

AMERICAN UNIVERSITY OF BEIRUT

CASH ASSISTANCE, FOOD SECURITY, AND EDUCATION
IN THE CONTEXT OF SYRIAN REFUGEES

by
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ABSTRACT
OF THE THESIS OF

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In 2017, UNHCR and WFP started the multi-purpose cash assistance program (MPC) to financially aid Syrian Households that are unable to sustain themselves. This program aimed at improving the eligible candidates' well-being in: Expenditures, Food Security, Housing, WASH, Education, Employment, Health, and Decision-Making.

In this research paper, we uncover the mechanism at work between cash assistance food security and education. In specific, we investigate how the level of education of household head/mother impacts the effect of cash assistance on food security.

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CHAPTER I

INTRODUCTION

During the last decade, the Syrian civil war has had a multitude of devastating effects. Arguably, one of the biggest effects it had was the refugee crisis. Lebanon was burdened the most in relative terms- with 1.5 million refugees, it has the world's largest per capita refugee population, accounting to a quarter of the Lebanese population (Government of Lebanon & United Nations, 2019). As of 2019, the poverty rate was at an alarming 73%, and the unemployment rate amongst Syrian Refugees was 31%, reaching a staggering 47% among women (VASyR, 2019). In contrast, in the same year, the poverty rate was 42% for the Lebanese and the unemployment rate was 11.35% (UNESCWA, World Bank Group).

As a result, in November 2017, UNHCR and WFP started a cash assistance program to aid Syrian Refugees and help improve their livelihood and well-being. The multi-purpose cash transfer is comprised of 173.5\$ and 175\$ administered per household per month by UNHCR and WFP respectively. Eligibility of households for the multipurpose cash program (MPC) is determined based on a proxy-means testing formula. The formula predicts the household's annual expenditures which in turn predicts their eligibility for MPC. It is recalculated on a yearly basis using new socio-demographic data collected from the yearly VASyr survey (Chaaban et al, 2020; Moussa et al, 2022).

The cash assistance program administered by UNHCR and WFP to Syrian refugees has been shown to have a positive effect on food security (Chaaban et al, 2020). As per the United Nations Committee on World Food Security, food security means that: "All people, at all times, have physical, social, and economic access to

sufficient, safe, and nutritious food that meets their food preferences and dietary needs for an active and healthy life” (IFPRI). The three main components of food security include: food consumption, livelihood-based coping strategies, and the share of expenditures on food. In addition, food insecurity is measured using the Food Insecurity Experience Scale-FIES, which is discussed in detail in later chapters (Ballard, Kepple, & Cafiero, 2013).

In 2019, the Vulnerability Assessment of Syrian Refugees in Lebanon reported that only 63% of Syrian refugee households are marginally food secure, 8% identified are food secure, 28% are moderately food insecure, and only 1% are severely food insecure. Also, 35% of female-headed households are food insecure compared to only 28% of male-headed households. Regarding food consumption, 75% of households had acceptable food consumption, 20% had borderline food consumption, and 5% reported poor food consumption. However, 89% of the Syrian refugees in Lebanon who were receiving MPC reported acceptable food consumption (VASyR, 2019).

The general motivation behind this research is to get an insight on the mechanisms that might be at work in the effect of cash assistance programs on one central development outcome, namely food security. We aim to study the relationship between the level of education of the household head and of the mother and the food security of the household in the context of cash assistance. More specifically, we aim to investigate whether the level of education of the household head or the mother modifies the impact of cash assistance on food security. We distinguish between the education of the head or the mother, when these two persons are distinct. The main research question is: “How does the level of education of the household head/mother affect the impact of cash assistance on the food security of the household?”

This question could shed light on the mechanisms through which cash assistance programs affect food security. Answering this question might inform the way cash assistance is given to ensure a higher percentage of food secure households. This can be highly beneficial to both refugees and to development and humanitarian agencies. This is because it may optimize the way the cash assistance budget is allocated to ensure food security.

The chapters that constitute this thesis are organized as follows. Chapter 2 is the literature review chapter. We review the literature on cash-assistance programs and food security, and we state our contribution to this fast-growing field. Chapter 3 presents the UNHCR dataset that we use in our research. In chapter 4, we delve into the empirical strategy that we aim to use in our research alongside some of the limitations we encountered. Chapter 5 examines the results and findings of our research. Lastly, chapter 6 gives a brief conclusion and some policy implications.

CHAPTER II

LITERATURE REVIEW

A large and diverse literature shows the presence of a strong relationship between education and food security subject to different environments and contexts. At the household level, low educational attainment was found to increase the likelihood of food insecurity when compared to households with some minimal educational background (Mutisya et al, 2016). In fact, there is a robust literature showing that the education of the household head/parent has a significant positive effect on the general well-being of the household, particularly on its food security (De Muro and Burchi, 2007; Nkomoki, 2019; Zhou et al, 2019). Household heads with a high level of education are more likely to land high-earning jobs, are more aware of the importance of nutrition, and are generally more skilled in budgeting and saving. These three factors contribute to the positive effect of educational background on food security (Esturk & Oden, 2014).

The impact evaluation literature on cash assistance programs also consistently shows that cash assistance has a significant effect on the food security of the household. (Bailey & Hedlund, 2013; Battistin, 2016; Chaaban et al, 2020; Lehmann et al, 2014; UNICEF Innocenti, 2016). In fact, the effect on food security was found to persist even after cash transfers were discontinued as households continued reporting adequate levels food security and dietary diversity (Chaaban et al, 2020).

Theoretically, the pathway from cash assistance to food security is as follows. Cash assistance leads to an increase in the income available to households which increases their expenditures- especially their food-related expenditures. In fact, 41.1% of the total household spending of Syrian refugees is on food expenditures. Cash

assistance improves the quality and the quantity of food purchased, which enhances the household's nutrition. This, in turn, causes an increase in the food security and the dietary diversity of the households in question (Chaaban et al, 2020; Salti et al, 2020).

Generally, cash transfers affect food security through four main channels which are: food expenditures, dietary diversity and food consumption frequency, food consumption behaviors and experience of food security, and coping with seasonalities. Results from eight impact evaluations of social cash transfers in Sub-Saharan Africa give important insight on the mechanism through which cash transfers affect food security. Cash transfers have been shown to have a positive effect on food expenditures. Households that receive assistance consequently increase their food purchases. Secondly, cash transfers (CTs) have a significant positive impact on both the number of daily meals consumed and the dietary quality of the households. Also, CTs increase the experience of food security among recipient households. Lastly, the report does not observe any strong impact of cash transfer on coping with seasonalities (UNICEF Innocenti, 2016).

Another paper detailing twelve impact evaluation reports on the effect of cash transfers reaches interesting findings. The report finds that the most consistent effect of cash transfers – regardless of type- is their positive impact in helping achieve food security. Also, there is strong evidence that cash transfers may be more effective than food transfers because they help increase the dietary diversity and nutritional health of the recipient households. In addition, six out of seven evaluations in Sub-Saharan Africa found that the main use of cash transfers was for expenditures on food. Even though the studies mentioned in the report use different methodologies, the impact of cash transfers on nutrition and food security was consistently a positive one (Mohammdi, 2016).

A report by the WFP in 2019 discusses the impact of cash assistance on the food security of Syrian refugees in Jordan. Food security was positively impacted as a result of unrestricted cash transfers. Also, the nutritional quality of food consumed vastly improved as the frequency of healthy meals increased. However, when it comes to coping, household reliance on consumption-based coping strategies significantly decreased whereas livelihood-based coping strategies remain strongly present (WFP, 2019).

In this paper, we aim to understand the channels by which MPC affects food security. Furthermore, we investigate whether the education of the head of the household/mother mediates the impact of cash assistance on food security. The dataset that we will use is provided by UNHCR and it includes Syrian refugees in Lebanon sampled from the total list of registered refugee households close to the eligibility cutoff for cash assistance. It includes data on the living conditions of these refugees across a varied spectrum of demographic and socio-economic indicators that we describe in the chapters on Data and Methodology.

CHAPTER III

DATA

The dataset that will be used is from the UNHCR Microdata Library titled: “Multi-Purpose Cash Assistance: Impact Evaluation on the Well-Being of Syrian Refugees”. This dataset is comprised of comprehensive surveys of 11,457 households done over three waves between July/August 2018 and July/August 2019. The dataset details major aspects of the refugees’ lives namely: Expenditures, Food Security, Housing, WASH, Education, Employment, Health, and Decision-Making. The surveyed refugee population includes households with and without access to MPC selected from the range of scores on the proxy means test around eligibility for MPC. The subsample we used is around 1600 observation. Each observation represents one household. We chose the subsample to be two score points above and below the cutoff. We also restricted it to encompass only waves 2 and 3 dating back to February/March 2019 and July/August 2019 respectively (Chaaban et al, 2020). This creates a quasi-natural experiment and thus allows for causal inference of the effect of cash assistance on different dimensions of well-being.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Score	1664	56.921	1.134	55.002	58.998
MPC Receipts	1664	.602	.49	0	1
Household Size	1664	5.877	1.887	1	16
Age of Head	1659	39.859	10.071	18	98
Dependency Ratio	1661	1.503	.996	0	11
% of Household with No Education	1664	.352	.261	0	1
Residency	1653	.384	.486	0	1
Gender of Head	1664	.216	.412	0	1
FIES	1661	4.436	2.598	0	8
FIES SFI	1661	.227	.419	0	1
Education of Head	1664	.532	.499	0	1
School Enrollment of the Head	1664	.179	.384	0	1
Education of the Mother	1271	.533	.499	0	1
School Enrollment of the Mother	1271	.208	.406	0	1
Meals Preparation Decision	1433	.919	.273	0	1

Table 1 provides descriptive statistics of the variables we use in our regressions. The data mentioned above was collected through a comprehensive questionnaire detailing many aspects of refugees' lives. The data includes both household-level and individual-level variables. For the purposes of this research, the focus will be centered variables on two aspects which are education, food Security. Also, we will use data from waves 2 and 3 of data collection from the February/March 2019 and July/August 2019 surveys respectively.

First, we use the score variable which ranges from 47 to 75 and gives the PMT score for the household. A proxy-means testing formula is utilized when households do not have accurate numbers of their income and expenditure. PMT uses the household's observable characteristics to estimate whether they have the means to sustain

themselves. Households who do not have the proper financial capability to sustain a living are then eligible for assistance. (World Bank Group).

As such, it is this score that allows us to distinguish between household that are eligible for assistance from those that are not, according to a cutoff point we discuss in the methodology chapter. Both the WFP and UNHCR rank households based on a proxy-means testing (PMT) score. It is a score that indicates the household's relative vulnerability. It is calculated according to a group of socio-demographic variables obtained from the UNHCR database. All households are ranked based on this score from most vulnerable to least vulnerable.

We construct a number of variables to measure education of the head, of the mother and food security of the household. To measure food insecurity this study uses households' reliance on coping strategies and the Food Insecurity Experience Scale (FIES) which is a cross-disciplinary indicator developed by the Food and Agriculture Organization (FAO) (Ballard, Kepple, & Cafiero, 2013). The indicator is comprised of a set of eight questions that facilitate understanding the difficulties households face when obtaining food. These questions result in a scale from 0 to 8 where 8 is the highest level of Food insecurity. All the above-mentioned food security variables give insight into the conditions of the households under survey and their required needs. FIES classifies households into three categories: food secure, moderately food insecure and severely food insecure. Food secure household have a score of 0-3. Moderate food insecure households have a score of 4-6. Lastly, severely food insecure households have a score of 7-8 (Sheikomar et al, NCBI 2021). We also used a dummy variable of FIES called FIES_SFI that indicates whether the household suffers from severe food insecurity. As such, the dummy is 1 when the household has score of [7-8] and 0 otherwise.

We also use the variable `daily_meals_dm5`. It is a variable which accounts for the degree of involvement of females in the decision-making process regarding meal preparation. It is 1 if the mother is the sole decision maker regarding meal preparation and 0 if the decision regarding meal preparation is taken jointly between the two parents

The Education variables range from “Never Attended” to “Postgraduate” and allows us to classify the educational level of the household head or mother. We constructed two dummy variables for the household head’s education. The first one is a dummy of whether he underwent primary schooling without a certificate. The other one is whether he attended school at all or not. Similarly, we constructed two dummy variables for the mother’s level of education with the same conditions as the above-mentioned dummy variables.

CHAPTER IV

EMPIRICAL STRATEGY

A. Regression Discontinuity Design:

To translate the research question above into an empirical strategy we aim to use regression discontinuity design (RDD). This will help us empirically investigate whether the effect of MPC on food security is affected by the education level of the household head or mother.

This methodology is optimal because it allows us to estimate the *causal* impact of cash assistance on the food security of the household across eligible and non-eligible households by different levels of education of mothers or household heads.

More specifically, we are going to implement a sharp simple regression discontinuity design around a single cutoff point for eligibility. We use the ordinary least squares to estimate our simple RDD model.

All households with an income per person per month that is below 87\$ are eligible for cash assistance. However, only some of the eligible households were actually given cash assistance. This was primarily due to a limited budget. WFP uses a bottom-up approach where they start with the households with the lowest score and move up until they run out of cash assistance. On the other hand, UNHCR uses a geographic bottom-up approach. They disburse cash assistance starting with the most vulnerable in each geographic region they reach their budget allocated to that area.

The empirical strategy is based on the assumption that around the last recipient household, households are likely similar on almost all observable and non-observable parameters with the differentiating characteristic being access to MPC (Moussa et al, 2022). This generates a quasi-natural experiment where any differences in the refugees'

well-being can be reasonably ascribed to the multi-purpose cash program (Imbens and Lemieux, 2008).

In essence, we plan to investigate the effect of the education of the head of household or mother on the impact of MPC on the family's food security. Finding a connection between these two will help us further understand how cash assistance works and how it affects food security given differing educational levels.

The steps we followed in our model were to establish the presence of a treatment, run smoothness checks across predetermined characteristics, run regressions that show the effect of cash assistance around the cutoff and the subsequent impact of the parent's education. We also run a regression that shows the difference between male-headed households and female-headed households in terms of food security experience.

The local average treatment effect is defined as:

$$LATE = \lim_{S \rightarrow 57^+} E[FIES | S = 57] - \lim_{S \rightarrow 57^-} E[FIES | S = 57]$$

It represents the link between the change in the Food Insecurity Experience Scale around the cutoff point of Score = 57 (S).

B. Main Regression

The general iteration of our regression is as follows:

$$FIES_i = \beta_0 + \beta_1 Dummy_i + \beta_2 Score_i + \beta_3 E_i + \varepsilon_i$$

Where:

1. FIES is the Food Insecurity Experience Scale and it is our main outcome we investigate
2. Dummy is the eligibility dummy variable that defines the discontinuity
3. Score is the running variable upon which the households are ranked and distributed
4. E refers to the dummy variable of the education of the household head or the mother respectively

C. Conditions and Limitations

The conditions of validity of using a Regression Discontinuity Design is that household are not able to manipulate their score and hence their position around the cutoff. Another condition is that predetermined characteristics must exhibit smoothness around the cutoff point. In other words, agents around the cutoff must have similar characteristics.

A limitation to the abovementioned dataset is that the outcomes are self-reported and may therefore be biased. Such biases may include social desirability bias and recall bias. Another bias might be that some households might not disclose other forms of cash assistance that they might have received. This is due to the fear that their perception that their answers may affect their eligibility for another round. (Chaaban et al, 2020)

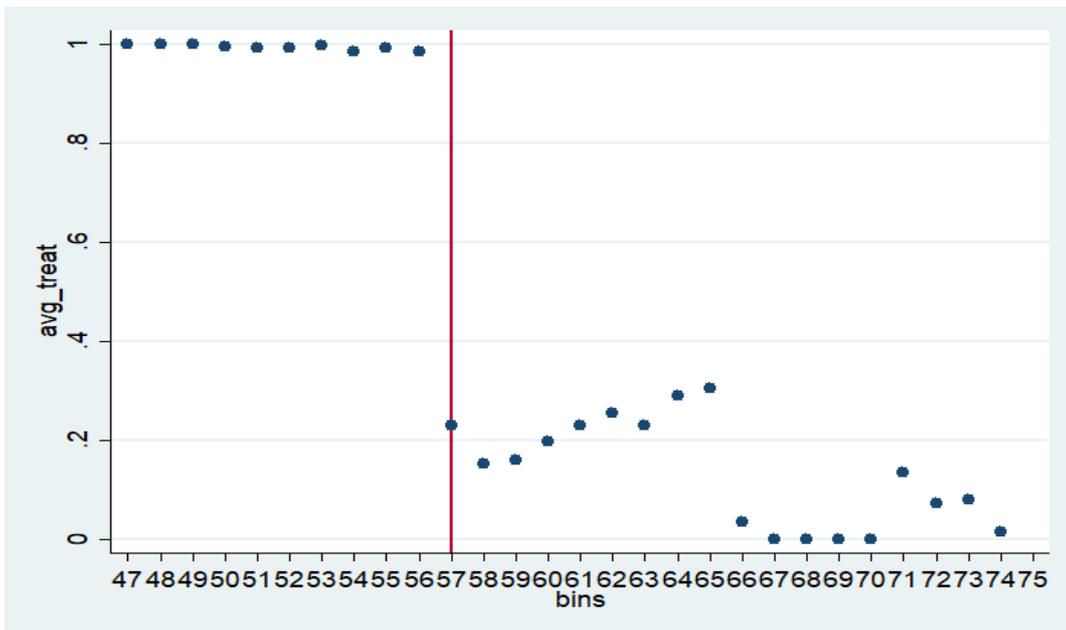
Moreover, a critical limitation in our study is duration. We are constrained with a limited duration that may not be sufficient to clearly show robust relationships (Moussa et al, 2022). This limits the conclusions we can infer from the results that we obtain.

D. Establishing Treatment

To establish the presence of an arbitrary cutoff score for the receipt of MPC, Figure 1, plots the probability of treatment (receipt of MPC) by PMT score. The x-axis represents the running variable (PMT score) in the year 2018. The score is based on a PMT regression run by UNHCR for the purpose of estimating the household's vulnerability on the basis of variables recorded in the registration database. The scores range between 47 and 75 with lower values indicating higher need. The y-axis represents the average of the dummy variable of the receipt of MPC assistance.

Figure 1 below suggests that the cutoff score for treatment is 57. Beyond this cutoff score, households no longer receive cash assistance. The treatment can be effectively visualized by the presence of a sharp drop in the probability of MPC receipt from 1 to around 0.2-0 exactly at bin 57.

Figure 1: Establishing Treatment



In our model we generated a dummy variable called “dummy” that indicates that the household’s PMT score is below the threshold:

$$Dummy_i = \begin{cases} 1 & \text{if } score_{2018} \leq 56 \\ 0 & \text{if } score_{2018} > 56 \end{cases}$$

As such, Figure 1 suggests that when the dummy is 1, households receive treatment, whereas when the dummy is 0, households are much less likely to receive cash assistance.

Table 2: Establishing Treatment

	(1)
	mpc_period3
score2018	-.4*** (.01)
dummy	-.234*** (.025)
_cons	23.458*** (.55)
Observations	1664
R-squared	.621

Standard errors are in parentheses
 *** $p < .01$, ** $p < .05$, * $p < .1$

In Table 2 and the following tables we move to a narrower scale of around 1600 household that are two points below and above the cutoff. This is done to accurately infer any causal mechanisms between the variables under investigation in our RD Design.

In Table 2, we regress the dummy variable measuring receipt of MPC on the PMT score administered in 2018 and the threshold dummy. The results are highly significant at the 1% level. There is a strict negative relationship between receiving cash assistance and the score. In other words, a higher score decreases the chance of

receiving any form of MPC. Also, the eligibility dummy is significantly associated with a higher probability of receiving cash assistance.

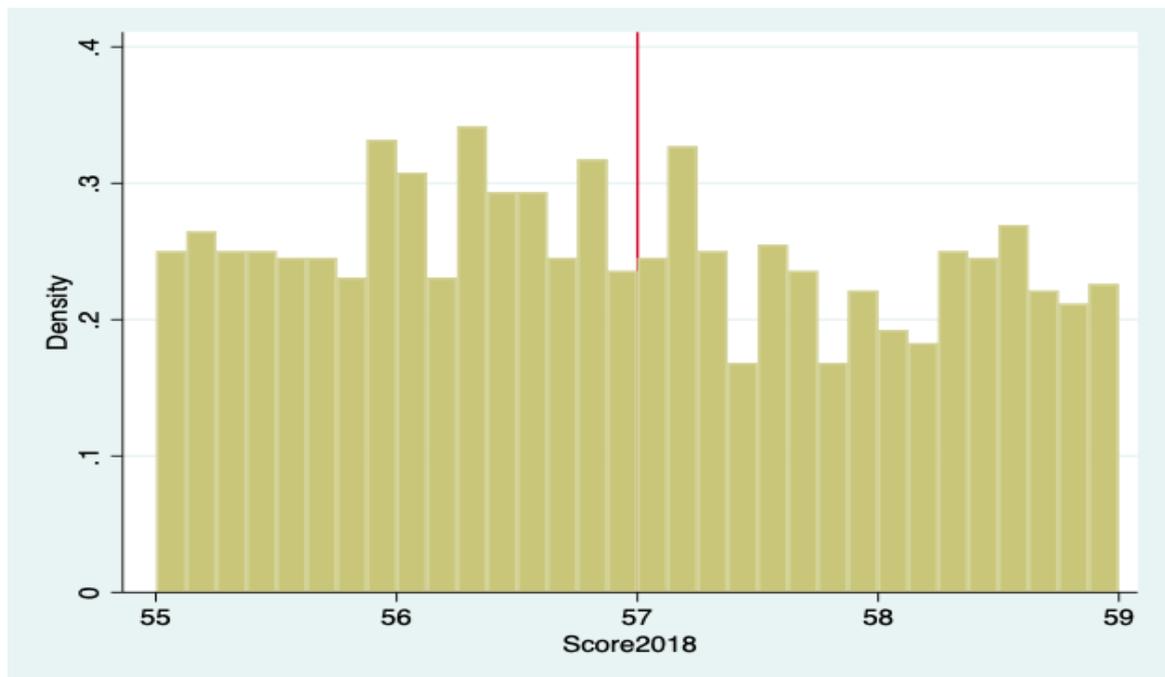
As a result, we will be using a sharp regression discontinuity design because we define the treatment deterministically to be either 1 or 0 around the cutoff.

E. Validity Checks:

The validity of the RDD estimator requires that households be relatively similar in terms of observable characteristics on both sides of the treatment threshold, and that households be unable of manipulating their score on the running variable.

Figure 2 is a histogram of the score around the cutoff in our subsample. The condition described above holds and it is evident in the fact the there is no bunching up of households close to the threshold.

Figure 2: Sample Histogram of the Score



Furthermore, we ran McCrary's test to check for manipulation (Appendix). The test proves the absence of any form of manipulation since the null hypothesis is not rejected.

To verify that both of the second condition is met, we run regressions of a number of household characteristics on the running variable and the threshold dummy in Table 3. This implies that their respective graphs should be continuous and smooth around the cutoff score of 57 (Check Appendix).

In Table 3, we performed validity checks on seven predetermined characteristics of the households under study. The variables, according to the order of the regressions are Household Size, Age of the Household Head, Dependency Ratio, Percentage of Household Members that have never attended School, State of Residency, The Marital Status of the Household Head, and Gender of the household head.

Table 3: Validity Checks

	(1) hhsizes	(2) agehoh	(3) dependenc y_ratio	(4) hhmem_no edu	(5) residency	(6) hoh_married	(7) female hoh
score2018	.002 (.06)	.646** (.32)	-.045 (.032)	.004 (.008)	-.015 (.015)	.007 (.012)	-.016 (.013)
dummy	-.028 (.155)	2.016** (.829)	-.153* (.082)	.014 (.021)	-.015 (.04)	.021 (.03)	-.048 (.034)
_cons	5.762* (3.441)	2.581 (18.357)	4.128** (1.815)	.142 (.476)	1.252 (.89)	.45 (.669)	1.124 (.751)
Observations	1664	1659	1661	1664	1653	1659	1664
R-squared	0	.004	.002	0	.001	0	.001

Standard errors are in parentheses

**** $p < .01$, ** $p < .05$, * $p < .1$*

As evident in the above table, the coefficients on the running variable and the threshold dummy are insignificant in all regressions except for the Age of the Household Head and the Dependency Ratio. To correct for any systematic difference in

these two characteristics of the household on either side of the cutoff, we include these two variables in the main regression as controls.

CHAPTER V

FINDINGS AND RESULTS

A. Basic Regression

In Table 4, we aim to study the effects of MPC on Food Security. The main outcome that we explore is the Food Insecurity Experience Scale. It is a scale from 0 to 8 where 0 is food secure and 8 is severely food insecure. In Regression (1), we simply regress FIES on the the eligibility dummy. In Regression (2), we add the running variable. In Regression (3) we add two controls (age of household head and dependency ratio).

The dummy exhibits a negative relationship with FIES and is significant at the 5% level in regressions (1) and (3) with a magnitude of -0.307 and -0.29 respectively. In other words, households who are eligible for MPC are significantly more likely to report lower experiences of food insecurity- hence a lower FIES score. These results consistent with the findings of Chaaban et al (2020). They also find that MPC led to a drop in the food insecurity experience of households which indicates the presence of a negative relationship between MPC and FIES.

Table 4: Basic Regression

	(1)	(2)	(3)
	FIES	FIES	FIES
dummy	-.307** (.146)	-.29 (.214)	-.29** (.144)
score2018		.009 (.083)	
agehoh			.024*** (.007)
dependency_ratio			.435*** (.067)
_cons	4.515*** (.074)	3.994 (4.737)	2.898*** (.325)
Observations	1661	1661	1653
R-squared	.003	.003	.029

Standard errors are in parentheses

**** $p < .01$, ** $p < .05$, * $p < .1$*

B. Education of the Household Head

In Table 5A, we investigate whether the effect of eligibility for treatment on food security is mediated by the education of the head of the household. The table is split into two subsets of identical regressions. The only differentiating factor is that in Regressions (1) through (3) the dummy variable of the head's education (hohLowedu) is 1 if the highest educational attainment is a primary education without certificate or below, and 0 if it is higher than that. In Regressions (4) through (6), the dummy variable of the head's education (hohNoEd) is 1 if they never attended and 0 if they attended any schooling.

In the first regressions (1 and 4), we regress FIES on the eligibility dummy and the dummy variable of education (hohLowedu and hohNoEdu respectively). In the second regressions (2 and 5) we add an interaction term between education and the threshold

dummy. In the third regressions (3 and 6), we add the control variables: age of the household head and the dependency ratio.

In all six regressions, the eligibility dummy has a negative relationship with FIES. However, the effect seems more significant in the regression where a tighter dummy variable for education is used: hohNoEdu.

Theoretically, as the education level of the household head is lower, the FIES score tends to be higher. Intuitively, when household heads- who tend to have the strongest influence on the household- have a weak educational background, the household tends to suffer more from food insecurity. This may suggest that higher educational background positively influences spending habits of the household which in turn tend to increase food security.

Results yield coefficients on the indicators of low education and on the interaction terms that have opposite signs. But none of these coefficients is significant. In regressions 4-6, the coefficient on the dummy for No Education is negative coefficient while the coefficient on the interaction term is positive, where the protective effect of MPC is attenuated in household whose heads have low levels of education. However, the coefficients are far from significance levels.

Table 5: Household Head Education

	(1)	(2)	(3)	(4)	(5)	(6)
	FIES	FIES	FIES	FIES	FIES	FIES
dummy	-.307** (.146)	-.265 (.213)	-.24 (.21)	-.309** (.146)	-.335** (.163)	-.316** (.161)
hohLowEd	.01 (.128)	.03 (.148)	.005 (.147)			
hohLowEdxdummy		-.079 (.292)	-.094 (.289)			
agehoh			.024*** (.007)			.024*** (.007)
dependency_ratio			.436*** (.067)			.435*** (.067)
hohNoEdu				.039 (.166)	-.001 (.198)	-.047 (.2)
hohNoEduxdummy					.135 (.367)	.135 (.365)
_cons	4.51*** (.1)	4.499*** (.108)	2.891*** (.329)	4.509*** (.079)	4.515*** (.081)	2.902*** (.326)
Observations	1661	1661	1653	1661	1661	1653
R-squared	.003	.003	.029	.003	.003	.029

Standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

In Table 5B, the outcome we use is an indicator variable for severe food insecurity instead of the full FIES scale. This table is constituted in the same manner as table 5A with the only difference being the main outcome.

In regressions 1-3, the dummy variable of education attainment hohNoEdu is positive and significant. This means that the level education of the head of the household is associated with a significantly higher risk of severe food insecurity. In other words, lower educational attainment is linked a higher chance of severe food insecurity.

The more interesting findings are in columns 5 and 6. Here, we find that the eligibility dummy is significant and negative, indicating that the risk of severe food insecurity is significantly lower on the eligible side of the threshold, which is in line with our findings from Table 5A. However, we also find that the interaction term between the dummy for no education and the eligibility threshold is positive and significant (at the 10% level), indicating that the protective effect of eligibility for MPC against the risk of severe food insecurity is attenuated in households with uneducated heads. The magnitude of the coefficient on the interaction terms is also large, compared to the magnitude of the coefficient on the threshold dummy, suggesting that eligibility may not be shielding households from severe food insecurity at all when household heads have no education.

Table 6: Severe Food Insecurity

	(1)	(2)	(3)	(4)	(5)	(6)
	FIES_SFI	FIES_SFI	FIES_SFI	FIES_SFI	FIES_SFI	FIES_SFI
dummy	-.029 (.023)	-.027 (.034)	-.025 (.034)	-.031 (.024)	-.052** (.026)	-.049* (.026)
hohLowEd	.042** (.021)	.043* (.024)	.04* (.024)			
hohLowEdxdummy		-.003 (.047)	-.006 (.047)			
agehoh			.003** (.001)			.003** (.001)
dependency_ratio			.043*** (.011)			.043*** (.011)
hohNoEdu				.045* (.027)	.013 (.032)	.013 (.033)
hohNoEduxdummy					.11* (.059)	.1* (.059)
_cons	.212*** (.016)	.211*** (.017)	.044 (.054)	.227*** (.013)	.232*** (.013)	.066 (.053)
Observations	1661	1661	1653	1661	1661	1653
R-squared	.003	.003	.013	.003	.005	.014

Standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

In Table 5C, we add the explanatory variable `daily_meals_dm5`. It is a variable which accounts for the degree of involvement of females in the decision-making process regarding meal preparation. When a female has some decision making power in deciding on meal preparation, FIES decreases. In other words, around the cutoff, women having some control over meal preparation leads to an increase in food security of the household as a whole. It is also interesting to note that the magnitude of the coefficient of the meal preparation dummy is larger than that of the eligibility dummy in all regressions

Table 7: Meal Preparation

	(1)	(2)	(3)	(4)	(5)	(6)
	FIES_SFI	FIES_SFI	FIES_SFI	FIES_SFI	FIES_SFI	FIES_SFI
dummy	-.053** (.025)	-.035 (.037)	-.033 (.037)	-.054** (.025)	-.067** (.028)	-.065** (.028)
hohLowEd	.049** (.022)	.057** (.026)	.056** (.026)			
daily_meals_dm5	-.1** (.041)	-.1** (.041)	-.105** (.041)	-.098** (.041)	-.099** (.041)	-.105** (.041)
hohLowEdxdummy		-.033 (.051)	-.033 (.05)			
agehoh			.002* (.001)			.002* (.001)
dependency_ratio			.049*** (.012)			.049*** (.012)
hohNoEdu				.045 (.029)	.026 (.034)	.028 (.035)
hohNoEduxdummy					.07 (.064)	.072 (.064)
_cons	.309*** (.042)	.305*** (.042)	.143** (.07)	.326*** (.04)	.331*** (.041)	.171** (.07)
Observations	1430	1430	1423	1430	1430	1423
R-squared	.01	.011	.023	.009	.009	.022

Standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

Table 6A is the same as Table 5A, but we account for the mother's level of education instead. As such, momLowEd and momNoEdu are the dummy variables of the mother's level of education. In the first three regressions the education dummy variable (momLowEd) changes from 1 to 0 when the level of education is higher than a primary education without a certificate. In the last three regression, the education dummy variable (momNoEdu) changes from 1 to 0 if the mother has ever attended school in her lifetime.

The results are similar to the results mention in Table 5. The eligibility dummy sustains a negative value throughout all the regressions with a more significant negative effect where momheadedu1 is used.

The dummy variables of the level of education of the mother have a positive relationship with FIES. That is, weaker educational backgrounds predict lower levels of food security. But neither the variables measuring mother's education, nor the interaction terms are significant in any of the regressions.

C. Education of the Mother:

Table 8: Education of the Mother

	(1)	(2)	(3)	(4)	(5)	(6)
	FIES	FIES	FIES	FIES	FIES	FIES
dummy	-.291*	-.25	-.283	-.292*	-.332*	-.31*
	(.165)	(.241)	(.238)	(.165)	(.186)	(.184)
momLowEd	.164	.185	.108			
	(.146)	(.17)	(.169)			
		-.077	.046			
momLowEdxdummy						
		(.331)	(.328)			
agehoh			.022***			.022***
			(.008)			(.008)
dependency_ratio			.5***			.502***
			(.09)			(.09)
momNoEdu				.059	.008	-.002
				(.179)	(.209)	(.209)
					.191	.242
momNoEduxdummy						
					(.407)	(.404)
_cons	4.318***	4.307***	2.739***	4.394***	4.404***	2.792**
	(.115)	(.124)	(.388)	(.093)	(.095)	(.385)
Observations	1269	1269	1265	1269	1269	1265
R-squared	.003	.003	.028	.003	.003	.028

Standard errors are in parentheses

**** $p < .01$, ** $p < .05$, * $p < .1$*

In Table 6B, we use FIES_SFI as the dependent variable and we add the explanatory variable daily_meals_dm5. In all regressions, daily_meals_dm5 displays a significant effect. As such, women having some decision-making power over meal preparation in the household decreases the prospects of severe food insecurity.

Table 9: Severe Food Insecurity and Meal Preparation

	(1)	(2)	(3)	(4)	(5)	(6)
	FIES_SFI	FIES_SFI	FIES_SFI	FIES_SFI	FIES_SFI	FIES_SFI
dummy	-.041 (.028)	-.046 (.041)	-.051 (.04)	-.04 (.028)	-.04 (.031)	-.039 (.031)
momLowEd	.035 (.025)	.032 (.029)	.021 (.029)			
daily_meals_dm5	-.138*** (.04)	-.139*** (.04)	-.143*** (.04)	-.141*** (.041)	-.141*** (.041)	-.145*** (.041)
momLowEdxdum my		.01 (.056)	.025 (.056)			
agehoh			.003** (.001)			.003** (.001)
dependency_ratio			.051*** (.015)			.051*** (.015)
momNoEdu				.018 (.031)	.018 (.036)	.011 (.036)
momNoEdu xdummy					-.003 (.071)	.007 (.072)
_cons	.322*** (.042)	.323*** (.043)	.124 (.077)	.339*** (.041)	.338*** (.041)	.132* (.076)
Observations	1066	1066	1062	1066	1066	1062
R-squared	.015	.015	.028	.013	.013	.026

Standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

D. Gender of the Household Head

In Regression (1), we regress the Food Insecurity Experience Scale (FIES) on the eligibility dummy and a dummy for female headed households. In Regression (2), we add an interaction term between the aforementioned dummy variables. In regression (3), we add the score variable. It should be noted that the gender dummy variable is 1 when the household head is female and 0 when it is male. In regression (4) through (6), we perform a similar procedure while using the binary variable of severe food insecurity.

The eligibility dummy persists with a negative relationship with FIES. It is highly significant in Regression (1) at the 5% level. In addition, female headed households are significantly less food secure (at the 1% level) in Regressions (1) through (6). Even when we add the score variable to the equation or change our main outcome variable, the relationship between female headed households persist in significance and implication.

It should be noted that cash assistance does not affect household differently based on the gender of the head. However, female headed households are significantly less food secure.

Table 10: Gender

	(1) FIES	(2) FIES	(3) FIES	(4) FIES_SFI	(5) FIES_SFI	(6) FIES_SFI
dummy	-.3** (.145)	-.267 (.163)	-.236 (.227)	-.027 (.023)	-.011 (.026)	-.007 (.036)
femalehoh	.433*** (.154)	.471*** (.178)	.472*** (.178)	.104*** (.025)	.124*** (.029)	.124*** (.029)
femalehohxdummy		-.155 (.359)	-.156 (.359)		-.079 (.058)	-.079 (.058)
score2018			.016 (.082)			.002 (.013)
_cons	4.419*** (.081)	4.411*** (.084)	3.481 (4.732)	.211*** (.013)	.207*** (.013)	.094 (.761)
Observations	1661	1661	1661	1661	1661	1661
R-squared	.007	.007	.008	.011	.013	.013

Standard errors are in parentheses

**** $p < .01$, ** $p < .05$, * $p < .1$*

CHAPTER VI

CONCLUSION AND POLICY IMPLICATIONS

A. Conclusion

Major lessons that can be inferred from the findings of the above research include:

- i. We did not find significant and robust evidence point to the fact that education of the mother/household head does in fact effect Food Security through the channel of Cash assistance
- ii. Eligibility for a Multi-purpose cash assistance predicts a lower FIES score and higher food security experience
- iii. Households with a female head who are eligible for MPC tend to have lower score of food insecurity
- iv. Households where females have some decision-making power when it comes to meal preparation suffer less from problems of food security

B. Policy Implications

As such, the findings of this research can have two structural policy implications:

- i. Stressing on the active involvement of women in decision-making in the family which can have positive effects of food security
- ii. Ensuring the highest number of eligible households get access to cash assistance due to its significant effect on food security

APPENDIX A

VALIDITY GRAPHS

Figure 3: Household Size

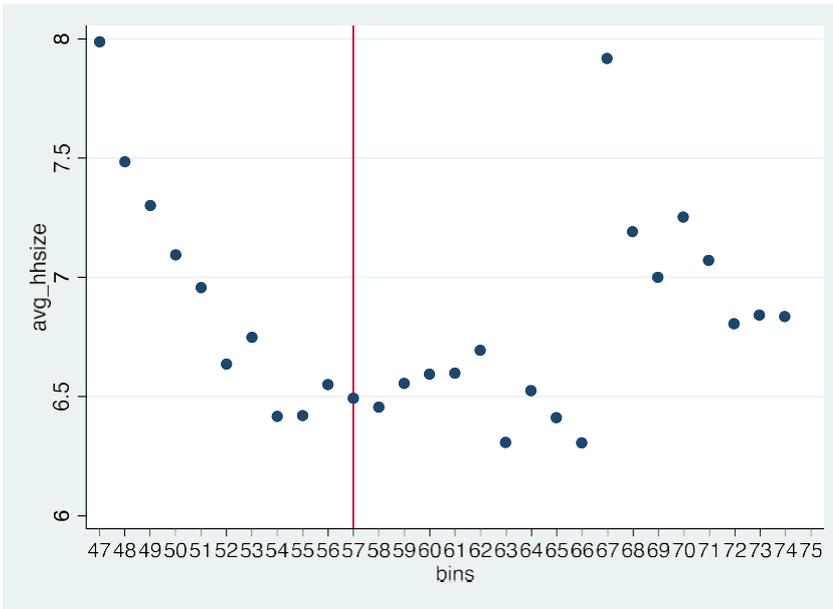


Figure 4: Age of the Household Head

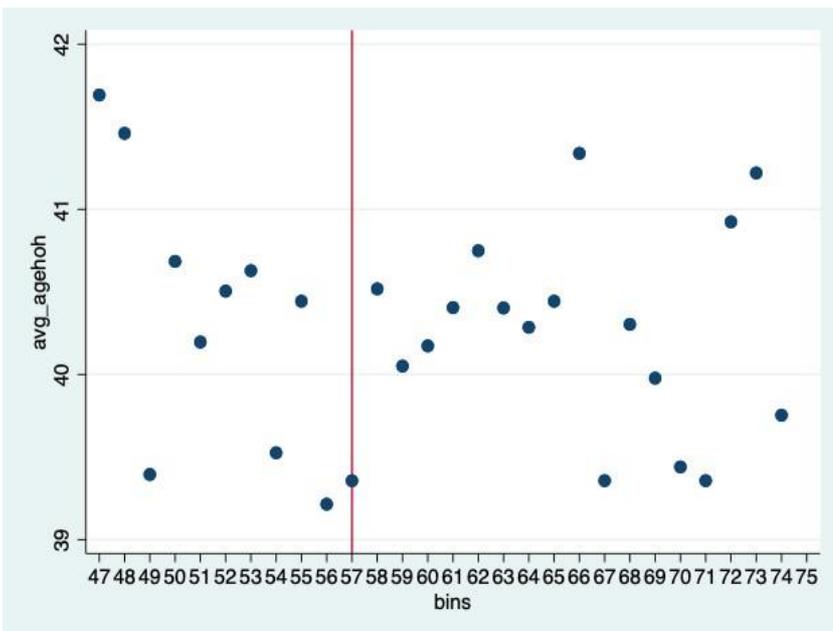


Figure 5: Dependency Ratio

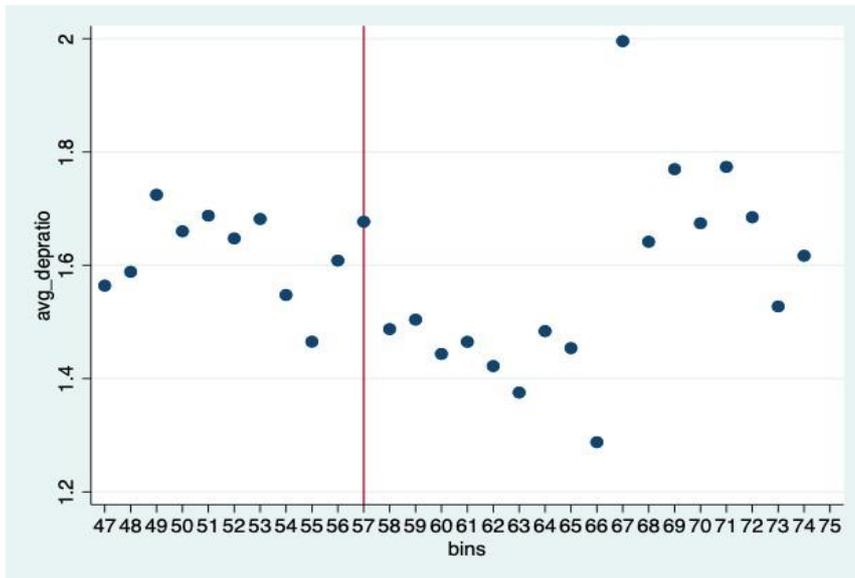


Figure 6: Percentage of Uneducated in the Household

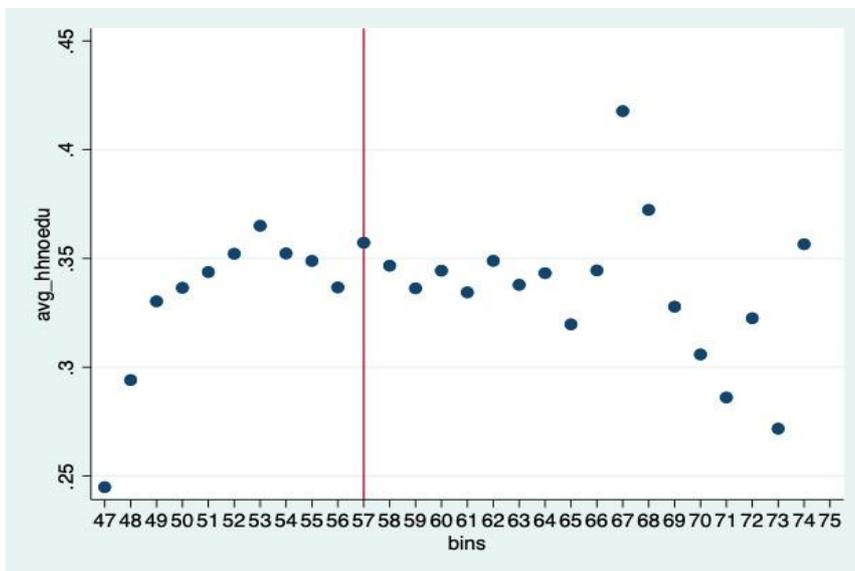


Figure 7: Residency

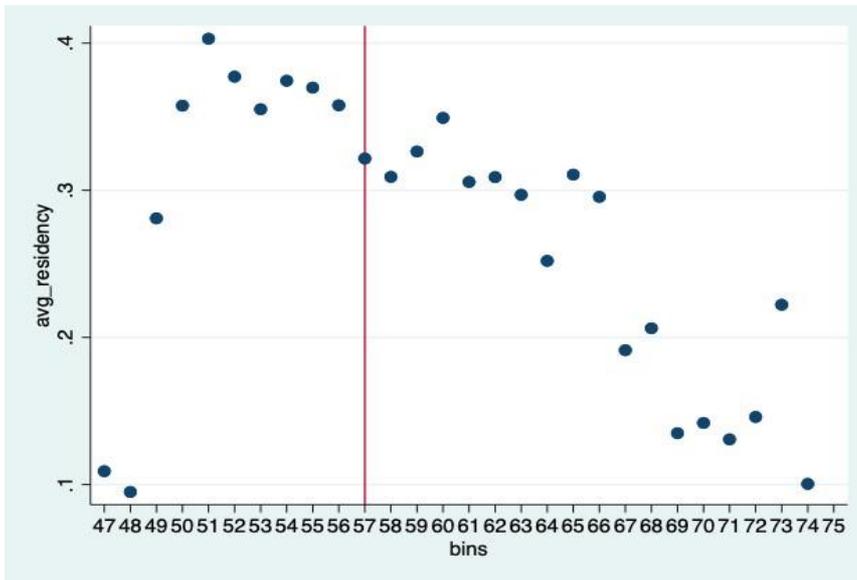


Figure 8: Marital Status

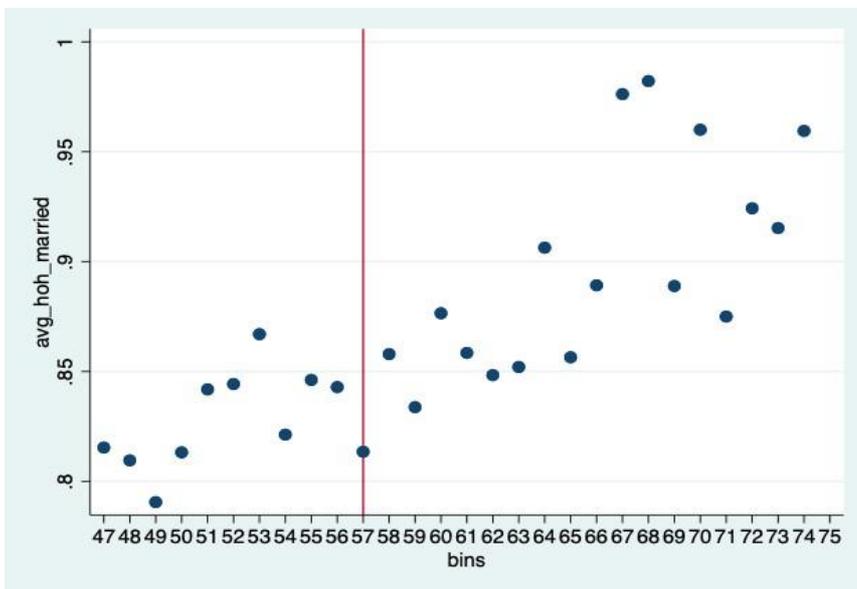
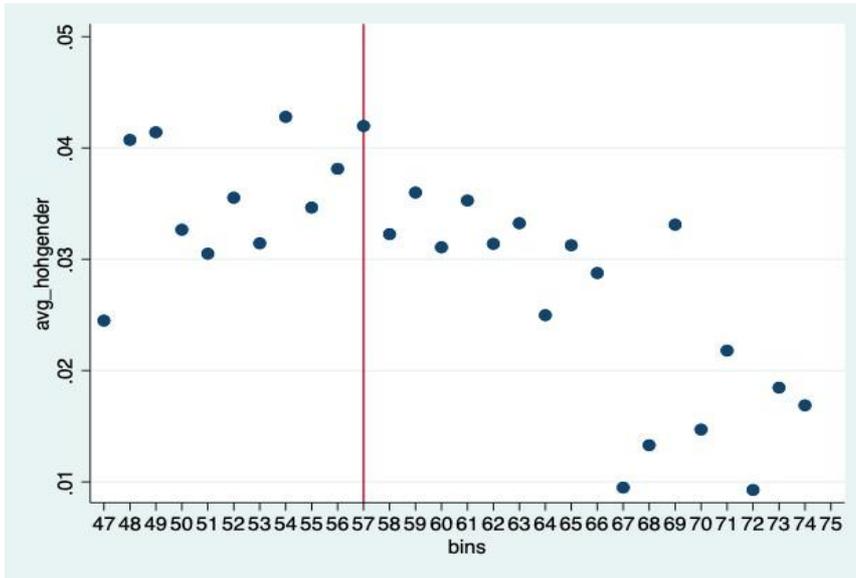


Figure 9: Household Head Gender



APPENDIX B

MCCRARY TEST

Table 11: McCrary Test

c = 57.000	Left of c	Right of c	Obs = 1664
Number of obs	901	763	
Eff. Number of observations	284	255	
Order est. (p)	2	2	
Order bias (q)	3	3	
BW est. (h)	0.617	0.619	

Running variable: score2018.

Method	T	P>T
Robust	0.243	0.808

P-values of binomial tests. (H0: prob = .5)

Window Length / 2	<c	>=c	P>T
0.004	10	10	1.000
0.009	19	15	0.608
0.013	36	15	0.005
0.018	63	24	0.000
0.022	74	31	0.000
0.026	77	45	0.005
0.031	77	51	0.027
0.035	82	64	0.159
0.040	88	64	0.062
0.044	106	75	0.025

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