FISCAL INCIDENCE IN ARMENIA

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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

We use methods developed by the Commitment to Equity Institute and data from the 2011 Integrated Living Conditions Survey (ILCS) to assess the effects of government taxation and social spending on poverty and inequality in Armenia. We find that Armenia achieves considerable redistribution despite a relatively small budget. More than half of this redistribution is due to old-age pensions. Results for poverty reduction are less encouraging. At a poverty line of US$2.50 per day, which is similar to Armenia's national poverty line, the fisc lowers the headcount by 0.084, but at the US$4.00 poverty line, the fisc actually increases the headcount slightly (0.019). Even though transfers are reasonably well-targeted in Armenia, taxes, especially indirect taxes, do fall on poorer households, thus offsetting the poverty-reducing effect of public expenditures. Expenditure targeting in Armenia is very good. Expenditures that are supposed to help the poor and vulnerable go disproportionately to the poor, as they should. At the same time, expenditures on services that should be universal – education and health care – are spread fairly evenly across the population, as they should be. Given already good targeting, Armenia's only option for greater redistribution is larger budgets for the best-targeted expenditures such as the Family Benefit.

JEL Codes: H22, H5, D31, I3

Keywords: Fiscal incidence, social spending, inequality, poverty, Armenia

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1. Introduction

Armenia is an interesting case for an incidence analysis in many ways. Although there are no reliable measures of living standards before independence in 1991, living standards were almost certainly in the middle-income range or higher. Social security and social protection systems were well developed, and education and health services were both universal and publicly provided. In short, Armenia almost surely did not look like a developing country.

The end of the Soviet Union brought independence but also an extraordinary economic crisis. Real gross domestic product (GDP) fell by half from 1991 to 1993 as the economy, once tied to and integrated with the Soviet economy, collapsed. By 1993, GDP per capita was a mere US$565 (constant 2005 U.S. dollars), poor by any standard. This left the government with very limited funds, so social expenditures also suffered greatly.

The economic collapse and political transition did, however, leave the government room to institute radical reforms, which it carried out in many areas, mostly to positive effect. The economy began to grow again in the mid-1990s, and accelerated dramatically in the 2000s before the 2008 financial crisis, with concomitant reductions in poverty. Armenia is again a middle-income country, but an unusual one. Spending on social protection and social services has recovered but remains small when compared with other middle-income and European and Central Asian countries and probably when compared with Armenia's own past. Tax revenue is also low. As a result, redistribution is not as extensive as one might expect.

This working paper uses household survey data, the 2011 Integrated Living Conditions Survey (ILCS), and budgetary data for the same year to assess the distributional consequences of government taxation and spending. Targeting for most social expenditures and taxes is quite good in Armenia. Expenditures like education and health care, which should be universal, are spread evenly across the population (though coverage is less than universal in most cases), while programs meant to be targeted toward the poor and disadvantaged by-and-large are. Yet overall, Armenia achieves a redistribution of income through the fisc[1] that is somewhat less than that in most middle-income countries in Latin America and much less than that found in the richer countries of Europe. The main reason that Armenia's better-than-average targeting does not generate more redistribution is that, except for pensions from the social security system, social expenditures are small relative to GDP. Tax incidence is also in line with what one would expect: direct taxes are progressive, while indirect taxes are slightly regressive.

Every incidence analysis should include a preemptory caution. When we find that one tax or expenditure is more redistributive to the poor than another, the temptation is to conclude that the former is preferable. But it is important to remember that redistribution is only one of many criteria that matter when making public policy. Not all redistributive taxes or expenditures are good ones,

[1] Throughout the working paper, "the fisc" denotes both government revenue collection and expenditure.

and not all good taxes or expenditures are redistributive. The results of this study and of all incidence studies are one input to public policy making, one that should be weighed with other goals before deciding that a tax or expenditure is desirable.

2. Methods and Approach

The working paper uses the standard methods described in Higgins and Lustig (2016) with one exception: we always treat pensions as transfer payments rather than deferred income. Although Armenia does have a tax on labor income and does pay larger pensions to those who have paid that tax during their working years, the social security system is not independent of the central government budget, which draws on general tax revenues as well as social security taxes to fund pensions. As such, treating pensions as transfers is consistent with the way Armenian officials think about and pay for them. The working paper also includes a sensitivity analysis that treats pensions as deferred compensation and reports key differences between that analysis and our main one.

The survey data for this study come from the 2011 ILCS, the most recent survey to which we have access.[2] In addition, we use 2011 budget information to estimate some of the information needed, most specifically the amount of spending per beneficiary on public education and health services.

Construction of the Income and Expenditure Variables

Disposable Income

Our construction of the five Commitment to Equity (CEQ) income concepts starts with disposable income and works backward to market incomes and forward to final incomes.[3] We assume that incomes reported in the ILCS are closest to disposable income.[4] ILCS income and expenditure data are collected using diaries. Responding households are asked to record all inflows and outflows every day for a month. We count as disposable income all reported inflows except asset sales, loans, and withdrawals from bank accounts. We then add to this 2.75 percent of household expenditures as implicit income from owner-occupied housing. This share is that found for the rental value of owner-occupied housing in the national income accounts in 2011. Most households in Armenia own their home. For the few that do not, we do not make the 2.75 percent adjustment.

Most poverty and inequality analysis done in Armenia is based on household expenditures rather than incomes, so we also include a second "disposable income" variable that is total household expenditures, plus a 2.75 percent adjustment for owner-occupied housing. The correlation between this expenditure measure and the disposable income measure is only 0.40, so even though most

[2] For a description of the Armenian ILCS, see NSSRA 2012b, 11–13.

[3] For a more detailed discussion of the CEQ income concepts used throughout this paper, Inchauste and Lustig (2017).

[4] This is because we use the income variable constructed by the National Statistical Service of the Republic of Armenia (NSSRA), which includes transfer payments.

CEQ analysis is done in terms of incomes, we carry out a parallel sensitivity analysis based on the expenditure data in Armenia. The expenditure variable that we use is calculated by the National Statistical Service of the Republic of Armenia (NSSRA) and includes expenditures, own-consumption, gifts, and an imputed use value for durable goods.

Net Market Income

To create net market income, we subtract direct monetary transfers from disposable income. The ILCS diary for inflows includes the following categories, which we assume are monetary transfer payments: pensions, compensation for privileges, family benefits, child benefits, unemployment benefits, other benefits, and student stipends.[5]

The diary itself does not allow us to distinguish contributory from noncontributory pensions. However, the main household questionnaire gathers detailed information about "social groups" to which individual household members belong that would entitle them to certain benefits. Among these is a set of "pensioner" characteristics: labor, social, and military. We assume that those who are in the "labor pensioner" group receive contributory pensions, while those in the other groups receive noncontributory pensions.

We then construct two direct transfer variables, consistent with the CEQ methodology. The first is all transfers except contributory pensions. This variable treats contributory pensions as deferred compensation (wages) for work done in the past rather than as a transfer payment and therefore part of market income. However, because significant shares of "contributory" pensions are funded through general revenues in many countries, including Armenia, we include a second variable that treats all pensions, including contributory, as transfer payments.

Net market income is then disposable income less these direct transfers. For the second disposable income estimate, based on expenditures, our estimate of net market income can be negative if households' expenditures in the 30 days of the diary are less than their transfer payments. This happens in 0.5 percent of households for the more narrow definition of monetary transfers without contributory pensions and in 7.7 percent of households when we include contributory pensions as transfers. In these cases, we truncate net market income at zero. For the first definition of transfers, exclusive of contributory pensions, this makes very little difference. For the second definition, the truncation raises the average household net market income a little more than 1 percent, but it may have a larger effect on poverty and especially inequality estimates.

In all, we have four net market income variables based on the two-by-two classification of (income versus expenditure) by (exclude versus include contributory pensions).

[5] "Compensation for privileges" refers to carry-over pensions from the Soviet era that are now a small share of all transfer payments.

Market Income

Market income is net market income plus all direct taxes and social security contributions (SSC) paid.[6] The ILCS does not ask about taxes paid, so we must simulate these values. We assume that employee income and self-employed income for formal sector workers pay statutory rates for both personal income tax (PIT) and SSC. At the same time, there is widespread agreement that tax evasion through informality is an important problem in Armenia, so we assume that informal self-employed income pays neither PIT nor SSC. It is not possible to identify the owners of corporations in the ILCS, so we do not simulate the corporate income tax.

Our formal-informal distinction uses the NSSRA definition.[7] We should note that wage income in the diary is aggregated across jobs, so workers with two jobs could mix formal and informal income. We assume that if either job is formal, then all wage income is formal and thus taxed. This risks some misclassification, but it will be rare. There are only 461 second jobs in the survey (compared with 12,388 primary jobs), and there are only 8 workers whose second job is formal and first job is not.

PIT rates are very simple in Armenia. The tax rate is 10 percent for income up to dram 80,000 (US$289 at purchasing power parity [PPP]) per month and 20 percent for any income in excess of dram 80,000. All tax payers are entitled to a standard personal deduction of dram 32,500 (US$118 at PPP) per month, so this is the threshold at which people begin to pay PIT. The employee share of SSC is also deductible. Withholding is final, so assuming full compliance, our simulations should reflect actual taxes paid accurately.

SSC are also straightforward. Employees pay a flat 3 percent of earnings. Their employers pay dram 7,000 (US$25 PPP) per month plus 15 percent of wages greater than dram 20,000 (US$72 PPP) per month up to dram 100,000 (US$362 PPP) per month. Wages greater than dram 100,000 per month pay dram 19,000 plus 5 percent of wages greater than dram 100,000. We assume that the incidence of both contributions falls entirely on employees.

A few households in the ILCS report lottery winnings. These are taxed at 10 percent if the winnings are greater than dram 10,000 (US$36 PPP) per month. We include these direct taxes in our simulation of PIT.

We add the PIT, SSC, and lottery taxes to the four net market income variables to get four comparable market income variables.

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[6] There is one exception: for the sensitivity analysis that treats pensions as deferred income, we do not treat social security contributions as taxes.

[7] A formal sector worker is an employee with a written contract, a member of a cooperative, an employer, or an own-account worker whose business is legally registered.

Consumable Income

To calculate consumable income, we return to our disposable income measures and subtract indirect taxes paid. There were no indirect subsidies in Armenia in 2011. Indirect taxes in Armenia include import duties; value added tax (VAT); and excises on petroleum products, alcoholic beverages, and tobacco products.[8]

The VAT system in Armenia is straightforward. The standard rate is 20 percent, with exemptions only for education, books, paper, jewelry, and financial services including insurance. In addition, small firms with revenues of less than dram 58.35 million (approximately US$160,550) per year are not required to pay VAT. Nevertheless, VAT revenue productivity is only about 50 percent in Armenia (IMF 2010). The main problem seems to be the exemption for small firms. Some of these firms, mostly in personal services, pay a presumptive tax in lieu of VAT, PIT, and corporate income taxes. That tax is based on the type of firm. It is impossible to know from the ILCS whether a household has made a purchase from a firm that pays VAT or not. Further, in a standard competitive model, prices at firms that do not pay VAT would be the same as those at VAT-paying firms, with the benefits of nonpayment going to the firm owner rather than customers. Households suffer the incidence of the tax regardless of the tax status of the seller, though not all the benefits go to the fisc; some are captured by small-business owners.[9]

Based on these considerations, we have calculated an effective VAT rate as total VAT collections in 2011 divided by the consumption in the national income accounts that is subject to VAT (that is, all consumption less education, books, paper, jewelry, and financial services). This rate is 10.67 percent, slightly higher than earlier estimates of VAT revenue productivity.[10] We apply this "effective" VAT rate to all household purchases except exempted items. In essence, we assume that all households buy the same share of VAT-paying goods so that the effects of VAT avoidance or evasion on market prices are spread across the population in proportion to each household's expenditures.

One concern with this assumption is the presumption that poorer households have higher food shares and may therefore pay a lower share of their total expenditures in VAT because almost all farms are not subject to that tax. We have not made an adjustment for this concern for two reasons. First, as figure 1 shows, the food share varies remarkably little across the income distribution in Armenia.[11] This is actually consistent with our assumption that expenditure shares with respect to VAT-taxable items are constant across the income distribution. The second reason to not make an adjustment for food shares is that 80 percent of food purchases by value are made in shops. Even if farmers do not pay VAT, the shops may well pay it if they are not small businesses. Thus, we keep

[8] The tax on tobacco products is formally a "presumptive" tax, but it applies only to these products, so we treat it as an excise tax.

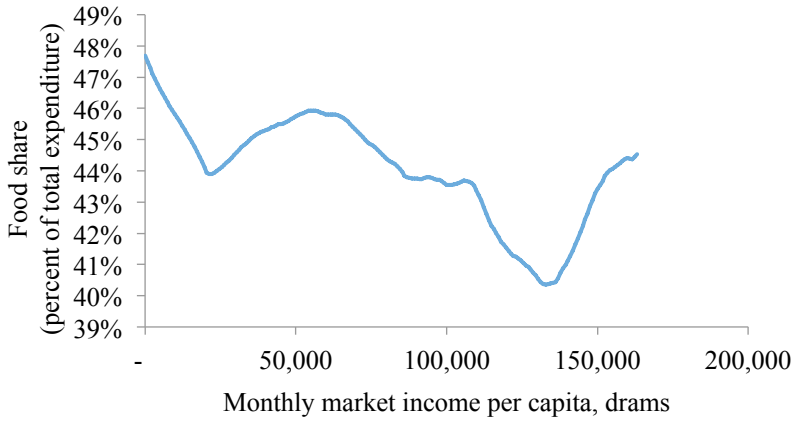
[9] In theory, we could assign these benefits to non-VAT-paying business owners, but there is no way to identify them in the ILCS.

[10] Previous estimates were done for earlier tax years, so our calculation may reflect increasing effectiveness of tax administration.

[11] The 95th percentile is at dram 90,453, and the 99th is at dram 163,220.

our approach as simple as possible by applying an "effective" VAT rate of 10.67 percent to all VAT-taxable purchases.

Figure 1. Kernel Regression of Household Food Share on Market Income in Armenia, 2011



Source: Based on 2011 Integrated Living Conditions Survey (ILCS) database, National Statistical Service of the Republic of Armenia, http://www.armstat.am/en/?nid=246.

Note: "Market income" comprises pretax wages, salaries, income earned from capital assets (rent, interest, or dividends), and private transfers.

Import duties are similarly straightforward in Armenia. All imports are subject to a 10 percent tariff, though the list of exemptions is longer than for the VAT. We calculate an "effective" tariff as the total tariff revenue recorded in 2011 divided by total nonexempted imports. This rate is 3.6 percent which, again, is slightly higher than previous estimates of import tariff productivity in Armenia. We apply this rate to all purchases of nonexcluded items, whether imported or not. (Indeed, we cannot tell whether a purchase was an import or not in the ILCS.) The logic here is similar to that for the VAT: in competitive markets, import tariffs increase the price of all goods, whether imported or domestic, so households suffer the incidence of the tax regardless of the source of their purchase.

Excise duties are the most complicated of the indirect taxes in Armenia, with different rates depending on the type of product and its source (domestic or imported). Table 1 has a complete description. Fortunately, the ILCS expenditure data are quite detailed as to the type of alcohol and tobacco purchased, including distinctions for domestic production versus imports. The ILCS also includes information on physical quantities purchased, so we can apply the excise rates quite precisely.

Table 1. Excise Duty Rates in Armenia, 2011

Item	Unit	Domestically produced	Imported
Beer	Liter	dram 70	dram 105
Wine	Liter	10 percent of factory price but not less than dram 100	10 percent of import price but not less than dram 150
Vermouth	Liter	500	600
Vodka, cognac, and other strong drinks	Liter	30 percent of factory price but not less than dram 380	30 percent of import price but not less than dram 600
Ciders and other alcoholic drinks	Liter	dram 180	dram 200
Filtered cigarettes	Cigarette	dram 5.5	dram 7
Unfiltered cigarettes	Cigarette	dram 1.95	dram 3.25
Raw oil and oil materials	Metric ton	dram 27,000	dram 27,000

Source: PwC 2011.

Note: There are other excise duties on other products, but those products cannot be identified from the Integrated Living Conditions Survey (ILCS).

If we calculate each household's indirect taxes paid based on its consumption expenditures, households with negative savings in the previous month (expenditures greater than income) can have negative consumable incomes. To avoid this, we apply the ratio of indirect taxes paid to expenditure, as described above, to disposable income to estimate indirect taxes paid. This guarantees a positive consumable income. When we use household expenditures rather than income to estimate disposable income, however, we do not make this adjustment.

Final Income

To calculate final income, we add in-kind transfers associated with public provision of education and health care to consumable income. We have not subtracted copayments or fees from these values. Both schools and health care facilities manage their own budgets. The state supports these institutions with transfers that are based on number of students and types of school, number of patients, types of facilities and procedures, and so on.

For education, schools are prohibited from charging extra fees (for example, parent-teacher association dues) for schooling that is publicly supported, so there is nothing to subtract. At universities, the state transfers the tuition of supported students to the institution. Since state-supported students in the ILCS universally report attending for free, we again have nothing to subtract.

For health care, almost all payments from government to providers are inframarginal, that is, they do not cover the full cost of the services provided. For that reason, it seems better to assume that any payments from the patient to the provider bring the full payment up to cost and do not diminish the benefit that the patient receives from the public support to the provider. Thus, we also do not subtract any additional payments from the estimated subsidy per patient.

For schooling, we have two approaches available to calculate the in-kind subsidy for each student. The standard approach takes the budget for 2011 for each type of school and divides by the number of students in those schools, at a national level.[12] The second approach uses the actual per-student funding formula used by the Ministry of Finance (MoF) to make transfers to schools. That formula is quite simple. In 2011, it was (#students)*(dram 105,775) + dram 16,708. Several adjustment coefficients are then applied, depending on the school type and location: 2 percent is added for schools in mountainous areas; 20 percent is added for schools in "high mountainous" areas; 20 percent is added for schools that are the only remaining school in a settlement and have fewer than 400 students; and 15 percent is added for high schools. Unfortunately, we cannot identify altitude or school size in the survey, so the best that we can do is to apply the standard formula without the fixed dram 16,708 and with only the adjustment for high schools. This will underestimate the total in-kind subsidies to students. Vocational schools are funded with a different formula that is based on the number and type of classrooms, so we cannot make the same calculation for vocational students. Preprimary schools are funded mostly through local budgets, with no standard per-student transfer.

Table 2 presents the estimated in-kind transfer per student using the standard method and the MoF transfer formula. Another useful comparison is a previous benefit incidence study for education in Armenia (AST 2010). That study calculates, for 2008, per-student benefits of dram 205,000 for general education (primary, general secondary, and secondary); dram 265,000 for vocational education; and dram 310,000 for higher education.

[12] Because the academic year is not consistent with the calendar year, we use one-third of the student population in 2010 and two-thirds of the population in 2011.

Table 2. Annual In-Kind Education Benefits per Student in Armenia *drams*

Level	Standard method (2011 data)[a]	MoF transfer formula (2011 data)[b]	Advanced Social Technologies (2008 data)
Preprimary	168,406	—[c]	n.a.
Primary (grades 1–4)	223,680	105,775	
General secondary (grades 5–9)	232,081	105,775	} 205,000
Secondary (grades 10–12)	185,539	121,641	
Secondary vocational	403,300	—[d]	} 265,000
Secondary professional (college)	386,213	—[d]	
Higher education and postgraduate	504,333	—[d]	310,000

Sources: 2011 Ministry of Finance state budget reports (http://mfe.am/index.php?cat=76&lang=1) and community budget reports (http://mfe.am/index.php?cat=78&lang=1); AST 2010.

Note: MoF = Ministry of Finance.

a. The standard formula divides the 2011 budget for each type of school by the number of students in those schools, at a national level. Because the academic year differs from the calendar year, the total number of students includes one-third of the 2010 student population and two-thirds of the 2011 population.

b. The MoF transfer formula in 2011 was (#students)*(dram 105,775) + dram 16,708. Several adjustment coefficients are applied, depending on the school type and location. For more specifics of the MoF funding formula, see http://www.arlis.am/documentview.aspx?docID=65300.

c. No data are available because preprimary schools are mostly funded through local budgets, with no standard transfer per student.

d. The MoF formula applies only to primary and secondary school.

Even though use of the MoF transfer formula is conceptually attractive, the fact that its estimates are much lower than the other two methods and cannot be applied to some types of schooling means that we would underweight the importance of transfers for general education if we used the MoF formula for those and the standard method for the others. So we use the standard method in this working paper. This also improves comparability with other CEQ studies. We take both student populations and budgets from standard administrative sources.[13]

Our treatment of in-kind health benefits also uses the standard method. The schedule of transfers from the State Health Agency to providers is quite detailed, with different amounts for different types of services. We cannot match that detail with information from the type of treatment in the ILCS, so we must use the standard method. We divide treatment into inpatient care at hospitals, which we divide into deliveries and other services, and outpatient care at polyclinics, family doctors,

[13] The numbers of students at each level except preprimary come from NSSRA (2010, 2011). The numbers of preprimary students come from NSSRA (2012c). Education budget data come from MoF state and community budget reports, http://mfe.am/index.php?cat=76&lang=1.

and so on (primary care providers).[14] Budget data come from the MoF, but we encountered dramatically different patient numbers from administrative records (NSSRA 2011) and the ILCS. The administrative data report 13 million visits to primary care providers in 2011, while the ILCS has only 3.6 million. Administrative data report 347,000 inpatient visits to hospitals, while the ILCS has only 167,000. One possible reason for this discrepancy is that the administrative data count each service that a patient receives as a separate visit, while the patient may view them (and report them in the ILCS) as only one visit. If that is true, then it is better to use the ILCS estimates of total patient visits rather than the administrative data. That is the option we have taken. This yields an average in-kind transfer of dram 6,149 for outpatient visits and dram 160,827 for inpatient visits.

The last in-kind benefit that we calculate is free or subsidized rent, usually to soldiers. We calculate this value as 2.47 percent of reported expenditures, which is the share of rental value of owner-occupied housing in consumption in the national income accounts. We apply this only to households that report that their dwelling is "state or municipality rented" and paid no rent.

Consistency between Administrative and Survey Data Sources

It is possible to calculate the total amount that the government spends on certain items and taxes on others using both administrative data (the national accounts, the budget, and so on) and data from the survey (ILCS). These amounts should coincide, but they often do not. This can lead to errors in our estimate of distributional effects if the degree of inconsistency varies among the tax, expenditure, and income variables used in the analysis. For example, suppose that the total value of unemployment benefits in the survey is only half of the amount found in the budget, perhaps because survey respondents are reluctant to report that they receive these benefits. If those benefits go disproportionately to poorer households, which seems likely, then their underreporting in the survey will cause us to underestimate the impact that these benefits have on both inequality and poverty reduction. It is important, then, to try to adjust for discrepancies between the administrative sources and the survey.

In Armenia, by far the largest problem is that the ILCS reports less household expenditures and incomes than do the national accounts. Household expenditures in the survey are only 37 percent of those in the national income accounts.[15] Other items such as pensions, family benefits, and PIT are much closer to the associated administrative accounts. As a result, simply adding or subtracting these items from the very low survey income values to generate the income concepts outlined in the previous section may exaggerate the extent to which these taxes and expenditures affect the distribution of income.

[14] Outpatient care at hospitals is not subsidized except for nonspecialist care for children under seven years old and beneficiaries of the basic benefit package (BBP). We do include children's and BBP beneficiaries' outpatient hospital visits in the analysis.

[15] Similarly direct comparisons for disposable income are more difficult, but disposable income in the ILCS is just 14 percent larger on average than household expenditures.

To account for these differences, and to provide some analysis of the sensitivity of our results to possible biases, we sometimes scale up or down certain items in our analysis. In all cases, we scale down the in-kind benefits from health and education spending. This is because our estimate of their monetary value comes entirely from administrative data—the government expenditure per beneficiary. These values are accurate, while the income values from the survey are too low. To get the in-kind benefits to a scale similar to the other information in the survey, we scale them down by 0.369, which is the ratio of household expenditures in the survey to those in the national accounts.[16] In addition, we run a sensitivity analysis that scales down PIT (0.753) and SSC (0.497) so that their ratio in the survey is the same as their ratio in the administrative information.[17]

3. Description of Taxes and Expenditures in Armenia

Tax Revenue Sources

Table 3 gives the breakdown of the major government revenue sources in 2011, the year of our ILCS data. Overall revenues are small as a share of GDP (23 percent) compared with other European countries (averaging 40 percent for the EU-28 countries in 2014),[18] a fact that limits government's ability to affect the distribution of income. Most of the taxes are familiar. VAT is by far the most important tax, and SSC, corporate profit, and PIT are also relatively large. Excise duties are levied on cigarettes, alcohol, and petroleum products.

The third column of table 3 indicates that not all of these revenue sources can be included in our analysis. To consider the distributional impact of these items, we must be able to identify them in the ILCS data. That is not always possible. For example, we cannot tell who owns most enterprises or who pays "other taxes" or "state duties." Presumptive taxes are levied on specific types of small businesses. We can identify the self-employed, including those in the informal sector, in the ILCS, but not the specific types of businesses they run. Overall, the analysis accounts for 69 percent of tax revenues, with corporate income tax being the most important omitted tax.

[16] We could also scale up all the survey-based variables, but this would make the resulting poverty results dramatically different from those that are commonly reported from the ILCS.

[17] We also explored a technique from Korinek, Mistiaen, and Ravallion (2007) to reweight the ILCS based on the probability that a sampled household will actually agree to be surveyed. That probability, in turn, is a decreasing function of household income. Doing this raises the amount of household consumption in the ILCS to 52 percent of that in the national accounts. As one would expect, it significantly increases estimated inequality and also reduces estimated poverty somewhat. More important for our analysis, though, is that *changes* in inequality and poverty brought about by taxes and public expenditures are very similar in the reweighted sample to the results that we present here. Given that, and in order to keep this analysis as similar to those in other countries as possible and to also use data familiar to analysts in Armenia, we did not pursue the reweighting approach further.

[18] Data for average European revenues as a share of GDP from the Eurostat database, http://ec.europa.eu/eurostat. See total receipts from taxes and social contributions (including imputed social contributions) after deduction of amounts assessed but unlikely to be collected.

Table 3. Government Revenues in Armenia, 2011

Revenue source	Drams, billions	Included in analysis?	Share of revenue (%)	Share of GDP (%)
Tax revenues	647,809	varies	71	17
Indirect taxes	437,119	varies	47	12
Value added tax	328,483	yes	36	9
Customs duty	36,289	yes	4	1
Excise tax[a]	39,405	yes	4	1
Environmental tax	12,200	no	1	0
Presumptive tax	20,742	no	2	1
Direct taxes	195,226	varies	22	5
Enterprise profit tax	97,842	no	11	3
Personal income tax	81,211	yes	9	2
Property tax	11,794	no	1	0
Land tax	4,429	no	1	0
Simplified tax[b]	−50	no	0	0
Other taxes	15,464	no	2	0
State duties	25,703	no	3	1
Social security payments	123,450	yes	14	3
Nontax revenues	69,371	no	8	1
Grants	39,740	no	4	1

Sources: Ministry of Finance state and community budget reports (http://mfe.am/index.php?cat=76&lang=1, http://mfe.am/index.php?cat=78&lang=1); NSSRA 2012a.

a. Includes presumptive tax on cigarettes.

b. "Simplified tax" provides an exemption from value added tax (VAT) and profit tax for small enterprises having turnover on the sale of goods and services (not including VAT) for the previous year of less than dram 30 million (US$51,500). Its contribution to government revenues is negative here because of overpayment refunds.

Social Expenditures

Table 4. Government Social Expenditures in Armenia, 2011

Expenditure type	Drams, millions	Included in analysis?	Share of expenditures (%)	Share of GDP (%)
Total expenditures	1,013,500	varies	100.0	26.8
Health	63,491	varies	6.3	1.7
Outpatient services	22,551	yes	2.2	0.6
Inpatient services	26,891	yes	2.7	0.7
Other health	14,050	no	1.4	0.4
Education	135,071	varies	13.3	3.6
Preschool	10,694	yes	1.1	0.3
Elementary	30,357	yes	3.0	0.8
General basic	36,022	yes	3.6	1.0
Complete secondary	15,724	yes	1.6	0.4
Initial professional (vocational)	2,180	yes	0.2	0.1
Secondary professional	3,177	yes	0.3	0.1
Higher	7,885	yes	0.8	0.2
Other	29,032	no	2.9	0.8
Social protection	258,336	yes	25.5	6.8
Ailment and disability	1,251	yes	0.1	0.0
Old age	188,396	yes	18.6	5.0
Relative lost persons	190	yes	0.0	0.0
Family members and children	43,596	yes	4.3	1.2
Unemployment	4,115	yes	0.4	0.1
Dwelling provision	815	yes	0.1	0.0
Special social privileges	10,934	no	1.1	0.3
Special protection	9,039	no	0.9	0.2

Source: Ministry of Finance state and community budget reports (http://mfe.am/index.php?cat=76&lang=1, http://mfe.am/index.php?cat=78&lang=1).

It is much more difficult to attribute the expenditure side of the budget to specific beneficiaries. Governments spend significant amounts of their budgets on genuine public goods—national defense, law enforcement, and public administration—that, by their nature, are not attributable to individuals. The areas in which we can identify specific beneficiaries are social expenditures: transfer payments, health, and education.

Table 4 gives a breakdown of social expenditures in Armenia in 2011. Overall, these social expenditures account for only 42.5 percent of total expenditures, and the items that we can identify in the ILCS account for 36.6 percent. Health and education spending are noticeably low in Armenia. The large share of old-age pensions also stands out, reflecting Armenia's relatively mature population. Old-age pensions are mostly contributory pensions, that is, pensions paid to retirees who paid social security taxes when they were working. These account for dram 159 billion of the dram 188 billion spent on pensions.

The other large social expenditures are for families and children. In 2011 they included Armenia's only means-tested, unconditional transfer, the Family Benefit (dram 29 billion); one-time payments to mothers upon childbirth (dram 4 billion); and childcare services for participants in the social security system (dram 2.9 billion). It is noteworthy that both unemployment and disability pensions are quite small compared with the other social expenditures (dram 4.1 billion and dram 1.3 billion, respectively).

4. Results

Inequality and Poverty

Table 5 gives the Gini coefficients and headcount indexes for three different PPP-based poverty lines for each CEQ income concept. The absolute values of the Ginis and Foster-Greer-Thorbecke indexes (FGTs)[19] will look unfamiliar to Armenians accustomed to the NSSRA poverty analyses, for four reasons. First, these variables are based on household incomes, not expenditures. Second, we use income per capita, not per adult equivalent.[20] Third, the poverty lines are international "dollar-a-day" lines rather than the cost-of-basic-needs poverty line that the NSSRA uses in its analysis. And finally, only "disposable income" is close to the measure that the NSSRA uses in its poverty analysis. All the other income variables involve the additions and subtractions described in the methodology section.

All of these choices are made to be consistent with other CEQ country analyses. The most important thing to remember is that while these choices can have large effects on estimated Ginis

[19] Foster-Greer-Thorbecke indexes refer to a family of poverty metrics, the most common of which puts higher weight on the poverty of the poorest individuals, making it a combined measure of poverty and income inequality (Foster, Greer, and Thorbecke 1984).

[20] Further, we make no adjustment for household members who were absent for part of the preceding month.

and FGTs, the *relative* changes of one measure to the next are much less sensitive to these choices. Thus, the effects of transfers and taxes on poverty and inequality estimated here—the *difference* between the various income concepts—will be quite close to the same effect estimated with the NSSRA welfare measure.[21]

Table 5. Gini Coefficients and Poverty Indexes in Armenia, by CEQ Income Concept, 2011

Inequality or poverty indicator	Market income[a]	Net market income[b]	Disposable income[c]	Consumable income[d]	Final income[e]
Gini coefficient[f]	0.469	0.456	0.373	0.374	0.357
Poverty headcount, US$1.25/day PPP (%)	21.3	22.4	9.6	11.9	9.0
Poverty headcount, US$2.50/day PPP (%)	39.3	44.2	28.9	34.9	30.9
Poverty headcount, US$4.00/day PPP (%)	58.3	65.9	55.5	62.7	60.2

Source: Based on 2011 Integrated Living Conditions Survey (ILCS) database, National Statistical Service of the Republic of Armenia, http://www.armstat.am/en/?nid=246.

Note: Income concepts were developed by the Commitment to Equity (CEQ) project to trace "the process by which taxes, subsidies, and transfers are allocated to each household to assess how incomes—and thus inequality indicators—change with fiscal policy" (Lustig and Higgins 2013), as further described in Inchauste and Lustig (2017). PPP = purchasing power parity.

a. Market income comprises pretax wages, salaries, income earned from capital assets (rent, interest, or dividends), and private transfers.

b. Net market income subtracts from market income the payments for personal income taxes and employees' social security contributions.

c. Disposable income is constructed by adding direct cash transfers to net market income.

d. Consumable income adds to disposable income the impact of indirect taxes, including value-added taxes; import duties; and excises on petroleum products, alcoholic beverages, and tobacco products.

e. Final income adds to consumable income the effects of in-kind transfers for health care and education.

f. The Gini coefficient measures the inequality of income distribution, ranging from 0 (full equality) to 1 (maximum inequality).

Effects of Direct Taxes

The difference between market income and net market income is direct taxes, which include PIT and SSC in our analysis. While progressive (see the following section), these taxes are small relative to market income because the tax take of these direct taxes is small (as shown earlier in table 3). As a result, the Gini coefficient for net market income is only slightly lower than that for market income.

[21] The one exception to this is the adult equivalence scale. Using per capita income tends to make households with children look poorer, and thus programs directed toward children, like education, look more progressive.

For headcount poverty, the difference is stronger, especially for the higher poverty lines. This shows that there are households with formal sector workers whose income falls below these lines.[22] This effect for Armenia is larger than that in any of the Latin American economies reviewed in Lustig, Pessino, and Scott (2014); direct taxes move a considerable number of people below the poverty line in Armenia.

Effects of Direct Transfers

The difference between net market income and disposable income is the addition of direct transfers, which include the Family Benefit, childbirth and childcare benefits, unemployment benefits, contributory and noncontributory (social) pensions, student stipends, and a variety of other transfers carried over from previous social protection policies. These transfers lower the Gini by more than 8 percentage points, a sizable decline. Transfer payments also reduce poverty headcounts by large amounts (10–15 percentage points).

These very positive distributional results are driven mostly by contributory pensions. If we consider those pensions to be deferred compensation rather than transfers, the remaining transfers reduce the Gini by only two points and the headcounts from 1.6–3.2 points.[23] We will see in the next section that these transfers have good-to-excellent targeting, but none of them is very large relative to income, so their overall impact is limited by program size more than targeting. In addition, the diminishing effect as the poverty line increases is because many transfer recipients are below the higher poverty lines both before *and after* the transfer. This, too, reflects the relatively small amounts for these transfers. At every poverty line, direct transfers are sufficient to offset the poverty-inducing effect of direct taxes, though only just so for the highest poverty line.

Effects of Indirect Taxes

Consumable income is disposable income less indirect taxes—VAT, import duties, and excises in our analysis. These taxes barely move the Gini, reflecting the fact that their distribution is similar to the disposable income distribution: in Armenia, the poor and the rich spend similar shares of their incomes on goods and services that pay indirect taxes.

These taxes do, however, increase all three poverty measures substantially. The poor buy goods and services that include indirect taxes and so pay a larger share of these taxes than they do of direct taxes, except at the highest poverty line where the effects are about equal. At the highest poverty line, poverty is higher for consumable income than it is for market income: direct transfers are not

[22] Note that taxes cannot *reduce* poverty as they can inequality because they only reduce incomes. The best case from a distributional perspective would be that no poor people pay taxes and the FGT remains unchanged after the tax.
[23] See annex A, figure 2A.

sufficient to overcome the poverty-inducing effects of all taxation at this high poverty line, though they continue to be sufficient for the lower poverty lines.

Effects of In-Kind Transfers

Final income is consumable income plus in-kind transfers, mostly health and education in our analysis. Despite the fact that we have scaled down the value of these transfers to be consistent with administrative data, they reduce the Gini coefficient by 1.8 points and also reduce poverty at all three poverty lines.

Overall Effects

The overall effect of the fisc, or rather, the parts that we can measure here, is a significant reduction in the Gini coefficient from 0.469 (market income) to 0.357 (final income). Mostly, this is driven by pensions, a large budget item.

The effect on poverty depends on the poverty line. For the lowest two, the fisc reduces the headcount by a significant amount. For the highest line, however, the effect of taxes overwhelms the transfers, leaving poverty slightly higher post-fisc than pre-fisc. We should note, however, that in-kind transfers are scaled down in this analysis, while direct taxes are not.[24] In a sensitivity analysis that scales down direct taxes as well as the overall effect of the fisc on poverty at the US$4.00 per day line, there is a 1 point decline.

Another way to evaluate the overall effect of taxes and expenditures is to ask: at what point in the income distribution do people become net payers to the fisc? Table 6 gives the results by income, grouped by international poverty lines in U.S. dollars at PPP.

[24] Indirect taxes are automatically scaled down because they are estimated as a share of observed expenditures on taxed goods.

Table 6. Net Impact of Taxes and Social Expenditures in Armenia, by Poverty Group
Percentage of market income

Income group (y)	Change to market income from all taxes	Change to market income from all transfers	Difference between market income and consumable income[a]	Difference between market income and final income[b]
y < $1.25	−42	250	208	247
$1.25 ≤ y < $2.50	−23	43	20	32
$2.50 ≤ y < $4.00	−26	21	−4	2
$4.00 ≤ y < $10.00	−27	9	−18	−15
$10.00 ≤ y	−28	4	−24	−23

Source: Based on 2011 Integrated Living Conditions Survey (ILCS) database, National Statistical Service of the Republic of Armenia, http://www.armstat.am/en/?nid=246.**]**

Note: Income groups stated in terms of U.S. dollars per capita per day at purchasing power parity (PPP). "Market income" comprises pretax wages, salaries, income earned from capital assets (rent, interest, or dividends), and private transfers.

a. Consumable income subtracts from market income tax payments, social security contributions, and indirect taxes (such as value added tax) and adds direct cash transfers.

b. Final income adds to consumable income the effects of in-kind benefits such as health and education.

For the poorest Armenians, the effect is quite positive. Consumable incomes (including all taxes and direct transfers but not in-kind benefits from health and education expenditures) are 208 percent higher than market incomes, and final incomes (including the in-kind health and education benefits) are 247 percent higher. These changes are much larger than those observed in other middle-income countries because Armenia has a large number of pensioner households whose market income is zero but whose pension is reasonably generous, lifting their post-fisc income considerably.

Nevertheless, households become net payers rather quickly as incomes increase. Those with modest incomes in the US$2.50–US$4.00 range just about break even, while those with higher incomes are net payers.[25] It is also interesting to note that those in the highest income group pay a relatively small share of market income in taxes (28 percent).

[25] We should recall, however, that the analysis includes a considerably larger share of taxes than it does expenditures, so it is biased toward a negative effect of the fisc.

Incidence Results

For a tax or expenditure to have large distributional impact, it needs to be large relative to income, but it also needs to be strongly targeted to the rich or the poor.[26] Even though the center of the CEQ analysis is a comparison of the five income concepts presented earlier, it is easier to interpret those results if we understand their targeting or incidence. To that end, Table 7 gives Kakwani coefficients calculated for four income concepts and the marginal contributions to changes in inequality for all of the tax and expenditure items included in the analysis.

Incidence of Direct Transfers

The Family Benefit is the expenditure best targeted to the poor, a result consistent with other studies of this program's targeting (Esado 2012; Karapetyan et al. 2011; Tumasyan 2006). Because it is Armenia's one explicitly need-based public expenditure, this makes sense. Although targeting of the Family Benefit is not perfect—about a third goes to households whose market income is above the US$2.50 per day poverty line—its Kakwani coefficient is higher than those for conditional cash transfer programs in Latin America and better than any other social expenditure in Armenia.

Other transfer payments also go disproportionately to poorer households. "Compensation for privileges" goes primarily to World War II veterans and their children, an elderly population that usually has no other source of income and is thus extremely poor in the absence of this transfer. The same is true for both contributory and noncontributory pensions. Unemployment benefits have significantly negative concentration coefficients as well. None of these transfers is means tested but are all based on the reasonable presumption that the unemployed and the elderly are likely to be poor before receiving them. While not universally true, this is certainly true on average and is reflected in the strongly positive Kakwani coefficients.

Among all the direct transfers we can examine, student stipends and childcare benefits have the lowest Kakwani coefficients. Stipends are merit-based, intended to support students based on ability rather than need. That ability is somewhat more common in richer households, especially when ordering the population by final income, which includes the large in-kind benefit of postsecondary education for stipend recipients. Childcare benefits are provided only for mothers who participate in the social security system, that is, those who have a formal job, which explains their households' somewhat higher incomes.

[26] Enami, Lustig and Aranda (2018) show that this statement is not strictly true if the tax or benefit generates a significant re-ranking of people in the income distribution. They give examples of transfers targeted to the poorest that are large enough to move them well up the income distribution and show that these transfers reduce the Gini less than similarly sized transfers spread more evenly across the population. Nevertheless, the size of taxes and transfers in Armenia are such that the intuition of the text is adequate.

Table 7. Kakwani Indexes for, and Marginal Contributions of, Specific Taxes and Social Expenditures in Armenia, 2011

	Kakwani/1 Coefficients				Marginal Contributions /1		
	Market Income	Disp. Income	Cons. Income	Final Income	Market to Disposable	Market to Consumable	Market to Final
Redistributive Effect	**--**				***0.096***	***0.095***	***0.114***
Income (Gini)	***0.469***	***0.373***	***0.374***	***0.356***			
Broad Aggregates							
Direct Taxes	0.097	0.106	0.099	0.116	0.017	0.019	0.021
Direct Transfers	0.660	0.224	0.223	0.207	0.083	0.101	0.092
Indirect Taxes	-0.129	-0.005	-0.013	0.002	--	-0.001	0.001
Indirect Subsidies	0.381	0.307	0.281	0.259	--	0.000	0.000
In-kind Education	0.519	0.473	0.472	0.402	--	--	0.014
In-kind Health	0.499	0.346	0.344	0.204	--	--	0.004
Cash Transfers							
Family Benefit	0.949	0.646	0.639	0.587	0.012	0.013	0.012
Non-contributory Pensions	0.596	0.273	0.272	0.241	0.006	0.007	0.006
Contributory Pensions	0.641	0.172	0.172	0.163	0.059	0.073	0.067
Unemployment	0.688	0.506	0.519	0.513	0.001	0.001	0.001
Stipends	0.249	0.011	0.015	-0.074	0.000	0.000	0.000
Special Privileges	0.923	0.328	0.348	0.370	0.000	0.000	0.000
Child Care Benefits	0.286	0.221	0.218	0.205	0.000	0.000	0.000
Other Transfers	0.642	0.041	0.049	0.016	0.000	0.000	0.000
In-Kind Education Benefits							
Pre-primary School	0.441	0.436	0.443	0.402	--	--	0.001
Primary School	0.573	0.552	0.551	0.489	--	--	0.005
Middle School	0.599	0.541	0.537	0.465	--	--	0.006
Secondary School	0.464	0.411	0.406	0.354	--	--	0.002
Initial Vocational School	0.869	0.630	0.639	0.497	--	--	0.000
Secondary Vocational	0.533	0.432	0.435	0.317	--	--	0.000
Post-secondary School	0.172	0.109	0.109	-0.003	--	--	0.000
In-Kind Health Benefits							
In-patient Care	0.496	0.340	0.338	0.128	--	--	0.001
In-patient, Maternity	0.593	0.546	0.546	0.471	--	--	0.001
Primary Health Care	0.475	0.292	0.290	0.193	--	--	0.002
Other Benefits							
Housing Subsidies	0.381	0.307	0.281	0.259	--	0.000	0.000
Direct Taxes							
Personal Income Tax	0.209	0.230	0.223	0.242	0.010	0.011	0.012
Social Security Contributions	0.048	0.052	0.045	0.061	0.007	0.008	0.009
Indirect Taxes							
VAT	-0.119	0.010	0.005	0.022	--	0.001	0.002
Import Duties	-0.127	0.002	-0.004	0.011	--	0.000	0.000
Petrol Excises	0.110	0.200	0.194	0.220	--	0.000	0.000
Tobacco Excises	-0.198	-0.108	-0.134	-0.123	--	-0.002	-0.002
Alcohol Excises	-0.069	0.046	0.034	0.049	--	0.000	0.000

Source: Based ILCS (2011)

1/ Kakwani coefficients are marginal contributions are calculated so that equalizing taxes or expenditures produce a positive coefficient.

Source: Based on 2011 Integrated Living Conditions Survey (ILCS) database, National Statistical Service of the Republic of Armenia, http://www.armstat.am/en/?nid=246.**]**

Note: n.a. = not applicable. Kakwani coefficients and marginal contributions are calculated so that equalizing taxes or expenditures produce a positive coefficient.

a. The "Kakwani coefficients" columns show the difference between the concentration coefficient and the Gini coefficient. The "Marginal contribution" columns show the difference between the Gini coefficients with and without the designated row's tax or expenditure. The Gini coefficient measures inequality of income distribution, from 0 (full equality) to 1 (maximum inequality).

b. Market income comprises pretax wages, salaries, income earned from capital assets (rent, interest, or dividends), and private transfers.

c. Disposable income is market income (a) minus the payments for personal income taxes and employees' social security contributions, and (b) plus direct cash transfers.

d. Consumable income adds to disposable income the impact of indirect taxes, including value-added taxes; import duties; and excises on petroleum products, alcoholic beverages, and tobacco products.

e. Final income adds to consumable income the effects of in-kind transfers for health care and education.

Incidence of In-Kind Benefits

Most in-kind education benefits also go more to poorer households: primary and middle-school education as well as both levels of vocational training all have large Kakwani coefficients, with that for initial vocational training (in years 10–12) being especially high. Secondary schooling and preschool have Kakwani coefficients near the value of the Gini (and so a concentration coefficient near zero). To some extent, this reflects our use of per capita income measures. Households with students are larger and have more members who do not work, giving them lower per capita incomes. But it also reflects the higher-than-average coverage rates of schooling in Armenia, especially at the secondary level. This is not true, however, for university studies, where the Kakwani is much smaller and turns negative when ordering by final income, for the same reason that stipends do.

In-kind health benefits have Kakwani coefficients near the Gini coefficients and so are spread evenly across the income distribution except when ordering by final income (which includes these sometimes large benefits and thus moves the recipients well up the income distribution). Hospital maternity care (deliveries), however, has a somewhat large Kakwani coefficient, indicating that these benefits, which are the most generous in the health care system, go disproportionately to the poor.

All of these health services are supposed to be universal and free. However, the transfers from the State Health Agency to the providers are insufficient to cover costs, so patients sometimes must pay informal fees. Those fees may discourage poorer households from using these services, tilting the beneficiary pool toward richer households. In many developing countries, this effect is more than offset by a flight of richer households from the poor quality of publicly provided services, so that the remaining clientele is relatively poor. In Armenia, however, all primary care providers, public and

private, receive the transfer from the State Health Agency for each client that they enroll, so shifts in the type of provider do not alter the income distribution of subsidy recipients.

Incidence of Taxes

As for taxes, both direct taxes (PIT and SSC) and excises on petroleum products[27] have positive Kakwani coefficients, indicating that these taxes are progressive, though only very mildly so in the case of SSC. For market income, the Kakwani coefficients for VAT, import duties, and alcohol excises are all negative, making them (mildly) regressive, a pattern more typical of a developed economy. This changes when we order by the other income concepts, however, because transfer payments, especially contributory pensions, move their recipients significantly higher in the income distribution. Since those pensioners also buy goods and services subject to indirect taxes, their incidence is much more regressive when using market income (which excludes the transfers) than the other income concepts. Tobacco excises are much more regressive than other taxes: smoking is spread more evenly across the population than is income in general.

Sensitivity Analyses of Concentration Coefficients

We have conducted four additional sensitivity analyses to test the robustness of our findings.[28] The first sensitivity analysis changes the treatment of contributory pensions. Rather than viewing them as transfer payments, this run treats them as deferred compensation and thus part of market income. To be consistent, this analysis must also treat SSC as saving rather than a tax, as in the benchmark run. The effect of these alternate assumptions is to move pensioners further up the market income distribution, and everyone else down. As a result, benefits that go disproportionately to households receiving contributory pensions—the pensions themselves but also health care—have less positive concentration coefficients in this run and are thus more progressive.

The view of contributory pensions themselves changes dramatically, giving them a much lower Kakwani coefficient. This reflects the fact that contributory pensions, which are the most generous transfer payments in Armenia, move their recipients well up the income distribution. At the same time, benefits that go disproportionately to households that are unlikely to receive a contributory pension—those receiving unemployment benefits or noncontributory pensions and those with students—move down the income distribution, and each of these items has a larger Kakwani coefficient than in the benchmark, though the change is not so large as to change the rankings very much. Other items remain reasonably stable. Initial vocational education actually shows a large

[27] We should note that here we are capturing only petroleum products, mostly gasoline, consumed directly by households. This is only a very small part of petroleum consumption in Armenia. Most petroleum products are consumed as intermediate goods, so gasoline excises will affect the price of many goods. We have not been able to trace this effect for lack of a current input-output table, but the concentration coefficient would surely decline if we could do so, since consumption of other goods that use petroleum as an input is more spread across the income distribution than is direct gasoline consumption.

[28] All tables and figures for the sensitivity analyses may be found in annex A.

decrease in its Kakwani coefficient, but it has a very large standard error (between 0.11 and 0.15) because there are few such students in the sample. We should not read too much into this change.

The second sensitivity analysis alters the construction of the income concepts from an income base to an expenditure base. Most poverty analysis in Armenia is done with consumption rather than incomes. Because the correlation between reported incomes and expenditures is low, it is important to check that a consumption-based welfare variable does not affect the results. Fortunately, that is the case. For this run, we defined disposable income as household total consumption and worked backward to market income and forward to final income in the same way as the base run. Results are very similar to the base run.

The third sensitivity analysis scales household income by the NSSRA adult equivalence scale[29] rather than the number of household members. This, too, has very little effect on the results. This is perhaps surprising but, unlike many other developing economies, households with children in Armenia are not especially large.

The fourth sensitivity analysis starts with the pensions-as-transfers scenario and scales down the direct taxes (PIT and SSC) so that the ratio of the total paid to total household income in the survey is equal to the same ratio for administrative data. As noted earlier, household expenditure in the ILCS is only 37 percent of that reported in the national income accounts, and total household income is only slightly larger, but the total household income from formal sector wages, and thus taxes based on them (PIT and SSC), are much closer to the values in administrative accounts. This makes them far too large relatively to income in the survey. The scaling down corrects for that.

Whether or not this is an appropriate adjustment depends on the nature of the under-reporting in the surveys. If all households are underreporting their incomes and expenditures, more or less proportionately, then this adjustment will give a more accurate estimate of the concentration coefficients because it also "underreports" direct taxes proportionately. Without it, households that pay direct taxes will move too high in the income distribution, because those direct taxes get added on to observed income to estimate market income. That will make the direct taxes appear too progressive. While this modification does lower the Kakwani coefficients for PIT and SSC, the effect is not large and both remain progressive taxes.

Overall, then, the results reported in table 7 are reasonably robust to alternate approaches and specifications.

Social Expenditure Coverage

A public expenditure's coverage rate is the number of beneficiaries divided by the target population. When subdivided by income groups, this information is a useful complement to the incidence

[29] The adult equivalence scale is (adults + 0.65*children)^0.87, with children being those under 15 years old.

analysis presented so far. In particular, good targeting alone is not sufficient to guarantee high coverage for the poor. The program size (expenditure) must also be sufficiently large. Coverage information can also show leakage of benefits to nontarget populations and indicate whether certain subpopulations are more or less likely to benefit from public services like health and education that should be universal. Table 8 gives coverage rates for social expenditures in Armenia.

Table 8. Social Expenditure Coverage Rates in Armenia, by Income Group, 2011
percentage

	Income group (x)					
	x < $1.25	$1.25 ≤ x < $2.50	$2.50 ≤ x < $4.00	$4.00 ≤ x < $10.00	$10.00 ≤ x	Total
	Income share, by group					
Expenditure type	2	8	17	53	20	100
Education[a]						
Preprimary	1.0	5.5	10.2	10.9	27.0	8.0
Primary (I–IV)	89.1	85.4	92.1	89.3	98.3	89.3
General secondary (V–IX)	85.6	83.6	85.9	83.2	73.0	84.0
Secondary (X–XII)	55.7	57.2	64.6	64.9	63.8	61.3
Secondary vocational	1.8	2.6	0.5	0.4	0.0	1.1
Secondary professional (college)	3.1	5.1	2.9	3.7	0.5	3.4
Higher education or post-grad	4.7	4.2	4.7	11.5	13.5	7.9
Health care[b]						
Outpatient care[c]	7.7	6.8	6.9	6.3	5.0	6.7
Inpatient care[d]	3.8	4.3	4.5	3.5	3.7	3.9
Old-age pensions[e]						
Noncontributory[f]	13.0	14.8	10.2	11.5	12.4	12.5
Contributory[g]	86.8	85.0	89.5	87.9	86.5	87.2
Other transfers						
Family Benefit[h]	24.5	13.0	n.a.	n.a.	n.a.	19.2
Unemployment[i]	4.6	3.0	3.2	3.6	2.5	3.6

Source: Based on 2011 Integrated Living Conditions Survey (ILCS), National Statistical Service of the Republic of Armenia (NSSRA).

Note: n.a. = not applicable. Income groups stated in terms of U.S. dollars per capita per day at purchasing power parity (PPP).

a. Education coverage defined as (# students)/(# children of appropriate age + # actual students of other ages).

b. Health coverage defined as people who had one or more consultations divided by population.

c. Outpatient care excludes hospital outpatient care; consultations counted from previous month.

d. Inpatient care is in hospitals only; consultations counted from previous year divided by 12.

e. Old-age pension coverage defined as (number of recipients)/(population 65 or older + actual pension recipients).

f. Noncontributory pensions are "social" pensions.

g. Contributory pensions are from the social security system.

h. Family Benefit coverage is #household members of recipients / #household members in households earning below US$2.50/day.

i. Unemployment coverage is #recipients / #unemployed (NSSRA definition).

Preprimary education is not a universal service in Armenia, with public provision provided mostly by local rather than national government. There is a sharp increase in coverage with income, which mostly reflects the Yerevan local government's ability to raise property tax revenue to provide public services, including preschool. Both primary and general secondary schooling have high coverage rates that are evenly balanced across the income distribution. This suggests that the reasons for less than 100 percent coverage are not income-related.[30] Higher education is also not a universal service in Armenia; students must pay tuition. Scholarships are available, but they are based on merit, not need. Not surprisingly, coverage rates are much higher for higher-income households. Note, however, that the opposite is true for vocational education.

Health care coverage is difficult to judge because there is no obvious benchmark for the number of health visits per month. The numbers reported are the share of the population that used either a publicly funded outpatient service (at a hospital, polyclinic, family doctor, and so on) or inpatient services (at a hospital) in the previous month (not year). Since not everyone is sick in a month, these rates are far less than 100 percent, as they should be. Overall, however, about 7 percent of the population has contact with the primary health system in a given month.

Old-age pension coverage is universal. Those who receive a contributory pension cannot receive a noncontributory (social) pension and vice versa, so the fact that the two rows sum almost to 100 percent means that every elderly person is receiving a pension.

Coverage for the other transfers is less impressive. The Family Benefit reaches only 22 percent of people living in households whose market income is less than US$2.50 per person per day. So even though targeting is very progressive for this transfer, it falls far short of covering all those in need. Indeed, there is often a trade-off between better targeting and better coverage in proxy means-tested

[30] Given the way we calculate coverage, it is in fact impossible to have 100 percent coverage if any students are in school outside of the appropriate age. For example, a 12-year-old who is in primary school would count in the denominators of both primary school (actual student) and general secondary school (appropriate age), but only in the numerator of the primary school calculation. In primary, general secondary, and secondary school, respectively, 10 percent, 8 percent, and 16 percent of students are outside the standard ages for those levels.

transfers like the Family Benefit. Tightening the proxy requirements for qualification will generally exclude richer households (which improves targeting) but also some poorer ones (which reduces coverage). Coverage for unemployment compensation is very low.

5. Income Mobility

Most fiscal incidence studies focus on expenditures; some examine taxes; but relatively few look at both. While either expenditures or taxes can be progressive and thus make the income distribution more equal, only expenditures can reduce poverty. Taxes at best leave the income distribution unchanged. This means that the fiscal system as a whole may increase or decrease any individual's income on net, and may move her or him up or down the income distribution. Most measures used to evaluate fiscal incidence are anonymous: they do not consider who is in the p^{th} quantile of the income distribution, only the income that that p^{th} person has.

Higgins and Lustig (2016) propose the use of mobility matrices to describe the extent to which the fiscal system increases or decreases people's incomes. Table 9 gives these matrices for mobility from market income to disposable income and from market income to consumable income. The income ranges are defined by the US$ PPP poverty lines standard to the CEQ analysis.

Overall, 34 percent and 36 percent of individuals change income groups in the two analyses, respectively. One can see that the combination of direct taxes and monetary transfers (which constitute the difference between market and disposable income) moves many people to higher income groups, especially those who start with less than US$2.50 per day at PPP. But these taxes and transfers also move a significant number of people to lower income groups, making them "poor." This effect is even stronger when looking at the transition from market to consumable income, which also includes the impact of indirect taxes. Here, even large numbers of those in the US$2.50–US$4.00 range fall below the US$2.50 poverty line post-fisc.

Table 9. Mobility Matrices in Armenia, by Income Concept

Market income[a] group	y < $1.25	$1.25 ≤ y < $2.50	$2.50 ≤ y < $4.00	$4.00 ≤ y < $10.00	$10.00 ≤ y < $50.00	$50.00 ≤ y	Percentage of population	Average market income (drams per month)
Disposable income[b] group								
y < $1.25	44%	35%	13%	9%	0%	0%	21	4,231
$1.25 ≤ y < $2.50	2%	55%	36%	7%	0%	0%	18	15,585
$2.50 ≤ y < $4.00	0%	10%	68%	21%	0%	0%	19	26,775
$4.00 ≤ y < $10.00	0%	0%	13%	86%	2%	0%	35	51,421
$10.00 ≤ y < $50.00	0%	0%	0%	38%	61%	0%	7	124,344
$50.00 ≤ y	0%	0%	0%	0%	58%	42%	0	520,501
Consumable income[c] group								
y < $1.25	51%	31%	13%	5%	0%	0%	21	4,231
$1.25 ≤ y < $2.50	6%	66%	24%	5%	0%	0%	18	15,585
$2.50 ≤ y < $4.00	0%	24%	64%	12%	0%	0%	19	26,775
$4.00 ≤ y < $10.00	0%	0%	25%	75%	1%	0%	35	51,421
$10.00 ≤ y < $50.00	0%	0%	0%	56%	44%	0%	7	124,344
$50.00 ≤ y	0%	0%	0%	0%	58%	42%	0	520,501

Source: Based on 2011 Integrated Living Conditions Survey (ILCS), National Statistical Service of the Republic of Armenia.

Note: Income groups expressed in U.S. dollars per capita per day at purchasing power parity (PPP).

a. Market income comprises pretax wages, salaries, income earned from capital assets (rent, interest, or dividends), and private transfers.

b. Disposable income is market income (a) minus the payments for personal income taxes and employees' social security contributions, and (b) plus direct cash transfers.

c. Consumable income adds to disposable income the impact of indirect taxes, including value-added taxes; import duties; and excises on petroleum products, alcoholic beverages, and tobacco products.

These results are more dramatic than any reported in CEQ analyses for Latin America.[31] There seem to be three reasons for this. First, this study analyzes taxes that are a larger share of GDP than in most of the other countries (17 percent in Armenia versus 11 in Bolivia, 25 in Brazil, 9 in Mexico, 9 in Peru, and 15 percent in Uruguay). And social expenditures in Armenia are a smaller share of GDP (7 percent) than in most of the other countries (14 percent in Bolivia, 15 percent in Brazil, 9 in Mexico, 5 in Peru, and 11 percent in Uruguay). In part, this reflects the fact that social expenditures

[31] See Lustig, Pessino, and Scott (2014) and the accompanying country papers in *Public Finance Review* (Bucheli et al. 2014; Higgins and Pereira 2014; Jaramillo 2014; Lustig and Pessino 2014; Paz Arauco et al. 2014; Scott 2014).

are a smaller share of GDP in Armenia than in the Latin American countries and also that Armenia's largest taxes, VAT, and social contributions are easily identified and modeled.

Second, taxes in Armenia, especially indirect taxes, are very broad-based. This is commendable on efficiency grounds, but it has an equity cost because these taxes do fall, to some extent, on the poor.

Third, Armenia's income distribution is much more concentrated in the lower income groups. Given that only 7 percent of the population has market income greater than US$10.00 per day, it would be impossible to fund the government by taxing only that group. Nevertheless, table 9 highlights the stark reality that public spending, including transfer payments, must be funded and that taxation can induce a significant amount of poverty in its own right.

6. Comparisons with Other Incidence Studies in Armenia

Prior Incidence Analyses

There are several other incidence analyses for Armenia, all done in the past decade. Hovhannisyan (2006) and AST (2010, 2012) examine the distribution of benefits from public expenditures across expenditure quintiles. Harutyunyan and Khechoyan (2008) and NSSRA (2012a) both examine the poverty reduction impact of transfer payments using methods similar to those of this paper. Bouvry-Boyakhchyan (2008) also provides a review of studies that analyze the distributional impact of the Family Benefit. There are no previous studies of tax incidence or the overall distributional effects of the fisc.

Table 10 gives the concentration coefficients for the expenditure items analyzed in previous incidence studies.[32] These estimates are not strictly comparable to those presented in table 7. Hovhannisyan (2006) appears to use ILCS data, but he gives neither the data sources nor the welfare measure used to establish the quintiles. AST (2010, 2012) uses its own survey of 1,600 households in each year and an expenditure (rather than income) per capita welfare measure. Nevertheless, with the exception of the Family Benefit, none of these estimates is too different from those derived in this working paper.

[32] These studies present their results as quintile shares. To condense the table and to make the results comparable to those presented in this study (table 7), the concentration coefficients are calculated from these papers' quintile shares. These will be biased toward zero because each person in a quintile is treated as having the same share of benefits.

Table 10. Concentration Coefficients from Previous Incidence Studies of Public Expenditures in Armenia

Expenditure type	Hovhannisyan (2006) data					AST (2010, 2012) data	
	1999	2000	2001	2002	2003	2008/09	2012
Education							
General education	−0.01	0.04	0.04	0.03	0.04	−0.05	−0.08
Vocational education	−0.01	0.05	0.05	0.03	0.02	−0.03	0.04
Higher education	0.12	0.06	0.06	0.12	0.05	0.14	0.13
Health							
Public health primary care services	0.05	—	0.05	0.08	0.04	−0.04	0.01
OB-GYN medical assistance	—	—	—	—	—	−0.07	−0.10
Hospital medical aid services	0.06	—	0.01	0.01	0.04	−0.03	−0.04
Public health services	—	—	—	—	—	−0.01	−0.17
Direct social transfers							
Family Benefit	0.01	—	0.04	0.04	−0.11	—	—
Water							
Drinking water supply	—	—	—	—	—	0.01	0.01
Sewerage	—	—	—	—	—	0.01	0.01
Irrigation	—	—	—	—	—	0.00	0.00

Sources: Based on Hovhannisyan 2006 and AST 2010, 2012.

Note: — = not available. AST = Advanced Social Technologies.

General education (which comprises primary and middle school and, in the Hovhannisyan [2006] paper, secondary school) is somewhat less progressive in Hovhannisyan (2006) than our findings suggest, and higher education is more regressive in our study than the previous ones. But for the most part, comparable items give similar results. That is important. One common criticism of studies of this type is that they are "out of date" because they use older survey data. Yet the behavioral patterns that underlie the incidence results are usually slow to change, so that results from previous years are still informative.

The one significant exception is the Family Benefit, which is much more progressive in our study than what Hovhannisyan (2006) found. After its introduction in 1999, the targeting of the Family Benefit was tightened significantly through modification and more careful application of the proxy means test. This had the effect of reducing its coverage but also improved its targeting significantly.

Analyses of Family Benefit Impact on Poverty

There are several papers on the poverty impact and targeting of the Family Benefit.
Bouvry-Boyakhchyan (2008) reviews papers that discuss the low coverage rate (only about 30 percent) of the Family Benefit as well as its targeting with an inclusion error of 44 percent early in the 2000s.

NSSRA (2012b) presents results for child poverty (for those under 18 years old), arguing that in 2011, loss of old-age pensions (both contributory and noncontributory) would increase extreme child poverty from the 4.7 percent observed in the 2011 ILCS to 17.0 percent. They would also increase child poverty from 41.9 percent to 52.7 percent. For the Family Benefit, the NSSRA results suggest an increase in extreme child poverty from 4.7 percent to 10.3 percent and child poverty from 41.9 percent to 46.6 percent.[33]

These effects are somewhat larger than those that we have estimated in table 5 (see change from net market income to disposable income) for all transfer payments. This difference may be due to differences in the welfare variable (NSSRA uses expenditures per adult equivalent) and also different poverty lines (NSSRA uses lines derived with the "cost of basic needs" approach rather than the international lines that we use). One important similarity is that pensions have a larger poverty impact in both studies because, as NSSRA (2012b) notes, they are a much larger budget item.

Harutyunyan and Khechoyan (2008) use the ILCS for 2006 to study the impact of transfer payments on poverty. As in this working paper and the NSSRA (2012b) study, these authors simulate poverty in the absence of transfers by simply reducing observed consumption by the amount of the transfer payments. In table 11 (reproduced from Harutyunyan and Khechoyan [2008, table 1]), the authors do not state which poverty lines they use, nor whether they use consumption per capita or per adult equivalent.

[33] NSSRA uses a poverty line of dram 30,920 per adult equivalent per month and an extreme poverty line (or food poverty line) of dram 17,483 per month.

Table 11. Poverty Impact of Social Transfers in Armenia, 2006

Poverty headcount, percentage

Measurement stage	Extreme poverty	Poverty
Income post-transfers (observed)	26.5	4.1
Income pre-transfers	32.8	12.1
Income pre-pension	31.0	8.2
Income pre-social assistance	28.0	7.2
Income pre-Family Benefit	27.8	7.0

Source: Harutyunyan and Khechoyan 2008, table 1.

Note: The Harutyunyan and Khechoyan (2008) study, based on data from the 2006 Integrated Living Conditions Survey (ILCS) does not define the poverty lines used nor whether those lines are defined by consumption per capita or per adult equivalent. However, the National Statistical Service of the Republic of Armenia (NSSRA), which conducts the ILCS, defines poverty based on a "cost of basic needs" approach instead of using standard international lines such as US$1.25, US$2.50, or US$4.00 per person per day. As such, the NSSRA poverty line is dram 30,920 per adult equivalent per month, and the extreme poverty line (or food poverty line) is 17,483 per month.

To compare with this working paper's table 5, the difference between "post-transfers (observed)" and "pre-transfers" here is the same as the difference between net market income and disposable income in table 5. To compare "post-transfers (observed)" with "pre-social assistance," we can look at the sensitivity analysis in annex A (Figure 2A.), which treats pensions as market income, and, again, compare net market income with disposable income. In both cases, the results in our paper are somewhat larger, that is, we find that these transfers have a larger effect on the headcount than do Harutyunyan and Khechoyan (2008), though for social assistance only, the results are quite close.

7. Conclusions

A CEQ analysis addresses three broad questions about the redistributive effect of taxes and expenditures:

- How much redistribution and poverty reduction is being accomplished in each country through social spending, subsidies, and taxes?
- How progressive are revenue collection and government spending?
- Within the limits of fiscal prudence, what could be done to increase redistribution and poverty reduction in each country through changes in taxation and spending?

The answer to the first question is: a large amount of redistribution occurs. From market income to final income, the Gini coefficient drops by 0.11. This compares with 0.13 in Brazil and 0.15 in the United States, respectively. This is impressive given the small share of GDP (7 percent) dedicated to transfer payments in Armenia.

However, if we treat contributory (social security) pensions as deferred income, the results are much smaller: the fisc reduces the Gini by only 0.05. By comparison, similar analyses for Brazil, Mexico, and the United States find that the fisc reduces the Gini by 0.11, 0.08, and 0.11, respectively. This is not because contributory pensions are the best-targeted social expenditures, but rather because they have by far the largest budget.

Results for poverty reduction are less encouraging. At a poverty line of US$2.50 per day, which is similar to Armenia's national poverty line, the fisc lowers the headcount by 8.4 percent, but at the US$4.00 poverty line, the fisc actually increases the headcount slightly (by 1.9 percent). Even though transfers are reasonably well-targeted in Armenia, taxes (especially indirect taxes) do fall on poorer households, thus offsetting the poverty-reducing effect of public expenditures. Further, the mobility matrices show that the fisc causes a significant amount of downward as well as upward mobility among the poor or near poor, much more so than in Latin American countries where similar analyses have been completed.

As for the second question, expenditure targeting is very good in Armenia. Expenditures that are supposed to help the poor and vulnerable go disproportionately to the poor, as they should. While it is true that transfer programs in developed countries often have better targeting (with concentration coefficients of □ 0.8 or lower), the concentration coefficients for most transfers—and the Family Benefit in particular—are as good as or better than those found in other middle-income countries that rely on proxy means tests to identify transfer payment beneficiaries.

At the same time, expenditures on services that should be universal—education and health care—are spread fairly evenly across the population, with concentration coefficients near zero, as they should be. This is not, however, because they are in fact universal. Coverage rates for schooling are less than one and worsen at higher levels. But income and (in)ability to pay for schooling do not seem to be a factor because coverage does not decline with income. The only exceptions to this general finding are for preschool and university, neither of which is meant to be a universal service in Armenia.

Even though transfers other than contributory pensions have good targeting in Armenia, they have a limited effect on the income distribution. This holds an important policy implication: large redistribution requires both good targeting and significant expenditures. Armenia has the former but, with the exception of contributory pensions, not the latter.

Coming to the third question, then, the fact that targeting is already good in Armenia means that there is not much scope for improving the distributional effect of fiscal policy by shifting expenditures among items. While it is true that, say, Family Benefit and unemployment compensation have lower concentration coefficients than noncontributory pensions and other transfers, the fact that the budgets involved are small and that the differences in concentration are not too large means that relatively little could be achieved by shifting expenditures toward the more progressive items. To achieve greater redistribution, Armenia would have to increase social spending. The fact that the one large (and moderately well-targeted) social expenditure—contributory pensions—has a very large redistributive effect underscores this point.

Whether greater distribution is desirable is a question for policy makers and voters. But if the polity feels that the fisc should have a greater influence on the distribution of income in Armenia, the best candidate on the expenditure side of the budget is the Family Benefit, which is more concentrated among the poor than any other social expenditure. This could be achieved by increasing the amount of the benefit or by increasing its coverage, which remains quite low.

On the revenue side, most recent discussion of tax reform revolves around indirect taxes, especially the VAT. This analysis shows that these taxes are significantly less progressive than direct taxes. This is especially true of poverty effects: the poorest households only rarely pay direct taxes in Armenia, but they do pay VAT, import duties, and excises, especially on tobacco. From an equity perspective, then, it would be preferable to consider tax reforms to increase direct taxes either by raising rates or by drawing more workers into the formal economy.

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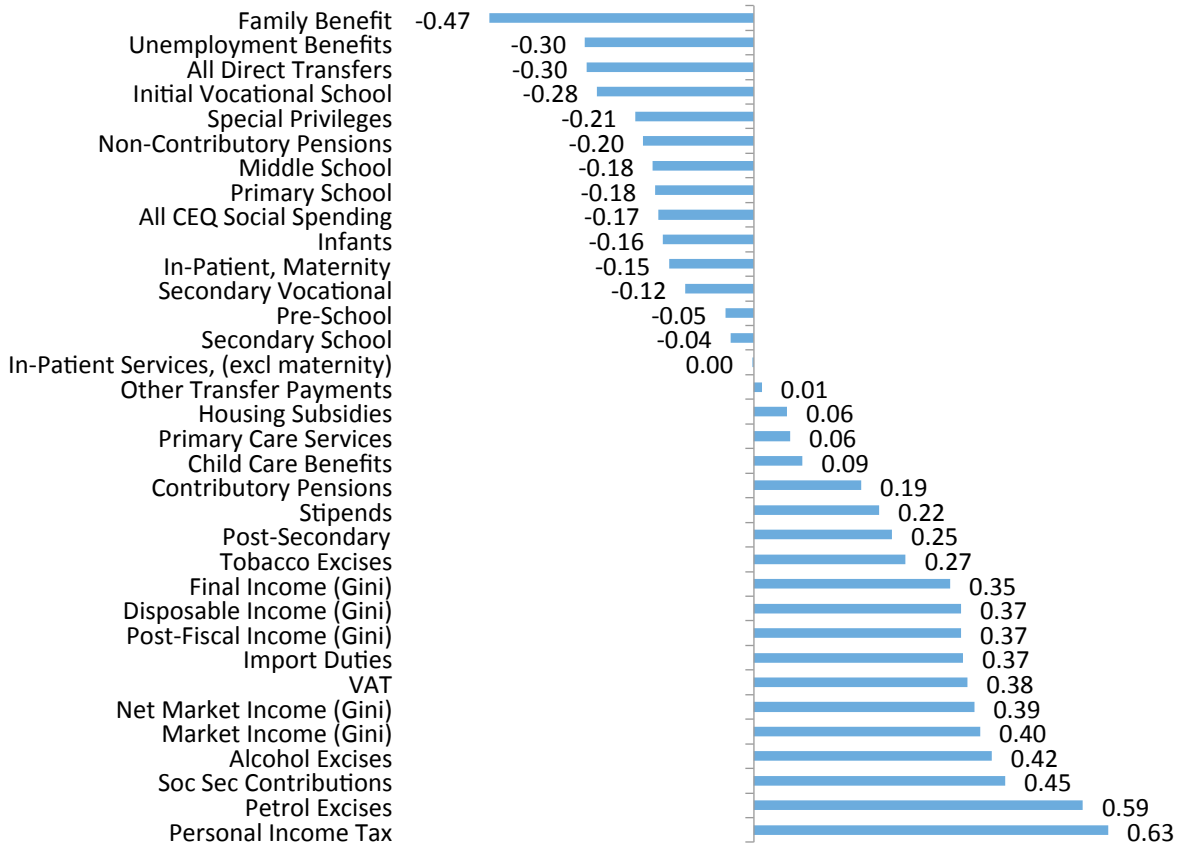
Annex A. Sensitivity Analyses

Figure 2A. Concentration Coefficients, Sensitivity Analysis 1: Contributory Pensions as Deferred Compensation

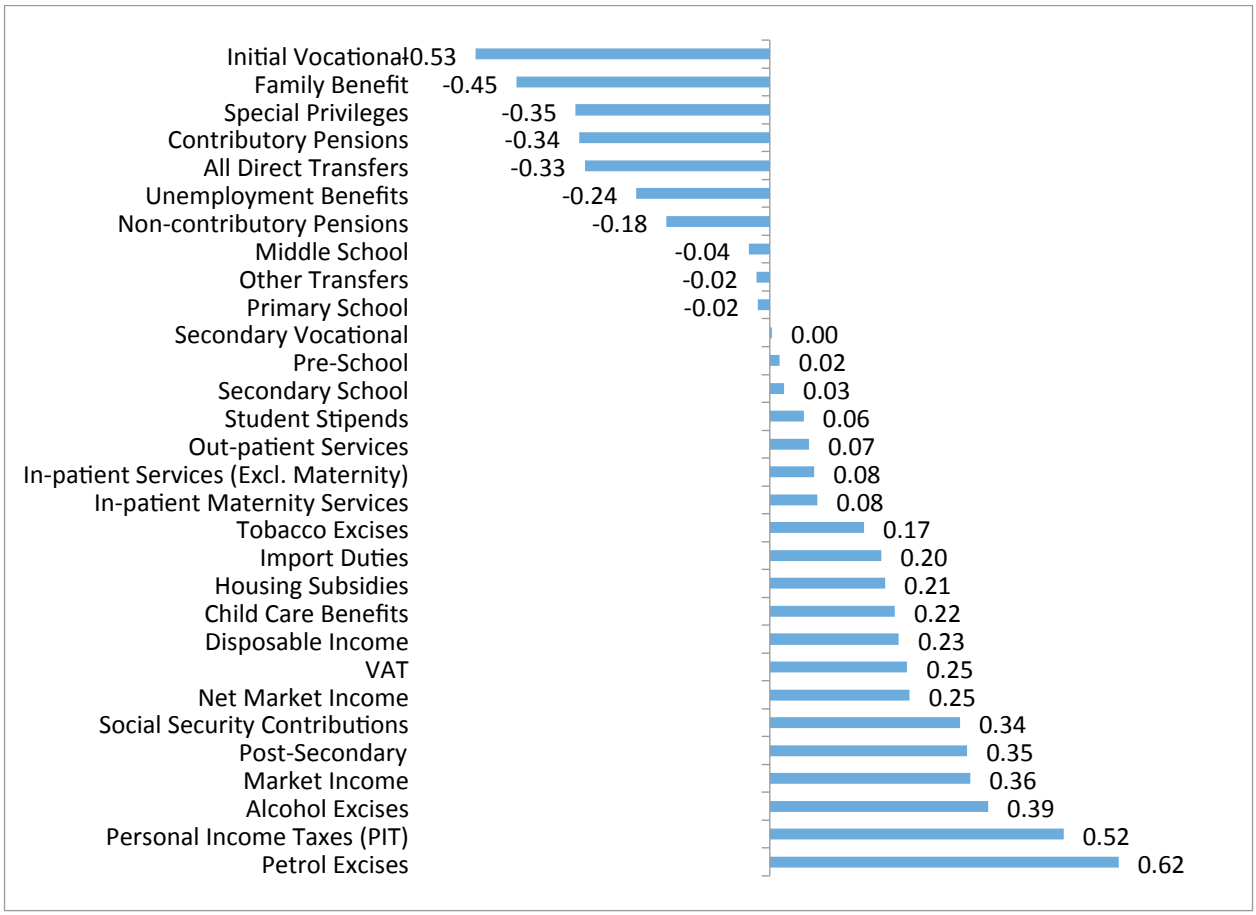


Source: World Bank.

Note: "Gini" refers to a measure of the inequality of income distribution from 0 (full equality) to 1 (maximum inequality). The CEQ (Commitment to Equity project) income concept terms used in the figure are as follows: "Market income" comprises pretax wages, salaries, income earned from capital assets (rent, interest, or dividends), and private transfers. "Net market income" subtracts from market income the payments for personal income taxes and employees' social security contributions. "Disposable income" is constructed by adding direct cash transfers to net market income. "Consumable income" adds to disposable income the impact of indirect taxes, including value-added taxes; import duties; and excises on petroleum products, alcoholic beverages, and tobacco products. "Final income" adds to consumable income the effects of in-kind transfers for health care and education.

a. "All CEQ social spending" refers to spending on direct cash transfers and health and education spending as defined by the Commitment to Equity (CEQ) project.

Figure 3A. Concentration Coefficients, Sensitivity Analysis 2: Disposable Income Estimated with Consumption Rather than Income



Source: World Bank.

Note: The CEQ (Commitment to Equity project) income concept terms used in the figure are as follows: "Market income" comprises pretax wages, salaries, income earned from capital assets (rent, interest, or dividends), and private transfers. "Net market income" subtracts from market income the payments for personal income taxes and employees' social security contributions. "Disposable income" is constructed by adding direct cash transfers to net market income.

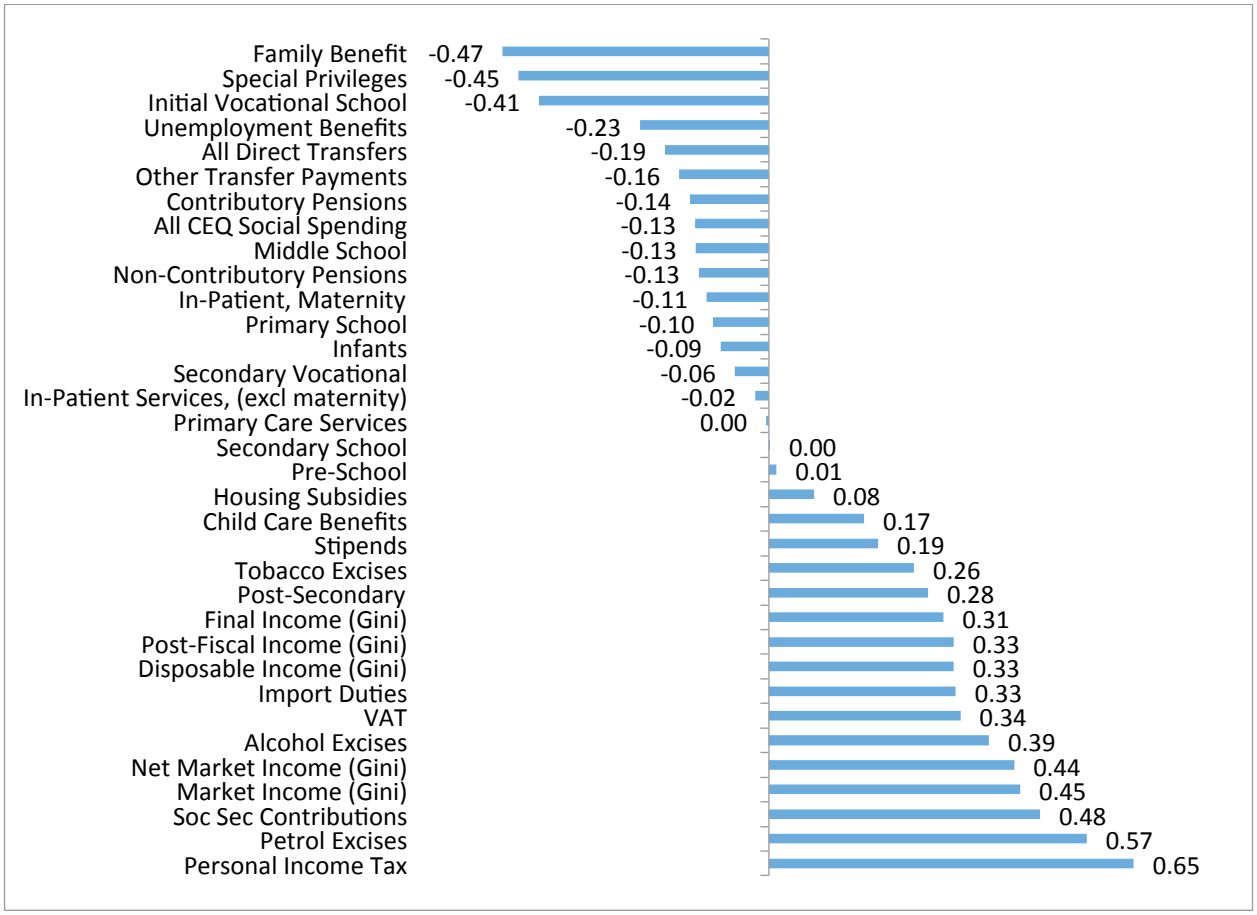
Figure 4A. Concentration Coefficients, Sensitivity Analysis 3: Income Per Adult Equivalent Rather than Per Capita

Source: World Bank.

Note: "Gini" refers to a measure of the inequality of income distribution from 0 (full equality) to 1 (maximum inequality). The CEQ (Commitment to Equity project) income concept terms used in the figure are as follows: "Market income" comprises pretax wages, salaries, income earned from capital assets (rent, interest, or dividends), and private transfers. "Net market income" subtracts from market income the payments for personal income taxes and employees' social security contributions. "Disposable income" is constructed by adding direct cash transfers to net market income. "Consumable income" adds to disposable income the impact of indirect taxes, including value-added taxes; import duties; and excises on petroleum products, alcoholic beverages, and tobacco products. "Final income" adds to consumable income the effects of in-kind transfers for health care and education.

a. "All CEQ social spending" refers to spending on direct cash transfers and health and education spending as defined by the Commitment to Equity (CEQ) project.

Figure 5A. Concentration Coefficients, Sensitivity Analysis 4: Direct Taxes Scaled Down to Same Proportion of Household Income Found in National Accounts



Source: World Bank.

Note: "Gini" refers to a measure of the inequality of income distribution from 0 (full equality) to 1 (maximum inequality). The CEQ (Commitment to Equity project) income concept terms used in the figure are as follows: "Market income" comprises pretax wages, salaries, income earned from capital assets (rent, interest, or dividends), and private transfers. "Net market income" subtracts from market income the payments for personal income taxes and employees' social security contributions. "Disposable income" is constructed by adding direct cash transfers to net market income. "Consumable income" adds to disposable income the impact of indirect taxes, including value-added taxes; import duties; and excises on petroleum products, alcoholic beverages, and tobacco products. "Final income" adds to consumable income the effects of in-kind transfers for health care and education.

a. "All CEQ social spending" refers to spending on direct cash transfers and health and education spending as defined by the Commitment to Equity (CEQ) project.