REGIONAL DINA UPDATE FOR EUROPE

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Technical Note

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Overview

This update revises the Distributional National Accounts (DINA) series for 38 European countries up to 2020, following the method in Blanchet, Chancel and Gethin (2022) (hereafter BCG22). We hence revise and extend last year's update as described in Andreescu and Sodano (2024). In this note, we explain the revisions made for both Western and Eastern European countries.

As before we classify Western Europe as comprising Austria, Belgium, Cyprus, Denmark, Finland, France, Greece, Germany, Iceland, Ireland, Italy, Luxemburg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. Eastern Europe includes Albania, Bosnia and Herzegovina, Bulgaria, Czech Republic, Estonia, Croatia, Hungary, Kosovo, Lithuania, Latvia, Moldova, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovenia, and Slovakia.

Data availability and quality

Table 1 presents the data used for the update.

Western Europe

For Western European countries, we rely entirely on the EU-SILC for survey data. The survey covers EU countries as well as non-EU countries. The update utilizes the latest

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release of the SILC micro data in 2025 for the wave year 2024, which provides information on incomes received in the previous calendar year, i.e. 2023. Three countries did not have a 2025 data release: Switzerland (latest survey year 2023 corresponding to 2022 income year), the UK (2018 survey year corresponding to 2018 incomes), Iceland (2020 survey year corresponding to 2019 incomes).

Tax data is available in the form of tabulations for all Western countries, with the exception of Malta, to varying degrees of annual coverage. This update incorporates new data from tax tabulations for France (2023). Access to tax microdata is often not systematic and restricted to country-based researchers.

Some country-based researchers are currently working on producing distributional national accounts for their countries at a greater level of detail and precision than the estimates of this update. Austria, France and Italy are the only countries included in this update that have followed this strategy to date (see Table 1). While the French country authors (Garbinti et al., 2023), could draw on tax microdata, the Austrian (Jestl and List, 2022) and Italian studies (Guzzardi et al., 2022) built DINA based on survey data and tax tabulations. We expect that more countries will be added to this list over time. This is desirable as it will improve cross-country comparability and the precision of our estimates.

As can be seen from Table 1, new tax data is available in raw form that hasn't been used in this update. The use of this new data is problematic given the harmonized methodology used to estimate the DINA series for European countries currently on WID.world. These tax tabulations are not straightforward to use either – many refer to "net taxable incomes", requiring treatments to correct for deductions, and other items. They thus require more time and resources to process. Further collaboration with local researchers will help us overcome these data obstacles.

Eastern Europe

Eastern Europe is still heterogeneous concerning data quality. We use the EU-SILC survey microdata for EU member states and Serbia. For many non-EU members, PovcalNet, PIP and heterogenous national surveys are currently the only available survey data source. In this light, the integration of further countries into the EU-SILC, already realized for Serbia and currently underway for North Macedonia, Montenegro, and Albania is a positive development.

Tax data in the form of tabulations is still sparse. An additional obstacle for the integration of tax information is that capital incomes are withheld at the source in many Eastern European countries. Therefore, a combination of personal income tax returns and a database on incomes for which tax was withheld at the source would be necessary. Kump and Novokmet (2018) can draw on such a database for Slovenia. Access to tax microdata is even less systematic than in Western Europe.

The constituent republics of the former Federal Republic of Yugoslavia – Bosnia and Herzegovina, Croatia, Montenegro, Northern Macedonia, Serbia and Slovenia – are plotted since 1980 as separate entities. This data is taken from Maddison Project Database (2020) and based on extrapolations. The same applies to the Czech Republic and Slovakia, forming late Czechoslovakia. Data since 2010 for the Czech Republic and Slovakia is taken from European Union sources. Kosovo is considered since 1999 a separate entity.

For National Accounts aggregates, we follow BCG22 by using EUROSTAT and OECD data as primary sources. UN SNA is used when the first two sources do not have information. Since detailed data on the composition of national income is sparse before 1995, we impute missing information by retropolation using exponential smoothing. As a last step, regional averages based on the regional classification by the UN Statistics Division are used to treat cases in which component information is missing for all years. This applies to subcomponents of national income for Albania, Bosnia and Herzegovina, former Czechoslovakia, the former German Democratic Republic, Kosovo, Moldova, Montenegro, and North Macedonia. Little is currently known about income redistribution in the South-eastern European countries, including information on social benefits and health expenditures used to compute posttax incomes in particular. For several Eastern European countries we use National Accounts aggregates directly from WID.world. These aggregates are based on data from UN MADT, OECD, IMF BOPS (see Blanchet et al. 2021, p. 88 for details).

Methodology

The procedure used in BCG22 involves various steps to distribute net national income within countries, sub-regions and the region of Europe as a whole. We provide a brief summary of the methodology, referring the readers to the published paper for further details. First, different household surveys are harmonized at a conceptual level to obtain cross-country distributions of pre-tax and post-tax income.

Second, these surveys are calibrated on top incomes from tax data, ensuring that top income shares calculated in previous research are maintained, while correcting for income under-coverage in surveys. The calibration is also done on top income shares from new tax data, which are estimated by using an internal control total for income from the survey, rather than an external control total from national accounts used in previous research on top incomes.

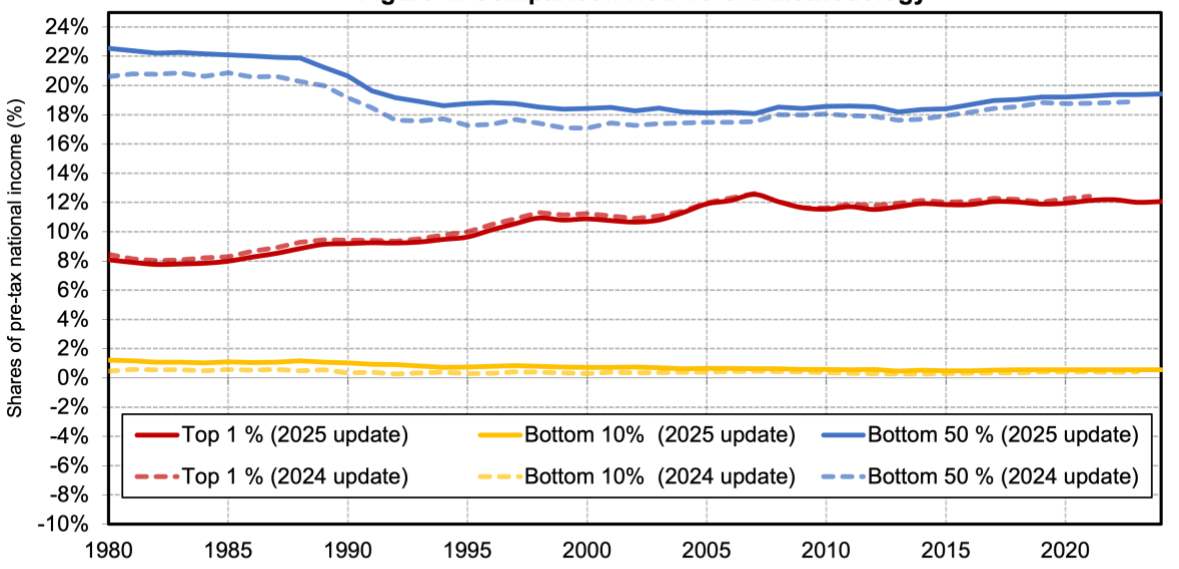
Third, missing income components are added to the calibrated survey from the national accounts following various distributional assumptions that utilize information from income surveys, consumption surveys and wealth surveys. These comprise imputed rents of households, the undistributed profits of corporations, product and production taxes, and in-kind government expenditure. Imputed rents are imputed to their distribution in the surveys where they are recorded (EU-SILC). Undistributed profits (which includes the corporate tax) are imputed to the distribution of corporate stock

holdings from wealth surveys (HFCS) calibrated on top income shares. Taxes on products and production are imputed proportionally to the distribution of pretax income. Lastly, in-kind government expenditures are imputed proportionally to the distribution of disposable income, except for public health spending, which is imputed in equal lump-sum shares to individuals.

This imputation process was using machine learning algorithms calibrated on existing distributional assumptions, relying heavily on data from top incomes. While this process performed adequately for the highest percentiles of the distribution, it proved inadequate for the bottom percentiles. Some bias existed in the smallest percentiles on which the algorithm lacked enough data to produce accurate estimations, such that the previously published distribution showed in some cases negative income levels or unreliably small levels. Furthermore, the imputations created long-term deviations due to the Covid-19 crisis, while the micro-data indicated this was a one-time shock with punctual (although important) distributional consequences. The income from 2020 was rendered complex by the apparition of new benefits to make up for the accidental loss in wages, that were not systematically measured correctly in micro-data. As this phenomenon concerned mostly the lower part of the distribution, the 2020 estimates were unduly low for the bottom 50. Thus, the 2025 update brings about a methodological update meant to avoid introducing bias due to the computational assumptions. Starting this year, the missing income components are imputed using a simplified calibration technique for bottom percentiles, that harmonizes the top distribution with the existing survey data for bottom percentiles. This procedure allows respecting the internal coherence constraints implied by distributional identities: both conditions of monotonicity of shares and preserving positive income estimations are respected. To avoid spurious breaks introduced by the 2020 data issues, the 2019 data is used as an anchor point to compute the deviations in each percentiles' income, using capped log growth rates. This procedure allows to preserve coherent trends in the distribution, while correcting for the levels in the bottom part of the distribution. The differences between the updated distribution and the previous data is illustrated in Figure 1.

We follow this routine to update the series up to 2023 with the new distributional and aggregate data (the survey microdata reaches 2017 in BCG22). Furthermore, we expand the distributional data by one more year to reach 2024, assuming a constant fiscal income (survey + tax data) distribution. We then add new macro data from national accounts that were updated this year on WID.world to 2024. In Table 1, "+ macro data 2024 (constant fiscal income distribution 2023-2024)" means that we impute these macro incomes assuming that the fiscal distribution remains unchanged. The imputation of these missing macro incomes alters the final distribution, given that they are not all imputed proportionally to fiscal incomes. The benchmark unit of observation used in these inequality series is the adult individual aged 20 or older, with income of couples being divided equally.

Figure 1: Comparison New vs Old Methodology



Notes: This figure shows the European distribution of pre-tax income, by percentile, comparing across methodologies. The previous methodology, used until the 2024 update created bias in the bottom 10%, especially in earlier series as it relied on insufficient data for complex machine-learning algorithms. The new 2025 update introduced a new methodology that does not infer nottom distribution from top-shares and relies on available survey data for its imputation. This lead to a revalorization of bottom 10% and overall better estimation of bottom shares.. **Sources and series**: wid.world

A note on the differences with the OECD-Eurostat expert group on disparities in a national accounts framework (EG DNA).

The sole focus of the EG DNA is to distribute the disposable income of the household sector in the SNA. In contrast, the WID.world's DINA series distribute the entirety of national income among resident households (including all income flowing to corporations, the government, and to and from the foreign sector). In this way we account for 100% of macroeconomic growth coming from GDP statistics. If data quality permits, we also present results for numerous concepts (i.e. not only pre-tax national income, but also post-tax disposable income and post-tax national income) across granular percentile groups reaching small fractiles at the very top of the distribution, with greater precision than the EG DINA, which primarily focuses on quintile groups.

For our harmonized European DINA series, we do not scale individual income components in the micro data to their macro equivalents in SNA. This is another difference with the EG DNA. However, for newly incorporated DINAs, like those for Austria, France and Italy, this component scaling to SNA is carried out by the authors.

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Table 1. Data sources and type of update by country

Western Europe							
Country	**New years of survey data used**	**Survey data source and format**	**Last/new year(s) of tax data used**	**Latest year of tax data available**	**Tax data source and format**	**Macro data**	**Type of update**
Austria	2021, 2022, 2023	EU-SILC, microdata	2018	2020	www.statistik.at, tabulations	EUROSTAT & OECD 1995-2024, UN SNA 1980-1994	2003-2017 from Jestl and List (2022) + extrapolations (1980-2002, 2018-2023) based on internal update
Belgium	2021, 2022, 2023	EU-SILC, microdata	2018	2018	www.statbel.fgov.be, tabulations	EUROSTAT & OECD 1995-2024 UN SNA 1980-1994	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Cyprus	2021, 2022, 2023	EU-SILC, microdata		2017	www.mof.gov.cy, tabulation	EUROSTAT & OECD 1995-2024, UN SNA 1980-1994	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Denmark	2022, 2023	EU-SILC, microdata	2010	2020	www.statbank.dk, tabulations	EUROSTAT & OECD 1995-2024, UN SNA 1980-1994	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)

Country	New years of survey data used	Survey data source and format	Last/new year(s) of tax data used	Latest year of tax data available	Tax data source and format	Macro data	Type of update
Finland	2021, 2022, 2023	EU-SILC, microdata	2009	2020	www.vero2.stat.fi, tabulations	EUROSTAT & OECD 1980-2024	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
France	2021, 2022, 2023	EU-SILC, microdata	2023	2023	www.impots.gouv.fr, tabulations	EUROSTAT & OECD 1980-2024	External estimation by Garbinti, Goupille-Lebret and Piketty (2018) for 1900-2014; Bozio et al. (2023) for 2014-2016. 2017-2024 are extrapolated using tax tabulations.
Germany	2021, 2022, 2023	EU-SILC, microdata	2017	2018	www.destatis.de, tabulations	EUROSTAT & OECD 1995-2024, UN SNA 1980-1994	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Greece	2021, 2022, 2023	EU-SILC, microdata	2018	2018	www.aade.gr, tabulations	EUROSTAT & OECD 1995-2024, UN SNA 1980-1994	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)

Country	New years of survey data used	Survey data source and format	Last/new year(s) of tax data used	Latest year of tax data available	Tax data source and format	Macro data	Type of update
Iceland	2018, 2019	EU-SILC, microdata	2017	2021	www.px.hagstofa.is, tabulations	EUROSTAT 1995-2024, 1980-1999 UN SNA	Survey microdata 2019 + macro data 2024 (constant fiscal income distribution 2019-2024)
Ireland	2022, 2023	EU-SILC, microdata	2018	2018	www.statbank.cso.ie, tabulations, updated top income shares for 2016-2018 provided by Brian Nolan.	EUROSTAT & OECD 1995-2024, UN SNA 1980-1994	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Italy	2021, 2022, 2023	EU-SILC, microdata	2018	2021	www1.finanze.gov.it, tabulations	EUROSTAT & OECD 1995-2024, UN SNA 1980-1994	2004-2015 from Guzzardi et al. (2022) + extrapolations (1980-2003, 2016-2024) based on internal update
Luxemburg	2022, 2023	EU-SILC, microdata	2012	2012	www.ces.public.lu, tabulations	EUROSTAT & OECD 1995-2024, UN SNA 1980-1994	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Malta	2021, 2022, 2023	EU-SILC, microdata				EUROSTAT 1997-2024, UN SNA 1980-2005	Survey microdata 2023 + macro data 2024 (constant fiscal income

							distribution 2023-2024)distribution 2019-2023)
Country	**New years of survey data used**	**Survey data source and format**	**Last/new year(s) of tax data used**	**Latest year of tax data available**	**Tax data source and format**	**Macro data**	**Type of update**
Netherlands	2022, 2023	EU-SILC, microdata	2014	2014	Salverda (2019)	EUROSTAT & OECD 1995-2024 UN SNA 1980-1994	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Norway	2022, 2023	EU-SILC, microdata	2018	2020	www.microdata.no, microdata (available to Norwegian-based researchers), www.ssb.no, tabulations	EUROSTAT & OECD 1980-2024	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Portugal	2021, 2022, 2023	EU-SILC, microdata	2019	2021	www.pordata.pt, tabulations	EUROSTAT & OECD 1995-2024, UN SNA 1980-1994	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Spain	2021, 2022, 2023	EU-SILC, microdata	2012	2019	www.agenciatributaria.es, tabulations	EUROSTAT 1995-2024	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)

Sweden	2023	EU-SILC, microdata	2013	2020	www.statistikdatabasen.scb.se, tabulations	EUROSTAT & OECD, 1980-2024	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Country	**New years of survey data used**	**Survey data source and format**	**Last/new year(s) of tax data used**	**Latest year of tax data available**	**Tax data source and format**	**Macro data**	**Type of update**
Switzerland	2020, 2021, 2022	EU-SILC, microdata	2014	2016	www.estv.admin.ch, tabulations	EUROSTAT 1995-2024, UN SNA 1980-1994	Survey microdata 2022 + macro data 2024 (constant fiscal income distribution 2022-2024)
United Kingdom	No update, latest inc. year 2021	LIS, microdata	2017	2017	Advani and Summers (2020)	EUROSTAT 1995-2024, UN SNA 1980-1994	Macro data 2024 (constant fiscal income distribution 2021-2024)
Eastern Europe							
Country	**New years of survey data used**	**Survey data source and format**	**Last/new year(s) of tax data used**	**Latest year of tax data available**	**Tax data source and format**	**Macro data**	**Type of update**
Albania	No update, latest inc. year 2020	PIP, tabulations				WID.world 1980-2023 (only GDP GNI, depreciation)	Macro data 2024 (constant fiscal income distribution 2020-2024)

Bosnia & Herzegovina	No update, latest inc. year 2015	PIP, tabulations				WID.world 1980-2023 (only GDP GNI, depreciation)	Macro data 2023 (constant fiscal income distribution 2015-2023)
Country	**New years of survey data used**	**Survey data source and format**	**Last/new year(s) of tax data used**	**Latest year of tax data available**	**Tax data source and format**	**Macro data**	**Type of update**
Bulgaria	2021, 2022, 2023	EU-SILC, microdata				EUROSTAT 1999-2024	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Croatia	2021, 2022, 2023	EU-SILC, microdata	2013	2013	Kump and Novokmet (2018)	EUROSTAT 2002-2024, UN SNA 1996-2001	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Czech Republic	2021, 2022, 2023	EU-SILC, microdata	2015 (top shares by Novokmet 2018)	2021	www.financnisprava.cz, tabulations	EUROSTAT 1995-2024	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Estonia	2021, 2022, 2023	EU-SILC, microdata	2019	2020	www.emta.ee, tabulations	EUROSTAT 1995-2024, UN SNA 1980-1994 (only GDP GNI, depreciation)	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)

Hungary	No update, latest inc. year 2020	EU-SILC, microdata	2008	2008	Top shares by Mavridis and Mosberger (2017)	EUROSTAT & OECD 1995-2023, UN SNA 1991-1994 (only GDP GNI, depreciation)	Survey microdata 2020+ macro data 2023 (constant fiscal income distribution 2020-2023)
Country	**New years of survey data used**	**Survey data source and format**	**Last/new year(s) of tax data used**	**Latest year of tax data available**	**Tax data source and format**	**Macro data**	**Type of update**
Kosovo	No update, latest inc. year 2017	PIP, tabulations				WID.world 1999-2024 (only GDP GNI, depreciation)	Macro data 2024 (constant fiscal income distribution 2017-2024)
Lithuania	2021, 2022, 2023	EU-SILC, microdata				EUROSTAT & OECD 1995-2024, 1993-1994 UN SNA	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Latvia	2021, 2022, 2023	EU-SILC, microdata				EUROSTAT & OECD 1995-2021, UN SNA 1980-1994	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
North Macedonia	No update, latest inc. year 2019	PIP, tabulations				WID.world 1980-2021, UN SNA 1990-1993, 1997-2011	Macro data 2024 (constant fiscal income distribution 2019-2024)

Moldova	No update, latest inc. year 2019	PIP, tabulations				WID.world 1980-2021	Macro data 2024 (constant fiscal income distribution 2019-2024)
Country	**New years of survey data used**	**Survey data source and format**	**Last/new year(s) of tax data used**	**Latest year of tax data available**	**Tax data source and format**	**Macro data**	**Type of update**
Montenegro	No update, latest inc. year 2021	PIP, tabulations				WID.world 1980-2021	Macro data 2024 (constant fiscal income distribution 2021-2024)
Poland	2021, 2022, 2023	EU-SILC, microdata	2015	2017	Top shares provided by Bukowski and Novokmet (2021)	EUROSTAT & OECD 1996-2024	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)
Romania	2021, 2022, 2023	EU-SILC, microdata	2014	2014	Shares by Andrei, et al. (2017)	EUROSTAT 1995-2022, UN SNA 1990-2017	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024))
Serbia	2022	EU-SILC, microdata	2017	2018	Shares provided by Statistical Office of the Republic of Serbia	WID.world 1980-2022, EUROSTAT 2016-2017, UN SNA 1997-2011	Macro data 2023 (constant fiscal income distribution 2019-2023)
Slovenia	2021, 2022, 2023	EU-SILC, microdata	2012	2019	Shares 1991-2012 provided by Kump & Novokmet (2018), further microdata access possible	EUROSTAT & OECD 1995-2024	Survey microdata 2023 + macro data 2024 (constant

					through Statistical Office of Slovenia		fiscal income distribution 2023-2024)
Country	**New years of survey data used**	**Survey data source and format**	**Last/new year(s) of tax data used**	**Latest year of tax data available**	**Tax data source and format**	**Macro data**	**Type of update**
Slovakia	2021, 2022, 2023	EU-SILC, microdata				EUROSTAT & OECD 1995-2024, UN SNA 1992-1994	Survey microdata 2023 + macro data 2024 (constant fiscal income distribution 2023-2024)