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# MONGOLIA

## DISTRIBUTIONAL IMPACT OF TAXES AND TRANSFERS

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## ABSTRACT

This paper uses Mongolia's Household Socio Economic Survey for 2016 to estimate the distributive impact of taxes and transfers. The findings show that the system is progressive and contributes to reductions in poverty and inequality. The Gini coefficient of the pre-tax-and-transfer income is 0.4183 and decreases to 0.3507 after-tax-and-transfer. This is a reduction of 6.76 Gini points (around 16 percent). Something similar happens with the poverty rate, which decreases from 47.31 to 31.96 percent. Despite the progressiveness of the whole system, there are some caveats and policy warnings. First, pensions are the most redistributive instrument in the system, but their actuarial and fiscal sustainability is weak. Second, two programs (the child money program and the mortgage subsidy) do little redistribution—the latter is actually regressive—but represent a large share of the budget (around 2.5 percent of gross domestic product). These two factors, and the fact that up to a 35 percent of total expenditures in monetary and in-kind transfers is funded by corporate taxes and royalties—which are highly dependent on volatile commodity prices—make the redistributive impact of the tax-and-transfer system susceptible to fiscal unsustainability.

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– Poverty & Equity Global Practice Knowledge Management & Learning Team

# MONGOLIA: Distributional Impact of Taxes and Transfers

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## I. Introduction

Mongolia's public budget instability led to a widening fiscal deficit in 2012-2016. The fiscal deficit stayed at 4-5 percent of GDP in 2007-2011, but doubled to the range of 8-12 percent of GDP in 2012-15 and then grew to over 17 percent of GDP in 2016. A significant portion of the budget deficit, however, was recorded off the budget during the same period as the government channeled substantial capital expenditure through an off-budget vehicle—the Development Bank of Mongolia, to bypass the structural deficit ceiling of the Fiscal Stability Law. In 2016, however, the increase in expenditure was largely attributed to a steep increase in budget spending programs reaching nearly 40 percent of GDP, the highest mark in recent history. It should be noted that the spike in expenditure in 2016 was due to several one-off payments. In 2017, the fiscal deficit had a remarkable turn-round to 1.9 percent of GDP because of increased commodity prices, limited off-budget expenditures and reduced interest payments. However, fiscal sustainability is still an issue, due to high public debt and unstable commodity prices. Consideration of the distributive impact of taxes and transfers can help inform fiscal reforms to be undertaken to help improve fiscal sustainability in Mongolia.

This analysis of the distributive impact of taxes and transfers concentrates on budgetary items that have a direct connection with households, have been in place for several years and have not experienced wide variations recently. Public expenditures in education have regularly represented 5.5 percent of GDP over the past decade, while public expenditures in health have hovered around 2.7 percent of GDP for the same period. Transfers due to social protection programs (i.e., pensions, social insurance payments, social welfare transfers and other transfers) have remained at 9 percent of GDP in the period 2013-2016.<sup>2</sup> Personal income tax and social security contributions increased from 7.2 to 9.4 percent of total revenues between 2012 and 2016, while social security contributions increased from 13.5 to 20 percent in the same period. VAT share within fiscal revenues declined from 26 to 20 percent.

Mongolia has a system of public health, education and social protection programs that has been in place for several years and well-established service delivery structures in place. Most social welfare programs are categorically targeted -rather than means-tested- to different population groups (e.g., disabled, elderly and single mothers) that are traditionally seen as the most vulnerable. There are both contributory and non-contributory pensions, and these deserve special attention because of its fiscal implications. Fiscal subsidies to the pension system in 2017 represent 2.2 percent of GDP and, without reform, it is estimated that these subsidies would reach unsustainable levels of 6 percent of GDP in 2030 and 11 percent in 2050. As of 2017, expenditures on health and education in Mongolia are in the mid-range of comparison groups. Total expenditures on health and education in Mongolia reach 4.4 percent of GDP and 4.6 percent of GDP, respectively, close to the middle of the range among comparison countries.

After this introduction, this paper contains four main sections. The first section describes the main taxes and transfers included in this analysis. The second explains the methodology adopted for gauging the distributional impact of tax and transfers and the data used. The whole study is done

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<sup>2</sup> The universal cash transfers from the Human Development Fund, in place between 2009 and 2012, led transfers to reach 12 percent of GDP.

using data from the 2016 Household Socio Economic Survey, so it refers to the distributional impact of taxes and transfers as of 2016. The third summarizes the main results by type of policy intervention and in total. The paper concludes with a comparison of the distributional effect of taxes and transfers in Mongolia vis-à-vis other countries in the world and a qualitative assessment of the distributional impact of some policy options for the country. The latter gives some basic intuition about the distributional consequences of some policy options currently discussed in the country.

## II. Description of taxes and social expenditures in Mongolia

This analysis focuses on taxes and transfers that can be directly traced to have an impact on households' welfare. It focuses on first order, partial equilibrium, short-term impacts on poverty and inequality measures of welfare across households. Therefore, it analyzes the distributional impact of personal income, value and excise taxes as well as social security contributions (on the revenue side), monetary transfers such as social insurance-assistance programs, and in-kind transfers in public health and education (on the expenditure side). The study also includes quasi-fiscal expenditures due to subsidized interest rates or energy prices. However, it does not include corporate taxes, custom taxes, royalties or expenditures in infrastructure because, although it is certain that they have impacts on the distribution of households' welfare, these are more the result of second order, general equilibrium, long-term impacts.

### Tax revenue sources

General government revenues as a percentage of GDP, have been declining in recent years. They have gone from around 30 percent of GDP in the late years of the past decade, to around 25 percent for the years 2014-2016. However, the main sources of revenue (i.e., corporate, personal, value added, excise and custom taxes, social security contributions and royalties) have remained quite stable over the years. These represent 20 percent of GDP (plus/minus one percentage point) since 2006. As of 2016, the year of reference for this study, personal income, value added, excise taxes and social security contributions represent 9.4, 19.5, 10.7 and 20.1 percent of general government revenues (see Table 1). Namely, the analysis refers to sources of revenue that represent almost 60 percent of total government revenues.

As of 2016, gross incomes are taxed for personal income at a flat rate of 10 percent. Filing of personal income tax in Mongolia is per individual and no joint filing by spouses or several family members is permitted. All sources of gross income are taxed, but there are deductions on social security contributions, and a personal annual tax credit of MNT 84,000 (approximately US\$ 39). There are also exemptions on expenditures for tuition fees for tertiary education.

The VAT law was reformed in July 2015, and new rates became effective on January 1<sup>st</sup>, 2016. This taxes goods and services with a flat 10 percent rate. The reform in the law increased the threshold for registration of taxable sales from 10 million to 50 million MNT a year (from around US\$ 4,672 to US\$ 23,361), this with the purpose of solving the problem of very small firms having to file due to high inflation in previous years by creating a new threshold that leaves outside taxation most small firms. In addition, the VAT has multiple exemptions, particularly on stocks

trading, banking services and gold sales, as well as on some food staples domestically produced (e.g., wheat, potatoes, vegetables, fruits, meat, milk).<sup>3</sup>

Excise taxes are levied on tobacco, alcohol, gasoline and passenger vehicles. Excise taxes on tobacco are MNT 3,480 (US\$ 1.63) per 100 units while excise taxes on alcohol average MNT 7,604 (US\$ 3.55) per liter in 2016. Gasoline and diesel excise taxes vary by octane and frontier port of entry, ranging between US\$ 11 and US\$ 48 per ton. Vehicles are also taxed according to engine size and production year ranging from approximately US\$ 500 (for vehicles less than 3 years old and less than 1,500 cm engine) to US\$ 4,000 per vehicle (more than 10 years and over 25,000 cm engine). Some goods are exempted from excise tax: Mongolian traditional home-made liquor; legally obtained and imported duty-free alcohol and tobacco; dual-fuel cars; cars running on liquefied gas; and electric cars.<sup>4</sup>

Social Security contributions include payments from both the employer and the employee. These contributions partly finance health, unemployment, work accidents, benefits and social insurance funds. Firms pay between 11 and 13 percent -depending on economic activity- of labor payroll. Employees pay a flat 10 percent of gross salaries, capped at MNT 192,000 a month (US\$ 90).

### Monetary transfers

General government expenditures as a percentage of GDP, have experienced an uneven trend in recent years. These declined from 37.6 percent of GDP in 2007 to 31.6 in 2011, soared the next year to 37.9, fell again to 30.8 in 2015 and then jumped again to 39.9 in 2016. This erratic behavior is not observed in the main monetary transfers in this study. On the one hand, social security benefits (i.e., contributory pensions and social insurance benefits) have seen a sustained increase from a little more than 5 percent of GDP in 2007-2008 to 7.4 percent in 2016. On the other hand, social assistance transfers (e.g., child program, maternity programs, merit programs) have oscillated around 2 percent of GDP during the past decade. As of 2016, these two components represent 18.6 and 5.1 percent of general government expenditures (see Table 1).

In terms of participation in the fiscal budget, contributory benefits, which include pensions, but also unemployment benefits and other social insurance benefits, represent 17 percent of public expenditures in 2016. Non-contributory benefits, which include child program, and other social assistance allowances, represent 5.1 percent of public expenditures the same year. These stand as 6.8 and 2.1, respectively of GDP (see Table 1).

The largest component among monetary transfers is pensions.<sup>5</sup> There are social welfare pensions, that support people not entitled to receive pensions from the social insurance system. These

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<sup>3</sup> Exemptions on gold sales are estimated to represent tax expenditures of MNT 41.3 billion. Financial, insurance and stock-market services 88.4 billion. Food staples 41.6 billion. These exemptions are estimated to represent 6.0, 12.8 and 6.0 percent, respectively, of total tax expenditures in year 2016 (or 0.7, 1.5 and 0.7 percent of total fiscal revenues in 2016). Data provided by the Mongolia Ministry of Finance in April 2017.

<sup>4</sup> Exemptions on hybrid cars are estimated to represent tax expenditures of nearly MNT 160 billion, which represents around 23 percent of total tax expenditures for year 2016 (or 2.7 percent of total fiscal revenues in 2016). Data provided by the Mongolia Ministry of Finance in April 2017.

<sup>5</sup> Pensions can be interpreted as a transfer or as delayed savings. The former is the usual interpretation for non-contributory pensions, whereas the latter is more common for contributory pensions. In any case, the case of contributory pensions, if under a pay-as-you-go system, may have a transfer rather than delayed saving interpretation,

pensions do not have an automatic adjustment but have been adjusted regularly. As of 2015, their value was 126,500 MNT per month. Contributory pensions can be received at age 60 for men and 55 for women, but some workers can retire as early as 10 years earlier. Individual replacement rates are about 60 percent for a worker who has completed 30 years of contributory service. A lower “partial” minimum benefit is provided as a guaranteed annuity for workers with 10 years of contributory service. Total coverage of the labor force under mandatory and voluntary schemes was 81 percent in 2016.

Among the several monetary transfers, the Child Money Program is one of the largest in terms of budget allocation. The CMP, launched in January 2005, has evolved in its scope and focus, but by mid-2016 gives an allowance of 20,000 Mongolian tugriks (MNT) (around US\$10 in June 2016) per month to all children aged 0 to 17 years old. By the end of 2015, almost 1.03 million, or nearly 100 percent of children aged 0 to 17 years old, received this benefit (NSO, 2015).

In addition, there are several social assistance programs targeted to specific population groups. These programs include yearly cash allowances for mothers who give birth to 4 or more children (100,000 MNT if more than 4 and 200,000 if more than 6 children), and monthly cash allowances for pregnant and breastfeeding women, after the 5<sup>th</sup> month of pregnancy and for 12 months. There are also allowances for people in programs for rehabilitation, elderly and children care, disabilities, as well as allowances for medicines and some for single parents.<sup>6</sup>

Some monetary transfers do not involve direct cash disbursements to beneficiaries but, instead, lower prices of basic goods and services thus increasing the purchasing power of households. Regulated low prices of staples (e.g., bread, rice, public transport) or energy inputs (e.g., gasoline, electricity and heating) are common examples in the world. In the case of Mongolia, tariffs for electricity and central heating are regulated below cost recovery production costs, and interest rates on certain mortgages are regulated below market interest rates.

The cost of these “indirect” transfers is not always explicit in the fiscal budget because it can be borne by para-fiscal entities (e.g., central banks) or even the private sector, (which may be only partly compensated for the difference between market and regulated prices). In the case of Mongolia, the indirect subsidies on mortgage interests is borne by the Central Bank of Mongolia,<sup>7</sup> while the electricity and heating subsidies are borne by the central government which, at least partially, compensates public and private companies engaged in production and distribution of electricity and central heating. There are no explicit figures on the size of the indirect subsidy in terms of reduced interest rates, but a rough estimate would suggest it represents about 1.5 percent of GDP.<sup>8</sup> Data from official sources indicate that subsidies to private and public companies have

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particularly if expenditures in pension benefit enjoy a substantial subsidy from the government. This analysis adopts a monetary transfer interpretation for all pensions in Mongolia.

<sup>6</sup> For more details on the Child Money Program see (International Labour Office, 2016), on pensions section 3.3 of (World Bank, 2018) and on welfare programs see (Onishi and Chuluun 2015) and (Carraro, Byambaa, & Marzi, 2015).

<sup>7</sup> The program was transferred to the government in April 2016 but continued to be financed by the central bank outside the budget. In late 2016, the government decided to transfer the program back to the central bank due to tight budget conditions. In 2017 the program returned to the government under new funding conditions for the program.

<sup>8</sup> According to (World Bank, 2016): “Outstanding subsidized mortgage loans reached MNT 3.1 trillion (13 percent of GDP)”. Assuming an indirect subsidy of 11.7 percentage points (i.e., the difference between 19.7 percent, the average

represented less than 1 percent (0.9 %) of GDP and a little more than 2 percent (2.1%) of the annual expenditures in 2016.<sup>9</sup>

The subsidy to interest rates associated to housing mortgages started in 2013. It was introduced to increase the affordability and accessibility of apartments for urban residents, particularly young families and those living in the ger districts. It originally established a top 8 percent interest rate for mortgage loans and in January 2016 it lowered the interest rate to 5 %. Given that in year 2016 the average market interest rate in Mongolia was 19.7 percent, this implies a subsidy of at least 11.7 percent over the outstanding loan for each beneficiary household, making the subsidy bigger the bigger the loan is.

Both electricity and central heating have tariffs regulated by volume of consumption. There are three electricity tariffs in Mongolia. The lowest tariff, for “vulnerable consumers”, is 48.2 MNT/kWh (2.3 cents of US\$/kWh) below a minimum consumption threshold and 69.30 MNT/kWh (3.2 cents of US\$/kWh) for consumption above that threshold. The minimum threshold is 100 kWh per month in Ulaanbaatar city, 75 kWh per month in Darkhan and Erdenet cities, and 50 kWh in all other cities or soums. The second tariff is for residential areas using a single meter. In this case the tariff is of 98.40 MNT/kWh (4.6 cents of US\$/kWh) for monthly consumption below 150 kWh and 118.20 MNT/kWh (5.5 cents of US\$/kWh) for consumption above that threshold. The third tariff is for residential areas using a time use meter (TUM). In this case, daytime consumption (from 6:00 to 21:00 hours) is charged 104.3 MNT/kWh (4.9 cents of US\$/kWh) and nighttime (21:00 to 6:00 hours) is charged 77.10 MNT/kWh (3.6 cents of US\$/kWh). Finally, for residential use, central heating tariffs are 3,000 MNT/month for areas up to 40 square meters (m<sup>2</sup>), 5,000 MNT/month for areas between 41 and 80 m<sup>2</sup> and 10,000 MNT for areas above 81 m<sup>2</sup>.

The subsidy to electricity and heating is computed using the price-gap approach, which compares actual consumer tariffs with production costs and then multiplies that differential by the volume of electricity consumed to obtain the level of subsidies. This method ignores implicit subsidies that may be due to other tax exemptions or preferential pricing for inputs to public utility companies, or to consumers, and makes use of data approximations about the actual cost of production of the service. The latter may be difficult to collect due to the dearth of accurate data in the companies and difficulties in gauging opportunity cost of these utilities which are seldom traded in international markets.<sup>10</sup>

Estimates of average production costs of electricity range from 147 MNT/kWh to 213 MNT/kWh, while for central heating the production costs range 460 to 693 MNT/m<sup>2</sup>. These come from data of reported costs of production, generation and distribution of electricity and central heating companies from the Central System (representing 95% of the total sector costs). Expert estimates indicate that these reported costs of production fail to include three important components: first, the implicit subsidy that companies receive from coal at a price estimated to be at least 50% lower

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market interest rate in 2016, and an 8 percent for the program) leads to an annual subsidy of MNT 351 billion which represents 1.5 percent of GDP in 2016.

<sup>9</sup> Preliminary data from 2016 Mongolian Statistical Yearbook indicate subsidies to government organizations and private companies for 224.4 billion MNT.

<sup>10</sup> For a recent use of this method in Central American countries see (Hernández Oré, Sánchez, Sousa, & Tornarolli, 2018) and for a more technical discussion see (Koplow, 2009).

than normal price; second, maintenance costs and; third, returns to capital investment. Hence the average production costs are an estimate based on reported costs of production and added costs for under-priced inputs, maintenance and capital returns.<sup>11</sup>

This implies that the marginal subsidies, in the case of electricity, vary from a maximum of 164.8 MNT/kWh (in the case of upper bound costs and below-threshold vulnerable consumers) and 28.8 MNT/kWh (in the case lower bound costs and above threshold households with a single meter). The marginal subsidy per kWh is lower for those with higher levels of consumption, although the sum of subsidies they receive may be larger because of a bigger volume of electricity consumption (see Figure 1).

### **In-kind transfers**

Investments in health and education are the foundations of individual and household well-being. The analyses of levels and trends of monetary measures of poverty repeatedly show that labor market earnings are the main force for poverty reduction. But labor earnings depend crucially on productive investments in health and education. Consequently, access to public health and education are in-kind transfers that rise the standards of living by allowing a family to afford basic productive investment in human capital. Moreover, its inclusion in this type of analysis underlines the important size of transfers that households receive in terms of public health and education.

Public health provision is extensive but has growing stresses due to changes in health risks. Even though Mongolia has significantly reduced the number of hospital beds over the last decade, the number of hospital beds was still around 7.2 beds per 1,000 population in 2015, which is much higher than that of other countries in the region (China, Malaysia, Philippines, Vietnam). However, the current delivery system is unable to address the growing burden of non-communicable diseases (NCDs). As NCDs expand, Mongolia will need to address both their underlying causes as well as increase early detection and chronic disease management.

Access to education is very high in Mongolia. The country has high enrollment rates in education. At 79 and 59 percent for women and men, respectively, tertiary education gross enrollment rates in Mongolia are the highest among comparison countries, and among the highest in the World. Similarly, gross enrollment rates for secondary education are 82 and 80, respectively, also very high in international perspective. Primary education gross enrollment rates are the same for boys and girls (86 percent).<sup>12</sup>

## **III. Methods, data and assumptions**

The methodology adopted in this study is based on the methods outlined in “*Commitment to Equity Handbook. A guide to estimating the impact of fiscal policy on Inequality and Poverty*”, by N. Lustig (2016) and developed in a previous work (Lustig & Higgins, 2013). This methodology has

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<sup>11</sup> Data collected by (Schlirf, Johansen, Georgieva, & Wu, 2018) who estimate that actual production costs are approximately 51 percent higher than reported costs. This number refers to both electricity and central heating. This study separates this adjustment into 39% for electricity and 79% for central heating given that electricity companies report less deficit in their accounts than central heating companies.

<sup>12</sup> Data from World Development Indicators.

been adopted, with variations and extensions, in several recent World Bank studies on the distributive impact of tax policies, such as (Inchauste & Lustig, 2017) and (Hernández Oré, Sánchez, Sousa, & Tornarolli, 2018).

The study makes use of Mongolia's Household Socio Economic Survey for year 2016 for this estimation of distributive impact of taxes and transfers. This survey allows for identification of some key fiscal policies with impact upon poverty and inequality: personal income tax (through questions on sources of income earned), value added tax and excise taxes (through pattern of consumption), social security contributions (through sources of income, particularly wages), direct transfers (through questions about reception of pensions and other social assistance transfers), and in-kind transfers (through information about attendance to public school or public health facilities). In addition, the survey also allows measuring the impact of indirect transfers such as subsidized interest rates to mortgage and regulated prices to household electricity and heating (through questions on home ownership and housing debt, as well as energy consumption patterns).

The fiscal policies included in this simulation exercise represent about 50 percent in central government fiscal revenues, and 42 percent of central government expenditures in year 2016. The HSES 2016 data get close to budgetary data in some items such as social benefits (nearly 80 percent of) and personal income tax (100 percent). On the other hand, HSES only captures 38 percent of social security contributions. In the case of VAT and excise taxes on alcohol and tobacco, HSES captures a lower volume than reported in administrative data: 57 percent in the case of the former and only 13 percent in the case of latter (see Table 1).

The tax-benefit incidence simulations are done assuming that Social Security contributions are fully paid by employees, personal income tax by income recipient and VAT/excise taxes by the consumer. No assumptions about tax evasion are adopted. In addition, administrative and capital expenditures are included in the redistribution of in-kind transfers (i.e., public education and health) (see Table 2). Expenditures in education and health are scaled-down to make administrative data more commensurate to survey data (more on this below).

## Assumptions

The analysis of the distributional impact of taxes and transfers considers the different income concepts and how taxes and transfers affect these concepts.<sup>13</sup> There are five primary income concepts used to reflect income before or after transfers and taxes: Market Income, Net Market Income, Disposable Income, Consumable Income, and Final Income. A succinct definition of each of these concepts and the main taxes and transfers included in this study is summarized in Table 3.

Market Income is constructed as the summation of grossed-up wage income and other net market incomes. The HSES includes information on net wages, therefore, these wages are grossed-up by adding back in an estimated SSC employee contribution as well as personal taxes paid on wages, non-farm income, and rental incomes. A flat income tax of 10% is applied to all these sources of income and a 10 percent Social Security Contribution (capped at MNT 192,000 per month).

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<sup>13</sup> This section owes to the methods developed by (Lustig & Higgins, 2013) and (Lustig N. , 2017).

Net Market Income is the result from subtracting direct taxes and SS contributions from Market Income. Direct taxes are applied to market income with deductions onto taxable income including SSC (employee contribution) and tertiary education expenditures. In addition, if direct taxes are less than 84,000 MNT per person per year, taxes are waived.

Adding all direct transfers to Net Income yields Disposable Income. Direct transfers include the totality of social transfers, pensions, and non-contributory income sources that are available from the HSES. Specifically, in the survey, these sources of income categories include pensions, unemployment benefits, maternity benefits, disability pension, survivor pension, illness pay, funeral pay, child allowances, HDF, student benefits, and other.

Applying indirect taxes and transfers to Disposable Income yields Consumable Income. Indirect taxes include VAT, Excise Taxes, while indirect transfers refer to Mortgage Subsidies, Electricity Subsidies, and Heating Subsidies. The former reduce the consumer power of disposable income, whereas the latter increase it.

Lastly, incorporating in-kind health and education expenditures to Consumable Income results in Final Income. This is a measure that aims at gauging the command on goods and services that a household has thanks to goods and services freely provided by the public sector in the form of in-kind transfers.

### **Tax revenue sources**

Tax revenues included in the CEQ analysis are personal income taxes, value-added taxes, excise taxes, and social security contributions. Personal income tax and Social Security contributions are derived from the estimates of gross income explained in the previous sub-section. Indirect taxes rates are applied to household consumption in relevant categories. A VAT rate of 8.6 percent is applied to household consumption excluding rent, health, education, and alcohol, tobacco and consumption from own-production. A rate of 17.4 percent is applied to alcohol and tobacco consumption as an approximation to the excise taxes to these items. The VAT rate approximates the effective VAT rate defined as the actual VAT revenue collection divided by household consumption expenditures in years 2016. The excise tax is also an approximation, based on the ratio of excise taxes on tobacco and their market price.

No simulations about excise taxes on dual-fuel vehicles are included because no information on type of vehicle owned is available in the household survey. Moreover, no distributional impact of price controls and excise taxes on diesel and gasoline has been estimated because these have a more complex and ever-changing form of policy intervention.<sup>14</sup>

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<sup>14</sup> The Mongolian government exerts different types of intervention on the gasoline market. It changes excise taxes (including temporary exemptions), controls prices and sometimes even grants soft loans for importers, all with the objective to avoid wide oscillations of gasoline prices. Excise taxes to gasoline amount to 321 billion MNT in 2016 (about 1.3 percent of GDP). In any case, it does not seem to be the case that gasoline prices in Mongolia are far from regional international prices.

## Indirect Subsidies

A household is assumed to receive a Mortgage Subsidy if it responds in the HSES that it has an outstanding loan for housing, and lives in an apartment or detached house. An extremely small number of households in the HSES fit these criteria (i.e., only 4.6 percent of the sample). To these households, an amount of 5,841,468 MNT is applied to each household. This number is equivalent to an average outstanding loan of 49,927,077 MNT and the implicit interest rate subsidy of 11.7 percent (i.e., 19.7 minus 8 percent).<sup>15</sup>

Electricity subsidies are applied to households who are connected to the Central System and this information is available in the HSES. There are three types of tariffs available which offer different pricing schedules based on monthly kWh usage and the type of connection they have (i.e., vulnerable household, and households with simple or TOU meter). The survey does not give information about how households are connected and which subsidies they receive, thus eligible households are randomly allocated into these 3 groups. The first price group is for “vulnerable” households. It is assumed that 1% of connected households living in Gers receive this price schedule. Connected households not living in Gers are randomly split 60% into the simple meter schedule and 40% receiving the Time-of-Use meter.<sup>16</sup>

In the HSES, interviewed households only report electricity expenditures in the previous month, and only a subset of the sample is interviewed in each month of the year. Since usage is expected to vary over the calendar year, electricity expenditures should be imputed for each eligible household and in each month. The imputation model predictors include housing type, household income decile, area of location (i.e., urban/rural), square meter of the dwelling, number of household members, and the number of electronic assets in the household (e.g., TV, radio, refrigerator). Once electricity expenditures are calculated for each month, kWh usage per month can be backed out. To calculate kWh in each month, the fitted electricity expenditure is divided by the price of kWh as given by the pricing schedule assigned to the household. Households are assumed to receive more subsidies in the winter months since there is higher usage of electricity. Electricity subsidies are calculated as the difference between the estimated production cost (the upper bound of 213 MNT/kWh) of electricity minus the tariff assigned to a household, multiplied by the estimate of monthly consumption, and the household cost. The total subsidies over the year are added together to yield the total amount of electricity subsidies received by a household.

Heating subsidies are applied to households reporting the survey to be connected to central heating, which almost completely exclude Ger households. Heating prices and subsidies are applied according to the size of the dwelling in terms of square meters. The subsidy is the difference between the estimated production cost and household average expenditures on heating for a given dwelling size.

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<sup>15</sup> The average outstanding loan is derived from official data provided by the Ministry of Finance in September 2017, indicating that there are 89,156 mortgage borrowers in the banking system, of which approximately 70 percent have preferential loans (i.e., 62,409 cases) with an average outstanding mortgage of 49.9 million MNT as of December 2016.

<sup>16</sup> Assumptions about the percentage of households from (Schlirf, Johansen, Georgieva, & Wu, 2018).

## Monetary transfers

Monetary transfers are captured directly from the survey. They refer to pensions (without separating between contributory and non-contributory), unemployment and maternity benefits, Child Money program, student benefits and several other benefits. The food stamps program, a small but only means-tested program in Mongolia, is not included in the survey. These monetary transfers are classified into three groups: pensions, Child money program and social welfare benefits. No assumptions or computations are made about these. Selection of beneficiaries and amount of benefit received is taken directly from the survey.

## In-kind transfers

Education expenditures are allocated to a given household based on the presence of school-aged children attending public school and official education expenditure per aimag. Education expenditures at the aimag level are available for Pre-School and Basic education (which includes both Primary and Secondary). Annual pre-school expenditure per child varies from 1,587,000 MNT in UB to 2,381,000 MNT in Dundgovi. Expenditures per student at the primary and secondary level are less than expenditures for pre-school, ranging from MNT 687,000 in UB to 1,529,000 in Govi-Altai. Tertiary education expenditures are not available at the aimag level, the national average expenditure on tertiary education per student is 3,537,140 MNT.<sup>17</sup>

Attendance in pre-school is not captured in the HSES, since these children are too young, thus an attendance rate at the aimag level is assumed, about one-third. By aimag, a random sample of pre-school aged children are selected to receive in-kind education. For primary, secondary, and tertiary students, attendance is based on responses in the HSES.

Finally, if a household indicated they used public health services in the HSES, an in-kind health transfer is applied. The amount of the annual transfer per household is 1,655,041.8 MNT, based on total expenditures in public health divided by number of patients as per HSES.<sup>18</sup>

In the case of public health and education the monetary value of transfers in kind has been scaled-down. This is because household surveys usually capture a level of consumption that is lower than household consumption in national accounts. In the case of Mongolia, for instance, public expenditures in education represent 8.2 percent of consumption expenditures as per aggregate fiscal and national accounts. But they would represent 13.5 percent if compared to consumption reported in the HSES survey. Without scaling down, transfers in-kind would have a disproportionately larger impact upon distribution of well-being as per survey data than they represent in aggregate data.<sup>19</sup>

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<sup>17</sup> Data on education expenditures by level of education and Aimag provided by ministry of Finance on December 2017. Data on students enrolled in each level of education and by Aimag, from 2016 Mongolia Statistical Yearbook.

<sup>18</sup> HSES questions 3.10 and 3.11 indicate whether a household member consulted a health facility/provider, and whether it was a public or private service. Health expenditures by Aimag provided by Ministry of Finance on December 2017.

<sup>19</sup> For more on the advantages and disadvantages of re-scaling in-kind transfers see (Lustig N. , 2017).

## IV. Main Results

The methodology adopted in this study identifies whether a given intervention, be it a tax or a transfer, is progressive (in terms to be defined below) and what is the impact of these interventions upon poverty and inequality in Mongolia. This section has two parts. First, a clarification of the definitions of progressivity used in this study, making clear the need to study both absolute and relative progressivity; and estimates of progressivity for each of the taxes and transfers under consideration. Second, a summary of the impact of these taxes and transfers upon several indexes of income inequality and poverty.

### Are taxes and transfers in Mongolia progressive?

Consider both relative and absolute progressivity. A traditional definition of progressivity refers to taxes being progressive (or regressive) when “...*the amount of tax paid as a proportion of the tax base rises (declines) with that base*”.<sup>20</sup> This is sometimes called “relative” progressivity as it refers to the proportion of taxes paid by an individual or a group relative to their income, consumption or wealth, which are the usual tax bases. There is also an “absolute” definition of progressivity which refers to the share of the total collection of taxes that is paid by an individual or a group. In this case, a tax can be called progressive (or regressive) if the share of the total tax collected from an individual or a group is larger (smaller) the larger the tax base from that individual or group. Similar definitions (but with opposite sign) can be applied to transfers and public expenditures in general. Relative progressivity is of importance because it gauges the net tax pressure (or transfer benefit) that each group bears as a proportion of their standard of living, whereas absolute progressivity measures whether the bulk of the budget of social expenditures is allocated (or the burden of taxes collected) to the poorest groups of the population.

The tax and transfer system in Mongolia shows relative progressivity. When adding taxes paid and transfers received, the net effect in terms of share of pre-market income is higher the poorer the per-capita market income. Figure 2 shows that transfers received, net of taxes paid, represent more than 150 percent of market incomes for those in the second decile of the income distribution.<sup>21</sup> This percentage declines to a little more than 50 percent for those in the third deciles and keeps declining to represent -2 and -7 percent for those in the top two richest deciles of the distribution. Namely the ninth and tenth deciles, because of taxes paid being larger than transfers received, have a post-tax-and-transfer income that is 2 and 7 percent lower than their market income, respectively. The negative slope of the blue line is a clear indication of relative progressivity of the tax and transfer system in Mongolia. Almost every transfer, both monetary and in kind, contributes to relative progressivity as they represent a larger share of market income among the poor than among the rich. Pensions, social assistance transfers, public education and health transfers in kind are the largest contributors to higher incomes among the poor. In terms of taxes, VAT subtracts a larger share of market incomes among the poor, whereas income tax does it among the richer.

In terms of absolute progressivity, not all tax and transfer programs are progressive. Most taxes are collected from richer households. The top three deciles of the distribution are responsible for

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<sup>20</sup> (Vickrey & Ok, 2018).

<sup>21</sup> The first decile is not included in the figure because net transfers are much too high for this group due to individuals with nearly no incomes before taxes and transfers.

67 percent of PIT and SSC, 54 percent of the VAT and 44 percent of excise tax collections. On the other hand, expenditures in transfer programs are mostly allocated to the poorest families. 60 percent of pensions budget and 48 percent of social welfare transfers are allocated to the bottom three deciles, respectively. The Child program is more equally distributed: almost all deciles - except the top and bottom- get approximately 10 percent of the budget of the program. Something similar is seen in terms of in-kind transfers in public health and in public education. Indirect subsidies, however, show a regressive pattern in absolute terms: it is richer families who received the larger share of the budget. Almost 80 percent of the budget in subsidized interest rates on mortgages goes to the top three deciles, as well as 59 percent of subsidies in central heating and 39 percent of subsidies in electricity (Figure 3).

Total transfers, taken as a whole, are distributed such that the poorest garner the larger shares of the budget. The bottom decile gets 23 percent of the total budget in transfers. The rest of the population get similar shares of the budget in social expenditures: the second and tenth deciles get 11 percent of the budget each, while the other deciles garner around 8 percent each. This is due to pensions and social welfare transfers, which mostly concentrate among the bottom two deciles, while subsidies to mortgage interests mostly concentrate in the top two deciles. On the other hand, contributions to tax collection rise from around 4 percent, from the bottom three deciles, to 28 percent from the top decile (Figure 4).

This progressivity is partly funded by corporate taxes, royalties and others government revenues. In monetary terms, all deciles of the distribution get more in transfers than what they pay in taxes, except the two richest deciles.<sup>22</sup> The total expenditure in transfers (monetary and in-kind) amounts to 4 trillion MNT in 2016. If indirect subsidies in mortgage interest, electricity and central heating tariffs were included, an additional 0.8 trillion should be added. But tax collections in PIT, VAT, SSC and excises is 3.2 trillion (see Table 1).<sup>23</sup> This means that 25 to 35 percent of redistribution through monetary and in-kind transfers is funded by taxes not collected from households and individuals.<sup>24</sup> Given the instability of royalties and corporate taxes related to mining commodity exports, sustainability of transfers depends crucially of responsible fiscal management.<sup>25</sup>

Absolute progressivity can be summarized in the concentration index. The concentration index is defined as the twice the average difference between the cumulative proportion of the population ranked by market income, beginning with the poorest, and the cumulative proportion of a given tax (or transfer). The index ranges from -1 to 1 taking a negative value when the poorest groups of the population get a more than proportionate concentration of transfers, and a positive value when they get a share of transfers that is smaller than their share of population. A negative concentration index implies that they are progressive in absolute terms (i.e., the poorer groups get a larger share of total transfers), whereas a positive index means the transfer is regressive in absolute terms (i.e.,

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<sup>22</sup> This statement is based on survey data. Since survey data do not replicate the amounts of taxes and transfers from administrative data, the statement should be taken as an approximation, if survey data at least capture the relative proportion of taxes and transfers, although not its absolute levels.

<sup>23</sup> These, in contrast to the previous footnote, are figures from administrative data.

<sup>24</sup> This sentence, as the rest of the analysis of the paper, refers to statutory rather than economic incidence of taxes.

<sup>25</sup> This statement mainly refers to short term sustainability. Longer term sustainability, particularly regarding pensions, requires adequate design in actuarial terms of the pensions system. For more on prudent fiscal management and pension reforms in Mongolia see (World Bank, 2018).

the poor get a less than proportionate share of transfers). A negative concentration index is also said to indicate that the transfer is “pro-poor”.

Relative progressivity can be summarized in the Kakwani index. The Kakwani index (Kakwani, 1977) is a measure of the relative progressivity of a social policy intervention (tax or transfer). In the case of a tax, it is defined as the difference between the concentration coefficient of the tax and the Gini coefficient of the pre-tax-and-transfer incomes (or the chosen welfare indicator). In the case of transfers, it is the negative of the difference; namely, the difference between the Gini coefficient of the pre-tax-and-transfer incomes and the concentration coefficient of the transfer. Progressive interventions have positive Kakwani coefficients, and regressive ones have negative coefficients.

All direct and in-kind transfers in Mongolia are “pro-poor” and progressive. Pensions, child money transfers, and other social welfare transfers, as well as expenditures in public pre-school, basic education and health have negative concentration coefficients. Consequently, their Kakwani indexes are all positive, with respect to any income definition (Table 4). This means that all these transfers represent a larger share of income among the poor than among the rich and the larger share of their total budget is allocated to poorer population groups. The only exception is in-kind transfers in tertiary education. In this case the concentration coefficient is positive, which means that poorer groups of the population get a smaller share of the total budget allocated to public expenditures in tertiary education. However, the Kakwani coefficient for tertiary education remains positive, which means that it is still progressive in real terms. This is because the distribution of in-kind transfers in tertiary education is less unequally distributed than pre-tax-and-transfer incomes, so tertiary education still helps to reduce inequality.

Direct taxes are mostly paid by richer population groups and have an equalizing effect. Concentration coefficients of the personal income tax and social security contribution are positive, and their Kakwani index is always positive indicating these are progressive interventions both in relative and absolute terms. The exception to note is deductions to personal income tax (i.e., payments for tertiary education and SSC) which would be regressive in relative terms if evaluated at disposable income. This is because, given the concentration of larger SSC and tertiary education payments at the top of the distribution, these deductions favor rich proportionately more than the poor.

Value added and excise taxes, on the other hand, are regressive. The concentration coefficients are positive because consumption levels are larger in absolute terms among the rich and middle classes, thus, they pay more in VAT and excises. But Kakwani indexes are negative at all income definitions, which means that these taxes have a dis-equalizing effect because their burden is proportionately larger among the poor than among the non-poor.

Indirect subsidies, namely regulated tariffs for mortgages interest, electricity and central heating have disparate distributional impacts. The subsidies to electricity are almost neutral in absolute terms (the concentration coefficient is closest to zero), meaning all population groups receive a similar share of total subsidies. The Kakwani is always positive, indicating its effect is still progressive helping the poor to afford electricity. On the other hand, regulated central heating tariffs and subsidized mortgage interest rates have high concentration coefficients and negative Kakwani indexes. In the case of the former, its concentration coefficient is even higher than that of

personal income taxes and social security contributions (Figure 5). That means that high-income households receive a share of this subsidy that is even larger than the share these groups contribute to personal income tax. Consequently, this is a highly regressive subsidy. This makes the interest rate on mortgage the only regressive subsidy in both relative and absolute terms.

All this analysis on progressivity of taxes can be illustrated in a single figure. The concentration curve is commonly used in the analysis of distributional issues. It shows the relationship between the cumulative percentage of the population on the horizontal axis, ranked by income and beginning with the poorest on the left, and the cumulative percentage of taxes, or transfers or incomes, on the vertical axis. The concentration and Gini coefficients are defined as twice the area between the concentration curve of income (in red, in Figure 6) and the line of equality, the 45° line running from the south-west corner to the north-east corner (a dotted line, in Figure 6). Given the definitions of absolute and relative progressivity, the area around the concentration curve of market incomes, defines whether a specific fiscal intervention is progressive or not. In the case of transfers, concentration curves above the diagonal indicate a progressive intervention in both absolute and relative terms. Concentration curves between the concentration curve of incomes and the diagonal are progressive in relative terms but regressive in absolute terms. And concentration curves to the right of the concentration curve of incomes are regressive in both relative and absolute terms.

Figure 7 summarizes the progressivity impact of all taxes and transfers considered in this paper. Social Security contributions and personal income tax have concentration curves to the left of the concentration curve for market income, whereas curves for deductions, VAT and Excise taxes lay to the right of this but still to the right of the diagonal. Hence, PIT and SSC are progressive in absolute and relative terms, while VAT and excise taxes are progressive in absolute terms but regressive in relative terms (top left panel, Figure 7). Pensions and social welfare transfers, whose concentration curves lay to the left of the diagonal, are progressive in both relative and absolute terms; while Child Money is almost on the diagonal indicating a neutral distribution in absolute terms, but still progressive in relative terms (top right panel, Figure 7). Indirect transfers are all regressive in absolute terms (their concentration curves lay to the right of the diagonal), with the subsidy of mortgage interest being also regressive in relative terms (bottom left panel, Figure 7). Finally, in-kind transfers are all progressive in relative terms (their curves lay to the left of the concentration curve of incomes) but only slightly progressive in absolute terms. Rather, their distributions are almost neutral in terms of budget allocation, except for tertiary education that is slightly regressive in absolute terms (bottom right panel, Figure 7).

### **Total Redistributive and Poverty effects**

The tax-and-transfer system in Mongolia leads to a reduction of inequality and poverty. The Gini of income declines from 0.4183 for market income (that is incomes before taxes or transfers) to 0.3752 for consumable income (that is monetary income that can be spent in goods and services). After including in-kind transfers (i.e., public education and health), final income Gini coefficient descends to 0.3507. Other inequality indexes show a similar trend. Poverty rates (using income as welfare aggregate) fall from 47.31 to 31.96 percent, using the same income concepts. Poverty gap and poverty severity show a similar decline (see Table 5). Namely, the tax-and-transfer system in Mongolia helps reduce poverty and inequality.

There are several contributors to the distributive impacts of transfers, and their marginal impact vary from one policy to another. Among monetary transfers, state pensions (which include both contributory and non-contributory, because they cannot be distinguished in the survey) have the largest impact in the reduction of the Gini coefficient (3.4 Gini points of reduction of final income), followed by other social assistance transfers (merit and motherhood programs represent a reduction of 1.8 Gini points) and the Child Money program (1.2 Gini points). Pre-school and Primary/Secondary education also contribute to a reduction of inequality (0.5 and 1.2 Gini points, respectively). Electricity and heating subsidies reduce inequality in 0.7 Gini points and public health services in 0.5 Gini point. Last in the list, PIT deductions and public expenditures in tertiary education have the smallest inequality reduction effect of only 0.4 and 0.2 Gini points. In stark contrast, the mortgage subsidies -because of being concentrated on middle and high-income groups- increase inequality in 1.2 Gini points (see Table 6).<sup>26</sup>

From the tax side, impacts on inequality are also diverse but limited. VAT and excise taxes increase inequality in about 1 Gini point. On the other hand, personal income taxes and Social Security contributions reduce the Gini of final income in 0.7 and 0.4 Gini points, respectively. These results are compatible with the usual finding that taxation is not the main driver of fiscal policy redistribution effects (more on this in the international comparison below). It also coincides with the observation made before that, in the case of Mongolia, PIT, SSC, VAT and excise taxes represent a small portion of fiscal revenues, and hence of public expenditures, due to the large influence of corporate and royalties' taxation that characterize mineral commodity-based economies. The redistributive impact of fiscal policy is mostly undertaken through public expenditures.

The equalizing effect of in-kind transfers in health and education is the result of low and middle-income groups making a larger use of public pre-school and primary/secondary education than high income groups. In the case of pre-school, primary and secondary education, at least 50 percent of the population of households in market income deciles 2 to 7 attends public schools. Less than 30 percent of those households in top and bottom deciles. The use of public health services goes from nearly 20 percent of the population living in the poorest deciles, to just 5 percent for those in top two deciles. In contrast, public tertiary education is more often used by high income families. Around 5 percent of the population in the three poorest deciles attend tertiary schools, but more than 10 percent in deciles 5 to 9. The lower incidence of public tertiary education in the top decile is perhaps due to attendance to private schools, as perhaps is also the case in lower levels of education (see Figure 8).

Similarly, the dis-equalizing effect of subsidized interest rates on mortgages is due to the concentration of mortgage loans among families in the top of the income distribution. Less than 2

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<sup>26</sup> All the numbers in this paragraph refer to marginal effects of fiscal policy at final income. The marginal effect of a given tax or transfer is defined as the difference between the Gini coefficient of an ending income concept (for instance, consumable income) without the intervention in question, and the Gini coefficient of the same income concept including the intervention. Kakwani indexes and other measures of progressivity refer to only one fiscal intervention, and one intervention may be very much progressive but -if, for instance, of small size- have little impact upon inequality. Marginal effects are needed to ascertain the effect of a given fiscal intervention when multiple interventions happen at the same time. For a technical discussion see (Enami, Lustig, & Aranda, 2017) and (Lustig & Higgins, 2017). A similar measure, often used in the literature, of redistributive capacity of a tax is by (Reynolds & Smolensky, 1977).

percent of the household in the bottom four deciles have a mortgage loan, whereas in the top decile of the distribution more than 17 percent of the households have a mortgage loan. A similar pattern is observed regarding connections to central heating. Less than 10 percent of households in deciles 2 to 6 have connection to central heating, whereas households in deciles 7 to 10 have up to 60 percent connectivity. In electricity, the pattern is less pronounced, but also favors those at the top. The share of electricity connections rises from 70 percent for households in the 3<sup>rd</sup> decile to 90 percent for households in the 10<sup>th</sup> decile (see Figure 9). In the end mortgages have a very regressive impact because almost no household at the bottom of the distribution gets mortgage loans and the total amount of the subsidy is substantial (1.5 percent of GDP, see Table 1), whereas the electricity subsidies, although sizable as well, are more equitably distributed and households at the bottom of the distribution get quite high access.<sup>27</sup>

If taking a socio-demographic perspective, the elderly is the group most favored from the tax-and-transfers system in Mongolia. Elderly population, and families with elderly members, as well as households with out-of-labor force household heads (which are usually pensioners) are the demographic groups with the largest poverty rate reduction because of tax-and-transfer policies. Other demographic groups, such as couples with children or households with active household heads see much smaller reductions in poverty rates. A small regional bias is observed in terms of redistributive impact as Ulaanbaatar, followed by Aimag and Soum centers, has a larger fall in poverty rates than rural areas in the countryside because of tax-and-transfer policy. (see Table 7).

## V. Some international comparisons and policy implications

The literature on international comparisons regularly indicates an equalizing effect of tax-and-transfer systems. In general, this effect is found large in developed countries when compared to developing countries (e.g. OECD vs Latin America) and mostly driven by social expenditures rather than by taxation.<sup>28</sup> This analysis of the Mongolia fiscal redistribution effect shows a similar pattern: direct monetary transfers like pensions, Child money and in-kind transfers in basic education have a marginal effect in reducing inequality of 3.4, 1.2 and 1.2 Gini points. In contrast, personal income tax reduces inequality by only 0.7 Gini points and Social Security contributions by only 0.4 Gini points (see Table 6).

Mongolia has features in its redistributive fiscal system like other developing countries. Using the same methodology, comparison with eight countries studied by (Inchauste & Lustig, 2017) shows that Mongolia has, in most cases the same direction of impacts. That is, direct taxes and transfers as well as in-kind transfers reduce inequality. The exception is indirect transfers in Mongolia which, in contrast to other countries, have an inequality-increasing effect. In terms of magnitudes, the redistributive effect of Mongolian taxes and transfers stands in the middle of the effects observed in the countries of the comparison. For instance, public health reduces inequality in

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<sup>27</sup> The volume of subsidies allocated by the Mongolian government to electricity and heating companies is not explicit in official publications like the Mongolian Statistical Yearbook or Mongolian Information System. This study estimates, using the methodology explained in section III, that nearly 400 billion MNT is the value of the difference between production costs and tariffs for electricity and heating. This would represent about 1.7 percent of GDP in 2016.

<sup>28</sup> Recent studies are: (Hanni, Martner, & Podestá, 2016), (Goni, López, & Servén, 2011) and (OECD, 2008).

Mongolia in 0.5 Gini points, lower than in South Africa and the Russian Federation where the effects are 4.3 and 1.5 Gini points, but higher than Indonesia's 0.3 Gini points (Table 8).

In general terms, taxes and transfers have a positive impact in reducing income inequality and poverty, there are some policy implications to be derived from the analysis in previous paragraphs:

- a. The main social transfers are not fully funded by regular internal funding. Up to 35 percent of total expenditures in monetary and in-kind transfers is funded by corporate taxes and royalties which, given their dependence on volatile commodity prices, makes the redistributive impact of the tax-and-transfer system susceptible to fiscal unsustainability.
- b. Pensions are the most important transfer in terms of both absolute and relative progressivity. These explain the largest increase of income from groups at the bottom of the distribution, helping explain most of the poverty reduction. Families with elderly are the most favored by the tax-transfer system in Mongolia. The analysis of this paper is only short-term but, given that the share of elderly population will increase in coming years, the dependence on pensions as the main redistributive policy is also bound to increase. Consequently, fiscal sustainability of the pension system in the short and long term is the most important factor to maintain the redistributive impact of fiscal policy in Mongolia.
- c. Two large transfer programs, on the other hand, despite representing a large share of the budget, have limited redistributive impact. A more targeted allocation of these funds towards groups in the bottom of the distribution would allow for larger transfers to these groups and, hence a more efficient poverty reduction effect of the transfers. Reallocation of these funds would enhance the poverty and inequality reduction impact of the fiscal system:
  - i. On the one hand, the subsidies on mortgage interest represent a large percentage of budget expenditures (around 1.5 percent of GDP) but this is mostly allocated in top income groups with a regressive impact both in absolute and relative terms.
  - ii. On the other hand, the Child Money program is also a relatively large transfer program (around 1 percent of GDP) that is neutral in terms of absolute progressivity.
- d. Finally, the 10 percent flat personal income tax is only slightly progressive in relative terms and collects only 9 percent of government revenues (much less than VAT and Social Security contributions, 20 percent each). There seems to be room for making this revenue source more effective in terms of revenue collection and more progressive in terms of redistribution.

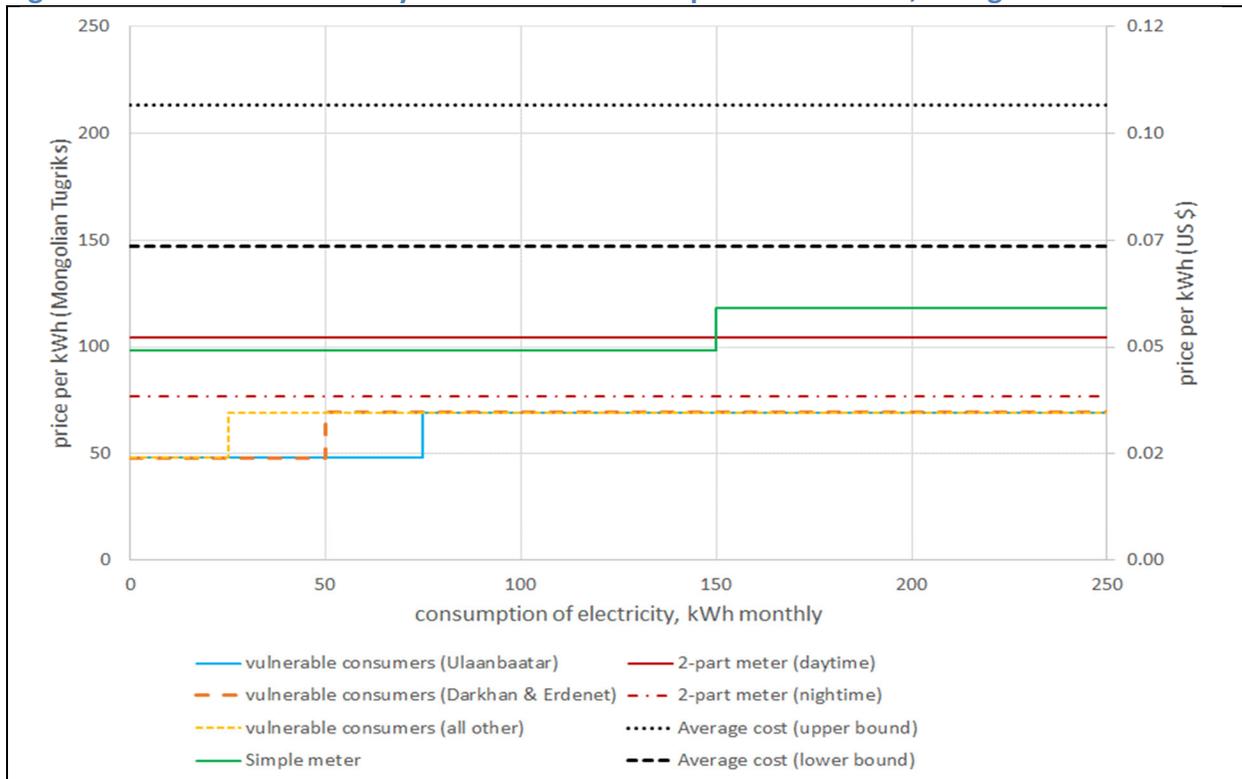
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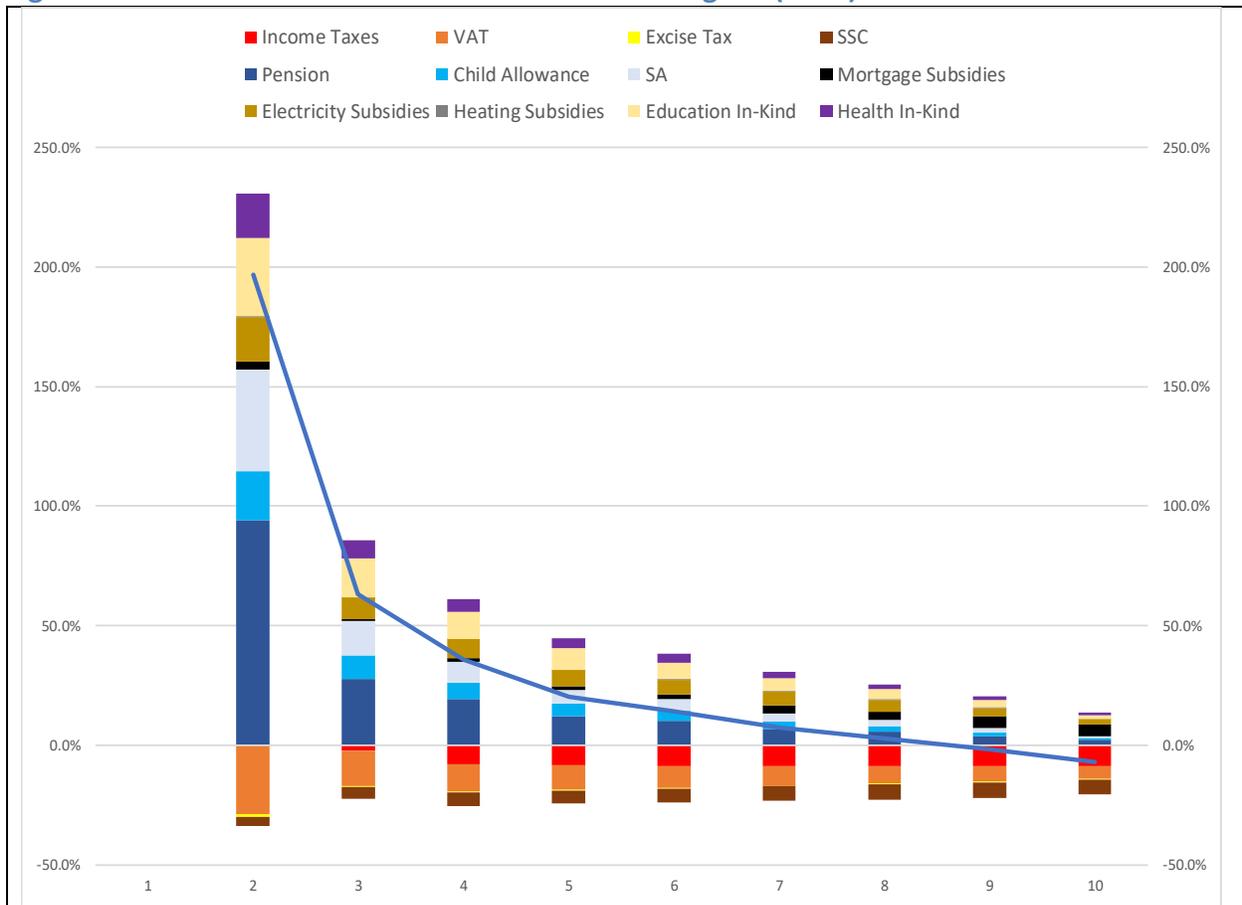
## Figures

**Figure 1: Residential Electricity Tariffs and estimate production costs, Mongolia 2016**



Source: Data from (Schlirf, Johansen, Georgieva, & Wu, 2018)

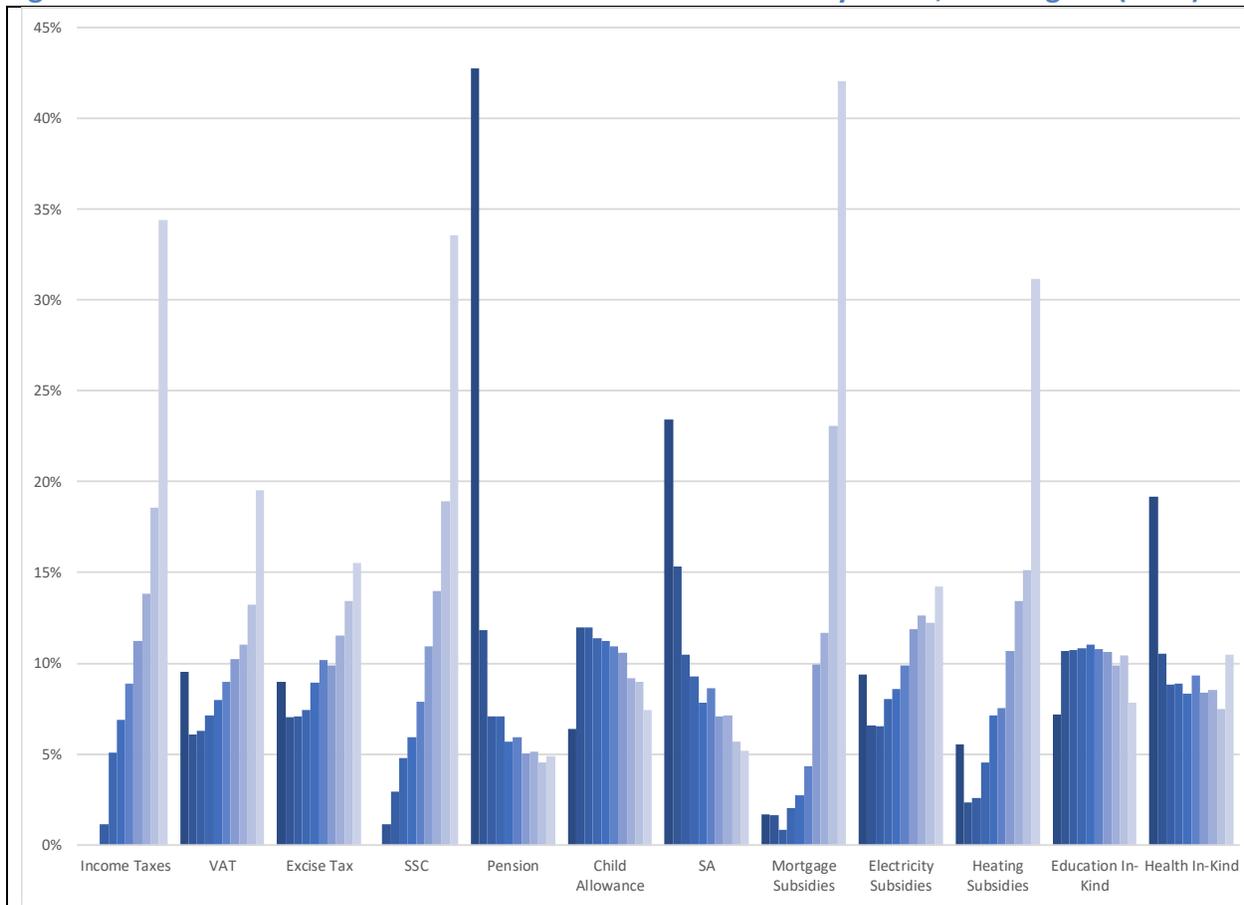
**Figure 2: Relative Incidence of main transfers in Mongolia (2016)**



Source: Authors elaboration using HSES 2016

Notes: Relative incidence refers average tax or transfer in each decile as a percentage of the average pre-tax-transfer income in the same decile. Horizontal axis stands for deciles of market income (i.e., before tax-and-transfers income). Line stands for relative incidence of total net benefits.

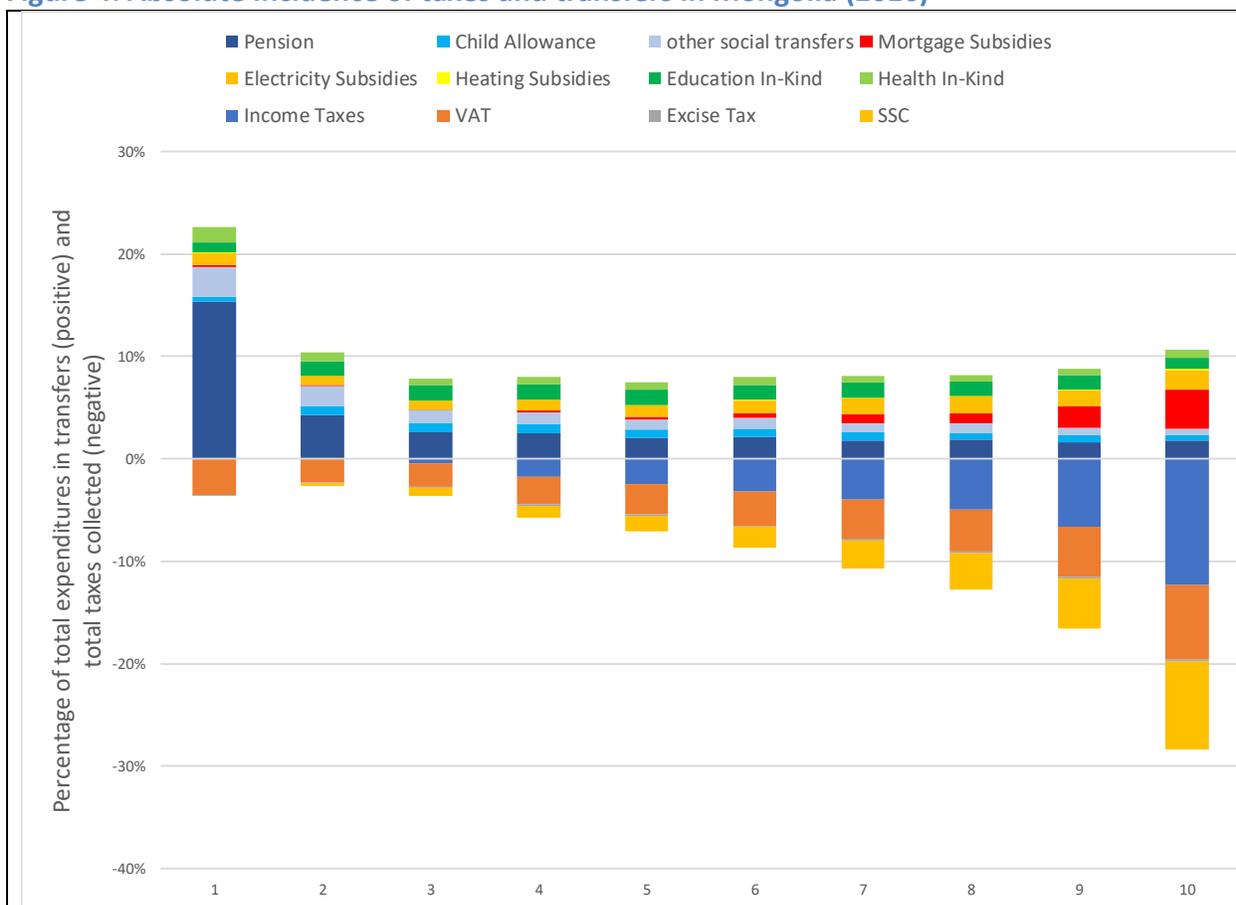
**Figure 3: Distribution of tax collection and transfer allocation by decile, in Mongolia (2016)**



Source: Authors elaboration using HSES 2016

Notes: Each bar represents the share of taxes paid (or transfers received), out of total specific tax collection or transfer expenditure, by each pre-tax-transfer income decile.

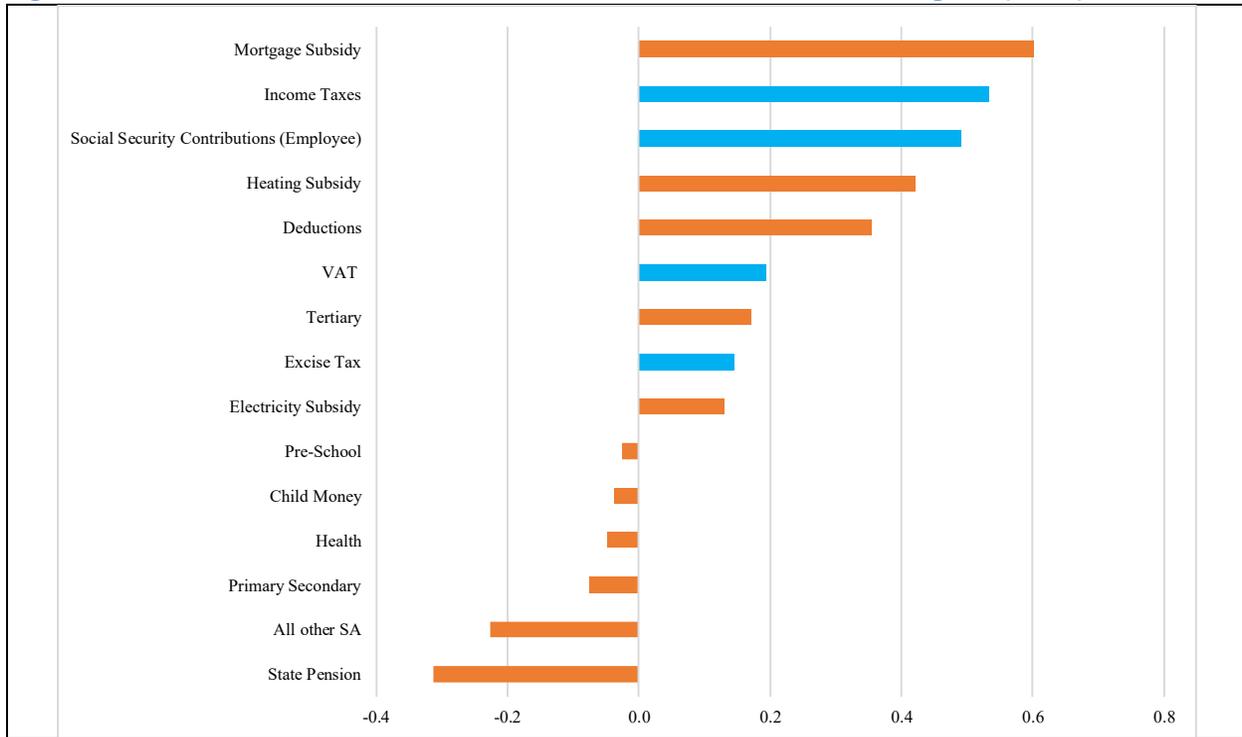
**Figure 4: Absolute Incidence of taxes and transfers in Mongolia (2016)**



Source: Authors elaboration using HSES 2016

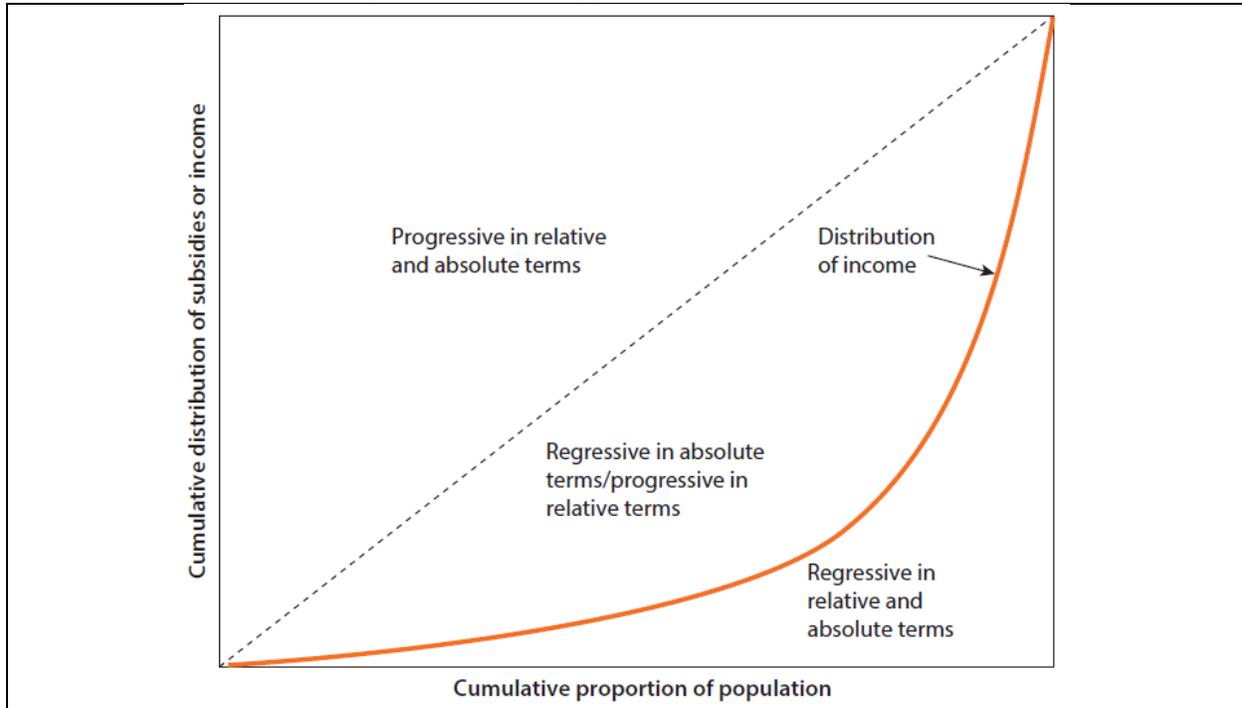
Notes: Absolute incidence refers to share of transfers received (or taxes paid) in each decile as a percentage of the total expenditures (or taxes collected). Horizontal axis stands for deciles of market income (i.e., before tax-and-transfers income).

**Figure 5: Concentration Coefficients for main tax and transfers in Mongolia (2016)**



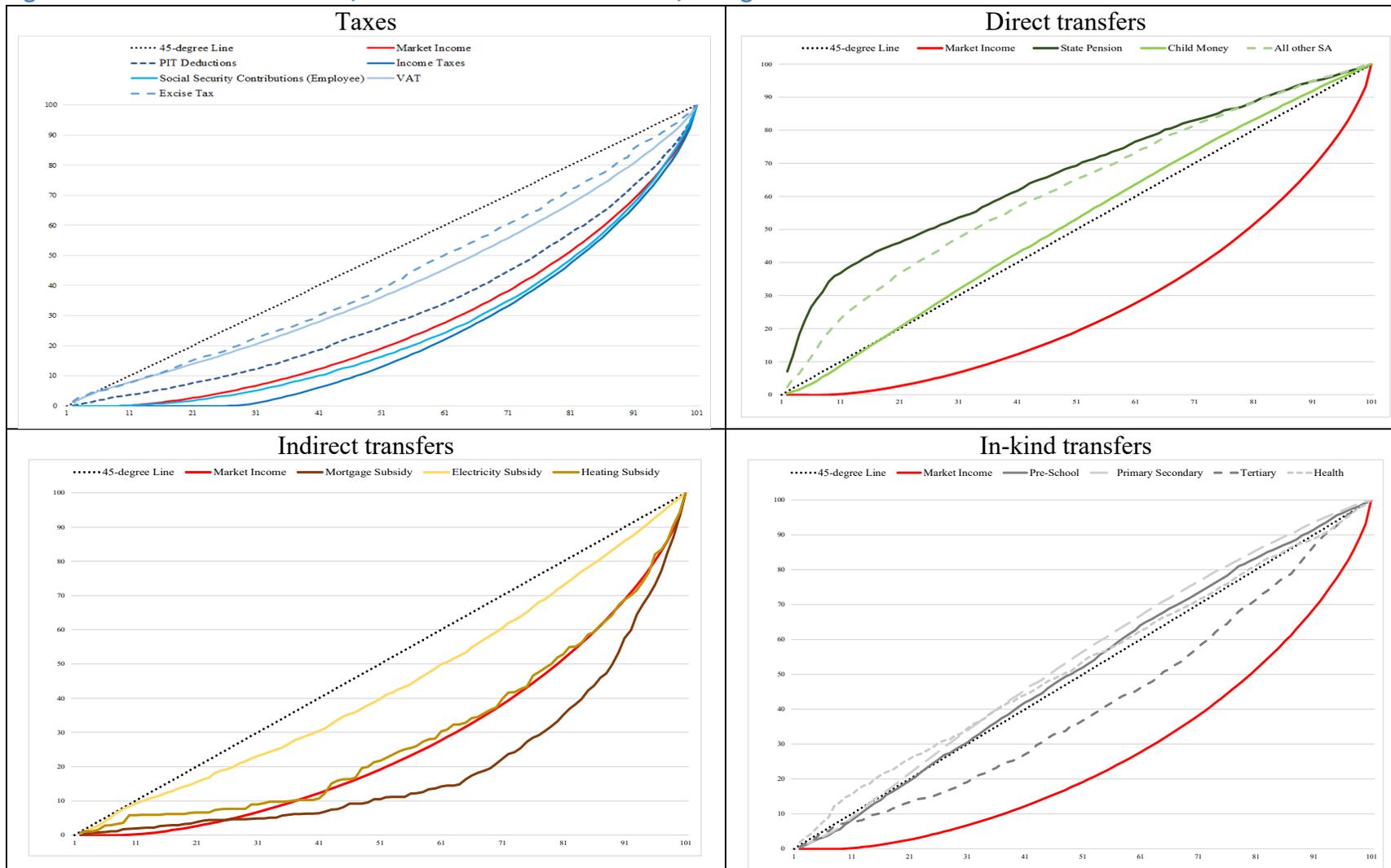
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**Figure 6: Definitions of Progressivity and Regressivity (for transfers)**

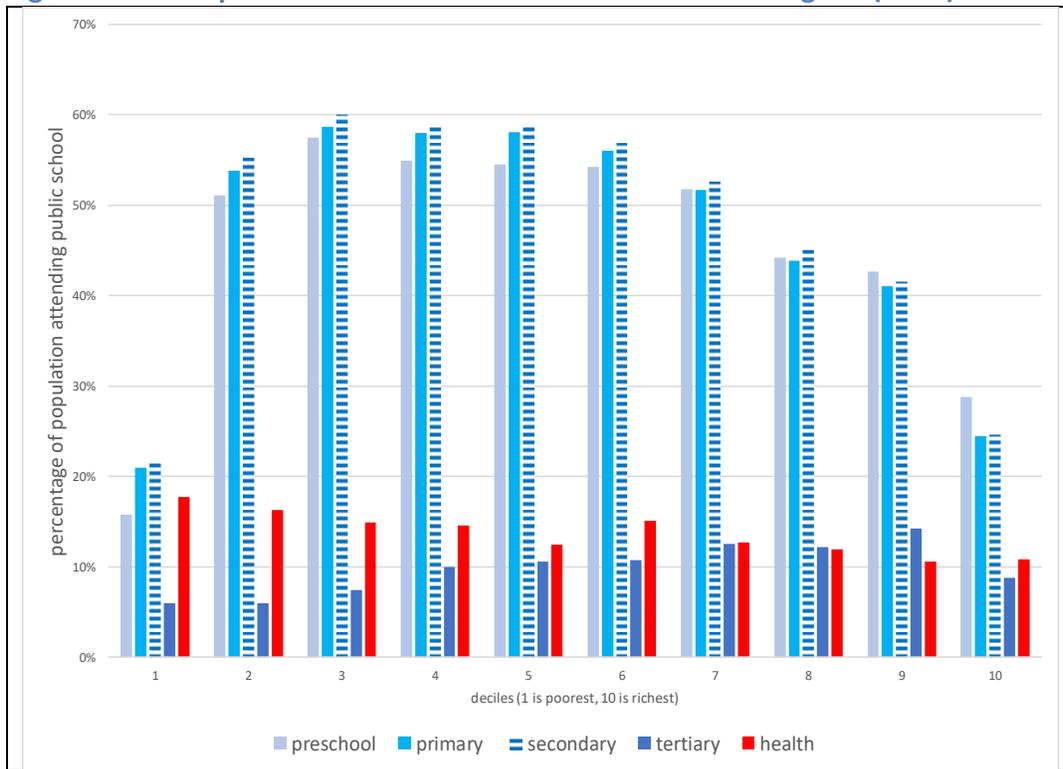


Source: (Sousa, Hernández Oré, & Tornarolli, 2018), page 118.

Figure 7: Lorenz curves for taxes, transfers and Market Income, Mongolia 2016

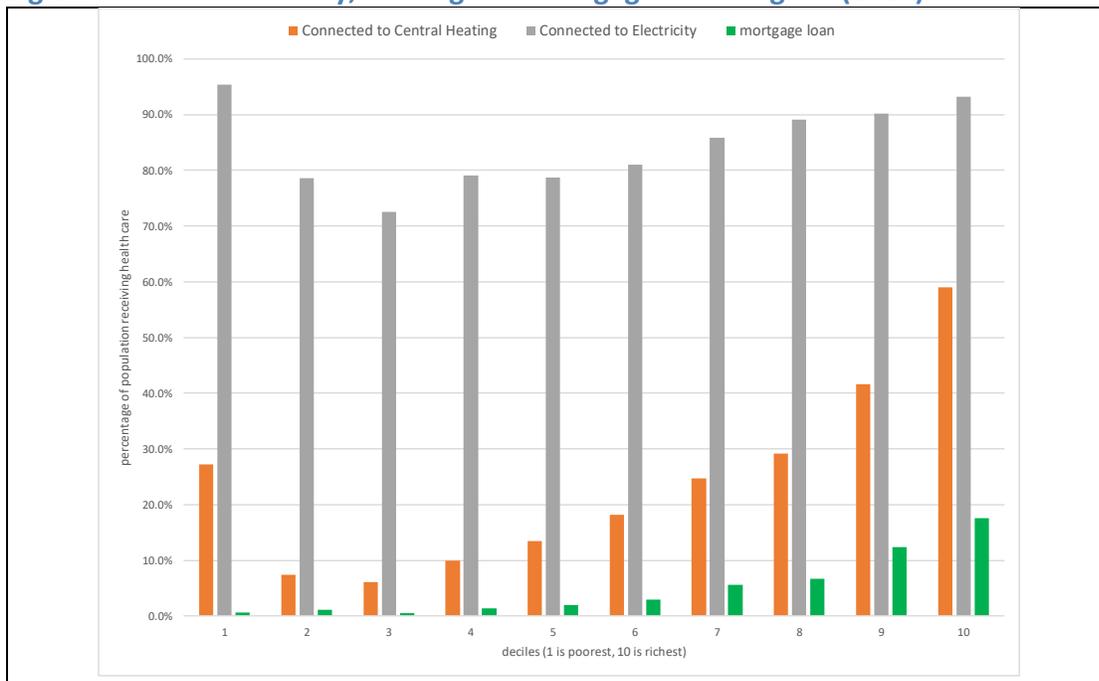


**Figure 8: Use of public education and health services in Mongolia (2016)**



Source: Authors elaboration using HSES 2016

**Figure 9: Use of electricity, heating and mortgages in Mongolia (2016)**



Source: Authors elaboration using HSES 2016

## Tables

**Table 1: Main revenues and expenditures in Central Government's budget, Mongolia (2016)**

		tugriks (millions)	share of budget (%)	share of GDP (%)	included in analysis?	total in survey (millions)	ratio of survey total to administrative data
<b>Revenue component</b>		5,852,075.9		24.5%			
Direct taxes							
	personal income tax	550,423.5	9.4%	2.3%	yes	625,000	114%
	property tax	104,623.3	1.8%	0.4%	no		
	corporate profits tax	510,582.4	8.7%	2.1%	no		
	net refunds	(39,995.3)	-0.7%	-0.2%	no		
Indirect taxes							
	value added tax	1,143,132.7	19.5%	4.8%	yes	654,000	57%
	import/export duties	328,461.1	5.6%	1.4%	no		
	excise tax	626,904.8	10.7%	2.6%			
	alcohol and tobacco	176,878.0	3.0%		yes	22,800	13%
	others	450,026.8	7.7%		no		
Social security contributions		1,175,932.3	20.1%	4.9%	yes	451,600	38%
Other taxes							
	royalties on natural resources	288,714.1	4.9%	1.2%	no		
	other	297,287.6	5.1%	1.2%	no		
	special purposes	10,767.4	0.2%	0.0%	no		
	Non-tax revenues	855,242.0	14.6%	3.6%	no		
<b>Spending component</b>		9,519,906.1		39.9%			
Direct transfers		2,104,000.6				1,717,000	82%
	Contributory benefits <sup>(1)</sup>	1,614,242.4	17.0%	6.8%		1,420,820	88%
	pensions <sup>(2)</sup>				yes	1,100,000	
	Unemployment benefits				no	1,481	
	social insurance benefits						
	maternity				yes	33,200	
	incapacity and others				yes	286,139	
	Non-contributory benefits <sup>(3)</sup>	489,758.2	5.1%	2.1%		291,050	59%
	child program				yes	233,000	
	HDF				yes	24,910	
	merit programs				yes	11,840	
	maternity programs				yes	21,300	
	food-stamps program				no	-	
In-kind transfers							
	Education <sup>(4)</sup>	1,338,660.5	14.1%	5.6%			
	pre-school	268,296.1	2.8%	1.1%	yes	100,300	37%
	primary and secondary	563,609.3	5.9%	2.4%	yes	203,500	36%
	tertiary	443,910.6	4.7%	1.9%	yes	119,100	27%
	other	62,844.5	0.7%	0.3%	no		
	Health care	662,987.1	7.0%	2.8%	yes	241,200	36%
Other expenditures		5,414,257.9	56.9%	22.7%	no		
Indirect transfers							
	Off-budget expenditures						
	Mortgage Subsidy				yes	279,600	
	Electricity Subsidy				yes	32,800	
	Heating Subsidy				yes	1,140	
Sources: National Statistics Office of Mongolia (2017). <i>Mongolia Statistical Yearbook 2016</i> , and tabulated data from Ministry Education, Culture and Science and Ministry of Health							
Notes:							
(1) Total transfers accruing to social security contributions and one time contributions for retirement (from 2016 Yearbook, table 15.6.1)							
(2) We include both contributory and non-contributory pensions here, because the Household Survey for 2016 does not separate this two.							
(3) Total transfers accruing to social welfare contributions (from 2016 Yearbook, table 15.6.1)							
(4) Total education expenditure and distribution by education level by World Bank staff using data from Ministry of Finance. (total is slightly different to data from Op.Cit.)							

**Table 2: Assumptions for analysis of distributive impact of taxes and transfers in Mongolia**

	MONGOLIA 2016
<b>Use of Input-output matrix for indirect taxes/subsidies</b>	
Indirect taxes calculated with an input-output matrix?	No
Indirect subsidies calculated with an input-output matrix?	No
<b>Take-up assumptions</b>	
Take-up of direct cash transfers -as reported in survey	as reported
Take-up of direct in-kind transfers -as reported in survey	as reported
<b>SSC,taxes and subsidies (shifting assumptions)</b>	
SSC: only those paid by employee, or both those paid by employee and employer are assumed to be borne by employee?	employee only
Direct taxes: burden of PIT assumed to be borne entirely by the recipient of income?	Yes
Indirect taxes: burden of VAT/excises assumed to be borne entirely by the consumer?	Yes
Indirect subsidies: benefit assumed to be borne entirely by the consumer?	Yes
<b>Tax evasion assumptions</b>	
Direct taxes	Assume that taxes on all reported income is paid
Indirect Taxes	No assumption on VAT avoidance
<b>Scaling-up/down assumptions</b>	
In-kind education services scaled up or down?	Scaled down
In-kind health services scaled up or down?	Scaled down
Taxes and subsidies scaled up or down?	No
Cash transfers include administrative costs?	No
In-kind transfers include administrative costs?	Yes
In-kind transfers include capital expenditures?	Yes
In-kind transfers include regional dispersion?	Yes (pre-school, primary and secondary average expenditure per student are Aimag specific, tertiary education and public health are national average expenditure)
<b>Treatment of special contributions</b>	
contributory pensions are treated as tax/transfer?	Direct Transfer
public sector fees are treated as taxes?	No included

**Table 3: Definition of main income concepts for distributional analysis**

<b>Income Concept</b>	<b>Description</b>
Net taxable Income	In HSES, all reported wages, nonf-farm income and income from rents are assumed to be in net terms (i.e., after personal income taxes)
Other Market Income	Own food consumption, net farm income, gifts, financial and other incomes
SSC (employee contributions)	Social Security Contributions made by the employee
<b>Market Income</b>	Grossed up Net Taxable Income + Other Market Income + SSC (employee contributions)
Education expenditures	Education (tertiary level) expenditures can be deducted for tax reporting purposes
Deductions	SSC (employee contributions) + Education expenditures
Taxable Income	Market Income - Deductions
Personal income tax (PIT)	Taxable income * flat personal income tax of 10% (If total direct taxes is <=94,000 per person then no taxes)
<b>Net Market Income (Market income - contributions - direct taxes)</b>	Market Income - PIT - SSC (employee contributions)
Direct transfers	Social Programs (social insurance such as pensions, unemployment benefits, etc; and social assistance such as merit programs, child program, etc)
<b>Disposable income (Net market income + direct transfers)</b>	Net Market Income + Direct Transfers
VAT	Flat 0.08623 rate on consumption expenditures excluding rent, health, education, and alcohol/tobacco
Excise	Flat 0.174 rate on alcohol and tobacco expenditures
Mortgage Subsidy	average interest rate (19% in 2016) minus subsidized mortgage rate (8%) by average household loan as of 2016, for households in HSES reporting a mortgage
Electricity Subsidy	(Estimate production cost minus tariff) * kWh of consumption by household defined according to type of tariff
Heating Subsidy	(Estimate production cost minus tariff) * heating consumption (in square meters of household size) by household defined according to type of tariff
<b>Consumable income (Disposable income - indirect taxes + indirect subsidies)</b>	Disposable Income - VAT - Excise Taxes + Indirect taxes (mortgage, electricity and heating subsidies)
Monetized In-Kind	Public education and public health are monetized (average expenditure per student/patient) and allocated to households with students and/or patients
<b>Final Income (Consumable income + in-kind transfers)</b>	Consumable Income + Monetized In-Kind

**Table 4: Concentration and Kakwani coefficients, in Mongolia (2016)**

		CONCENTRATION COEFFICIENTS	KAKWANI COEFFICIENTS			
			Market Income	Disposable Income	Consumable Income	Final Income
<b>market income</b>						
	PIT deductions	0.35	0.101	-0.039	-0.029	-0.058
	income taxes	0.53	0.078	0.218	0.208	0.238
	social security contributions	0.49	0.035	0.175	0.166	0.195
<b>taxable income</b>						
	state pensions	-0.31	0.769	0.629	0.639	0.609
	child money	-0.04	0.492	0.352	0.362	0.332
	other social assistance	-0.23	0.682	0.542	0.552	0.523
<b>disposable income</b>						
	VAT	0.19	-0.262	-0.122	-0.131	-0.102
	excise taxes	0.15	-0.310	-0.170	-0.180	-0.150
	Mortgage interest subsidy	0.60	-0.146	-0.286	-0.276	-0.306
	Electricity Subsidy	0.13	0.325	0.185	0.195	0.166
	Heating Subsidy	0.42	0.034	-0.106	-0.097	-0.126
<b>consumable income</b>						
	In-Kind Education					
	pre-school	-0.03	0.482	0.342	0.351	0.322
	primary & secondary	-0.08	0.531	0.391	0.400	0.371
	tertiary	0.17	0.284	0.144	0.154	0.125
	In-Kind Health	-0.05	0.504	0.364	0.374	0.344
<b>final income</b>						

Source: Authors elaboration using HSES 2016

Note: The concentration coefficient measures the cumulative proportion of benefits (or taxes) received by each group of the population ranked by level of income (or some other wellbeing indicator). A negative concentration coefficient means that poorer members of the population receive a proportion of taxes (or benefits) larger than their share of the population. The Kakwani coefficient, a measure of progressivity, is computed as the difference between income Gini coefficient of a given income definition (e.g. market income, disposable income) and the concentration coefficient of benefits (the reverse in the case of taxes). A positive Kakwani index means the tax (benefit) is progressive (regressive).

**Table 5: Redistributive and Poverty effect of taxes and transfers in Mongolia (2016)**

	Market Income	Net Market Income	Disposable Income	Consumable Income	Final Income
	(1)	(2) = (1) - Direct Taxes - SSC (EE)	(3) = (2) + direct transfers	(4) = (3) - indirect taxes	(5) = (4) + inkind transfers
<b>Inequality</b>					
Gini index	<b>0.4183</b>	<b>0.4096</b>	<b>0.3626</b>	<b>0.3752</b>	<b>0.3507</b>
Theil index	0.3220	0.3118	0.2434	0.2581	0.2257
90/10	7.8513	6.8426	5.1933	5.7006	4.9468
<b>Poverty headcount</b>	<b>47.31%</b>	<b>54.20%</b>	<b>37.84%</b>	<b>38.88%</b>	<b>31.96%</b>
<b>Poverty gap</b>	25.34%	28.25%	13.22%	14.42%	10.34%
<b>Poverty severity</b>	18.76%	20.16%	6.72%	7.70%	5.00%

Source: Authors elaboration using HSES 2016

Note: Poverty indexes use income as welfare aggregate (differ from official estimates, which use consumption as welfare aggregate).

**Table 6: Marginal contributions to redistribution by taxes and transfers in Mongolia (2016)**

		From market income to consumable income	From market income to final income
<b>redistributive policy</b>			
direct taxes:			
	income taxes	0.006	0.007
	social security contributions	0.004	0.004
direct transfers:			
	PIT deductions	0.001	0.004
	state pensions	0.037	0.034
	child money	0.012	0.012
	other social assistance	0.020	0.018
indirect taxes:			
	VAT	-0.009	-0.008
	excise taxes	-0.001	0.000
indirect subsidies:			
	Mortgage Subsidies	-0.012	-0.012
	Electricity Subsidies	0.008	0.007
	Heating Subsidies	0.000	0.000
in-kind transfers:			
	education		
	pre-school		0.005
	primary & secondary		0.012
	tertiary		0.002
	health		0.005

Source: Authors elaboration using HSES 2016

Note: The marginal contribution shows the difference between the Gini coefficient of an income concept (say market income) without a given fiscal intervention and the Gini coefficient of the relevant income concept (say final income) including the fiscal intervention. All other interventions are kept constant.

**Table 7: Changes in poverty rate by demographic group, Mongolia (2016)**

	Market Income	Net Market Income	Disposable Income	Consumable Income	Final Income	Total reduction in poverty rate
<b>By household type</b>						
couple without children	30.5%	34.8%	11.0%	13.3%	11.0%	-19.5%
couple with children	40.0%	47.9%	41.2%	42.4%	34.5%	-5.5%
couple w/children and elderly	62.7%	70.6%	27.1%	28.8%	23.0%	-39.8%
elderly	81.7%	83.6%	3.4%	3.8%	3.5%	-78.2%
<b>By type of head:</b>						
out of labor force	74.4%	79.9%	44.4%	44.5%	37.1%	-37.3%
unemployed	78.5%	87.0%	75.9%	77.2%	66.2%	-12.3%
agriculture	58.2%	64.3%	52.3%	58.2%	50.5%	-7.8%
manufacturing	30.2%	38.2%	30.0%	31.5%	25.0%	-5.2%
services	29.1%	36.8%	28.7%	28.4%	22.2%	-6.9%
<b>By location of household:</b>						
Ulaanbaatar	39.7%	47.0%	30.1%	29.0%	22.9%	-16.8%
Aimag centre	51.4%	58.1%	40.9%	41.5%	34.7%	-16.7%
Soum center	51.9%	58.4%	43.5%	45.8%	37.5%	-14.4%
Countryside	58.3%	64.9%	49.9%	56.4%	48.2%	-10.1%

Source: Authors elaboration using HSES 2016

**Table 8: Marginal effect upon Gini coefficient (at final income) (various countries)**

	Mongolia	Armenia	Georgia	Ghana	Indonesia	Jordan	Russian Federation	South Africa	Sri Lanka
	2016	2011	2013	2013	2012	2010	2010	2010	2010
Direct taxes	0.011	0.021	0.022	-0.006	0.000	0.007	0.014	0.043	0.003
Direct transfers	0.068	0.092	0.100	0.001	0.004	0.005	0.020	0.052	0.004
Indirect taxes	-0.008	0.001	-0.014	0.002	-0.002	-0.001	-0.001	0.013	0.006
Indirect subsidies	-0.050	0.000	0.000	-0.001	0.001	0.004	0.032		0.005
In-kind transfers									
Pre-school	0.005	0.001	0.002	0.001		0.000		0.000	0.011
Primary	0.012	0.005	0.016	0.013	0.009	0.013		0.030	
Secondary				0.002		0.002		0.017	
Tertiary	0.002	0.000	0.001	-0.008	-0.001	0.000		-0.001	0.000
Health	0.005	0.004	0.008	0.007	0.003	-0.009	0.013	0.043	0.006

Source: Data from Table 6 and from table 1C.1, page 34 from (Inchauste & Lustig, 2017).

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