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## Tax Policy and Poverty in Armenia

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### Abstract

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the Armenian International Policy Research Group. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

This study explores microdata on individuals and households in Armenia in order to analyze the burden of various taxes across household income classes. Data sources include administrative data from the State Tax Service, survey data from the National Statistical Service, and some survey data from an independent study. Although administrative data generally do not exist at the level of the taxpayer for income tax and social insurance contributions, the income tax declarations that do exist constitute a sample of entrepreneurs and show that entrepreneurs are miscalculating their income tax liabilities with the result of making the tax burden flat across income classes. Other taxes and state duties burden entrepreneurs regressively, as will the new provision for a minimum income tax liability for entrepreneurs. In spite of differing compositions of income across household income classes, the income tax and employee share of the social insurance contribution generally burden households progressively. The employer contribution, however, if analyzed with incidence falling on households, makes the employment taxes taken together regressive, especially at the top of the distribution. Property tax on residences, although progressive in structure, is much less progressive based on cadastral values than it would be on market values.

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## **Introduction**

Two important challenges facing Armenia today are to increase tax revenues as a share of GDP and to decrease poverty. The two are of course inter-related. Greater tax revenues can enable the Government to better implement programs designed to reduce poverty, both directly through transfers and indirectly through health and education. But tax revenues ultimately come from the pockets of the people, and so increasing revenues could negatively affect poverty as well. During the process of developing Armenia's Poverty Reduction Strategy Paper, there were many discussions of the tax system as it relates to poverty. In the beginning there were several proposals to make significant changes to tax policy, especially the income tax. Fortunately, these were eventually dropped. The most recent translated draft of the document, however, still refers to the "unfair tax system" and proposes that poverty strategies involve "ensuring fair and substantiated [sic] distribution of the tax load."<sup>1</sup> This study is a first response to achieving that objective.

There are two purposes to this study. The first is to explore micro data that has only recently been collected or computerized for Armenia in order to get an idea of what kinds of policy questions, particularly concerning tax burden or tax policy, can be analyzed using these data. The two existing studies of public finance and poverty in Armenia [Barkhudaryan 2002 and Barkhudaryan and Griffin 2002] both rely on macro data. Thus they are unable to measure tax burden across classes of the population. The second purpose is to begin some of that analysis. The analysis in this paper is not complete, but the discussion of the findings in this paper should help direct more rigorous analysis to the appropriate specific questions.

This study is motivated by a concern about poverty, however, it is not a poverty study or assessment. The determination of poverty lines in any country is arbitrary and controversial, and analysis according to just two groups—the poor and the non-poor—can often obscure important information. Therefore, in this study, I present the results in terms of income deciles rather than according to poverty lines.

The paper proceeds as follows. First I discuss the data sources and their weaknesses. Then I take the sources in turn: income tax declarations, household survey income side, household survey purchases side, and property tax declarations and survey data.

## **Data**

This study explores two types of data for Armenia, administrative data and survey data. For all intents and purposes, micro-level administrative data have not been available for analysis in Armenia, and they are still not publicly available. One reason for this is that until recently the data did not exist, or did not exist in computerized format. The Ministry of State Revenue, recently renamed the State Tax Service, has implemented reforms over the last few years with the help of donor assistance, primarily the USAID/Armenia Tax, Fiscal, and Customs Reform Project. These reforms have greatly improved the situation, both in terms of the amount of

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<sup>1</sup> "Poverty Reduction Strategy Paper," Republic of Armenia, draft, October 2002, p. 96.

information computerized and the quality of those data. Tax declarations and other information are becoming increasingly computerized, and the next step is to begin to make use of this data for analysis beyond just looking at total liabilities and collections. The National Statistical Service has conducted three household surveys in the last five years. While roughly patterned off the World Bank's Living Standards Measurement Surveys, these surveys do not constitute proper LSMSs. Analysts who have worked with the 1996 and the 1998-99 databases raise numerous concerns about the quality of the data and the ability to compare statistics across the two periods. These data are the primary source of data for measuring such important indicators as poverty and inequality, however, and provide a wealth of information that is not elsewhere available.

The biggest disadvantage of the administrative data is that we have very little individual level data on income tax. The vast majority of income tax collections come from tax that is withheld by tax agents and considered final. The declarations that tax agents file with their withholding payments do not require any information on the taxpayers for whom the agents are withholding.<sup>2</sup> The Social Insurance Fund does seem to have been collecting slightly more detailed information on social insurance contributions, but we have not been able to get raw data from them. The simplified tax is also considered a direct tax, but that declaration also requires very little information.

Currently there is no single taxpayer identification number (TIN) for taxpayers like the Social Security Number in the United States. The TIN is an issue that the international donor organizations have focused on, and some reforms are beginning. As of the beginning of 2003, physical persons are supposed to be assigned the equivalent of a social security number for recording their social insurance contributions. The larger problem arises due to the administrative separation of the Social Insurance Fund from the State Tax Service and the Ministry of Finance and Economy. The SIF is semi-autonomous, and neither the SIF or the STS seem to have any interest in working together or, even worse, sharing information. Although the desire of the donor agencies is that the STS will use the social security numbers of physical persons for administering taxes such as the income tax, observers are currently quite skeptical that it will happen anytime soon or without some significant organizational changes.

The dearth of individual level administrative data makes it more important to see what we can learn about taxes from the household survey data. The ISLS data do not come with accompanying documentation, other than copies of the survey questionnaires in Armenian. So there is important information about the data that we do not have. In particular, we do not know anything about the sample design. Sources at the World Bank tell us that the sample was designed to be representative at the urban/rural level, although the 2001 survey yielded a very different urban/rural ratio than the 1998-99 survey. Comparisons with population data from the *2001 Statistical Yearbook of Armenia* suggest that the 2001 sample is generally representative in terms of sex, age, and urban/rural groupings, but the population statistics in the yearbook are still based on very old census data. What is of more interest for the study at hand is how representative the data are of income and expenditure classes, but there is no evidence that the

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<sup>2</sup> Apparently the declaration forms that tax agents complete for withholding from contract workers (self-employed workers) do require information for each taxpayer, but those data have not been computerized yet.

sample was stratified according to those or related indicators, and there is no obvious independent source of data on these variables against which a sample could be stratified. The World Bank and the Government of Armenia generally analyze the household survey data in unweighted format. There is no indication that the Armenian surveys were designed to over-sample the poor, as many LSMSs do, but we do presume that the rich were less likely to respond, or at least less likely to respond completely. Unless noted, this study does not weight the survey data; the results should be considered the results for the sample, not for the population.<sup>3</sup>

We do have reason to believe that the data are relatively clean. The USAID/Armenia Social Protection Project implemented by Padco, Inc. conducted a cleaning of the data. We have requested and are hoping to receive documentation on this cleaning. In the course of the analysis for this study, I did not run across any obvious outliers that would suggest dirty data, but I did find some missing values that could easily be filled in. I did not undertake a full cleaning of the data myself, however.

Although this study does not use sample weights, it does use inter-household weights, discussed in the appendix, for the calculation of per capita income and purchases. The Gini Coefficient on per capita monthly income, using the inter-household weights, is 0.54, which is close to the number in the Poverty Reduction Strategy Paper using the 2001 data (0.53.) The Gini on per capita monthly purchases, again using the weights, is 0.41, which is seven percentage points higher than the PRSP reports for per capita expenditures. There is no information in the PRSP on how the Ginis are calculated, so I do not know where the difference comes from.<sup>4</sup> As discussed below, the diary data on monthly expenditures cover only purchases of goods and services. The expenditures estimates for the PRSP may include imputed monthly values of other expenditures, such as rent, which this study does not.

Although we generally tend to think that household budget surveys miss the top end of the income distribution and that rich households under-report their income and expenditures, it is also true that recall error and unintentional under-reporting can create more observations with low income and expenditure than are representative of the population. When we apply weights, discussed in the appendix, based on the likelihood of unintentional under-reporting (sloppy reporting) of purchases, the calculated Gini on income reduces from 0.54 to 0.50, which is quite a significant measurement difference when compared with the targets in the PRSP for reduction in the Gini coefficient (0.51 by 2005 and 0.48 by 2010.) The Gini on purchases reduces from 0.41 to 0.36.

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<sup>3</sup> The World Bank's documentation of the 1996 survey reports that the sample was not stratified. Unless the NSS significantly changed sampling design between surveys, this documentation provides additional evidence that the 2001 sample was not stratified.

<sup>4</sup> When interpreting the expenditures Gini, it should be taken into consideration that the expenditures diary data in the 2001 survey are only purchases of goods and services.

## Income tax declarations

The income tax declarations provide very limited information on tax burden primarily because they cover such a small share of the population. Income tax declarations are NOT required of physical persons if one of the following conditions are met:

- all income received by the individual during the year is deductible
- all income received (regardless of amount) by the individual during the year is subject to withholding by a tax agent (regardless of whether the tax agent withheld the tax)
- the individual receives 250,000 AMD or less of gross income during the year from which no tax was withheld by a tax agent, or
- the individual received only income subject to presumptive or simplified tax.

These provisions exempt a large portion of the population. In addition, it is likely that many who are required to file do not file, either because they use one of those provisions as an “excuse” or because so few are legally required to file that most people in the country do not know about or understand income tax declarations. The income tax declaration database for 2001 includes only 2469 records, and only 1095 of those records have data in the most relevant fields. The sum of credits—the amounts to be collected solely due to the income tax declarations—from the database is 32.7 million AMD compared to 11 billion AMD in total income tax collections. Credit minus debits (refunds) is 25.9 million AMD, but it is unlikely that the refunds are paid.

Regardless, there are a few things we can learn from the income tax declarations. For one, it provides a sample of entrepreneurs. It is important to remember throughout this analysis, however, that this sample is non-random; it is determined by those who choose to declare. There are many entrepreneurs who pay income tax but do not file, so the sample does not include all those who pay. The data can also reveal something about how well taxpayers understand the tax law and how to calculate tax liability. Table 1 presents some descriptive statistics from the database. The database includes fewer than 10 observations with any other kind of income than contract salary or entrepreneurial income, so those are not included. The analysis here does include the observations on contract salary, which is self-employment income, but there are only 13 observations of contract salary, and only six of those filers have no entrepreneurial salary. Ultimately, the tax returns represent a sample of entrepreneurs.<sup>5</sup>

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<sup>5</sup> I leave the contract salary observations and amounts in because income tax liability is calculated on the sum of these two amounts. Income tax on other types of income is calculated independently (and with different rates).

Table 1. Descriptive statistics for income tax declarations, in thousands of drams

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Sum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Contract salary	13	-28	848	2,240	2	31
Entrepreneurial salary	1089	-2,985	24,581	408,049	373	1206
Salary plus entrepreneurial salary	1095	-2,985	24,581	410,288	375	1207
Income tax on annual taxable income	1095	0	4,772	42,102	38	222
Subject to payment to RA State Budget	1045	0	4,772	32,676	14	129
Subject to refund from RA State Budget	50	0.1	1,691	6,765	135	313

The database accounts for only 410 million AMD of individual income in the economy. The mean annual net income in the sample is 375 thousand AMD (roughly \$675), which averages just over 31 thousand a month. Only 50 declarations report a refund, with the average refund amount being 135 thousand. All but one of the declarations with refunds report making advance payments on income tax during the year. Table 2 shows how salary grosses up to revenues and expenses. Final salary is about five per cent of revenues. The bulk of the expenses are material expenses, representing the highest frequency, the highest sum, and the highest mean. Taxes and duties and “other” expenses also play a significant role, and after those in frequency come lease and insurance payments.

Table 2. Revenues, expenses, and salaries of entrepreneurs filing declarations, in thousand AMD

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Sum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Revenue from entrepreneurial activity	1099	0	908,783	7,760,140	7,061	38,044
Entrepreneurial expenses	1099	0	910,135	7,352,091	6,690	37,655
Entrepreneurial salary	1099	-2,985	24,581	408,049	371	1,204

Table 3 presents data on overall income tax burden for those filing income tax declarations. The first row is the sum of salaries (income minus expenses) for both contract and entrepreneurial activity, which I label work income. For ease of presentation, I have taken out the observations of work income less than or equal to zero. None of those with work income less than or equal to zero report any tax liability. The second two rows report tax liability as reported on the

declaration and tax burden (liability as a share of income) based on those reports. The total reported liability is 42 million AMD with a mean of about 40,000. The average tax burden is 5.4 per cent.

Table 3. Overall income tax burden for those filing declarations, in thousand AMD

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Sum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Work income	1051	0.016	24,581	418,989	399	1,221
Income tax on annual taxable income	1051	0	4,772	42,102	40	226
Reported tax burden on work income	1051	0	1.00	-	0.054	0.061
Estimated tax liability without imputed months	826	0	4,772	37,516	45	252
Estimated tax burden without imputed months	826	0	0.19	-	0.037	0.039
Estimated tax liability with imputed months	1051	0	4,772	44,213	42	227
Estimated tax burden with imputed months	1051	0	0.19	-	0.035	0.039

Before discussing the rest of table 3, it is useful to review the income tax law. The law is fairly straightforward; it was amended as of 2001 to increase the personal exemption, eliminate some privileges, and decrease the rates. For 2001 and 2002, the monthly exemption is 20,000AMD, and the tax rates are 10 per cent up to 80,000AMD of taxable income and 8,000 plus 20 per cent of the difference between taxable income and 80,000AMD for taxable incomes over 80,000AMD. For annual (entrepreneurial) income, the exemption still applies monthly. That is, filers are supposed to declare the number of months of activities accounted for by the revenues and then calculate the annual exemption as the number of months times 20,000AMD. The rates are based on annual income, however. So, the rate is 10 per cent of taxable income (i.e. after the exemption) up to 960,000AMD and 96,000 plus 20 per cent of the difference between taxable income and 960,000AMD for taxable income over 960,000AMD. The schedule, although progressive in design, is relatively flat compared to progressive schedules in many other countries.

In the database there are roughly 200 observations with data on incomes and liability but missing data for months and exemption. In many of these cases, the filer actually neglects to give him/herself the allowed exemption. Row four of table 3 presents the descriptive statistics on

estimated tax liability for those observations with months. That is, I take reported work income and activity months and calculate what the tax liability should be according to the tax law (also accounting for charitable contributions). The average liability is higher, but note that the average tax burden is lower. Lower income filers are overestimating their liability and higher income filers are underestimating their liability. For the final two rows, I impute the number of activity months in order to estimate tax liability for those with missing months. The imputation uses average months by work income deciles. Based on the imputation, we see that average liability remains higher than reported, and that burden remains lower.

Table 4 presents information on tax burden by income deciles. These deciles are constructed using the work income variable and again leaving out negative and zero values. They are not, and should not be interpreted as, representative of the population as a whole. First, we know that these taxpayers are almost exclusively entrepreneurs. Second, these decile means divided by 12 turn out to be lower, in all but the 10<sup>th</sup> decile, than the decile means of gross monthly work income from the household survey presented below.

Table 4. Income tax burden for those filing declarations, by deciles

Decile	N	Work Income	Reported Tax Burden		Estimated Tax Burden	
		Mean	Mean	St. Dev.	Mean	St. Dev.
1	105	10,888	0.047	0.050	0.000	0.000
2	104	33,962	0.049	0.047	0.005	0.013
3	105	55,501	0.041	0.042	0.011	0.019
4	105	81,301	0.039	0.035	0.020	0.021
5	104	118,734	0.051	0.039	0.025	0.026
6	106	176,390	0.052	0.041	0.031	0.026
7	105	249,961	0.044	0.036	0.033	0.026
8	105	346,766	0.050	0.031	0.047	0.020
9	105	548,799	0.060	0.031	0.064	0.014
10	105	2,366,259	0.093	0.061	0.114	0.036

In the second column of statistics in table 4, we see that tax burden according to declared liabilities is essentially flat with a small increase up to 9.3% in the top decile, which is largely accounted for by the jump in the marginal rate. In the lowest decile, with an average annual income of a little over 10,000 drams (roughly \$18), the declared tax burden is 4.7 per cent. In contrast, the fourth column of statistics shows the tax burden based on the estimated tax liabilities. Here the tax burden is clearly progressive. In all but deciles eight and nine, the hypothesis that the two means are the same can be rejected. While the lower income filers are over-estimating their liability, the high income filers in decile ten are under-estimating their liability. Thus, although the income tax law itself is meant to be progressive, in practice it turns out to be almost a flat tax rate on entrepreneurial salaries.

Entrepreneurs are also subject to the Social Insurance Contribution. The rates are a flat rate of 60,000AMD for income up to and including 400,000AMD, 15 percent for incomes over 400,000AMD and under 1,200,000AMD, and 180,000 plus 5 percent of the amount exceeding 1,200,000 for incomes over 1,200,000. Two important factors about SIC for entrepreneurs are



not entirely clear in the tax laws or on the income tax form. The first is what the taxable income base for SIC is, and the second is whether the SIC is an allowable expense for determining taxable income for income tax. A source in the State Tax Service reports that the SIC is assessed on *gross* income for entrepreneurs and that the full amount is then an allowable expense. An examination of the data suggests that many entrepreneurs are indeed including SIC in their expense line for taxes and duties. For example, the amount 60,000 shows up with very high frequency in the taxes and duties line. Not all entrepreneurs list an expense for this item, however, and many who do list an expense for this item report an amount less than 60,000, so either many entrepreneurs are either deducting it from gross income, do not understand to include SIC as an expense, or they are not paying the SIC.

Table 5 presents some indicators of tax burden for the taxes and duties facing entrepreneurs. As noted, sometimes these taxes include SIC, and sometimes they do not. The first column of average tax burden takes the reported taxes as a percentage of the gross income. When analyzing this number, remember that on average, income (income net of allowable expenses) is five percent of gross income. We see that these taxes are essentially a regressive tax on gross income. The second column of average tax burden uses the same reported taxes in the numerator but relates them to net income where income is augmented to include the amount of the taxes. Again we see that these taxes are regressive—quite regressive over the first few deciles, and then essentially flat.

Table 5. Tax burden of taxes and duties on gross and net income

Decile	N	Work Income	Burden of other taxes on gross income		Burden of other taxes on net income plus tax	
		Mean	Mean	St. Dev.	Mean	St. Dev.
1	105	10,888	0.096	0.183	0.231	0.335
2	104	33,962	0.103	0.181	0.159	0.216
3	105	55,501	0.059	0.117	0.120	0.201
4	105	81,301	0.046	0.101	0.103	0.159
5	104	118,734	0.050	0.079	0.117	0.139
6	106	176,390	0.059	0.067	0.121	0.135
7	105	249,961	0.048	0.097	0.100	0.125
8	105	346,766	0.042	0.062	0.101	0.103
9	105	548,799	0.030	0.045	0.104	0.147
10	105	2,366,259	0.033	0.093	0.099	0.189

I did try estimating the SIC liability using gross income, but the results are wild. Given the complications both that SIC is mixed up with other taxes in some places and that many likely deduct SIC from gross income before reporting that, it is hard to make the right assumptions to calculate the estimates. Looking at the mean net incomes across the deciles, however, we can see that the rate structure of the SIC is regressive for entrepreneurs, at least those represented by declaration filers. Net income is less than the amount of the tax for the first three deciles.

For the purpose of analyzing the 2001 data, I use the 2001 tax law. At the very end of 2002, however, the Parliament passed changes to the tax law, including a change to the income tax law

that requires individual entrepreneurs to pay a minimum annual income tax of 30,000AMD. Because the 2001 income declarations represent a sample of entrepreneurs the 2001 declarations data can be used to make some quick estimates of the effects of this policy change. Taking the tax liabilities for 2001, both reported and estimated, I introduce a 30,000 dram minimum. Calculated total liability does increase from 42 million and 44 million to 63 and 66 million. Table 6 presents the tax burdens, by deciles, represented by these new tax liabilities. Again, work incomes less than or equal to zero are not included. The tax system for these filers becomes entirely and significantly regressive with only a slight increase from the ninth to tenth deciles. Of course it is extremely unlikely that even with an identical sample of entrepreneurs these results would be observed. Many of these entrepreneurs will likely either go out of business or evade the tax and thus revert to the underground economy.

Table 6. Estimated tax burden on entrepreneurs for new income tax law

Decile	N	Work Income	New Tax Burden A		New Tax Burden B	
		Mean	Mean	St. Dev.	Mean	St. Dev.
1	105	10,888	94.338	294.475	94.338	294.475
2	105	34,050	0.922	0.193	0.919	0.194
3	105	55,501	0.545	0.047	0.545	0.047
4	105	81,301	0.374	0.045	0.374	0.045
5	105	118,775	0.263	0.078	0.255	0.027
6	106	176,390	0.172	0.020	0.172	0.020
7	105	249,961	0.121	0.011	0.121	0.011
8	105	346,766	0.089	0.010	0.088	0.010
9	105	548,799	0.072	0.018	0.070	0.010
10	105	2,366,259	0.098	0.054	0.114	0.036

### Integrated Survey of Living Standards, income data

The Integrated Survey of Living Standards (ISLS) does not have any direct information on taxes, but it has the advantage of having very detailed information on a large sample of households. The ISLS is a not a proper LSMS. It does not have a community service, and more to the point, it does not have a prices survey. It does contain expenditure data collected from daily diary tables that are supposed to be completed daily over 30 days. The income data also come from the diary portion of the survey. The main part of the survey asks questions about demographics, health, education, and other social condition issues. The income question allows for 20 different types of income and asks the respondent to identify how often each payment recorded is typically received by that individual (daily, weekly, monthly, or non-periodic.) The respondents are supposed to write down each income payment on the day it is received during the 30 days. So in theory these are not recall data, which is an advantage.

Although the level of detail for income and expenditure type is quite useful, there are two distinct disadvantages in the survey design, particularly for the type of analysis in this study. The first is that the income types from which respondents choose do not coincide exactly with

the income types relevant to the tax laws. Self employment income and entrepreneurial income are treated differently in the Social Insurance Contribution law, for example, but there is no separate designation for entrepreneurial income in the survey and it is not entirely clear whether respondents would call their entrepreneurial income salary or self-employment income.<sup>6</sup> A second disadvantage is that the expenditure and income sides of the survey were not designed to be complete, that is, they were not designed so that the sum of all expenditure items during the month should be the sum of all income items. The income side does allow for money taken from savings and credit taken, for example, but does not ask about payment received on loans made. The survey is complete in the sense that there is an “other income” category for respondents to use, so the survey should pick up all income received, but the other category accounts for 3% of total monthly income. Three per cent may not seem like a lot, but it is a greater share than 12 of the other possible types in the survey, suggesting that there is some important detail about income that is lost in “other.” On the expenditure side there are no codes for tax payments or loans payments, for example. In fact, the data really only include purchases of goods and services, rather than complete household expenditure data.<sup>7,8</sup>

Table 7 presents some descriptive statistics for households in the database. All statistics reported for individuals and households from the ISLS data are monthly.<sup>9</sup> It is clear that there is a lot of variation in the data, with the richest household receiving over 2000 times the poorest household, of those households reporting income data. The second row reports weighted per capita income, with lower weights assigned to children and seniors and to additional members in a household. The weighting scheme, outlined in the appendix, is still very generous and never assigns a weight lower than 0.5. Average weighted per capita income in the survey sample is 18,234 AMD, which was roughly \$33 in 2001.<sup>10</sup> Average purchases are lower, underlining the absence of certain expenditure items in the purchases survey. Only 4.1% of households report saving money during the survey month, and the macroeconomic data for Armenia also suggest that there is little saving.

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<sup>6</sup> Self-employment is considered to be individual contracting type work, while entrepreneurs are considered to be those who run their own businesses. In the individual income tax form, the entrepreneur is supposed to list “income” and then expenses; the difference between the two is “salary” from which tax liability is determined. So even though we think of entrepreneurs as being self employed, they could very easily record their own income from their business as salary.

<sup>7</sup> Other sections of the survey, filled out in interview rather than diary format, do ask questions about expenditures like rent. There are two problems aggregating these data with the purchases data, however. The first is that it is unclear, from the English translation anyway, whether the questions ask about actual money outlays or whether they just ask for information on prices. For example, “what is your monthly rent?” may not yield the same answer as “what did you pay last month in rent.” In addition, the timing of the questions in the interview survey is less specific than the timing in the diary. We do not know for sure that one monthly rent was indeed spent during the same 30-day period that the household filled out the purchases diary.

<sup>8</sup> There are also some key purchases that are not included. For example, there is no code for lottery tickets, which turns out to be a regressive tax in most cases.

<sup>9</sup> The survey was conducted over several months in 2001. Inflation in Armenia was quite low in 2001, so it should not be a problem. Seasonality always exists, although it likely affects purchases data more than income data. I do not attempt here to adjust the data for seasonality, however.

<sup>10</sup> The dram to dollar exchange assigned to the data by the NSS for 2001 is 555.1 AMD to 1 dollar.

Table 7. Descriptive statistics of households in the ISLS

<b>Variable</b>	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>St. Dev.</b>
Total household income	3650	1000	2,803,255	47,500	83912
Weighted per capita income	3650	217	2,803,255	18,234	52644
Total household purchases	3845	250	589,350	38,621	37256
Weighted per capita purchases	3845	86	203,155	14,205	13178
Work income	3650	0	800,000	27,597	50506
Social benefits and pensions	3650	0	108,000	4,500	6594
From real wealth	3650	0	474,250	2,195	17549
From financial wealth	3650	0	2,775,500	3,004	47638
Private transfers	3650	0	1,897,000	8,811	44804
Other	3650	0	222,040	1,392	9742

The bottom six rows in table 7 report the average income from income categories for those who report income from any source. The majority of income comes from work, where work here includes sale of agricultural production in addition to salaried and self-employment. The second most significant source of income is private transfers. This category includes transfers from relatives within Armenia as well as from relatives outside of Armenia.<sup>11</sup> These transfers account for 19% of household income on average. The category “from real wealth” includes income from sources such as the sale of property and the sale of valuables, and the category “from financial wealth” includes money taken from savings and credits.

Income tax and the social insurance contribution are levied on individual incomes, so I begin by estimating the tax liability on individuals in the sample for each income payment. Both the income tax law and the social insurance contribution law state that taxes are due separately on incomes from different sources. The income tax exemption, for example, applies to each income payment during the month. This provision was introduced as part of the income tax law change for 2001 as way to facilitate tax administration. It absolves employers from collecting any information from employees regarding exemptions. This provision itself introduces possibilities for distortions in tax burdens, which are discussed in the USAID/Armenia Tax, Fiscal, and Customs Reform Project “Tax Policy Review”. There are also no exemptions in the law for dependents. Income tax is supposed to be withheld from all salary and self-employment payments and is then final. Similarly tax agents are supposed to collect and pay social insurance contributions on all salary and self-employment payments. Thus, I estimate both income tax payments and social insurance contributions by applying the laws to each observation of income. Observations of income in the survey are assumed to be net of taxes, so I also calculate “work income” as the gross income associated with the net payments observed. See the appendix for information on the treatment of non-monthly payments.

As noted above, for 2001 and 2002, the monthly exemption applicable to income tax is 20,000AMD, and the tax rates are 10 per cent up to 80,000AMD of taxable income, and 8,000 plus 20 per cent of the difference between taxable income and 80,000AMD for taxable incomes over 80,000AMD. The employee contribution to the social insurance fund is three percent of

<sup>11</sup> There is not an option for transfers from non-relatives.

monthly gross income. The employer contribution is 5,000 AMD for wages up to 20,000 AMD a month, 5,000 plus 15 percent of the difference between wages and 20,000 for wages over 20,000 and less than 100,000, and 17,000 plus five per cent of the amount over 100,000 for wages over 100,000.

Table 8 presents descriptive statistics on individual incomes and tax liabilities for individuals reporting taxable income payments in the sample. Work income for these calculations is predominantly salary and self-employment income, but also includes a few observations of interest, for which income tax is also supposed to be withheld and final. Total income includes all types of income reported in the survey. The total income tax liability estimated from the survey is less than 0.04 per cent of total income tax collections in 2001, and the total social insurance contribution estimated from the survey is less than 0.08 per cent of total social insurance contributions in 2001. Although we have no way of knowing whether these individuals paid the taxes as estimated, withholding taxes seem to be collected much more efficiently than self-reported taxes. In fact, if we assume that tax agents over-estimate tax liabilities in the way that the taxpayers filing individual income tax declarations do, we may think that these estimates are less than actual tax withheld. Evidence from withholding data in Moldova, for example, shows that firms do over-withhold from their employees' wages, especially at the low end of the wage distribution. [Brown 2001] On the other hand, some observers in Armenia suggest that the reason total collections are low is that firms are under-withholding for income tax.

Table 8. Descriptive statistics on income and tax liability for individuals with taxable income in the ISLS

<b>Variable</b>	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Sum</b>	<b>Mean</b>	<b>St. Dev.</b>
Gross work income	2816	515	763,636	81,424,178	28,915	36005
Personal income tax	2816	0	140,727	4,175,463	1,483	5011
Employees' SIC	2816	0	22,909	2,393,612	850	1051
Employers' SIC	2816	0	80,000	19,822,727	7,039	4292
Gross income	2816	515	763,636	97,825,276	34,739	44814

Tables 9 and 10 present the tax burden results from these tax liability estimates according to income deciles. The decile sizes are not entirely equal due to multiple observations with the same values. Table 9 illustrates tax burden for individuals only relative to taxable income. The results are not surprising given that the tax estimates were made based on the law. Income tax is progressive, and there is no burden on the lower deciles and low burdens on the upper deciles. Even with a top marginal rate of 20 per cent, the burden on the top decile is only eight per cent. The employees' total withholding, income plus social insurance contribution, is also progressive at the top end of the distribution.<sup>12</sup>

<sup>12</sup> It is not entirely clear from the tax laws whether the employee's contribution is deductible from taxable income when tax agents collect income tax withholding. The estimates in this study assume that it is not, that is, both the employee's contribution to the social insurance fund and the income tax liability are determined using the same taxable income base.

Table 9. Individual income tax and SIC burden as share of work income for employed sample, ISLS Survey

Deciles	N	Work Income	PIT Burden		Employee Tax Burden		Total Payroll Burden	
		Mean	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev
<i>Avg.</i>	2816	28,915	0.021	0.030	0.050	0.029	0.030	0.119
1	286	4,140	0.000	0.000	0.030	0.000	0.582	0.114
2	245	8,136	0.000	0.000	0.030	0.000	0.414	0.580
3	318	11,056	0.000	0.000	0.030	0.000	0.339	0.037
4	375	15,021	0.000	0.005	0.030	0.004	0.274	0.022
5	187	17,791	0.001	0.007	0.030	0.005	0.253	0.045
6	276	21,136	0.005	0.004	0.035	0.004	0.231	0.032
7	277	27,118	0.024	0.007	0.054	0.007	0.236	0.034
8	306	34,201	0.040	0.010	0.070	0.009	0.235	0.035
9	275	47,646	0.054	0.012	0.084	0.012	0.237	0.014
10	271	106,487	0.083	0.029	0.112	0.029	0.236	0.026

These tables also report statistics related to the employers' contribution to the social insurance fund. In Armenia, the incidence of the employers' contribution is considered to fall on the employer. Firms complain that labor taxes are an impediment to being profitable. The structure of the rates, however, clearly differentiates between low-wage and high-wage labor. While it would be wrong to assume that if the employers' contribution were eliminated, employees would receive the full amount of the contribution as increased wages, it can still be useful to assign those contributions to employees to see how the burden correlates across the distribution. Even if a change in the structure were to only increase employment and not wages, it would still increase employment in the wage categories where the current burden is highest, thus benefiting that part of the population.

The final columns of tables 9 and 10 add the employer's social insurance liability to the income tax and employee's contribution for each observation. The denominator is also increased by the amount of the employer's contribution. The change in tax burden is dramatic. The burden is regressive over the first four deciles and then becomes flat. It is also quite high, 30 per cent on average.

Table 10. Individual income tax and SIC burden as share of total income for full sample, ISLS Survey

Deciles	N	Total Income	PIT Burden		Employee Tax Burden		Total Payroll Burden	
		Mean	Mean	St. Dev	Mean	St. Dev	Mean	St. Dev
<i>Avg.</i>	6211	28,972	0.009	0.022	0.021	0.031	0.127	0.161
1	640	3,075	0.000	0.000	0.004	0.010	0.100	0.247
2	621	4,203	0.000	0.000	0.001	0.005	0.019	0.102
3	604	5,193	0.000	0.000	0.006	0.012	0.098	0.197
4	618	8,602	0.000	0.000	0.009	0.013	0.126	0.192
5	622	11,970	0.000	0.004	0.017	0.015	0.193	0.163
6	623	16,105	0.000	0.000	0.019	0.014	0.172	0.125
7	610	21,801	0.003	0.005	0.019	0.017	0.136	0.117
8	630	29,980	0.020	0.016	0.042	0.028	0.171	0.100
9	622	47,472	0.030	0.027	0.048	0.040	0.145	0.112
10	621	141,258	0.035	0.044	0.048	0.056	0.107	0.110

Table 10 replicates the calculations but using each individual's total income in the denominator. In the sample, taxable income is only 43 per cent of total income on average. If different income classes of individuals have different shares of taxable vs. non-taxable income, the burden of income tax across the distribution be different. The results in the table do suggest, in fact, that individuals with higher income have a lower share of taxable income. While the income tax and the income tax plus the employee's contribution continue to be progressive in the lower deciles, they flatten out in the top deciles. When the employer's contribution is added, the burden becomes fairly flat across the distribution with a noticeable drop in the tax burden in the top decile. There is an interesting drop in the burden from the first to the second decile. It turns out that while 94 of the individuals in the bottom decile are employed, only 26 of those in the second decile are employed.

Table 11 aggregates the individuals into their households and presents the results according to deciles of households ranked by weighted per capita income. In this sample, income tax is a progressive tax on household incomes as well as individual incomes, although it flattens for the top deciles. The addition of the employee's social insurance contribution increases the average rate and appears to make the burden on the top deciles flatten more, but the differences are not statistically significant. The addition of the employer's contribution increases the burden across the distribution significantly and definitely makes the total burden regressive at the top of the distribution with the differences between the means of the eighth and ninth, and ninth and tenth, deciles being statistically significant.

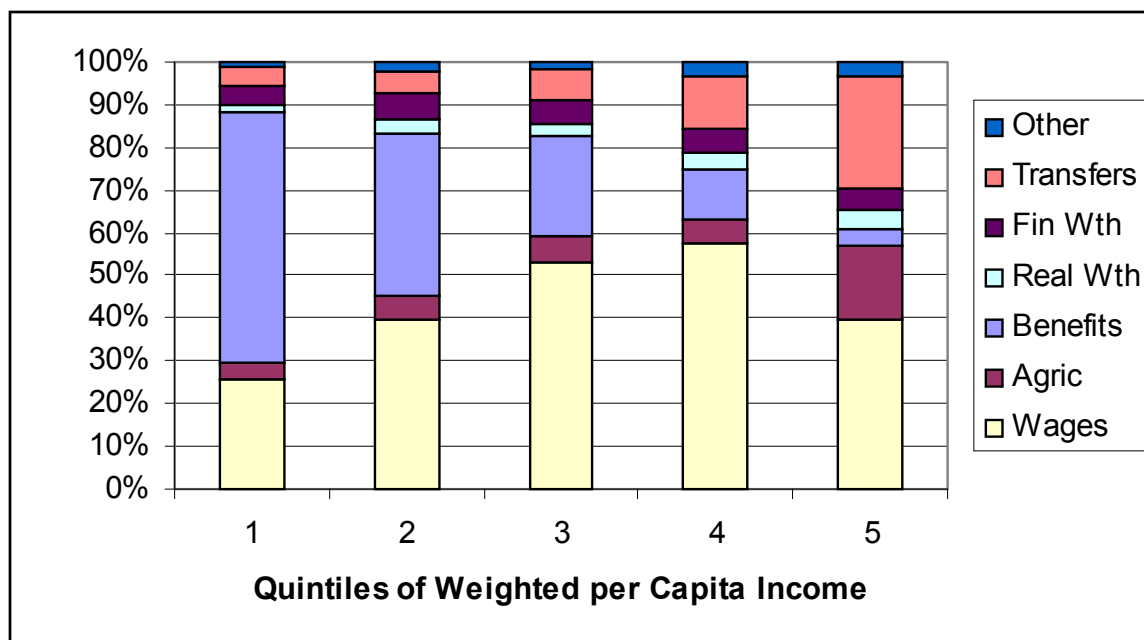
Table 11. Income tax and SIC burden on household income, ISLS Survey

Deciles	N	Weighted Per Capita Income Mean	PIT Burden		Employee Tax Burden		Payroll Tax Burden	
			Mean	St. Dev	Mean	St. Dev	Mean	St. Dev
<i>Avg.</i>	3650	18,234	0.012	0.023	0.025	0.032	0.131	0.142
1	365	2,065	0.000	0.000	0.008	0.013	0.149	0.245
2	365	4,175	0.000	0.001	0.007	0.012	0.096	0.156
3	364	5,618	0.001	0.003	0.011	0.014	0.124	0.147
4	366	7,547	0.003	0.008	0.016	0.019	0.137	0.137
5	365	9,330	0.008	0.015	0.023	0.025	0.138	0.126
6	366	11,535	0.012	0.018	0.029	0.027	0.162	0.115
7	369	14,800	0.017	0.021	0.034	0.031	0.152	0.108
8	360	19,313	0.022	0.025	0.039	0.035	0.149	0.103
9	366	28,695	0.025	0.030	0.040	0.041	0.126	0.103
10	364	79,471	0.027	0.043	0.037	0.053	0.081	0.098

As suggested already, the effects of taxes on different deciles of the income distribution come from two factors, the structure of the tax system and the structure of household income. In addition, when analyzing tax burden on households, it is important to take into account the social benefits received by households. That is, benefits could be considered “negative taxes”—money that comes into the household from the budget rather than going out to the budget. The structure of household income, then, tells us both about which households benefit from taxes as well as which households are likely to pay more taxes. Chart 1 below shows the structure of household income across weighted per capita income quintiles.



Chart 1. Structure of household income across weighted per capita income quintiles



As indicated by the earlier analysis, the chart clearly shows that the share of wage income in total income decreases for the top quintile, although it increases across quintiles for the first four. As long as income and social insurance taxes are based primarily on wage and salary income, they will essentially be regressive at the top end of the distribution. The benefits share of income follows the expected, and desired, path. Benefits (which include pensions) account for a large share of income for low-income households but a small share for high-income households. Perhaps more striking is the role of agricultural income. We might expect that low-income households would have a significant share of income from agriculture since those households would be more likely to engage in production to make extra money. Such a hypothesis might justify why income from agricultural production is not taxable under the income tax law. Instead we see that agriculture accounts for a significantly larger share of income in the top quintile of households. These are probably not individual producers but owners of farms. Agriculture is taxed through the land tax, which is calculated on cadastre values that are supposed to correlate with potential value of output, but it is unlikely that this correlation is close. A final trend to notice in the chart is the increasing share of income across quintiles that is accounted for by private transfers. It is sometimes argued that private transfers have prevented even more Armenians from becoming poor during the transition. That might be true, but transfers seem to be benefiting the rich more than the poor and are thus contributing to the increase in inequality.

### Integrated Survey of Living Standards, purchases data

Generally consumption taxes that apply equally across goods are considered to be regressive when the consumption share of income increases over income classes. The ISLS data clearly show that the consumption share of income increases over income classes, with the lowest quintile spending much more than its income and the highest quintile spending about 60 percent

of its income. So in this sense certainly, the consumption taxes are regressive. As Barkhudaryan and Griffin [2002] report, indirect taxes have increased in importance significantly during transition growing from 3.5 to 10.4 per cent of GDP and from 26.5 to 57.8 per cent of tax revenues. The change in the overall structure of taxes alone has caused the tax system to become more regressive (or at least less progressive).

Purchases by Armenian households are subject to several taxes. Most obviously, they are subject to VAT. VAT accounts for roughly half of tax collections in Armenia, but the effective VAT rate is quite low. The VAT statutory rate is 20 per cent, and an estimate of the effective rate (collections as a share of estimated VAT base) in 2001 is 4.3 per cent.<sup>13</sup> The VAT law itself is fairly clean, with relatively few exemptions, although the most recent amendments complicate the process of claiming credits. The policy impediments to effective VAT collection come instead from the simplified and presumptive taxes. These taxes also negatively impact the income and profits taxes. The simplified and presumptive taxes make it difficult to analyze the burden of all three taxes on consumption. Each has a different tax base (VAT is based on value added; simplified is based on turnover; and presumptive are based on other indicators entirely) and a good is likely to be “subject to” more than one regime along the production-consumption value chain. “Subject to” is in quotes because simplified and presumptive taxes are actually direct taxes—taxes on agents not goods. But a good that has had VAT applied to it during production is likely to be sold to the final consumer by an agent in the simplified or presumptive tax regime. In fact, until January of 2003, all commercial trade organizations were simplified taxpayers. An analysis of the simplified and presumptive taxes is beyond the scope of this paper.<sup>14</sup>

There are a few things we can learn from the ISLS about VAT and excise tax, however. First we know that there are some goods that are VAT exempt. A VAT exemption does not mean that the price of the good embodies no VAT at all. Because the seller of the good cannot claim a credit on his/her inputs, he/she will have to account for the tax paid on inputs in the mark-up on the good. It should mean, though, that the VAT embodied in the price of the good does not include VAT on the value added by the final supplier. So, theoretically the VAT paid on VAT exempt goods is lower, although not zero. VAT exempt goods include agricultural products sold by the producer, educational products, financial services, and others. Table 12 below shows the share of VAT exempt purchases of goods and services across weighted per capita income quintiles.<sup>15</sup>

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<sup>13</sup> “Tax Revenue Forecasts and Projections: 2002-2005,” USAID/Armenia Tax, Fiscal, and Customs Reform Project (Annette N. Brown) March 2002. This estimate uses VAT collections before presumptive taxes are reclassified into VAT.

<sup>14</sup> The USAID Tax, Fiscal, and Customs Reform Project is currently developing a VAT simulation model that will allow more detailed analysis of the impact of VAT and VAT exemptions on different sectors and of simplified and presumptive on VAT.

<sup>15</sup> Households reporting purchases but not incomes are excluded.

Table 12. VAT exempt share of purchases and excise tax burden on purchases by weighted per capita income quintiles

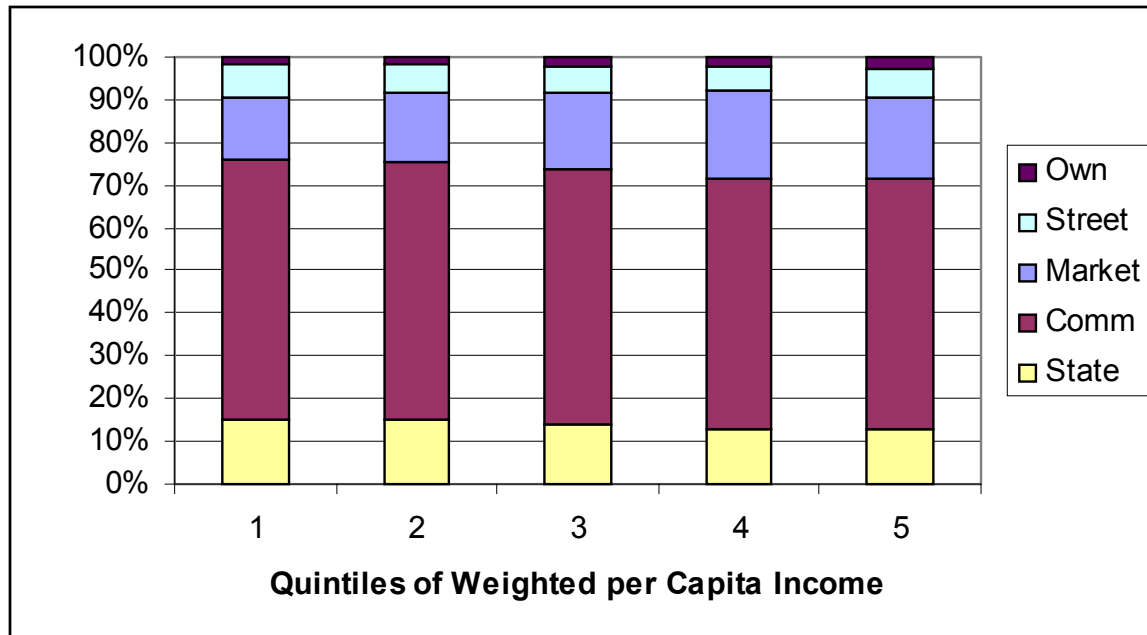
			Share of purchases exempt from VAT		Excise tax burden on purchases	
Quintiles	N	Income	Mean	St. Dev	Mean	St. Dev
1	678	3,120	0.080	0.085	0.032	0.062
2	684	6,585	0.088	0.079	0.025	0.043
3	701	10,434	0.093	0.073	0.024	0.035
4	716	17,029	0.098	0.076	0.025	0.035
5	712	54,013	0.086	0.086	0.026	0.036

The table shows that VAT exempt purchases make up an increasing share of total purchases from the first through the fourth quintile, with a drop in share from the fourth to fifth quintiles. This benefit to better off families is likely to be due in large part to the VAT exemption on higher education.

Table 12 also shows the burden of excise tax on total purchases. These statistics come with a few caveats. First, the excise tax on tobacco, which is included here, is a presumptive tax. The presumptive taxes on fuels are not included, because the data are not complete enough. Thus the calculation includes the excise on alcohol and the presumptive on tobacco. It is generally believed, and the data concur, that the tax on tobacco is often evaded. I assign an excise tax of zero to cases where the price of the box of cigarettes is actually less than the tax, and I assign an excise tax of zero to cigarettes purchased in “the market”. The average price of cigarettes from this source, even for identical brands, is significantly lower in the data than the average price from other sources. Of course the interpretation of tax burden for the taxes on these goods, which may be considered “bads,” may be different than the general interpretation of tax burden. Either way, we see that excise taxes for the lowest-income households do account for a larger share of purchases. The rate is then flat across the second through fifth quintiles, suggesting that the elasticity of demand of these goods with respect to income is roughly one.

Finally, there is reason to believe that the tax regime and/or the ability to evade taxes may differ over the type of trading organization that is selling goods for consumption. For example, commercial trading organizations, until January 2003, were all supposed to be in the simplified regime, but market organizers also pay presumptive tax according to their square meters and other coefficients, and trading stalls pay presumptive tax instead of simplified tax. Another example comes from the tobacco data, which revealed that the prices in the “markets” are lower than other places for identical goods. Chart 2 below shows the share of total purchases according to where purchased by weighted per capita income quintiles.

Chart 2. Shares of purchases by place of purchase



There seems to be a small increase in the share purchased in markets and a small decrease in the share purchased in commercial shops as households are better off, but these changes are quite small. Overall, it appears that place of purchase does not have a big impact on tax burden across the income distribution.

### Property tax data

One of the popular arguments during the PRSP discussions was that the best way to increase taxes without hurting the poor is through the property tax, in particular improving administration and possibly moving to market valuation. We have two databases that can be used to analyze the burden of property tax, particularly property tax on dwellings in Yerevan. First, there is an administrative database on property tax with different tables for different property categories. Second, in 2000 and 2001, the USAID Tax, Fiscal, and Customs Reform commissioned a study of the market values of dwelling units in Yerevan. The survey produced data on both cadastre value and market value for the sample of properties. Neither source contains or can be linked to information on taxpayer incomes.

There is also some information in the ISLS on housing. Of the sample with positive household income, 92 percent own their residence. Table 13 presents some descriptive statistics of residences across weighted per capita income quintiles.

Table 13. Descriptive statistics of residences by weighted per capita income quintiles

Quintile	N	Percent Owned		Living Space		Number Rooms	
		Mean	St. Dev	Mean	St. Dev	Mean	St. Dev
1	730	0.927	0.260	58.3	31.0	2.94	1.20
2	730	0.922	0.268	54.5	33.3	2.82	1.17
3	731	0.919	0.273	49.7	25.6	2.66	0.99
4	729	0.915	0.279	50.0	27.8	2.73	1.15
5	730	0.908	0.289	57.6	31.9	2.86	1.13

The striking feature of table 13 is how little difference there is between income classes. In fact, although the differences are probably not statistically significant, it appears that the lowest quintile has the most ownership of larger residences with more rooms. Households in the highest quintile are the least likely to own the residence they are living in. This finding is not surprising in the transition environment. Initial ownership came from privatization. It is actually the better off households who are able to move to a more preferred residence by either renting or selling their initial residence. This finding is consistent with the result that the primary reasons for moving indicated by the survey are to improve housing condition and for family reasons, i.e. household choice. Only eight per cent of households report a move in the five years preceding the survey.

Based on the property tax administrative data, table 14 below shows the average cadastral values for all dwelling units in Yerevan in 2001 according to the property tax brackets. The final column comes from the property tax survey and shows the ratio of cadastre value to market value for the survey observations in the same brackets. It should be noted that the market value adjustment ratios for the higher tax brackets are based on very small samples from the survey; the ratio for the top bracket is based on only 12 observations. The similarity of that ratio with the ratio for the next bracket down lends additional credibility to the estimate, however.

Table 14. Cadastral value tax liabilities and adjustment factors for residences in Yerevan

Tax Bracket	Number of Buildings	Average Cadastral Value	Total Tax Liability	Adjustment to Market Value
0 – 3,000,000 AMD	123,238	423,108	0	1.0555
3,000,001 – 10,000,000	97,136	4,608,905	165,996,161	0.7491
10,000,001 – 20,000,001	3,891	13,240,774	52,845,805	0.5009
20,000,001 – 30,000,000	688	24,277,823	30,417,370	0.3746
30,000,001 – 40,000,000	355	34,466,755	33,334,687	0.2805
> 40,000,000	395	60,089,604	113,687,648	0.2614
Total	225,703		396,281,671	

The final column reveals that the cadastre value of residential property in Yerevan increasingly under-estimates market value as cadastre values increase. Put differently, a household owning a property with a high cadastre value, while paying more tax than those with lower valued residences, is likely paying far less than it would be if the tax were based on the market value of the property. We cannot say, however, that the cadastre tax system is regressive on income. As seen in table 13, residences do not necessarily vary in their basic characteristics across the income distribution.

Table 15 shows the tax burden across tax brackets of the current residential property tax rates for both cadastral valuation and market valuation. Clearly the tax itself is a progressive tax on wealth, but consistent with table 14, it would be more progressive if it were applied to market values.

Table 15. Tax burden of property tax on residences in Yerevan relative to property value for cadastral and market valuation

Tax Bracket	N	Cadastral Valuation		Market Valuation	
		Mean	St. Dev	Mean	St. Dev
0 – 3,000,000 AMD	123231	0.0000	0.0000	0.0000	0.0000
3,000,001 – 10,000,000	97136	0.0003	0.0002	0.0005	0.0002
10,000,001 – 20,000,001	3891	0.0010	0.0002	0.0020	0.0005
20,000,001 – 30,000,000	688	0.0018	0.0003	0.0050	0.0004
30,000,001 – 40,000,000	355	0.0027	0.0003	0.0064	0.0001
> 40,000,000	395	0.0043	0.0009	0.0070	0.0002

Although the policy recommendation may seem obvious here, it is not. Property tax is a tax on wealth, but it must be paid from income, no matter how the property is generating income. This distinction is likely to be important in some cases in Armenia because of the transition process.<sup>16</sup> Because of the way apartments were allocated (officially anyway) during the Soviet period, there are likely to be households that are poor but that obtained, through apartment privatization, apartments with very high value in the market economy, for example, apartments in the center of the city. As table D1 shows, according to some characteristics, lower-income households own similar residences to higher income households. If these original households are still occupying their apartments, a property tax based on market values could force them out of their homes. Some would argue that there is no problem with this, as it is merely forcing these households to realize the income possible from their wealth by selling or renting. But that argument is always controversial.

## Conclusion

The analysis of the income tax declarations shows that income tax liabilities are often being calculated incorrectly resulting in a tax burden that is relatively flat across income deciles. If liabilities were calculated correctly, according to the previous law anyway, the tax would indeed

<sup>16</sup> This distinction is also important in U.S. cities where old, poor neighborhoods become gentrified, and property values increase significantly in a short period of time.

be progressive. The new minimum tax for entrepreneurs is shown to be highly regressive among the sample filing declarations. The analysis of the ISLS does not tell us what the effective rates are as there are not tax data in the ISLS, but it does allow us to see how statutory rates affect different individuals and households based on the composition of their income. They also allow one to estimate the combined effect of the income tax and SIC and see how that burden changes across income classes. The results show that the income tax and employee SIC relative to taxable income are, not surprisingly progressive. As a share of household income and across weighted per capita income deciles, the taxes are still progressive but the burdens flatten out across the top deciles as these households have a greater share of income from non-taxable sources. When the employers' SIC is added to the mix, however, the total tax burden becomes flat across the bottom deciles and regressive in the top deciles.

On the consumption side, the share of VAT exempt purchases in total purchases actually increases across the first four weighted per capita income quintiles and then drops in the fifth. These exemptions, to the extent that they do reduce prices, seem to be benefiting better-off families more than worse-off families. Excise tax on alcohol and tobacco results in a flat tax burden across quintiles except for a higher burden on the lowest. These goods seem to be somewhat inelastically demanded at lower incomes and then have unitary elasticity of demand with respect to income for the rest.

The “regressivity” of the property tax on residences arises not because the rates are regressive, they are actually quite progressive, but because the cadastre values undervalue property by a great proportion the more valuable the property is. Thus, households with high-value property benefit disproportionately from the continuation of the cadastral system.

The concerns about tax burden in Armenia arise, not surprisingly, when the system uses flat amounts—not even flat rates—to determine liabilities. The employer's contribution to the Social Insurance Fund is extremely regressive and no doubt provides a disincentive for the employment of low-wage labor. There is also evidence that SIC for entrepreneurs is regressive, providing a disincentive for entrepreneurship. The new income tax minimum for entrepreneurs is also regressive and again will provide a disincentive for entrepreneurship, or at least for reporting and paying taxes. If the cadastral valuation system for the land tax is as far off the mark from market valuation of potential output as the valuation of residential property in Yerevan, high-income households are benefiting more than proportionately as they have a higher share of income from agricultural production.

These minimums, and the use of cadastral values, are justified on the basis of tax administration. We know that there is extensive tax evasion, both under-reporting of incomes and wages and non-reporting. The philosophy seems to be that as long we can observe them, we can get at least a minimum amount from them. Clearly the uses of the SIF revenues are important and benefit poor households, so it is not a bad thing to want to guarantee a minimum amount of revenues.

Thinking about the bigger picture, however, these minimums contribute to several negative outcomes. First, they discourage employment of low-wage labor, in many cases exactly those who need employment to be lifted out of poverty. They discourage entrepreneurship, which is

also considered a key strategy for poverty reduction. They create a significant disincentive for agents to register with the tax system and come into the formal economy. An entrepreneur knows, for example, that as soon as she registers, she will have a tax bill of at least 90,000AMD.<sup>17</sup>

Proponents of entrepreneurship suggest that the solution is to have tax breaks and privileges during the first years of operation, but such provisions introduce their own complications and disadvantages to the tax system. Better would simply be to tax everyone according to the same rates, but fairly, so that those who have bad years, especially during start-up, have a low or zero tax bill. It is better to get these agents into the tax system with a zero tax bill so that they can be taxed over the years when they do become profitable than to scare them out of the tax system and have them develop their tax evasion procedures from the beginning. The simplified tax does address some of these problems, but it does not exempt an entrepreneur from SIC and it confuses market signals by taxing turnover rather than profit and by not allowing taxpayers to gain their VAT credits.

The presumptive tax, although not analyzed in this paper, is also an example of a tax where the liability is essentially a flat amount rather than being based on income. Most of the tax schemes under the presumptive regime have coefficients that should roughly correlate with profitability, but these are very rudimentary, and certainly do not account for length of time in business or economic fluctuations or any other significant determinants of profit and income. Of course if they did account for these things, the tax would not be easy to administer, which is the point of it. But the outcome is that these flat taxes distort the prices in the economy.

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<sup>17</sup> The simplified tax regime would exempt her from the income tax, but there is still a minimum SIC for those in the simplified regime.



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## Appendix. Data notes

### *Income tax declarations data*

There are two big outliers for tax burden: TIN = 25227672 and TIN = 25227672. These have been assigned outlier value of 1 and selected out of table A4. In these cases the taxpayers reports owing the full amount of taxable income (burden = 1). The calculations otherwise seem to be done correctly, and the liability is entered into the credit column.

Months of economic activity are imputed by using the average number of months reported for filers in the same income decile.

### *ISLS, income*

On weighting members of households:

First filter out all members who were away for 3 months of the quarter.

Create variable named memtype that is 1 for adult ( $18 \leq \text{age} < 60$ ), 2 for senior ( $\text{age} \geq 60$ ), 3 for child ( $13 \leq \text{age} < 18$ ), 4 for young child ( $\text{age} < 13$ )

Create weights, variable = memwgt, values below

Person 1 = 1

Person 2 & adult = .8

Person 2 & (senior or child) = .7

Person 2 & young child = .6

Person 3 & adult = .7

Person 3 & (senior or child) = .6

Person 3 & young child = .5

Person 4-N & adult = .6

Person 4-N & (senior or child or young child) = .5

Note: there are 14 households with sums of weights less than 1. These are cases where the head of the household (at least) has been away for 3 months out of the quarter. In these cases, I have reset the sum of weights to be 1.

On frequency of income payments:

A check of the data revealed that many daily incomes seem to be monthly and probably wrongly coded. For example, 26/134 daily incomes are pensions, which we know are paid monthly. The amounts for these payments are more typical for monthly pension amounts (4000-5000AMD.) A rough check of daily salary incomes reveals rather high numbers in most cases—too high to be 1/21 of monthly income. Thus, I believe most of these are also wrongly coded. For this reason, daily incomes are NOT multiplied by 21 to get monthly income, but rather added in as they are in the data.

Similarly, a rough check of the data suggests that weekly incomes should not be multiplied by 4 to get monthly incomes. The vast majority of weekly incomes reported are for sale of agricultural production, which makes sense as a weekly source of income. But most cases list four or more of these observations, suggesting that the weeks are listed separately, with the corresponding amounts for each week. Again, the weekly incomes are added to get total monthly, without multiplying by 4.

Non-periodic are a hodge-podge, but a rough check also suggests that they should be added without multiplying by some imputed number of days, mostly because the amounts are too large to be daily incomes and also because the sources are non-periodics type sources.

Before summing, the ruble and dollar amounts are converted to drams at the rates 18.97 drams to the ruble and 555.1 drams to the dollar.

### *ISLS, purchases*

Purchases are summed simply over the month to get the total. Purchases from Z3 (annual purchases of consumer durables) are not included, as almost all these items are also included in X4, the daily diary list.

I derive a weight for households based on the likelihood they filled out the diary completely using two variables. The first is a basket of goods including perishable items that almost every household in the survey reports consuming during the year. I picked these items using the annual consumption data from the HH set. I picked six items: cheese, eggs, cucumber, tomatoes, onion, and cabbage. It is true that the annual responses are “consumption” rather than “purchases” and there could be households that consume home production and therefore do not have to purchase. Assuming that at least one of these would have to be purchased, we simply weight according to whether there is any of these items purchased during the month, not how many or how much.

Oddly, the food items in the HH set do not match exactly with the codes in X1. For example, there is no code for matsun in X1 but almost all households report annual consumption of X1 in HH. There are several codes for cheese, so I include them all. The basket food codes are:

10406  
10407  
10408  
10409  
10410  
14011  
10501  
10804  
10803  
10805  
10801.

Purchases of these items account for 13% of all purchase events. 634 households do not report a purchase in the last 30 days of any one of these items.

The weights also take into consideration the number of days purchases are reported. Thinking about how the diary is filled out, it seems that more “benign” under-reporting probably arises more when a household skips a day of reporting rather than skipping purchases on days that are recorded. Certainly purchases are skipped or forgotten on days that do have purchases, but more is missed when households forget the diary for a few days and then try to pick up again. I do not just use days because some households do “stock up” and not shop many days in a month.

The important thing is not to downweight poor households too much.

The weights are of course purely arbitrary, but here they are:

No basket purchases and days < 5 – 0.2

No basket purchases and  $5 \leq \text{days} < 10$  – 0.5

No basket purchases and  $10 \leq \text{days} < 15$  – 0.8

Assigning excise and presumptive rates.

I use the rates for 2001. This is important because even though the rates are not as relevant to current policy, the amounts purchased now would have of course changed as a result of the changes in the tax. The only change in rate for alcohol is a small decrease from 2001 to 2002 in the rate on champagne (300 to 250). The rates for tobacco changed a lot, so again, I use the rates for 2001 since consumption during 2001 would have responded to those rates.

For some reason, for cigarettes, there were some missing values on quantity even though there were values for purchase cost. These missing values would suggest that Padco’s cleaning process was not complete. I filled them in choosing the quantity number that made sense given the total purchase amount and the household’s consumption pattern. In almost all cases, the appropriate number was quite obvious.

Presumptive rates on tobacco need to be converted to per box and drams (law is in dollars). Use exchange rate of 555.1 and 20 cigarettes per box.

I checked whether the average box prices differ across place of purchase. Interestingly, the market is definitely the cheapest place to get cigarettes. The street is close to as expensive as in a shop. The only case where the market was not definitely cheaper was for Cosmos.

Rates for 2001:

Filter import – 111.02 per box

Filter domestic – 88.82 per box

Non-filter import – 33.31 per box

Non-filter domestic – 24.42 per box

I assume that all cigarettes bought in the market were tax free. For the “other” category, even assuming that the other tobacco goods are those with the lowest tax rate, cigarettos, the average tax is equal to the average reported price, so I assume a rate of zero for these purchases.