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Inequality and Energy Subsidies Reform:

Insights from the Largest Cash Transfer in the Developing World

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ECONOMIC RESEARCH FORUM 30 years منتدى البحوث الاقتصادية

2024

Inequality and Energy Subsidies Reform: Insights from the Largest Cash Transfer in the Developing World.

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Abstract

We study the distributional effect of one of the largest global subsidy reforms, which replaced more than 40 billion USD annual energy subsidies with universal cash transfers in Iran. Using a novel identification strategy, we find a significant redistribution effect that has not been documented in previous studies. The reform led to an increase in expenditures for the bottom 70 and a decrease in expenditures for the top 20. Lower deciles experience greater expenditure growth, as large as 30% growth in the bottom 10. The Gini index also decreased by 14 percent. Our study identifies cash transfers as the main source of variation in the inequality measures over time. We estimate that one USD daily cash transfer to each individual, instead of energy subsidy, leads to an 8 percent decrease in the Gini Index. These results inform policy debates on energy policy and public finance.

Keywords: Subsidy Reforms, Energy Prices, Inequality

JEL Classification: Q47, Q41, D21, D22

1. Introduction

At least 60 countries expanded or introduced fuel subsidies between early 2021 and 2022 (Mukherjee et al., 2023). According to the IEA's latest estimates (IEA, 2023), global support for only fossil fuel consumption exceeded US$1 trillion in 2022.[3] In some of these countries, energy subsidies account for a greater proportion of government spending than health and

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[3]Coady et al. (2017) estimate that the size of total global energy subsidies reached $5.3 trillion in 2015.

education (Davis, 2014). Energy subsidies are also criticized for being regressive, distorting prices and production, and harming the environment (Del Granado et al., 2012; Mukherjee et al., 2023; IMF, 2013). Some studies have also suggested that fuel subsidies are not particularly effective at redistribution (Birol et al. (2011); Sterner (2012)).

Although energy subsidies have negative impacts, reforms remain challenging. There are many examples of reform reversals or slowdowns following public demonstrations (Salehi-Isfahani et al., 2015). There are ambiguous post-reform distributional consequences that need to be addressed (El-Katiri and Fattouh, 2017; Rentschler and Bazilian, 2017a). In order to protect low-income households from losing subsidies, several papers recommend a cash transfer instead of an energy subsidy policy to the poor who benefit only slightly from low domestic energy prices (Rentschler and Bazilian, 2017b) and (Stephanie Majerowicz Todd Moss, 2015). There is, however, only thin empirical evidence on the impact of cash transfers and subsidy reforms contemporaneously on ex-post redistribution (Davis, 2014). Equal transfers are predicted to increase poor incomes and decrease inequality. We test this hypothesis ex-ante and ex-post by using a novel measure on Iran's 2010 energy-to-cash subsidy reform and find large pro-poor distributional impacts. The reform replaced major energy subsidies with universal cash transfers to citizens, also known as "oil to cash reform" by the "Center for Global Development" (Stephanie Majerowicz Todd Moss, 2015). To our knowledge, it is the largest energy subsidy elimination and payment in cash scheme in history. In December 2010, the government suddenly cut energy subsidies and introduced new administrative energy prices ranging from 1.6 to 9 times higher than before. Following the elimination of energy subsidies and massive fuel price increases, the program also began paying almost all Iranian households (covering about 75 million citizens) 28% of the median per capita household income (Salehi-Isfahani and Mostafavi-Dehzooei, 2018). The size of the cash transfer was significant and non-trivial in the initial years of the reforms, but given high inflation rates, the real value of cash transfers declined over time. For a review of the

broad impacts of the reform, see (Solaymani, 2021).

Using a novel approach, which uses the share of consumption of households in each expenditure decile before and after the reform, we uncover the impact of the reform on each decile separately. We find a large distributional effect, which is often overlooked in previous studies. Our empirical analysis has two steps: ex-ante and ex-post. For the ex-ante analysis, we use micro data from other studies on household energy consumption in the year before reform. This ex-ante and exogenous measure is used to identify the potential effects of reform on each decile. Based on our analysis, we find that the net effect of reform is remarkably heterogeneous across expenditure deciles in both value and direction. We predict the positive income shock generated by reform in the first seven deciles and negative income shocks in deciles 9 and 10. We also predict close to zero on average for decile eight households. Therefore, we use decile eight as a control group that allows us to overcome the challenge of isolating the impact of reform from other negative trends in the Iranian economy, especially the U.S. sanctions. To establish the argument about inequality reduction after the reform, we examine changes in the share of consumption in two adjacent consumption deciles of our control group. Decile 9, with a slightly higher amount of energy consumption, experienced a negative income shock, and Decile 7, with a slightly lower energy consumption, experienced a positive income shock. We show that these groups had a stable level of consumption share and similar trends before the reform, but the steady pattern of pre-reform changed immediately after the reform.

Our difference-in-difference (DiD) results suggest universal cash instead of subsidies produces positive expenditure for the bottom 70 (Deciles 1 to 7) and negative expenditure for the top 20 (Deciles 9 and 10). We find the predicted ex-ante income shocks are consistent with ex-post observations in consumption share and inequality measures. We support our main finding with other supplementary evidence on inequality measures, such as the Gini index. Our analysis of a long panel of deciles from the Household Expenditure and Income

Survey (HEIS) and our supplementary inequality indexes reveal a large and robust redistribution outcome of reforms toward the poor. We find economically and statistically significant changes in all inequality measures. We also find that the dynamics of cash transfers explain about 90% of the variation in inequality indices in the country from 1984 to 2019.

Based on the results, we expect to resolve some debates in the literature by isolating the impact of the subsidy reform package. The debate on the net impact of the reform is unsettled because previous studies found contradicting aggregate results for Iran's 2010 subsidy reform (Zarepour and Wagner (2022); Dadgar et al. (2020a) and Breton and Mirzapour (2016)). Part of the disagreement is rooted in not controlling for several confounding factors, such as sanctions. The second factor of controversy is the largely heterogeneous impact of reform. As we will note, while spending on the bottom ten percentile increases by roughly 30%, spending on the top ten percentile decreases by more than 14% in the three years following the reform. As a result, looking only at the average consumption of the *representative agent* does not reveal the true impact of the reform on low-income households and can potentially be misleading. For example, (Zarepour and Wagner, 2022) suggests that "the reform resulted in a 7%–9% decrease in household consumption, cash transfers did not fully compensate for the negative effects of subsidy removal, and that inequality decreased slightly."

We also contribute to the large literature on inequality dynamics (Ravallion (2014), Batuo et al. (2022), Amanzadeh and Heydari (2023)) and the universal basic income (UBI) and their intersection in developing countries. It is often argued that inequality, on average, hardly changes over time in cross-country comparisons (Watkins, 2005). The claim is consistent with our data before the reform. We, however, show that after the subsidy reform, inequality measures became *volatile* and are strongly linked to the real value of cash transfers. Development economics have focused on raising the poor's income (Banerjee et al., 2019; Banerjee and Mullainathan, 2008) and Iran's subsidy reform in 2010 and 2019 is one of the biggest natural experiments that provided large amounts of cash transfers and many

consequences which is still understudied. We show that a 1 USD daily cash transfer to each individual instead of an energy subsidy leads to a 16 percent increase in the expenditure of the bottom 10. Figure 1 shows the Gini index fluctuated for more than a quarter of a century in a narrow range of 0.415 to 0.43 but suddenly dropped to below 0.37 after the reform.[4]

As Figure 1 suggests, a historically stable Gini index dropped about 15 percent immediately following the reform in 2010. As inflation reduces the real amount of cash transfers, the Gini index rises until the second round of transfers in 2019 (the third round of reform). Consistently, the second reform in 2014, which did not include cash transfers, did not affect the Gini index. Another index of inequality is the share of the expenditure of the poorest quantile in total expenditure. For 27 years before the 2010 reform, the poorest quantile had 5 to 5.5 percent of total expenditure. Immediately after the 2010 reform, their share of total expenditures increased to more than 6.5 percent, which means about an 18 percent improvement.

To understand better the role of cash transfers on inequality magnitude, we exploit quasi-exogenous variations in the real cash transfer. The cash subsidy started in December 2010 at about 3 USD (PPP) per person daily. It has been nominally fixed for nine years until November 2019 in the third reform round. In 2019, this 3 USD decreased to 73 cents per person daily. Using multiple inequality measures, we show that inequality is highly related to the real magnitude of cash transfers. 0n average 1 USD daily cash transfer instead of energy subsidy leads to an 8 percent decrease in the Gini Index and a 24 percent decrease in the expenditure ratio from the top 10 to the bottom 10.

[4]Noghanibehambari and Rahnamamoghadam (2020) note that while income and consumption inequality declined after the 2010 reform, the level of income is greater than consumption inequality. Following the usual practice, we use the measure of inequality in consumption to mitigate the under-reporting problem of the income data in household surveys.

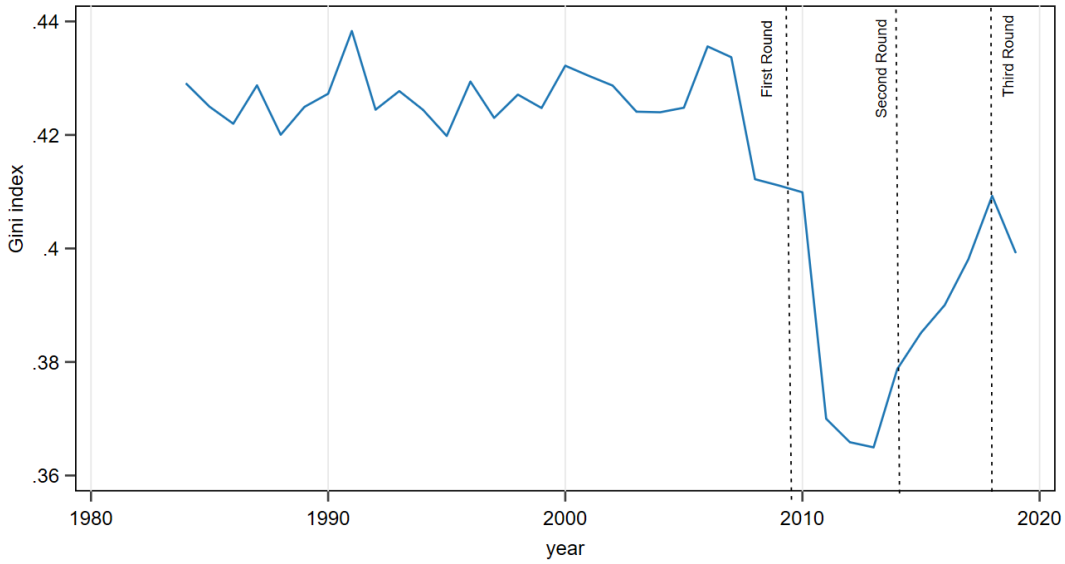


Figure 1: Dynamics of the GINI Coefficient

Notes: This graph depicts the Gini coefficient in Iran from 1984 to 2019. The dashed lines show the dates of the first, second, and third rounds of reform in 2010, 2014, and 2019. Cash transfers started in the first reform round in December 2010 and increased nominally in the third round in 2019. Energy prices rose much less in the second round than in 2010 in the absence of a cash compensation program.

2. Context: Subsidy Reforms in Iran

Policy debates argue that low energy prices may encourage the inefficient use of energy resources, such as the overuse of electricity, water, and fuel, which may result in adverse environmental and fiscal impacts. In the case of Iran, some authors (e.g., Tanaka et al. (2010) and Clements et al. (2014)) go as far as suggesting that Iran was the least efficient country in the world when it came to using energy. Iran was at the top of the list of thirty-seven developing countries that subsidized energy. Additionally, the government has had to finance the subsidization of energy prices, resulting in fiscal pressures. In 2010, the government passed a strict reform of energy prices to deal with the growing social and economic problems caused by energy subsidies. Using global energy prices, a rough estimate of energy subsidies totaled $70 billion in 2010, twice the government budget and one-fifth of GDP (Salehi-Isfahani et al., 2015). At the same time, bread and medicine subsidies only amounted to $5 billion. In December 2010, cash transfers began concurrently with

price increases. The government credited each individual's bank account with 455,000 rials (about $45, or $90 in PPP) per month. The first bimonthly payment of $90 ($180 PPP) per person was released to about 60 million Iranians, nearly 80 percent of the population. The entire amount due to household members is paid to the household head.

2.1. First Round: Iran Subsidy Reform of 2010

Iranian subsidy reform 2010 has generated large interest among researchers due to its substantial and exogenous nature. Here, we focus on the inequality and welfare analysis of these reforms, and interestingly, the findings around this large energy subsidy to cash are controversial. Given the general downward trend of the Iranian economy after 2009, one may assert that some negative outcomes may not be entirely due to the reforms. The study that aligns most closely with ours, but focuses on the very short run, is Salehi-Isfahani et al. (2015), which argued that the key to its success was a cash transfer intended to compensate households for price increases. Because of the general downward trend of the Iranian economy after 2009, they used only the HEIS for the first three months. In their simulation, they found that poverty rates decreased in the year of reform compared to the same month the year before (9.7 percent versus 11.1 percent). In addition, they show that the Gini coefficient changed only slightly when transfers were removed from household incomes - 0.39 compared to 0.41 when transfers were retained.

Salehi-Isfahani et al. (2015) asserts *"As a candidate for president in 2005, Ahmadinejad campaigned on the promise of "putting the nation's oil wealth on people's tables." It had taken him six years to accomplish this goal. After his controversial reelection in 2009, the subsidy reform presented him with the last opportunity to save his reputation as a man of the people. As a tool of redistribution, he initially conditioned cash transfers on family income and wealth as a result of his desire to use subsidy reform as a tool of redistribution, but as identifying personal income proved impractical, his pragmatic side forced him to switch to uniform cash transfers instead."*

2.2. Second Round: Price Increase with No Cash Adjustment, 2014

The second round of the subsidy reform was less significant than the first. It officially launched on April 9, 2014, with the registration of applicants for cash transfers. According to the survey, 91.2% of Iranian people in this phase desired to receive cash transfers through the official website. In the second stage of reform, many things did not change; the nominal amount of the transfer payment, the price of bread, and electricity did not change. The price of energy carriers also increased between 30 and 60 percent, while they increased 200 to 800 percent in the first round. For example, the minimum price of gasoline changed from 4000 to 7000, and the maximum price from 7000 to 1000 Iranian Rials. We cannot find any significant impact on inequality measures in this round of reform.

2.3. Third Round: November 2019

The last year of data, 2019, coincides with the last round of subsidy reforms. In November 2019 (Aban 1398, in the Iranian calendar), the government unexpectedly announced the third round of subsidy reform. This round, unlike 2014, included an increase in cash payments. Initially, the government announced that 60 million Iranians, or 18 million households, would receive an additional subsidy called the "subsistence subsidy," which is 550K rials for a single family, 1030K rials for a two-person family, 1380K rials for a family of 3, and 1720K rials for a family of 4. And the family of five people or more will be paid 205 thousand tomans per month. The cash payment was planned to be paid to the bottom 70. It was announced that those who believe they should be eligible for subsistence allowance could appeal. This number increased again to 75 million people after the protests in March of this year. Given Iran's slightly more than 83 million population that year, this coverage is equivalent to 90.2% of the population.

3. Data and Measures of inequality

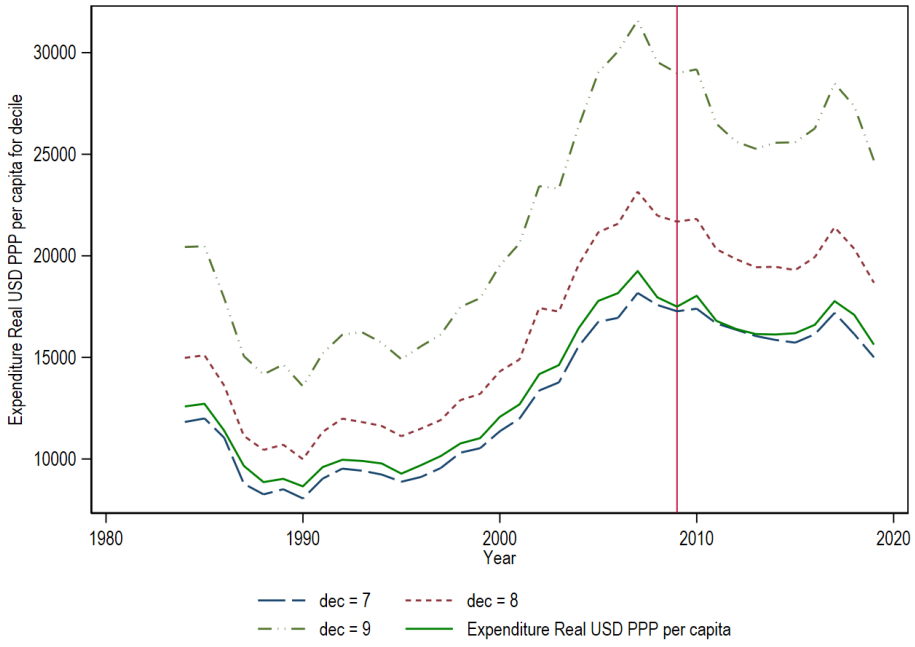
Increased volatility and downward trend in the Iranian economy after 2010, primarily due to international sanctions, makes it difficult to single out macroeconomic impact of subsidy reforms. Because of this consequent downward trend, the 2010 reform has not be viewed favorably by researchers and the general public. A novel feature of our study is the use of expenditure share, instead of absolute expenditure, as the key measure. By using this approach, redistribution effects can be better captured since aggregate shocks to the economy are less likely to impact expenditure share. Figure 2 illustrates why it is crucial to evaluate the impact of reform by considering this transformation. In panel A of Figure 2, expenditure of deciles 7 to 9 of and an average expenditure in USD PPP are plotted. The first observation is that household expenditures are volatile on average and across deciles. Secondly, expenditures declined after 2010. Alternatively, if we examine panel B, which shows the expenditure share in deciles 7 to 9, this parallel movement of volatility disappears. At least for assessing reform distributional effects, expenditure shares are more stable measures.

Figure 2 also conveys another message: Absent of a control group, the evaluation of reform might be subject to endegeneity and omitted variable biases. Due to the non-random nature of reform (i.e., the inclusion of all households in the reform), there is no experimental control group. For instance, as we see in panel A, even decile 7 experienced a decrease in expenditure after the reform. However, comparing them with decile 8, we find their expenditure share increased. The decline we observed in panel A may be due to the aggregate shock to the whole Iranian economy. Because of this limitation, a control group is created using an innovative methodology in the following section.

3.1. Data Sources

Our primary data source for this study is the Household Expenditures and Income Survey (HEIS). The HEIS employs a two-stage stratified sampling method and has been consistently

Panel A: the yearly expenditures of deciles 7 to 9 and the average expenditure per capita in USD PPP



Panel B: Share of expenditures of deciles 7 to 9 and average expenditure per capita in USD PPP

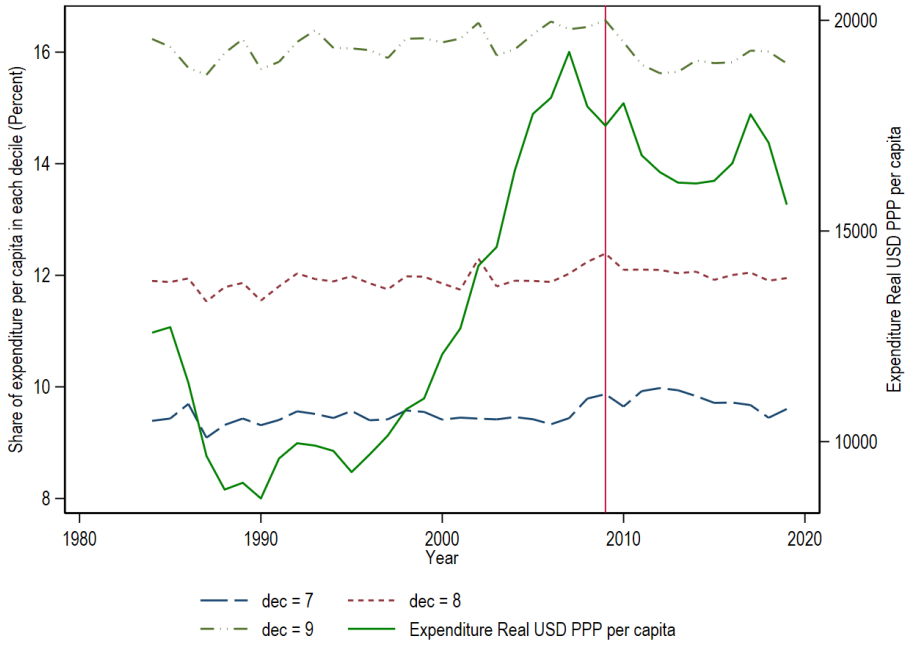


Figure 2: Share of Expenditure in each deciles V.S Expenditure per capita in USD PPP

collected by the Statistical Center of Iran for over fifty years. However, unit records have only been publicly available since 1984. Each year, the survey encompasses approximately 38,000 households and 150,000 individuals, offering a representative sample of province- and national-level populations. The HEIS categorizes household expenditures into 12 main groups, including food and beverages, housing, clothing, health, transportation, communication, furniture, amusement, education, hotel and restaurant, durable goods, and others.

To calculate a household's annual expenditures, we sum all expenditures and divide by the household size. Additionally, we calculate the share of each decile by dividing the expenditures of each group, split into ten equal segments, by the total expenditures. However, these calculations are not necessary, as the Statistical Center of Iran provides a dataset titled "share of gross expenditure per capita in the entire county (weighted)," offering usable aggregate data. Between 1984 and 2020, 36 rounds of the HEIS were available. Due to the significant impact of the pandemic on inequality measures, we excluded data from 2020. Consequently, our final sample comprises 360 annual observations.

Additionally, we utilize the following data sources and measures:

Aggregate Consumption Data:. We rely on aggregate consumption data as a primary source.

Detailed Energy Consumption Data:. For estimating the ex-ante impact of subsidy removal on household budgets, we incorporate detailed energy consumption data specific to each income decile, drawn from existing studies.

Measures of inequality:. To test our hypothesis regarding decreased inequality in Iran following the 2010 reform, we employ three key inequality metrics that will be discussed in further details.

1. Gini Index
2. Share of the Poorest Quantile
3. Expenditure Ratio of Top to Bottom Quantiles

Nominal Value Adjustment:. All nominal values are adjusted using the annual consumer price index (CPI) provided by the Statistical Center of Iran.

3.2. Measures of inequality

Using decile-level data, we calculate three major alternative inequality measures to determine how reforms affect different expenditure deciles and what role cash transfers play.

Expenditure Share. The first index of inequality is the share of expenditure per capita from total expenditures in a year in each expenditure decile. If one segments the total population into ten expenditure deciles, the index is obtained simply by:

$$\text{Share of expenditure per capita in decile}_t^i = \frac{\text{expenditure per capita in decile}_t^i}{\text{total expenditure per capita}_t} \qquad (1)$$

This measure is a good proxy to measure income and consumption distribution in developing countries where administrative data on wealth and income is not readily available. More importantly, looking at cross-deciles lets us see how the distribution of the economy's total resources has changed. It is also helpful for determining the ratio of losers to winners after the reform.

Gini Index. The Gini coefficient measures the deviation of income distributions within a country from a perfectly equal distribution. The value of 0 represents absolute equality, and 1 represents absolute inequality. Lower values indicate a more even distribution of consumption in the population. Given the popularity of the Gini index, we will use it as one of the major indices in this study. [5]

Top/Bottom m% Ratios. The last three indices of inequality are three m%/m% ratios based on housholds expenditures. An m%/m% ratio calculates the ratio between households in

[5]The statistics center of Iran reports the Gini index from 1984 based on income per capita.

the top m% of the distribution to the bottom m% of the distribution.

$$\text{expenditures ratio of top to bottom}_{\text{t}}^{\text{m}} = \frac{\text{expenditures of top}_{\text{t}}^{\text{m\%}}}{\text{expenditures of bottom}_{\text{t}}^{\text{m\%}}} \tag{2}$$

To capture the inequality in the top and bottom of the distribution, we analyze the m%/m% ratio at 10/10 (i.e., the ratio of top 10% to bottom 10%). As a robustness check, we also provide analysis for 20%/20% and 40%/40% in the appendix.

Based on these explanations, the following relationship can be used to figure out how much cash is transferred per person per month on average in the specific year:

$$E[realcash_t] = nominalcash_t \times \frac{CPI_{2010}}{CPI_t} \tag{3}$$

t: Index for specific year m: the indicator for the month Cash-r: cash transfer real per person per month in a specific year of t. ratio of recipient: ratio of recipients from the most reliable source (will be indicated). nominal amount of cash-mt: Cash transfer nominal per person per month in a specific year and month, which is 445K rials in this period. CPI: consumer price index.

3.3. Economic Mechanisms

Why would a cash transfer reduce consumption inequality? In a static setup, cash transfer expands the budget constraint of the household and increases their consumption. As a lump-sum payment, they may also reduce households' labor supply, in which case the impact on consumption may be smaller than what happens in a mechanical budget expansion case.

In a dynamic framework, there are multiple channels through which direct payment may sharply reduce the gap between low and high-income households. First, if households consider the cash transfer as a long-term safety net (that reduces future risks), they may reduce their precautionary saving and abruptly increase their current consumption. Additionally, considering the permanent income hypothesis (PIH) argument, low-income households may boost their current consumption due to changes in their perceived lifetime income. Finally,

if the household is constrained by borrowing constraints, the cash transfer serves as a means to get the current consumption closer to its unconstrained optimal path.

4. Statistical Framework and Identification Strategy

Our ultimate goal is to identify the dynamic causal effects of reform on inequality and the role of cash transfers in this regard. Due to potential time variations in policies and economic context (that may have a heterogeneous impact on different income groups), a direct calculation of changes in consumption across different income groups (before and after the reform) is subject to various biases. To overcome potential missing variables and endogeneity concerns, we adopt the following control group approach using income groups.

4.1. Construction of Control Group

Calculating the intensity of income and expenditure shocks across income deciles, we determine that the ex-ante intensity of income shock is close to zero for **decile 8**. We also conduct an ex-post analysis using regression discontinuity form and find out that decile 8 is the only decile with no discontinuous pattern in the expenditure share before and after the reform. In Figure 3, we demonstrate the heterogeneous impact of subsidy reforms on the real consumption of deciles 7, 8, and 9. Panel A shows deciles 7, 8, and 9 together, and Panels B to D show them separately to highlight trends and discontinuities. As predicted in Figure 4, we expect reform to have a positive impact on decile seven, a negative impact on decile nine, and almost no impact on decile eight.

Based on these findings, decile 8 serves as a *control group*, at least for its adjacent deciles of 7 and 9. As a parallel trend check, we confirm that deciles 7 to 9 demonstrate similar trends in consumption before the reform.

4.2. Econometric Specifications

Using the control group approach, we mainly concentrate on three deciles, 7, 8, and 9, because their pre-reform trends are more likely to move parallel over time, as shown in Figure

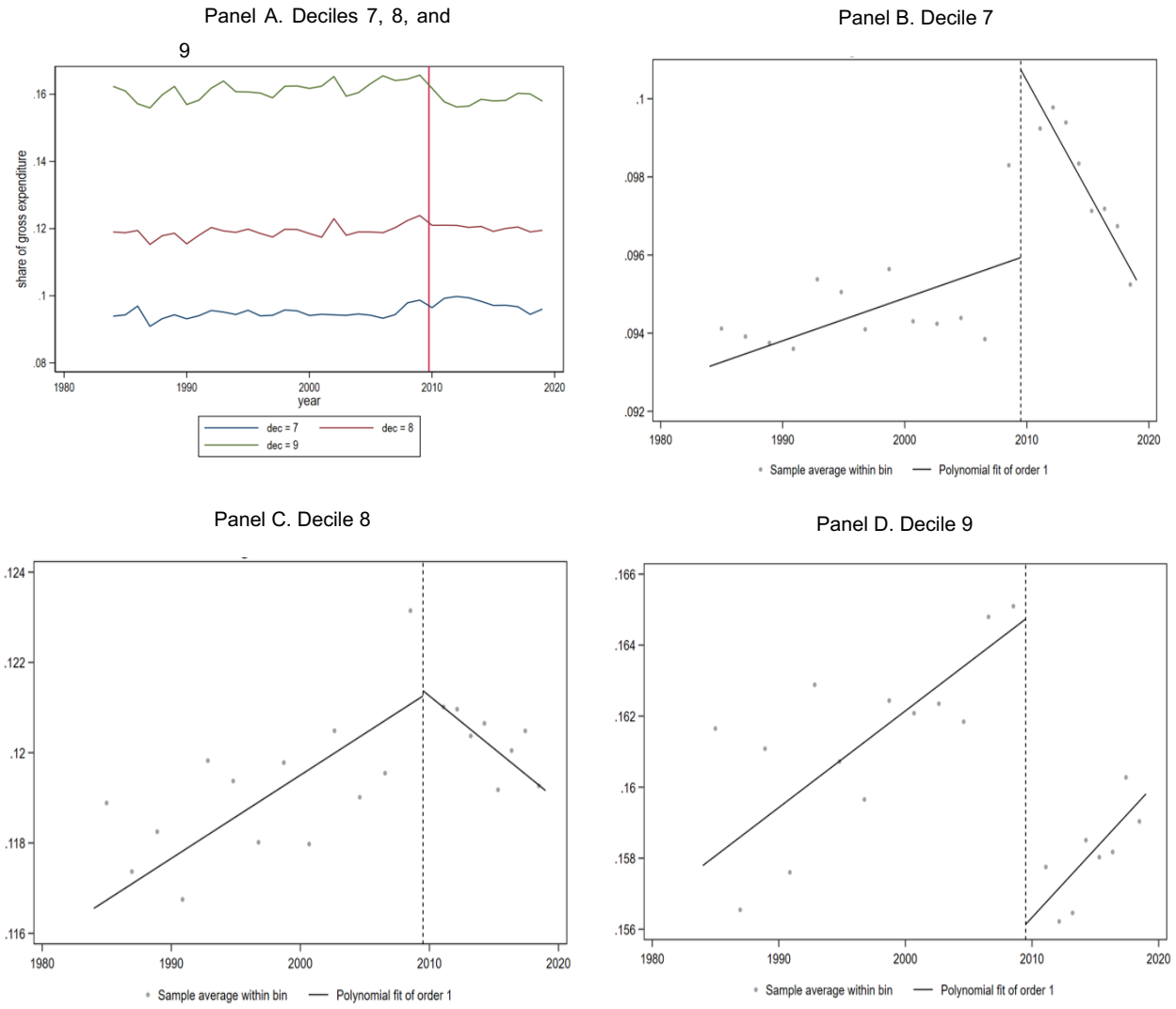


Figure 3: Panel A. share of expenditure, by expenditure decile 7, 8, 9. Panel B. Regression discontinuity on the share of expenditure for decile 7. Panel C. Regression discontinuity on the share of expenditure for decile 8. Panel D. Regression discontinuity on the share of expenditure for decile 9 Source: Authors' calculation on HEIS.

3.

4.2.1. Binary Treatment: Difference in Differences

Our first empirical analysis compares decile 7 and 9 deviations from decile 8. As mentioned, we use decile 8 as the control group and deciles 9 and 7 as treatment groups separately. To mitigate the impact of long-term confounders, we evaluate the deviation in the share of expenditure from decile 8 three years after the reform.

The main DID model in Equation 4 compares the outcome of control (decile 8) and treatment groups (deciles 7 and 9 separately) before and after the reform.

$$E(y_t^i) = \gamma_i + \gamma_t + \delta \cdot \text{treatment} \cdot \text{post-reform} + \varepsilon_t^i \tag{4}$$

In this regression, $E[(y_t^i)]$ denotes the average expenditure share for the group (decile) $i \in \{7, 8\}$ and similarly but separately $i \in \{8, 9\}$ at time t, and post-reform is an indicator of whether the observation belongs to a post-event period up to 3 years. The parameter δ represents the average causal effect of reform on changes in the share of expenditure of treatment and control groups under the assumption that, in the absence of the reform, the treatment (decile 7 and 9) and control (decile 8) groups move parallel. γ_i and γ_t are group (decile) and time fixed effects. We exclude 2010 from the analysis due to its transition period.

4.2.2. Intensity of Treatment Model

The treatment intensity is determined by the net income effect of the reform, which varies by deciles and years. The actual amount of cash transfers, which is almost universal (90 USD PPP per capita per month in December 2010) net of energy and bread cost increases that vary across income and expenditure deciles. The next section explains this in more detail.The next section explains this in more detail and shows this is exogenous to the reform. In the following panel model, we use this measure to assess the relationship between one USD income shock and the decile share of expenditure:

$$E[(y_t^i)] = \gamma_i + \gamma_t + \sigma \cdot \text{intensity}_t^i \cdot \text{post-reform} + \epsilon_t^i \tag{5}$$

In this regression, $E[(y_t^i)]$ denotes the average expenditure share for the group (decile) i at time t, and γ_i and γ_t are time and group (decile) fixed effects. Intensity_t^i is the value of income shock to each decile at time t. Those shocks are calculated and represented, in USD, in the Pandel D of Figure 4. The parameter σ captures the average impact of a one USD change in income on the study's outcome, which is the decile share in the first analysis. Since treatment intensity is strictly exogenous to the outcome, we can estimate the causal effect of reform on the outcomes.

We explain the intensity of treatment in further detail in Subsection 4.3.

4.2.3. Cash Transfer and Inequality

After demonstrating a causal impact of reforms on inequality using the DiD specification, we also estimate Equation 6 to report the quantitative effect of one USD cash transfer and measures of inequality.

$$Z_t^j = \beta_0^i + \beta_1^i \cdot \text{cash\_transfer}_t \cdot \text{post-reform} + \epsilon_t \tag{6}$$

In this regression, Z_t^j denotes the particular inequality measure of type j (e.g., GINI index or consummation share) at time t, cash_transfer_t is the real amount of cash transfer for year t. The parameter β_1 represents the average causal effect of cash transfers on changes in inequality outcomes. $Z^j \in \{\text{Gini Index}, \text{Ratio of Top to Bottom Consumption}\}$

4.3. Justification of Intensity of Treatment Approach

The net income impact of the reform was calculated based on households' 2009 energy and bread consumption and cash transfers. Our identification heavily relies on the assumption that a group of households that experience near-zero net impact from reforms can be used as a control group. Exogenous shocks to household resources, such as cash transfers and

price increases, do not affect all households equally, even though everyone receives the same amount of cash and experiences the same price increase. Households with lower expenditures on subsidized goods may or may not benefit from cash transfers net of increased expenditures.

Approximating the negative income shock. According to the findings of other studies and a large body of literature on energy subsidies, higher-income deciles capture most of the subsidies. As a starting point, we use Salehi-Isfahani et al. (2015) 2009 expenditure on the major categories of energy and bread. We use expenditures from 2009, the year before the reform, because expenditures from the reform year may be endogenous as households adjust their consumption, work hours, and incomes in response to the reform. Because we use the previous year's expenditure as an exogenous measure rather than actual consumption after the reform, we need two assumptions to approximate negative income shock across income deciles: first, there is no substitution effect after the reform, at least in the short term, and second, price increases monotonically across deciles. The second assumption is required because tiered pricing was implemented following the reform. It means that after the increase in energy prices, the first decile pays the minimum tiered pricing, but the second decile pays slightly more, as calculated by:

$$\text{price}_j^i = \frac{11-i}{10} \times \text{Min}(\text{price}_j) + \frac{1-i}{10} \times \text{Max}(\text{price}_j)$$

Where price_j^i is the post-reform price approximation of good j for decile i, and Min and Max are the minimum and maximum of the tiered pricing for good j.

To illustrate the new expenditures, consider the following example. According to Salehi-Isfahani et al. (2015), before the reform, decile one (the poorest decile) spent 1.3 USD per capita per month on gasoline, while decile two spent 1.63 USD. After the reform, gasoline is sold in a two-part price system, which adjusted 4 to 7 times compared to previous price. When a car exhaust its lower price (4X) gas quota, the marginal gas price moves to the next

tier; i.e., 7X. The new expenditure for decile one is assumed to be 4 X 1.3. At the same time, the new decile two expenditure is (0.9) (4)1.63+ (0.1) (7)1.63=4.3*1.63. In other words, the higher deciles experience greater income shock because they consume more and pay more for each consumption unit. An approximation of the negative income shock is generated by multiplying before the reform bundle of consumption and new price vector. This, however, is not a perfect measure due to several simplifications. It yields a reliable exogenous instrument for ex-ante analysis of income shocks immediately following the reform. Figure 4 depicts the steps for new expenditures following the reform, as well as the magnitude of the income shock for each decile, in four panels. Panel A shows the 2009 expenditure for each decile in the major subsidized goods categories. Panel B represents the expenditure for each good and decile after the reform, assuming no substitute effect. Panel C shows the difference in spending by decile after and before the reform. Finally, Panel D assumes that 98 percent of each decile received 90 USD per person per month and subtracts the expenditure shock calculated in Panel C.

Approximating the positive income shock. Cash transfers started simultaneously with price hikes in December 2010. Every month, the government deposited 455,000 rials into each individual's bank account. Our analysis of the official report of the Iranian Parliament, attached in the appendix, shows more than 98 percent of the population received cash in 2011. Since other studies estimate this amount to be 90 USD (about $45 or 90$ in PPP), we use it as the starting point. However, we show both the cash transfer real value and the price hike magnitude dynamically decrease over time due to inflation in the next years. We return to this in the long-term analysis of the reform. As Figure 4 panel D shows, the increase in energy expenditure net off the cash transfers does not hit all income deciles equally. The decile one has about 54$ per capita per month benefit. The amount decreases slowly across deciles and becomes almost zero around decile 8. Finally, deciles 9 and 10 experienced adverse income shocks after the reform. The ex-ante analysis predicts that the bottom 70

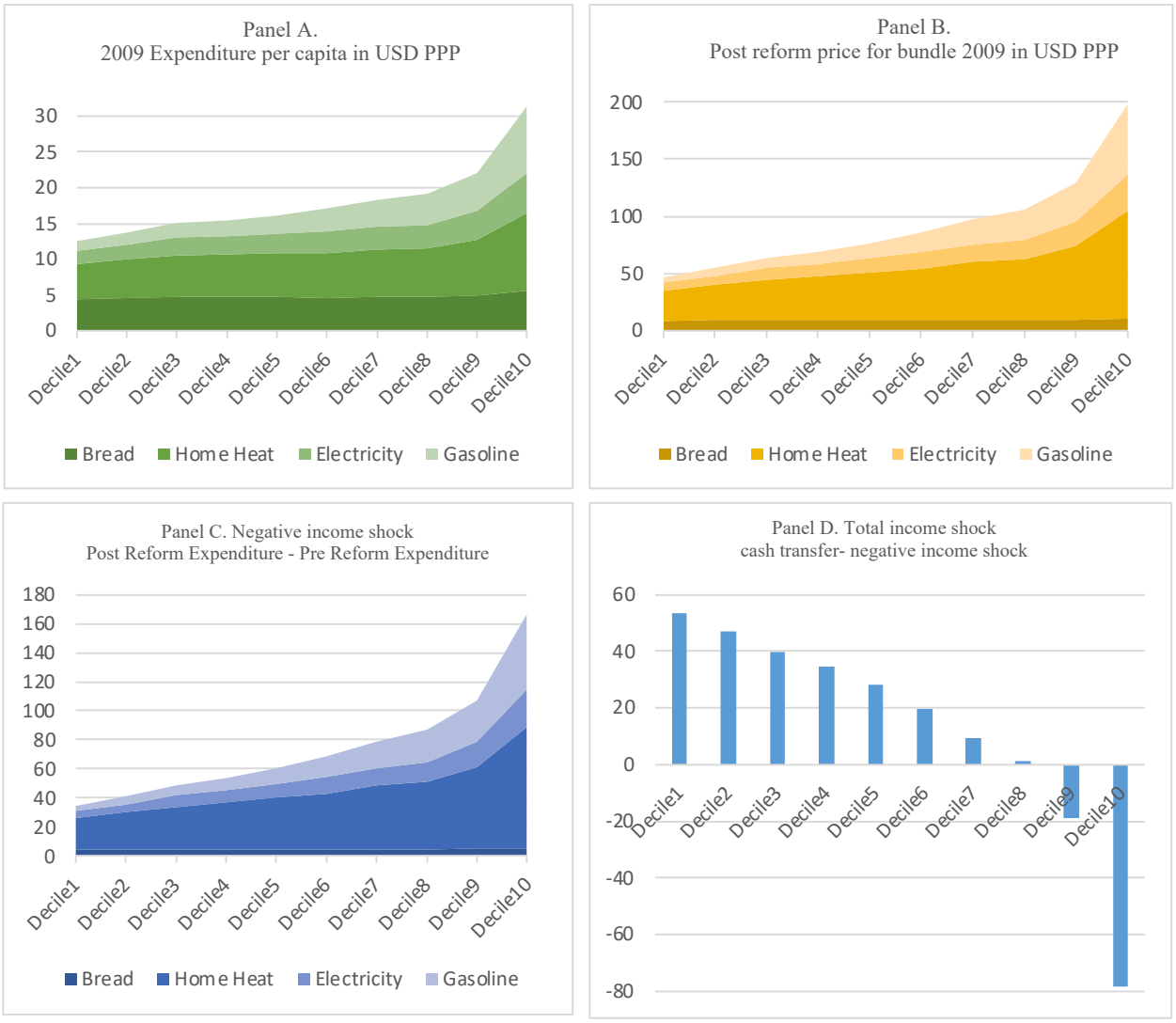


Figure 4: Panel A. Expenditures per capita on subsidized goods per month, by income decile, 2009. Panel B. Price of the bundle in 2009 after the reform, by income decile. Panel C. difference between expenditures in panel A and B. Panel D. cash transfer for 98 percent of the population-expenditures in panel C.

Note: Kerosene and natural gas are the main sources of space heating. Source: Salehi-Isfahani et al. (2015) Panel A is directly reproduced. Panel B, C, and D are produced by the authors' calculation using new prices times the 2009 bundle, differences, and adding 90 USD for 98 percent of recipients.

percent will benefit from the reform versus the top 20, who will lose because of a negative shock, while 10 percent of the population experienced little impact on income.

4.4. Cash Transfer and Inequality

Energy prices and cash transfers were fixed for a long period of time while the country experienced two-digit annual inflation. Under this setting, and because inflation dilutes the real value of subsidies, the economy is likely to approach pre-reform equilibrium. We empirically test this intuitive hypothesis in a variety of ways. First, we compare the impact of the reform three and eight years after it was implemented. Second, using Equation 6, we test if variations in the inequality indexes can be explained by cash transfers or treatment intensity. The higher the amount of real cash transferred to the bottom 70, the higher the bottom 70 expenditure share, and the lower the inequality. To examine this relationship, we rely on exogenous changes in the value of cash transferred. Table 1 shows the details of cash transfers from 2010 to 2019, based primarily on the Iranian Parliament's annual fiscal reports and the Iranian Parliament Research Centre, which can be found in Appendix. Column 2 shows the fraction of cash recipients; The nominal cash transfers are listed in billions of rials in Columns 3 and 4. Finally, columns 5 and 6 report total per capita cash transfers in USD.

5. Results

In this section, we report the impact of subsidy reforms on the set of inequality measures using econometric models.

5.1. Overall Impact of Reforms

We report the overall impact of reforms on the consumption of deciles 7 and 9 using the DiD and Intensity of Treatment models.

5.1.1. Difference-in-Difference Model

The results of the main DiD model (Equation 4) are demonstrated in Table 2. The table reports the short- and long-term effects of Reform 2010 on deciles 7 and 9 in comparison

Table 1: Details of Cash Transfers

(1) Year	(2) Ratio of Cash Recipients	(3) Nominal Cash Transfers (Billions of Rials)	(4) Real Cash Transfer (Billions of Rials)	(5) Real Total Cash Transfer per cap yearly (USD)	(6) Real Total Cash Transfer per cap daily (USD)
2010	0.854	114003	114003	292.315	0.801
2011	0.982	392573	3.11e+05	796.583	2.182
2012	0.986	413204	2.54e+05	652.192	1.787
2013	0.988	420075	1.96e+05	603.716	1.654
2014	0.959	421370	1.71e+05	438.553	1.202
2015	0.913	418206	1.53e+05	391.114	1.072
2016	0.905	415049	1.42e+05	363.613	0.996
2017	0.903	415670	1.31e+05	336.780	0.923
2018	0.904	420000	1.05e+05	268.723	0.736
2019	0.901	430000	79848.242	272.827	0.747

Notes: This table displays cash transfers from 2010 to 2019, based on the Iranian Parliament's annual fiscal reports and the Iranian Parliament Research Centre. Column 2 shows the fraction of population that receive cash. The total population started at 64 millions in 2010 and reached 78 millions in 2019. Columns 3 and 4 report aggregate nominal and real regular cash transfers (in local currency). Columns 5 and 6 report total per capita cash transfers (including some ad-hoc one-time payments) in USD. Source: Report of the Program and Budget Commission of the Iranian Parliament regarding the operation of the law on the targeting of subsidies in the annual budget laws during the years 2010 to 2019.

to decile 8 as a control group. The coefficients in the first row indicate that the share of expenditure in decile 7 increased by more than 0.3 percentage points three years after the reform and by roughly 0.2 percentage points nine years later. The coefficients in the second row show a decrease in the share of expenditure in decile 9. Because deciles 9 and 10 experienced adverse income shocks, these coefficients are negative and roughly twice as large as those in the first row for 7.

Parallel Trend Test. The reason for using the adjacent deciles of decile eight as the control group, deciles 7 and 9, is that they are more likely to move similarly to decile 8. According to DiD estimates, if the 2010 reform had not been implemented, the share of expenditure for the two groups, control and treatment, would have followed the same trend (the parallel trend assumption.) If this holds, the plausible explanation for the difference in outcomes after reform is the reform itself. To put this assumption to the test and provide an intuitive graphical demonstration of the impact of reform, we plot the observed share of expenditure

in deciles 7 and 9 versus decile 8. Prior to the reform, the outcome trajectories in the control and treatment groups were very similar. We can see slightly increasing trends in both groups prior to the reform. The linear-trends model on the right side of Figure 5 helps to clarify this. The decile expenditure trajectories are shown with a common reference point, t=1984, making them easy to compare.

Table 2: Impact of Reform on Change in the Share of Expenditures in control and adjacent groups with positive and negative income treatment intensity

Model	% share expenditure relative to decile 8 as control group	
	Short (2011-2013)	Long (2011-2019)
	(1)	(2)
Decile 7x post	0.313***	0.190***
	(0.044)	(0.065)
Decile 9x post	-0.631***	-0.430***
	(0.072)	(0.097)
Observations	58×2	70×2

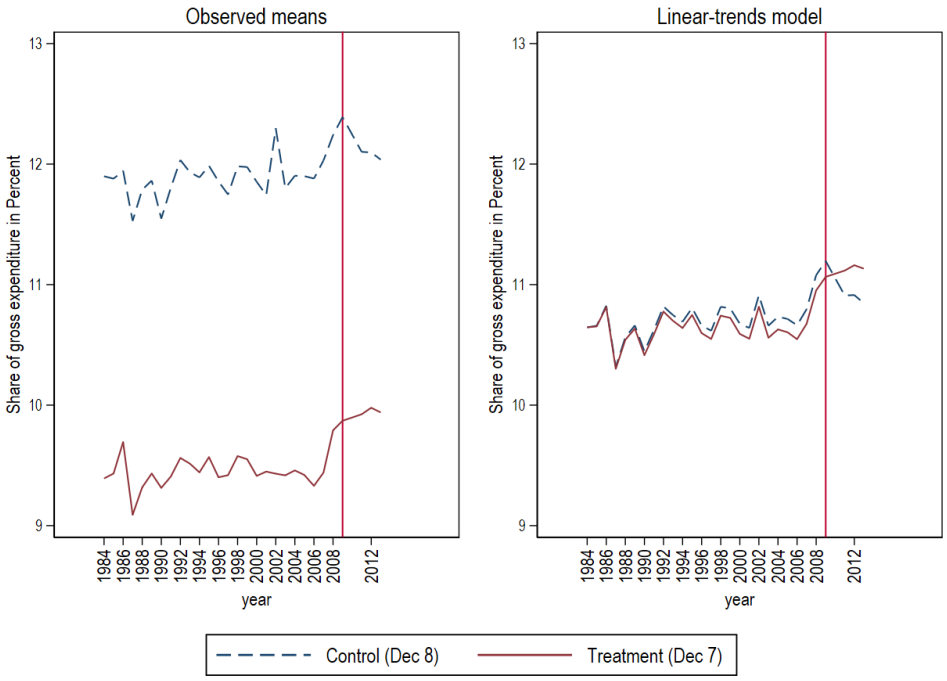
* Notes: This table estimates the short-term (3 years) and long-term (9 years) impact of the 2010 subsidy reform on the share of expenditure in deciles 7 and 9 relative to the control group, which is decile 8, using the specification of equation (1). Standard errors in parentheses are clustered at the year level. Source: Authors' calculations based on the Statistical Centre of Iran's Household Expenditure and Income Survey (HEIS). All coefficients are significant at the 1 percent level.

A more formal method of determining whether the pre-treatment trajectories are parallel is to test the linear-trend model coefficient, which captures the differences in trends between the treated and control groups. If the pre-reform trends in both groups are linear, then this coefficient will be 0 because the slopes in the two groups are the same. Table 3 shows the pre-trend analysis and reveals that we cannot reject the null hypothesis of the linear trends being parallel. Since the coefficient is not statistically significant from zero, parallel trajectories in expenditure share cannot be rejected in the pre-treatment period.

5.1.2. Intensity of treatment

The second method for testing the heterogeneous impact of reform on the share of expenditure across deciles is to use an exogenous measure of treatment intensity in USD PPP.

Panel A: Decile 7 vs Decile 8



Panel B: Decile 9 vs Decile 8

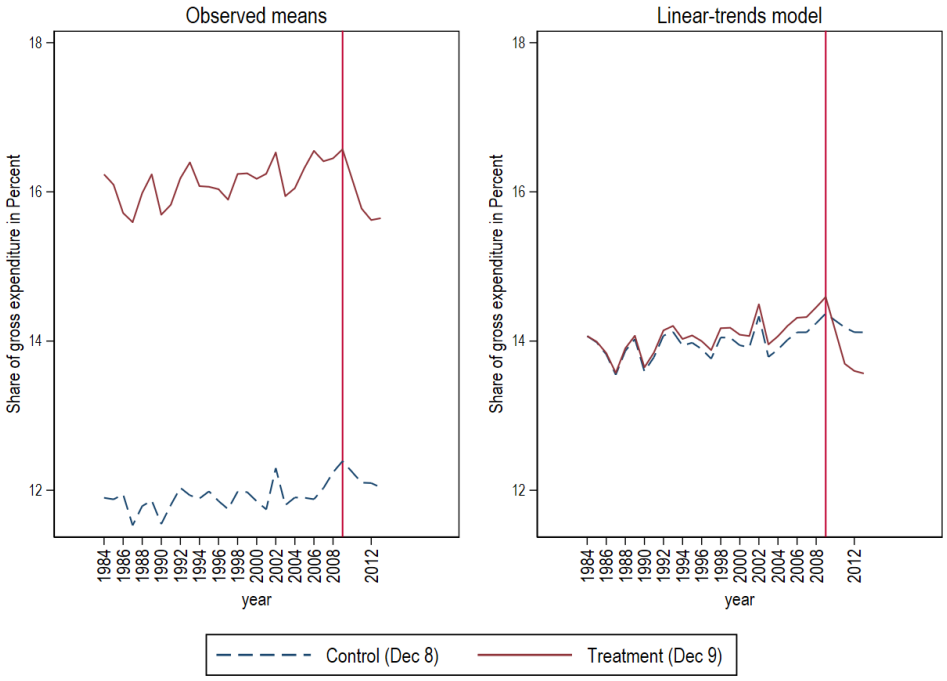


Figure 5: Share of Gross Expenditure Across Deciles 7, 8, and 9 Over Time. The vertical line indicates the time before large cash payments replaced energy subsidies in 2010.

Table 3: Parallel-Trends Test (Pre-Treatment Time Period)

H0: Linear trends are parallel	
Dec 7 V.S Dec 8	Dec 8 V.S Dec 9
F(1, 28) = 1.72	F(1, 28) = 1.43
Prob > F = 0.2001	Prob > F = 0.2423

* Notes: This table shows the statistical results test if pre-treatment trajectories are parallel and compares the linear-trends model coefficient to the null hypothesis of parallel pre-reform period trajectories. If linear, the coefficient equals zero, indicating parallel trajectories.

Treatment intensity varies greatly across deciles, as illustrated in Figure 4 Panel d. We anticipate a positive relationship between this metric and the share of expenditures across all deciles. According to Table 4, a change of one U.S. dollar in income (an increase for deciles 1 to 7 and a decrease for deciles 9 and 10) significantly affects expenditure share. As discussed, it is an exogenous income shock defined as universal cash transfers net of increases in energy and bread costs called treatment intensity. The first row of Table 4 shows the impact of treatment intensity in 2010, as calculated in Figure 3 panel d, on the expenditure share in each decile. Because the intensity of the treatment is affected by inflation, the second row is more precise. Inflation reduced the real price of energy and bread and the total cash transfers. The second row depicts one USD income change caused by reform, associated with an average 0.06 change in expenditure share across all deciles.

5.1.3. Impact of Reform on Inequality

The previous frameworks demonstrate the causal impact of reform on inequality using DID and exogenous income shock. As a complementary piece of information, we report a simple comparison of the years before and after the reform of each decile. For this purpose, we run the following regression model separately for each decile.

$$\ln(y_t^i) = \alpha_0^i + \alpha_1^i \times \text{post\_reform} + \epsilon_t^i \tag{7}$$

Here, y_t^i represents the consumption share of decile i at time t, and post_reform is a

Table 4: Impact Income Shock on Change in Share of Expenditures

	% Share Expenditure	
	Short (2011-13)	Long (2011-2019)
	(1)	(2)
Intensity of treatment in December 2010	.0381***	.0264***
	(.00128)	(.0037)
Intensity of treatment adjusted for inflation	.0577***	.0603***
	(.0086)	(.0072)
Observations	290	350

* Notes: This table estimates the short-term (3 years) and long-term (9 years) impact of 1 USD income change on the share of expenditure in all deciles, using the specification of equation (2). Standard errors in parentheses are clustered at the year level. Source: Authors' calculations based on the Statistical Centre of Iran's Household Expenditure and Income Survey (HEIS). All coefficients are significant at the 1 percent level.

dummy variable that marks years after the reform. The parameter α_1^i represents the average effect of reform on the consumption share of each decile. We exclude 2010 from the analysis due to its transition period.

The estimated values of the 10 $\alpha_i^1 s$ (each associated with a decile) is reported in 5. The top part of Table 5 shows the results when we restrict the post-treatment sample to 2011-2013. The lower panel of Table 5 reports the results when a long period after the 2010 reform is considered.

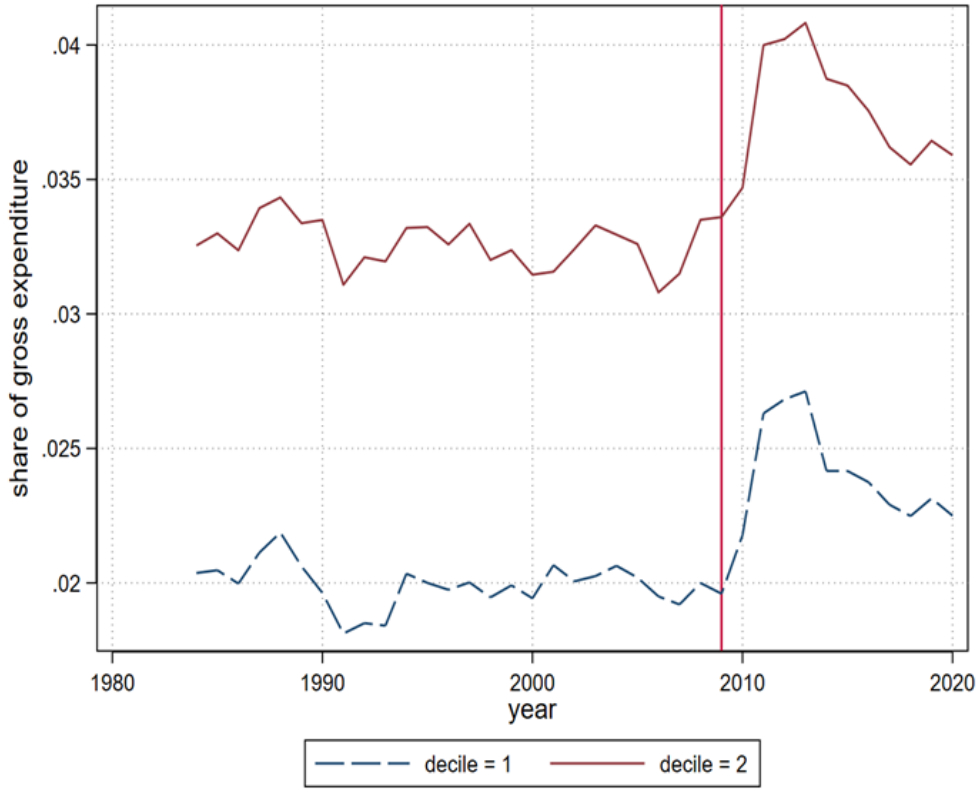
Figure 6 also provides a visual inspection of the results reported in Table 5. The results show positive and significant improvement in the share of the bottom 7 deciles, almost no effect on decile 8, and a negative impact on deciles 9 and 10. This finding means only the top 20% lost out after the reform, and their share of total expenditure decreased. On the other hand, the bottom 70 won, and their share of the economy's total expenditures increased. The higher the expenditure deciles, the less benefit from the 2010 reform. The most significant and large improvement in the expenditure share is in the lowest deciles, meaning the reform is a strongly pro-poor policy. The percentage of improvement in the lowest decile is about 30

Table 5: Impact of Reform on Change in Expenditures Share Across Expenditure Deciles

Log Expenditures Share in Each Decile				
Post Reform short (2011-13)				
(1)	(2)	(3)	(4)	(5)
.295***	.212***	.166***	.135***	.104***
(.024)	(.016)	(.014)	(.011)	(.01)
(6)	(7)	(8)	(9)	(10)
.074***	.05***	.014	-.029***	-.143***
(.011)	(.01)	(.009)	(.01)	(.014)
Observations: 29×10				
Post Reform long (2011-19)				
(1)	(2)	(3)	(4)	(5)
.206***	.157***	.125***	.099***	.073***
(.019)	(.013)	(.011)	(.009)	(.008)
(6)	(7)	(8)	(9)	(10)
.047***	.030***	.009	-.020***	-.097***
(.008)	(.006)	(.006)	(.0057)	(.011)
Observations: 35×10				

* Notes: This table reports estimates of the three-year impact of reform on the share of each expenditure decile using the specification of equation (3). These regressions present medium-run effects (the focus of our analysis), so the post-reform assumes the value 1 for 2011, 2012, and 2013. Standard errors are reported in parenthesis. Source: Authors' calculations based on the Statistical Centre of Iran's Household Expenditure and Income Survey (HEIS). *** Significant at the 1 percent level.

Panel A: Share of Deciles 1 and 2



Panel B: Share of Deciles 5 to 10

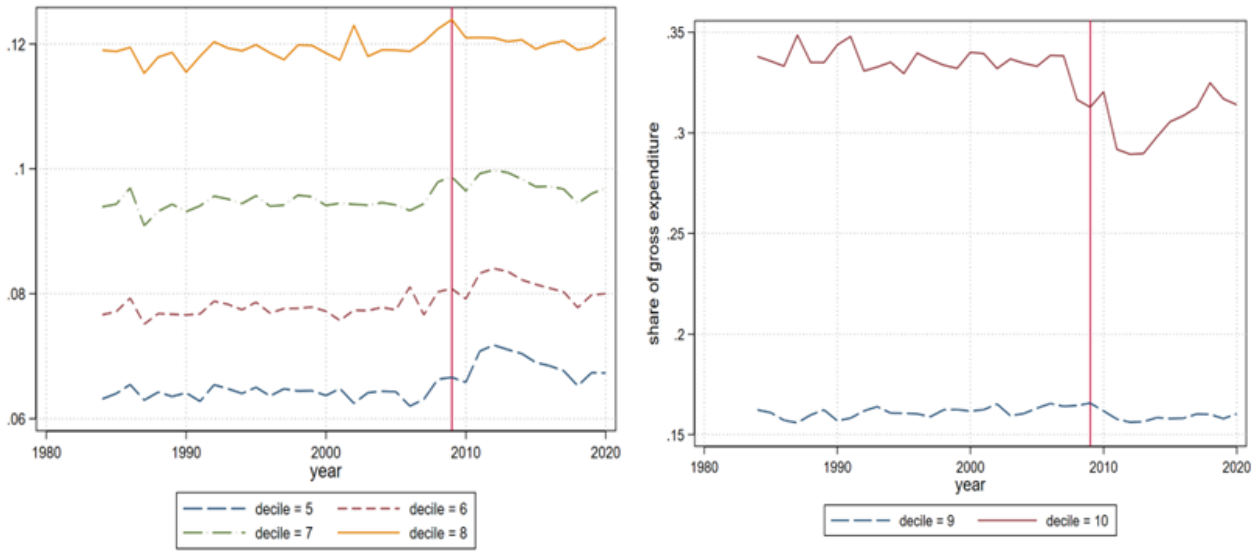


Figure 6: Share of Gross Expenditure Across Different Expenditure Categories Over Time. The vertical line indicates the time before large cash payments replaced energy subsidies in 2010. Panel A depicts the share of expenditure in deciles 1 and 2 of total expenditure, and panel B depicts the share of expenditure in deciles 5 to 10 of total expenditure.

percent, and as shown in Figure 6, it is by far the most significant policy from 1984 to 2019. This finding is consistent with the fact that the energy subsidies were captured more by high-income groups, and replacing them with universal and unique cash transfers improves low-income groups.

Econometric Results. We report the overall impact of reform on inequality using the specification that was presented in Equation 6.[6] Table 6 shows how the two measures of inequality (i.e., the Gini coefficient and the ratio of top to bottom 10%) change significantly over the next three years after the 2010 reform. Figure 6 shows that the Gini coefficient was stable at around 0.43 before the reform. It suddenly drops to about 0.37 over the three years after the reform, which means about 115 percent decrease.

Table 6: Impact of Reform on Change in Inequality Measures

	Log(Gini Coefficient)	Log(Expenditure Ratio of Top 10 to Bottom 10)
Post Reform (2011-13)	-.149***	-.438***
	(.005)	(.013)
R-squared	.919	0.92

* Notes: This table reports estimates of the three-year impact of reform on various inequality indexes. These regressions present medium-run effects (the focus of our analysis), so the post-reform assumes the value 1 for 2011, 2012, and 2013. Standard errors are reported in parenthesis. Source: Authors' calculations based on the Statistical Centre of Iran's Household Expenditure and Income Survey (HEIS). *** Significant at the 1 percent level.

5.2. Role of Cash Transfers

In the previous subsection, we provide evidence of how the reform has changed inequality measures in both the short and long term. Our findings indicate that the long-term impact of the reform is weaker compared to the short-term effect. We examine the reasons behind the tendency of these inequality measures to revert to pre-reform equilibrium and demonstrate

[6] We repeat Equation 6 here, $Z_t = \beta_0^i + \beta_1^i \cdot \text{cash\_transfer}_t^i \cdot \text{post\_reform} + \epsilon_t^i$.

that cash transfers are the main driver of the changes observed in these inequality measures. As stylized facts, we show the scatter plot of two inequality measures against the real size cash transfers in Figure 7 and Figure 8.

The exogenous changes in cash transfers implemented by the Iranian government are associated with variations in all inequality measures. Additionally, we observe semi-exogenous variation in cash transfers due to inflation over the years following the reform and fixed monthly payments from December 2010 to November 2019. There is also some variation in the ratio of cash recipients, and two unexpected increases in payments in 2013 as a New Year surprise and November 2019 as the second round of cash transfers in the reform. Table 1 provides a summary of these variations observed in 2010, including the adjusted amount of cash transfers in US dollar purchasing power parity (PPP) per capita per day.

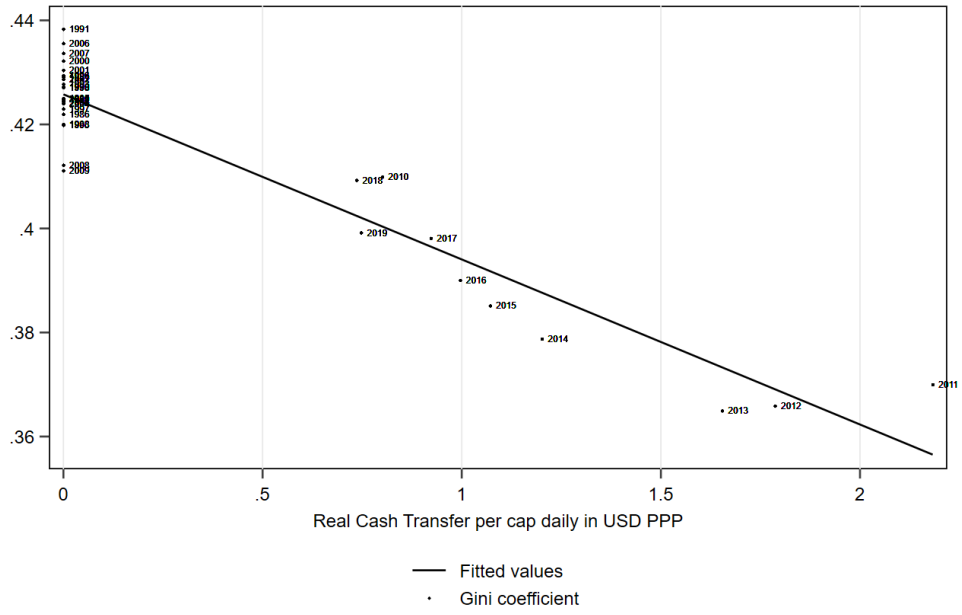
To further examine the relationship between cash transfers and inequality, we run a regression of these cash transfers on the share of expenditures across expenditure deciles and other inequality measures using Equation 7. The results of these regressions are presented in Table 7 and Table 8. Furthermore, the R^2 of regressions suggest that cash transfers can explain approximately 90 percent of the variation in inequality measures.

Table 7: Impact of One USD Subsidy-to-Cash on Change in Expenditures Share Across Expenditure Deciles

Log (Expenditures Share in Deciles)	(1)	(2)	(3)	(4)	(5)
Cash transfers (One USD PPP daily)	.163***	.122***	.097***	.078***	.059***
	(.017)	(.014)	(.012)	(.009)	(.007)
	(6)	(7)	(8)	(9)	(10)
	.04***	.026***	.008***	-.016***	-.079***
	(.005)	(.004)	(.002)	(.003)	(.008)

* Notes: This table reports estimates of the three-year impact of reform on the share of each expenditure decile using the specification of Equation (1). These regressions present medium-run effects (the focus of our analysis), so the post-reform assumes the value 1 for 2011, 2012, and 2013. Standard errors are reported in parenthesis. Source: Author calculations based on the Statistical Centre of Iran's Household Expenditure and Income Survey (HEIS). *** Significant at the 1 percent level.

Panel A: Gini Coefficient



Panel B: Ratio of Two 20 to Bottom 20 Consumption

of top 20 all twoway.png

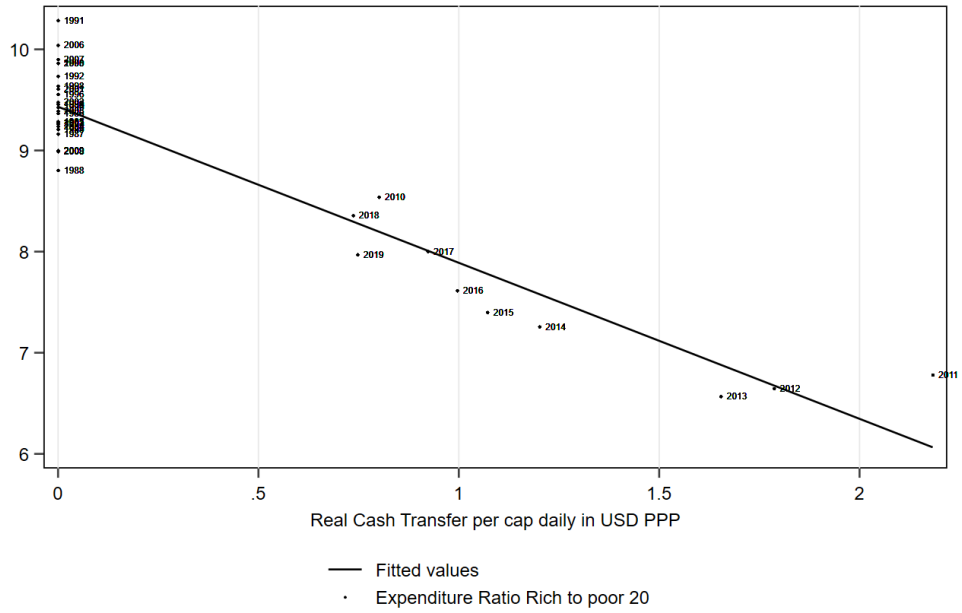
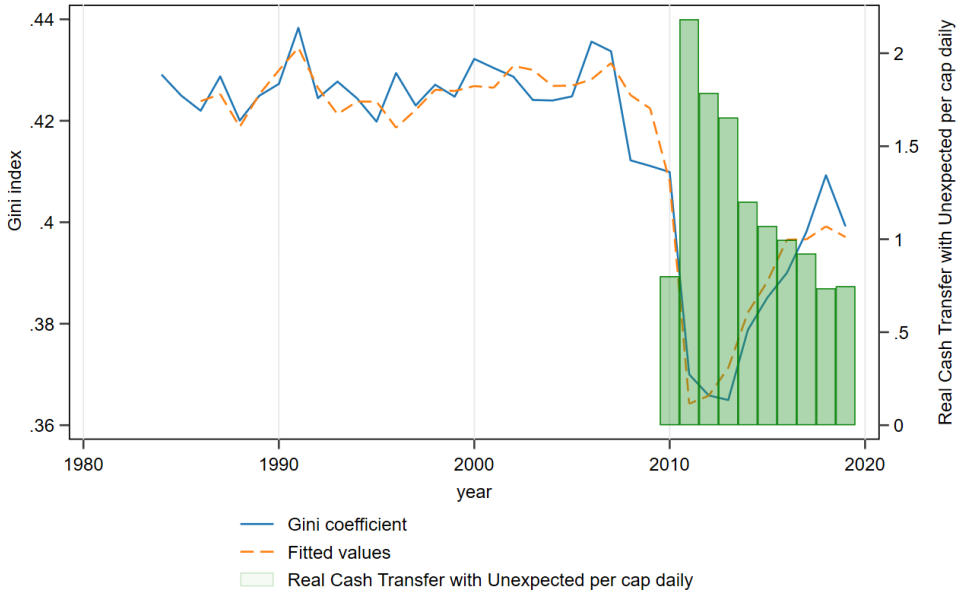


Figure 7: Inequality Index and Amount of Cash Transfers. Panel A depicts the Gini coefficient, and panel B depicts the share of the bottom 20 of the total expenditure. The data points around zero are the years before cash payments replaced energy subsidies in 2010. Source: Author calculations based on the Statistical Centre of Iran's Household Expenditure and Income Survey (HEIS).

Panel A: Gini coefficient and the real amount of cash transfers



Panel B: Share of the poorest quantile from total expenditure and the real amount of cash transfers

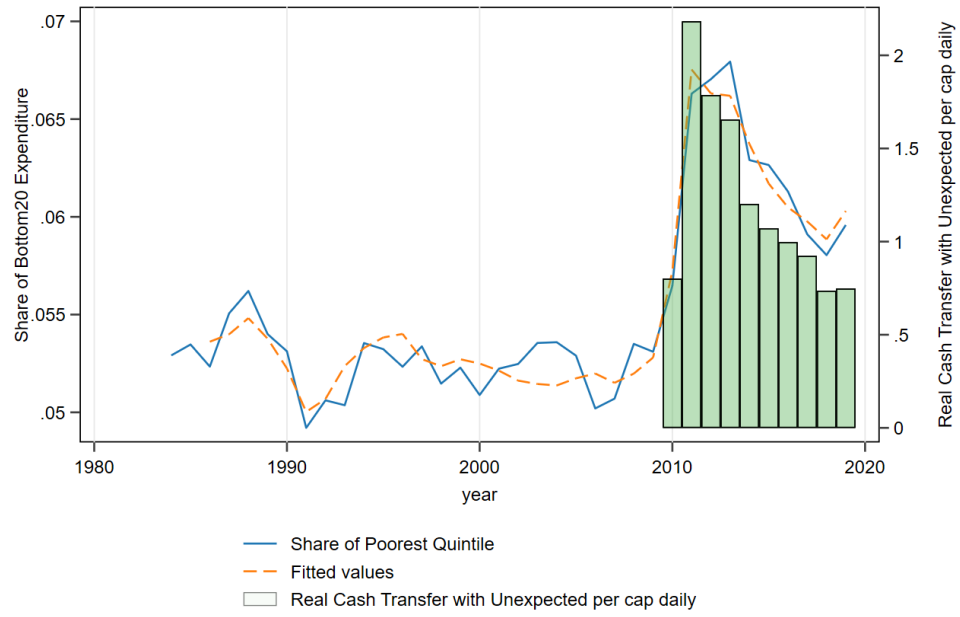


Figure 8: Inequality Measures and Cash Transfer. Panel A depicts the Gini coefficient, and panel B depicts the share of the bottom 20 expenditures in total expenditures.

Table 8: Change in Inequality Indexes (%Δ)

	Log(Gini Index)	Log (Change in Expenditure Ratio of Top10 to Bottom10)
Cash transfers (One USD PPP daily)	-.082***	-.242***
	(.009)	(.025)

Notes: This table reports an estimate of one USD replacing subsidy to cash on the inequality indexes. Robust standard errors are reported in parenthesis. Source: Authors' calculations based on the Statistical Centre of Iran's Household Expenditure and Income Survey (HEIS). *** Significant at the 1 percent level.

5.3. Possible Alternative Mechanisms

In this section, we briefly discuss some potential concerns about our results.

Data quality. A possible reaction to the observed reduction in the inequality measure could be that it is due to data manipulation by the government to produce a rosy picture of the subsidy reforms. While this claim cannot fully be refuted, we have not come across evidence that supports a hypothesis of mass manipulation of household-level data in the years following the reforms. It should also be noted that the inequality indexes extracted from official data started worsening in the years following the reforms, which also does not support intentional data manipulation.

Effect of Sanctions. Major subsidy reforms in Iran approximately coincide with the tightening of international sanctions imposed on various sectors such as oil, precious metals, and banking. It is likely that some of the observed changes in inequality measures are driven by changes in the terms of trade and exchange rates. However, this is only a plausible argument if goods and services consumed by top deciles are subject to a stronger effect from sanctions, leaving them with a tighter budget for subsidized goods.

6. Conclusion

In this paper, we provide supporting evidence that an energy subsidy reform coupled with cash transfers can produce favorable effects on consumption inequality. Using multiple

identification strategies, we demonstrate Iran's 2010 subsidy reform reduced the gap between top and bottom decile consumption, at least in a few years following the initial reform. Thus, contrary to popular belief, we find a significant and robust redistribution of reforms toward low-income households. On the other hand, we find that in the years following the 2014 price change, which lacked a transparent and significant updating of cash transfers, inequality kept increasing.

As a robustness check, we conduct additional analyses using alternative measures of inequality. Specifically, we examined the ratio of expenditures between different income groups, employing various thresholds to define the top and the bottom income groups. All measures consistently showed a reduction in inequality during the initial years following the reform. Furthermore, we found a significant association between the inequality index and the actual amount of cash transfers, contradicting popular beliefs and reports that suggested a negative impact on the country's poor. The results of the current paper align with the findings of Salehi-Isfahani et al. (2015), who observed a continued decline in poverty and inequality towards the end of 2010. Our research extends the analysis to investigate the long-term impact of the reform and the dynamic role cash transfers play.

The dilution of the real value of subsidies (due to inflation) has caused the initial reduction in inequality measures to revert back to their long-term historical values until 2019. The 2019 price change faced widespread protests across the county. We consider this as evidence that citizens who have witnessed the dynamics of inequality in the years following the 2014 reform understood that a price increase without a universal cash transfer could negatively impact their welfare.

Reforms in energy-to-cash subsidies have resulted in positive income shocks for low-income households. Recent studies in the country demonstrate that poverty can lead to children's malnutrition and affect many aspects of children's human capital, including physical (Dadgar et al., 2020b; Karimi et al., 2020) and mental health (Mokhtari, 2023), in the

long term. A positive income shock we found in this study can improve children's human capital in low-income households, which may be of interest to future studies.

Our work contributes to the literature on energy policy and public finance by suggesting that a comprehensive subsidy reform plan can indeed benefit the poor; however, sustaining the impact requires additional efforts to index cash transfer to inflation.

The current paper can be expanded in multiple directions. First of all, we focus on the observed aggregate equilibrium outcomes in the consumption basket of deciles. Future research can examine micro-level changes in the consumption pattern that followed updated relative prices of various commodities. That research can report short-term and long-term price and income elasticities of food and fuel components for different income levels and discuss how households adopt their consumption facing new income and price shocks. Second, exogenous shocks identified in this paper can be used to estimate marginal propensity to consume for different income groups. It can also be used to test the validity and implications of Permanent Income Hypothesis (PIH) in the Iranian data.

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Appendix A. Supplementary evidence on the amount of cash transferred and the number of cash recipients from official sources

جدول شماره (3): مصارف سازمان هدفمندسازی یارانه‌ها (مبالغ به میلیارد ریال)

شرح	ماده (7) قانون		ماده (8) قانون	عدالت در بهداشت و سلامت	پرداخت عیدانه	تسویه تنخواه بانک مرکزی	جمع
	یارانه نقدی و غیر نقدی	تأمین اجتماعی	سهم تولید				
1389	114.003	950	0	0	0	0	114.953
1390	392.573	1.000	0	0	0	18.000	411.573
1391	413.204	0	759	0	65.456	5.000	484.419
1392	420.075	0	180	25.500	0	0	445.755
1393	421.370	6.400	5.585	28.400	0	0	461.755
1394	418.206	25	5.769	8.700	0	0	432.700
1395	415.049	0	6.439	5.000	0	0	426.488
جمع	2.594.480	8.375	18.732	67.600	65.456	23.000	2.777.643
درصد	%93/4	%0/3	%0/7	%2/4	%2/4	%0/8	%100

جدول شماره (4): آمار جمعیت دریافت کننده یارانه نقدی در اسفند ماه هر سال

	سال 1395	سال 1394	سال 1393	سال 1392	سال 1391	سال 1390	سال 1389 *
تعداد جمعیت یارانه بگیران	75.416.524	74.678.820	76.707.464	77.520.904	76.271.445	74.934.001	64.367.437

* کم بودن تعداد یارانه بگیران در سال 1389 به دلیل تکمیل نشدن فرآیند ثبت نام بوده است.

Figure A.9: Details of Cash transfers in 2010 to 2016 based on official reports. Sources: Parliament Budget Commission 2017

Figure A.10: Details of Cash transfers in 2017, 2018, and 2019 based on official reports. Sources: 2017 Iran State Accounts Court. 2018 Iran Parliament Research Center. 2019 Iran Plan and Budget Organization