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# FISCAL POLICY, INEQUALITY AND POVERTY IN IRAN: ASSESSING THE IMPACT AND EFFECTIVENESS OF TAXES AND TRANSFERS \*‡

*Ali Enami<sup>†</sup>, Nora Lustig<sup>‡†</sup> and Alireza Taqdir<sup>††</sup>*

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## ABSTRACT

Using the Iranian Household Expenditure and Income Survey (HEIS) for 2011/12, we apply the marginal contribution approach to determine the impact and effectiveness of each fiscal intervention, and the fiscal system as a whole, on inequality and poverty. Net direct and indirect taxes combined reduce the Gini coefficient by 0.0644 points and the headcount ratio by 61 percent. When the monetized value of in-kind benefits in education and health are included, the reduction in inequality is 0.0919 Gini points. Based on the magnitudes of the marginal contributions, we find that the main driver of these reductions is the Targeted Subsidy Program, a universal cash transfer program implemented in 2010 to compensate individuals for the elimination of energy subsidies. The main reduction in poverty occurs in rural areas, where the headcount ratio declines from 44 to 23 percent. In urban areas, fiscally-induced poverty reduction is more modest: the headcount ratio declines from 13 to 5 percent. Taxes and transfers are similar in their effectiveness in achieving their inequality-reducing potential. By achieving 40 percent of its inequality-reducing potential, the income tax is the most effective intervention on the revenue side. On the spending side, Social Assistance transfers are the most effective and they achieve 45 percent of their potential. Taxes are especially effective in raising revenue without causing poverty to rise, indicating that the poor are largely spared from being taxed. In contrast, since the bulk of transfers are not targeted to the poor, they are not very effective: the most effective ones achieve 20 percent of their poverty reduction potential. The effectiveness of the Targeted Subsidy Program could be improved by eliminating the transfer to top deciles and re-allocating the freed funds to the poor.

**Keywords:** Inequality, poverty, marginal contribution, CEQ framework, policy simulation.

**JEL classification:** D31, H22, I38

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## I. Introduction

Political rhetoric of reducing inequality and poverty is often used to create social support for the tax and transfer programs. The real outcome of these policies, however, is not always as good as promised and the incidence analysis is one of the widely used approaches that help to identify the true equalizing and/or pro-poor effect of fiscal policies. One major problem that arises from the utilization of different methodologies of incidence analysis is a lack of comparability; as a consequence, detecting important patterns or deducing general rules becomes difficult. The Commitment to Equity (CEQ) framework deals with this difficulty by unifying the analysis tool in order to provide comparable results across countries. At the heart of this framework is a flowchart (Figure 1 in the methodology section) that shows how different taxes and transfers are categorized and combined in order to form different income concepts (such as Disposable Income or Consumable Income) and therefore allows for a systematic analysis of the contribution of each component of the fiscal system to reducing (or increasing) poverty and inequality. In order to determine whether a fiscal policy is equalizing (or poverty alleviating) the marginal contribution approach which differentiates it from the common methods of analysis that uses progressivity measures such as the Kakwani index. This is specially an important feature of this framework since the well-known progressivity indices are not infallible rigorous predictors of identifying equalizing interventions (Enami et al., forthcoming). In other words, taxes or transfers that would be classified as progressive (regressive) using the conventional measures of progressivity can actually increase (reduce) inequality when their impact is analyzed taking into account the rest of the taxes and transfers. As we show in the result section, Iran also has an example of a progressive deduction and transfer that reduce inequality (i.e. “Health User-fees” and “Semi-cash Transfers (Food)”). Marginal contribution approach, on the other hand, has the advantage of identifying equalizing interventions by asking how the inequality (or poverty) would change if a specific tax or transfer is removed from (or changed in) the fiscal system or, equivalently, if it is replaced with a tax or transfer that would not change the inequality (or poverty) of the fiscal system (without it).

This paper analyzes the impact of taxes and transfers on inequality and poverty in Iran with data for 2011-2012. Our analysis pays special attention to the impact of Iran’s Targeted Subsidies Program, introduced in December 2010 to replace energy subsidies. In essence, general price subsidies were replaced by a lump-sum cash transfer of 455,000 Rials (equivalent to \$37 to \$44<sup>1</sup>) per person per month to all Iranians (including children of any age)<sup>2</sup> (Guillaume et. al. 2011). One of the factors behind this policy decision was the high fiscal burden of the general subsidies which were transferring resources in a larger proportion to the nonpoor (Guillaume et. al. 2011; Salehi-Isfahani et al. 2015). The subsidies used to cost the government around 20 percent of GDP (about \$70

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<sup>1</sup> Throughout 1390 Iranian year which is equivalent to March 2011 to March 2012, the official exchange rate changed from 10,364 to 12,260 Rials per dollar. Using these official exchange rates, the value of the monthly cash transfer was between \$43.90 and \$37.11 respectively. (Source: Central Bank of Iran’s Exchange Rates available at [http://www.cbi.ir/exrates/rates\\_en.aspx](http://www.cbi.ir/exrates/rates_en.aspx) and author’s calculations).

<sup>2</sup> The reform had some other components but the main aspect implemented in 2011-12 (1390 Iranian year) is the cash transfer aspect of it.

billion in 2010).], Different motives have been listed for this reform among which are the fiscal burden of the pre-reform energy subsidies, the unequal distribution of these subsidies, the excessive size of the energy consumption per GDP comparing to the neighboring as well as developed countries, the excessive waste in using the subsidized goods, the environmentally negative side effects of the use of cheap fossils fuels, the problem of smuggling the subsidized fuel out of the country, the fear of international embargo on importing gasoline and finally the political interests of the populist president or Iran at the time (Guillaume et. al. 2011; Salehi-Isfahani et al. 2015). The reform, however, did not reduce the fiscal burden of the government as much as it was expected since the cash transfer exceeded the additional revenue generated from the increase in energy prices (Salehi-Isfahani et al. 2015). The Targeted Subsidies Program cost. The universal nature of the cash transfer was necessary for ensuring political support for the elimination of energy subsidies, viewed as an entitlement by the population. the peaceful transition since energy subsidies are one of the most controversial fiscal policies in developing countries. They have high fiscal burden, costs to the environment and usually enjoyed more by those who do not need it. However, eEliminating energy subsidies in other countries has frequently resulted in extensive negative, and often violent, social reactions leading to unsuccessful implementation (Salehi-Isfahani et al. 2015). Such overt negative reactions were not witnessed in the case of Iran. One major contributing factor to this peaceful transition was the fact that the government used the banking system to distribute the money and even provided the ATM services in remote rural areas (Guillaume et. al. 2011; Salehi-Isfahani et al. 2015). The most creative and trust-building aspect of the use of banking system in this reform was to transfer the money to the accounts of Iranians but not to allow them to withdraw it until the official beginning day of the reform.

The estimation of the incidence of taxes and transfers use the Household Expenditure and Income Survey (HEIS) of Iran for 2011/12 (1390 Iranian year) to examine the inequality and poverty reduction of fiscal system, and specifically the Targeted Subsidy Program, in Iran. A previous study by Salehi-Isfahani et al. (2015) analyzes the change in poverty during the first three months of this reform in January-March 2011 (1389 Iranian year), and reports a 5% decrease in the poverty rate among rural households. However, logistical issues with the reform's implementation including numerous families' inability to receive their cash transfers during the reform's initial months, likely muted the reform's impact. Thus, a more representative depiction of the reform's effect on inequality and poverty among Iranian households is necessary. To this goal, the current study circumvents the implementation issues of the reform's initial months by analyzing the fiscal system in March 2011- March 2012 (1390 Iranian year) — that is, a full calendar year after implementing the reform. In addition, a clear advantage of 1390 HEIS over the 1389 round (used in Salehi-Isfahani et al. (2015)) is that the more recent survey allows for the clear identification of the beneficiaries<sup>3</sup>. While Salehi-Isfahani et al. (2015) are able to identify less than 70% of the households as beneficiaries of the transfer using their indirect identification technique in 1389, we can directly

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<sup>3</sup> In 1389 the cash transfer earning is recorded in addition to the “other income” sources and inseparable from them while in 1390 it is recorded as a completely separated variable.

observe that 96% of households are beneficiaries in 1390. This figure coincides with official statistics for the total number of beneficiaries of this cash transfer program.

While the fiscal savings were not immediate, we find that the fiscal system including direct and indirect taxes, direct transfers, subsidies and in-kind transfers in education and health in Iran reduces the Gini coefficient by 0.0919 points or 21% reduction compared to market income Gini. Excluding the in-kind transfers, the reduction equals 0.0644 Gini points or 15%. This fiscal system is powerful in reducing poverty: the headcount ratio falls from about 26% to 10%.<sup>4,5</sup> Effectiveness is here measured as the realized power of taxes and transfers in reducing inequality and poverty compared to their potential (Enami, forthcoming). We find that taxes are very effective in raising revenue without increasing poverty and moderately effective in reducing inequality. In contrast, since transfers are universal and not targeted on the poor, they only realize less than 16% of their potential to reduce poverty with no one transfer exceeding 21% of its potential. With regard to inequality, transfers are more similar to the taxes in terms of moderately realizing their power in reducing inequality with “Social Assistance” program leading the rest of interventions with a realized power of about 40% to 45%. Among taxes, only Income Tax displays an effectiveness of this magnitude.

Targeted Subsidy Program is the most important component in the fiscal system of Iran in reducing inequality and poverty (in marginal contribution sense). We find that in 2011-12 (1390 Iranian year), this program reduced the inequality of the Consumable Income by about 0.0534 Gini point. Without the Targeted Subsidy Program the poverty headcount ratio of the Consumable Income would have been about 22% instead of its current level which is about 10%. The reduction in poverty is mainly because of the effect of this program in the rural areas. In the absence of it, the rural areas would have experienced about 44% (instead of currently 23%) poverty while the urban areas would have only suffered from about 13% poverty (instead of currently 5%). As a final step we evaluate different alternative scenarios in how to manage the Targeted Subsidy Program. We show that removing the subsidy from the top deciles of the income distribution and allocating part of it to the bottom deciles would significantly reduce inequality and poverty. This is mainly due to the fact that this program is very successful in reaching to the low income group especially in the rural areas.

The rest of this paper is organized as follows: section II briefly reviews the fiscal system of Iran and lists the programs that are included in the analysis. It also explains the method and assumptions that are used in constructing items that are not directly observed in the household survey. Section III presents the CEQ framework and the marginal contribution approach in calculating the effect of different taxes and transfers in reducing (increasing) inequality and poverty. Section IV introduces the Iranian household survey and provides summary statistics about the size and distribution of Market Income, Contributory Pensions and different components of the fiscal system among socio-

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<sup>4</sup> Unless otherwise specified, we use \$4 per day in 2005 purchasing power parity (PPP) as the poverty line throughout this paper.

<sup>5</sup> We calculate the poverty indices using the international poverty lines that are calculated without accounting for the “consumption” of education and health so we avoid calculating the poverty indices for the Final Income and use the Consumable Income instead. See figure 1 for the construction of different income concepts.

economic groups in Iran. Section V provides the results of the inequality and poverty analysis of this paper. A special attention is given to the target Subsidy Program due to its significant role in reducing inequality and poverty. Finally, section VI concludes and provides policy recommendations for how to move forward in managing the Targeted Subsidy Program in Iran.

## II. Overview of the Iran's Fiscal System and What is Included in this Analysis

The fiscal system in Iran is composed of taxes, transfers, subsidies, and pensions. A brief description of each follows below. In each section, we indicate which components are included in the analysis and what assumptions are used in constructing the values for them if they are not directly observed in the household survey. One should note that the information in this section is in close relationship with Figure 1 and the methodology section.

To provide some context, note that Iran's GDP and government expenditure in 2011-12 (1390 Iranian year) was 6,245,766 billion Rials<sup>6</sup> and 631,222 billion Rials<sup>7</sup> respectively. Moreover, the average household Market Income in the survey is 111,217 Thousand Rials<sup>8</sup>.

### II.A. Tax System

The current tax system in Iran has two main categories: direct and indirect taxes. Direct taxes include two main sub-categories: property tax (inheritance tax and stamp duty) and Income tax (real estate income tax, tax on income from agriculture, tax on salary income, tax on individual business income, tax on the profits of legal persons (i.e. Corporate income tax), incidental income tax and tax on aggregate income derived from different sources). On the other hand, the Value added tax (VAT) is the main indirect tax in Iran (INTA, 2015).<sup>9</sup> The movement from sales tax to VAT is a recent policy reform in Iran and it was not implemented for the year of the survey (i.e. 2011-2012) that is used in this study. It is worth noting that the main entity in charge of taxation in Iran is the "Ministry of Finance and Economic Affairs".

In this paper, we mainly focus on estimating the incidence of taxes that can be directly observed in the household survey or inferred or simulated from the available data. Income tax of self-employed individuals are directly observed in the survey. Payroll taxes, however, are imputed using the reported gross and net income variables as well as the reported deductions for pensions and health insurance schemes. The incidence of sales taxes is simulated. We use the general rule of 3%

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<sup>6</sup> Based on the exchange rate of March 2012 (12,260 Rials per \$1), this is equivalent to \$509.44 billion. World Bank reports \$528.43 and \$502.73 billion for the GDP of Iran in 2011 and 2012 respectively (WDI, 2015).

<sup>7</sup> Based on the exchange rate of March 2012 (12,260 Rials per \$1), this is equivalent to \$51.48 billion.

<sup>8</sup> Based on the exchange rate of March 2012 (12,260 Rials per \$1), this is equivalent to \$9.07 thousands.

<sup>9</sup> A complete description of each item is available (in English) from "Iranian National Tax Administration (INTA)" website: <http://en.intamedia.ir/> under the heading "Taxes in Iran".

sales tax and combine it with the data on the household monthly consumption expenditure<sup>10</sup> to impute for the value of the sales taxes for the whole year. Corporate income taxes and stamp duties are excluded.

## II.B. Transfers and Subsidies

Iran has several transfer programs and subsidies. Here we classify them into three main categories: cash or near-cash transfers, price subsidies and in-kind transfers. The first category is the “cash transfer” programs. It includes the “Targeted Subsidy Program”<sup>11</sup>, cash transfer programs by BSOI<sup>12</sup> (which is an organization in charge of providing assistance to the families of those that are considered “martyr, prisoners of war or injured in defending the Islamic revolution in Iran”), Imam Khomeini Relief Foundation<sup>13</sup> (which mainly assists low income families), Islamic Revolution Mostazafan Foundation<sup>14</sup> (which mainly assists low income families) and State Welfare Organization of Iran<sup>15</sup> (which assists several groups including individuals who are disabled, addicted, orphans or elderly).

Cash transfers received through the Targeted Subsidy Program are observed directly in the survey. The survey shows that almost all of the households (about 96%) receive this subsidy. In the year of the survey, beneficiaries received 455,000 Rials per person per month (equivalent to \$37 to \$44 depending on the exchange rate from March 2012 or March 2011, respectively). The average transfer received by an Iranian household<sup>16</sup> through the Targeted Subsidy Program is about 14.7 million Rials (about 13% of average Market Income) in the survey. To implement this subsidy reform, a new organization, the “Targeting Subsidies Organization”, was established. The transfer is deposited in the bank account of the head of the household. ATM machines were installed in remote rural areas to facilitate access to this transfer.

All the other cash transfer programs mentioned above are reported in the survey as a total amount, without distinguishing among them. We call the combined transfers the “Social Assistance” program. The average transfer received by an Iranian household through the Social Assistance program is 0.9 million Rials (about 1% of the average Market Income). The third transfer programs included in the analysis are food or so-called near-cash transfers, that is the edible goods that a household received for free but not from other households. The expenditure data has a code to identify goods that are consumed “free but not from other households” and given the existence of the “self-consumption” code, we decide to consider these free edible goods as all provided by the

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<sup>10</sup> Iranian household survey has the income information of each household member for the year prior to the day of survey but only the expenditure information of the whole household for the month prior to that day.

<sup>11</sup> In Farsi: “Tarh-e Hadafmansazi-e Yarane-ha”.

<sup>12</sup> In Farsi: “Bonyad-e Shahid va Omoor-e Issargaran”.

<sup>13</sup> In Farsi: “Komite-ye Emdad-e Imam Khomeini”.

<sup>14</sup> In Farsi: “Bonyad-e Mostazafan-e Enghelab-e Eslami”.

<sup>15</sup> In Farsi: “Sazmane-e Behzisti-e Keshvar”.

<sup>16</sup> The total number of households in the extended survey is 21,159,033.



government. The average transfer received by an Iranian household as free food is about 0.06 million Rials (about 0.1% of the average Market Income).

Price subsidies include both consumer and producer subsidies and the main items and their budgetary values in the year of survey are presented in Table 1. One should note that the household survey does not have enough information to allow us to allocate these subsidies to households and therefore we do not include them in this paper. The only exception is part of the bread subsidy that is distributed to families as part of the Targeted Subsidy Program.

**Table 1. Price subsidies (Consumer and Producer) and their value in the budget for the year of survey (1390 Iranian calendar, equivalent to 2011-12)**

<b>Item</b>	<b>Value in the budget in billion Rials (Value in current 2011 US billion Dollars)</b>	<b>% GDP</b>
Bread subsidy	35,000 (3.38)	0.56%
The subsidy for production factors used in the agriculture sector	12,000 (1.16)	0.19%
The subsidy for essential consumption product	25,000 (2.41)	0.40%
To cover the loss due to the “guaranteed purchase” programs	1,000 (0.10)	0.02%
To cover the difference between the real price and the price set by the government for specific items and also to pay for the remained accounts from the previous years	4,000 (0.39)	0.06%
To pay for the obligations of specific governmental agencies with regard to the essential consumption items	4,800 (0.46)	0.08%
Subsidy for Medicine and Skim milk (aka Skimmed milk or Dried milk)	3,900 (0.38)	0.06%
To cover the difference between the guaranteed price of water and purified water purchased from the private sector and the market price	300 (0.03)	0.00%
To help patients with diseases such as cancer, MS, etc.	1,100 (0.11)	0.02%
The subsidy to pay for profit related to the guaranteed purchase of agriculture and essential consumption products	1,000 (0.10)	0.02%
Subsidy for milk and enriched bread in schools and food in specific schools	3,000 (0.29)	0.05%

Energy subsidy (the difference between the price of electricity and the fuel used in power plants to produce it)	40,660 (3.92)	0.65%
Subsidy for the city bus and subway tickets	4,000 (0.39)	0.06%
To help with the financial loss in public companies	1,308 (0.13)	0.02%
To help with the financial loss in water and sewage companies in rural areas	1,038 (0.1)	0.02%
<b>Total</b>	<b>138,106</b> <b>(13.33)</b>	<b>2.21%</b>

Source: Government budget of Iran for 1390 calendar year (equivalent to 2011-12) available at: <https://goo.gl/LpoGFb>

Note: The exchange rate used here is 10,364 Rials per \$1 which is the exchange rate of March 2011 (beginning of the 1390 Iranain year and the month that the budget became effective) according to the Central Bank of Iran: [http://www.cbi.ir/exrates/rates\\_en.aspx](http://www.cbi.ir/exrates/rates_en.aspx)

In-kind transfers are divided into education subsidies, health subsidies, and housing subsidies. Since we are not able to identify the beneficiary households of housing subsidies so they were not included in this analysis. However, the information related to the budgetary values of this subsidy group is reported in Table 2.

**Table 2. Housing subsidies and their value in the budget for the year of survey (1390 Iranian calendar, equivalent to 2011-12)**

<b>Item</b>	<b>Value in the budget in billion Rials (Value in current 2011 US billion Dollars)</b>	<b>% GDP</b>
Discount on the fees related to the house constructions, financial assistance to house construction and construction of “Mehr” public houses	2,430 (0.23)	0.04%
housing subsidy to teachers	365 (0.04)	0.01%
Providing the infrastructure for the “Mehr” public houses (Government share)	1,621 (0.16)	0.03%
Subsidy to assist with the interest on loans related to rural houses	324 (0.03)	0.01%
Assisting clergies with their housing	100 (0.01)	0.002%
Subsidy to assist with the interest on loans related to “Mehr” public houses	1,621 (0.16)	0.03%
<b>Total</b>	<b>6,461 (0.62)</b>	<b>0.10%</b>

Source: Government budget of Iran for 1390 calendar year (equivalent to 2011-12) available at: <https://goo.gl/LpoGFb>

Note: The exchange rate used here is 10,364 Rials per \$1 which is the exchange rate of March 2011 (beginning of the 1390 Iranain year and the month that the budget became effective) according to the Central Bank of Iran: [http://www.cbi.ir/exrates/rates\\_en.aspx](http://www.cbi.ir/exrates/rates_en.aspx)

The primary and secondary education in Iran is under the supervision of the Ministry of Education and it is composed of 12 grades: 5 for primary, 3 for middle school and 4 for high school and the compulsory education is until the end of middle school (i.e. 8<sup>th</sup> grade). The primary and secondary education is free for all 12 grades in public schools but people have the option to switch to the private schools. The tertiary education is supervised by the Ministry of Science, Research and Technology and the Ministry of Health and Medical Education, depending on the field of study. Tertiary education is not free but public universities offer it freely in exchange for an obligation that a student will work in the country for a period after the end of their education which could be as long as 3 times of their length of education. So for example a person who gets a 4 years B.S. degree, depending on which public university he has attended, can be required to work for 12 years in the country before his degree is released to him<sup>17</sup>. The Ministry of Science, Research and Technology

<sup>17</sup> The requirement only affects those who wish to leave the country and for the rest of population it is as it was not existed. The only exception is for those who receive their degree from the Ministry of Health and Medical Education as they are required to work in the public run hospitals/medical centers of the government’s choice for a period of time upon graduation.

normally doesn't require people to work in any specific place in the country but just to contribute to the pension system for a specific number of years. Ministry of Health and Medical Education on the other hand usually assigns people to cities that normally lack medical staff. Students, however, have the option to buy their degrees from the Ministry of Science, Research and Technology before their obligation ends and leave the country; this is a harder task for those who fall under the jurisdiction of the Ministry of Health and Medical Education. Beside the above mentioned education-for-work type of the universities, which is limited to the public universities and is the most favored option by Iranian students, both public and private universities admit students who are willing to pay for their education.

This analysis includes the education transfer using the imputation method and the per pupil budgetary expenditures on education. Table 3 presents the per pupil education transfer for students of different grades in the year of survey that is used in this study (based on Adlband, 2011; MNA, 2011). Since we are not able to identify the type of high school or university from the survey, we allocate the average value of per pupil expenditures for these two levels<sup>18</sup>.

**Table 3. Per pupil education transfer (in-kind) in the budget for the year of survey (1390 Iranian calendar, equivalent to 2011-12)**

<b>Item</b>	<b>Per pupil expenditure in the budget (Thousand Rials) (Value in current 2011 US Thousand Dollars)</b>	<b>% Average household Market Income</b>
Primary	4,462 (0.43)	4.01%
Secondary	-	-
Middle School	6,431 (0.62)	5.78%
High School	9,854 (0.95)	8.860%
Tertiary	94,800 (9.15)	85.24%

Source: Adlband (2011) and MNA (2011).

Note: The exchange rate used here is 10,364 Rials per \$1 which is the exchange rate of March 2011 (beginning of the 1390 Iranain year and the month that the budget became effective) according to the Central Bank of Iran: [http://www.cbi.ir/exrates/rates\\_en.aspx](http://www.cbi.ir/exrates/rates_en.aspx)

Finally, with regard to the health system, Iran combines medical provision and education through public and private medical schools. Each province of Iran has at least one public medical university which is both a place to train physicians and also in charge of the public health in that province. These universities, which are directly supervised by the Ministry of Health and Medical Education, control a health network that expands into the rural and urban areas of each province.

<sup>18</sup> The average does not include values for the PhD or Doctorate programs.

Every village or a group of them has a “health house” (with the ratio of 1 health house per 1,200 inhabitants) with a trained health worker known as “Behvarz”. The health houses are all connected to “rural health centers” (with the ratio of 1 rural health center to 7,000 inhabitants) that each has at least one physician. Similar structure exists in the urban areas, where “health posts” and “urban health centers” replace the corresponding entities in the rural areas respectively. All of the rural and urban health centers are supervised by the “district health centers” which are controlled by the public medical university which is in charge of a province. Public hospitals are also directly report to this university. Beside this public health system, private sector is active in the field with private physician offices and hospitals. Moreover, NGOs are also present and active in the health market of Iran (Asaei, 2015; Mehrdad, 2009).

Medical services are not free in Iran but receive a subsidy from the government. Government’s budget has a specific line for “medicine and skim milk” subsidy which amounted to 3,900 billion Rials in 1390 (2011-12) which is the year of survey used in this analysis. Health insurance is available to a large fraction of population but mostly include large copayments. According to the Statistical Center of Iran, total public expenditure on health in year 1390 (2011-12) was about 170,000 billion Rials (SCI, 2015). In that year the private expenditure was about 283,000 billion Rials of which the share of households was about 245,000 billion Rials. The rest is covered by the private insurances, employers, NGOs and also the additional (optional) coverage provided by the public insurance companies. Finally, the fund received from international sources amounted to 26,000 billion Rials in that year (SCI, 2015). For the purpose of this analysis, we allocate the per capita health subsidy of 2,250,720 Rials to every member of a household that has a medical expenditure in the survey<sup>19</sup>.

### III.C. Pension system

The first civil servant (contributory) pension system legislation in Iran dates back to 1922 (1301 Iranian calendar) (CSPO, 2015). Since then, it has experienced several major changes but it is still mainly a pay-as-you-go (PAYG) system and it is known as the Civil Servants Pension Organization (CSPO). Currently, there are several ways through which a civil servant can be retired among which are “Compulsory retirement (employees of 65 years of age regardless of the years of rendering service)”, “Retirement based on Mutual agreement (50 years of age and at least 25 years of rendering service for male and 20 years for female employees)”, “Forcible retirement (based on the issued verdicts of the board of investigation administrative violations but requires 25 years of rendering service for male and 20 years for female employees)”, “Voluntary retirement by authority of employee (if he is 60 years old) or authority of organization (if the employee has rendered 30 years of service)”, “Invalidity pension (occupation a non-occupation related invalidity or )” (CSPO, 2015). The main factors in calculating one’s pension are his/her years of service and his salary and benefits in the last two years of service (CSPO, 2015).

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<sup>19</sup> We observe the medical expenditure in the household level but allocate the health subsidy to all members of the family.

Military servants have their own pension and health insurance system. Prior to 2002 (1381 Iranian calendar) different branches of armed forces of Iran had their own pension system but they are all combined in one organization in 2002 (although still funds of each branch is kept separated from each other) known as the “Retirement Organization of Armed Forces” which is part of the “Social Security Organization of Armed Forces” which is the centralized entity in charge of Armed forces welfare. This system is also a PAYG one and it is mainly funded through fees paid by the servants and the government, a governmental budget and the financial investments of the Organization (IPRS, 2015).

Those who are employed by the private sector are mandated to be covered in the pension and health insurance system provided by the Social Security Organization (SSO). The first initiation for providing social security to the workers dates back to 1932 (1310 Iranian calendar) (SSO, 2015). This system is also a PAYG one and is considered an independent organization but under the supervision of the “Ministry of Cooperatives, Labour and Social Welfare”. SSO is financed through payments made by employees (7% of their base salary), employers (about 23% of the base salary of each employee) and government (3% of the base salary of each insured employee) as well as financial activities by the entities that are controlled by SSO (SSO, 2015). One should note that any employee who is covered by the SSO is considered an “insured” employee and the fees that are paid by him/her and his/her employer are also called “insurance fee” and this is mainly due to the fact that SSO provides both health insurance, retirement insurance (i.e. pension) as well as other types of insurance (e.g. invalidity and unemployment) (SSO, 2015).<sup>20</sup> Those who are self-employed have the option to self-insure themselves through SSO. The general rule for the calculation of pension in SSO is similar (although not identical) to CSPO. Male and female employees have to be at least 50 and 45, respectively, and must have at least 30 years of paid insurance fees to be eligible for retirement. Age requirement does not apply to those who have at least 35 years of paid insurance fees. Male and female individuals who are above 60 and 55 respectively who have at least 20 years of paid insurance fee are eligible to become retired. Under some special circumstances women can be eligible for retirement if they are at least 42 years old (SSO, 2015).

It is important to note that all incomes from pensions are exempt from taxes (CSPO, 2015). Moreover, pension deduction of all Civil and Military servants is 9% of their salary and the government pays 1.5 times of their fee as its contribution to the pension funds (HVM, 2015). For the purpose of this study, it should be noted that the household survey has information about the pension that is received by any member of a household as well as the deductions for the social security system and the related health insurance.

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<sup>20</sup> There are exceptions to which employers are mandated to pay their share or which employees are qualified for mandatory participation in SSO which interested readers are encouraged to review the complete law (available on SSO website)

### III. Methodology

This study uses the methodology that is developed by the Commitment to Equity (CEQ) institute<sup>21</sup> at Tulane University which is explained in great detail in Lustig (forthcoming) and an earlier version of it is presented in Lustig and Higgins (2013). The backbone of this methodology is a flowchart displayed in Figure 1. It shows how different taxes and transfers (income components) are combined to produce different main income concepts as well as extended income concepts.

In a nutshell, this taxonomy allows us to evaluate how different taxes and transfer programs contribute to the reduction of (or increase in) poverty or inequality in a country. Enami et al. (forthcoming) show that commonly used indicators such as progressivity are not able to provide information about how equalizing (or in the context of poverty, poverty alleviating) a tax or transfer is and may lead to misleading conclusions. For example, a regressive tax can be in fact equalizing when it is added to a progressive transfer. Enami et al. (forthcoming) argue that marginal contribution analysis is a safe way to evaluate the role of a tax or transfer in fighting inequality and poverty. Theoretically, marginal contribution analysis asks how the distribution of income would have been in the absence of a tax<sup>22</sup> (or transfer) and defines the difference between this counterfactual and the actual distribution of income as the marginal contribution of that tax (or transfer). This is shown in the equation below:

$$MC_{T(or B)}^{End\ income} = Index_{End\ income \setminus T(or B)} - Index_{End\ income} ;$$

where  $MC_{T(or B)}^{End\ income}$  is the marginal contribution of tax or transfer to the inequality or poverty index of an End Income concept.  $Index_{End\ income \setminus T(or B)}$  is the value of that index for the End Income of interest when T (or B) is not part of the fiscal system. Similarly,  $Index_{End\ income}$  is the value of that index when T (or B) is added to the system. For example, the change in Gini index when we add Direct Taxes to the “Consumable Income without Direct taxes” is considered the marginal contribution of Direct Taxes to the Gini of Consumable Income. In practice and in this paper we focus on the first order effects of removing a tax or transfer and therefore ignore the behavioral responses.

In order to determine how successful taxes and transfers are in achieving their potential in reducing inequality and poverty, here we use the CEQ measures of effectiveness (introduced first in Enami, forthcoming). For inequality reduction, we use two measures of effectiveness, Impact and Spending Effectiveness. The Impact Effectiveness indicator calculates how much a tax or transfer fulfills its potential in reducing inequality. In other words, it compares the marginal contribution of a tax or transfer to the case of an “optimal” tax or transfer of equal size in which we collect the same amount of tax or distribute the same amount of transfer in the most inequality-reducing way. Mathematically, the most inequality-reducing-optimal way of taxing is to levy tax only on the richest

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<sup>21</sup> Hereafter we refer to this methodology as the CEQ methodology

<sup>22</sup> Or alternatively replacing that tax with another tax that is neutral in reducing inequality (or poverty)

individual and bring her income down until it reaches the income of the second richest individual. Then to tax them equally until their income becomes equal to the income of the third richest person and so on. An optimal transfer would follow a similar procedure but starting with the poorest individual and moving up in the income distribution. This indicator is defined as follows:

$$\text{Inequality Impact Effectiveness}_{T \text{ (or B)}}^{\text{End income}} = \frac{MC_{T \text{ (or B)}}^{\text{End income}}}{MC_{T \text{ (or B)}}^{\text{End income}^*}} ;$$

where  $MC_{T \text{ (or B)}}^{\text{End income}^*}$  is the maximum possible  $MC_{T \text{ (or B)}}^{\text{End income}}$  if the same amount of Tax (or Benefit) is levied on (distributed among) individuals optimally. The End Income in our analysis is three income concepts, Disposable Income, Consumable Income and Final Income.

The Spending Effectiveness indicator examines the capability of taxes and transfers in reducing inequality from a different perspective. It determines how much smaller the total tax or transfer could be while producing the same level of reduction in inequality. This reduction in the size of a tax or transfer is obtained through the same optimal redistribution process described above. This indicator is defined as follows:

$$\text{Inequality Spending Effectiveness}_{T \text{ (or B)}}^{\text{End income}} = \frac{T^* \text{ (or B}^*)}{T \text{ (or B)}} ;$$

where  $T^* \text{ (or B}^*)$  is the minimum amount of  $T \text{ (or B)}$  that is needed to create the same  $MC_{T \text{ (or B)}}^{\text{End income}}$  if the tax or transfer were optimally redistributed. The Spending effectiveness is only calculated for the taxes and transfers with a positive  $MC_{T \text{ (or B)}}^{\text{End income}}$  because it is impossible to calculate the optimum size of tax or transfer.

By definition, the values of the Inequality Impact Effectiveness and Spending Effectiveness indicators must lie between -1 and 1, with the most effective intervention in reducing inequality relative to its potential being the closest to 1. Both indicators can be applied for any inequality measure.

For poverty reduction, effectiveness indicators are based on the new Fiscal Impoverishment (FI) and Fiscal Gains to the Poor (FGP) developed by Higgins and Lustig, (2016).<sup>23</sup> The FI indicator measures how much poor individuals become worse-off and non-poor became poor as a result of a tax. The FGP indicator measures how much poor individuals are made better-off as a result of a transfer. The increase (decrease) in poverty gap is used to calculate the FI (FGP) index. The FI-FGP indicators are defined as follows:

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<sup>23</sup> While we define these indicators here, they are discussed with more details in a chapter of the CEQ Handbook (Lustig (forthcoming)).



$$FI\_FGP_T = \frac{T - FI\_MC_T^{End\ income}}{T};$$

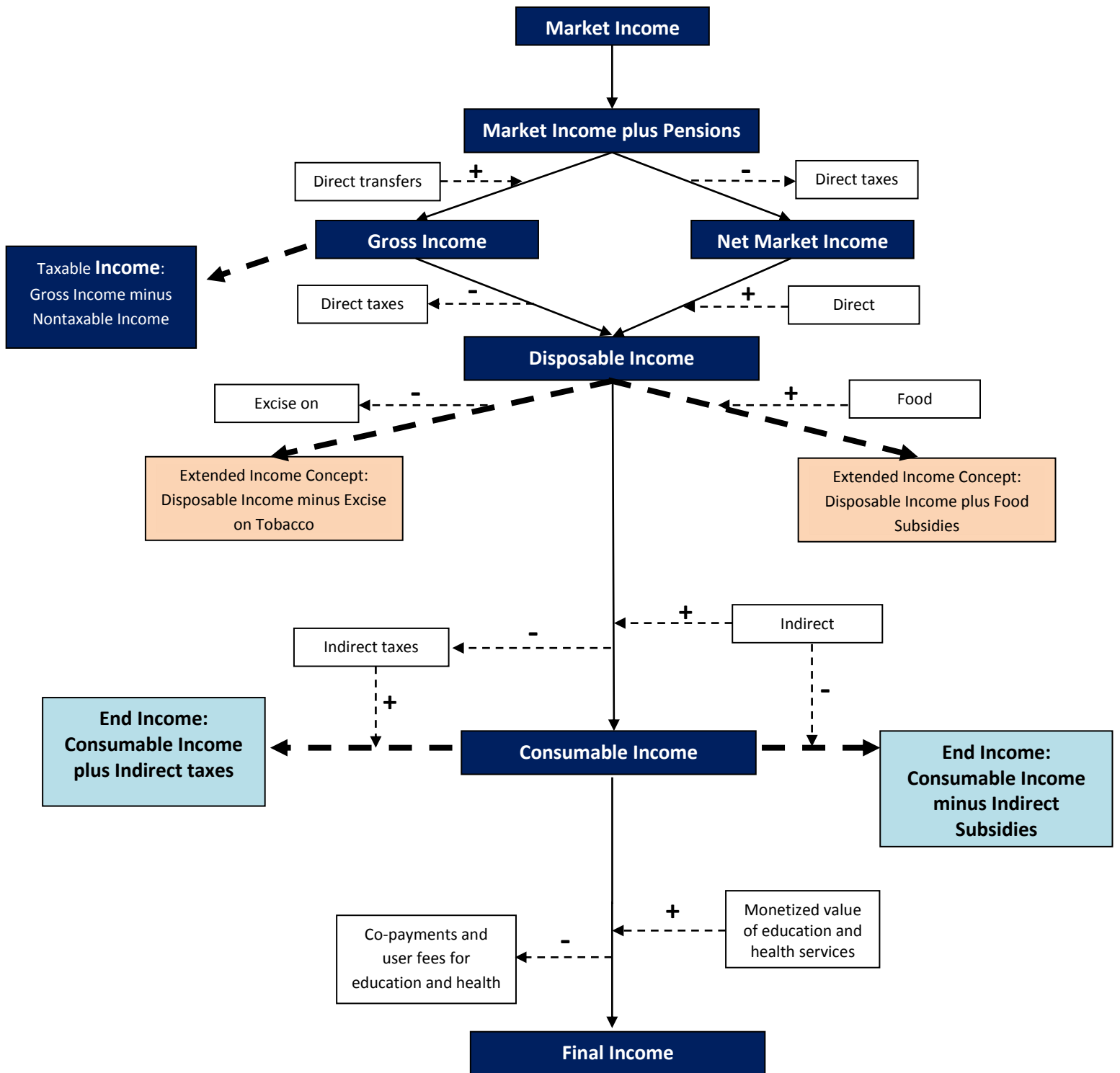
$$FI\_FGP_B = \frac{FGP\_MC_B^{End\ income}}{B};$$

$$FI\_FGP_{Total\ system} = \left[ \left( \frac{B}{T+B} \right) \left( \frac{FGP\_MC_B^{End\ income}}{B} \right) \right] + \left[ \left( \frac{T}{T+B} \right) \left( \frac{T - FI\_MC_T^{End\ income}}{T} \right) \right]$$

where  $FI\_MC_T^{End\ income}$  is the marginal contribution of tax T to the FI index of the End Income of interest and  $FGP\_MC_B^{End\ income}$  is the marginal contribution of transfer B to the FGP index of the End Income of interest. In this paper we use Disposable Income and Consumable Income as the End Income for this indicator and the poverty line is set at 2005 \$4PPP. Note that even though FI-FGT indicator for taxes and transfer is between zero and one, they should not be compared to each other. Since they are subtracted from income, taxes at best leave poverty unchanged or only increase poverty so the effectiveness of taxes is calculated with respect to how much they do not increase poverty while raising revenue. Transfers, on the other hand, can only reduce poverty so their effectiveness is calculated with respect to their performance in reducing poverty. The total fiscal system, which is the combination of all taxes and transfers, can both increase or decrease poverty and, therefore, should be only compared to the alternative fiscal systems.

The Poverty Effectiveness indicators, by definition, can take values between zero and 1. The higher the value of the indicator, the more effective is a tax or a transfer at reducing poverty relative to its potential.

Figure 1: Income concepts diagram according to the CEQ methodology.



Source: Lustig (forthcoming).

Note: Core Income Concepts in dark blue background, Fiscal Interventions in white background, Examples of Extended Income Concepts in light orange background, Examples of End Income Concepts in light blue background.

## IV. Data

The main data base for this study is the Iranian Household Expenditure and Income Survey (HEIS) for the calendar year 1390 (2011-12)<sup>24</sup>. The Statistical Center of Iran conducts this survey every year and its sample represents all rural and urban areas of Iran. In the year of survey that is used in this analysis there are 18,727 urban and 19,786 rural households in the sample. These households represent about 56.4 million urban and 23.1 million rural individuals. For each one of the households in the sample, we follow Figure 1 and construct different main income concepts as well as income components (i.e. taxes and transfers) as it is described in Table 4.

Table 5 shows the distribution of individuals and household based on their income group as well as the average size of household in each income group. About 20% of the population live in poverty and about 39% are economically vulnerable. Together, about 59% of the Iranians are considered low income. The middle class is also large and includes about 40% of the population. The remained 1% belong to the high income group.

**Table 4. Description of Market Income and other income components**

<b>Main Category</b>	<b>Sub Categories (if any)</b>	<b>Description</b>
<b>Market Income</b>	-	All monetary and non monetary income received as an employee or self-employed individual excluding any subsidy or social assistance and including imputed rent for home owners. All components are directly observed in the survey.
<b>Contributory Pensions</b>	-	All pensions received through the retirement programs. The relevant information is observed directly in the survey.
<b>Direct Taxes and Contributions</b>	Income Tax	Income tax for self-employed individuals (observed directly in the survey) and payroll tax for employees (imputed using the data about gross and net income as well as contributions to pensions).
	Employee contributions to the health insurance	The deductions from employees' paychecks that is paid toward the health insurance. The relevant information is observed directly in the survey.
	Employer contributions to the health insurance	The employers' payment toward the health insurance of employees. Since this is a mandatory payment and we assume it results in lower payments to employees, we

<sup>24</sup> Most of the survey data is available at <http://goo.gl/pcG70N>. Please note that the online data base does not include the survey weight variables. These variables are, however, available for researchers who visit the Statistical Center of Iran in person.

		include it as a type of deduction. The relevant information is observed directly in the survey.
	Employee contributions to the Social Security Insurance	The deductions from employees' paychecks that is paid for the social security insurance (i.e. pension) of an employee. The relevant information is observed directly in the survey.
	Employer contributions to the Social Security Insurance	The employers' payment toward the social security insurance (i.e. pension) of employees. Since this is a mandatory payment and we assume it results in lower payments to employees, we include it as a type of deduction. The relevant information is observed directly in the survey.
<b>Direct Transfers</b>	Targeted Subsidy Program	The direct cash transfer program that is established by the government following the energy subsidy reform in Iran. The relevant information is observed directly in the survey.
	Social Assistance	Includes all cash transfers to low income individuals through public organizations. The relevant information is observed directly in the survey.
	Semi-cash Transfers (Food)	Include the monetary value of all edible items that a household receives for free. The values are imputed assuming all edible goods that are obtained "free but not from other households" are provided by the different public agencies.
<b>Indirect Taxes</b>	-	Sales taxes. Imputed using the 3% rule of thumb and the information available in the survey about the consumption expenditure of each household)
<b>In-kind Transfers</b>	Education	Includes a nominal subsidy for each student in a household depending on the grade minus any user fees (the latter is observed directly in the survey)
	Health	Includes a nominal subsidy for each individual in a household with health costs minus these costs (the latter is observed directly in the survey)

Source: Own elaboration.

**Table 5. Distribution of individuals and households according to the socio-economic group**

In Daily US 2005 PPP	Socio-Economic Group	Number of individuals (% share)	Number of households (% share)	Average size of household
0 to 1.25	Ultra Poor	2,854,655 (3.59%)	723,401 (3.42%)	3.9
1.25 to 2.5	Extreme Poor	5,183,157 (6.52%)	1,283,224 (6.06%)	4.0
2.5 to 4	Moderate Poor	8,237,206 (10.36%)	1,866,324 (8.82%)	4.4
4 to 10	Vulnerable	30,738,625 (38.66%)	7,408,106 (35.01%)	4.1
10 to 50	Middle Class	31,727,688 (39.90%)	9,500,720 (44.90%)	3.3
50 or more	Wealthy	770,363 (0.97%)	377,258 (1.78%)	2.0
<b>Total</b>		<b>79,511,694</b>	<b>21,159,033</b>	<b>3.8</b>

Source: Own calculations using the Iranian household survey of year 1390 (2011-12).

Note1: The total population exceeds the actual population for this year due to the application of survey weights.

Note2: Socio-Economic group is determined according to the “Market Income plus contributory Pensions”

Note3: PPP stands for Purchasing Power Parity. In calculating PPP values, we use the 2005 round of ICP (International Comparison Program) as reported in the World Development Indicators (WDI) published by the World Bank. To change monetary values from the year of survey to 2005, we use the CPI index from the WDI.

Table 6 shows the average annual Market Income, Contributory Pensions and different taxes and subsidies at household level in each income group. The average market income of an ultra poor household is about 6% of a middle class household and 2% of a rich household. But the retirement pensions received on average by an ultra poor household is less than 0.06% of a middle class family and about 0.03% of a wealthy household. Therefore, while the divide in the market income of the low and high income groups is large as expected, the divide in average pension received by these groups is considerably larger. Given that the pensions are generally of a moderate size in Iran, this can be only derived by the fact that not that many low income households in Iran are benefiting from pension system. Direct taxes mainly target middle class (as the percentage of their Market Income) and Wealthy households only pay about 0.8 percentage point more taxes than the Vulnerable households. In the absolute value, of course, the Wealthy households pay the bigger share of the total Direct Taxes collected in Iran. Direct transfers benefits all income groups very similarly in the absolute term which means lower income groups are benefiting much more relative to their Market Income.

Nevertheless, allocating transfers to the high income groups, who do not need such programs, is a negative property for a fiscal system from the equality and anti-poverty stand points. This issue also applies to the In-kind transfers that are hardly pro-poor. Indirect taxes in Iran, as it is presented in Table 6, is anti-poor since poor households pay higher share of their Market Income in the form of Indirect Taxes (ranging from about 6% to 20%) comparing to Non-poor households (ranging from about 3% to 4%). In the next section we take a more in depth look at the general groups of fiscal incidences as well as their sub-items to determine how they contribute, positively or negatively, to the reduction of inequality and poverty in Iran.

**Table 6. Average per household market income and incidence of taxes and transfers by income category**

**Panel A: Poor households**

Values are per annum per household and in Rials	Socio-Economic Group (In Daily US 2005 PPP) [% of the average market income in each group]		
	Ultra Poor (0 to 1.25)	Extreme Poor (1.25 to 2.5)	Moderate Poor (2.5 to 4)
Market income	7,580,660	19,197,462	35,033,146
Contributory Pensions	15,346 [0.20%]	42,552 [0.22%]	533,412 [1.52%]
Direct Taxes and Contributions	84,460 [1.11%]	159,351 [0.83%]	691,923 [1.98%]
Direct Transfers	18,570,980 [244.98%]	18,658,331 [97.19%]	18,670,515 [53.29%]
Indirect Taxes	1,497,458 [19.75%]	1,677,521 [8.74%]	2,166,210 [6.18%]
In-kind Transfers (Not including user fees)	15,470,359 [204.08%]	13,968,198 [72.76%]	16,943,252 [48.36%]

**Panel B: Non-poor households**

Values are per annum per household and in Rials	Socio-Economic Group (In Daily US 2005 PPP) [% of the average market income in each group]		
	Vulnerable (4 to 10)	Middle Class (10 to 50)	Wealthy (50 and more)
Market income	64,261,691	121,189,851	325,669,874
Contributory Pensions	5,883,345 [9.16%]	25,928,555 [21.39%]	57,162,297 [17.55%]
Direct Taxes and Contributions	3,894,608 [6.06%]	11,946,875 [9.86%]	22,356,889 [6.86%]
Direct Transfers	22,779,987 [35.45%]	39,790,516 [32.83%]	64,769,668 [19.89%]
Indirect Taxes	2,830,037 [4.40%]	4,549,796 [3.75%]	8,622,093 [2.65%]
In-kind Transfers (Not including user fees)	17,326,270 [26.96%]	16,338,552 [13.48%]	7,394,337 [2.27%]

Source: Own calculations using the Iranian household survey of year 1390 (2011-12).

Note1: Socio-Economic group is determined according to the “Market Income plus contributory Pensions”

Note2: PPP stands for Purchasing Power Parity. In calculating PPP values, we use the 2005 round of ICP (International Comparison Program) as reported in the World Development Indicators (WDI) published by the World Bank. To change monetary values from the year of survey to 2005, we use the CPI index from the WDI.

## V. Results

In this section we first review the change in inequality and poverty between different income concepts from “Market Income” to “Final Income”. Then we analyze each component of the fiscal system and evaluate its marginal contribution to reducing inequality and poverty. Finally, we focus on the “Targeted Subsidy Program” and evaluate how much it would contribute to the change in poverty and inequality (in the marginal contribution sense) under different policy scenarios.

### V.A. Inequality and Poverty from Market Income to Final Income

Table 7 shows the change in different inequality indices from “Market Income” to “Final Income”. The total change in Gini from Market to Final income is about 0.0919 Gini point which is equivalent to about 21% reduction in Gini index of the Market income. The most reduction in Gini is when the direct transfers are added to the system. In other words, the biggest reduction in Gini happens when one compares the Gini of Market Income Plus Contributory Pensions to Gross Income and also Net market Income to Disposable Income. The second and much less noticeable drop is when In-kind Transfers net of user fees are added to the system (i.e. comparing Consumable Income to Final Income). However, given the amount of imputation and the type of assumptions in calculating In-kind Transfers (as it is explained in the previous sections), one should use results related to the In-kind Transfers with caution. Other inequality indices in Table 7 are also pointing to the same story which is the considerable role of direct transfers in reducing inequality.



**Table 7. Inequality indices for the main income concepts**

Index	Market Income (MI)	MI plus Contributory Pensions	Net MI	Gross MI	Taxable Income	Disposable Income	Consumable Income	Final Income
<b>Gain</b>	0.4390	0.4312	0.4286	0.3757	0.4305	0.3721	0.3746	0.3471
<b>Absolute Gini</b>	10191687	11706157	11288917	11762695	11119090	11349098	11073678	11083072
<b>S-Gini v=1.25</b>	0.1945	0.1919	0.1901	0.1628	0.1921	0.1607	0.1622	0.1508
<b>S-Gini v=1.5</b>	0.3126	0.3104	0.3075	0.2631	0.3100	0.2596	0.2619	0.2445
<b>S-Gini v=2.5</b>	0.5388	0.5398	0.5350	0.4565	0.5367	0.4507	0.4547	0.4298
<b>S-Gini v=3</b>	0.5962	0.5980	0.5929	0.5056	0.5943	0.4993	0.5038	0.4784
<b>Theil</b>	0.3491	0.3328	0.3298	0.2536	0.3346	0.2498	0.2531	0.2150
<b>90/10</b>	8.9033	8.8939	8.6877	5.7517	8.5613	5.5551	5.6521	4.8569

Source: Own calculations using the Iranian household survey of year 1390 (2011-12).

Similarly, Table 8 shows how different poverty indices are compared across income concepts. The whole fiscal system reduces the headcount of the poor population (i.e. those with a daily income less than \$4 PPP) from about 26% in Market Income to 10% in Consumable Income<sup>25</sup>. The major reduction again happens with the addition of direct transfers that cuts the poverty by about two third. The reduction in poverty headcount is even higher for the other two poverty lines. In-kind Transfers are again the second best fiscal intervention in reducing poverty. The increase in poverty due to the indirect taxes (i.e. Sales Taxes) is relatively low and of the second order importance.

<sup>25</sup> The poverty indices are not calculated for the Final Income since these international poverty lines are calculated without accounting for the “consumption” of education and health.

**Table 8. Poverty indices for the main income concepts**

Index (Poverty line in daily US 2005 PPP)		Market Income (MI)	MI plus Contributory Pensions	Net MI	Gross MI	Taxable Income	Disposable Income	Consumable Income
1.25	Headcount	0.0463	0.0359	0.036 3	0.0025	0.0368	0.0025	0.0032
	Poverty Gap	0.0175	0.0134	0.013 6	0.0009	0.0139	0.0009	0.0013
	Squared Poverty Gap	0.0096	0.0072	0.007 4	0.0005	0.0075	0.0005	0.0009
2.5	Headcount	0.1331	0.1011	0.102 4	0.0201	0.1056	0.0205	0.0251
	Poverty Gap	0.0517	0.0394	0.039 8	0.0048	0.0411	0.0048	0.0062
	Squared Poverty Gap	0.0291	0.0222	0.022 5	0.0020	0.0231	0.0020	0.0028
4	Headcount	0.2614	0.2047	0.208 8	0.0903	0.2149	0.0912	0.1031
	Poverty Gap	0.1059	0.0813	0.082 5	0.0221	0.0852	0.0224	0.0263
	Squared Poverty Gap	0.0601	0.0460	0.046 5	0.0086	0.0480	0.0087	0.0106

Source: Own calculations using the Iranian household survey of year 1390 (2011-12).

Note: PPP stands for Purchasing Power Parity. In calculating PPP values, we use the 2005 round of ICP (International Comparison Program) as reported in the World Development Indicators (WDI) published by the World Bank. To change monetary values from the year of survey to 2005, we use the CPI index from the WDI.

## V.B. Contribution of Fiscal Incidences to Inequality and Poverty

The results in the previous section shows that direct transfers are the main components of Iran's fiscal system that contribute to reducing inequality and poverty. To further analyze this result, we turn our attention to sub-components of the fiscal system. Table 9 shows the progressivity of each income component as well as their marginal contribution to reducing (or increasing) inequality in three of the main income concepts (i.e. Disposable, Consumable, and Final incomes). The marginal contributions should interpret as how much the Gini of an income concept would have been higher (or lower), if a specific income component (i.e. a tax or transfer) is removed from the fiscal system. The positive values mean that the Gini would have been higher and therefore removing that component increases the inequality. In other words, positive values for the marginal contribution mean that an income component has a positive effect in increasing equality (reducing

inequality). Among all income components, only indirect taxes (i.e. Sales Taxes) have a negative effect on equality. As expected, direct transfers have the highest marginal contribution to reducing inequality in all three income concepts. The whole contribution, however, is derived by the Targeted Subsidy Program. In fact, in the absence of this program, the Social Assistance would play a role similar to the other components of the fiscal system in reducing inequality.

Table 9 also reveals two examples of a phenomenon known as the Lambert Conundrum (Enami et al., forthcoming). The commonly used rule of thumb regarding the effect of a tax or transfer in reducing inequality expresses that a progressive tax or transfer (as measured by the Kakwani index) reduces inequality and a regressive one increases it. Lambert Conundrum shows that the rule is not always correct as adding a regressive tax to a progressive transfer can result in higher equality. In the case of Iran, Semi-Cash Transfer (Food) and Health User-fees are progressive (have a positive Kakwani index) yet their marginal contributions to the inequality of Final Income (and other Income concepts for the Semi-Cash Transfer) are negative. In other words, removing these Progressive interventions would result in lower (instead of higher) inequality in the whole income distribution.

**Table 9. Marginal contribution of taxes and transfers to inequality**

Fiscal Incident		Progressivity (Kakwani Index)	Marginal contribution to the Gini index of:		
			Disposable Income (0.3721)	Consumable Income (0.3746)	Final Income (0.3471)
<b>Direct Taxes and Contributions</b>	Income Tax	0.2414	0.0019	0.0019	0.0020
	Employee contributions to the health insurance	0.0222	0.0005	0.0005	0.0006
	Employer contributions to the health insurance	0.0922	0.0013	0.0013	0.0013
	Employee contributions to the Social Security	0.0283	0.0012	0.0011	0.0013
	Employer contributions to the Social Security	0.1284	0.0039	0.0039	0.0040
	<b>Total Direct Taxes and Contributions</b>	<b>0.1141</b>	<b>0.0092</b>	<b>0.0093</b>	<b>0.0097</b>
	<b>Direct Transfers</b>	Targeted Subsidy Program	0.4186	0.0511	0.0534
Social Assistance		0.8308	0.0043	0.0045	0.0040
Semi-cash Transfers (Food)		0.3170	-0.0000	-0.0000	-0.0000
<b>Total Direct Transfers</b>		<b>0.4412</b>	<b>0.0565</b>	<b>0.0591</b>	<b>0.0502</b>
<b>Indirect Taxes (Sales Taxes)</b>		<b>-0.1364</b>	<b>-</b>	<b>-0.0025</b>	<b>-0.0024</b>
<b>In-kind Transfers</b>	Education Transfers	0.3481	-	-	0.0219
	Education User-fees	0.0709	-	-	0.0017
	Health Transfers	0.4201	-	-	0.0173
	Health User-fees	0.1583	-	-	-0.0074
	<b>Total In-kind Transfers</b>	<b>0.5914</b>	<b>-</b>	<b>-</b>	<b>0.0283</b>

Source: Own calculations using the Iranian household survey of year 1390 (2011-12).

Note: The original income used to calculate the Kakwani index is the “Market Income plus contributory Pensions”.

Table 10 performs the same marginal contribution analysis for the poverty headcount ratio. Positive values in this table have a positive connotation similar to the previous table. In other words, a transfer with a positive value for marginal contribution would reduce poverty and if it is removed

from the fiscal system would result in an increase in the poverty headcount ratio equal to the size of the marginal contribution. As expected, taxes always can do harm, i.e. to increase poverty but they are not a concern in the case of Iran unless in the case of the Sales Taxes. With respect to the Consumable Income, Direct Taxes increase poverty headcount ratio by about 0.2 percentage points and Sales Taxes increase it by about 1.2 percentage points. Direct transfers, on the other hand, reduce this poverty index by about 12.2 percentage points and most of this reduction is due to the Targeted Subsidy Program which reduces the poverty by about 11.4 percentage points. To put this value in the context note that the poverty head count ratio of the Consumable Income is about 7.2% so without the Targeted Subsidy Program, the value of this indicator would be about 18.6%.

**Table 10. Marginal contribution of taxes and transfers to poverty**

Fiscal Incident		Marginal contribution to the \$4 PPP Poverty headcount index of:	
		Disposable Income (0.0912)	Consumable Income (0.1031)
<b>Direct Taxes and Contributions</b>	Income Tax	-0.0001	-0.0002
	Employee contributions to the health insurance	-0.0007	-0.0012
	Employer contributions to the health insurance	-0.0002	-0.0004
	Employee contributions to the Social Security	-0.0007	-0.0013
	Employer contributions to the Social Security	-0.0002	-0.0005
	<b>Total Direct Taxes and Contributions</b>	<b>-0.0015</b>	<b>-0.0024</b>
<b>Direct Transfers</b>	Targeted Subsidy Program	0.1092	0.1137
	Social Assistance	0.0102	0.0109
	Semi-cash Transfers (Food)	0.0001	0.0002
	<b>Total Direct Transfers</b>	<b>0.1176</b>	<b>0.1222</b>
<b>Indirect Taxes (Sales Taxes)</b>		-	<b>-0.0119</b>

Source: Own calculations using the Iranian household survey of year 1390 (2011-12).

Note: PPP stands for Purchasing Power Parity. In calculating PPP values, we use the 2005 round of ICP (International Comparison Program) as reported in the World Development Indicators (WDI) published by the World Bank. To change monetary values from the year of survey to 2005, we use the CPI index from the WDI.

## V.C. Alternative Scenarios for the Implementation of “Targeted Subsidy Program”

Since Targeted Subsidy Program is the main component of the fiscal system in reducing inequality and poverty, it is important to further analyze it. This subsidy program (in the year of survey used in this paper) offers a similar cash transfer to every Iranian regardless of their income (Baseline scenario). In this section we analyze three alternative scenarios to see how much the marginal contribution of this program to reducing inequality and poverty would change in each scenario. The first scenario is the one that is very recently considered by the Iranian government which is to remove the subsidy from the top deciles. Here we simulate the results by removing the transfer from the top 20%. In the second scenario we continue to remove the subsidy of the top 20% but we also increase the transfers of the bottom 80% by 10%. Finally, in the third scenario we eliminate transfers to the top 20% but increase those of the bottom 30% by 20%. Before we compare these scenarios with respect to their power to reduce inequality and poverty, it is worth comparing them with respect to the size of budget necessary for them. Based on the survey data, the Baseline scenario distributes 311,108 billion Rials (4.98% of GDP) while Scenario one through three distribute 262,512 billion Rials (4.20% of GDP), 288,763 billion Rials (4.62% of GDP), and 283,016 billion Rials (4.53% of GDP) respectively.

Table 11 shows how the marginal contribution of Targeted Subsidy Program to reducing inequality changes in different scenarios. As expected, the inequality decreases in all scenarios as the subsidy of top income group is removed and the subsidy of low income group is increased. Focusing on the Final Income the marginal contribution of this subsidy program to reducing inequality is about 0.0544, 0.0590, and 0.0619 Gini points under scenarios one through three respectively. To put in the context, note that the marginal contribution of Targeted Subsidy Program to the Gini of the Final Income in the Baseline case is about 0.0452. So from the inequality perspective, there is not that much a difference between these scenarios. The three alternative scenarios and the

**Table 11. Alternative policies for how to manage Targeted Subsidy Program and their effect on inequality**

Policy	Marginal contribution to the Gini index of:		
	Disposable Income (DI)	Consumable Income (CI)	Final Income (FI)
Baseline (All income deciles receive the subsidy)	0.0511 (Gini of DI: 0.3721)	0.0534 (Gini of CI: 0.3746)	0.0452 (Gini of FI: 0.3471)
S1: No subsidy for top 20%	0.0607 (Gini of DI: 0.3624)	0.0633 (Gini of CI: 0.3647)	0.0544 (Gini of FI: 0.3379)
S2: No subsidy for top 20% and an extra 10% for bottom 80%	0.0659 (Gini of DI: 0.3573)	0.0686 (Gini of CI: 0.3593)	0.0590 (Gini of FI: 0.3333)
S3: No subsidy for top 20% and an extra 20% for bottom 30%	0.0690 (Gini of DI: 0.3541)	0.0719 (Gini of CI: 0.3561)	0.0619 (Gini of FI: 0.3304)

Source: Own calculations using the Iranian household survey of year 1390 (2011-12).

Table 12 performs a similar analysis for the change in poverty under each scenario using the poverty headcount ratio. The Baseline and the first scenario are not different given that the top 20% would not become poor if they lose this subsidy. With respect to the Consumable Income, scenarios two and three both improve the marginal contribution of this subsidy program from 11.37 percentage points in the baseline to 12.38 percentage points in scenario two and 13.24 percentage points in scenario three.

**Table 12. Alternative policies for how to manage Targeted Subsidy Program and their effect on poverty**

Policy	Marginal contribution to the \$4 PPP Poverty headcount index (PHI) of:	
	Disposable Income (DI)	Consumable Income (CI)
Baseline (All income deciles receive the subsidy)	0.1092 (PHI of DI: 0.0912)	0.1137 (PHI of CI: 0.1031)
S1: No subsidy for top 20%	0.1092 (PHI of DI: 0.0912)	0.1137 (PHI of CI: 0.1031)
S2: No subsidy for top 20% and an extra 10% for bottom 80%	0.1180 (PHI of DI: 0.0824)	0.1238 (PHI of CI: 0.0931)
S3: No subsidy for top 20% and an extra 20% for bottom 30%	0.1267 (PHI of DI: 0.0737)	0.1324 (PHI of CI: 0.0845)

Source: Own calculations using the Iranian household survey of year 1390 (2011-12).

Note: PPP stands for Purchasing Power Parity. In calculating PPP values, we use the 2005 round of ICP (International Comparison Program) as reported in the World Development Indicators (WDI) published by the World Bank. To change monetary values from the year of survey to 2005, we use the CPI index from the WDI.

The poverty reducing effect of additional subsidy to the low income deciles is moderate but important. Therefore, as a final step, we analyze the effect of different policy scenarios on the poverty headcount index of the urban versus rural areas. Panel A and B of Table 13 present these results. It is clear from these two panels that the Targeted Subsidy Program substantially benefits the rural areas. In the Baseline case (as well as scenario one), the Targeted Subsidy Program reduces the poverty headcount ratio in the rural areas by about 21 percentage points (for the Consumable Income) as opposed to only 7 percentage points in the urban areas. By removing the subsidy from the top deciles and allocating it to the bottom deciles (in scenarios two and three), the marginal contribution of this program to reducing poverty in rural areas increases more. In the rural areas, the marginal contribution of the Targeted Subsidy Program to headcount poverty index increases from about 21.4 percentage points in the Baseline case to about 23.4 and 25.4 percentage points in scenarios two and three respectively. In the Urban areas, the marginal contribution increases from 7.3 percentage points to only 7.9 and 8.2 in these two scenarios.



**Table 13. Alternative policies for how to manage Targeted Subsidy Program and their effect on poverty in urban vs. rural areas**

**Panel A. Urban areas**

Policy	Marginal contribution to the \$4 PPP Poverty headcount index (PHI) of:	
	Disposable Income (DI)	Consumable Income (CI)
Baseline (All income deciles receive the subsidy)	0.0684 (PHI of DI: 0.0452)	0.0729 (PHI of CI: 0.0529)
S1: No subsidy for top 20%	0.0684 (PHI of DI: 0.0452)	0.0729 (PHI of CI: 0.0529)
S2: No subsidy for top 20% and an extra 10% for bottom 80%	0.0724 (PHI of DI: 0.0412)	0.0786 (PHI of CI: 0.0472)
S3: No subsidy for top 20% and an extra 20% for bottom 30%	0.0768 (PHI of DI: 0.0369)	0.0824 (PHI of CI: 0.0434)

**Panel B. Rural areas**

Policy	Marginal contribution to the \$4 PPP Poverty headcount index (PHI) of:	
	Disposable Income (DI)	Consumable Income (CI)
Baseline (All income deciles receive the subsidy)	0.2087 (PHI of DI: 0.2033)	0.2135 (PHI of CI: 0.2255)
S1: No subsidy for top 20%	0.2087 (PHI of DI: 0.2033)	0.2135 (PHI of CI: 0.2255)
S2: No subsidy for top 20% and an extra 10% for bottom 80%	0.2291 (PHI of DI: 0.1828)	0.2341 (PHI of CI: 0.2049)
S3: No subsidy for top 20% and an extra 20% for bottom 30%	0.2485 (PHI of DI: 0.1635)	0.2544 (PHI of CI: 0.1847)

Source: Own calculations using the Iranian household survey of year 1390 (2011-12).

Note: PPP stands for Purchasing Power Parity. In calculating PPP values, we use the 2005 round of ICP (International Comparison Program) as reported in the World Development Indicators (WDI) published by the World Bank. To change monetary values from the year of survey to 2005, we use the CPI index from the WDI.

## V.D. Effectiveness of Taxes and Transfers in Reducing Inequality and Poverty

In this section we focus on the CEQ measures of effectiveness. As it was mentioned before, these indicators show how effective taxes and transfers are in reducing poverty and inequality comparing to their full potential. Table 14 through 16 presents the results for the Impact Effectiveness, Spending Effectiveness and Fi-FGP Effectiveness indices respectively.

Focusing on Table 14 and with respect to the Final Income, Income Tax has the highest Impact Effectiveness among direct taxes by fulfilling about 40% of its potential in reducing inequality. The highest effectiveness, however, belongs to the Social Assistance (a direct transfer) which fulfills about 45% of its potential. The lowest Impact Effectiveness among interventions with a positive marginal contribution is Employee Contributions to the Health Insurance with about 12% effectiveness. Health User fees are the worst with regard to having an increasing effect on inequality yet a relatively more potential to reducing it.

**Table 14. Impact Effectiveness indicators for taxes and transfers in Iran**

Fiscal Incident		Impact Effectiveness with respect to:		
		Disposable	Consumable	Final Income
<b>Direct Taxes and Contributions</b>	Income Tax	0.3287	0.3547	0.4048
	Employee contributions to the health insurance	0.0838	0.0789	0.1246
	Employer contributions to the health insurance	0.2214	0.2267	0.2383
	Employee contributions to the Social Security	0.1479	0.1195	0.1718
	Employer contributions to the Social Security	0.3178	0.3354	0.3056
<b>Total Direct Taxes and Contributions</b>		<b>0.2564</b>	<b>0.2540</b>	<b>0.2871</b>
<b>Direct Transfers</b>	Targeted Subsidy Program	0.3880	0.3936	0.3839
	Social Assistance	0.4250	0.4369	0.4490
	Semi-cash Transfers (Food)	-0.0214	-0.0245	-0.0319
	<b>Total Direct Transfers</b>	<b>0.4194</b>	<b>0.4239</b>	<b>0.4110</b>
<b>Indirect Taxes (Sales Taxes)</b>		-	<b>-0.1395</b>	<b>-0.1303</b>
<b>In-kind Transfers</b>	Education Transfers	-	-	0.2327
	Education User-fees	-	-	0.1630
	Health Transfers	-	-	0.3287
	Health User-fees	-	-	-0.2490

Source: Own calculations using the Iranian household survey of year 1390 (2011-12).

With regard to the Spending Effectiveness (Table 15) and focusing on the Final Income column, Social Assistance (with about 41%) and Income Tax (with about 39%) are the two top effective interventions. The worst place belongs to the Employee Contributions to the Health Insurance with almost zero effectiveness. That means with a very small fraction of this contribution, one can achieve the same level of reduction in inequality as it is currently produced by this

contribution. This is an expected outcome given the small size of the Marginal Contribution of this intervention (see Table 9).

**Table 15. Spending Effectiveness indicators for taxes and transfers in Iran**

Fiscal Incident		Spending Effectiveness with respect to:		
		Disposable	Consumable	Final Income
<b>Direct Taxes and Contributions</b>	Income Tax	0.3693	0.3709	0.3918
	Employee contributions to the health insurance	≅0	≅0	≅0
	Employer contributions to the health insurance	0.1855	0.1872	0.2223
	Employee contributions to the Social Security	0.1237	0.1211	0.1392
	Employer contributions to the Social Security	0.2843	0.2825	0.2932
	<b>Total Direct Taxes and Contributions</b>	<b>0.2475</b>	<b>0.2439</b>	<b>0.2633</b>
<b>Direct Transfers</b>	Targeted Subsidy Program	0.2863	0.2887	0.2675
	Social Assistance	0.4147	0.4199	0.4132
	Semi-cash Transfers (Food)	N/A	N/A	N/A
	<b>Total Direct Transfers</b>	<b>0.2966</b>	<b>0.2993</b>	<b>0.2784</b>
<b>Indirect Taxes (Sales Taxes)</b>		-	N/A	N/A
<b>In-kind Transfers</b>	Education Transfers	-	-	0.1761
	Education User-fees	-	-	0.1413
	Health Transfers	-	-	0.2722
	Health User-fees	-	-	N/A

Source: Own calculations using the Iranian household survey of year 1390 (2011-12).

Note: fiscal interventions with an N/A are the ones with a negative marginal contribution which it is impossible mathematically to calculate the spending effectiveness for them.

FI-FGP effectiveness indicators are presented in Table 16. As it was mentioned before, Taxes and Transfers should not be compared to each other since taxes can only increase the poverty while

transfers can only reduce it. All taxes are highly efficient in raising revenue without increasing poverty in a significant way while direct transfers are not much efficient in reducing poverty. Social Assistance has the highest effectiveness (about 21% with respect to the Consumable Income) and Semi-Cash Transfers have the lowest one (about 4% with respect to the Consumable Income). The poverty reduction effectiveness of Targeted Subsidy Program is about 14%. One may question the validity of these results given the high marginal contribution of this program to reducing poverty, as it is established in the previous sections, while having a very low effectiveness. The answer lies in the properties of this program. Since the transfer is made to all Iranians (i.e. poor and non-poor equally benefited from it) it has a very large size and not specifically targeted toward the poor. As a result, the poverty effectiveness of this program diminishes substantially. This means the poverty would be reduced significantly if the Targeted Subsidy Program is more allocated toward the low income households. Finally, it is worth mentioning that the fiscal system as a whole is moderately effective in reducing poverty (relative to its potential) with about 41% and 48% of its potential realized (with respect to the Disposable Income and Consumable Income respectively).

**Table 16. FI-FGP effectiveness indicators for taxes and transfers in Iran**

Fiscal Incident		\$4PPP FI-FGP Effectiveness with respect to:	
		Disposable Income	Consumable Income
<b>Direct Taxes and Contributions</b>	Income Tax	0.9994	0.9987
	Employee contributions to the health insurance	0.9921	0.9895
	Employer contributions to the health insurance	0.9981	0.9971
	Employee contributions to the Social Security	0.9956	0.9943
	Employer contributions to the Social Security	0.9995	0.9991
	<b>Total Direct Taxes and Contributions</b>	<b>0.9976</b>	<b>0.9969</b>
<b>Direct Transfers</b>	Targeted Subsidy Program	0.1297	0.1441
	Social Assistance	0.1813	0.2050
	Semi-cash Transfers (Food)	0.0342	0.0385
	<b>Total Direct Transfers</b>	<b>0.1422</b>	<b>0.1569</b>
<b>Indirect Taxes (Sales Taxes)</b>		-	<b>0.9587</b>
<b>Total System</b>		<b>0.4094</b>	<b>0.4829</b>

Source: Own calculations using the Iranian household survey of year 1390 (2011-12).

Note: PPP stands for Purchasing Power Parity. In calculating PPP values, we use the 2005 round of ICP (International Comparison Program) as reported in the World Development Indicators (WDI) published by the World Bank. To change monetary values from the year of survey to 2005, we use the CPI index from the WDI. The FI-FGT effectiveness indicators are bounded between zero and one and the higher the value of an indicator, the better the tax is in not increasing poverty and a transfer is in reducing poverty.

## VI. Conclusion

This paper analyzes the effect of different components of the fiscal system in Iran on reducing inequality and poverty. Using the CEQ framework and the marginal contribution approach, we show that the direct transfers in general and the Targeted Subsidy Program in particular play the most significant role in creating a more equal distribution of income as well as less poverty in Iran. The system as a whole reduces the inequality of Final Income by 21% and poverty head count ratio of Consumable Income by about 61%. The Targeted Subsidy Program by itself reduces the inequality and poverty of Consumable Income by about 0.0534 Gini points and 11 percentage points respectively. The main reduction in poverty comes from the rural areas where this program reduces the poverty headcount ratio from about 44% to 23%. The urban areas only experience a moderate 8 percentage points reduction in the poverty (i.e. from 13% to 5%) due to this program.

In terms of how effective tax and transfers are in reducing inequality and poverty comparing to their potential, we find mixed results. Taxes are very efficient in raising revenue without increasing the poverty and moderately effective in reducing inequality. Transfers, on the other hand, exhibit a similar and moderate effectiveness in reducing inequality comparing to the taxes but they are not focused on the poor households and only realize less than 16% of their potential power to reduce poverty.

We evaluate different policy scenarios about how to proceed with the current Targeted Subsidy Program in Iran. We find that if the current plan of Iran's government in eliminating the subsidy of top deciles is combined with a moderate increase in the subsidy of the bottom deciles, the outcome would be moderately significant in reducing poverty and inequality. Comparing to the baseline case of providing the same subsidy for everyone, if the subsidy of the top 20% is eliminated and the subsidy of the bottom 30% is increased by only 20%, the inequality and poverty would experience an extra 5% and 16% reduction respectively (comparing to the current Gini and poverty headcount ratio of the Consumable Income). The poverty reduction effect of implementing this policy is heterogeneous in the rural versus urban areas. An extra 20% for the bottom 30% would reduce the poverty headcount ratio of the Consumable Income to 18% in the rural areas (which is currently 23%). The reduction in the poverty head count ratio of urban areas would be only 1 percent (4% instead of currently 5%). The power of the Targeted Subsidy Program in reducing inequality and poverty stems from the success of this program in reaching to the bottom deciles of the income distribution in rural areas of Iran. Therefore, the main policy recommendation of this paper regarding the Targeted Subsidy Program is to not just remove the subsidy of the top deciles (as it is implemented recently in Iran) but to allocate part of the resulted extra funds to the bottom deciles especially in the rural areas. Even if the government of Iran finds it challenging (especially politically) to effectively target the bottom deciles, we show that a 10% increase in the subsidy of the bottom 80% has also a significant effect on the reduction of poverty and inequality.

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