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# Welfare and Fiscal Implications from Increased Gasoline Prices in the Islamic Republic of Iran

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## Abstract

Facing a fiscal crisis, the Islamic Republic of Iran decided to increase gasoline prices at the end of 2019. This paper estimates the impact of the price increase on household welfare and government revenue, using the most recent Household Expenditure and Income Survey conducted by the Statistical Center of Iran in March 2018–March 2019. The paper looks at the direct and indirect impacts of the reform and quantifies the compensatory cash transfer program the government instituted. Despite very regressive gasoline subsidies benefitting the rich the most, the increase in gasoline prices is found to affect the poor to a greater extent due to larger negative indirect impacts as well as their relatively low incomes. In total, poverty is estimated to increase by about 2.9 percentage points, with the direct impact accounting for a third of this increase. The proposed government scheme, if targeted perfectly to the poorest 18 million households, would fully compensate the poorest bottom 50 percent of the population and reduce poverty to below pre-reform levels. The annual cost of the program will be around 338 trillion rials, which accounts for 77 percent of the estimated total savings from the subsidies reform (439 trillion rials).


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# Welfare and Fiscal Implications from Increased Gasoline Prices in the Islamic Republic of Iran[1]

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## 1. Introduction

Like many other countries in the MENA region, the Islamic Republic of Iran subsidizes energy very extensively. Pricing fuels below costs tends to increase inefficiency, overconsumption and environmental problems (Fattouh and El-Katiri 2013, and Davis 2014). Energy subsidies, especially on gasoline, are mostly regressive and benefit the rich more than the poor in the context of the Middle East and North Africa region in general and the Islamic Republic of Iran in particular (Mostafavi-Dehzooei and Salehi-Isfahani 2017, Verme and Araar 2017). Reducing energy subsidies, on the other hand, is challenging due to the general public opposition to price and fiscal reforms. In an oil exporting country like the Islamic Republic of Iran, energy subsidy is for the most part implicit and has little direct fiscal burden. However, it results in inefficient use and a regressive distribution of national wealth.

The Islamic Republic of Iran's economy continued to face recession after 2016/17, along with new international sanctions imposed on the country's petrochemicals, metals, mining, and maritime sectors. GDP is expected to further decline. The fiscal deficit is estimated to further widen, calling for urgent fiscal adjustment measures (World Bank 2019).

Reducing energy subsidies is one of the ways to address the strained fiscal situation. The Government of the Islamic Republic of Iran (GOI) increased the price of energy on several occasions over the past two decades. Price reforms and rationing of gasoline have always been the subject of many discussions and opposition during this time. A major price reform was the Targeted Subsidy reform of 2010, where prices of energy carriers and bread increased by multiples ranging from 2 to 9 (Salehi-Isfahani 2014). The goal of the reform was to keep prices of energy carriers close to Persian Gulf FOB, and cash transfers were paid to virtually everyone to reduce opposition. Nine years after this major overhaul, the price of energy is still very low compared to international levels mainly due to the instability of the rial. The gasoline price, for example, was 10,000 IRR (around US$0.10) per liter before the new gasoline price reform of 2019.

On November 15, 2019, the National Iranian Oil Products Distribution Company (NIOPDC) implemented a 50 percent increase in the of price of petrol at re-introduced rationed amounts (e.g. 60 liters/month for private cars) and a 200 percent increase for consumption beyond the ration amount. The official announcement came only one day before the start of the price reform, in which it was specified that revenues generated from the price increase were supposed to be exclusively redistributed back to 18 million means tested households. This drastic change was introduced and went into effect overnight and led to street protests which quickly became violent. To the best of our knowledge, until now there has been no comprehensive empirical evidence on the welfare and fiscal implications of the 2019 reform in the Islamic Republic of Iran.

This paper uses the most recently available household expenditure and income survey (HEIS) from 2018/2019 to estimate direct and indirect impacts of the proposed price increase on poverty, inequality and government revenues. The direct impact measures the impact of a price change on household well-being via the consumption of the subsidized products. Indirect effects measure the impact via the consumption of products that are affected indirectly by the change in price of subsidized products. For example, the prices of goods and services which use gasoline in their production or delivery will also be affected by the increase in gasoline prices. In addition, we compare poverty and fiscal implications from the proposed government cash transfer scheme with a scenario of universal or perfectly targeted cash transfers needed to bring poverty back to the pre-reform level. All estimations are based on a particular

model specifically designed for the distributional analysis of subsidies and the simulation of subsidy reforms. The model is called "SUBSIM" (Araar and Verme 2015).

The analysis consists of the following steps. First, we update household expenditure from HEIS 2018/2019 by applying projected nominal GDP per capita growth and the poverty line by projected increases in the Consumer Price Index in order to obtain expenditures and the poverty line in 2019/20 prices, from which can be obtained a forecasted poverty rate for this period.[2] Second, we analyze the distribution of gasoline expenditures and quantities consumed across the household consumption distribution in the Islamic Republic of Iran. Third, we simulate direct and indirect impacts from the increase of gasoline prices on population well-being, poverty and inequality using the publicly available SUBSIM Stata package (Araar and Verme 2012). Finally, we assess the impact on government expenditures and revenues after the reform, including the cost of any mitigation measures.

## 2. Preparing the microdata and initial parameters

### 2.1 Forecasting household budget expenditure and initial parameters

The Household Expenditure and Income Survey (HEIS) conducted by the Statistical Center of Iran in March 2018-March 2019 is used to analyze the potential impact on poverty and inequality from higher gasoline prices and reintroducing a rationing system. In order to have the most up to date poverty and expenditure numbers, we forecasted poverty for the period March 2019-March 2020. This is done by adjusting household expenditures by the estimated nominal gross domestic product (GDP) per capita growth rate and the poverty line by the estimated increase in the Consumer Price Index (CPI). Inflation is assumed to be 35 percent; GDP per capita nominal growth is predicted to be around 32 percent and population growth around 1 percent (World Bank staff estimates before the breakout of COVID-19). Resulting daily expenditure and population numbers are shown in Table 1.

Table 1. Population and daily expenditures in IRR in 2019/20, forecasted numbers

| | Population, million | Number of households, million | Household size | Total expenditures, billion | Total expenditures per capita, thousand | Total expenditures per household, thousand |
|---|---|---|---|---|---|---|
| poorest | 8.7 | 1.9 | 4.5 | 691 | 79,832 | 359,075 |
| 2 | 8.7 | 2.1 | 4.1 | 1,064 | 122,793 | 504,247 |
| 3 | 8.7 | 2.2 | 3.9 | 1,330 | 153,666 | 594,420 |
| 4 | 8.7 | 2.3 | 3.7 | 1,567 | 181,104 | 677,333 |
| 5 | 8.7 | 2.4 | 3.6 | 1,847 | 213,291 | 764,559 |
| 6 | 8.7 | 2.5 | 3.5 | 2,175 | 251,124 | 868,359 |
| 7 | 8.7 | 2.6 | 3.3 | 2,596 | 300,020 | 990,845 |
| 8 | 8.7 | 2.8 | 3.1 | 3,196 | 369,119 | 1,137,665 |
| 9 | 8.7 | 3.0 | 2.9 | 4,236 | 489,272 | 1,430,198 |
| richest | 8.7 | 3.5 | 2.5 | 8,149 | 941,671 | 2,318,160 |
| Total | 86.6 | 25.4 | 3 | 26,852 | 310,157 | 1,056,611 |

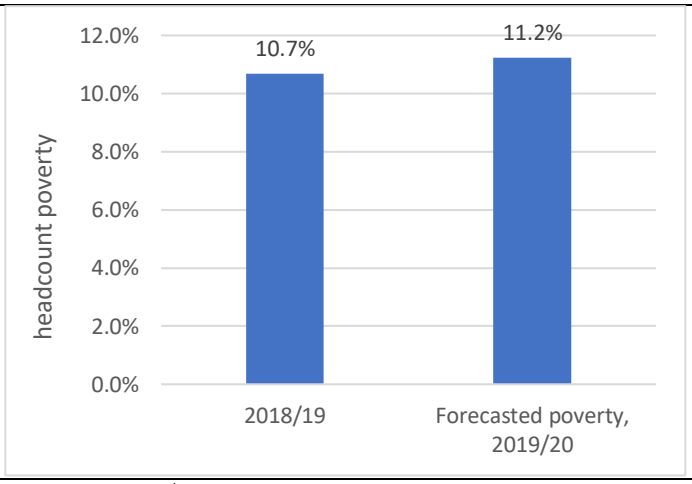
Source: Forecasted numbers based on HEIS 2018/19.
Note: GDP and CPI numbers are from Statistical Center of Iran.

[2] This is a very crude prediction of poverty due to the assumption of a one-to-one relationship between GDP and consumption, but our main goal is to have consumption in the current prices and baseline poverty level to check the impact from the reform. It is the change over the forecast baseline which represents the magnitude of the impact of the reform; the precise levels matter less for our purposes.

Inflation in 2019/20 is predicted to be higher than the nominal GDP per capita growth, which makes the population worse off in real terms. The national poverty rate, measured at the 5.5 USD 2011 PPP daily poverty line used by the World Bank for upper middle-income countries, is forecasted to increase slightly from 10.7 percent in 2018/19 to 11.2 percent in 2019/20.

For simplicity we assumed that the GDP per capita growth rate has a one-to-one relationship with growth in household expenditure and is also distribution neutral. The main goal of the current analysis is not to get an accurate poverty rate, but rather to make sure we are using expenditures in the current prices. As such, the 2019/20 estimate is not a precise forecast but rather acts just as a baseline for analyzing the impact of the reforms in present-day Islamic Republic of Iran.

Figure 1. Headcount poverty rates in 2018/19 and forecasted poverty rate in 2019/20 using 5.5 USD 2011 PPP daily poverty line




Source: Authors' calculation using HEIS 2018/19.
Note: Poverty is calculated using a spatially adjusted welfare aggregate to account for price differences across different regions and rural/urban areas following methodology described in Atamanov et al. 2016. The resulting poverty rate is therefore slightly different from the one reported in PovcalNet.

## 2.2 Reform scenario for simulation

On November 2019, NIOPDC announced a 50 percent price increase in gasoline prices to IRR 15,000 per liter below re-introduced rationed amounts (e.g. 60 liter/month for private cars and 25 liters for motorcycles) and a 200 percent increase to IRR 30,000 per liter for consumption above this. In this note we simulate the impact on poverty and inequality after this change in gasoline prices. For those who have both cars and motorcycles, we assumed the rationed amount to be 85 liters per month.

Initial and final prices are shown in Table 2. Despite the proposed increase, gasoline prices will remain much lower than our estimated cost recovery price of IRR 66,301 per liter. The cost recovery price for gasoline is estimated as follows. We used U.S. regular all formulations retail gasoline price from November 2019 reported by the U.S. Energy Information Administration. We have subtracted from this price federal tax and an average of total state taxes taken from the same website. The resulting cost recovery price is about USD 56 cents per liter. Applying the average November market exchange rate of IRR 118,530 per USD gives us a cost recovery price about IRR 66,301 per liter (Table 3).

Table 2. The price schedule of the gasoline in the Islamic Republic of Iran, November 2019

| | | Initial price | Initial subsidy | Final price | Final subsidy |
|---|---|---|---|---|---|
| only car | below 60 liters per month | 10,000 | 56,301 | 15,000 | 51,301 |
| | more than 60 liters | | 56,301 | 30,000 | 36,301 |
| only motorcycle | below 25 liters per month | 10,000 | 56,301 | 15,000 | 51,301 |
| | more than 25 liters | | 56,301 | 30,000 | 36,301 |
| both car and motorcycle | below 85 liters per month | 10,000 | 56,301 | 15,000 | 51,301 |
| | more than 85 liters | | 56,301 | 30,000 | 36,301 |

Source: Authors' compilation.

Table 3. Inputs for calculating cost recovery price for gasoline

| unit | U.S. Regular All Formulations Retail Gasoline Prices | Federal and state taxes | Cost recovery price, USD | Cost recovery price, IRR |
|---|---|---|---|---|
| per gallon | 2.5980 | 0.481 | 2.11740 | 250,975 |
| per liter | 0.6863 | 0.127 | 0.55936 | 66,301 |

Source: Authors' calculations using information from U.S. Energy Information Administration (https://www.eia.gov/) and Bonbast website (https://www.bonbast.com/historical)

## 3. Distribution of subsidies and gasoline expenditures

More than 40 percent of households in the Islamic Republic of Iran do not report expenditure on gasoline and as a result have zero consumption (Figure 2). A further 40 percent consume 60 or more liters per month. The remaining 19 percent consume 1-60 liters per month. There are more households with zero consumption of gasoline in rural than in urban areas.

Consumption of gasoline is directly linked to the ownership of personal transport. About 41 percent of all households in the Islamic Republic of Iran have neither car nor motorcycle, consistent with the number reporting zero consumption of gasoline. Forty-one percent have only cars, 11 percent only motorcycles and 7 percent both cars and motorcycles. Figure 3 shows the structure of population deciles by ownership of cars and motorcycles. Richer households are more likely to own private transportation, in particular cars, while poorer households are more likely to own motorcycles.

Figure 2. Distribution of households by quantity of gasoline consumed, %

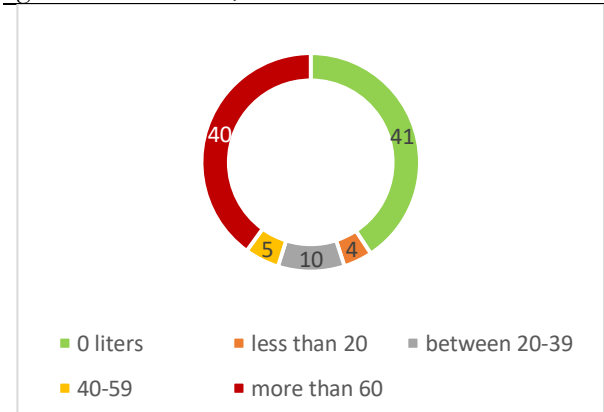
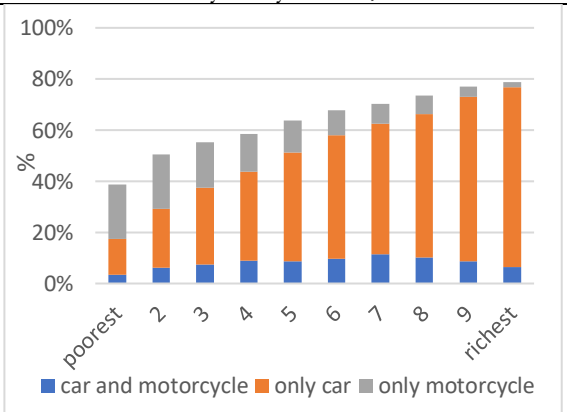



Figure 3. Distribution of population by ownership of car and motorcycle by deciles, %




Source: Authors' calculation using forecasted HEIS 2018/2019.
Note: Quantity consumed is calculated by using current price of gasoline and reported expenditures. Given that we do not know the quality of gasoline the price of 15,000 rials is used which may overestimate consumption among the richest households who use more expensive high-quality gasoline. We also do not how may cars and motorcycles households have. We have to assume ownership of one car or/and one motorcycle per household.

Table 4 contains daily amounts of per capita gasoline expenditure and the monthly household level of consumption among the population in the Islamic Republic of Iran. A strong gradient in expenditure and consumption of gasoline is clearly apparent, consistent with transportation ownership. The richer population is more likely to own cars and tends to spend and consume more gasoline compared to the less wealthy population who either do not own transportation or own motorcycles only. Thus, the richest 10 percent consume about 116 liters per month on average compared to 20 liters consumed by the poorest 10 percent. Another way to look at this is to check the distribution of population by gasoline consumption (Figure A1 in the annex). The largest share of population without gasoline consumption is from the poorest decile – 61 percent, compared to 22 percent for the richest decile.

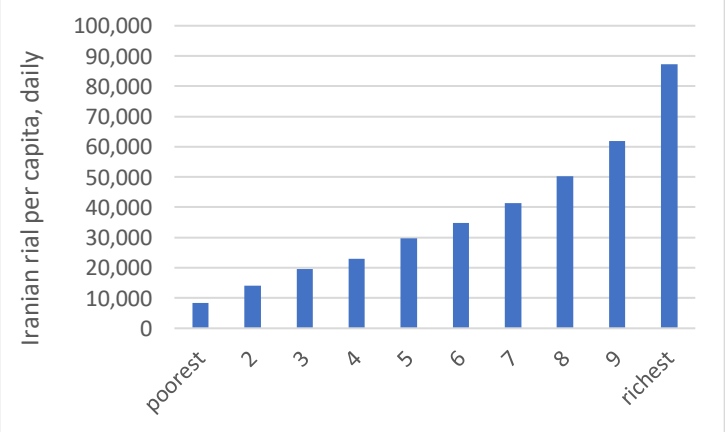
Table 4. Expenditures and consumption of gasoline in the Islamic Republic of Iran by deciles

| deciles | Daily expenditure on gasoline, IRR per capita | Quantity, liters per month per HH |
|---|---|---|
| poorest | 1,476 | 20 |
| 2 | 2,493 | 31 |
| 3 | 3,482 | 41 |
| 4 | 4,098 | 47 |
| 5 | 5,270 | 57 |
| 6 | 6,190 | 65 |
| 7 | 7,349 | 74 |
| 8 | 8,935 | 84 |
| 9 | 10,982 | 98 |
| richest | 15,487 | 116 |
| Total | 6,576 | 68 |

Source: Authors' calculation using forecasted HEIS 2018/2019.
Note: Overall daily consumption of gasoline is estimated to be around 53.3 mln liters. This is quite close to gasoline consumption numbers reported by Iranian authorities.

As a result of higher consumption of gasoline, richer people are the main beneficiaries of fuel subsidies as shown in Figure 4. The richest decile gets a 10 times higher direct benefit per capita through subsidized gasoline compared to the bottom decile. This is consistent with previous studies (Mostafavi-Dehzooei and Salehi-Isfahani 2017, Salehi-Isfahani et al. 2015).

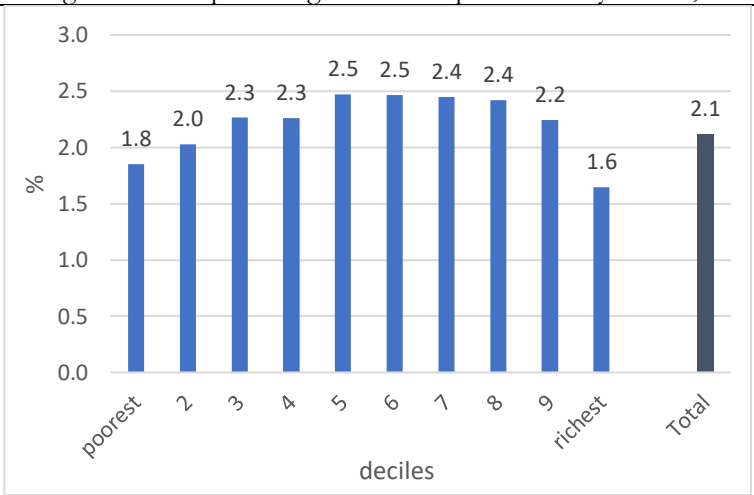
Figure 4. The per capita daily benefit through gasoline subsidies across deciles, Iranian rial




Source: Authors' calculation using forecasted HEIS 2018/2019.
Note: Benefit is calculated as the difference between costs recovery and the price multiplied by quantities consumed.

Despite much higher consumption of gasoline by the rich, in relative terms the gap between different wealth groups narrows substantially. On average, Iranians spend about 2.1 percent of their household budget on gasoline, but the poorest and the richest 10 percent spend about only 1.8 percent and 1.6 percent respectively. It is the population in the middle of the distribution who spend the largest share of their budget on gasoline (Figure 5). This implies that while increases in gasoline prices will affect all households, it is those in the middle of the distribution who will be most affected, despite the highly skewed benefits from subsidies towards the richest. That is, the middle class will be more affected than both the poor and the rich, because the poor consume less gasoline and the consumption of the rich is still a relatively small amount of their total expenditure.

Figure 5. Expenditure on gasoline as a percentage of total expenditures by deciles, %




Source: Authors' calculation using forecasted HEIS 2018/2019.

## 4. Impact of reform on poverty and government revenues without mitigation efforts

In this section we simulate the direct and indirect impacts of the reform on poverty and inequality without any mitigation steps by the government, as well as the associated impact on government spending.

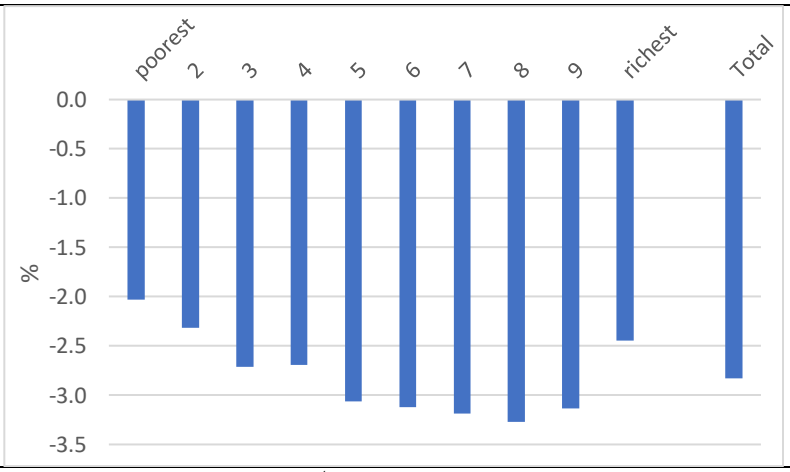
### 4.1 Direct impact on poverty and inequality without mitigation efforts

To estimate the direct impact on poverty and inequality, we assume that, except for the change in prices, all other determinants of welfare, in effect presenting a first-order approximation of the true impact of the reform. The approach thus simulates the 'direct effects' of subsidy reform, which are the price and quantity changes that apply to the final consumer when subsidies on final products are changed. These include the short-term crude change in prices (also called first-round effects) and the medium-term behavioral response of the final consumer in terms of quantities consumed (also called second-round effects, behavioral changes or demand responses to price changes). The change in welfare is equal to the deflation of subsidized expenditure following the increases in prices (Araar and Verme 2015). The use of elasticities does not affect the estimation of the impact of subsidy reforms on household welfare. Households can reorganize consumption as they wish but the impact on total household welfare will not change. Higher prices on subsidized products will reduce overall consumption/expenditure, negatively

affecting household well-being. For the elasticity of demand, we used -0.15 in this analysis,[3] which influences the estimated changes in quantity of electricity consumed (and in the next section, the fiscal effect on government revenues and spending).

As discussed, Iranians spend around 2.1 percent of their budgets on gasoline at pre-reform prices, with the middle of the distribution spending the largest share. On average, people will lose about 2.8 percent of their expenditure due to higher gasoline prices (Figure 6). Consistent with this, the increase in gasoline prices will affect the middle of the distribution. The poor will also experience a non-negligible loss in expenditure. The poorest 10 percent will lose about 2.0 percent of expenditure and the second poorest decile about 2.3 percent of expenditure.

Figure 6. The direct impact on well-being from increase in gasoline prices by deciles, % of total expenditure




Source: Authors' calculation using forecasted HEIS 2018/2019.

In terms of poverty and inequality, Table 5 shows pre-reform and post-reform estimates. Without mitigation, poverty would be expected to increase by 1 percentage point due to the direct impact of higher gasoline prices. Inequality, measured by the Gini Index, is also expected to increase modestly by 0.1 point.

Table 5. The direct impact on poverty and inequality after increase in gasoline prices

| | Pre-Ref | Post-Ref | Change |
|---|---|---|---|
| Welfare (per capita), (IRR) | 310,157 | 301,373 | -8,785 |
| Poverty (%) | 11.2 | 12.3 | 1.0 |
| Inequality (%) | 39.7 | 39.8 | 0.1 |
| Transfer per capita, daily (IRR) | | 3,109 | 3,109 |

Source: Authors' calculation using forecasted HEIS 2018/2019.
Note: Inequality is based on welfare aggregate, not spatially adjusted.

## 4.2 Indirect and overall impact on poverty and inequality without mitigation efforts

The indirect impacts of the reform consist of the effect of the rise in gasoline prices on other goods and services that households consume. When the price of gasoline increases, the production costs of many other goods may also increase if gasoline is used in their production or transportation. Therefore, there is

[3] The short-term price elasticity of gasoline was estimated to be around 0.15 in Taghvaee and Hajiani (2014).

pressure on prices of other goods and services to rise as a result of the increase in gasoline prices. The indirect impacts aim to capture these effects and the model used is called "costs-push".[4]

We estimate the impact of the gasoline price reform on producer prices by combining the Input-Output (I/O)[5] table of the Islamic Republic of Iran for 2011/12 with a price-shifting model of price formation in the productive sectors. Since all petroleum products are aggregated together in the Iranian I/O table, we estimate the price hike in petroleum products to be 57.9 percent (details of the estimation are provided in Annex 1). Using the I/O table and a price-shifting model, we estimate the increase in prices of productive sectors due to the reform. We then use the same forecasted HEIS 2018/19 micro-data for expenditure records of households and map all household consumption expenditure to economic sectors for which we have estimated producer price changes. The estimate of the indirect impact is empirically driven in precisely the same way as the direct impact estimate: it uses household-level consumption expenditure records to compile a household-specific indirect impact.

The negative impact on consumption from increased prices of goods and services other than the gasoline sector is shown in Table 6. The average loss in welfare from indirect impacts is about 3.4 percent and it is higher than the direct impact for all deciles. Thus, due to the higher cost of other goods and services, the poorest 10 percent will lose more than twice as much as they lose due to their direct consumption of more expensive gasoline. For the richest, direct and indirect impacts are closer in the magnitude of impact on the overall consumption per capita.

In contrast to the direct impact, the indirect impact hits the poor the most. For instance, population from the poorest decile lose about 5.2 percent of their expenditures through indirect impacts while the richest lose only 2.7 percent. This happens because of several sectors where prices are expected to rise because of higher gasoline prices such as agricultural products and chicken account for much higher shares in the total household budget of the poor. For example, consumption of agricultural products accounts for about 21.0 percent of total expenditures among the bottom 10 percent of population compared to 6.5 percent among the richest decile.

Table 6. The indirect and direct impact on well-being from increase in gasoline prices, %

| | direct impact | indirect | ratio, indirect over direct |
|---|---|---|---|
| poorest | -2.0% | -5.2% | 2.7 |
| 2 | -2.2% | -4.6% | 2.1 |
| 3 | -2.6% | -4.3% | 1.6 |
| 4 | -2.6% | -4.2% | 1.6 |
| 5 | -3.0% | -3.9% | 1.3 |
| 6 | -3.0% | -3.7% | 1.2 |
| 7 | -3.1% | -3.6% | 1.1 |
| 8 | -3.2% | -3.4% | 1.1 |
| 9 | -3.1% | -3.1% | 1.0 |
| richest | -2.4% | -2.7% | 1.1 |
| Total | -2.8% | -3.4% | 1.2 |

Source: Authors' calculation using forecasted HEIS 2018/2019.

Table 7 shows pre-reform and post-reform estimates for poverty and inequality. The combined impact is modeled sequentially. First, we estimate the direct impact, construct new welfare aggregates and then

[4] Detailed explanation of the model can be found in Araar and Verme (2015).

[5] The Input-Output table is prepared by the Statistical Center of Iran (SCI) and is available at: https://www.amar.org.ir/

estimate the indirect impact. Resulting poverty is expected to increase overall by 2.9 percentage points – 1.9 percentage points higher than the direct impact alone. That is, the ripple effect of the higher prices on other goods and services due to higher gasoline prices will be large. Inequality, measured by the Gini, is expected to increase by 0.5 point (compared to just 0.1 point through the direct impact only).

Table 7. The total (direct and indirect) impact on poverty and inequality after increase in gasoline prices

| | Pre-Ref | Post-Ref | Change |
|---|---|---|---|
| Welfare (per capita), (IRR) | 310,157 | 290,836 | -19,321 |
| Poverty (%) | 11.2 | 14.17 | 2.9 |
| Inequality (%) | 39.7 | 40.3 | 0.5 |

Source: Authors' calculation using forecasted HEIS 2018/2019.
Note: Inequality is based on welfare aggregate, not spatially adjusted.

### 4.3 Impact on government spending without mitigation efforts

The increase in gasoline prices would generate substantial savings for the government but would not be enough to eliminate subsidies fully as shown in Table 8. In particular, the savings will be around IRR 439 trillion. This is about 38 percent of current government spending on subsidies. However, part of these savings could be spent on mitigating the impact on poverty, which is examined in the next section.

Table 8. The impact on Government annual spending and revenues after increase in gasoline prices, trillion IRR

| | Pre-Ref | Post-Ref | Change |
|---|---|---|---|
| Subsidies | 1,170 | 731 | -439 |
| Transfers, universal | 0 | 98 | 98 |
| Net total budget | 1,170 | 829 | -341 |

Source: Authors' calculation using forecasted HEIS 2018/2019.

## 5. Impact of reform on poverty and government revenues with mitigation efforts

The previous section looked at the overall impact on poverty and inequality if the government did not introduce a mitigating response. In this section we simulate how effective mitigation could be and the associated impact on government expenditures.

Table 9 contains the amounts of subsidies pre- and post-reform. As we already saw, the annual savings from gasoline subsidy reform will be about 439 trillion IRR. We also model the impact on poverty from proposed GOI mitigating measures. In particular, GOI has proposed distributing cash transfers to the poorest 18 million households. The monthly size of the benefit depends on the household size and ranges from 550,000 IRR for one-member households to 2,050,000 IRR for five-member households and above. We assumed *perfect targeting* for this program which will approximately cover the bottom 77 percent of the total population in the Islamic Republic of Iran.[6] The overall cost of this transfer program will be about IRR 338 trillion, meaning a net savings on subsidy spending after transfer spending of about 101 trillion IRR.

[6] Although targeting is never perfect, the very large household coverage of the program means that it is likely that few poor and near-poor households will be excluded, meaning ignoring targeting errors in the current analysis will not have a large effect.

Table 9. The impact on Government annual spending and revenues after increase in gasoline prices and providing cash transfers under proposed Government scheme, trillion IRR

| | Pre-Ref | Post-Ref | Change |
|---|---|---|---|
| Subsidies | 1,170 | 731 | -439 |
| Average transfer per capita, daily (IRR) | 0 | 13,894 | 13,894 |
| Transfers, Government scheme | 0 | 338 | 338 |
| Net total budget | 1,170 | 1,069 | -101 |

Source: Authors' calculation using forecasted HEIS 2018/2019.
Note: Transfer per capita of 13,894 is the mean transfer based on the government scheme.

The proposed mitigating measure (if perfectly targeted) would fully compensate the population from the bottom 50 percent for the direct and indirect impacts from increased gasoline prices. For example, consumption per capita of the population from the poorest decile after the price reform *and* government transfer will be 8 percent higher than before the reform (Table 10). As a result of cash transfers, poverty might even fall below the pre-reform level. Inequality would be also reduced substantially because the proposed cash transfers play a more important role relative to the budget of poor people (Table 11).

Table 10. Ratio of consumption per capita after reform and after government transfers to pre-reform consumption per capita

| | Daily expenditure per capita, pre-reform (1) | Daily expenditure per capita after reform, (2/1) | Daily expenditure per capita after reform and proposed Government scheme (3/1) |
|---|---|---|---|
| poorest | 100% | 93% | 108% |
| 2 | 100% | 93% | 104% |
| 3 | 100% | 93% | 102% |
| 4 | 100% | 93% | 101% |
| 5 | 100% | 93% | 100% |
| 6 | 100% | 93% | 99% |
| 7 | 100% | 93% | 98% |
| 8 | 100% | 93% | 96% |
| 9 | 100% | 94% | 94% |
| richest | 100% | 95% | 95% |
| Total | 100% | 94% | 97% |

Source: Forecasted numbers from HIES 2018/19 are used.

Table 11. The total (direct and indirect) impact on poverty and inequality after increase in gasoline prices after providing cash transfers under proposed Government scheme

| | Pre-Ref | Post-Ref | Post-Ref after transfers, Government scheme |
|---|---|---|---|
| Poverty (%) | 11.2 | 14.2 | 9.7 |
| Inequality (%) | 39.7 | 40.3 | 38.1 |

Source: Authors' calculation using forecasted HEIS 2018/2019.
Note: Inequality is based on welfare aggregate without spatial adjustment.

For illustrative purposes, we have also calculated how much it would cost just to maintain poverty at pre-reform levels (rather than decreasing it as the proposed GOI measure does). We do this by providing universal cash transfers. Results are shown in Table 12. The amount of daily per capita transfer will be about IRR 8,380– smaller than the GOI proposal. The overall costs of the cash transfers would be about IRR 300 trillion. This will be lower than the costs of the GOI program despite being universal. The overall net savings will be higher at about IRR 139 trillion.

Table 12. The impact on Government annual spending and revenues after increase in gasoline prices and providing universal cash transfers, trillion IRR

| | Pre-Ref | Post-Ref | Change |
|---|---|---|---|
| Subsidies | 1,170 | 731 | -439 |
| Average transfer per capita, daily (IRR) | 0 | 8,380 | 8,380 |
| Transfers, universal | 0 | 300 | 300 |
| Net total budget | 1,170 | 1,030 | -139 |

Source: Authors' calculation using forecasted HEIS 2018/2019.

It is important to mention that cash transfers may lose their value if not adjusted for inflation in time. This happened after 2012 in the Islamic Republic of Iran, when due to due to high inflation the real value of cash transfers diminished and was the key factor behind the increase in poverty in 2012-2014 (Karakurum-Ozdemir et al. 2016). Regular indexation of cash transfers to keep their real value unchanged along with introducing targeting mechanisms could help the poor to cope with the social-economic shocks.

## 6. Conclusions

In this paper we studied the impact of the gasoline price reform of 2019 on poverty, inequality and government spending using the most recent household budget survey from the Islamic Republic of Iran conducted in 2018/19 and updated to reflect the prices in 2019/20. We showed that households spend 2.1 percent of their expenditures on gasoline, with the middle deciles consuming the most gasoline directly, relative to their total household budget. The benefits of subsidies are highly regressive, with the richest decile benefiting 10 times the poorest decile.

We separate the effect of the price increase into direct and indirect impacts. We find that the reduction in the monetary well-being of households due to the direct impact is 2.8 percent, but due to the indirect impact it is 3.4 percent on average. The average loss in welfare from indirect impacts is higher than the direct impacts for all deciles. The overall increase in poverty, measured by the 5.5 2011 PPP USD daily poverty line, will be about 2.9 percentage points. Inequality is expected to increase as well.

Although the rich benefit much more than the poor from gasoline subsidies, the poor stand to lose a larger share of their welfare with the price reform due to their low initial incomes and their greater consumption of goods which depend upon gasoline for transportation. Overall, the poorest decile loses almost 7 percent of their welfare while the richest decile loses about 5 percent. The fact that the poor would face higher negative impacts from the price reform justifies the use of cash transfers to keep poverty from increasing.

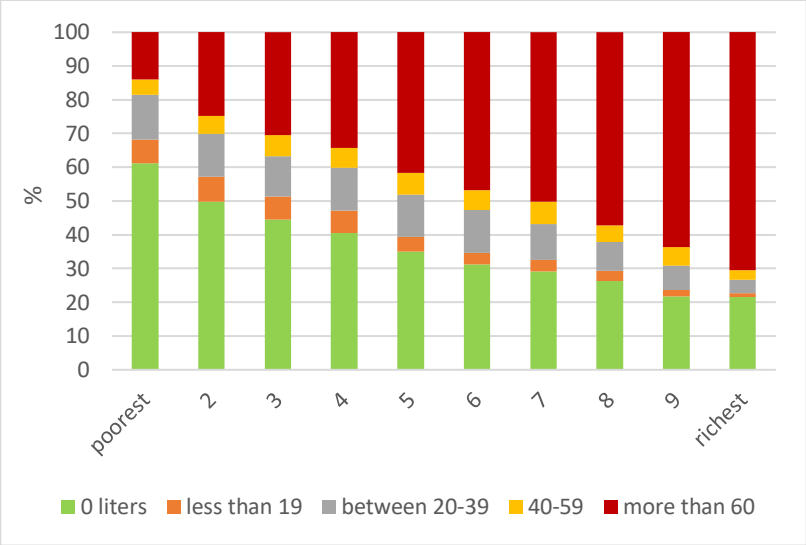
We estimated that a universal payment of 8,380 IRR would keep poverty at the pre-reform level. This transfer would amount to 300 trillion IRR, which is 68 percent of the program savings of 439 trillion IRR. The GOI-stated aim of the price reform was to use the revenues for cash distribution among households and started paying cash based on household size to the poorest 18 million households. We showed that if targeting is perfect, cash transfers under this scheme would be on average equal to IRR 13,894 per capita daily and would reduce poverty below the pre-reform level despite the impacts of the price increase. It will fully compensate the bottom 50 percent of the population and will require 77 percent of savings to be re-distributed.

Our findings indicate that a welfare reducing price reform can reduce poverty and inequality if it is accompanied by cash transfers. The savings from the program are enough for both compensating the affected population and budgetary relief for the government. The important implicit assumption in our

simulations is that the government is able to perfectly target the poor households for cash distribution. In practice, this is hard to achieve and as a result the mitigating impact on poverty and inequality may be lower than this study finds, although the very large size of the transfer program means most poor and vulnerable households are likely to be included. If cash transfers are going to be distributed for several years, introducing an indexation mechanism for the benefit size to account for inflation and further targeting will be crucial for keeping the program sustainable and effective in reducing poverty.

## Annex 1

Figure A1. Distribution of population by gasoline consumption by deciles, %




Source: Authors' calculation using HEIS 2018/2019.

**Box 1. Price shock for estimation of indirect impacts**

The indirect impact estimation requires an I/O table of the Iranian economy for which we use the I/O tables of 2011/12 provided by SCI. In these tables, petroleum products are reported in a single column which includes gasoline, diesel, jet fuel and other items. For our estimation, therefore, we need to estimate the increase in average petroleum product prices as a result of the gasoline price reform. In order to do so, we first find the price hike in gasoline for all purposes and then use that to estimate the price hike for the petroleum products.

Gasoline is consumed by many different agents in the Islamic Republic of Iran's economy and there are different quotas for each user. The quotas mentioned earlier in this report are for household consumption. Taxis, for example, have a quota of 400 liters per month with IRR15,000 per liter if their engine is gasoline only. Taxis with LPG+gasoline engines have another quota and trucks have their own quota based on their engine types. In our estimation, we assume that taxis and trucks will not exceed their quota and therefore will observe a 50 percent increase in their gasoline price. We then calculate the weighted average of the increase in gasoline price for different purposes using Table A.1. For cars, we find the weighted average of the price hike to be 211.34 percent based on consumption levels reported in HEIS, which means households on average have to pay twice as much as before for gasoline if they maintain their pre-reform consumption levels. For motorcycle owners, the price hike using HEIS consumption levels will be 193.59 percent, which is a price hike of less than double. For taxis and trucks, as mentioned earlier, we assume all consumption will be under the quota and the price hike will be 150 percent. The weighted average of the price hike of gasoline, therefore, is equal to 190 percent, using the consumption proportions reported in Table A.1 as weights.

Table A.1. Gasoline price hike by type of user

| | Car | Motorcycle | Taxi | Truck |
|---|---|---|---|---|
| Gasoline consumption proportion (percent of total) | 61 | 6 | 8 | 25 |
| Price shock, percent | 211.34 | 193.59 | 150 | 150 |

Source: Authors' calculation using HEIS 2018/2019. Gasoline consumption proportions are based on the Islamic Parliament Research Center report available at: http://rc.majlis.ir/fa/report/show/1328570

In the next step, we find the price shock for the petroleum products sector. Within petroleum products, the only product with a price shock is gasoline, as prices for other products are set by the government and were kept the same during the reform. We find the weighted average of the price shock using the expenditures on different products as weights (see Table A.2). The weighted average price shock for petroleum products assuming a 190 percent shock for gasoline[7] and no shock for the rest of the products will be 157.89 percent.

Table A.2. Price shock for petroleum products

| | Gasoline | Diesel | kerosene | Jet fuel | Mazut |
|---|---|---|---|---|---|
| Value (Trillion rials, per year) | 272.7 | 87.8 | 4.7 | 43.6 | 15.3 |
| Share of consumption (percent) | 64 | 21 | 1 | 10 | 4 |

Source: Authors' calculation using HEIS 2018/2019. Petroleum products consumption is based on National Iranian Oil Refining and Distribution Company (NIORDC) publication which is available at: http://niordc.ir/uploads/amarname95.pdf?fkeyid=&siteid=78&fkeyid=&siteid=78&pageid=2302, and authors' calculation.

[7] Consumption of gasoline for taxis, motorcycles, and trucks is based on the report by the Islamic Parliament Research Center in 2019 available at: http://rc.majlis.ir/fa/report/show/1328570.

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