2021 DINA Regional Update for Armenia, Azerbaijan, Belarus, Georgia and Ukraine

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Distributional National Accounts Update Armenia, Azerbaijan, Belarus, Georgia and Ukraine
Technical Note

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Overview

In this note, we discuss the inclusion of five new countries – Ukraine, Belarus, Armenia, Azerbaijan and Georgia - in the Distributional National Accounts (DINA) for Europe, in addition to the 38 European countries covered on https://wid.world/. As pointed out by Morgan and Neef (2020), these countries used to be regionally imputed. Thanks to the use of new distributional data from PovcalNet, a database provided by the World Bank to assess worldwide poverty, we now have a clearer view of inequality trends in these countries. Georgia poses a special case: since we have access to survey micro data as well as tax tabulations for the years 2010 to 2019, we only employ the here-described methodology for the years before 2010. Thereafter, we top-correct micro survey data with information from tax tabulations (see Todua & Neef, 2021).

Data sources and quality

Our series are based on survey data. PovcalNet generally provides distributional information in terms of consumption, or net income. Series are presented the format of generalized percentiles ranging from 1 to 99.999% of the adult population.

Overall, the data is generally of relatively low quality, providing percentiles or bigger quantiles of the net income or consumption distribution. Due to this, we apply a simplified DINA methodology. More precise income-consumption ratios, as well as region- and time-specific fiscal corrections would be needed to assess trends with more certainty.

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Methodology

In the following, we detail the specific steps to arrive at the series provided on https://wid.world/.

Conversion from consumption to income

For most countries and periods in this region, PovcalNet provides distributional information on consumption rather than net income (see table A1 for more details). Survey data measuring consumption instead of income at the household level need to be converted using income-consumption ratios to be comparable to inequality estimates based on income. These ratios are computed based on other European countries covered in PovcalNet for which income and consumption concepts are available in common years.[4] To arrive at income-consumption ratios, we divide bracket average incomes by bracket average consumption for percentiles and further broken down for the top 1%. Then, we multiply the PovcalNet-based consumption distributions with the estimated ratio. For further steps, we normalize all distributions such that the average income equals one.

From survey income to fiscal income

One of the main caveats of survey data is their underestimation of top incomes. In the absence of country-specific tax data, one way to better approximate the top of the income distribution is to apply fiscal correction ratios. Those ratios are computed from countries with available tax data. To compute country-year-specific fiscal correction ratios, we divide the bracket averages of top-corrected fiscal income by survey income for percentiles and further broken down for the top 1%. We pool the fiscal correction ratios from a variety of Asian countries, among others Thailand and India. Further, we pool ratios over time periods (e.g. decades). To avoid extreme values at the very top, we assign the values for the top 0.1% to all g-percentiles above that threshold.

Interpolation between years

We eliminate inconsistent and outlier years from our dataset, in case of extreme changes in income shares in isolated years. Our data show temporal gaps between years of study. We linearly interpolate between those years. Last, we extrapolate forward to 2021 and backwards to 1980 for each series (base survey, income imputation, and fiscal income).

From fiscal income to national Income

Survey data often does not only underrepresent top incomes in general but capital incomes (e.g. dividends, withdrawals from business, interest) which are concentrated at the top in particular. Further, retained earnings, which can be interpreted as temporarily shifted capital income, are not at all visible in survey data. To account for those missing capital incomes, we, first, deduct a normalized distribution of capital income using wealth data from France and the US, since this information is not available for any country of our sample. To approximate a normalized labor income distribution, we deduct the share of retained earnings in national income uniformly from the the PovcalNet-based normalized distribution. Next, we follow the DINA Guidelines (Blanchet

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[4] Those country-years comprise Bulgaria 2007, Estonia 2003-2004, Croatia 2009-10, Hungary 1999 & 2004-2007, Lithuania 2004 & 2008, Latvia 2004 & 2007-2009, Montenegro 2012-2014, Poland 1999 & 2004-2018, Romania 2006-2013 & 2016, Serbia 2013 & 2015, Slovakia 2004-2009.

et al, 2021) and employ the quantile ratio method using a hyperbolic quantile function. This method links the PovcalNet-based labor income distribution to the imputed capital income distribution. The hyperbolic quantile function differs from previous updates and has the advantage to avoid extreme ratios near the bottom of the distribution. Last, we rescale the resulting normalized joint distribution of labor and capital income to match average national income. Figures A1-A5 show the development of income shares at different steps of the procedure.

The special case of Georgia

For Georgia, we have access to survey micro data as well as tax tabulations for the years 2010 to 2019. Thus, we primarily build inequality estimates on this high-quality data sources. To approximate the developments between 1996 and 2009, we link the PovcalNet-based inequality series before 2010 to the survey- and tax-data based series for 2010-2019. Since the top-corrected series shows higher inequality estimates, we adjust the level of our inequality indicators in the PovcalNet-based series to the higher-quality series. For more details on our methodology to construct Georgian inequality indicators for 2010 to 2019, please check Todua & Neef (2021).

Bibliography

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Morgan, M., Neef, T. (2020): 2020 DINA Update for Europe, *WID.world Technical Note 2020/04.*

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Appendix

Table A1: survey years available in previously regionally imputed European countries.

Country	Consumption data, available years	Income data, available years
Armenia	1996; 1999; 2001 - 2019	
Azerbaijan	1995; 2001 - 2005	
Belarus	1993; 1995	1998 - 2019
Georgia	1996 - 2019	
Ukraine	1992; 1993; 1995; 1996; 2002 - 2019	1999

Figure A1: Income shares at different steps of applying the discussed method, Armenia.

Income share(%) in Armenia

Figure A2: Income shares at different steps of applying the discussed method, Azerbaijan.

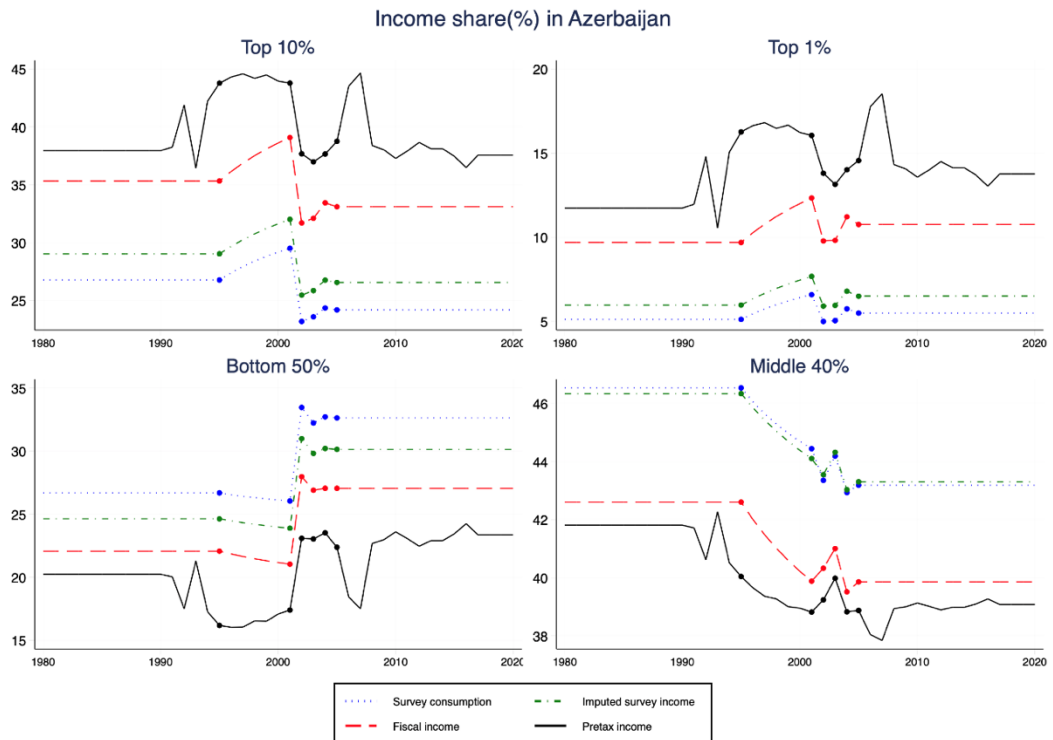**Income share(%) in Azerbaijan**

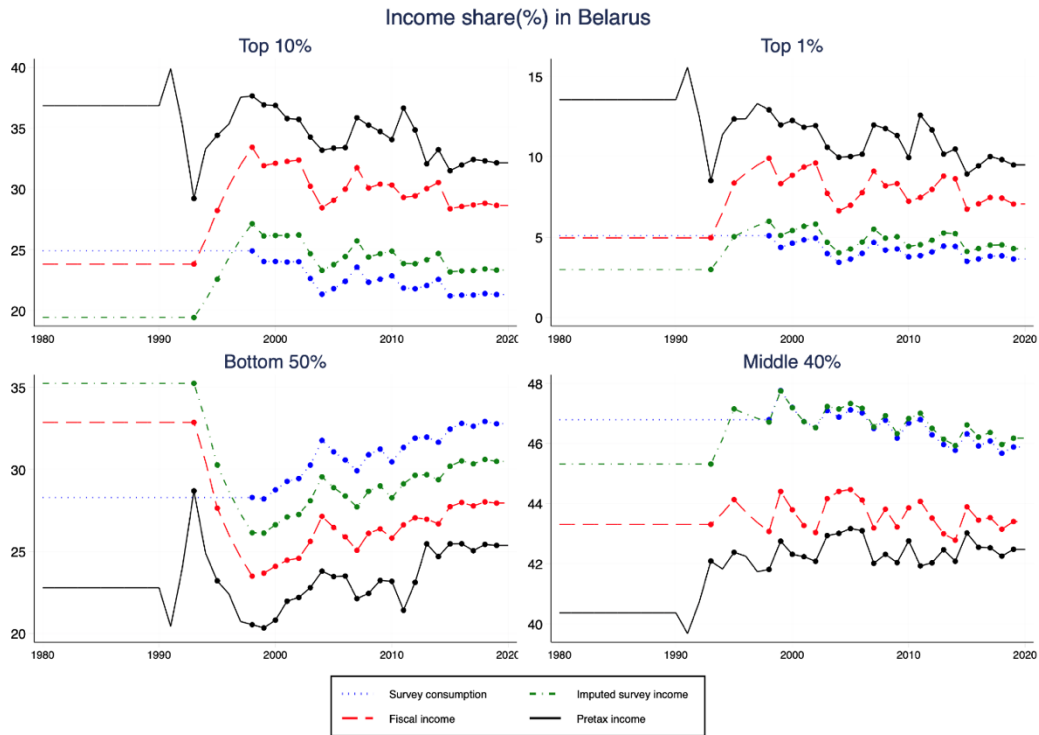*Figure A3: Income shares at different steps of applying the discussed method, Belarus.*

Figure A4: Income shares at different steps of applying the discussed method, Georgia. Those developments are only used before 2010 and are later level-adjusted to match the top-corrected series of 2010-2019 (Todua & Neef, 2021).
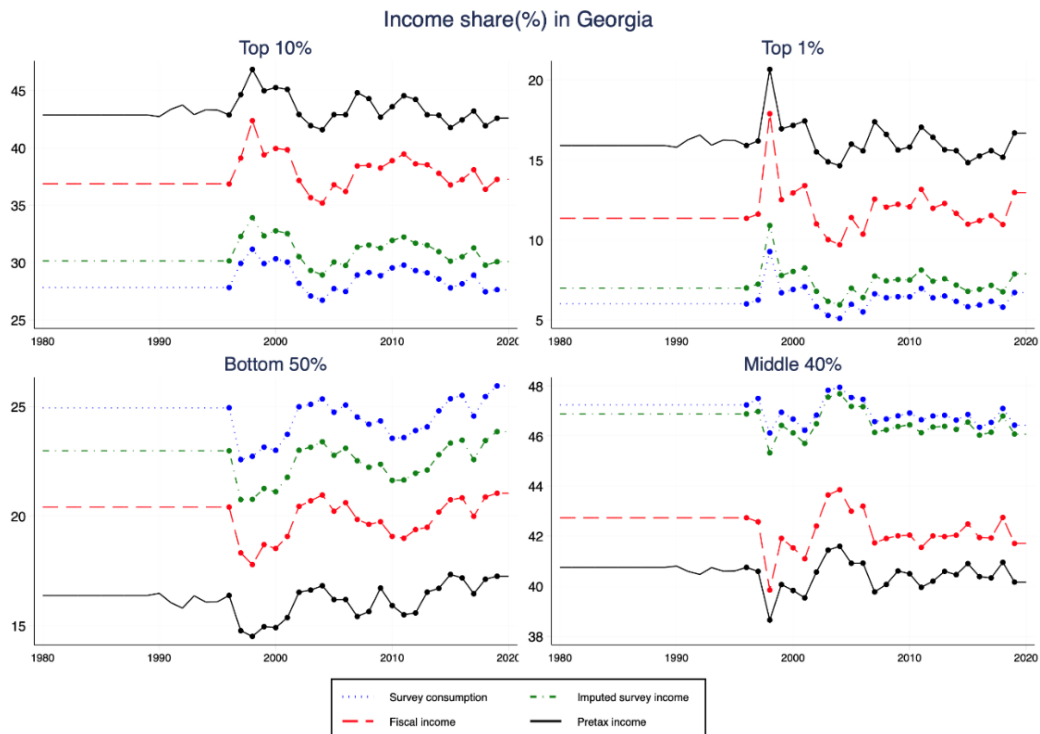
Figure A5: Income shares at different steps of applying the discussed method, Ukraine.

Income share(%) in Ukraine

Top 10%

Top 1%

Bottom 50%

Middle 40%

⋯⋯ Survey consumption	—·— Imputed survey income
— — Fiscal income	—— Pretax income