Security Sector has experienced funding shortages, and has therefore cut the number of households receiving food assistance by around 30% in an attempt to prioritize aid to the most vulnerable (IRIN, 2013). Food assistance has been provided to refugees through e-vouchers and the value of these has progressively been lowered from $30 to $13.5 per person in the last year (Reuters, 2015).

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[3] The ten sectors are: Basic Assistance, Child Protection in Emergencies, Education, Food Security, Health, Livelihoods, Protection, Shelter, Social Stability, WASH (UNHCR, 2015a).

Qualitative assessments conducted in April 2015 suggested that households are using "negative coping strategies such as begging, borrowing cash and child labour" to ensure their basic food needs (UNHCR, 2015d).

1.2   The LCC Multipurpose Cash Program

During the past four years of humanitarian aid to refugees in Lebanon, basic assistance has been delivered either through in-kind distributions or through unconditional, unrestricted cash assistance (hereinafter referred to as Multipurpose Cash Assistance, MCA). Cost reduction and the pursuit of higher operational efficiency when addressing very diverse needs of hundreds of thousands of households is one of the main arguments behind the shift from in-kind to cash assistance in Lebanon (UNHCR, 2014; Cabot Venton, Bailey & Pongracz, 2015).

Of the 65,000 households surveyed until June 2015, around 25,000 had been found eligible for MCA and 20,000 had been assisted (UNHCR, 2015b). The remaining 5,000 were not enrolled in the MCA program reportedly due to lack of funding (Battistin, 2015).

The Lebanon Cash Consortium (LCC) was established in June 2014 by a group of six International Non-Governmental Organizations (INGO) to distribute MCA to eligible Syrian refugee households across the country, in a harmonized manner. In the Lebanon case study around Value for Money, Pongracz found that harmonization and consolidation were particularly desirable in cash-based programming (Cabot Venton, Bailey & Pongracz, 2015).[2]

As of June 2015, the LCC program size was of around 3,800 households (Battistin, 2015). According to an unpublished study conducted by El Asmar in 2015, which is representative of LCC recipient households, the greatest majority (86%) are headed by a man, and the average age of the head of household is 39.2 years. Almost a third of heads of households are uneducated, and half have attained a primary education level (El Asmar, 2015).

Grants amounting at 174 US$ (260,000 LBP) are transferred on a monthly basis to selected households, regardless of their size. The transfers are processed via ATM cards during the last week of each month. Recipients can withdraw the money from any ATM, in either US$ or LBP, in one lump sum or multiple tranches; if they decide so, they can refrain from withdrawing and can cumulate the cash in their account. No fees are charged at withdrawal, hence the total maximum amount that beneficiaries can withdraw corresponds to the cumulated transfer.

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[2] The members of the LCC are Save the Children International (Chief of Party), IRC (agency lead for M&E and Research activities), ACTED, Care, Solidarité, and World Vision.

Humanitarian Aid
and Civil Protection

UKaid
from the British people

NGO ACTED NGO CARE NGO IRC NGO SCI NGO SI NGO WVI

Humanitarian Aid
and Civil Protection

LCC
LEBANON CASH CONSORTIUM
الإتحاد النقدي اللبناني

Department
for International
Development
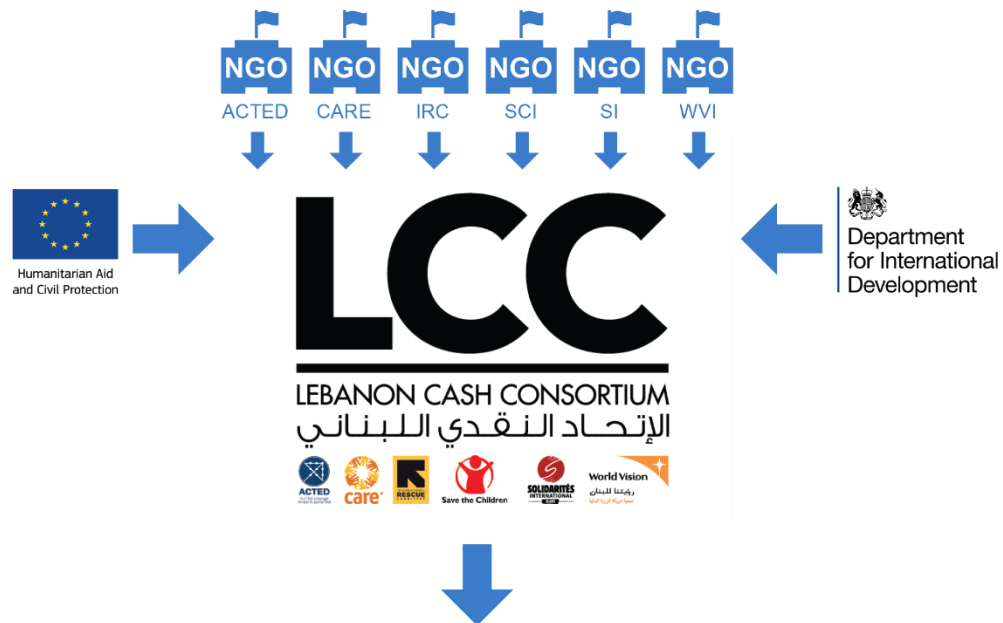
1) Household Needs Assessment

2) Distribution of PIN Cards

$174

3) Reaching beneficiary households

3,800 total

= 100 beneficiary HHs

1.3 Proxy Means Test to Target Cash-based Programming

Evidence on targeting in cash-based programming shows that it is not possible to define an ideal mechanism, fitting any program, in any country. Instead, targeting approaches should be designed according to program objectives and size, characteristics and access to the target population, institutional context, availability of up-to-date data, acceptability and cost-efficiency considerations (Arnold, Conway & Greenslade, 2011).

Types of targeting mechanisms include proxy means test, community-based targeting, self-selection, geographic targeting, and mixed methods. The opposite of targeting would be universal transfers. All of these have trade-offs and inefficiencies, which have to do with the inclusion and the exclusion errors that they generate, as well as with their degree of transparency and acceptability (Arnold, Conway & Greenslade, 2011; Harvey & Bailey, 2011; Dershem, Saidulloev, Nadareishvili, Arnold, & Rittmann, 2013).

In Lebanon, more than 20,000 Syrian refugee households have been found eligible and are now receiving MCA from several aid providers (including the LCC) based on a proxy means test (i.e. the PMT score). This mechanism has been introduced in September 2014, following encouragement from donors to standardize the targeting system.

For the most part, existing literature on the use of PMT in cash transfer interventions concerns country-specific attempts to develop or simulate the performance of a hypothetical PMT (Johannsen, 2006; Ribas, Issamu Hirata, & Veras Soares, 2008; Narayan & Yoshida; van Edig, Schwarze, & Zeller, 2013). The cases in which a PMT was actually operationalized, however, appear to be relatively few (Dershem et al., 2013). Among the PMT that were developed but not applied, are the one for Peru (Johannsen, 2006); the one proposed for the food stamp program in Sri Lanka (Narayan & Yoshida); the one simulated for Paraguay (Ribas, Issamu Hirata, & Veras Soares, 2008); and the one studied in Central Sulawesi, in Indonesia (van Edig, Schwarze, & Zeller, 2013). Instead, a PMT was applied in a cash transfer program in Kazakhstan, running from 2009 to 2014 (Dershem et al., 2013). In Lebanon, the Ministry of Social Affairs uses a PMT to target the subsidized services offered by its National Poverty Targeting Program (NPTP).

One theoretical argument in favor of PMT as a targeting tool is that it allows measuring a certain individual or household characteristic that is cumbersome or unaffordable to measure and verify, especially in certain contexts; examples are income or expenditures, for which there may not be objective and reliable evidence. In addition to that, PMT is more objective, is less prone to manipulation, is characterized by lower inclusion errors, reflects multiple dimensions of one concept, and is more suitable for large-scale programs (Narayan & Yoshida; Johannsen, 2006; Dershem et al., 2013).

On the other hand, it is argued that PMT-based targeting systems have limited acceptability

and transparency. In fact, the formula is the result of statistical methods, with limited – if any- participation of targeted communities in the decision making process; for the complexity of the methods used to develop it, it is also poorly understood (Kidd & Wylde, 2011; Dershem et al., 2013, 2013). The targeting formula is generally kept confidential because, if criteria are made public or found out, the selection process can be manipulated in order to fit the inclusion thresholds. This is an evident issue, especially when cash transfer programs are implemented through multiple rounds of application and enrollment, like in the context of this study. Kidd and Wylde also criticize PMTs because they represent the reality at a given point in time (Kidd & Wylde, 2011).

A precondition for developing a robust PMT is the availability of up-to-date survey data representing the target population, for all demographic and socio-economic factors of interest. The process consists of choosing an indicator that – according to existing literature - is believed to validly represent the concept of interest (e.g. poverty, food insecurity) but for which it is difficult or too expensive to collect reliable information; this benchmark measure is the gold standard. Then, statistical association is tested with each of the demographic and socio- economic variables for which information is available and that are considered relevant.

Finally, multi-variable models are fitted through regressions, including all variables for which a crude association has been found with the gold standard. Once the best fitting model has been determined, the result is an equation that retains relevant variables with their weight; the equation allows to predict the average value of the gold standard for each combination of selected factors. An error always exists in this prediction. One or more cutoff points are determined along the gold-standard continuum, based on which assistance candidates will be included or excluded.

At the beginning of 2014, the humanitarian community in Lebanon formed the UN-INGO Targeting Task Force (TTF) with the specific mandate of developing a standardized targeting methodology for cash-based programming in Lebanon (UN-NGO Targeting Task Force for Lebanon, 2014).

In line with other experiences at the international level (e.g. Sri Lanka, Indonesia, Peru) and following recommendation by the WB, the TTF chose household expenditures as the standard proxy metric of households' economic status (Narayan & Yoshida; Johannsen, 2006; van Edig, Schwarze, & Zeller, 2013; UN-NGO Targeting Task Force for Lebanon, 2014). After analyzing thousands of records of available refugees' data, a PMT index was developed, as a predictor of per-capita monthly expenditures. The PMT is calculated as a weighted sum of the variables household size, disability adjusted dependency ratio, shelter type, occupancy type, toilet type, luxury assets, basic assets, extreme negative coping strategies, number of working adults (UN-NGO Targeting Task Force for Lebanon, 2014).

The PMT in Lebanon allows to define several levels of economic vulnerability, based on three cutoff points. Eligible beneficiaries of MCA are Syrian refugees with a PMT score equal to or

lower than 114, which is the estimated minimum expenditure basket (in US$) for an average person in a month.

1.4   Relevant Evidence of the Effect of Cash-based Programs

In the past decade, a rich body of evidence has been built around the impact of cash transfers in development (Fraker, Martini, & Ohls, 1995; Rivera, Sotres-Alvarez, Habicht, Shamah, & Villalpando, 2004; Rivera Castiñeira, Currais Nunes, & Rungo, 2009; Paes-Sousa, Pacheco Santos, & Shisue Miazakib, 2011; Haushofer & Shapiro, 2013) and, more recently, also in humanitarian and refugee crisis settings (Hidrobo, Hoddinott, Peterman, Margolies, & Moreira, 2012; Lehmann & Masterson, 2014; El Asmar & Masterson, 2015). Amid the principal dimensions of material and physical wellbeing, which is the focus of this study, researchers have mostly studied the impact on food security and health.

The most recurrent research designs of choice are Randomized Controlled Trials (USA, Brasil, Mexico, Ecuador, Kenya), and Regression Discontinuity Design (two studies in Lebanon prior to the present one) (Fraker et al., 1995; Rivera et al., 2004; Rivera Castiñeira et al., 2009; Haushofer & Shapiro, 2013; Lehmann & Masterson, 2014; El Asmar & Masterson, 2015). These study designs confer more credibility to the findings and, most importantly, allow causal inferences and impact estimation.

A consistent finding across studies is that cash-based programs increase households' consumption; in other words, money is spent in consumables. When given the freedom to choose how to use the purchasing power that is transferred to them (that is, when receiving restriction-free cash grants), beneficiaries may decide to allocate the cash across a multitude of needs (Rivera Castiñeira et al., 2009; Haushofer & Shapiro, 2013; Lehmann & Masterson, 2014). Both their consumption levels and expenditure composition change.

Recipients of multipurpose cash grants would allocate their family budget across different expenditure items, but food and water would be the main expenditure (Rivera Castiñeira et al., 2009; Lehmann & Masterson, 2014). In Lebanon, this would be the case irrespective of the season and of receiving food assistance on top of cash aid (Lehmann & Masterson, 2014).

Cash transfers have been found to benefit food security, in terms of reduced hunger, increased average meals per day, dietary diversity, and consumption of bigger quantities of food and with higher nutritional quality (Adato and Bassett, 2009; Rivera Castiñeira et al., 2009; Hidrobo et al., 2012). Anthropometric measures show that cash transfers coupled with health and nutrition education have a significant positive impact on children's nutritional status (Paes-Sousa et al., 2011), as well as on their growth and anemia status (Rivera et al., 2004).

Greater expenditures in more and better-quality food and reduced food-related coping strategies would be expected to translate into an improved nutritional status and, hence,

better health (Rivera Castiñeira et al., 2009; Forde, Rasanathan, & Krechb, 2012; FAO, 2015b). More generally, a positive impact on health could be hypothesized because cash transfers can cover the costs associated to healthcare, including fees, medicines, transportation, hospitalization (Adato & Bassett, 2008). However, the available evidence on cash-transfers' impact on beneficiaries' health status and health services utilization shows inconsistencies: some studies found a significant impact, others did not. A literature review by Adato and Bassett reports that cash transfers reduced illness in the Malawi's Mchinji program, improved health for all household members in South Africa's Old Age Pension program, lowered illness rates among children under five in the Mexico's PROGRESA, and reduced illness incidence in Zambia's Social Cash Transfer Scheme (Adato & Bassett, 2008). Instead, the studies by Rivera Castiñeira and colleagues in Brasil, and by Haushofer and Shapiro in Kenya did not find any significant impact on either service utilization or health outcomes (Rivera Castiñeira et al., 2009; Haushofer & Shapiro, 2013).

Finally, evidence of a dose-response effect of cash aid can be hypothesized, as Adato and Bassett reported from other studies that the amount of transfers is significantly associated with the size of the impact (Adato & Bassett, 2008).

1.5   Significance and Objectives of the Study

In this protracted urban refugee crisis, the humanitarian community in Lebanon fears "donor fatigue", reduced funding, and a shift in priorities, which in turn are feared to trigger a wider diffusion of negative coping strategies among refugees (Massih, N., 2014). Reduction in food-aid is a source of major concerns and it is well acknowledged that the capacity of the LCC and - more generally - of the Basic Assistance Sector to achieve their goals through MCA is closely related to the availability of food assistance. In fact, although MCA is intended for non-food basic needs, it is expected that – in response to the drop in the amount of the food vouchers - MCA recipients will allocate an increasing share of the grant to food purchases (UNHCR, 2015b).

In general, donors' main concerns are around the efficiency and the effectiveness of the aid programs they fund, as they are accountable to their constituencies. A recent case study in Lebanon shows that cash aid is not always as cost-efficient as in-kind assistance, unless it is delivered for multi-sectoral purposes. One of the instances is that of hygiene items and non-food items, which are covered by the Basic Assistance Sector; procuring hygiene and other non-food items items internationally in bulk would reduce costs compared to cash-based programming (Cabot Venton, Bailey & Pongracz, 2015). The cost-efficiency aspect of MCA is however not the focus of this study.

The other key question - which instead is addressed in this study - would be: what is the impact of MCA on households' basic needs and hence wellbeing, in accordance with the objectives of the Basic Assistance Sector? The effectiveness of cash aid as a development intervention has been extensively researched, but much less so as a humanitarian

intervention (Arnold, Conway & Greenslade, 2011). The "Lebanon winterization study" by Lehmann and Masterson is one of the few research efforts in this sense (Lehmann & Masterson, 2015). However, the monthly amount of cash grants studied in this report was relatively small (50 US$ as compared to the 174 US$ of the current MCA program), and when the study was carried out, WFP vouchers had a monthly value of 19 US$ per person.

Although being the most robust and credible impact evaluations, previous experimental and non-experimental studies on cash-transfer programs are not generalizable to the context in Lebanon, even more so because they studied different amounts of transfers and different durations.

This study therefore aims to assess the impact of the current program to inform programs moving forward. If for example, no significant impact is found, questions should be raised regarding considerations of future funding and the allocation of further resources to the program.

This study is the first evaluation of the impact of the LCC program on households' capacity to achieve physical and material wellbeing, in a context of decreasing food assistance.

The findings of the research are expected to inform humanitarian actors in Lebanon for making multi-purpose cash aid more efficient (i.e. how much; per-capita vs. household-based amounts), for adjusting - or advocating for the adjustment of - MCA program size (i.e. to how many) and for better targeting basic assistance (i.e. to whom). In particular, the findings could help determining whether the amount of cash grants should be per capita or per household, and below which amount MCA becomes ineffective in helping households meet their basic needs – all of which are prerequisites for good health. Finally, and most importantly, the findings may inform whether cash assistance has any significant impact on physical and material wellbeing outcomes.

2. Methods

The present study is a secondary data analysis of two surveys conducted at baseline and midline of a cash intervention by LCC surveyors, under the lead of the International Rescue Committee, in August 2015. Data were de-identified, then transferred to the investigator through a Data Transfer Agreement signed by IRC and the American University of Beirut.

2.1 Study Design

In order to assess the impact of the cash assistance, the study compares recipients to non-recipients of MCA based on the Regression Discontinuity Design (hereinafter RDD).

In impact evaluations, RDD's robustness is equivalent to that of Randomized Controlled Trials (RCT), but – differently from these – RDD does not require random assignment to intervention and control groups. This would have been ethically unacceptable in the LCC cash assistance program, where household selection for assistance is based on economic vulnerability. RDD is especially appropriate in humanitarian crises where the situation changes rapidly and setting up longitudinal primary research is difficult and/or non-ethical.

RDD is based on identifying a "discriminating factor" (i.e. the forcing variable) and a related cutoff point around which the intervention and the control groups are formed, choosing among the households that are just below and just above it. Under the assumption that at baseline these households are socio-demographically similar and – to a certain extent – interchangeable, the only difference between them would lie in the reception of cash assistance; any other difference detected at midline would be imputed to the assistance itself.

Therefore, the main underlying assumption in this study was the similarity between the two groups with regard to socio-economic and demographic factors outside of program control, which may have affected - positively or negatively - the outcomes of interest. In this way, the design approximates the features of an RCT design where the intervention is randomly allocated.

The forcing variable of this study is the Proxy Means Test (PMT) index, which is a measure of economic vulnerability and determines the eligibility to the LCC cash program. The cutoff point for the study was set at 114.5 USD per capita monthly expenditure. The two groups were chosen among recipient and non-recipient households that, following the vulnerability assessment, scored just below and just above 114.5, respectively.

2.2 Selection and Recruitment of Intervention and Control Groups

The researcher of this study was not involved in the sampling or data collection. Participants were randomly selected by IRC at the start of the study, aiming at an intervention and a control group of 900 subjects each, with PMT just below and just above the cutoff point. The overall sample frame was the list of 22,602 households that had been interviewed by LCC member agencies between December 2014 and February 2015, to assess their eligibility for MCA and select recipients.

More specifically, the sample frame for the intervention group was the list of households that had been interviewed during the mentioned period, that were found eligible, that had been subsequently enrolled in the LCC MCA program, and that scored between 95 and 114.5 included. The frame for the control group was the list of households that had been interviewed during the same period but were found non-eligible, with a score ranging between 114.6 and 125 included. Within the frame for the intervention group, as described above, any household could be selected to partake the study, irrespective of the sex and age of the head of household or the place of residence, and the number of card loads received

from LCC. They were considered eligible for the study even if they had moved residence and changed household size during the assistance period. By the time the study started, they had received four, five or six cash grants from LCC through ATM transfer, from February till July 2015, for a cumulative amount equivalent to that of six transfers (i.e. 1,044 US$). The survey was conducted in August 2015, within 30 days from the last card load.

The only specific requirement was that they must have made at least one withdrawal of LCC cash, with the assumption that the cash assistance would have been spent. In order to verify that households had successfully withdrawn cash, the intervention group dataset was merged with the ATM card transaction report database covering the period February-July 2015.

Similarly, within the frame for the control group, any household could be selected for this research, regardless of the sex and age of the head of household or the place of residence.

Eligible households were contacted by telephone and were invited to participate in the study. They were recruited for the study upon informed consent taken by IRC. Since, in a first phase of the survey, the non-response rate among the control subjects was high, non-responses were replaced with 60 additional candidates within the same range of the PMT (i.e. 114.6-125). Upon recruitment, the total sample included 1491 households; the size of treatment group was of 789 households and the control group of 702 households.

Ideally, and in order to ensure balance between intervention and control group as required in RDD studies, the PMT bandwidth should have been narrow and close to the cut-off point. However, when the sample was constructed, IRC opted for a larger PMT range in order to achieve a sample size that would secure enough power.

After data cleaning, the entire sample included 1378 units, with neither duplicates nor crossovers and with households situated within the PMT score bandwidth 95-125. Of these 1378 households, 721 were in intervention group and 657 in control group, for a sampling rate to the intervention group of 0.52. After checking balance of key variables at baseline and comparing three subsets (see 2.6 Statistical Methods for the Balance Check at Baseline), the rest of the analysis was conducted on a subset of 508 cases extracted from the entire sample, with PMT between 109 and 118.

Around 100 records were removed from the entire set of surveys collected by the LCC members, due to a mix of reasons: missing essential information (e.g. missing assignation to study group), non-compliance between PMT score and assignation to intervention/control group (i.e. crossovers), non-plausibility of values. Out of the dropped records, for instance, 33 were dropped from the midline because they did not have a match in the baseline; 20 because the PMT score was outside of the expected range; five because they were crossovers.

2.3   Data Sources

The study merged two datasets: the impact evaluation survey conducted by IRC, which is the main dataset for the study; and the baseline study, based on which the LCC selected it MCA recipients.

The impact evaluation survey dataset contained 1491 records, 789 households in the intervention group and 702 in the control group. The survey was designed and conducted by IRC, along with support from the other LCC agencies, in July 2015. Data was collected by LCC surveyors within 30 days from the last cash transfer. This dataset contained all outcomes of interest. The baseline survey contained similar questions as the impact evaluation survey. Both treatment and control groups were included. The study required all variables for which balance had to be checked.

2.4   Concepts and Measurements[3]

The objective of the study was to measure the impact of LCC MCA on physical and material wellbeing of recipient households. Physical and material wellbeing is a complex and multi-dimensional concept, a construct that is not unequivocally defined. It will not be analyzed as one construct with one consolidated measure; but rather, multiple indicators will be used to measure it.

Physical wellbeing is operationalized in this study as the satisfaction of those needs that are related to a human being's survival, such as food, water, health; the latter includes physical and mental health. Material wellbeing, instead, encompasses housing, personal hygiene, and clothing. These two sets of concepts are overlapping: for example, in the case of housing and health, the quality of indoor air and ventilation are closely linked to respiratory tract diseases, allergies and airborne infections; adequate weatherproofing of shelters can protect from cold and humidity, and related health issues (WHO, 2010).

In the context of humanitarian operations in Lebanon, physical and material wellbeing as defined above are mostly addressed by the Basic Assistance, Food Security, and Health sectors.

In this section, a definition of the following concepts and measures is provided to account for the broader construct of physical and material wellbeing: food security, health, housing quality, and personal hygiene. Wellbeing-related indicators have been measured through proxies of "consumption", including through expenditure data on relevant supplies and, when available, from respondents' perception of having met related needs. All expenditure data was self-reported, in Lebanese pounds (LBP). Wherever possible, variables are kept in their continuous form instead of being categorized, in order to maintain the richness of the information they contain.

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[3] The full list of variables is in Table 3

Food security is defined by FAO as "when all people, at all times, have physical, social and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 1996). In literature, one standard, aggregate measure of food security does not exist. Instead, food security is measured by a multitude of indicators of calorie deprivation, monetary poverty, dietary diversity, and experience (WFP, 2009).

The following are adopted in this study: the food consumption score, where food items are divided into nine food groups, each weighted between 0 and 4, and summed up; the Household Weekly Dietary Diversity (HWDD) score which is the total number of food groups consumed the previous week and ranges between 0 and 12; the Household Daily Average Dietary Diversity (HDADD) score, which is the daily average of the Household Weekly Dietary Diversity and ranges between 0 and 12; food-related coping strategies, which is the weighted sum of five types of negative coping strategies that households use to address food needs when they experience access problems; and food expenditures during the seven days prior to the survey. They will all be treated as continuous outcomes.

Health encompasses both physical and mental health. It was measured through two self-rated indexes for physical and mental health, which were treated as categorical variables with five levels (i.e. not good at all, not good, half/half, good and very good). Expenditures on health was an additional outcome, computed by summing up the costs sustained for prescription drugs, doctors' visits and illness/injury/medical condition; it was treated as continuous variable. It is important to underscore that expenditures are a proxy of access and use, an "input" for health rather than a measure of health status itself.

The impact of cash assistance on the quality of housing was measured by comparing intervention and control group on the basis of the expenditures on housing (including rent, shelter materials, utilities and household items), which is a continuous variable.

Hygiene was measured with total self-reported expenditures on hygiene items during the previous 30 days, as well with an index counting the number of personal-hygiene item categories that the household reported access to: personal hygiene items (soap, toothbrush/paste, other personal hygiene items); cleaning/hygiene items (laundry detergent, cleaning products, etc); female hygiene items; baby care items (diapers, etc.).. It was treated as a discrete, count variable with a Poisson distribution, and possible values ranging between zero and four.

Total wellbeing expenditures incurred during the previous 30 days was the summation of food expenditures, water, health-related expenditures, personal and household hygiene, housing expenditures. It was treated as continuous variable.

Non-food related coping strategies are negative measures taken by households to cope with a lack of food or money to buy it. They are prompted by the need to procure food, but – differently from the food-related coping strategies - they are not related to food consumption behaviors. Among others, they include measures such as withdrawing children from school, sending them to work, or selling productive assets and other belongings. They were treated as binary variables.

The main exposure of interest is being a recipient of the LCC MCA program. It was treated as a binary variable (yes/no).

The unit of analysis is the household, intended as "a group of people who routinely eat out of the same pot, live in the same compound (or physical location), and share the same budget, managed by the head of household."[4]

2.5 Assumptions of the Study

According to Trochim, three main assumptions should apply in RDD studies (Moss & Yeaton, 2006):
1.   The assignment to intervention and control groups has been followed.
2.   The pattern of the forcing variable is correctly specified, through a linear or a polynomial function.
3.   No coincidental factor can explain a causal effect on outcomes of interest other than the intervention itself.

The first assumption was satisfied by removing all five crossovers,[5] which did not comply with the requirement of correspondence between the PMT score and the assignation to either intervention or control group. These were all cases of non-eligible households (based on the reported PMT) that received the intervention. The second assumption was addressed by modeling all outcomes with complex polynomial functions and progressively removing non-significant PMT terms from the highest degree to the lowest (Ross, 2006; Shadish, Cook, & Campbell, 2002). Finally, the third assumption was met by controlling for the possession of basic household items, household size and non-LCC cash assistance. The variable "possession of basic household items" was imbalanced at baseline, whereas "household size" and "non-LCC cash assistance" were imbalanced at midline and could be possible confounding factors.

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[4] This definition is contained in the midline survey questionnaire.

[5] The five cross-overs were removed from the sample corresponding to the largest PMT bandwidth (95-125); when restricting the bandwidth, the crossovers were two only.

An additional way to ensure RDD assumptions applied, consisted in establishing the most appropriate bandwidth of the PMT score and, consequently, the subset of sample subjects that would be retained for the study. In this regard, Van der Klaauw warned that larger bandwidths are more prone to "produce a bias in the effect estimate, especially if the assignment variable was itself related to the outcome variable conditional on treatment status", as it is the case here (Van der Klaauw, 2008). This decision was informed by the balance check and a post-hoc power analysis (see 2.6 Statistical Methods for the Balance Check at Baseline and Midline and 2.7 Statistical Methods for the Bivariate Analysis and Simple Regressions). Here, it is plausible to believe that no other discontinuity occurs at the specific PMT boundary of interest; hence, possible effects detected in the analysis could be reasonably attributed to LCC intervention.

One of the terms contained in the formula to compute the PMT score, is the total expenditures at baseline, for which it could have been argued that treating expenditures as outcome would have been methodologically incorrect. Contrary to this methodological position and under certain conditions, this seems accepted in RDD studies: according to Imbens and Lemieux (2008), an association between the forcing variable (here the PMT score) and the outcome is admissible, but the association must be smooth. Since this applies, any discontinuity at the PMT cut-off point is interpreted as a causal effect of the cash intervention (Imbens & Lemieux, 2008).

An additional extenuating circumstance in this study, is that the outcome of interest is expenditures at midline, and not at baseline, i.e. in a different time dimension. The following step has been to test whether there was any significant association between groups, as well as between pre- and post-intervention expenditures. No significant difference was found in the total expenditures at baseline between the control and the intervention group. Therefore, it is plausible to conclude that there is no imbalance between the two groups with respect to this variable and it will not be necessary to control for expenditures when conducting the impact analysis.

Secondly, and most importantly, the paired t-test on total expenditures at baseline and midline achieves significance, meaning that the discrepancy between pre and post-intervention expenditures is significantly different from zero (p-value=.000). The test resulted significant also if stratified the analysis by intervention status (i.e. intervention and the control groups are analyzed separately). In other words, there is a significant variation of expenditures from baseline to midline, therefore it is methodologically acceptable to treat expenditures at midline as outcome.

Finally, extreme coping strategies are also among the PMT variables. However, analyzing coping strategies as outcomes is not controversial from a methodological perspective, because the relationship between the variable in the PMT and the outcomes is not linear: the former is a binary variable indicating whether at least two extreme coping strategies out of a list of six is applied by the household; instead, the outcomes are coping strategies taken individually as binary variables.

2.6 Statistical Methods for the Balance Check at Baseline and Midline

The purpose of the balance check at baseline level was to verify the existence of possible significant differences between the intervention and control groups, with regard to key socio-demographic variables (sex, age and level of education of head of household), as well as to the variables contained in the Proxy Means Test (PMT) score, which is the forcing variable in the RD study. These covariates were: household size, disability adjusted dependency ratio, shelter type, occupancy type, toilet type, possession of selected luxury items (i.e. beds, refrigerator, water heater, dish washer), possession of selected basic items (mattresses, blankets, winter clothes, gas stove), extreme negative coping strategies, total household expenditures, and having at least one household member who has worked during the past 30 days. Balance was also checked for the total amount of cash assistance received from any source in Lebanon, and irrespective of the typology (e.g. restricted vs. unrestricted).

The statistical methods consisted in testing the existence of significant differences between intervention and control group in the means and proportions of the above-mentioned variables (i.e. tests of independence), within the entire sample and in two of its subsets. The subsets were generated selecting more or less ample PMT-score ranges, that guaranteed a fairly even split between intervention and control cases. The first subset contained households with PMT score ranging between 100 and 125, and included 1378 units; the second included 792 units with PMT score between 106 and 120; the third subset contained 508 units with PMT score ranging between 109 and 118.

The tests of independence entailed running the chi-square test between the intervention status, and all binary covariates, i.e. gender, extreme negative coping strategies, and at least one household member working; the chi-square test between the intervention status and multinomial covariates, i.e. shelter type, occupancy type, toilet type; the Cochrane Armitage test with the ordinal covariate, i.e. education level of head of household; the unpaired two-sample t-test for unequal and equal variances, between the dependent variable and all continuous and discrete covariates, i.e. age, household size, disability-adjusted dependency ratio, count of luxury assets, count of basic assets, total household expenditures.

When conducting the chi square test, the expected cells were displayed to verify that no more than 20% of them had values lower than 5; where this occurred, the Fischer exact test was employed. Prior to conducting the t-test, the test of equality of standard deviation (hence homogeneity of variance) was conducted to establish whether the t-test had to be set for equal or for unequal variances.

Contrary to the analysis performed with the entire sample, in the following instances different tests were chosen for the two smaller subsets: Fisher exact test was used instead of Cochrane-Armitage between intervention status and "education level of head of household", because more than 20% of the expected cells had counts <5; the independent sample t-test for equal variances instead of the t-test for unequal variances was run for the variables "household size" and "possession of luxury household items", following findings of sd-test.

Cochrane-Armitage between intervention status and "education level of head of household", because more than 20% of the expected cells had counts <5; the independent sample t-test for equal variances instead of the t-test for unequal variances was run for the variables "household size" and "possession of luxury household items", following findings of the sd-test.

In a second stage, simple logistic regressions were run between treatment status and the statistically associated covariates, to generate crude odds ratios and verify if the associations found with the independence tests had significant strength. For multi-level categorical variables (i.e. the education level of head of household, shelter type, the occupancy type, the three-category main income source, self-rated health) a multi-level logistic regression was conducted.

For the entire sample only, the same variables at baseline were plotted against the PMT score to generate graphs, using STATA rdplot (Figure 3). Generally, this command is used to assess impact on an outcome comparing two sides of the cut-off; here, the dependent variables were not outcomes, but pretest covariates. The intention was to show with a visual aid which variables had a significant discontinuity between the two groups around the cut-off point.

Each of the subsets had its own set of variables with significantly different proportions and means between the intervention and the control groups; the number of unbalanced variables decreased as the PMT bandwidth got narrower (Figure 1).

Figure 1: Variables with imbalance between intervention and control groups for different PMT bandwidths
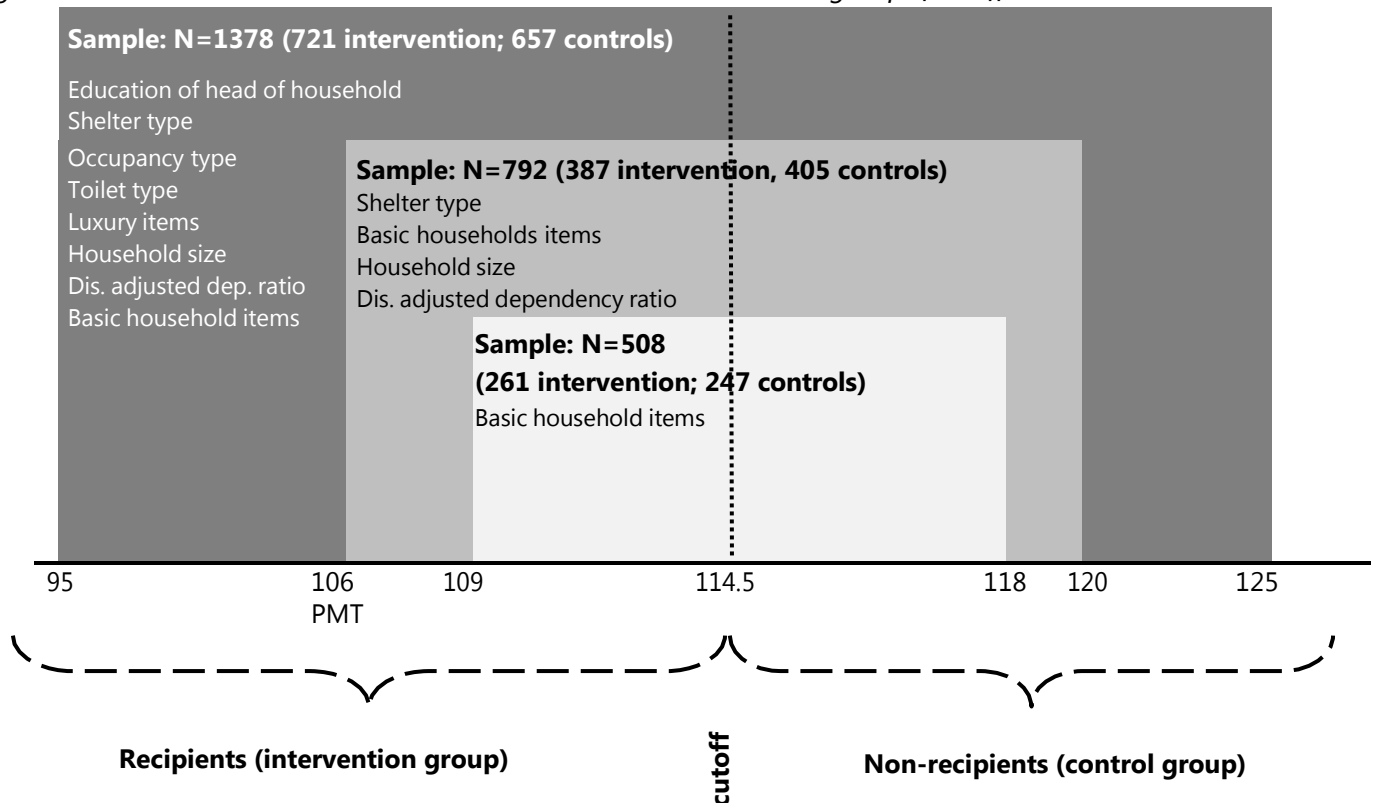
Within the entire sample, between intervention and control group, there is imbalance in eight out of eleven relevant variables, most of which are contained in the PMT. The subset with 508 cases shows that, close to the PMT cut-off point of 114.5, the two groups are similar under all of the socio-economic aspects composing the PMT score, except the variable "possession of basic household items".

The balance check at midline was conducted on possible confounding factors, i.e. household size, age of head of household, sex of head of household and total amount of non-LCC cash assistance.

Independent t-tests conducted on household size show that, while control and intervention group at baseline are balanced with respect to this variable, they are imbalanced at midline; households in the intervention group are on average larger than in the control group (6.60 household members vs. 6.11; p-value 0.029). Accordingly, the intervention effect will have to be adjusted for household size at midline. Additional paired t-test on household size do not provide evidence of a significant change between baseline and midline, also when stratified by intervention status.[6]

Similarly, non-LCC cash assistance was balanced at baseline and significantly different at midline, when the average amount of cash assistance at midline is on higher among LCC recipients (147,049 LBP vs. 122,277 LBP; p-value=0.005). Hence, when analyzing the impact of LCC cash aid, it will be necessary to control for the total amount of non-LCC cash assistance received in the month preceding the survey.

2.7 Statistical Methods for the Bivariate Analysis and Simple Regressions

Categorical outcomes were cross-tabulated with the intervention status to describe their distribution across intervention and control groups, and assess associations. The crude ORs for the categorical outcomes and the intervention status were estimated through simple regression models in the three samples.

Means, standard deviations and ranges were computed to characterize the continuous and the count covariates. The histograms and quantile-normal transformations of continuous variables were plotted, and tests of normality were run, to determine the closest-to-normal transformation prior to proceeding with further analysis. Continuous outcomes were transformed according to the plots and the findings of these tests, and simple linear regressions were conducted for all of them, to estimate coefficients of association.

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6   There are 171 cases out of 508 where household size at baseline is different from household at midline. There are 77 cases out of the 171 for which the household size at baseline is bigger than the household at midline; out of them 38 are in the intervention group and 39 in the control group. There are 94 cases out of the 171 for which the household size at baseline is smaller than the household at midline; out of them 48 are in the intervention group and 46 in the control group.

These tests and regressions were run for the three subsets of cases, from the largest to the narrowest. The results of the simple logistic and linear regressions show, for the most part, consistency among the three samples, albeit with more conservative results for the sample with narrower PMT score bandwidth.

Then, a post-hoc power analysis of the study was conducted for all non-significant differences between intervention and control groups in the smallest sample, with a view to explore whether non-statistically significant results could be explained by the insufficient size of the sample. In other words, the objective of the post-hoc analysis was to measure how powerful the sample of 508 households was to detect any existing differences in proportion and means between intervention and control groups, considering that the bigger the sample, the higher its power to detect even the smallest differences. The findings informed a final decision around the size of the sample to be used for the multi-variable analysis.

2.8   Statistical Methods for the Multiple Variable Regressions

As justified in the previous section, the multi-variable analysis was run exclusively on the sample with the narrowest PMT score bandwidth (i.e. 109-118).

Using this subset allowed on the analysis to be conducted on simpler models (i.e. with fewer variables), whereby the effect of confounding factors could be more easily estimated. In fact, it would have been difficult to predict how the presence of many unbalanced covariates at baseline would have affected the polynomial regressions in larger samples.

Multivariable logistic, linear and Poisson regression models were generated for all categorical continuous, and Poisson outcomes, respectively. Models included all variables with a p-value<0.2 in their crude OR with intervention status. Through these multi-variable regressions, ORs and coefficients were estimated by modeling the outcomes of interest against the intervention status, and adjusting for different degrees of the PMT score and interaction terms.

The models were also adjusted for the possession of basic household items, household size reported at midline, and total amount of cash assistance received from alternative sources to LCC program. Possession of basic household items was the only unbalanced variable between intervention and control groups at baseline, in the 508-subject subset. Household size at midline and total amount of non-LCC cash assistance are possible confounding factors of the impact of LCC cash aid.

As the aim was to exclude the presence of interactions and non-linear PMT score terms, the analysis started with fourth-degree polynomial models. Non-significant terms were removed, one by one, provided that the changes in pseudo R2 or in the adjusted R2 were negligible and that the root MSE would decrease. Different iterations of models were assessed and aimed to optimize statistical significance and to maintain a pseudo R2 (or the adjusted R2) of acceptable magnitude and ensure consistence between the significance of the model and

LCC
LEBANON CASH CONSORTIUM
الإتحـاد النـقـدي اللبنـاني

Humanitarian Aid
and Civil Protection

UKaid
from the British people

that of the individual covariates. The results of the multi-variable polynomial logistic and linear regressions were compared to the regression-discontinuity plots. These were generated with the robust package in STATA 13, by manually setting a PMT score bandwidth that allowed to retain all observations in the sample, while maximizing the power of the analysis. The plots are a good visual aid to identify discontinuities in outcomes.

2.9   Supplementary Analysis

Supplementary tests were conducted at midline to explore and determine patterns of association between sex of head of household and all the outcomes of the study. Simple logistic, linear and Poisson regressions were conducted on categorical, continuous and count variables, respectively.

All analyses were conducted using STATA 13, and were considered statistically significant at a level of 0.05.

3.   Results[7]

The sample used for the impact analysis is formed of 247 control and 261 intervention subjects. The average age of heads of household is around 39, with the youngest head of household being aged 17 and the oldest; they are mostly men (around 76%) and a little more than the half has attained a primary school degree. With regard to the sex of the head of households, the proportion of female-headed households in this sample is significantly larger than among LCC recipients, meaning that – closer to the cut-off point (i.e. recipients with the lowest vulnerability levels), we find more women-headed households than among more vulnerable recipient households.[8] Households in the intervention group are on average larger than those in the control group (6.60 household members vs. 6.11); the smallest household consists of one member only, and the largest includes 19 members. Slightly more than the half of households live in apartments or houses and the greatest majority rent their shelters, with a third of the households residing in the North of the country and another third in Mount Lebanon (Table 4).

All significant findings of the impact evaluation are reported in Table 1 below.

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7   The findings of the impact evaluation are related to the analysis on the smaller subset only (N=508). They are reported in *Table 1*. Graphic representations of the discontinuities are in *Figure 2*.

8   This finding results from the test of proportions for one sample on both the entire sample of 508 participants and the intervention group only (p-value=0.000 in both tests). The hypothesized proportion (86%) was that found by El Asmar in his pre-post evaluation study of a representative sample of LCC recipients (El Asmar, 2015).

Table 1: Comparison of means and proportions and significant intervention effects (N=508)[9]

Outcome	Control	Intervention	Coefficient / OR intervention	Coefficient / OR interaction		Point estimate at PMT=114.5	
						Control	Intervention
Food expenditures [a]¤	**N=246**	**N=261**					
Mean ± sd	94521±103316	104875±77308	43.17	--		81,094	107,545
p-value			.043*	--			
Gas expenditures¤¤	**N=246**	**N=261**					
Mean ± sd	20270±11192	23966±11108	.11	--		18,207	20,324
p-value			.003**	--			
Total wellbeing expenditures¤¤	**N=246**	**N=261**					
Mean ± sd	798338±605240	911848±548433	.19	--		496,439	599,724
p-value			.002**	--			
No. days borrowed food	**N=246**	**N=261**					
Mean ± sd	1.74±2.26	1.47±1.88	-.27	--		.57	.30
p-value			.003**	--			
No. days eating elsewhere	**N=246**	**N=261**					
Mean ± sd	.17±.65	.27±.99	-9477.9	163.71[b]	-.70[c]	-.24	-41.62
p-value			.000***	.000***	.000***		
No. days eating dairy	**N=246**	**N=261**					
Mean ± sd	2.52±2.74	3.10±2.86	.17	--		.87	1.04
p-value			.001**	--			
Main income source							
Coping and other (base)	42 (17.14)	23 (8.85)					
Cash aid (all sources)	124 (50.61)	177 (68.08)	not significant	--			
Work vs. coping and other	79 (32.24)	60 (23.08)	60.14 / 1.32e+26	-.52 / .60		-1.01	-.41
p-value (of work vs. coping)			.041*	.044*			
Debt for rent							

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9 The table reports only significant effects. The two last columns display the point estimate of the outcome for a hypothetic non-recipient and a recipient with PMT≈114.5, more precisely, between 114.35 and 114.65.

No	112 (47.46)	149 (61.32)				
Yes	124 (52.54)	94 (38.68)	-.59 / .55	--	.09	-.50
p-value			.002**	--		
Felt happy						
No	128 (54.70)	80 (31.37)				
Yes	106 (45.30)	175 (68.63)	1.45 / 4.27	--	-.38	1.07
p-value			.000***	--		
Stress due to financial issues						
No	28 (11.86)	17 (6.77)				
Yes	208 (88.14)	234 (93.23)	4.34 / 76.76	--	1.22	5.56
p-value			.001**	--		
Increased community trust						
No	109 (46.19)	98 (40.00)				
Yes	127 (53.81)	147 (60.00)	1.53 / 4.62	--	-.11	1.42
p-value			.002**	--		
Felt more secure						
No	113 (48.50)	89 (35.18)				
Yes	120 (51.50)	164 (64.82)	2.11 / 8.21	--	-.69	1.42
p-value			.000***	--		

§ From logistic or linear regression with polynomial PMT score terms and interaction.

¤ Square root transformation of the variable.

¤¤ Log-transformation of the variable.

[a] Having removed three extremes of expenditures>1000000 because not plausible.

[b] Linear interaction term.

[c] Quadratic interaction term.

Overall, LCC cash recipients have higher consumption levels and feel they can best satisfy their households' needs, as shown by the significantly greater expenditures on physical and material wellbeing and by the happiness they report. More specifically, monthly expenditures on food, water, housing, health and hygiene of a hypothetical recipient household at the cutoff point would be on average 20.8% higher than those of a non-recipient household with the same vulnerability level and similar characteristics (p-value=.002).

% effect of LCC cash assistance on expenditures: simulation at cutoff point
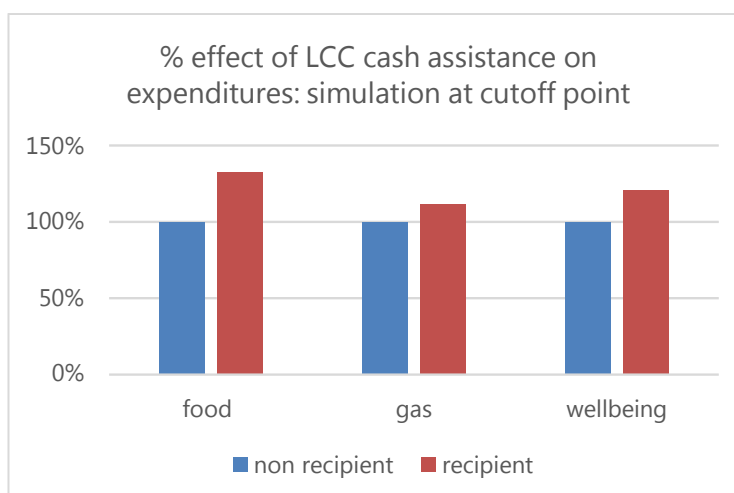
Around the cutoff point, expenditures on food are on average 32.6% higher for LCC beneficiaries compared to those who are excluded from LCC aid (p-value=.003). Nonetheless, higher consumption does not translate into greater food security. In fact, none of the food security-related indicators is significantly impacted by LCC cash assistance: there are no significant differences in dietary diversity or in the weighted frequency of the intake of specific types of food (i.e. FCS). On the contrary, the FCS is significantly associated with non-LCC cash assistance, which includes also WFP food vouchers (p-value=.015). Also, LCC cash assistance does not have any impact on food-related coping strategy index, to which both recipients and non-recipients resort in a similar way.

The analysis of individual food groups reveals that LCC recipients consume dairy with a greater frequency compared to non-recipients, taking into account family size (p-value=.001); more specifically, on average, a recipient household would consume dairy for more days compared to a non-recipient household. Also, family size and the possession of basic assets are significant predictors of frequency of dairy intake: the greater the family size, the greater the frequency with which households consume dairy products. Instead, the relationship with possession of basic assets is inversely proportional.

If items from the food-related coping strategy is analyzed individually, it is possible to detect a significant effect of the LCC assistance on some food-related coping strategies, namely borrowing food and sending households' members to eat elsewhere. LCC recipients resort less frequently to borrowing food (p- value=.003) or to sending households' members to eat elsewhere (p-value=000), in order to meet food consumption needs.

The level of economic vulnerability, measured with the PMT score, modifies the effect of LCC assistance on households' choice of being hosted by others for consuming a meal, also in a quadratic way (p-value=.000 for the linear interaction term; p-value=.000 for the quadratic interaction term). As shown in the discontinuity plot (Figure 2), there is an evident

discontinuity at the cutoff point, but among recipients the frequency of using this coping strategy varies with the PMT; it increases with the PMT and then decreases again to reach its lowest point near the cutoff. Interestingly, and contrarily to the negative sign of the coefficient, among non-recipients the average number of days in which the coping mechanism is applied is lower than among recipients (.17 vs. .27).

Beneficiaries versus Non-beneficiaries

Monthly expenditure

Total

$ → $ **21%** ↑
increase for beneficiaries

Food

32% +
more for beneficiaries

Gas

12% +
more for beneficiaries

Debt

Non-beneficiaries
1.8x
more likely to rely on debt for rent

Security

Beneficiaries felt
8.2x
more secure

When accounting also for cash assistance received from other sources, LCC cash aid does not affect households' choice of eating less expensive or less preferred food. On the hand, receiving cash assistance from other sources does make a difference in this regard, and higher amounts are

Effect of LCC cash assistance on coping strategies: simulation at cutoff point
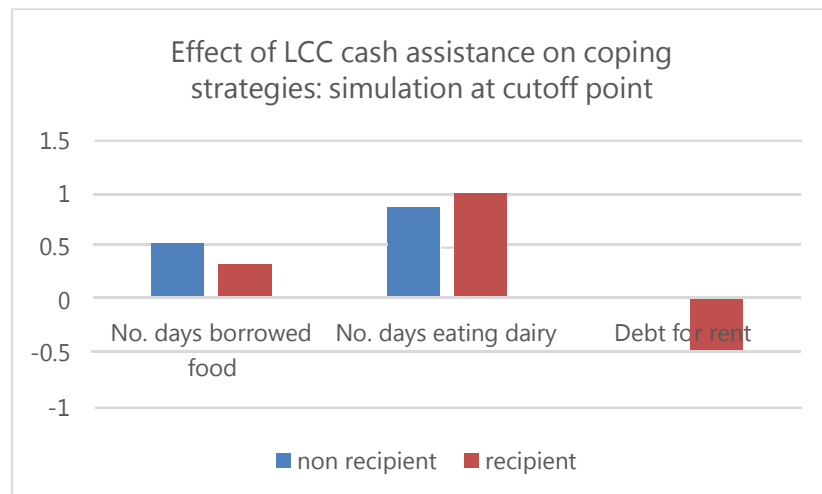
associated to a more limited use of this coping mechanism. Perhaps, this is because of WFP food vouchers, which are contained in the variable "non-LCC cash assistance" and are transferred to nearly all the study participants, except 16 in the control group, on a per capita basis. Thus, bigger families receive more support to purchase food, while they receive the same amount of multi-purpose cash grant as smaller families.

With regard to housing expenditures, the only expenditure that is positively affected by receiving LCC aid is that on gas. More specifically, gas expenditures in a LCC beneficiary household near to the PMT cutoff point would be 11.6% higher than in a non-beneficiary household (p-value=.003). Household size is also a significant predictor of how much households spend on gas: the bigger the household, the higher gas expenditures.

Not only can recipients spend more in consumption goods, but they also struggle less to sustain important costs such as rent of their housing. As a matter of fact, LCC cash assistance protects beneficiaries from having to borrow money to pay their rent. In other words, a non-LCC beneficiary is 1.8 times more prone to indebtedness to rent accommodation as compared to a recipient household with similar socio-demographic characteristics (p-value=.002). Since the crude OR is very similar to the adjusted OR, it is safe to assume that the effect of the intervention is quite robust and not affected by household size, non-LCC cash assistance and possession of basic household items. However, there is no evidence of an impact on total amount of debt, which is significantly associated to household size and possession of basic household items.

Compared to non-beneficiaries, LCC cash recipients are more likely to work for their main income source as opposed to coping strategies, such as debt, remittances, gifts and

sale of assets or food (p-value=.041). As shown in the discontinuity plots (Figure 2) and confirmed by the significant interaction term (p-level=.044), the intervention changes the relationship between vulnerability level and households' main income source: recipients' preference for work over coping strategies is less marked. Also, smaller households and households with higher PMT scores are more likely to depend on cash aid as a source of income, regardless their reception of LCC multi-purpose cash assistance.

Psychosocial wellbeing is positively affected by LCC cash assistance. LCC beneficiaries report being significantly happier than non-recipients for being able to satisfy their households' needs, considering the other baseline-level characteristics that may have impacted on this result. Those receiving LCC cash aid were 4.27 times more likely to report happiness for meeting households' needs,

Effect of LCC cash assistance on psychosocial

compared to non-recipients (p-value=.000). Although they consume more, are less dependent on debt to pay off their rent, and are happier, LCC beneficiaries feel more stressed for financial issues than non-beneficiaries (p-value=.001).
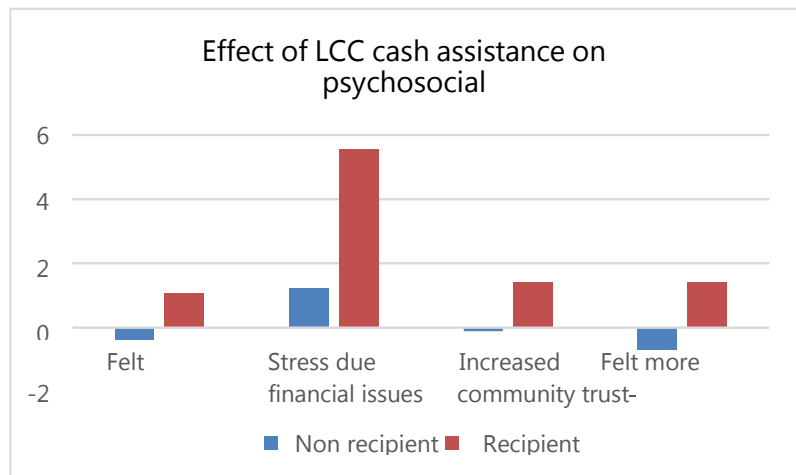
Finally, with regard to their social relations within the community in which they live and with which they interact, LCC beneficiaries feel 8.2 times more secure, as compared to non- beneficiaries (p-value=.000). In addition, LCC cash assistance appears to increase the sense of trust within the community hosting them, by 4.6 times (p-value=.002).

The supplementary analysis of the association between sex of head of household and the outcomes of interest revealed that households headed by a female - in this PMT range and regardless of receipt of cash assistance - are on average smaller (p-level=.001), and their head is younger (p-level=.000) (Table 2). They have lower levels of consumption, across the board, but also lower amounts of outstanding debt (p-level=.001); these findings could be explained by the fact that women-headed households are smaller than men-headed households. Compared to them, they are more reliant on cash aid (p-value=.042). Very importantly, female-headed households resort more frequently than male-headed ones to negative food-related coping strategies. More specifically, on average they borrow more food (p-value=.000), they are more inclined to send household's members to eat elsewhere (p-value=.029), and their households experience forced fasting more frequently than male- headed households (p-value=.047). However, female heads of household restrict adults' food consumption less frequently than their male counterparts (p-value=.036), this also can be attributed to a lower number of adults. In terms of dietary diversity, female-headed households eat beans more frequently and vegetables less frequently (p-value=.006; p-value=.000). Their reported health status is comparatively worse than that of male-headed households (p-value=.017).

Beneficiaries versus **Non-beneficiaries**

Beneficiaries felt

4.6x

more trust in
host community

Happiness

Beneficiaries

4x

happier

But more financially
stressed
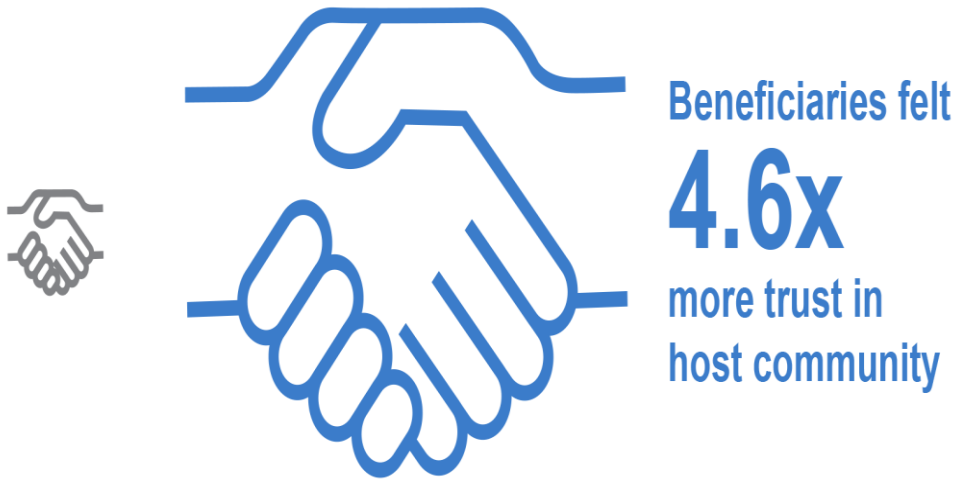
Table 2: Significant, unadjusted coefficients and OR between outcomes and sex of head of household at midline (N=508)

Variable	Male	Female	Unadj. coeff./OR	p-value	95% CI
Age of HoH (n=508)	40.121±10.22	36.21±11.13	-3.91	.000***	-6.06 to -1.77
Household size (n=508)	6.57±2.33	5.69±2.97	-.88	.001**	-1.39 to -.37
Food exp. (7d) (n=506) ¤	102338±76364	81850±61895	-34.15	.003**	-56.39 to -11.91
Hygiene exp. (n=440) ¤¤	30025±29648	21758±19959	-.26	.001**	-.42 to -.11
Total wellbeing exp. (n=506)¤¤	891147±593122	745911±517399	-.19	.003*	-.32 to -.07
Total debt (n=483)¤¤	1103140±1237383	838542±913730	-.33	.001**	-.53 to -.14
No. days borrow food (n=507)	1.48±2.05	2±2.13	.30	.000***	.15 to .45
No. days no eating (n=507)	.08±.45	.14±.75	.60	.047*	.01 to 1.20
No. days restricting adults' food (n=507)	1.69±2.42	1.41±2.23	-.18	.036*	-.40 to -.01
No. days eat elsewh. (n=507)	.20±.77	.31±1.03	.44	.029*	.05 to .83
No. days eating beans (n=507)	3.27±1.93	3.80±1.92	.15	.006**	.04 to .26
No. days eating veg. (n=507)	3.24±2.35	2.58±1.89	-.23	.000***	-.35 to -.10
No. days eating spices (n=507)	6.00±1.91	5.12±2.44	-.16	.000***	-.25 to -.07
Self-rated physical health	N=501			.017*	
Very poor (base)	39 (10.16)	24 (20.51)			
Poor	95 (24.74)	35 (29.91)	.60	.116	.32 to 1.13
Half	101 (26.30)	23 (19.66)	.37	.004**	.19 to .73
Good	115 (29.95)	29 (24.79)	.41	.007**	.21 to .79
Very good	34 (8.85)	6 (5.13)	.29	.015*	.10 to .78
Main income source (binary)	N=505			.042*	
Not cash aid	165 (42.86)	39 (32.50)			
Cash aid (all)	220 (57.14)	81 (67.50)	1.56	.044*	1.01 to 2.40

¤ Square root transformation of the variable.

¤¤ Log-transformation of the variable.

¥ P-value of simple linear regression.

† P-value of Poisson regression.

*, **, *** Significance levels.

Figure 2: Discontinuity plots of outcomes (N=508)

RD plot - Main income source 3 categories N=508

RD plot - Debt for rent N=508

RD plot - Happy for meeting household's needs N=508

RD plot - Financial stress N=508

RD plot - Trust within the community N=508

RD plot - Feel secure N=508
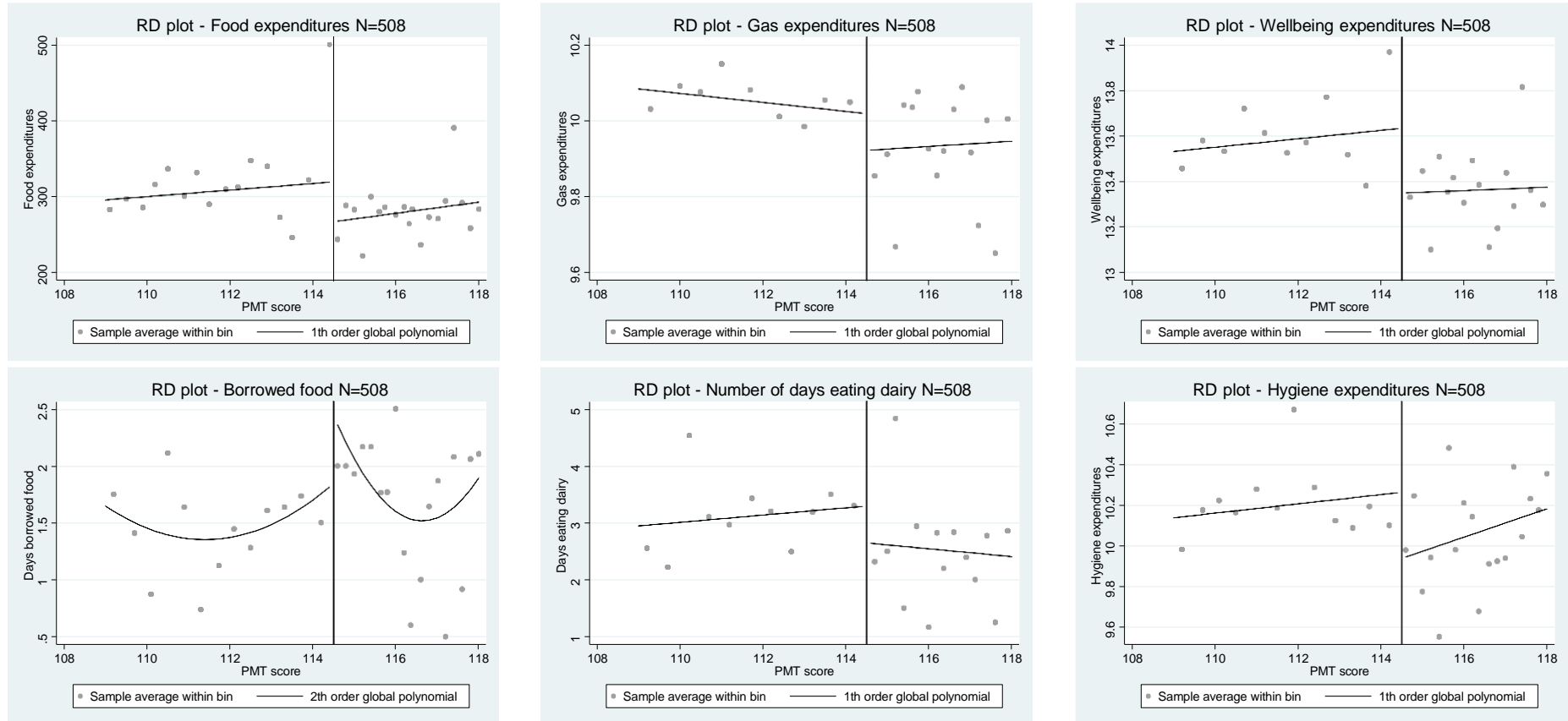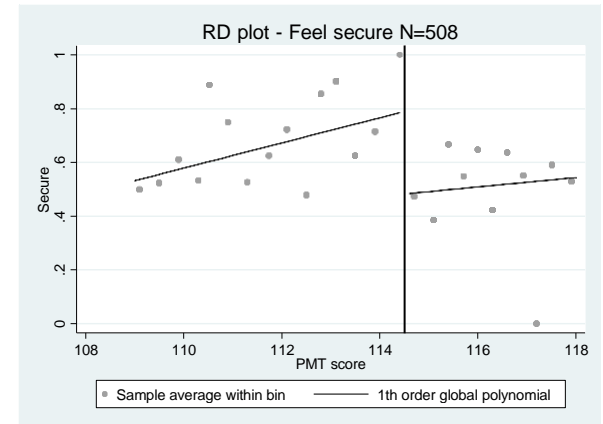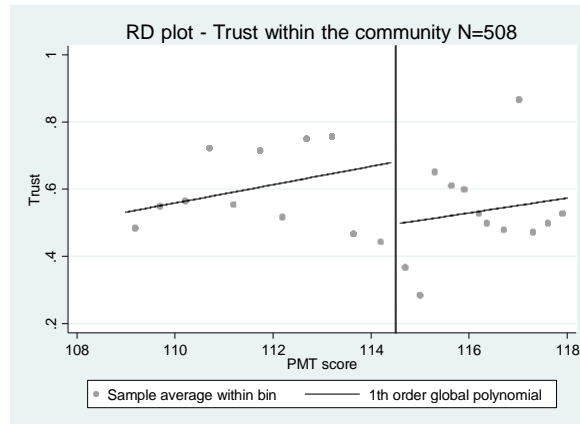
4. Discussion

4.1 Interpretation of Findings

The central question of this study was: did the LCC multi-purpose cash assistance program help recipients in achieving higher levels of physical and material wellbeing? The study findings show multiple positive outcomes of the program.

Other recent studies which used experimental or semi-experimental designs (i.e. RCT or RDD) provide similar findings for common outcomes of interest. It is important to underline that, in public-health and social sciences research, RCTs are reputed the "gold standard" for evaluating the effectiveness of interventions, due to their scientific rigor; RDD is a quasi-experimental design, increasingly used in economics, political science, epidemiology and social sciences, also apt to measure impact (Imbens & Lemieux, 2008). Differently from previous studies on cash aid, this was rather exploratory, in that it searched for associations with more than 40 outcomes, all of which were related to households' physical and material wellbeing, and coping strategies. To the researcher's knowledge, it is the widest range of outcomes analyzed so far in MCA impact studies.

Not having found evidence of any undesirable effect on our outcomes of interest – except the financial stress - is in itself a positive result. The strong effect of cash in determining a sense of happiness for meeting households' needs is a validation of MCA as a means to deliver basic assistance to Syrian refugees in Lebanon, from their own point of view. Recipients perceive a greater ability to address their basic needs.

The analysis was controlled for household size and amount of non-LCC cash, which were found unbalanced at midline between intervention and control groups; they are conceptually important in the framework of this analysis as they may affect the outcomes. Larger households are ex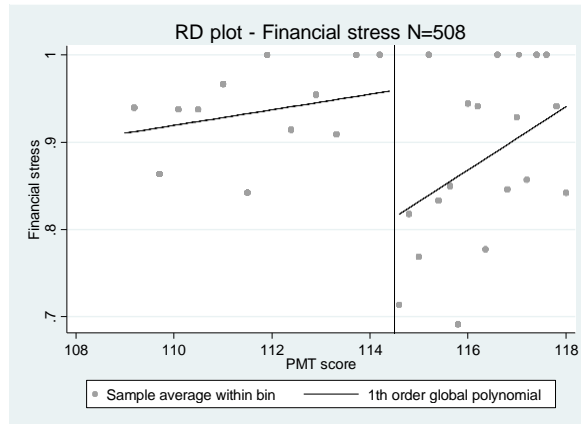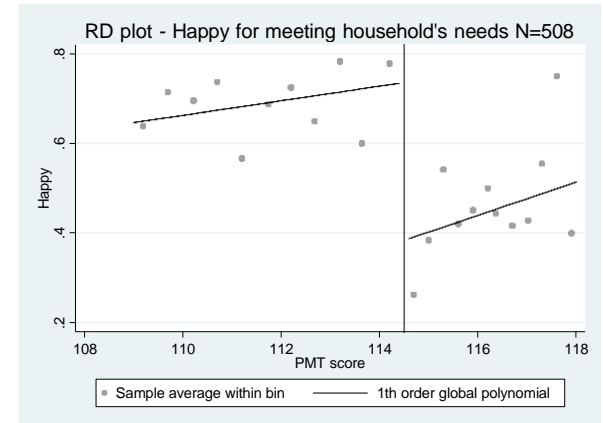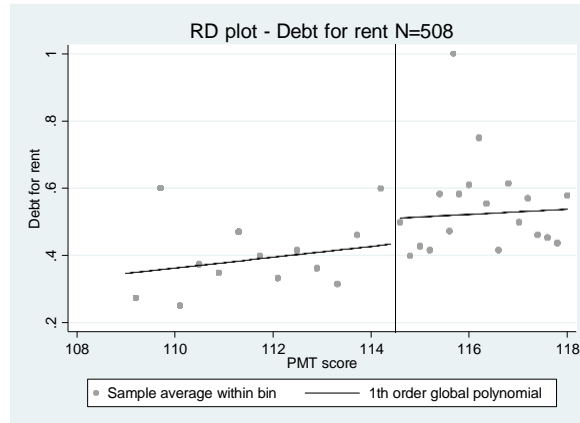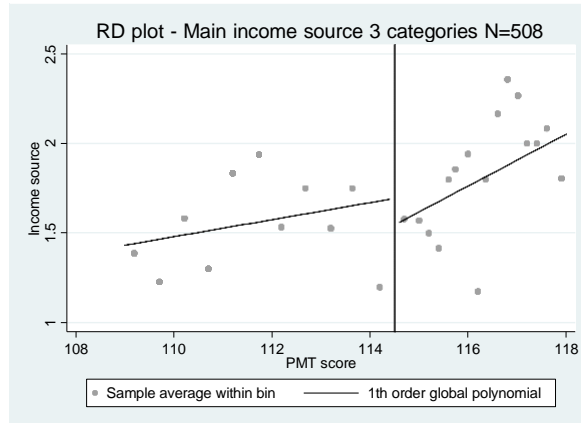pected to have greater needs for food and non-food items, as the results confirm; cash aid offered by non-LCC sources is expected to generate similar results as those of LCC cash grants.

Targeting larger households appears to be an appropriate approach, as household size is significantly associated to many of the physical and material wellbeing outcomes, even after taking into account LCC and non-LCC cash aid. LCC program designers may consider adjusting cash amounts based on household size, but a research on per-capita amounts is needed to provide robust arguments in support to this suggestion.

The study shows that LCC assistance causes an increase in expenditures on what was referred to as "physical and material wellbeing", encompassing food, water, housing, health and hygiene items. In particular, LCC aid generates an increment in food expenditures, which they

add on top of the food vouchers that they receive from WFP.[10] Increased consumption levels as an effect of unconditional cash assistance are also found by Haushofer and Shapiro in an RCT study conducted in Kenya (2013), as well as by Lehmann and Masterson in an RDD study conducted in Lebanon (2014). Both studies found also that cash is not spent on non-essential purchases (i.e. not dictated by humanitarian needs or considered superfluous by development actors). Giving cash assistance without restrictions allows recipients to make their own decisions, according to their needs, and these needs are essential to survival; case-by-case needs assessments are not required and it is not necessary to restrict the use of cash grants to match individual households' needs.

According to the indicators that were employed in this study, providing MCA does not translate into lower food insecurity levels, or a more diversified diet, or less reliance on negative food-related coping strategies. However, as found also by Lehmann and Masterson, cash aid prompts beneficiaries to spend more money on food items (32.6% more; p-value=.003). Such a difference in expenditures can be interpreted as higher food consumption, or consumption of more expensive food.

How can we explain higher food expenditures in conjunction with no improvements in food-related indicators? It could be argued that the food-related indicators are not robust enough to capture existing differences between recipients and non-recipients of LCC assistance, for instance because composing items have not been weighted properly. The validity of food security measures currently in use is still debated in the relevant literature. None of the existing measures alone is able to capture variations of all dimensions of food security, both as a status and with respect to its relevance to nutrition, and as a dynamic condition that may change due to external shocks and seasonal effects (Headey and Ecker, 2012).

In fact, when analyzing coping strategies and food groups individually, significant effects were found: LCC assistance reduces the frequency with which beneficiaries borrow food or send members to eat elsewhere, and increases the frequency with which they eat dairy products. A substantive significant decrease in the proportion of households that resorted to borrowing food after intervention was also found by El Asmar in his pre-post evaluation study of the LCC program: 17% of recipients reduced the use of this coping strategy. They also found a borderline significant decrease in the food-related CSI (p-level=.044) (El Asmar, 2015). Interestingly, and contrarily to the negative sign of the coefficient, among non-recipients the average number of days in which the coping mechanism is applied is lower than among recipients (.17 vs. .27); we would expect the opposite. This contradictory result must be due to the effect modification of the intervention

In their study, Lehmann and Masterson found also that cash assistance helped beneficiaries avoid the reduction of meals and meal size, as well as the restriction of adults' food

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10 At baseline, all study subjects except 16 controls were receiving food vouchers.

consumption to children's advantage (Lehmann & Masterson, 2014). To address possible weaknesses in the food-related indicators used in this study, it would be recommended to follow guidelines in the development and validation of indicators and scales, and to adopt a more varied range of food security indicators able to better describe food insecurity. An example is the Food Insecurity Experience Scale, which is currently tested by FAO (FAO, 2015). In this study, since the validity of CSI and FCS scale weights was doubted, an item-based analysis proved to be more informative.

Differently from Lehmann and Masterson's study, no significant impact has been found on school enrolment and child labour which they found higher and lower, respectively, as an effect of cash aid (Lehmann & Masterson, 2014). It should be noted that schooling of refugee children depends on multiple conditions (e.g. access and availability of education services), in addition to the availability of financial means. Also other non-food related, extreme coping strategies (e.g. child marriage, dangerous work) were not affected by LCC cash aid, according to the findings of the present study. This means that, either the cash grant amount is not sufficient to deter the use of these coping strategies, or that there are other reasons leading households to make such choices, in addition to financial vulnerability, or a combination of both. It is to be said that instances of extreme coping strategies are particularly rare, and that some respondents may have failed to report honest answers, in the fear of stigma.

Cash assistance in this humanitarian setting with limited income-generating opportunities is not a once-for-all fix and, when the amount is relatively low compared to households' needs, it helps only marginally and temporarily. Higher happiness in conjunction with perception of financial stress may indicate that recipients are aware of the potentially temporary nature of cash assistance, and may fear not to be able to cope with their needs, should financial assistance be discontinued. Discontinuing cash assistance may cause households to resume the negative coping strategies that they had abandoned, and would force them again into debt (especially to cover their rent). This may be because they have no savings and are already indebted (Lehmann & Masterson, 2014; Foster & Westrope, 2015).

In this regard, El Asmar and Masterson have found that the washout period of cash assistance for Syrian refugees in Lebanon is as short as two months. This means that, after this period of time, the benefits of cash assistance fade away and the households returns to pre-assistance situation (El Asmar & Masterson 2015, unpublished).

Higher happiness was found as well by Haushofer and Shapiro in their RCT in Kenya; however, differently from this study, they also found that cash makes recipients less stressed and more satisfied in life. To measure these outcomes, they used psychological questionnaires, perhaps more sophisticated than the ones used in this survey. For larger, one-off transfers, they also tested the level of cortisol in participants' blood, which is undoubtedly a more reliable indicator of this outcome (Haushofer & Shapiro, 2013).

Also this study, similarly to those of Rivera Castiñeira et al. (2009), and Haushofer and Shapiro (2013), did not find any evidence of a significant effect of LCC cash aid on use of health services (approximated by expenditures), self-reported physical and mental health status, and adoption of unhealthy behaviours. Rivera et al. suggest that this may be a consequence of the insufficiency or poor quality of health services and information around nutrition and healthy behaviours (Rivera et al., 2009). Cash interventions address an access issue, but leave unresolved a possible deficiency of service availability and households' awareness of the basics of nutrition and health.

In Lebanon, registered Syrian refugees are granted universal access to health services, based on a set of conditions that transcend households' economic vulnerability. Therefore, we can hypothesize that health services are equally distributed between households in the intervention and in the control groups of this study. In addition, we may also assume that, in a state of major economic stress, the consumption of health supplies and services is deprioritized as compared to that of food or rent.

It is worth noting that El Asmar, however, reported a significant and substantive increase in health expenditures among recipients, compared to baseline; the mean health expenditure increased by 62,169 LBP (p-level=.002). The different finding may be explained by the fact that El Asmar's analysis was not adjusted for possible confounding factors; hence, the increased expenditures in health may be attributed (also) to other reasons than the LCC intervention. For instance, after controlling for other variables, non-LCC cash aid has been found associated to better physical health status for those who report a poor state of health compared to very poor (p-value=.003).

Part of the planned analysis was not conducted due to unavailability of necessary data. The impact on one of the outcomes of interest, namely the self-rated housing improvement index, was not measured because the question was asked to the intervention group only. The pre-post evaluation conducted by El Asmar allows to shed some light on quality of housing. Their results "indicate a general improvement in the shelter types that households resorted to after the cash intervention. In fact, while only 16% and 10.5% of the sample initially resided in not shared apartments and single rooms, these numbers respectively increased significantly to 21% and 20% at midline. Furthermore, 7%, 14% and 7.5% respectively resided in informal settlements, substandard shelters, and unfinished buildings. These numbers significantly decreased to 0.9%, 8.7% and 4.2%" (El Asmar, 2015). After intervention, the use of flush toilet increased as well, from 13% to 17.4%. Recipients can also afford more luxury assets than prior to the intervention (El Asmar, 2015).

Another limitation of the study was lack of data on transaction reports showing actual spending of the cash assistance. In Kenya, Haushofer and Shapiro (2013) found that large, one-off transfers result in greater intervention effects than small, monthly transfers, but with decreasing marginal returns; hence, after reaching a certain level of transfer, the intervention effect does increase. In Lebanon, a knowledge gap persists with regard to the plausibility of

adjusting cash-grant amounts on the basis of household size; the recommendation is to address this gap.

In fact, the significant association between household size and many of the outcomes of interest of this study (in simple as well in multi-variable models) supports the idea that per-capita cash amounts would be more effective in reaching the desired goals of MCA, as compared to one-fit-all amounts. Household sizes varied quite substantively within the sample, from 1 to 19. The more numerous a household, the higher the amount of outstanding debt, rent, expenditures in gas, hygiene items, healthcare, food and, more generally, expenditures for the household's wellbeing; dietary diversity (HDADD) improves as well, proportionally to household size; larger households report greater consumption of dairy; they resort less often to borrowing food from others; they also are more likely to rely on work as the main source of income compared to non-sustainable coping strategies. Larger households are also less likely to rely on cash aid than smaller households, perhaps because they can count on more members who can work and earn an income. Before concluding that cash grants should be fixed according to household size, these findings must be confirmed by further analysis on the per-capita MCA amounts. In any case, they are sufficient to confirm the importance of prioritizing larger households when targeting cash assistance.

Household size has changed across time, increasing from baseline to midline, although not significantly; at midline, LCC recipient households are on average significantly larger than non-recipient households. This may be due to new arrivals from Syria and family reunification or restructuring, as well as births. It could also be imputed to the intervention itself, which may have encouraged members of previously different households to get together and share cash aid. Part of the changes could be the result of inaccurate data collection; however, these are assumed to be equally distributed in the interventions and the control groups. If household size figures are real, basic needs procured with LCC cash grants have been shared among a greater number of individuals, which may have affected the households' ability to achieve the outcomes of interest. This is a reminder that household demographic situation changes over time and it would be recommendable to periodically re-assess Syrian household composition.

In Kenya, Haushofer and Shapiro found that intervention effects do not differ between men and women-headed households (Haushofer & Shapiro, 2013). Sex-based differences are likely to be affected by cultural and social norms, as well as by level of education, hence they are context specific; if this is the case, Haushofer and Shapiro's findings may not be applicable to Syrian refugees in Lebanon. In this study, the impact analysis was not stratified by sex of head of household, but supplementary analysis was conducted to explore the association between sex of head of household and all outcomes of interest. This revealed that women-headed households are somehow less self-reliant than those headed by men. To begin with, they are more dependent on cash aid as means of earning a living and they resort more frequently to negative food-related coping strategies, relying on others to meet their food consumption needs. Interestingly, and in line with a study conducted on Palestinian

refugees in Lebanon, women-headed households in this study feel less healthy than men-headed households (Chaaban, Ghattas, Habib, Hanafi, Sahyoun, Salti, et al., 2010).

A further effort, to elaborate on the present study and verify if sex of head of household modifies or confounds the effect of MCA, could be the stratification of the analysis of the intervention by sex of head of households; this additional analysis could be conducted for those outcomes where a significant association has been found. However, one should bear in mind that stratification would further reduce the power of the sample.

LCC cash assistance is oftentimes offered in parallel to other cash aid programs that are independent from this one. In particular, nearly all study subjects, except 16 controls, are also recipients of food vouchers from WFP. This study accounted for this factor, in order to isolate the specific effect of LCC cash aid. We do not know what would happen if these households were excluded from WFP food assistance, or if the voucher amount would decrease further; how this would affect their choices. We also have to consider that the receipt of other assistance is self-reported and the accuracy of this information may be limited. For instance, El Asmar found a slightly lower Food Consumption Score level after LCC intervention as compared to baseline; recipient households at midline ate more bread and beans, but less vegetables (El Asmar, 2015). This finding could be explained by the substantive reduction of food voucher value that was enforced between baseline and the midline (Reuters, 2015).

Finally, can we generalize these findings to other programs, or to a wider population within the same program?

A simple "yes" or "no" answer would not suffice. An important premise to make is that the sample is not representative of the population of Syrian refugees in Lebanon; the descriptive statistics cannot be used to make general inferences on the distribution of sex, age, residence and other socio-demographic variables.

The study found a significant effect of cash assistance on several outcomes of interest, consistently with other RCT and RDD studies on MCA, which supports the generalization of these findings. On the other hand, the size of the effect cannot be generalized beyond this PMT bandwidth, and for other amounts of MCA. The average size of the effect may change, for instance, if we change the PMT cut-off point. Also, when we expand the bandwidth of the PMT score, we have to re-model the association between the PMT and the outcomes, for two main reasons. As we move away from the cut-off point, we observe an increasing number of factors that contribute to determining the outcomes. In addition, when enlarging the PMT bandwidth, we may be faced with a different function describing the relationship between the outcomes, the PMT score and the intervention status. Instead of a linear shape (i.e. a straight line), this may be curvilinear; as a result, we would have different coefficients and effect size.

4.2 Limitations

The assumption of balance of socio-demographic and economic characteristics between treatment and control group was violated within the entire sample where eight out of twelve socio-demographic variables were found significantly associated with the intervention status. As a cautionary measure in response to the imbalance, bivariate analysis and simple regressions on the outcomes of interest were conducted for three samples, to compare results and detect possible different behavior of the outcomes. In the end, due to uncertainty around the effect of covariates on the outcomes within the two samples with widest PMT bandwidth, the adjusted analysis to determine the impact of LCC intervention was conducted only for the narrowest one (N=508). This has inevitably caused some power loss.

For this reason, a post-hoc power analysis was conducted on effects that were not significant in the smallest sample but significant in the largest one. Nevertheless, with post-hoc power analysis findings at hand, it is still impossible to state whether the effects could have achieved significance if the sample was larger. In fact, the small and large samples of this study are different with respect to multiple factors at both baseline and midline, and difference in proportions and means are, for most part, incomparable.

Secondary data analysis avoids the challenges of field research, but its results depend on data quality as well as to compliance to the research design protocols. Around 100 records were removed from the entire set of surveys collected by the LCC members, due to a mix of reasons: missing essential information (e.g. missing assignation to study group), non-compliance between PMT score and assignation to intervention/control group (i.e. crossovers), non-plausibility of values. Out of the dropped records, for instance, 33 were dropped from the midline because they did not have a match in the baseline; 20 because the PMT score was outside of the expected range; five because they were crossovers.

All data are self-reported and have limited reliability. Information may not be accurate due to recall bias and to the deliberate intention not to answer honestly, especially if respondents believed that their answers may influence their status as recipients or non-recipients. Among others, non-LCC cash assistance is one of the self-reported variables, and possible inaccuracies and incompleteness of information may have biased ORs, since this was a variable based on which the intervention effect was adjusted. In conducting the study, it was assumed that biases were evenly distributed across the sample.

Also social-desirability biases are to be expected, especially when it comes to food-consumption or to other negative and socially unacceptable coping strategies. For instance, some respondents may have felt ashamed of reporting that they had to restrict the food portions given to some members of the family.

Another source of potential information bias is linked to surveyors' awareness of survey participants' status within the LCC program (i.e. recipients or not); had been blinded (i.e. not informed of recipients' status), this could have been avoided.

Information from the Refugee Assistance Information System (RAIS) on other cash assistance received by study subjects was not used as it was found less complete compared to the self-reported answers.

Selection bias may have occurred if the non-respondents - which were reportedly within the control group only - were replaced with households falling in a different PMT bandwidth. In fact, this study retained only subjects with PMT between 109 and 118, while the entire sample had a PMT bandwidth ranging from 95 to 125. This could not be verified, as a thorough description of the sampling procedure was not available to the researcher.

A final consideration could be made on ethics. Despite the positive findings on the impact of cash, participants of the control group will not be entitled to receiving MCA, unless PMT bandwidth is modified; this violates the Beaumont principle of beneficence, which stipulates that – when an intervention is found effective in research on human subjects – it should be extended to the research participants who have not received it. However, enrolment in the LCC program is not feasible for the control group of the present study, because - according to program protocols -they are not eligible to receive cash assistance.

4.3 Conclusions

In absence of more durable alternatives for Syrians in displacement, such as access to income-generation opportunities, multipurpose cash assistance continues to be a necessary and appropriate aid modality for addressing basic needs, in accordance with households' priorities. Multipurpose cash aid appears to be effective as a modality to deliver supplementary assistance because it is versatile, but no evidence from this study would support using it to replace specialized assistance, such as food aid and health services, unless availability issues are addressed.

In fact, multipurpose cash assistance is particularly effective to address access barriers, in situations where markets are functioning and are more elastic to demand increase, such as that of food items. In markets characterized by availability issues, instead, multipurpose cash assistance alone is not effective. Specific interventions are needed, aimed at strengthening services and expanding delivery capacity and outreach.

Whereas multipurpose cash assistance is targeted to the most vulnerable refugee households, an equitable, universal access to healthcare supplies and services is to be maintained in this protracted refugee crisis, not to create disparities in the health status of affected peoples.

5. Tables

<div style="text-align: center;">Table 3: Codebook</div>

Variable label	Variable name	Treated as	Description
Intervention status	study_group_enc	Main exposure	Binary (2 levels; 0=No, 1=Yes)
Food consumption score[11]	mdl_fcs_log	Outcome	Continuous
Household Weekly Dietary Diversity (HWDD)[12]	mdl_hwdd_identity	Outcome	Continuous (from 0 to 12)
Household Daily Average Dietary Diversity (HDADD)	mdl_hdadd	Outcome	Continuous (from 0 to 12)
Food-related coping strategies index[13]	mdl_csi_sqrt	Outcome	Continuous (from (-56) to 0)
Weekly food expenditures[14]	rdd_expfood7_sqrt	Outcome	Continuous (in LBP)
Expenditures in water[15]	rdd_expwater_log	Outcome	
Health expenditures[16]	rdd_exphealth_log	Outcome	Continuous (in LBP)
Expenditures on hygiene items[17]	rdd_exphyg_log	Outcome	Continuous (in LBP)
Rent[18]	rdd_exprent_sqrt	Outcome	
Expenditures on shelter fixes[19]	rdd_expshelt_log	Outcome	Continuous (in LBP)

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11 Log-transformation of FCS.

12 Identity transformation of HWDD.

13 Squared-root transformation of the food-related coping strategy index.

14 Squared-root transformation of weekly food expenditures.

15 Log-transformation of water expenditures

16 Log-transformation of health expenditures.

17 Log-transformation of hygiene expenditures.

[18] Squared root transformation of rent.

Household expenditures[20]	rdd_exphh_log	Outcome	Continuous (in LBP)
Expenditures on electricity[21]	rdd_expelectr_log	Outcome	Continuous (in LBP)
Expenditures on gas[22]	rdd_expgas_log	Outcome	Continuous (in LBP)
Total expenditures on housing[23]	rdd_exphousing_sqrt	Outcome	Continuous (in LBP)
Total expenditures related to physical and material wellbeing[24]	rdd_expwellbeing_log	Outcome	Continuous (in LBP)
Household's outstanding debt[25]	midl_debttot_log	Outcome	Continuous (in LBP)
No. days relying on less expensive food	midl_lessexpf	Outcome	Discrete (from 0 to 7)
No. days borrowed food	midl_borrfood	Outcome	Discrete (from 0 to 7)
No. days reduced number of meals	midl_redmeal	Outcome	Discrete (from 0 to 7)
No. days reduced portion of meals	midl_redport	Outcome	Discrete (from 0 to 7)
No. days without eating	midl_nofood	Outcome	Discrete (from 0 to 7)
No. days restricting adults' food portions	midl_adultrestr	Outcome	Discrete (from 0 to 7)
No. days eating elsewhere	midl_eatelsew	Outcome	Discrete (from 0 to 7)
No. days eating bread	midl_bread	Outcome	Discrete (from 0 to 7)
No. days eating beans	midl_beans	Outcome	Discrete (from 0 to 7)
No. days eating vegetables	midl_veg	Outcome	Discrete (from 0 to 7)
No. days eating fruits	midl_fruit	Outcome	Discrete (from 0 to 7)
No. days eating meat	midl_meat	Outcome	Discrete (from 0 to 7)
No. days eating eggs	midl_egg	Outcome	Discrete (from 0 to 7)
No. days eating dairy	midl_dairy	Outcome	Discrete (from 0 to 7)
No. days eating sugar	midl_sug	Outcome	Discrete (from 0 to 7)
No. days eating oil	midl_oil	Outcome	Discrete (from 0 to 7)

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[19] Squared-root transformation of expenditures in shelter fixes.

[20] Squared-root transformation of expenditures in household items.

[21] Log-transformation of expenditures in electricity.
[22] Log-transformation of expenditures in gas.
[23] Squared-root transformation of expenditures in housing.
[24] Log-transformation of total expenditures in wellbeing.
[25] Log-transformation of total outstanding debt.

No. days eating spices	midl_spice	Outcome	Discrete (from 0 to 7)
Self-Rated Health Index (multi-level)	midl_evalhealth_rec2	Outcome	Categorical ordinal (5 levels: 1=not good at all; 2=not good; 3=half/half; 4=good; 5=very good)
Self-Rated Health Index (binary)	midl_evalhealth_rec3	Outcome	Categorical ordinal (2 levels: 0=not good; 1=good or more)
Self-Rated Psychological Index (multi-level)	midl_evalpsy_rec2	Outcome	Categorical ordinal (5 levels: 1=not good at all; 2=not good; 3=half/half; 4=good; 5=very good)
Self-Rated Psychological Index (binary)	midl_evalpsy_rec3	Outcome	Categorical ordinal (2 levels: 0=not good; 1=good or more)
Main income source (binary)	midl_incsour1_dich	Outcome	Binary (2 levels; 0=Not cash aid, 1=Cash aid)
Main income source (3 categories)	midl_incsour1_3cat	Outcome	Categorical nominal (3 levels; 1=Coping and other, 2=Cash aid (all sources); 3=Work)
Borrowed money in past 3 months	midl_debt_enc2	Outcome	Binary (2 levels; 0=No, 1=Yes)
Debt for food	midl_debt_food	Outcome	Binary (2 levels; 0=No, 1=Yes)
Debt for health	midl_debt_health	Outcome	Binary (2 levels; 0=No, 1=Yes)
Debt for rent	midl_debt_rent	Outcome	Binary (2 levels; 0=No, 1=Yes)
Children out of school at baseline	bsl_noschool_rec	Independent variable	Binary (2 levels; 0=No, 1=Yes)
Children out of school at midline	midl_nosch_enc2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Child labour	midl_childlab_enc2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Child marriage	midl_chilmarr_enc2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Adults in high risk activities	midl_explwork_enc2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Children in high risk activities	midl_chilexplwork_enc2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Begging in the past 30 days	midl_beg_enc2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Verbal abuse	midl_verbabus_rec2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Physical abuse	midl_physabuse_rec2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Felt happy	midl_happy_enc2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Felt worried	midl_worried_enc2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Stress due to financial issues	midl_finstress_enc2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Increased community trust	midl_trust_enc2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Felt more secure	midl_secur_enc2	Outcome	Binary variable (2 levels; 0=No, 1=Yes)
Self-rated index of access to personal hygiene items	midl_index_hyg	Outcome	Discrete, count variable (from 0 to 4)
PMT score at baseline	Score_right	Independent variable	Continuous (from 109 to 118)

Age of head of household at baseline	bsl_hoh_age2	Independent variable	Continuous
Age of head of household at midline	midl_agehoh2	Independent variable	Continuous
Number of household members at baseline	bsl_tothh_size	Independent variable	Discrete
Number of household members at midline	midl_hh_size_enc	Independent variable	Discrete
Disability-adjusted dependency ratio at baseline	bsl_adj_depratio	Independent variable	Continuous
Availability of luxury assets at baseline	Luxury	Independent variable	Discrete, count variable (from 0 to 4)
Availability of basic assets	Basic	Independent variable	Discrete, count variable (from 0 to 4)
Total expenditures at baseline	bsl_totexp_calcul	Independent variable	Continuous (in LBP)
Total non-LCC cash at baseline	bsl_cashass_amount2	Independent variable	Continuous (in LBP)
Sex of head of household	midl_sexhoh_enc	Independent variable	Binary (2 levels; 0=Male, 1=Female)
Level of education of head of household	bsl_hohedu	Independent variable	Categorical ordinal (7 levels; 0=None; 1= Knows how to read and write; 2= Primary school; 3= Intermediate/complementary school; 4= Secondary school; 5= Technical course; 6= University)
Governorate	location_rec	Independent variable	Categorical nominal (6 levels; 1= North; 2= Beirut; 3=Mount Lebanon; 4= Bekaa; 5= Nabatieh; 6= South)
Monetary value of non LCC cash assistance	midl_tot_nonlcc_cash	Independent variable	Continuous (in LBP)
Shelter type at baseline	bsl_sheltype2	Independent variable	Categorical nominal (10 levels: 1=Flat/house/villa not shared; 2= Flat/house/villa shared; 3=unmanaged collective shelter; 4=managed collective shelter; 5=one room structure; 6=other (including homeless); 7= shelter in informal settlement; 8= Substandard shelter; 9=Tent/structure in formal settlement; 10=unfinished building)
Type of occupancy at baseline	bsl_occuptype2	Independent variable	Categorical nominal (7 levels: 1=Owned, furnished rental, 2=unfurnished rental, 3=provided by employer/Working for rent, 4=rent/work combination, 5=hosted (for free), 6=squatting (occupancy without permission of owner), 7=assistance/charity)
Toilet type at baseline	bsl_typetoil	Independent variable	Categorical nominal (5 levels: 1= bucket; 2= flush;

			3=improved pit latrine; 4= open air; 5= traditional pit latrine)
Two or more extreme coping strategies baseline	extreme_cs_rec	Independent variable	Binary variable (2 levels; 0=No, 1=Yes)
At least one household member working	bsl_working_rec	Independent variable	Binary variable (2 levels; 0=No, 1=Yes)

5.1 Tables of Balance Check at Baseline

Table 4: Socio-demographic characteristics of the two study groups in the three samples, at baseline

Variable	Entire sample (N=1378)		Reduced sample 2 (N=792)		Reduced sample 3 (N=508)	
	Control (N=657)	Intervention (N=721)	Control (N=405)	Intervention (N=387)	Control (N=247)	Intervention (N=261)
PMT score						
Mean ± sd	119.104 ± 2.57	106.54 ± 4.49	117.39 ± 1.56	110.15 ± 2.33	116.37 ± 1.02	111.47 ± 1.53
Range	114.6 - 123.4	96.2 - 114.4	114.6 – 120	106 – 114.4	114.6 – 118	109- 114.4
Age of HoH						
Mean ± sd	39.32 ± 10.86	38.75 ± 9.58	38.93 ± 10.95	39.26 ± 10.11	38.91 ± 10.41	39.72 ± 10.31
Range	13 - 83	13 - 83	13 - 81	13 – 83	17 – 81	17 - 83
Household size						
Mean ± sd	5.91 ± 2.28	6.32 ± 2.07	5.91 ± 2.33	6.34 ± 2.25	6.09 ± 2.42	6.38 ± 2.20
Range	1 - 24	2 - 22	1 - 24	2 – 22	1 – 24	2 - 15
Disability adj. dep. Ratio						
Mean ± sd	1.76 ± 1.12	2.09 ± 1.11	1.77 ± 1.17	2.06 ± 1.10	1.83 ± 1.18	2.02 ± 1.06
Range	0 – 6	0 – 8	0 – 6	0 – 6	0 – 6	0 -5
Luxury assets						
Mean ± sd	1.06 ± .90	.89 ± .81	.98 ± .88	1 ± .84	1.02 ± .87	1.07 ± .83
Range	0 -4	0 -3	0 – 3	0 – 3	0 – 3	0 – 3
Basic assets						
Mean ± sd	3.20 ± 1.09	2.72 ± 1.24	3.16 ± 1.13	2.73 ± 1.21	3.18 ± 1.11	2.74 ± 1.22
Range	0 – 4	0 - 4	0 – 4	0 -4	0 – 4	0 - 4

Total expenditures						
Mean ± sd	715759 ± 389051	742989 ± 374267	718275 ± 395832	753389 ± 368946	729233 ± 398183	763322 ± 376156
Range	0 - 2650000	0 - 2590000	0 - 2650000	0 – 2205000	0 – 2650000	10000 - 2205000
Total non-LCC cash (baseline)						
Mean ± sd	89707 ± 98353	72083 ± 61836	98449 ±104579	54500 ± 62470	99040 ± 107769	71428 ± 67188
Range	0 – 480000	0 – 150000	0 – 480000	0 – 140000	0 – 480000	0 - 140000
Sex of HoH						
Male	490 (74.58)	547 (75.87)	301 (74.32)	296 (75.38)	187 (75.71)	201 (77.01)
Female	167 (25.42)	174 (24.13)	104 (25.68)	91 (24.62)	60 (24.29)	60 (22.99)
Education level of HoH						
None	168 (25.57)	200 (27.74)	103 (25.43)	99 (25.58)	60 (24.29)	59 (22.61)
Primary school	335 (50.99)	378 (52.43)	214 (52.84)	208 (53.75)	133 (53.85)	146 (55.94)
Read and write	82 (12.48)	101 (14.01)	46 (11.36)	51 (13.18)	30 (12.15)	34 (13.03)
Secondary	50 (7.61)	32 (4.44)	31 (7.65)	22 (5.68)	19 (7.69)	17 (6.51)
Technical school	12 (1.83)	3 (.42)	6 (1.48)	3 (.78)	3 (1.21)	3 (1.15)
University	10 (1.52)	7 (.97)	5 (1.23)	4 (1.03)	2 (.81)	2 (.77)
Governorate						
North	209 (31.81)	264 (36.62)	125 (30.86)	119 (30.75)	78 (31.58)	79 (30.27)
Beirut	8 (1.22)	25 (3.47)	5 (1.23)	15 (3.88)	3 (1.21)	10 (3.83)
Mt. Lebanon	193 (29.38)	216 (29.96)	115 (1.23)	136 (35.14)	69 (27.94)	93 (35.63)
Bekaa	154 (23.44)	49 (6.80)	99 (24.44)	23 (5.94)	54 (21.86)	15 (5.75)
South	93 (14.16)	167 (23.16)	61 (15.06)	94 (24.29)	43 (17.41)	64 (24.52)
Shelter type						
Flat/house/villa not shared	269 (40.94)	202 (28.02)	154 (38.02)	134 (34.63)	99 (40.08)	98 (37.55)
Flat/house/villa shared	97 (14.76)	69 (9.57)	62 (15.31)	48 (12.40)	36 (14.57)	34 (13.03)
Unmanaged collect. shelter	8 (1.22)	37 (5.13)	7 (1.73)	14 (3.62)	4 (1.62)	11 (4.21)
Managed collective shelter	14 (2.13)	33 (4.58)	9 (2.22)	15 (3.88)	7 (2.83)	7 (2.68)
One room	121 (18.42)	113 (15.67)	74 (18.27)	60 (15.50)	43 (17.41)	44 (16.86)
Other (include homeless)	44 (6.70)	18 (2.50)	30 (7.41)	5 (1.29)	12 (4.86)	2 (.77)
Shelter informal settlement	19 (2.89)	48 (6.66)	9 (2.22)	24 (6.20)	5 (2.02)	15 (5.75)
Substandard shelter	39 (5.94)	109 (15.12)	26 (6.42)	41 (10.59)	16 (6.48)	19 (7.28)
Tent in formal settlement	29 (4.41)	50 (6.93)	23 (5.68)	27 (6.98)	17 (6.88)	21 (8.05)
Unfinished building	17 (2.59)	42 (5.83)	11 (2.72)	19 (4.91)	8 (3.24)	10 (3.83)

Occupancy type

Assistance charity	34 (5.18)	82 (11.39)	25 (6.17)	38 (9.84)	19 (7.69)	22 (8.43)
Furnished rental	32 (4.87)	23 (3.19)	16 (3.95)	13 (3.37)	9 (3.64)	9 (3.45)
Hosted	26 (3.96)	38 (5.28)	12 (2.96)	22 (5.70)	6 (2.43)	16 (6.13)
Other	4 (.61)	5 (.69)	4 (.99)	4 (1.04)	1 (.40)	2 (.77)
Unfurnished rental	527 (80.21)	515 (71.53)	327 (80.74)	280 (72.54)	200 (80.97)	196 (75.10)
Provided by employer	25 (3.81)	44 (6.11)	15 (3.70)	25 (6.48)	11 (4.45)	13 (4.98)
Rent-work combination	9 (1.37)	13 (1.81)	6 (1.48)	4 (1.04)	1 (.40)	3 (1.15)

Toilet type

Bucket[26]	2 (.30)	6 (.83)	1 (.25)	3(.78)	0 (.00)	1 (.38)
Flush	190 (28.92)	148 (20.53)	97 (23.95)	86 (22.22)	60 (24.29)	58 (22.22)
Improved pit latrine	276 (42.01)	284 (39.39)	175 (43.21)	146 (37.73)	108 (43.72)	103 (39.46)
Open air	6 (.91)	11 (1.53)	6 (1.48)	3 (.78)	2 (.81)	1 (.38)
Traditional pit latrine	183 (27.85)	272 (37.73)	126 (45.82)	149 (54.18)	77 (31.17)	98 (37.55)

Extreme negative coping strategies (2 or more)

No	636 (96.80)	698 (97.08)	392 (96.79)	377 (97.42)	240 (97.17)	253 (96.93)
Yes	21 (3.20)	21 (2.92)	13 (3.21)	10 (2.58)	7 (2.83)	8 (3.07)

At least one HH member working

No	273 (41.55)	306 (42.44)	169 (41.73)	152 (39.28)	110 (44.53)	100 (38.31)
Yes	384 (58.45)	415 (57.56)	236 (58.27)	235 (60.72)	137 (55.47)	161 (61.69)

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[26]Both expected cells with values lower than 5.