MEASURING THE EFFECTIVENESS OF TAXES AND TRANSFERS IN FIGHTING POVERTY AND INEQUALITY IN IRAN

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The CEQ logo is a stylized graphical representation of a Lorenz curve for a fairly unequal distribution of income (the bottom part of the C, below the diagonal) and a concentration curve for a very progressive transfer (the top part of the C).

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ABSTRACT

This paper introduces two new Commitment to Equity (CEQ) indexes to assess the effectiveness of taxes and transfers in reducing inequality and poverty: the Impact and Spending Effectiveness indicators. The Spending Effectiveness indicator has an additional interpretation as a measure of efficiency. These effectiveness indicators are used in this paper to rank taxes and transfers in Iran. In addition, I estimate the Fiscal Impoverishment and Fiscal Gains to the Poor Effectiveness indicators, which have also been developed by the CEQ Institute. The results show that in this case study, taxes and transfers are similarly effective in achieving their inequality-reducing potential. The income tax is the most effective intervention on the revenue side, achieving 40 percent of its inequality-reducing potential. On the spending side, social assistance transfers are the most effective, achieving 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 taxation. In contrast, transfers are not very effective because the majority of them are not targeted to the poor: the most effective transfers achieve 21 percent of their poverty reduction potential.

Keywords: D31, H22, I38
JEL classification: Inequality, poverty, fiscal incidence, marginal contribution, effectiveness indicator, policy simulation, Iran

* This paper is a chapter in Lustig, Nora, editor. Forthcoming. *Commitment to Equity Handbook. Estimating the Impact of Fiscal Policy on Inequality and Poverty* (Brookings Institution Press and CEQ Institute, Tulane University). [Online version available in http://www.commitmentoequity.org/publications/handbook.php]. Launched in 2008, the CEQ project is an initiative of the Center for Inter-American Policy and Research (CIPR) and the department of Economics, Tulane University, the Center for Global Development and the Inter-American Dialogue. The CEQ project is housed in the Commitment to Equity Institute at Tulane. For more details visit www.commitmentoequity.org.

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1. Introduction

As indicated in the Introduction, one of the key questions to be addressed by a CEQ Assessment is how effective taxes and government spending in reducing inequality and poverty are. This paper introduces new Commitment to Equity (CEQ) effectiveness indicators to evaluate the effectiveness of taxes and transfers in reducing inequality and poverty, and applies them to Iran. The main goal of the effectiveness indicators defined here is to provide policymakers with meaningful but easy-to-interpret indexes that measure fiscal interventions' "bang for the buck" in terms of inequality or poverty reduction relative to the amount collected and spent. Special attention has been given to the design of these indicators to fulfill the mathematical requirements of "proper ordering": specifically, the design of the indicators assures that, everything else being equal, an intervention with higher marginal contribution to the reduction of inequality (or poverty) has a higher ranking. By contrast, an intervention with higher potential to reduce inequality (or poverty) but with lower realized effect receives a lower ranking. A brief description of the effectiveness indicators can also be found in Chapter 1 of the CEQ Handbook[1]. Chapter 7 by Higgins describes how these indicators are calculated with the CEQ Stata Package. All the effectiveness indicators are calculated by the CEQ Stata Package and automatically pasted in section E of the CEQ Master Workbook (which is in Part IV of the CEQ Handbook, available on-line only).

This paper begins by introducing two general indexes, the Impact and Spending Effectiveness indicators, which are designed to measure the effectiveness of fiscal policies in reducing poverty and inequality. The paper then reviews the Fiscal Impoverishment and Gains Effectiveness Indicator (FI/FGP) designed by Enami and others, based on the concepts of fiscal impoverishment (FI) and fiscal gains to the poor (FGP) introduced by Higgins and Lustig.[2] This effectiveness indicator can better capture the poverty reducing or increasing effects of fiscal interventions. Finally, taxes and transfers in Iran are evaluated with respect to these indicators. I find that taxes are very effective in raising revenue without increasing poverty in a significant way and also moderately effective in reducing inequality. In contrast, because transfers are universal and not targeted to the poor, they realize less than 16 percent of their potential to reduce poverty with no one transfer exceeding 21 percent of its potential. With regard to inequality, transfers are more similar to taxes in terms of moderately realizing their potential to reduce inequality, with the "Social Assistance" program leading the interventions with a realized power of about 40 to 45 percent. Among taxes, only income tax demonstrates an effectiveness of this magnitude.

Before introducing these indicators, the next section will briefly review the concept of marginal contribution (MC), which is central to the construction of the CEQ effectiveness indicators here, as well as the notation used throughout this paper.

[1] Higgins and Lustig (2017).

[2] See Enami, Higgins, and Younger (2016) and Higgins and Lustig (2016).

2. Notation

This paper uses *T* and *B* to refer to taxes and benefits, where *T* can refer to any combination of direct and indirect taxes, and *B* can refer to any combination of direct transfers, indirect subsidies, and in-kind transfers from public spending on health and education. The indicators can also be defined as combinations of taxes and transfers, which is why *T (and/or B)* is used throughout. One can calculate the marginal contribution (MC) of any combination of taxes or benefits as follows:

$$MC^{\text{End income}}_{T\ (and/or\ B)} = Index_{End\ income \backslash T\ (and/or\ B)} - Index_{End\ income}$$

Index refers to any inequality or poverty indexes that may be used to calculate the marginal contribution. For example, this paper uses the Gini index as a measure of inequality. The subscript of the *Index*, *End income,* refers to the income concept used to calculate the marginal contribution to the index of a tax or benefit. For example, $Gini_{Disposable\ Income}$ refers to the Gini coefficient of disposable income, and using $Gini_{Disposable\ Income}$ for $Gini_{End\ income}$ implies that we are interested in calculating the marginal contribution of a tax or benefit to the disposable income Gini. *End income\T (and/or B)* refers to the income concept that is equivalent to *End income* prior to the tax or benefit of interest. For example, *Disposable Income\Direct Taxes* equals disposable income plus direct taxes (to find the income concept *prior to* subtracting out direct taxes). Intuitively, $MC^{\text{End income}}_{T\ (and/or\ B)}$ is the change in the value of $Index_{End\ income}$ if *T (and/or B)* is removed from the fiscal system or replaced with a tax (or benefit) of the same size that has no effect on inequality (or poverty) when it is added to the fiscal system. It should be noted that *End income* does not have to be one of the CEQ core income concepts. For example, if we wanted to calculate the marginal effect of indirect taxes with respect to disposable income, because indirect taxes have not yet been subtracted out of disposable income, the end income concept would be *Disposable Income minus Indirect Taxes*. The MC in this case would be calculated as follows:

$$MC^{\text{Disposable Income minus Indirect Taxes}}_{\text{Indirect Taxes}} = Index_{\text{Disposable Income}} - Index_{\text{Disposable Income minus Indirect Taxes}}$$

On the other hand, if we were calculating the MC of *direct* taxes with respect to disposable income, because disposable income is already net of direct taxes, the end income would be disposable income, whereas the end income without the fiscal intervention would require taking disposable income and *adding back in* direct taxes, as follows:

$$MC^{\text{Disposable Income}}_{\text{Direct Taxes}} = Index_{\text{Disposable Income plus Direct taxes}} - Index_{\text{Disposable Income}}$$

In calculating MC, the important point is that we have two income concepts that are different from each other only because of one component or a bundle of taxes or transfers. In other words, one can use components of a fiscal system separately and also in different combinations (or bundles) to perform a marginal contribution analysis. An example would be to evaluate the inequality reducing effect of different taxes in a system separately first and then of the whole taxation system together as

one entity. Regardless of how a component or bundle is set up, we consider the MC of a fiscal intervention to be the difference between these two income concepts (the *End income* with and without that specific component or bundle) for a particular inequality (or poverty) index.

Although the preceding examples are all related to the Gini index, the concept of MC is applicable to any inequality or poverty index.

3. New CEQ Effectiveness Indicators

Before introducing the new indicators, it is helpful to review why they have replaced the previous CEQ effectiveness indicators. Following this review, the new indicators will be discussed.

Shortcomings of the 2013 Effectiveness Indicator

The effectiveness indicator introduced in the previous handbook (2013) was defined as follows:

$$CEQ\ Old\ Effectiveness\ Indicator = \frac{MC_{T\ (or\ B)}^{\text{End income}}}{T\ (or\ B)} * GDP$$

This indicator suffers from some shortcomings. The first one relates to the mathematical interpretation of this indicator. The indicator in the equation above states how much the marginal contribution of a tax (or transfer) would change if that tax (or transfer) were scaled up to the size of GDP. Because this is a linear interpolation, the values could easily exceed the reasonable boundaries. For example, values beyond unity (in absolute terms) are meaningless for the power of a tax (transfer) to reduce inequality simply because the change in Gini cannot exceed unity (in absolute terms).

Even if this awkward interpretation were ignored, the indicator would fail to rank the taxes and transfers properly, especially with respect to the inequality reduction effectiveness. One would expect the indicator to remain constant if a program were scaled up proportionally. The reduction in Gini is a non-linear function of *T* (or *B*) so if *T* (or *B*) were multiplied by two, the reduction in Gini would not necessarily be multiplied by two (note that the change in Gini cannot exceed unity in absolute value). Therefore, even if a completely efficient program were scaled up in the most mathematically efficient way, the indicator would be likely to reduce (it never increases). As a result, bigger programs would be unreasonably penalized.

With respect to poverty reduction, the indicator is not problematic in ranking the taxes and transfers individually if the proper indicator is used. However, this indicator is not developed adequately to assess bundles of taxes and transfers. In the case of poverty reduction of a bundle, the two concepts Fiscal Gains to the Poor (FGP) and Fiscal Impoverishment (FI) should be accounted for separately because transfers can only create the former while taxes exclusively affect the latter.

Impact and Spending Effectiveness Indicators

The two new CEQ effectiveness indicators are introduced in this section.

Impact Effectiveness

Impact Effectiveness is defined as the ratio of the observed MC of a tax (transfer) to the optimum MC of that tax (transfer) if it is distributed in a way that maximizes its inequality or poverty reducing impact. The following equation shows how this indicator is defined mathematically:

$$Impact\ Effectiveness_{T\ (and/or\ B)}^{End\ income} = \frac{MC_{T\ (and/or\ B)}^{End\ income}}{MC_{T\ (and/or\ B)}^{End\ income\ *}} \quad ,$$

where $MC_{T\ (and/or\ B)}^{End\ income\ *}$ is the maximum possible $MC_{T\ (and/or\ B)}^{End\ income}$ if the same amount of *T (and/or B)* is distributed differently among individuals. For example, for the Gini index we deduct taxes from (add benefits to) the richest (poorest) until her income becomes equal to the second richest (poorest), then deduct taxes from (add benefits to) these two richest (poorest) until their incomes become equal to the third richest (poorest), and we continue this procedure until we end up with the same total value of *T* (*B*) that we observe in the actual system. If the indicator of interest is a Gini or S-Gini index, the Impact Effectiveness indicator is identical to what is proposed by Fellman and others.[3]

This indicator shows the relative realized power of a tax or transfer in reducing inequality, or of a transfer (or combined tax-transfer system) in reducing poverty. (Because taxes can only increase poverty, the poverty reduction indicator is only defined for benefits and combined tax-transfer systems that have a positive marginal contribution.) An example shows how to interpret this indicator: if the impact effectiveness of a transfer is equal to 0.7, it means the transfer has realized 70 percent of its potential power in reducing inequality. Therefore, the higher the value of this indicator, the more effective a tax (transfer) is in fulfilling its potential to reduce inequality.

One can calculate this indicator for taxes and transfers with both positive and negative MC for inequality. To see why this indicator properly ranks taxes and transfers with a positive MC to inequality or poverty, assume taxes A and B cause the same reduction in inequality but A is larger than B. In this case, B is preferred to A because both taxes do good (by reducing inequality), but A has a higher (unrealized) potential to reduce inequality because it is larger. So when $\mathrm{MC}_{\mathrm{T\ (and/or\ B)}}^{\mathrm{End\ income}} > 0$, the Impact Effectiveness indicator abides by this ranking because $MC_{T\ (and/or\ B)}^{End\ income\ *}$ is in the denominator and is increasing in the size of *T*. Now to see why the indicator properly ranks taxes and transfers with a negative MC to inequality (that is, taxes and transfers that cause an *increase* in inequality), assume tax A has a similar negative effect on inequality as tax B but tax A is larger. This would mean that, while A and B both do harm, tax A at least collects more revenue while doing the same harm.[4] In other words, if tax B were scaled up to collect the same revenue as tax A, its negative effect on inequality would be higher (its MC would be more negative). Thus, tax A is preferred to B, and this is indeed the information given by the Impact Effectiveness indicator because

[3] See Fellman and others (1999).

[4] This is not exactly a mathematical property because the MC of taxes A and B is calculated with respect to different reference points, so having different potentials does not necessarily correspond to collecting more revenue.

$MC_{T\ (and/or\ B)}^{End\ income\ *}$ is in the denominator and is increasing in the size of *T* (note that here $\mathrm{MC}_{\mathrm{T\ (and/or\ B)}}^{\mathrm{End\ income}} < 0$).

For poverty, one can calculate the Impact Effectiveness indicator (using the formula above) for benefits or combined tax-benefit systems. For taxes, which can only increase poverty, the denominator will always be zero (so the optimal effect of a tax on poverty is zero). Therefore, the denominator is modified in the following expression to reflect the most harmful way of taxing (taxing the poorest until her income equals zero, then the second poorest until her income equals zero, and so on). We denote this harmful taxation as $MC_{T\ (or\ B)}^{End\ income^H}$ and calculate

$$Poverty\ Impact\ Effectiveness_T^{End\ income} = -\frac{MC_T^{End\ income}}{MC_T^{End\ income^H}}\ ,$$

where the negative sign is included to ensure that the higher the value of the indicator, the less harmful the tax is relative to its potential to do harm.

Spending Effectiveness

The Spending Effectiveness indicator is defined as the ratio of the minimum amount of a tax (transfer) required to be collected (spent) in order to create the observed MC of the tax (transfer), if the tax (transfer) is instead redistributed optimally. The following equation shows how this indicator is calculated:

$$Spending\ Effectiveness_{T\ (and/or\ B)}^{End\ income} = \frac{T^*\ (and/or\ B^*)}{T\ (and/or\ B)},$$

where $T^*\ (and/or\ B^*)$ is the minimum amount of *T* (or *B*) that is needed to create the same $\mathrm{MC}_{\mathrm{T\ (or\ B)}}^{\mathrm{End\ income}}$ using the same optimal redistribution procedure that was discussed previously to find the maximum MC.

This indicator shows how much less tax (transfer) is required to achieve the same observed outcome (in terms of inequality reduction) if the tax (transfer) is collected (spent) in an optimal way. For example, a value of 70 percent for spending effectiveness of a transfer means that the same MC could be achieved by spending only 70 percent of the current resources if those resources were spent optimally (if the objective function is to maximize equality). This indicator can only be calculated for the taxes and transfers with a positive MC (and as a result, the spending effectiveness of taxes on poverty reduction is undefined).

Spending effectiveness has an important interpretation as a measure of efficiency as well. Because the value of the normative index of interest (for example, the Gini index) is kept constant, spending effectiveness shows how the fiscal intervention could have reached the same social goal with less distortion through a smaller size of tax or transfer. Therefore, this indicator not only ranks the

effectiveness of different taxes and transfers in reducing inequality and poverty but it can also be used to rank alternative taxes and transfers from the view of economic efficiency.

Fiscal Impoverishment and Gains Effectiveness Indicators

This section reviews the effectiveness indicators introduced by Enami and others.[5] These indicators are specific to the effect of taxes and transfers on fiscal impoverishment (FI) and fiscal gains to the poor (FGP). Axiomatic indicators for FI and FGP are derived by Higgins and Lustig and described earlier in the CEQ handbook.[6] Consider a set of policies that may include both benefits and taxes. We measure the effectiveness of these policies at reducing poverty as

$$Effectiveness_{FI/FGP} = \left[\left(\frac{B}{T+B}\right)\left(\frac{FGP\_MC_B^{End\ income}}{B}\right)\right] + \left[\left(\frac{T}{T+B}\right)\left(1 - \frac{FI\_MC_T^{End\ income}}{T}\right)\right]$$

where T and B are the size of total taxes and transfers (both positive values), $FGP\_MC_B^{End\ income}$ is the marginal contribution of transfer B to FGP (always a non-negative value), and $FI\_MC_T^{End\ income}$ is the marginal contribution of tax T to FI (always a non-negative value).[7]

This indicator is a weighted average of the income reductions for some poor people and income increases for other poor people as a result of the tax and transfer system. For analyzing bundles that include only taxes, including a single tax, the indicator reduces to

$$Tax\ Effectiveness_{FI} = \frac{T - FI\_MC_T^{End\ income}}{T}.$$

For policies that include only benefits, it reduces to

$$Transfer\ Effectiveness_{FGP} = \frac{FGP\_MC_B^{End\ income}}{B}.$$

These indicators vary between zero and one and the higher the value of the indicator, the better a tax or transfer is in terms of its effectiveness in reducing poverty. Note that taxes can only hurt and transfers can only help the poor, and even though both of the preceding indicators have positive values, one should not compare the effectiveness of a tax to a transfer in reducing poverty.

4. Data

The data for this paper is from the 1390 (2011-12) round of the Iranian Household Expenditure and Income Survey (HEIS). The Statistical Center of Iran conducts this survey every year and its sample represents all rural and urban areas of Iran. In 2011-2012, the year of survey that is used in this

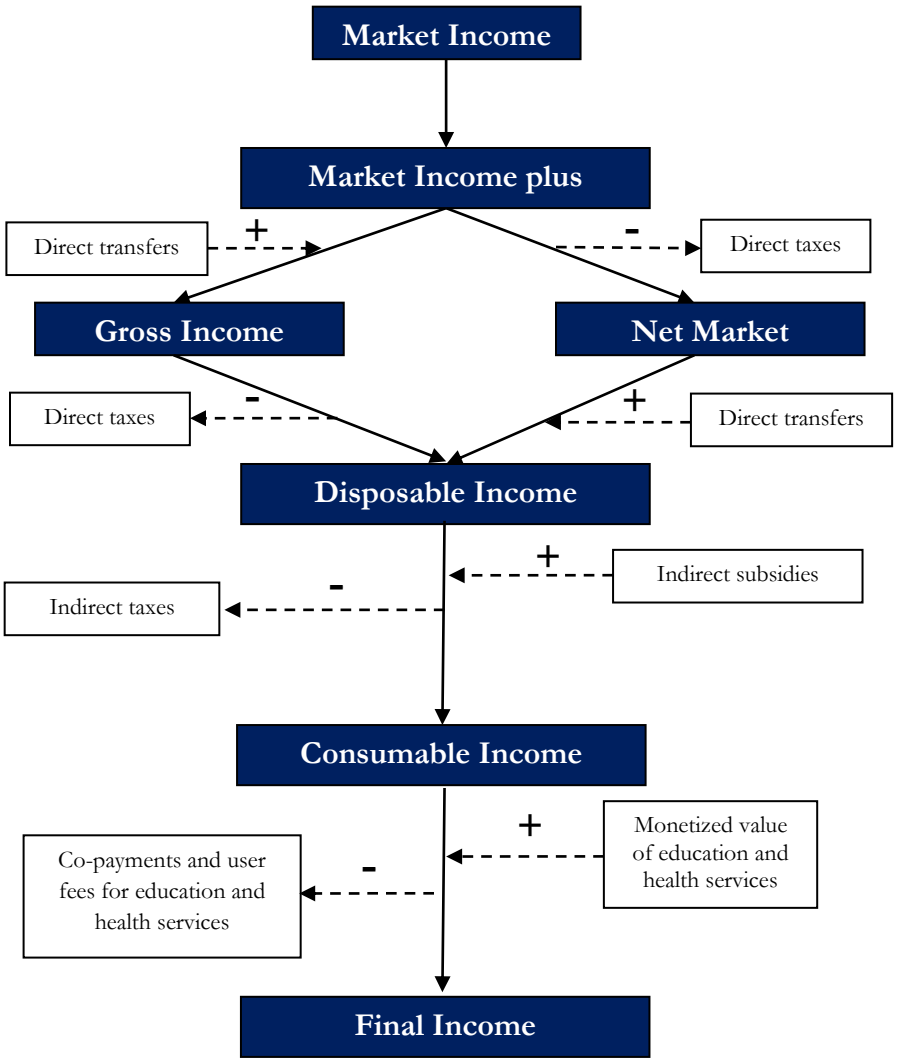
[5] See Enami, Higgins, and Younger (2016).

[6] See Higgins and Lustig (2016).

[7] FGP and FI are in Higgins and Lustig (2016) and the article is reproduced as Chapter 4 of the CEQ Handbook. A brief description can be found in Chapter 1 by Lustig and Higgins and the instructions on how to calculate them with the CEQ Stata Package are in Chapter 7 by Higgins in the same Handbook.

analysis, there were 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, I follow the CEQ income concepts diagram in chapter 1 by Lustig and Higgins of the CEQ handbook and reproduced below, which shows how different CEQ income concepts are created, and I construct different main income concepts as well as income components (that is, taxes and transfers) as described in table 1. A detailed review of this system and empirical statistics are provided by Enami and others.[8] Here, I focus on calculating the effectiveness indicators discussed in the previous section, using Disposable, Consumable, and Final Incomes as the income concepts for *End income* in the previous notations. Therefore, the effectiveness of each tax and transfer will be with respect to these income concepts.

Figure 1. Income Concepts Diagram According to the CEQ Methodology



Source: Adapted from Chapter 1 in the Lustig and Higgins (2017) Handbook.

[8] See Enami, Lustig, and Taqdiri (2016).

Table 1. Description of Market Income and Other Income Components for Iran

Main Category	Subcategories	Description
Market Income	…	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.
Contributory Pensions	…	All pensions received through the retirement programs. The relevant information is observed directly in the survey.
Direct Taxes and Contributions	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 health insurance	The deductions from employees' paychecks paid toward health insurance. The relevant information is observed directly in the survey.
	Employer contributions to health insurance	The employers' payment toward the health insurance of employees. Because 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.
	Employee contributions to social security insurance	The deductions from employees' paychecks paid for social security insurance (pension) of employees. The relevant information is observed directly in the survey.
	Employer contributions to social security insurance	The employers' payment toward the social security insurance (pension) of employees. Because 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.
Direct Transfers	Targeted subsidy program	The direct cash transfer program 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)	Includes 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.
Indirect Taxes	…	Sales taxes. Imputed using the 3-percent rule of thumb and the information available in the survey about the consumption expenditure of each household.
In-kind Transfers	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 expenditure minus these health costs (the latter is observed directly in the survey)

… Not applicable.

5. Results: Effectiveness of Taxes and Transfers in Reducing Inequality and Poverty in Iran

This section provides the value of the effectiveness indicators discussed previously for different taxes and transfer programs in Iran. Note that the Impact and Spending Effectiveness indicators are only estimated for the Gini index. Tables 2, 3, and 4 present the results for the Impact Effectiveness, Spending Effectiveness, and FI-FGP Effectiveness indexes respectively.

Focusing on table 2 with respect to final income, income tax has the highest impact effectiveness among direct taxes in fulfilling about 40 percent of its potential in reducing inequality. The highest effectiveness, however, belongs to "Social Assistance" (a direct transfer), which fulfills about 45 percent of its potential. The lowest impact effectiveness among interventions with a positive MC is "Employee Contributions to the Health Insurance," with about 12 percent effectiveness. Health user fees are the worst with regard to increasing the effect on inequality while having relatively more potential to reduce it.

Table 2. Impact Effectiveness Indicators for Taxes and Transfers in Iran

Elements of Fiscal System		Impact Effectiveness		
		Disposable income	Consumable income	Final income
Direct Taxes and Contributions	Income tax	0.3287	0.3547	0.4048
	Employee contributions to health insurance	0.0838	0.0789	0.1246
	Employer contributions to health insurance	0.2214	0.2267	0.2383
	Employee contributions to social security	0.1479	0.1195	0.1718
	Employer contributions to social security	0.3178	0.3354	0.3056
	Total direct taxes and contributions	**0.2564**	**0.2540**	**0.2871**
Direct Transfers	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
	Total direct transfers	**0.4194**	**0.4239**	**0.4110**
Indirect Taxes (Sales Taxes)		…	**−0.1395**	**−0.1303**
In-kind Transfers	Education transfers	…	…	0.2327
	Education user-fees	…	…	0.1630
	Health transfers	…	…	0.3287
	Health user-fees	…	…	−0.2490

Source: Author's calculations using the Iranian household survey of year 1390 (2011-12).
The table includes the value of the Impact Effectiveness indicator for each component of the fiscal system. The value of the index is between −1 and +1. The Gini coefficient is the index used to calculate the effectiveness indicator here.
… Not applicable.

With regard to the spending effectiveness (table 3) shown in the "Final Income" column, "Social Assistance" (with about 41 percent) and "Income Tax" (with about 39 percent) are the two most effective interventions. The least effective category is "Employee Contributions to Health Insurance" with almost zero effectiveness. That result means that with a contribution only a small fraction of its current size, the same level of reduction in inequality could be achieved as is currently produced.

Table 3. Spending Effectiveness Indicators for Taxes and Transfers in Iran

Elements of Fiscal System		Spending Effectiveness		
		Disposable income	Consumable income	Final income
Direct Taxes and Contributions	Income tax	0.3693	0.3709	0.3918
	Employee contributions to health insurance	≅0	≅0	≅0
	Employer contributions to health insurance	0.1855	0.1872	0.2223
	Employee contributions to social security	0.1237	0.1211	0.1392
	Employer contributions to social security	0.2843	0.2825	0.2932
	Total direct taxes and contributions	**0.2475**	**0.2439**	**0.2633**
Direct Transfers	Targeted subsidy program	0.2863	0.2887	0.2675
	Social assistance	0.4147	0.4199	0.4132
	Semi-cash transfers (food)	NMC	NMC	NMC
	Total direct transfers	**0.2966**	**0.2993**	**0.2784**
Indirect Taxes (Sales Taxes)		…	NMC	NMC
In-kind Transfers	Education transfers	…	…	0.1761
	Education user fees	…	…	0.1413
	Health transfers	…	…	0.2722
	Health user fees	…	…	NMC

Source: Author's calculations using the Iranian household survey of year 1390 (2011-12).
The table includes the value of the Impact Effectiveness indicator for each component of the fiscal system. The value of the index is between 0 and +1. The Gini coefficient is the index used to calculate the effectiveness indicator here.
NMC. Fiscal interventions with "NMC" have a negative marginal contribution, making it mathematically impossible to calculate their spending effectiveness. / … Not applicable.

FI-FGP effectiveness indicators are presented in table 4. As previously mentioned, taxes and transfers should not be compared to each other because taxes can only increase poverty whereas transfers can only reduce it. All taxes are highly effective in raising revenue without increasing

poverty in a significant way, whereas direct transfers are not very efficient in reducing poverty. "Social Assistance" has the highest effectiveness (about 21 percent with respect to consumable income) and "Semi-Cash Transfers" has the lowest (about 4 percent with respect to consumable income). The poverty reduction effectiveness of the targeted subsidy program is about 14 percent. Finally, it is worth mentioning that the fiscal system as a whole is moderately effective in reducing poverty (relative to its potential), realizing about 41 percent and 48 percent of its potential with respect to disposable income and consumable income respectively.

Table 4. Fiscal Impoverishment and Fiscal Gains to Poor (FI/FGP) Effectiveness Indicators for Taxes and Transfers in Iran

Elements of Fiscal System		US$4 PPP FI-FGP Effectiveness	
		Disposable income	Consumable income
Direct Taxes and Contributions	Income tax	0.9994	0.9987
	Employee contributions to health insurance	0.9921	0.9895
	Employer contributions to health insurance	0.9981	0.9971
	Employee contributions to social security	0.9956	0.9943
	Employer contributions to social security	0.9995	0.9991
	Total direct taxes and contributions	**0.9976**	**0.9969**
Direct Transfers	Targeted subsidy program	0.1297	0.1441
	Social assistance	0.1813	0.2050
	Semi-cash transfers (food)	0.0342	0.0385
	Total direct transfers	**0.1422**	**0.1569**
Indirect Taxes (Sales Taxes)		**…**	**0.9587**
Total System		**0.4094**	**0.4829**

Source: Author's calculations using the Iranian household survey for year 1390 (2011-12).

The FI-FGT effectiveness indicators are bounded between zero and one and the higher the value of an indicator, the better the tax is at *not* increasing poverty and a transfer is at reducing poverty.

PPP. Purchasing power parity. In calculating PPP values, I use the 2005 round of International Comparison Program (ICP) as reported in the World Development Indicators (WDI) published by the World Bank. To transform monetary values from the year of the survey to 2005, we used the CPI index from the WDI.

… Not applicable.

6. Conclusion

This paper introduced two new CEQ effectiveness indicators for evaluating the performance of taxes and transfers in reducing inequality and poverty. The first indicator is the Impact Effectiveness indicator, which takes the size of a tax or transfer as given and compares the realized reduction in inequality (or poverty) to the maximum possible reduction. The second indicator, Spending Effectiveness, takes the reduction in inequality (or poverty) as given and compares the actual size of a tax or transfer to the minimum required tax or transfer to create the same reduction in inequality (or poverty). The Spending Effectiveness index has an interpretation as a measure of efficiency as well because it determines how much unnecessary tax (or transfer) is collected (distributed), which if avoided would have resulted in less distortion. This paper also reviewed another family of indicators that are specific to the effectiveness of taxes and transfers in reducing poverty.[9] These indicators are based on the indexes of fiscal impoverishment and fiscal gain to the poor introduced in Higgins and Lustig.[10] Finally, an application of these indicators for the case of taxes and transfers in Iran was presented.

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

[9] Enami, Higgins, and Younger (2016).

[10] See Higgins and Lustig (2016).

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