

The Effect of Unconditional Cash Transfer (UCT) on Household  
Behavior: Evidence from Iran

by

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Major Paper Presented to the  
Department of Economics of the University of Ottawa  
in partial fulfillment of the requirements of the M.A. Degree

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April - 2020

## **Abstract**

In 2010, in order to replace energy subsidies, Iran introduced a large Unconditional Cash transfers (UCTs) program providing monthly cash transfers per person in all households that registered for the program. This paper examines the potential effect of this program on household behavior during 2010-2011, based on the difference-in-difference method. The result shows that UCT had no significant effect on total expenditure and investment in rural and urban areas. The results also indicate that UCT has a significant effect on food nutrition security (calories and protein) in urban areas. The result of the UCT impact on fertility behavior estimates the probability of having a newborn child among urban and rural households with different family sizes. The findings of the study based on the Generalized Ordered Logit model indicate that the UCT did not lead to a significant increase in fertility behavior in urban households. However, the program negatively affected fertility behavior in households without a child, but it led to a positive impact on fertility behavior in households with one, two, and three children.

**Keywords;** *Unconditional Cash transfers, Subsidy policy reform, Household behavior, Expenditure*

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## **1- Introduction**

Since the early 1970s, governments have been using cash payment policies to improve welfare, public health, and education. In recent years, cash payment policies have significantly increased in the world (Salehi-Isfahani et al., 2015). One of the main objectives of these programs is the reduction of poverty. Today, in most middle-income countries, at least one cash payment program is implemented.

The impact of cash transfer programs on household behavior is one of the critical issues for policymakers and academics. The economic literature on the implementation and consequences of cash transfers shows that these types of policies already exist. In this area, two kinds of cash transfers, Conditional Cash Transfers (CCTs) and Unconditional Cash Transfers (UCTs), have been used by governments in many countries in Latin America, Africa, and Asia. In conditional cash transfer programs, the government or policymaker provide a certain amount of cash directly to eligible households, based on some specified conditions to receive sustained benefits. These conditions could be related to children's healthcare, education, etc. In contrast, unconditional cash transfers provide a certain amount of cash directly to eligible households, without any baseline conditions to the head of households in order to tackle poverty (Cooper, J. E., Benmarhnia, T., Koski, A., & King, 2020).

Conditional and unconditional cash transfers might have different effects on the household's decisions in relation to labour supply, welfare, fertility, consumption, and saving. Evidence often shows that conditional and unconditional cash transfers can have different effects on the target group. The experimental literature in this field also suggests different results. For example, authors such as, (Whittington et al., 1990) (Acs, 1996), (Stecklov et al., 2007), (Feldman et al., 2009) (Salehi-Isfahani & Mostafavi-Dehzoeei, 2018) and (keshavarz haddad et al., 2018) showed that cash transfer programs and income tax exemption policies have no significant effect on household

behavior. In contrast (Nandi & Laxminarayan, 2016), (Cleland et al., 2016), (D. et al., 2017), and (Bhalla et al., 2018) indicated that cash transfer policies have a significant effect on household behavior including consumption, fertility, childcare, and healthcare.

The effectiveness of cash payment programs might be related to the social and cultural conditions of a society. For instance, living in an urban or rural area can provide different opportunities for households to spend the cash transfer. Besides, the household structure could impact the effectiveness of cash payment programs. Based on the experimental literature mentioned above, experiments showed conflicting results; consequently, finding the gaps may help to identify the pathways to improve households' wealth. In particular, the effectiveness of the cash transfer policies for different subgroups is unclear.

The 1979 Islamic Revolution in Iran has delivered many populist promises, including free utilities for households. Based on these populist promises, i.e., subsidies for energy, Iran is one of the least energy-efficient countries in the world. (Guillaume et al., 2011) In an oil-rich developing country such as Iran, reducing or removing these subsidies is challenging because people believe that they are entitled to the consumption of low-cost energy products. In 1989, the Iranian government began a series of economic reforms. Based on these economic reforms, some progress has been made in deregulation and privatization. However, the energy price reforms were postponed because of political and social unrest. Cheap energy had made Iranians the most wasteful energy users in the world, and the energy consumption in Iran has increased sharply during this period, according to World Bank Indicators (Figure 1).

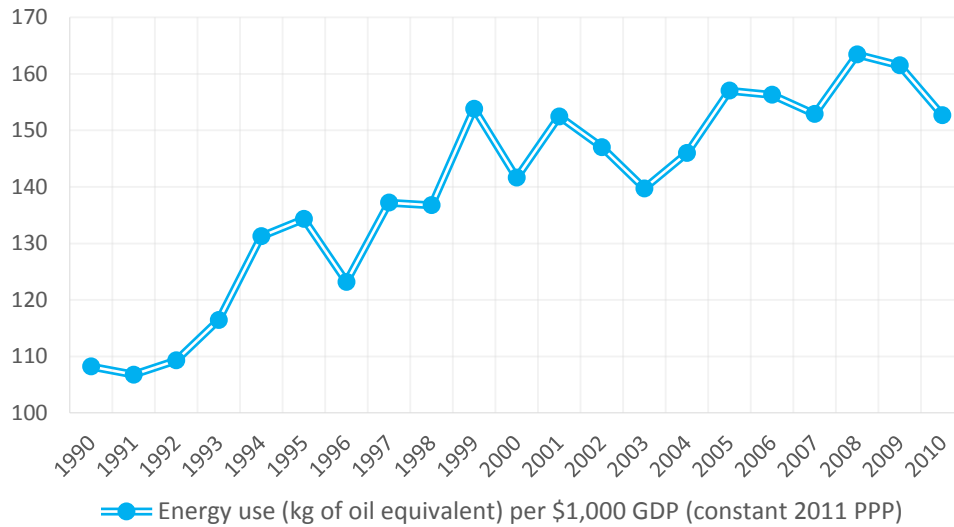


Figure 1: Consumption of energy in Iran  
 Source: World Bank Indicators

During the high inflation periods of the 1990s and 2000s, the nominal prices of energy products grew slightly. The enormous pressure of the energy subsidy forced the Iranian government to implement a price increase policy. Thus, in December of 2010, the government decided to pay per capita cash transfers to all citizens every month to minimize the adverse impact of energy price increases on households.

The Targeted Subsidy Reform (TSR) policy to remove the energy subsidies was passed by the Iranian parliament in January 2010, but the government did not implement the TSR until December 2010 because of political and social unrest. The president of the time, Mahmud Ahmadinejad, tried to increase the amount of the unconditional cash transfer by the TSR policy. The president opposed a gradual increase in energy prices close to the end of the Fifth Five Year Plan in 2015, insisting on raising prices at once. Increasing the amount of the cash transfer was a mistake because inflation would reduce the chance of political backlash (Salehi-Isfahani et al., 2015). In this situation, the government decided to finance the TSR policy by printing more money.

Finally, the government of Iran, in December 2010, implemented a monthly unconditional cash transfer program that replaced price subsidies on fossil fuel products. The cash transfer per person was paid to all households that were registered for the program. The amount of this financial aid was 445,000 Rials (45 USD or 90 USD in PPP dollars) per person payable to all Iranian citizens.

The evidence from the Household Income and Expenditure Survey (HIES) shows that household expenditures on energy products such as transportation, gas, electricity, and fuels increased for the highest income decile (Table.1). Table.1 shows that expenditure inequality declines immediately after the TSR policy in 2011. For instance, for the lowest income decile, expenditures on energy products decreased from 2010 to 2011. However, for the highest income decile, expenditures on energy products increased one year after the TSR policy.

Table.1: Household expenditures on energy products by income decile.

decile/year	2009	2010	2011	2012
1	1	1	1	1
2	1.43	1.44	1.42	1.46
3	1.76	1.78	1.7	1.73
4	2.06	2.03	1.99	2.06
5	2.35	2.36	2.23	2.27
6	2.56	2.65	2.52	2.56
7	3.01	3.06	2.84	3.03
8	3.48	3.33	3.24	3.57
9	4.3	4.45	4.07	4.39
10	9.03	7.51	8.00	9.95

Source: Statistical Center of Iran, HIES database

Given the above-mentioned policy in Iran, this study investigates the impact of the cash transfer payment of 2010 on household behavior by using the annual Household Income and Expenditure Survey (HIES) data from the Islamic Republic of Iran.

Most of the literature on this subject has generally focused on the behavioral effects of cash transfer programs on one aspect of household behavior. Thus, the impacts of the programs on the detailed expenditures in households are not clear in the literature. Thus, the main contribution of this paper is to study the impact of UCT on some particular aspects of household behavior in amusement, communication, medical, services, furniture, restaurant, and clothing expenditures, fertility, and nutrition.

This paper has consisted of five sections, structured as follows. Section 2 provides a literature review and the theoretical background on the effect of cash transfer on household behavior. Section 3 discusses the data used in analyses. Section 4 shows the empirical model and presents the result of the paper. Section 5 discusses the main findings of the study.

## **2- Literature Review**

Economic theory suggests that cash transfer policy through income and substitution effects may affect household behavior patterns in many aspects of life. As mentioned before, this effect may be related to the cultural and social conditions background of society. The cash transfer programs provide some income resources for households, such as consumption, children's education, and healthcare, which may influence their behavior (Namboodiri, 1972). In this situation, households can update their budget constraint and expenditures, since the cash transfer programs have an income effect on resources in the household. As a result, the mechanism of cash transfer programs can influence the relative expenditures of the households. Identification of the cash transfer programs impacts on households behavior can be related to three aspects according to (Stecklov et al., 2007):

- (i) The amount of the cash transfer;
- (ii) The way that the cash transfer changes the absolute and relative costs associated with saving, expenditures, and fertility

(iii) The impact of cash transfer on labour supply.

Many studies in this regard show that cash transfer programs have a different impact on the household's behavior related to their expenditure, savings, and fertility behavior. There is an extensive economic literature identifying the impacts of cash transfer programs on individual and household levels of the outcome. In general, the effects of these programs can be summarized as follows:

1. Cash transfers improve the budget constraint
2. Cash transfers might increase attention to children school attendance
3. Cash transfers can improve health service and nutrition
4. Cash transfers might increase household investment and savings
5. Cash transfers are associated with labour supply (child and adults working)
6. Cash transfers improve household empowerment
7. Cash transfers can impact on intra-household decision-making power
8. Cash transfers can change fertility behavior

Based on the variety of evidence in this area, this section is organized into categories of cash transfer policy impacts on household behavior.

### **2-1- Cash Transfer Effect on Consumption**

The cash transfer programs may change household consumption for food and temptation goods such as alcohol and tobacco. Some experimental evidence shows that cash transfer programs have a positive and significant impact on food and nutrition security. These types of results have been reported by, (Hoddinott, John & Skoufias, 2004) (Attanasio & Mesnard, 2006), (Angelucci & De Giorgi, 2009) in Mexico, (Attanasio et al., 2009) in Colombia, (Resende & Oliveira, 2008) in Brazil, (Brugh et al., 2018) in Malawi, (D. et al., 2017) in Indonesia, and (Bhalla et al., 2018) in Zimbabwe.

Studies that investigated the consumption of temptation goods have conflicting results. (Rubalcava et al., 2004) found that the Progressa conditional cash transfers in Mexico had a significant negative effect on alcohol and tobacco consumption (Maluccio & Flores, 2005) showed that Nicaragua's "Red de Protection Social" program had no impact on alcohol or tobacco consumption. (Attanasio & Mesnard, 2006) found that the cash transfer program in Colombia did not significantly impact on the consumption of alcohol or entertainment. (Harvey et al., 2005) showed that cash transfer programs did not affect the expenditure on alcohol and cigarettes. (Cunha et al., 2011) found that the Programa de Apoyo Alimentario in Mexico increased alcohol consumption; however, there was no impact on tobacco consumption. (Evans & Popova, 2017) indicated that cash transfer programs did not significantly impact on the consumption of temptation goods. (Keshavarz Haddad et al., 2018) showed that unconditional cash transfer programs in Iran's had no impact on tobacco consumption.

## **2-2- Cash Transfer Effect on Savings**

The cash transfer programs through the income effect might affect household savings and investment. Some studies in this area have considered the impact of cash transfer programs on savings and investment. The review in this area shows that cash transfer programs might increase investment in businesses, productive activities, and assets. Various studies have emphasized the impact of these programs on household saving. (Duflo, 2003) found that cash transfer to men and women in South Africa had a different effect on the savings rate between men and women, in a way, women had more savings rate. (Attanasio & Mesnard, 2006) showed that half of the households saved the conditional cash transfer payments in Colombia. (Gertler et al., 2006) estimated that 12% of the Progressa conditional cash transfer program was invested in assets. (de Mel et al., 2012) showed that all of the cash transfers distributed to micro-entrepreneurs in Sri Lanka were invested in businesses. (Angelucci & De Giorgi, 2009) found that the

Progressa conditional cash transfer program increased agriculture-related expenses and the purchase of livestock in Mexico.

### **2-3- Cash Transfer Effect on Labour Supply**

There is a large body of academic literature on the impact of cash transfers programs on household labour allocation. (Maluccio & Flores, 2005) showed that cash transfer in Nicaragua had no significant effect on labour supply. (Tavares, 2010) showed that the Bolsa Familia program in Brazil reduced mothers' time spent working outside the home. (Teixeira, 2010) showed that the Bolsa Familia program in Brazil had a small and significant impact on the hours worked per week. (Hernani-Limarino & Mena, 2015) indicated that unconditional transfers in Brazil reduced women's labour supply, but this program had no impact on men's labour supply. (Banerjee et al., 2015) showed that in seven developing countries, there was no significant evidence to support the "lazy welfare recipients." (Handa et al., 2018) found that cash transfer programs in Sub-Saharan Africa reduced labour supply. (Salehi-Isfahani & Mostafavi-Dehzoeei, 2018) showed that unconditional cash transfer programs in Iran had no impact on labour supply. Based on the lecture on labour supply, the evidence indicates that the effect of cash transfers on adult labour supply varies by gender, size of cash transfer, and duration of cash transfer.

### **2-4- Cash Transfer Effect on Healthcare**

Cash transfer policy might improve healthcare services, well-being, and increase dietary diversity for households. (Fiszbein et al., 2012) reported that the Progresa program had a positive and significant effect on healthcare in Latin American countries. (Ranganathan & Lagarde, 2012) analyzed 13 conditional cash transfer programs in middle-income countries. They found that these programs have been effective in increasing health services and health outcomes. (Baird et al., 2011) investigated the

impact of cash transfer on mental health among females in the Republic of Zambia. The results showed that cash transfers reduced indicators of depression among a sample of female youths aged 13 to 22 years old. (Kilburn et al., 2016) reported that cash transfer for orphans and vulnerable children in Kenya reduced the depression symptoms among youths aged 15 to 24 years old. A recent study by (Angeles et al., 2019) found that the cash transfer program significantly improved health outcomes in Malawi. (Okeke, Edward & Abubakar, 2020) showed that the cash transfer program in Nigeria had a significant impact on uptake and child survival, driven by a decrease in in-utero child deaths.

## **2-5- Cash Transfer Effect on Children**

The literature indicates that cash transfer policy may have an impact on children's education, child labour, and children's healthcare. Cash transfers improve the financial situation of the household, and this might reduce children's labour activities. Besides, cash transfer may reduce the costs of attending schools, such as tuition fees, books, and uniforms. Consequently, children in low-income families can continue their education (Baez & Camacho, 2011).

(Attanasio & Mesnard, 2006) found that the cash transfer policy in Colombia had a significant impact on school enrolment. (Skoufias & Parker, 2001) showed that cash transfer in Mexico had a positive effect on school attendance and a negative effect on the participation of children in early labour activities. Also, Barrow and Schanzenbach (2012) supported the view that cash transfer policy increases children's enrolment in education. (Handa et al., 2018) reported that dependency on the government and the cash transfer program do not impact on children's healthcare. In a recent study, (Mostert & Vall Castello, 2019) found that cash transfer policy improved reading and writing abilities among children and that this had the spillover effects on other members of the family.

## **2-6- Cash Transfer Effect on Fertility**

The Economic theory of fertility decision-making suggests that cash transfer policy, through the income and the substitution effects, may affect the demand for children; (Becker & Lewis, 1973)(Stecklov et al., 2007).Based on this model, children provide utility to the couple, as well as being production goods. Consequently, couples maximize the utility that they receive for their children by choosing the quality and quantity of children. The cash transfer programs provide some income resources for children's care, such as education and health, and they may influence fertility behavior(Namboodiri, 1972). In this situation, couples can update their choices for the quality and quantity of children, because their social or economic situation has changed. As a result, the mechanisms of the cash transfer programs can influence the relative costs of having the child. Also, the potential biological supply of parents can impact on fertility outcomes.

Moreover, the couple's preferences during the life cycle can change, and fertility outcomes in the short term and long term can be different. The cash transfer programs have an income effect on resources in the household, and the impact of this policy on fertility behavior is theoretically ambiguous. Due to the income effect, the couple's preferences regarding the quality of life of their children may contribute to a fall in fertility behavior (Becker & Lewis, 1973),(Schultz, 1997).On the other hand, the shift from quantity to quality may have a positive impact on fertility behavior (Stecklov et al., 2007).

The cash transfer programs may change the relative price of the quality and quantity of children, and this depends on some elements such as whether the cash transfer is conditional or unconditional and the amount of the transfer. The large scale unconditional cash transfer program may not be entirely for the well-being of children. Since cash transfers increase household income, expenditure on any normal good is

expected to increase. Therefore, the impact of Unconditional Cash Transfers (UCTs) on women's fertility behavior is theoretically ambiguous. (Stecklov et al., 2007) identified the three aspects of UCTs which influence fertility; (i) the amount of the transfer, (ii) the way that UCTs change the absolute and relative costs associated with investing and having children, and (iii) the impact of the program on labour supply. Based on their assumption, if UCT programs influence total income, this policy may induce increased fertility, and this is related to the design of the UCTs. Also, preferences for fertility over time may be related to the mother's time and education, fecundity, and the costs of having children.

Studies conducted in countries such as Kenya, South Africa and Malawi (UCTs), as well as in Nicaragua and Mexico (CCTs), show that CT programs have no impact on fertility; (Stecklov et al., 2007), (J. Todd et al., 2011), (J. E. Todd et al., 2012), (Rosenberg et al., 2015), and (Schultz, 1997). indicated that the cash transfer program in Mexico in the short-term had no significant impact on fertility.(Baird et al., 2012) showed that CTs in Malawi (Zomba Cash Transfer Programme) led to delays in marriage and fertility while the unconditional cash transfers (UCTs) program had a negative and significant impact on marriage and pregnancy. (Handa et al., 2018)found that Kenya's CT-OVC had a negative impact on the first pregnancy among young people. (Rosenberg et al., 2015) found that receipt of cash transfer did not increase the pregnancy rates in South Africa.

On the other hand, other studies such as(Garganta, Gasparini, Marchionni, & Tappat, 2017) and (Nandi & Laxminarayan, 2016) showed that cash transfer programs had a positive impact on fertility. (Whittington et al., 1990) found that the American federal personal exemption for dependent children had a positive effect on the birth rate. Arenas et al. (2015), using nonexperimental data from the cash transfer program in Mexico (PROGRESA), showed that the rate of fertility increased in households who were

enrolled early in the program. The overview of the literature, as shown above, confirms the fact that cash transfer programs may affect fertility behavior. However, the exact impact of UCTs on fertility is not fully understood. Consequently, the main contribution of this paper is to explore the impact of UCT on the newborn child in Iranian households with different numbers of children. In order to measure the impact, this paper applies a Difference-in-Differences analysis.

### **3- Data and methodology**

#### **3-1- Data**

As mentioned in the introduction, the government of Iran decided to offer cash transfer to all households regardless of income. All citizens were permitted to apply for self-registration for UCT in 2010, but some households did not sign up in this program. The UCTs payment began in December 2010 (9th month of Iranian national calendar), and on the same day, the energy subsidies were removed. It should be mentioned that in the fourth season of 2010, only 65 percent of the households had registered, and following that, more than 95 percent of the households had registered in this program in 2011. Thus, this paper uses the longitudinal survey data collected at a household level over 2010-2012 to investigate the impact of UCT on household behavior in Iran. This data was collected annually in all provinces. The Household Income and Expenditure Survey (HIES) surveys the entire sample almost uniformly during the twelve months of the year. Every year about 20 percent of the households are replaced with new households in the survey. So, this data has the ability to track households over different years.

Figure.2 shows the share of expenditures for various items in total household expenditure from 2006 to 2013. Durable goods, food, and services had a high share of household expenditure in Iran. On the other hand, expenditures for amusement, education, and the restaurant had the lowest share of household expenditure.

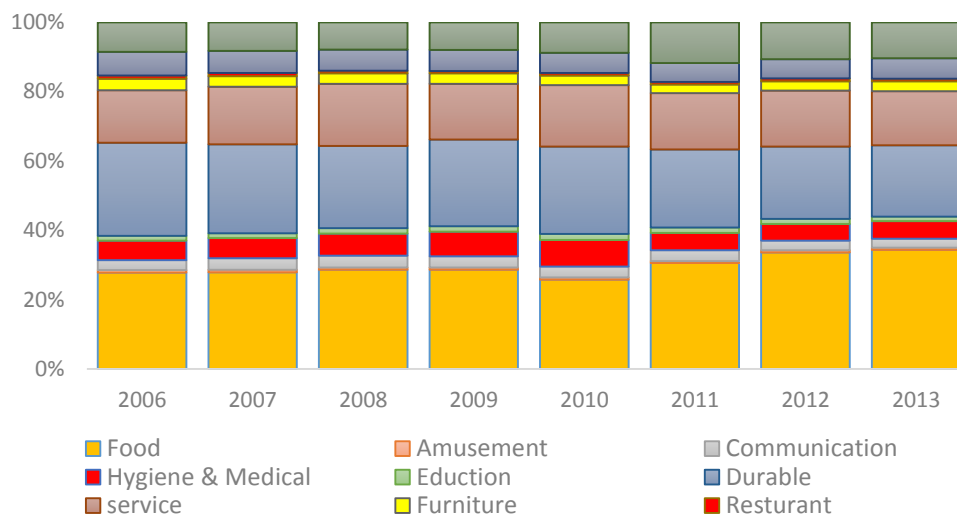


Figure 2: The share of expenditures for various items in total household expenditure

Source: Statistical Center of Iran, HIES database

In Figure.3, we can observe that food expenditure was higher than that of other items in the household basket, which decreased in 2010 during the Targeted Subsidy Reform (TSR). Besides, expenditure on durable goods declined immediately after 2010. Also, the share of service expenditure was smooth and has changed slightly.

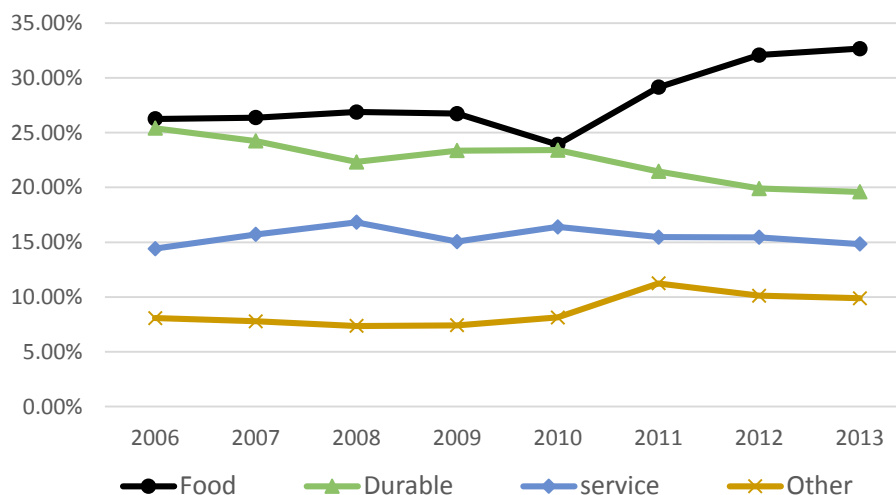


Figure 3: The share of expenditures for food, durable goods, services, and other items in total household expenditure

Source: Statistical Center of Iran, HIES database

Figure.4 presents the expenditure for other items, including amusement, medical communication, education, furniture, restaurant, and clothing. Each of these items accounted for less than 8% of household expenditure. As Figure 4 shows, medical and hygiene expenditure declined immediately after 2010. However, the other items changed slightly from 2010 to 2013.

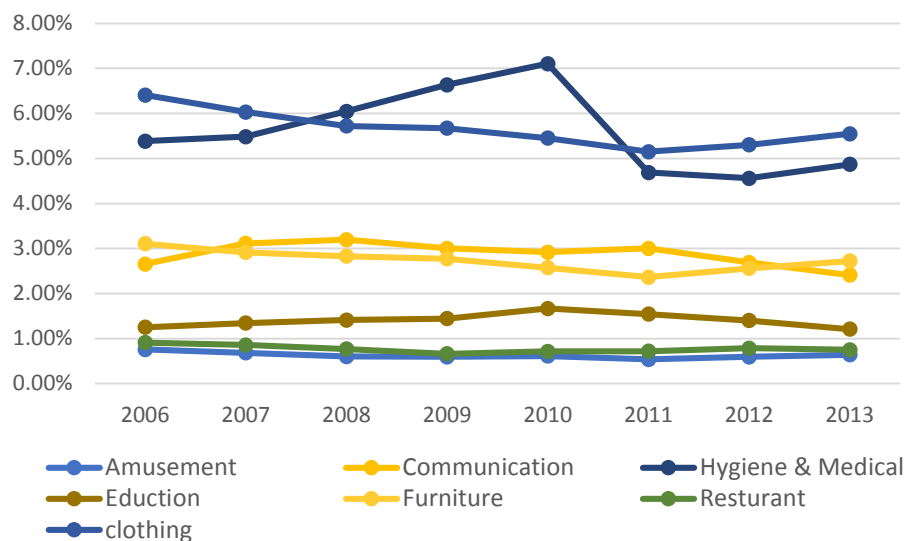


Figure 4: The share of expenditures for various items, including Amusement, Communication, Medical, Education, Furniture, Restaurant, and Clothing in total household expenditure. Source: Statistical Center of Iran, HIES database

Table.2 below presents the data statistics in this study for the 5,670 urban and 6,501 rural households from 2010 to 2012.

	Mean	Std. Dev.	Min	Max
Variable	Urban			
Log-Total Expenditure	10.066	0.944	6.974	13.286
Log-Food Expenditure	8.717	1.000	4.670	12.149
Log-Amusement Expenditure	3.409	2.752	0.054	11.113
Log-Communicate Expenditure	6.133	1.638	0.510	10.499
Log-Medical Expenditure	4.540	3.206	0.489	12.487
Log-Food Calories	9.427	0.590	4.893	11.494
Log-Food Protein	5.995	0.549	1.792	8.172
Log-Education Expenditure	2.931	3.146	0.386	10.507

	Mean	Std. Dev.	Min	Max
Log- Durable goods	8.130	1.553	0.340	12.590
log -Total investment	3.266	6.715	2.384	22.158
Log-Services Expenditure	12.494	3.622	1.030	17.371
Log- Furniture Expenditure	11.746	2.055	0.019	16.673
Log-Restaurant Expenditure	5.126	5.785	2.210	16.588
Log-Clothing Expenditure	7.140	1.455	0.586	12.029
Variable		Rural		
Log-Total Expenditure	10.470	0.847	6.532	14.183
Log-Food Expenditure	9.432	0.860	5.397	13.850
Log-Amusement Expenditure	2.979	3.005	0.234	11.372
Log-Communicate Expenditure	6.340	1.936	0.023	11.434
Log-Medical Expenditure	4.915	3.457	0.795	13.287
Log-Food Calories	9.352	0.509	4.200	11.384
Log-Food Protein	5.958	0.487	1.674	7.854
Log-Education Expenditure	1.980	2.766	2.345	10.797
Log- Durable goods	8.160	1.523	5.345	13.215
log -Total investment	5.135	7.751	7.454	21.064
Log-Services Expenditure	13.110	3.537	6.353	17.217
Log- Furniture Expenditure	11.977	2.315	2.455	17.933
Log-Restaurant Expenditure	5.610	6.046	3.456	17.281
Log-Clothing Expenditure	7.750	1.339	2.303	12.173

Source: Statistical Center of Iran, HIES 2010-2012

For the investigation of the UCT on fertility behavior, Table.3 shows the data statistics for the sample of women between 16 and 45 years of age, who are married and have the ability to fertility.

Table.3: Summary of statistics for fertility behavior

Variable	Obs	Mean	Std. Dev.	Min	Max
Children under 15 years old (Rural)	28,255	1.058326	1.023195	0	8
Children under 15 years old (Urban)	28,748	1.190309	1.170684	0	9

Source: Statistical Center of Iran, HIES 2010-2012

### 3-2- Methodology

Difference-in-Differences is a quasi-experimental design to compare “treatment” and “control” groups before and after treatment. This analysis is usually used to estimate the effect of a specific intervention or treatment by comparing the changes in outcomes over time between a group that is registered in a program and a group that is not. The *dif-in-dif* regression formwork;

$$Y_{it} = \beta_0 + \beta_1 T_{it} + \beta_2 time_{it} + \beta_3 T * time_{it} + u_{it} \quad (1)$$

In this question,  $\beta_3$  is the *dif-in-dif* in the group means. So, this is the average treatment effect on treated, as shown in Table.4 below.

Table.4: The difference-in-difference table and program effect.

	Time (2011=0)	Time (2010=1)	Difference
Treatment (S=0,T=1)	$\beta_0 + \beta_1$	$\beta_0 + \beta_1 + \beta_2 + \beta_3$	$\beta_2 + \beta_3$
Control(S>0,T=0)	$\beta_0$	$\beta_0 + \beta_2$	$\beta_2$
Difference	$\beta_1$	$\beta_1 + \beta_3$	$\beta_3$

Note: S > 0 stands for being a cash assistance recipient.

Where  $Y_{it}$  is the relevant outcome<sup>1</sup> for household  $i$  at time  $t$  listed by Table.2.  $T_{it}$  is a binary variable that equals one if the household  $i$  is in the treatment group at time  $t$  and zero otherwise. The control group is the households that received the cash transfer in all the sample periods. It should be noticed that the control and treatment groups determined randomly. *Time* is a binary variable that equals one if the year is 2010 and zero otherwise. Consequently, the negative and significant  $\beta_3$  is interpreted as a positive

<sup>1</sup> The relevant outcome variables are; log of expenditures in amusement, communicate, medical, services, furniture, restaurant, and, clothing. Log of received food calories and protein. Also, relevant outcome variable for fertility section is a sequential variable that equals the number of children in household  $i$  at time  $t$ .

policy effect of the treated group; this shows that policy has a positive impact on the relevant outcome.

Due to the partial participation in the initial implementation in 2010 and full participation in the following year, we cannot use 2010 as the reference year for the Difference-in-Differences model. Because by considering cash transfer as a treatment, then a portion of the households received this treatment in the first year, and more than 95 percent of them received it in 2011. Based on the fact that we need a two-period dataset for the difference-in-difference, we do not have any observation that households received the treatment in year  $t$ , but a portion of them received it in year  $t+1$  (keshavarz haddad et al., 2018). Accordingly, (keshavarz haddad et al., 2018)'s approach was used in this situation; we reversed the direction of time. It is assumed that the first year of the Targeted Subsidy Reform (TSR) is 2011, in which more than 95 percent of households received cash transfers, and 2010 was considered as the second year. Thus, the control group is the households that received the UCT in both 2011 and 2010, and the program group is the households that did not receive the cash transfer in 2010. Besides, for the parallel trends test, we consider 2012 as the year zero to overcome this difficulty.

Based on the fact that the amount of UCT program is per person to all household members, it can affect every single household with any size. So, this paper used two different approaches. In the first part, to investigate the impact of UCT on household behavior for expenditure and food and nutrition security, we use the robust OLS model.

In the second part, this paper uses the Generalized Ordered Logit model in order to investigate the impact of UCT on fertility behavior among urban and rural households with different family sizes. When the dependent variable (the number of children) has more than two categories (based on data statistics in *Table 2*), and the values of each

category are sequential order, then we can use the ordinal logit model. The general form if this model is;

$$y_i^* = \beta' X_i + \varepsilon_i \quad (2)$$

Where  $y_i^*$  is the expected number of children, X is the explanatory variables.

$$\begin{aligned} y_i &= 0 \text{ if } y^* \leq 0 \\ y_i &= 1 \text{ if } 0 \leq y^* < \mu_1 \\ y_i &= 2 \text{ if } \mu_1 \leq y^* < \mu_2 \\ y_i &= J \text{ if } \mu_{j-1} \leq y_i^* \leq +\infty \end{aligned} \quad (3)$$

Where  $\mu_1$  and  $\mu_2$  are jointly estimated threshold values that determine the number of children. One of the main assumptions in this model is that the relationship between each pair of groups is identical. In case of violation of the assumption of parallel regression, the Generalized Ordered Logit model can solve this problem. This model can be written as

$$P(Y_i \geq j) = g(X \beta_j) = \frac{\exp(\alpha_j + X \beta_j)}{1 + \{\exp(\alpha_j + X \beta_j)\}} \quad j = 1, 2, 3, \dots, M - 1 \quad (4)$$

In equation (4),  $M$  is the number of stages of the ordinal dependent variable. So, it can be determined that the probabilities that  $Y$  will take on each of the values  $1, \dots, M$  are equal to;

$$\begin{aligned} P(Y_i = 1) &= 1 - g(X \beta_j) \\ P(Y_i = j) &= g(X \beta_{j-1}) - g(X \beta_j) \quad j = 1, 2, 3, \dots, M - 1 \\ P(Y_i = M) &= g(X \beta_{M-1}) \end{aligned} \quad (5)$$

In this case, if the outcome variable has  $j$  possible values (in this case  $j=7$ ), the Generalized Ordered Logit model will have  $j-1$  sets of coefficients; in effect,  $j-1$  equations are estimated simultaneously. If  $M=2$  so, the generalized ordered logit model will be equivalent to the ordinary logit model. If  $M>2$ , the generalized ordered logit model will be equivalent to a series of binary logistic regressions where categories of the dependent variable are combined (Williams, 2006).

#### 4- Empirical Results

The result of the *dif-in-dif* for household's total expenditure, investment, and durable goods expenditure are presented in Table 5. The impact of the UCT on household behavior is captured by the coefficient of the interaction term (treatment×time) in this model. Table.5 presents the result of *dif-in-dif* estimation for total expenditure, investment, and durable goods.

Table.5: the result of dif-in-dif estimation for total expenditure, investment, and durable goods in the urban and rural area (2010-2011)

Variables	Urban		
	Total Expenditure	Investment	Durable Goods Expenditure
treatment×time	-0.0174 (-0.800)	0.100 (1.145)	-0.00833 (-0.0269)
treatment	-0.215*** (-8.024)	-0.0936 (-0.794)	-0.414 (-1.817)
time	-0.148*** (-5.734)	-0.152* (-2.095)	-0.0146 (-0.0767)
Constant	9.122*** (439.5)	8.197*** (68.53)	17.17*** (184.1)
Observations	3,780	3,779	829
R-squared	0.013	0.001	0.005
Variables	Rural		
	Total Expenditure	Investment	Durable Goods Expenditure
treatment×time	-0.0246 (-0.987)	0.177* (1.854)	-0.00399 (-0.0379)
treated	-0.0355 (-0.738)	-0.0886 (-0.490)	-0.0801 (-1.003)
time	-0.207*** (-8.870)	0.0402 (0.735)	-0.0762 (-0.853)
Constant	10.48*** (102.8)	16.56*** (104.3)	8.184*** (65.88)
Observations	4,334	1,488	4,332
R-squared	0.019	0.003	0.001

Note1: Robust t-statistics in parentheses and \*\*\* p<0.01, \*\* p<0.05, \* p<0.10

The results show that in rural and urban areas, the coefficient of the treatment×time variable is not statistically significant, but in the rural area, the results show that cash transfer has a negative and statistically significant impact on the rural household investment. The result in this section shows that the UCT program did not affect expenditure total expenditure, investment, and durable goods in urban areas.

In order to investigate the impact of the UCT program on food expenditure and food nutrition security (Calories and Protein), we estimate the *dif-in-dif* for urban and rural households.

Table.6: the result of dif-in-dif estimation for food expenditure and food nutrition security in the urban and rural area (2010-2011)

Variables	Urban		
	Food Expenditure	Food Calories	Food Protein
treatment×time	-0.0504 (-1.291)	-0.0901* (-2.210)	-0.103** (-2.378)
treatment	-0.0647*** (-4.023)	0.0447 (1.145)	0.0624 (1.560)
time	-0.316*** (-11.63)	0.0808* (2.261)	0.0902** (2.672)
Constant	8.807*** (180.1)	9.387*** (291.4)	5.939*** (172.3)
Observations	3,780	3,780	3,780
R-squared	0.034	0.001	0.001
Variables	Rural		
	Food Expenditure	Food Calories	Food Protein
treatment×time	-0.0240** (-3.335)	0.0157 (0.545)	0.0106 (0.417)
treated	0.0357 (0.739)	0.00442 (0.232)	0.00779 (0.546)
time	-0.374*** (-32.57)	-0.0266 (-1.083)	-0.0179 (-0.888)
Constant	9.428*** (96.08)	9.355*** (409.8)	5.956*** (334.8)
Observations	4,334	4,334	4,334
R-squared	0.055	0.001	0.002

Note1: Robust t-statistics in parentheses and \*\*\* p<0.01, \*\* p<0.05, \* p<0.10

Table.6 shows that the treatment×time variable for the urban area is negative and statistically significant. The results indicate that the UCT policy had a positive impact on food nutrition security in urban areas. However, in rural areas, this policy had no significant effect on food nutrition security. Besides, the results of estimating the unconditional *dif-in-dif* model for samples of rural households show that the UCT policy had a positive impact on food expenditure. Consequently, the households that received the cash transfer in 2011 but not in 2010 had more food expenditure between 2010 to 2011.

The results for other aspects of expenditure, including education, amusement, communication, medical, furniture, restaurant, clothing, and services, show that the UCT policy in Iran does not have a statistically significant impact on the urban household expenditure (Table.7). On the other hand, the UCT policy had a negative effect on amusement expenditure in rural areas in Iran, because the treatment×time variable for the rural area is positive and statistically significant. The results in this section indicate that the rural households who received the cash transfer in 2011 but not in 2010 decreased amusement expenditure from 2010 to 2011 because the treatment×time variable is positive and statistically significant.

The findings in this paper show that in the urban households, unconditional cash transfer had no impact on durable and non-durable goods expenditure, savings, and services. However, in rural households, the UCT policy had a negative and significant impact on household behavior for amusement expenditure. The results show that nutrition security, including calories and protein, increased among the households who received the cash transfer in 2011 but not in 2010.

Table.7: the result of dif-in-dif estimation for education, amusement, communication, medical, furniture, restaurant, clothing, and services expenditure in the urban and rural area (2010-2011)

		Urban						
Variable	Education Expenditure	Amusement Expenditure	Communication Expenditure	Medical Expenditure	Furniture Expenditure	Restaurant Expenditure	Clothing Expenditure	Services Expenditure
treatment×time	-0.0874 (-0.589)	0.0517 (0.695)	0.0570 (1.397)	-0.0455 (-0.311)	-0.0686 (-0.982)	0.0998 (1.065)	0.00982 (0.130)	-0.0168 (-0.328)
treatment	0.714 (1.666)	-0.0784** (-2.740)	0.0510 (0.952)	0.01000 (0.183)	0.0270 (0.368)	-0.122*** (-4.150)	-0.504*** (-11.91)	-0.121** (-3.478)
time	0.0443 (0.209)	-0.188*** (-4.077)	-0.214*** (-7.971)	0.0547 (0.543)	0.0137 (0.286)	-0.132 (-1.471)	-0.139 (-1.462)	-0.0102 (-0.294)
Constant	4.659*** (18.54)	5.281*** (122.5)	6.353*** (117.7)	6.398*** (93.28)	12.01*** (225.7)	11.69*** (698.9)	7.566*** (104.4)	13.62*** (259.3)
Observations	2,043	2,486	3,600	2,686	3,701	1,669	3,780	3,505
R-squared	0.008	0.003	0.006	0.000	0.001	0.001	0.014	0.003
R-squared	0.0874	0.0517	0.0570	0.0455	0.0686	0.0998	0.00982	0.0168
		Rural						
Variable	Education Expenditure	Amusement Expenditure	Communication Expenditure	Medical Expenditure	Furniture Expenditure	Restaurant Expenditure	Clothing Expenditure	Services Expenditure
treatment×time	0.0485 (0.456)	0.153* (2.090)	0.0456 (1.358)	-0.202 (-1.790)	0.164 (1.829)	-0.0709 (-0.615)	0.00559 (0.0952)	0.0280 (0.411)
treatment	0.558 (1.455)	0.0505 (0.783)	0.0846* (2.182)	0.189 (1.736)	-0.135 (-1.572)	0.0430 (0.590)	-0.218** (-2.734)	-0.0295 (-0.809)
time	-0.24*** (-4.905)	-0.228** (-2.596)	-0.162*** (-5.186)	0.0659 (0.732)	-0.131 (-1.795)	0.0428 (0.354)	-0.109** (-2.537)	-0.0274 (-0.468)
Constant	4.385*** (28.25)	5.581*** (46.31)	6.679*** (81.36)	6.900*** (53.05)	12.45*** (150.1)	12.02*** (167.5)	7.857*** (68.05)	14.04*** (312.8)
Observations	1,713	2,246	3,975	3,012	4,206	2,021	4,334	4,052
R-squared	0.012	0.003	0.005	0.003	0.001	0.001	0.005	0.002

Note1: Robust t-statistics in parentheses and \*\*\* p<0.01, \*\* p<0.05, \* p<0.10

To make sure that the results of this paper are reliable, we should show that the characteristics of the treated (households that received cash transfers in 2010) are similar to those of the untreated (households did not receive unconditional cash transfers in 2010). For achieving this goal, this paper uses the Parallel Trends Tests (Garganta, Gasparini, Marchionni, & Tappat, 2017). So, we must show that the time trends in the dependent variable of the treated and untreated households have been parallel during the observation interval. In this situation, we can conclude that the parallel trends assumption is valid if the estimated coefficient of the *treatment*×*time* term is statistically insignificant.

Table.8 reported the results of the parallel trend tests for the previous estimation for household expenditure in urban areas, including investment and nutrition security during 2011-2012. The results indicate that the time trends are indeed parallel to the *dif-in-dif* approach, so the results are not biased. So we can conclude that estimated coefficients are valid. Besides, in rural areas, the parallel trend indicates that there are parallel trends in the pre-treatment periods for the outcome of interest (Table.9).

Table.8: The result of dif-in-dif Parallel trends Placebo test for the urban area in Iran (2011-2012)

Variables	Total Expenditure	Food Expenditure	Amusement Expenditure	Communication Expenditure	Medical Expenditure	Calories	Protein
treatment×time	0.0176 (0.421)	-0.0561 (-1.762)	0.0996 (1.476)	-0.0135 (-0.372)	0.0651 (1.163)	-0.0505 (-0.763)	-0.0437 (-0.620)
treatment	-0.101** (-2.731)	-0.0647*** (-4.023)	-0.0784** (-2.740)	0.0510 (0.952)	0.01000 (0.183)	0.0447 (1.145)	0.0624 (1.560)
time	0.165*** (5.215)	0.313*** (13.26)	0.171* (2.190)	0.0898** (2.589)	0.0394 (0.848)	0.0464 (0.895)	0.0431 (0.774)
Constant	10.15*** (232.3)	8.807*** (180.1)	5.281*** (122.5)	6.353*** (117.7)	6.398*** (93.27)	9.387*** (291.4)	5.939*** (172.3)
Observations	3,780	3,780	2,396	3,682	2,613	3,780	3,780
R-squared	0.011	0.020	0.009	0.001	0.001	0.000	0.001
Variables	Education Expenditure	Durable Expenditure	Investment	Service Expenditure	Furniture Expenditure	Restaurant Expenditure	Clothing Expenditure
treatment×time	-0.214 (-0.702)	0.0501 (0.431)	-0.255 (-0.504)	0.0972 (1.084)	-0.00815 (-0.0792)	0.0435 (0.467)	-0.0661 (-0.653)
treatment	0.714*** (3.204)	-0.0936 (-0.794)	-0.414 (-1.798)	-0.121* (-1.917)	0.0270 (0.371)	-0.122*** (-4.150)	-0.504*** (-11.91)
time	0.373 (1.307)	0.0763 (0.657)	0.530 (1.211)	-0.135 (-1.599)	0.0214 (0.221)	-0.0704 (-0.978)	0.251** (2.601)
Constant	4.659*** (22.19)	8.197*** (68.53)	17.17*** (182.1)	13.62*** (228.5)	12.01*** (175.2)	11.69*** (698.9)	7.566*** (104.4)
Observations	2,092	3,778	612	3,496	3,682	1,686	3,780
R-squared	0.009	0.002	0.012	0.002	0.001	0.001	0.018

Note1: Robust t-statistics in parentheses and \*\*\* p<0.01, \*\* p<0.05, \* p<0.10

Table.9: the result of dif-in-dif Parallel trends Placebo test for the rural area in Iran (2011-2012)

Variables	Total Expenditure	Food Expenditure	Amusement Expenditure	Communication Expenditure	Medical Expenditure	Calories	Protein
treatment×time	-0.0774 (-0.947)	-0.111 (-1.169)	0.0444 (0.658)	-0.0402 (-0.625)	-0.197 (-1.508)	0.0469 (1.210)	0.0131 (0.332)
treatment	-0.0355 (-0.738)	0.0357 (0.739)	0.0505 (0.783)	0.0846* (2.182)	0.189 (1.736)	0.00442 (0.232)	0.00779 (0.546)
time	0.345*** (3.595)	0.409*** (3.863)	0.341** (2.611)	0.226*** (4.144)	0.341** (3.453)	-0.0496 (-1.304)	-0.0170 (-0.418)
Constant	10.48*** (102.8)	9.428*** (96.08)	5.581*** (46.31)	6.679*** (81.36)	6.900*** (53.05)	9.355*** (409.8)	5.956*** (334.8)
Observations	4,334	4,334	2,252	4,170	2,962	4,334	4,334
R-squared	0.030	0.038	0.022	0.010	0.005	0.001	0.000
Variables	Education Expenditure	Durable Expenditure	Investment	Service Expenditure	Furniture Expenditure	Restaurant Expenditure	Clothing Expenditure
treatment×time	-0.170 (-0.618)	-0.0962 (-0.821)	0.294 (0.853)	-0.0153 (-0.205)	0.146 (1.640)	-0.125 (-0.949)	-0.129 (-1.414)
treatment	0.558*** (2.740)	-0.0801 (-1.003)	-0.0886 (-0.485)	-0.0295 (-0.557)	-0.135** (-2.137)	0.0430 (0.590)	-0.218** (-2.734)
time	0.421* (1.675)	0.306* (2.242)	0.00614 (0.0230)	0.0321 (0.464)	-0.122 (-1.476)	0.0743 (0.634)	0.457*** (3.983)
Constant	4.385*** (23.47)	8.184*** (65.88)	16.56*** (103.2)	14.04*** (286.1)	12.45*** (213.1)	12.02*** (167.5)	7.857*** (68.05)
Observations	1,777	4,332	1,112	4,062	4,208	2,004	4,334
R-squared	0.010	0.006	0.006	0.001	0.001	0.001	0.022

Note1: Robust t-statistics in parentheses and \*\*\* p<0.01, \*\* p<0.05, \* p<0.10

Based on the fact that the size of households who are in the treatment groups is not more than six people, the generalized ordered logit model was estimated to be used for households with less than six children. Table.9 below presents the result of the *dif-in-dif* model for samples of rural and urban households. The outcome of interest in our investigation is the newborn child in each household with different numbers of children. As explained earlier, the impact of the UCT on fertility is captured by the coefficient of the interaction term (treatment×time) in this model.

The first column compares households without a child and households with 2 to 6 children; the second column compares households with less than two children and households with 3 to 6 children. Finally, the last column compares households with 1 to 5 children and households with six children.

We can see that the estimated values of the coefficient of the interaction term for the urban households for any stages of the generalized ordered logit model are not significant. The findings indicate that monthly UCT payments did not change fertility behavior.

On the other hand, the coefficients of the interaction term for the rural households for the first four columns of the generalized ordered logit model are significant. Based on these results, UCT payments negatively affected fertility behavior in households without a child, Whereas UCT payments led to a positive impact on fertility behavior in households with 1, 2, and 3 children; in other words, the households (with 1, 2 and 3 children) who received the cash transfer in 2011 and 2012 but not in 2010, had more births between 2010-2012.

Table.10: Average treatment dif-in-dif estimation for fertility behavior in Iran

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Urban					
treatment×time	-0.0256 (-1.264)	0.00647 (0.340)	0.0152 (0.899)	0.000245 (0.0225)	0.00139 (0.223)	0.00230 (0.646)
treatment	0.154*** (14.00)	-0.0488*** (-4.114)	-0.102*** (-8.490)	0.000529 (0.0721)	-0.00292 (-0.683)	-0.00110 (-0.477)
time	0.0371* (1.901)	-0.00575 (-0.315)	-0.0248 (-1.556)	-0.00323 (-0.318)	-0.000934 (-0.164)	-0.00244 (-0.782)
Observations	28,670	28,670	28,670	28,670	28,670	28,670
	Rural					
treatment×time	0.148*** (6.403)	-0.136*** (-6.513)	-0.00733*** (-10.41)	-0.00630** (-2.394)	0.00180 (0.391)	-0.000469 (-0.688)
treatment	0.215*** (5.335)	-0.0344* (-1.701)	-0.141*** (-5.348)	-0.0317*** (-3.339)	-0.00799 (-1.028)	-3.51e-06 (-0.00549)
time	-0.173*** (-6.732)	0.150*** (6.959)	0.0192*** (10.52)	0.00618*** (3.876)	-0.00195 (-0.551)	-0.000410 (-0.483)
Observations	28,195	28,195	28,195	28,195	28,195	28,195

Note1: Marginal effects reported

Note2: z-statistics in parentheses and \*\*\* p<0.01, \*\* p<0.05, \* p<0.10

## 5- Conclusion

The government of Iran in 2010 decided to offer cash transfer to all households instead of an energy price subsidy. The cash transfer program per person was paid to all households that were registered in the program. This paper examined the impact of UCT on household expenditure and fertility behavior. The study used Iran's household income and expenditure survey (HIES) database to investigate the UCT program's effect on detailed expenditure and also on fertility in Iranian households based on a *diff-in-diff* model. The results of the first part show that total expenditure, investment, and durable goods have not been affected by the UCT program in the urban and rural areas. Besides, for the detailed expenditure, the results indicated that in urban areas, the UCT program only impacted food nutrition security (calories and protein). On the other hand, in rural areas, the results indicated that the unconditional cash transfer policy had a significant effect on investment, food expenditure, and amusement expenditure. Also, the Parallel trends Placebo test indicated that the result is valid for the *diff-in-diff* approach.

The results of the statistical analysis of fertility behavior suggest that the introduction of unconditional cash transfer did not lead to a significant increase in fertility behavior in urban households. However, in rural households, it was found that UCT payments negatively affected fertility behavior in households without a child. At the same time, the UCT program led to a positive impact on fertility behavior in rural households with 1, 2, and 3 children.

The reasons for the results of this study can be stated as two reasons; One reason may be the cash transfer program, as a means to replace energy subsidies, did not necessarily make people richer; it replaced a source of money (low energy price) with another one (unconditional cash payment). Consequently, the effect on purchasing power and expenditures may be small. Another reason is that the study looks at a short period due to existing restrictions, while household behavior usually takes a long time to adjust.

Generally, conditional and unconditional cash transfers could be a valuable tool to tackle poverty in middle-income countries in the world by considering any dimensions of maximizing effects and controlling the side-effects. For instance, modifying the risk for the target group, sustainability, and cost-effectiveness for these programs are necessary. In future research, it would be interesting to adopt a regression approach for long-term analysis related to this paper.

## 6- References

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