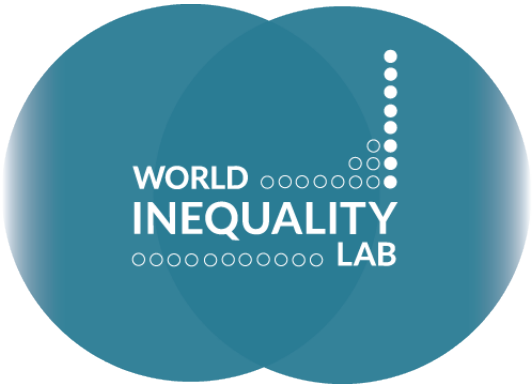
World Inequality Lab – Technical Note N° 2021/06

2021 DINA Regional Update for Asia

Félix Bajard
Rowaida Moshrif

November 2021



WID.WORLD
THE SOURCE FOR
GLOBAL INEQUALITY DATA

Technical Note – 2021 regional Asia update

Rowaida Moshrif[1], Felix Bajard[2]

In this note, we discuss the latest update of income inequality series in Asia. In continuity with Jenmana et al. (2020), we extended the existent series for several countries in Asia with recently published PovcalNet tabulated data. In addition, we integrated to WID.world new inequality series for four Asian countries (Brunei, Cambodia, Papua New Guinea and Afghanistan) that were previously regionally imputed due to lack of consistent Household survey data. Those inequality series were constructed using external inequality data, in particular PovcalNet series provided by the World Bank, and National Statistics surveys extracted from the World Income Inequality Database (WIID), a UNU-WIDER project.

While this represents a step forward in analyzing inequality in Asia, most data are still of poor quality, making the assessment of inequality trends over time uncertain. Moreover, due to a lack of adequate ratios, we have no choice but to assimilate some income and consumption concepts which may vary greatly between one country and another, and even between databases. A better homogenization of these concepts should be a priority in the future, perhaps by examining more in detail differences between country statistics methods or databases conventions.

I. Simplified DINA for 23 countries based on External data

Types of data

In our sample, we are only concerned about survey data, which may be measured in terms of different concepts. PovcalNet data are generally available in terms of consumption, but may also present income data. WIID data offers a distinction between gross and net income in the few countries that are in our sample, but this distinction is hardly relevant considering the variety of income concepts that countries from our sample have. Series are presented in generalized percentiles ranging from 1 to 99.999% of the adult population.

We further down offer a comparison of a subset of Asian countries for which new external data was obtained with their previous WID.world estimates. New data come from the PovcalNet database for Papua New Guinea, while they come from WIID for Cambodia, Afghanistan and Brunei.

Income imputation

Survey data measuring consumption instead of income at the household level need to be converted using income-consumption ratios. These are computed using data from previous papers on Thailand (Jenmana, 2018), India (Chancel & Piketty, 2019), Indonesia (Chancel, Jenmana & Yang) as well as from PovcalNet data, for which only Philippines has data available for both concepts in common years. These ratios are averaged over 4 periods ranging from 1980 to 2020 to be applied to consumption survey data, after rescaling each series to match WID.world's convention of income per adult instead of income per capita. Since average income in local currency unit are underestimated in earlier years of our sample, we normalize by available average national income.

[1] Middle East coordinator at the World Inequality Lab, contact: rowaida.moshrif@psemail.eu
[2] Research assistant at the World Inequality Lab, contact: felix.bajard@eleves.enpc.fr

Fiscal correction

One of the main caveats of survey data is their underestimation of top brackets, because of their self-reporting nature. One way to resolve that issue is to apply fiscal correction ratios, which are computed from countries with tax data available, better capturing the top of the distribution. Such ratios are available for a variety of countries and years in Asia, and are broken down in several periods in a similar fashion as income-consumption ratios. To avoid extreme values at the very top, we assign the values for the top 0.1% to all g-percentiles above that threshold.

Filling gaps

Our data are scarce and suffer from many gaps between years of study, and thus need to be interpolated. Before that, we eliminate inconsistent years from our dataset, in case of brutal changes in income shares in isolated years. We also extrapolate forward to 2021 and backwards to 1980 for each series (base survey, income imputation, and fiscal income)

Japan and Korea

Japan and Korea are treated separately from the rest of the sample, since fiscal shares were previously available for those two countries in top g-percentiles. We use generalized Pareto interpolation[3] on the available brackets to estimate the shape of the distribution at the top, and stitch these newly created distributions to the bottom 90%, using a constraining method described in the DINA Guidelines (2021), which constrains the lower part of the distribution so that their Lorenz curves are smooth and differentiable at any given percentile.

Matching to National Income

Missing capital income needs to be accounted for to obtain an accurate depiction of the full income distribution. We follow the DINA Guidelines in distributing retained earnings of corporations with the quantile ratio method, using a new quantile function (hyperbolic), which differs from previous updates by avoiding extreme ratios near the bottom of the distribution. This method links the labor income distribution to the capital income distribution, which we have to estimate externally using wealth data from France and the US, since it is not available for any country of our sample. We add to our previous distributions this capital income weighed by the share of primary corporations in net national income, before rescaling one last time the average of the distribution to match national income.

II. Extrapolation and adjustment of preexisting series

Another region that was added to our database this year is Hong Kong, for which we used equal split total household income - obtained from Piketty and Yang (2021)-, adjusted with national income. Unfortunately, we could not account for undistributed retained earnings in Hong Kong, and thus approximated total pretax income with the available measure of household income. Future updates should solve this problem.

[3] See Blanchet et al (2021) for more details on general Pareto interpolation, and the use of the related gpinter R package, also available at https://wid.world/gpinter/

A few other countries already had existing series and were updated using PovcalNet data, namely Taiwan, Thailand, Malaysia and Indonesia. As PovcalNet series are of lower quality than those produced by WID.world fellows, we used them as the benchmark on which we adjusted the newly available years, with the exception of Indonesia which was entirely replaced by the new source of data. For more detail on the construction of the base series, see the individual papers.

As for the remaining Asian countries available on WID.world (China, India, Singapore), but that were not updated this year, as there are no new survey/tax years available, we assumed that inequality levels remained unchanged and extrapolated forward the series up to 2021. We refer the readers to the country pages to consult the data and the Working papers for details on the construction of these series.

III. Countries with no data

Currently we are not able to access to any survey data or tax data for the following countries: North Korea and Macao. For these countries, the distribution of national income is imputed each year using the distribution of a particular neighboring country, for more details, please see (Countries with Regional Imputations on WID.world, Chancel and Piketty, 2020)

Bibliography

Blanchet, T., Chancel, L., Flores, I., Morgan, M. (2021). "Distributional National Accounts (DINA) Guidelines 2020: Methods and concepts used in the World Inequality Database"

Chancel, L., Piketty, T., "Indian Income Inequality, 1922-2015: from British Raj to Billionaire Raj?" *WID.world Working Paper 2017/11*

Jenmana, T. "Democratisation and the Emergence of Class Conflicts: Income Inequality in Thai-land, 2001-2016", *WID.world Working Paper 2018/15*

Jenmana, T., Moshrif, R., Yang, L. "2020 DINA Update for Asia", *WID.world Technical Note 2020/08*

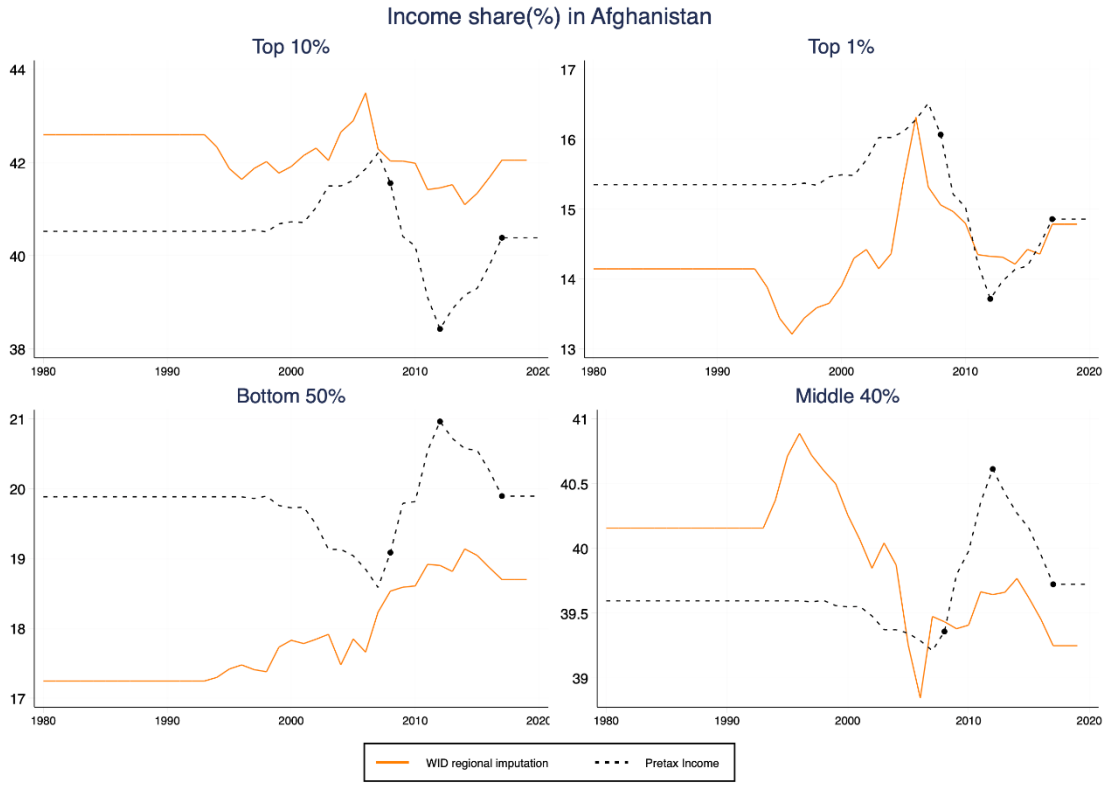
Chancel, L., Piketty, T., "Countries with Regional Imputations on WID.world", *WID.world Technical Note 2020/13*

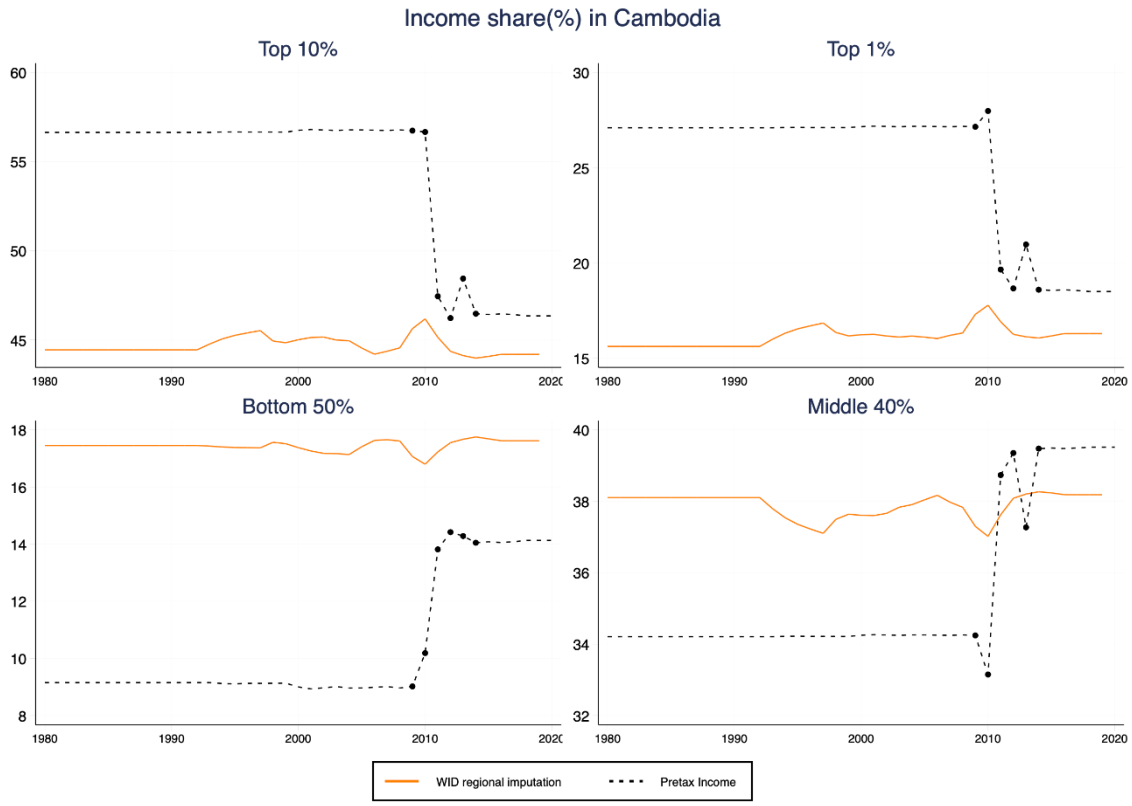
Piketty, T., Yang, L., "Income and Wealth Inequality in Hong Kong, 1981-2020: The Rise of Pluto-Communism?"*, World Inequality Lab Working Paper 2021/18*

Table 1: survey years available in Asia

Country	Survey Years	New survey data
Afghanistan	2008; 2012; 2018	2008; 2012; 2018
Kazakhstan	1993; 1996 ; 2000 – 2018	1993; 2000; 2018
Kyrgyzstan	1998 ; 2001 – 2019	2000; 2018; 2019
Mongolia	1995 ; 1998 ; 2002 ; 2007 ; 2010-2012 ; 2014 ; 2016 ; 2018	1995; 1998; 2018
Tajikistan	1999 ; 2003 ; 2004 ; 2007 ; 2009 ; 2015	
Turkmenistan	1998	
Uzbekistan	1998 ; 2000 ; 2002 ; 2003	
China	1978-2015	
Hong Kong	1981; 1986; 1991; 1996; 2001; 2006; 2011; 2016	1981-2016
Japan	2008; 2010; 2013	
Korea	2006 ; 2008 ; 2010 ; 2012; 2014; 2016	
North Korea		
Taiwan	1977-2013; 2016-2020	2016-2020
Macao		
Bangladesh	1991 ; 1995 ; 2000 ; 2005 ; 2010 ; 2016	
Bhutan	2003 ; 2007 ; 2012 ; 2017	
Maldives	2002 ; 2009; 2016	
Nepal	1995 ; 2003 ; 2010	
Pakistan	1987; 1990 ; 1996 ; 1998 ; 2001 ; 2004 ; 2005 ; 2007 ; 2010 ; 2011 ; 2013 ; 2015; 2018	2018
Sri Lanka	1985; 1990 ; 1995 ; 2002 ; 2006 ; 2009 ; 2012 ; 2016	
Brunei Darussalam	2005; 2011; 2016	2005; 2011; 2016
Cambodia	2009-2014	2009-2014
Indonesia	1984; 1987; 1990; 1992-2018	1984; 1987; 1990; 1992-2018
Lao PDR	1992 ; 1997 ; 2002 ; 2007 ; 2012 ; 2018	2018
Malaysia	1984; 1987; 1989; 1992; 1995; 1997; 2002-2015	1984; 1987; 1989; 1992; 1995; 1997
Myanmar	2015; 2017	2017
Philippines	1985; 1988; 1991 ; 1994 ; 1997 ; 2000 ; 2003 ; 2006 ; 2009 ; 2012 ; 2015; 2018	2018
Singapore	1947-2014	
Thailand	1981; 1988; 1990; 1992; 1994; 1996; 1998-2020	1981; 1988; 1990; 1992; 1994; 1996; 1998-2000; 2016-2020
Timor-Leste	2001 ; 2007 ; 2014;	
Viet Nam	1992 ; 1998 ; 2002 ; 2004 ; 2006 ; 2008 ; 2010 ; 2012 ; 2014 ; 2016; 2018	2018

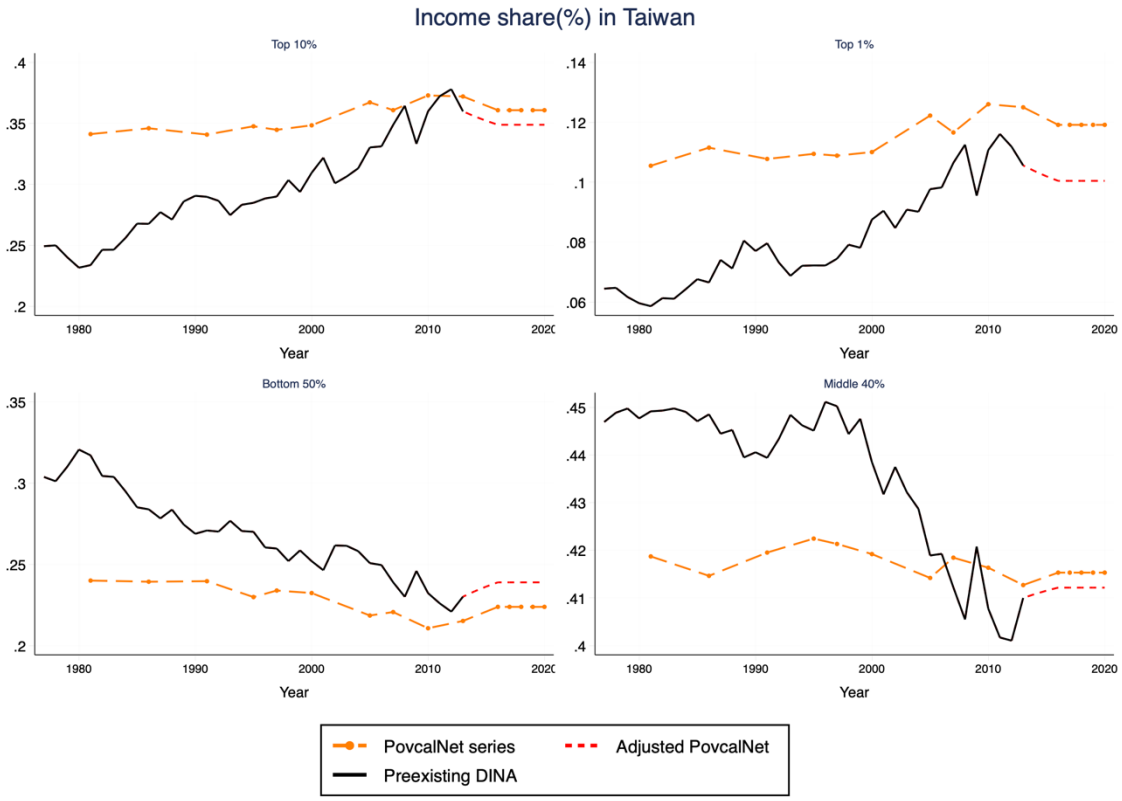
a. Comparison between WID regional imputations and new inequality estimates using external data

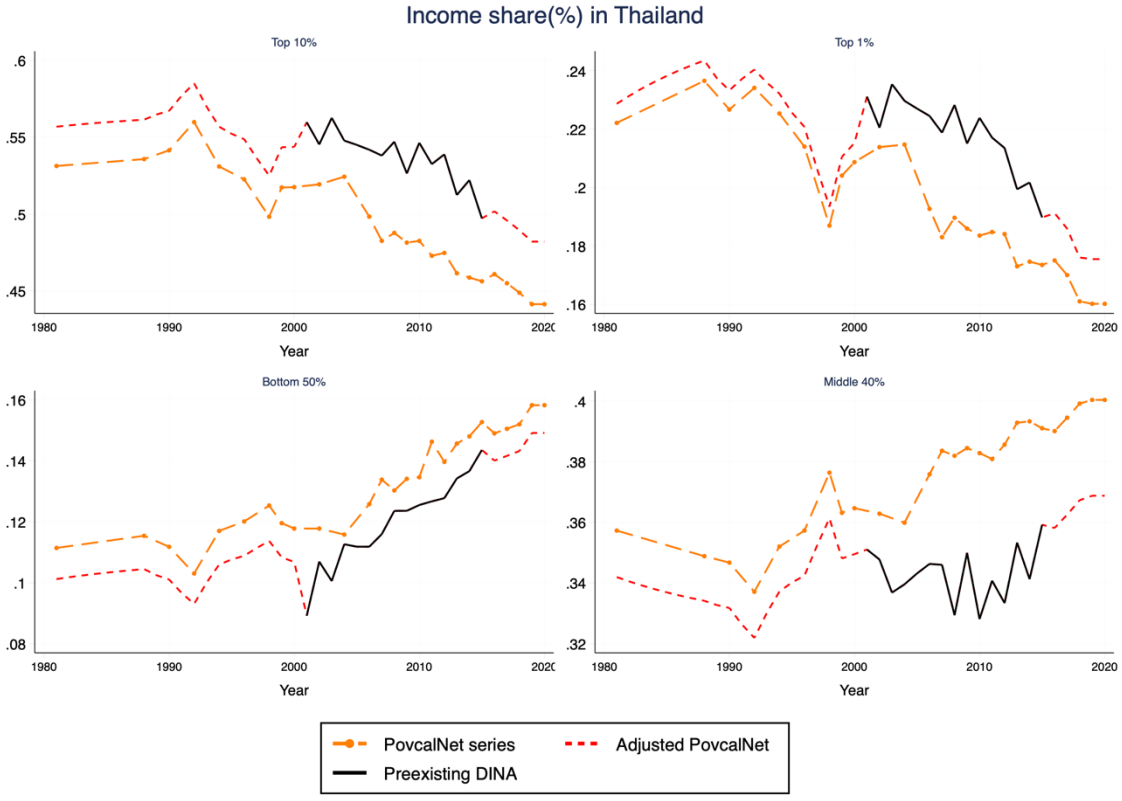


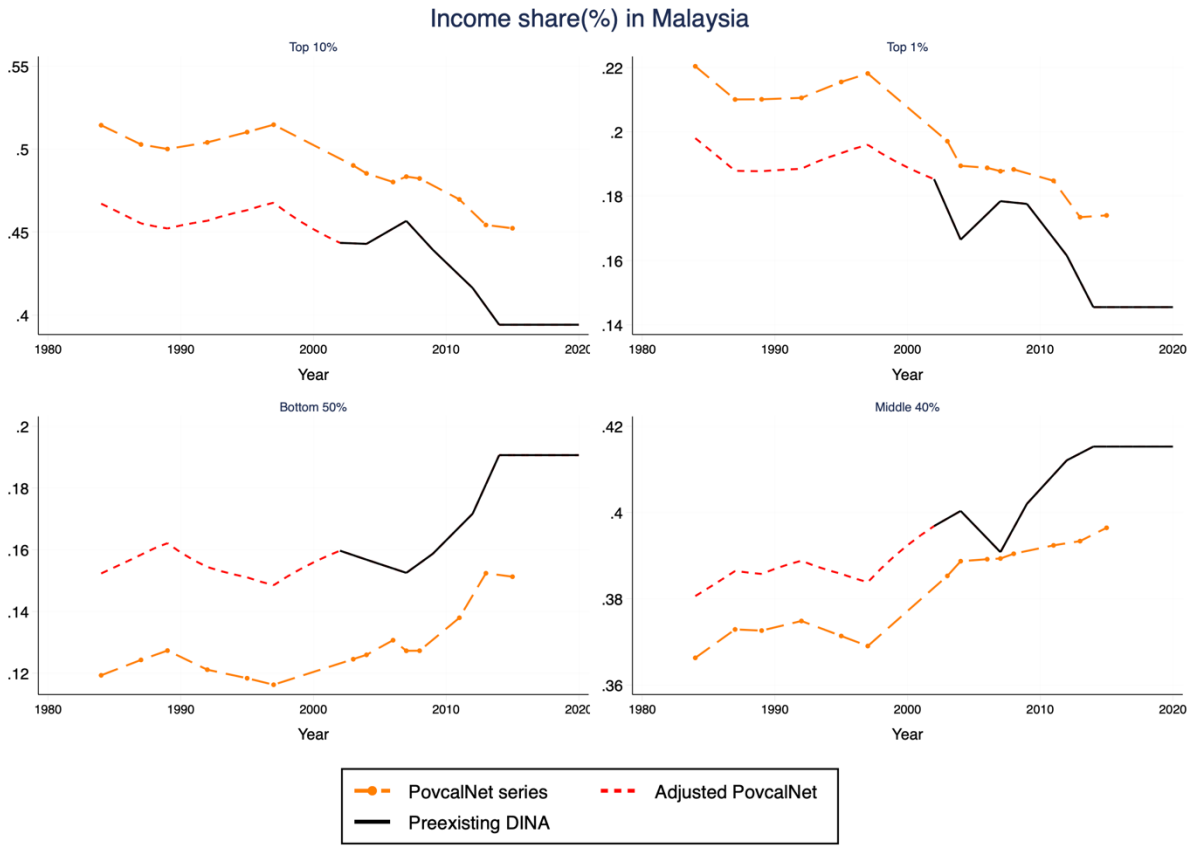

Income share(%) in Cambodia
Top 10%
Top 1%
Bottom 50%
Middle 40%
WID regional imputation
Pretax Income

Income share(%) in Papua
Top 10%
Top 1%
Bottom 50%
Middle 40%
WID regional imputation
Pretax Income

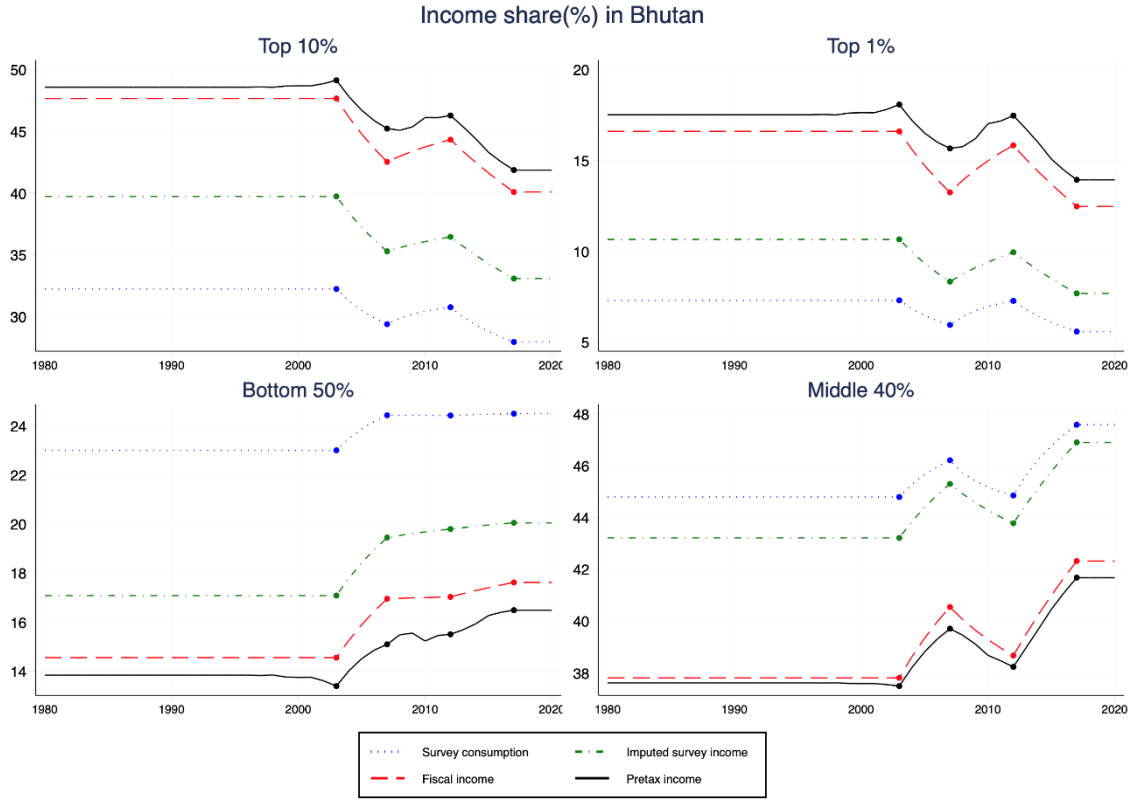
b. Extension of existing DINA series using adjusted PovcalNet data

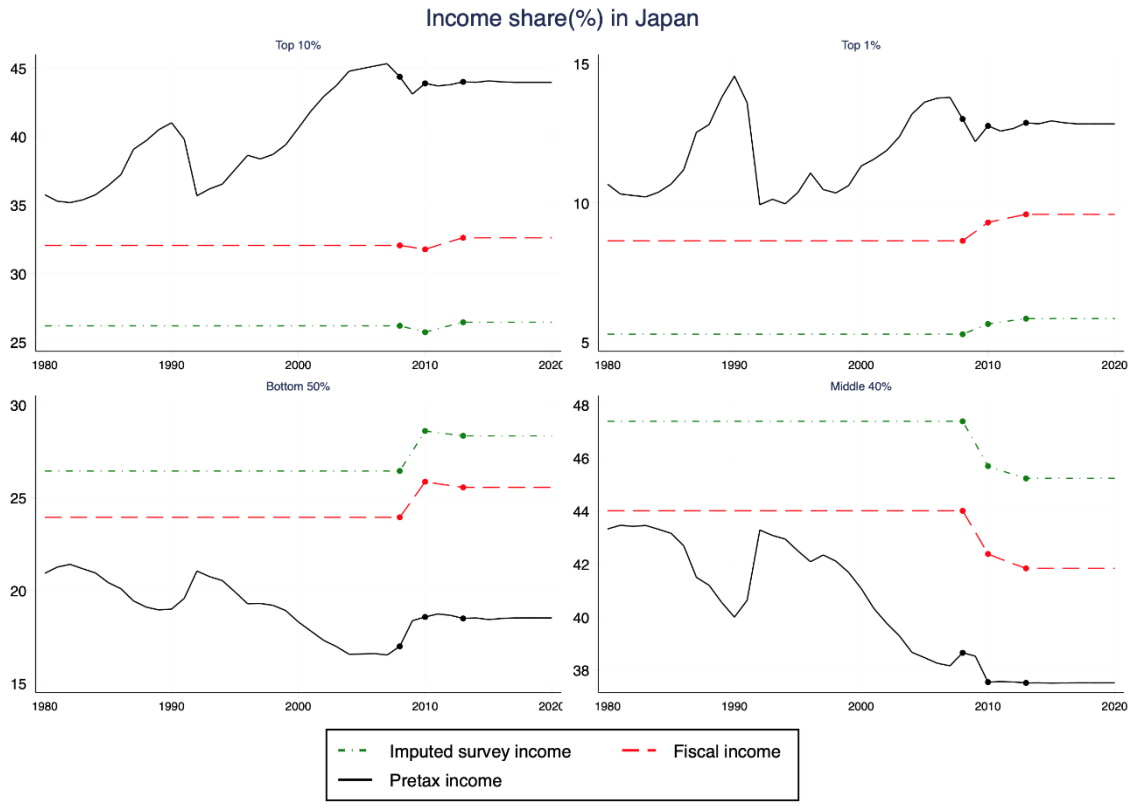


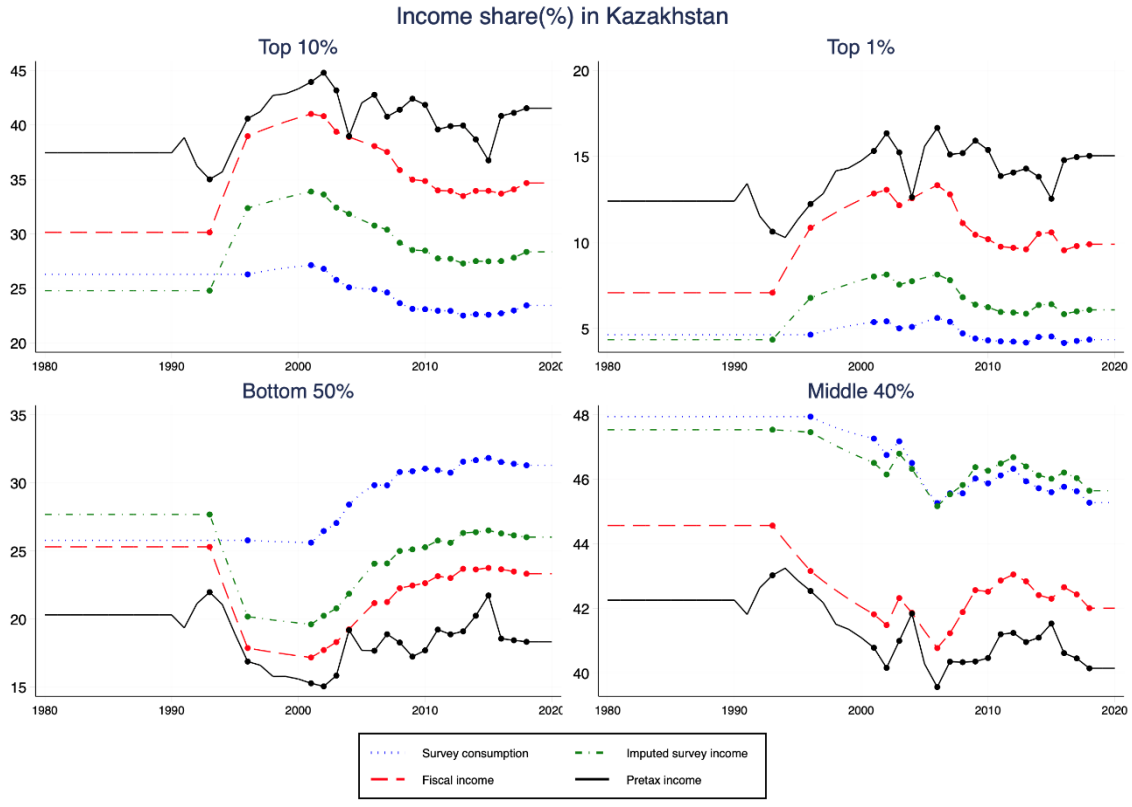


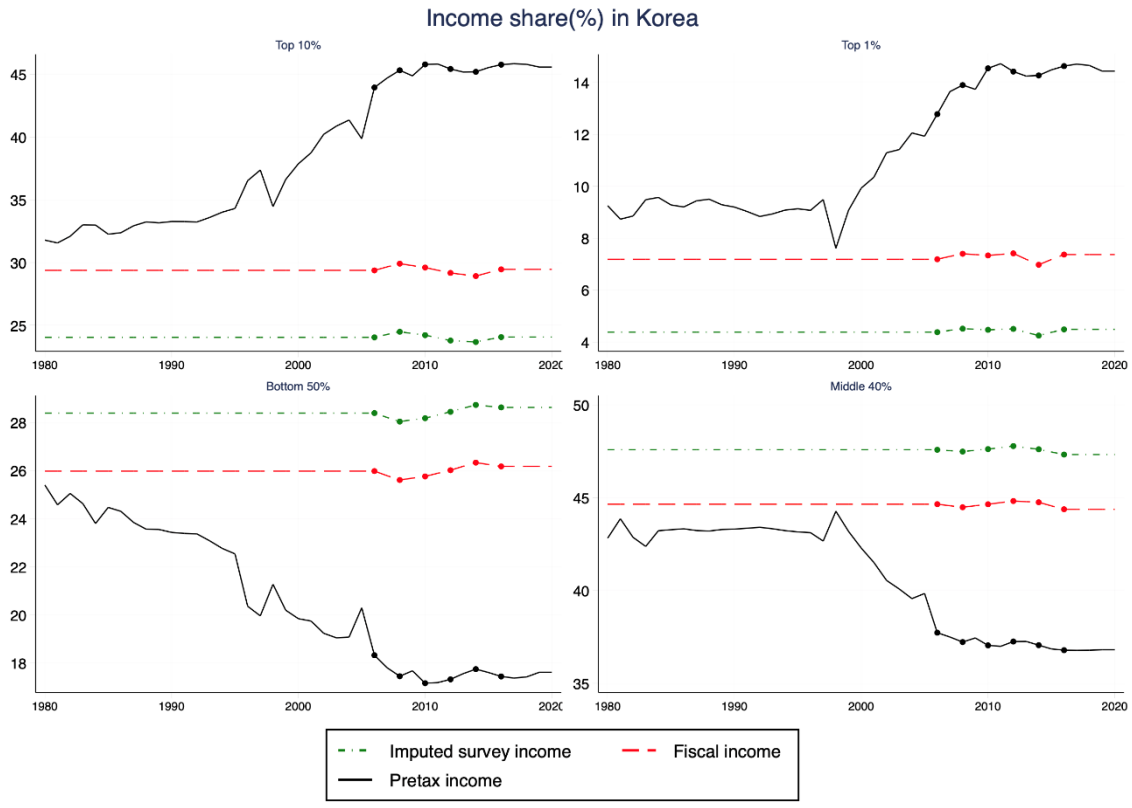

Income share(%) in Malaysia
Top 10%
.55
.5
.45
.4
1980
1990
2000
2010
2020
Year
Top 1%
.22
.2
.18
.16
.14
1980
1990
2000
2010
2020
Year
Bottom 50%
.2
.18
.16
.14
.12
1980
1990
2000
2010
2020
Year
Middle 40%
.42
.4
.38
.36
1980
1990
2000
2010
2020
Year
PovcalNet series
Adjusted PovcalNet
Preexisting DINA

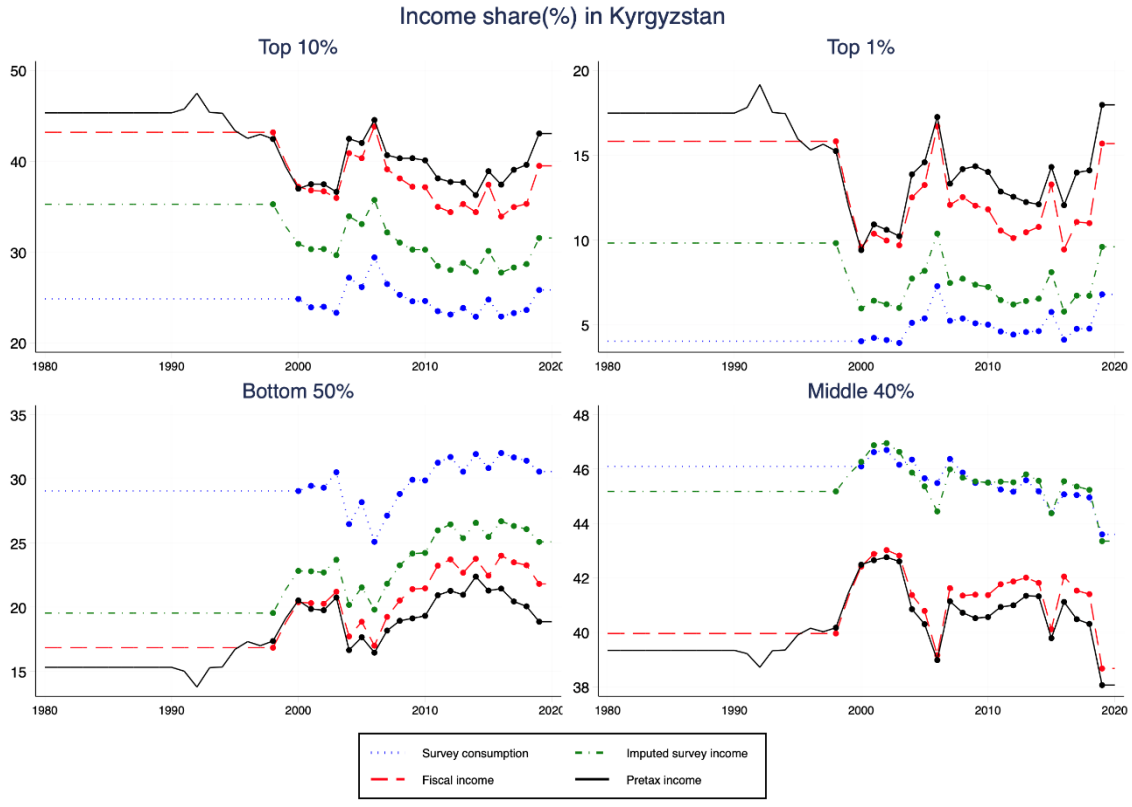
c. Construction of new Asian DINA series using PovcalNet



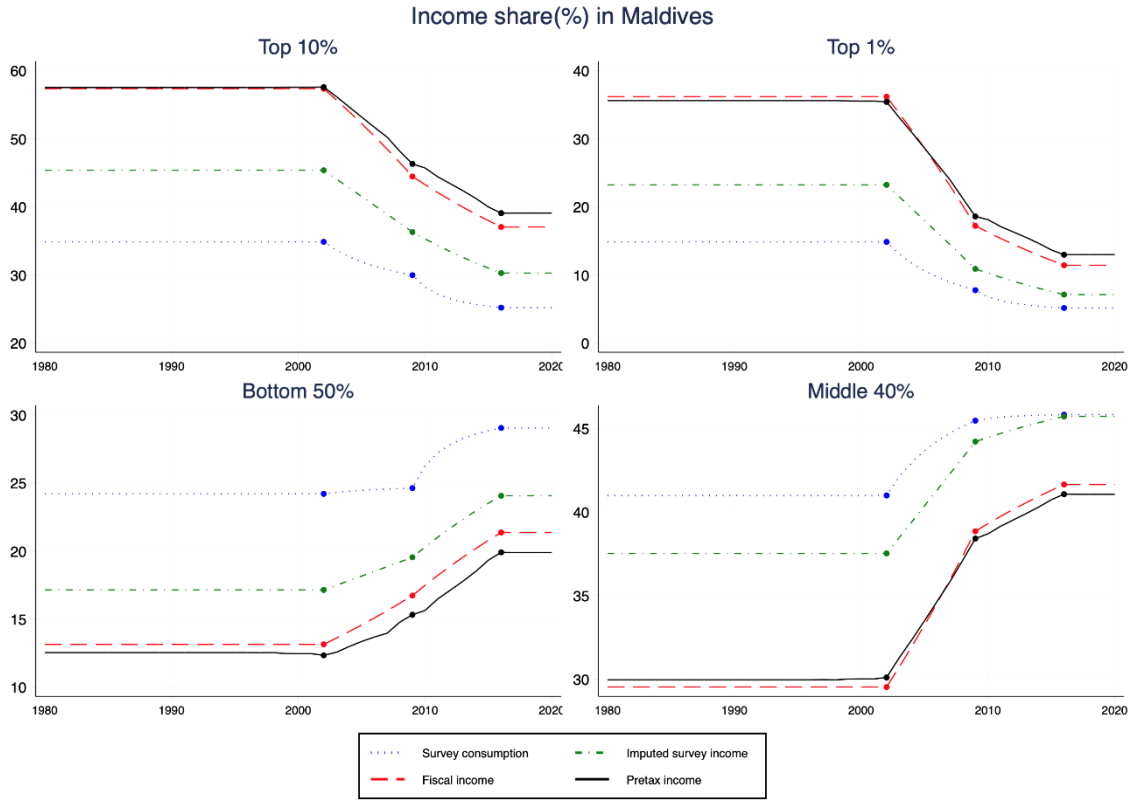

Income share(%) in Japan
Top 10%
Top 1%
Bottom 50%
Middle 40%
Imputed survey income
Fiscal income
Pretax income

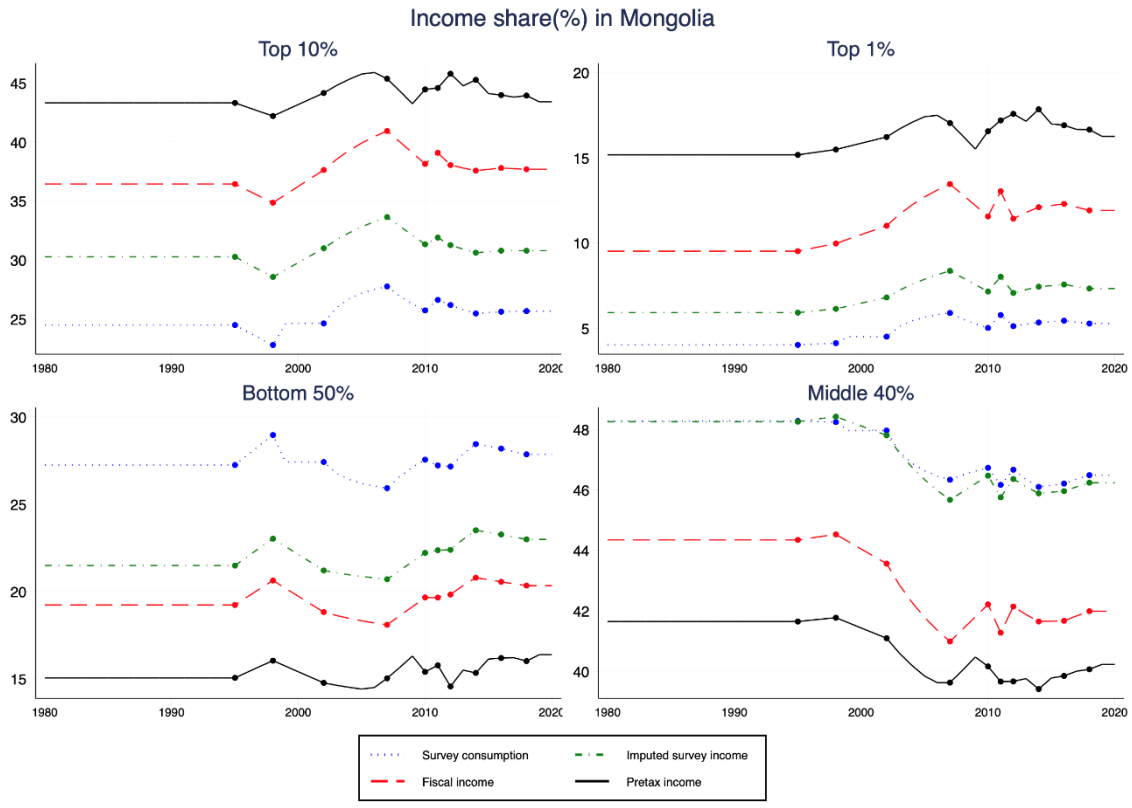

Income share(%) in Kazakhstan
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income

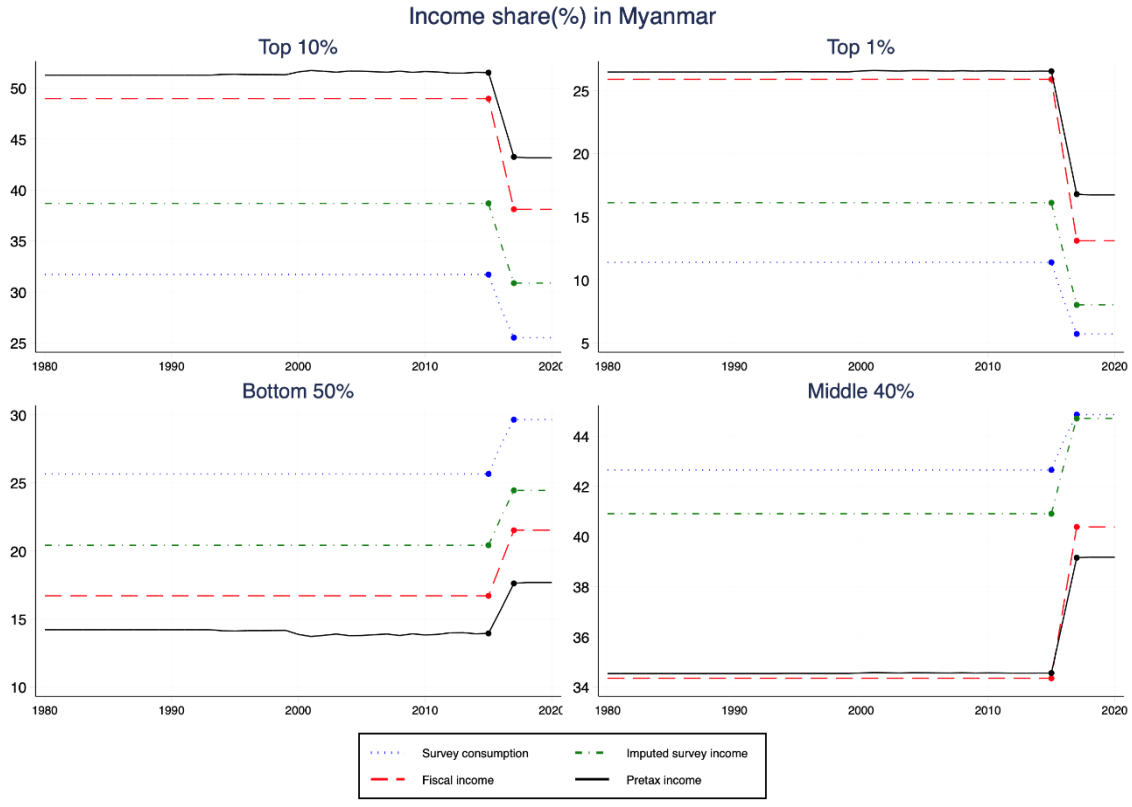

Income share(%) in Korea
Top 10%
Top 1%
Bottom 50%
Middle 40%
Imputed survey income
Fiscal income
Pretax income

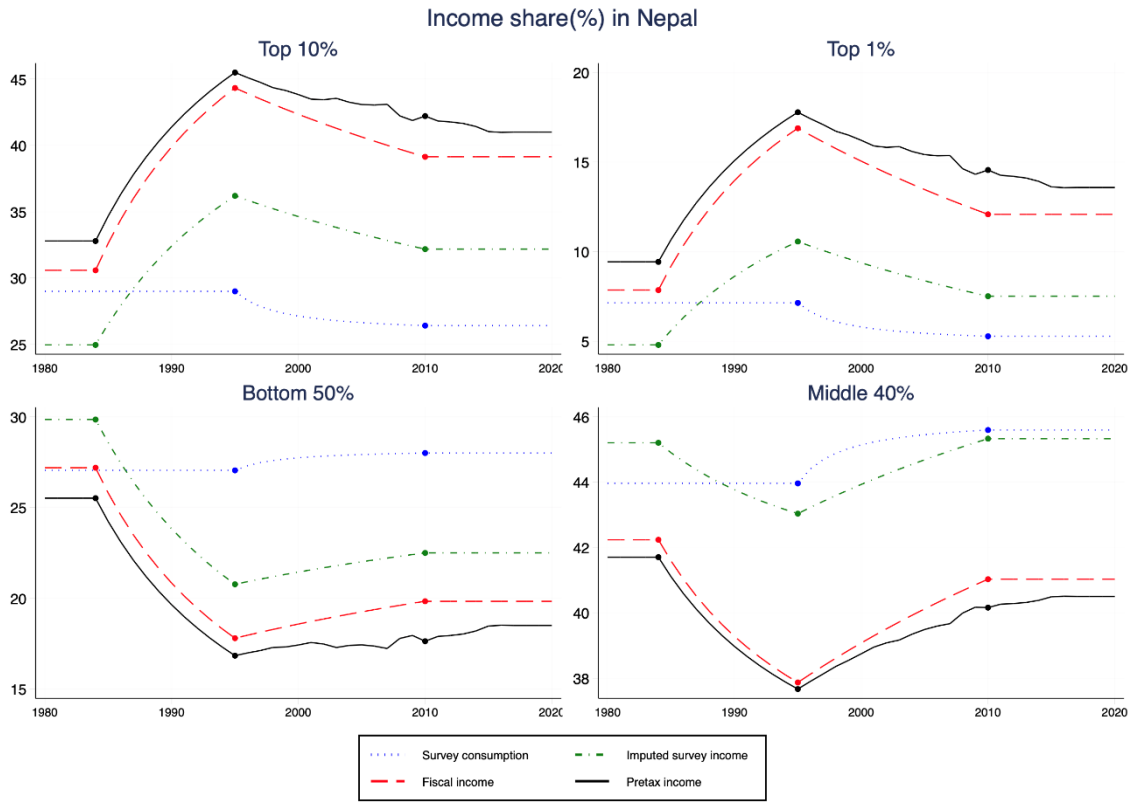

Income share(%) in Kyrgyzstan
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income

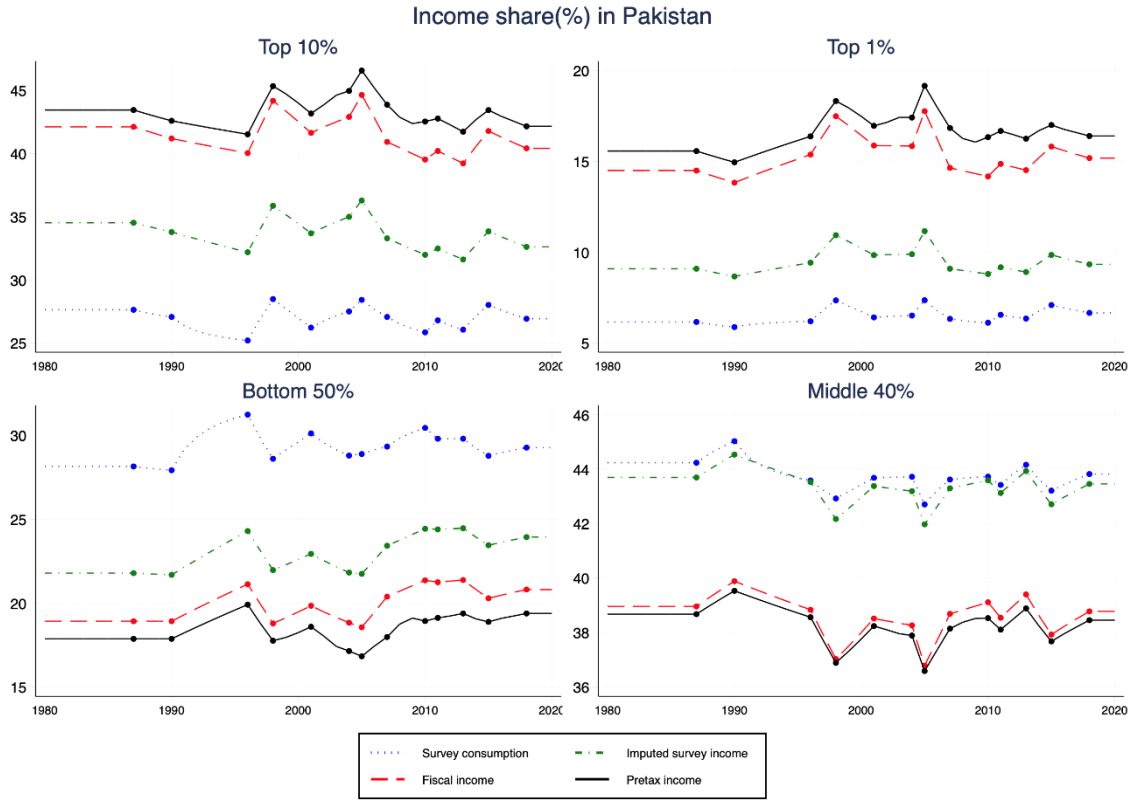
Income share(%) in Lao PDR
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income

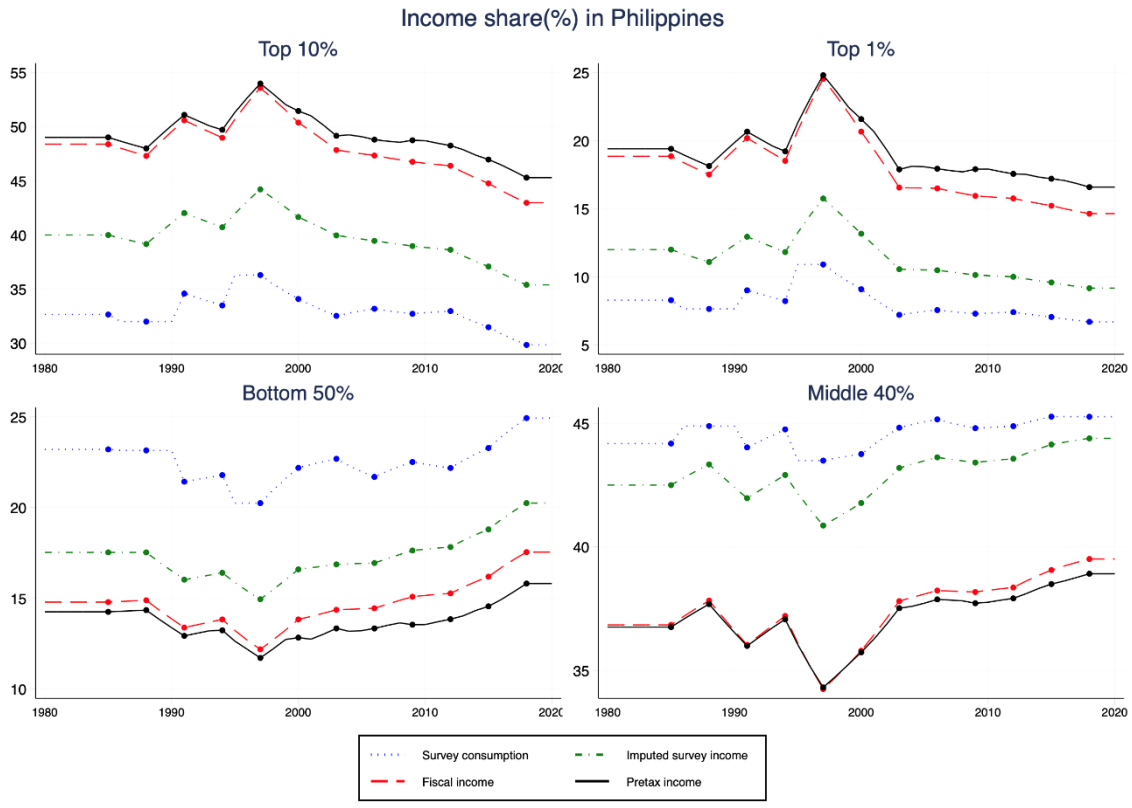

Income share(%) in Maldives
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income

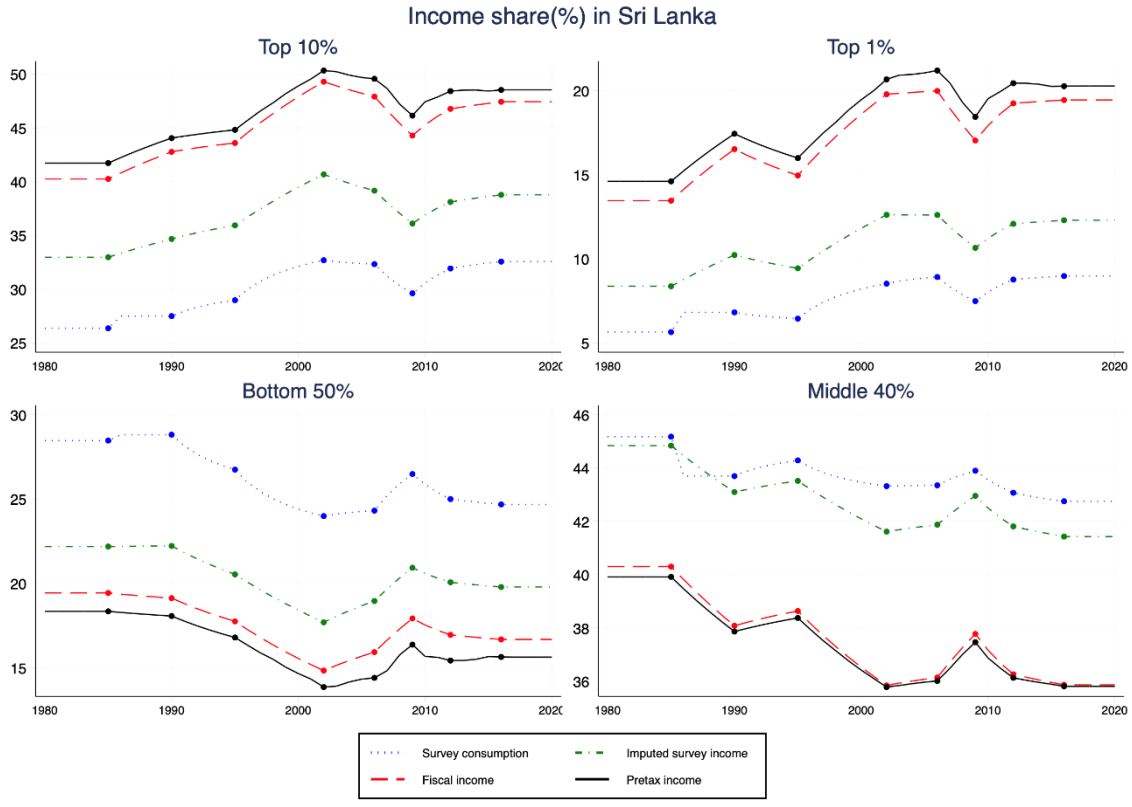

Income share(%) in Mongolia
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income

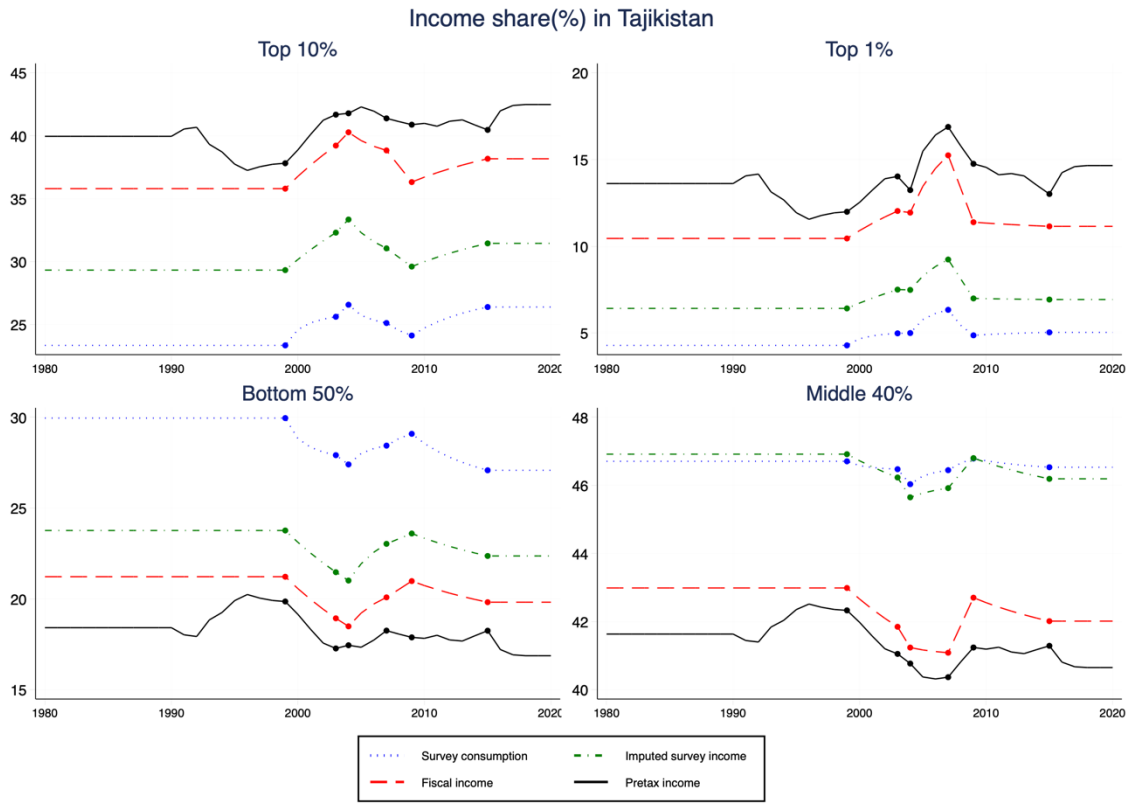

Income share(%) in Myanmar
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income

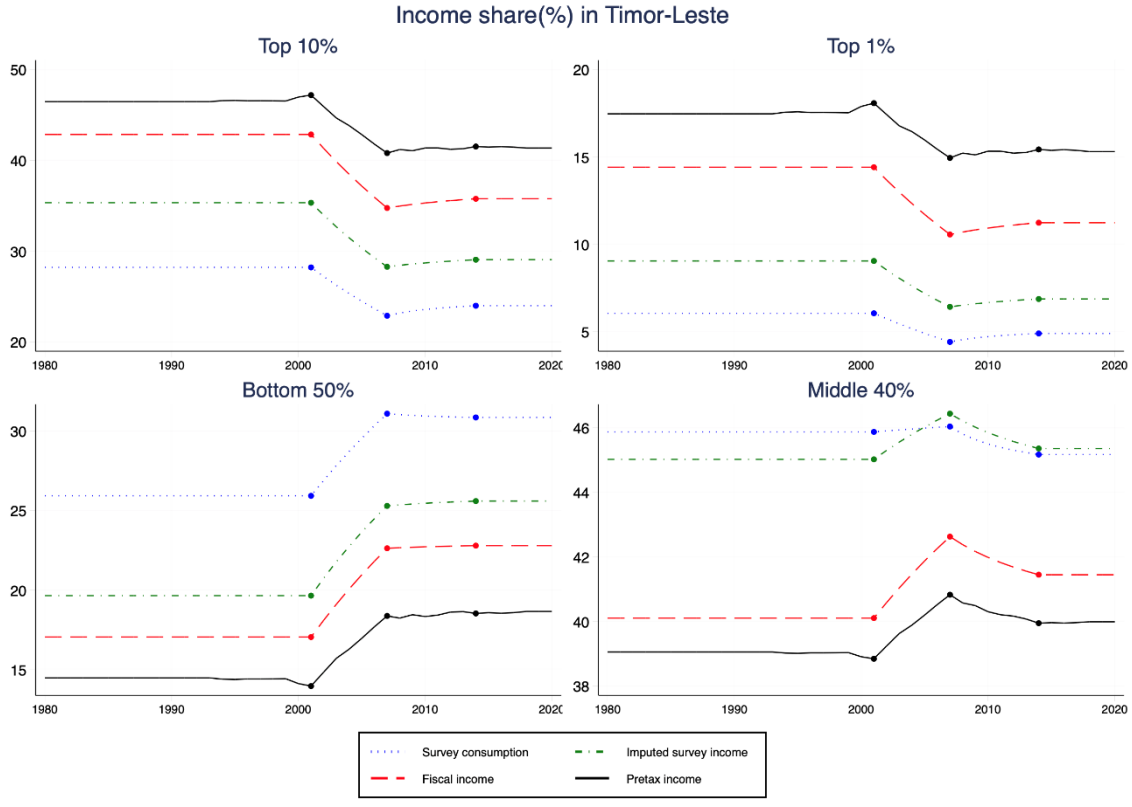

Income share(%) in Nepal
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income

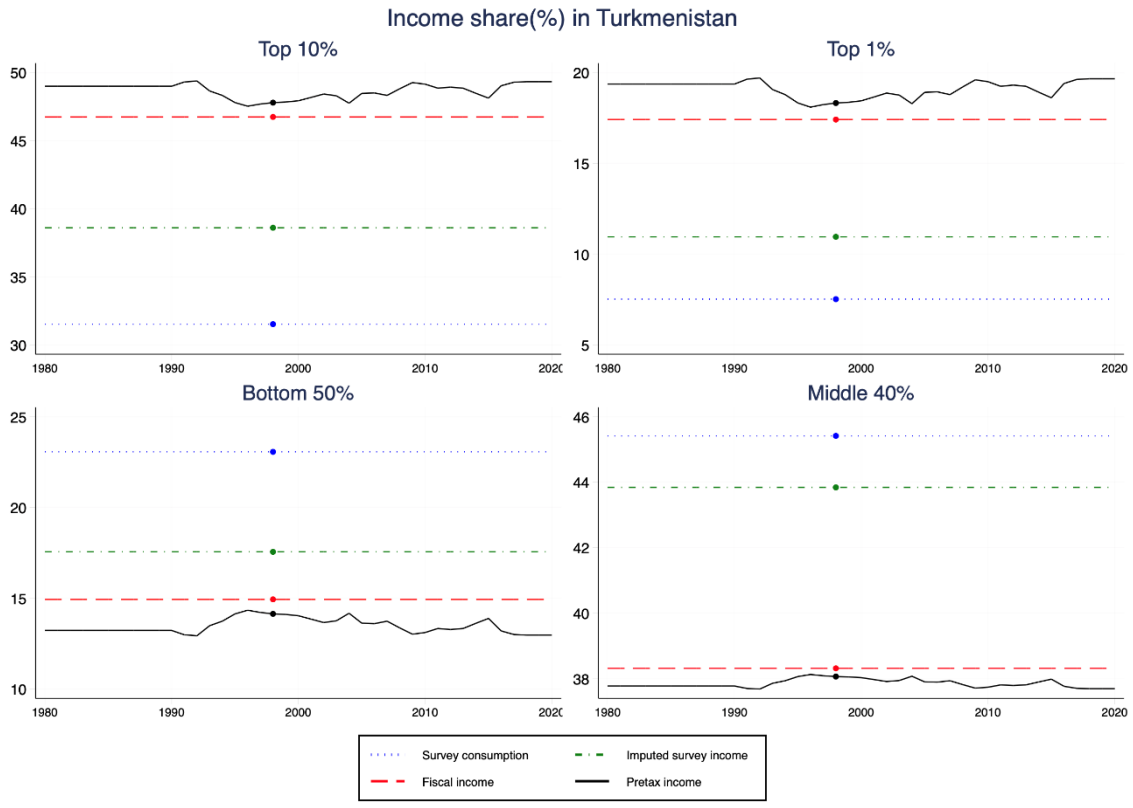

Income share(%) in Pakistan
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income

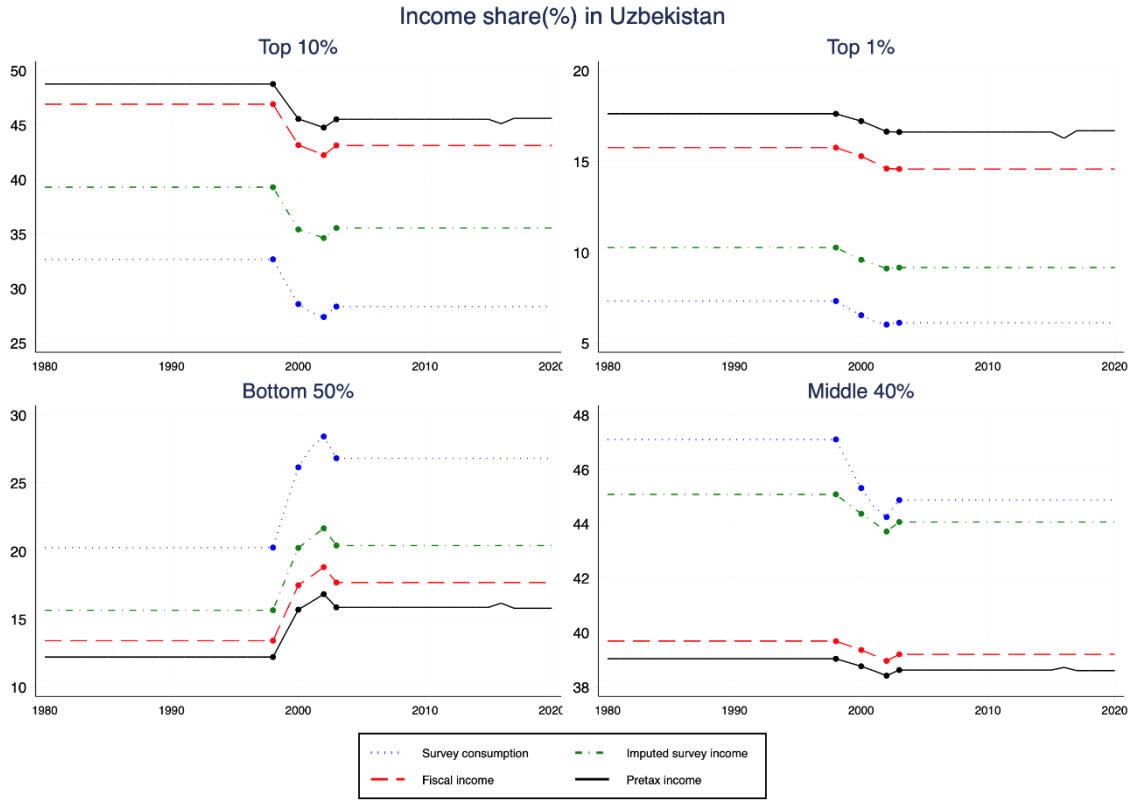

Income share(%) in Philippines
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income


Income share(%) in Sri Lanka
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income

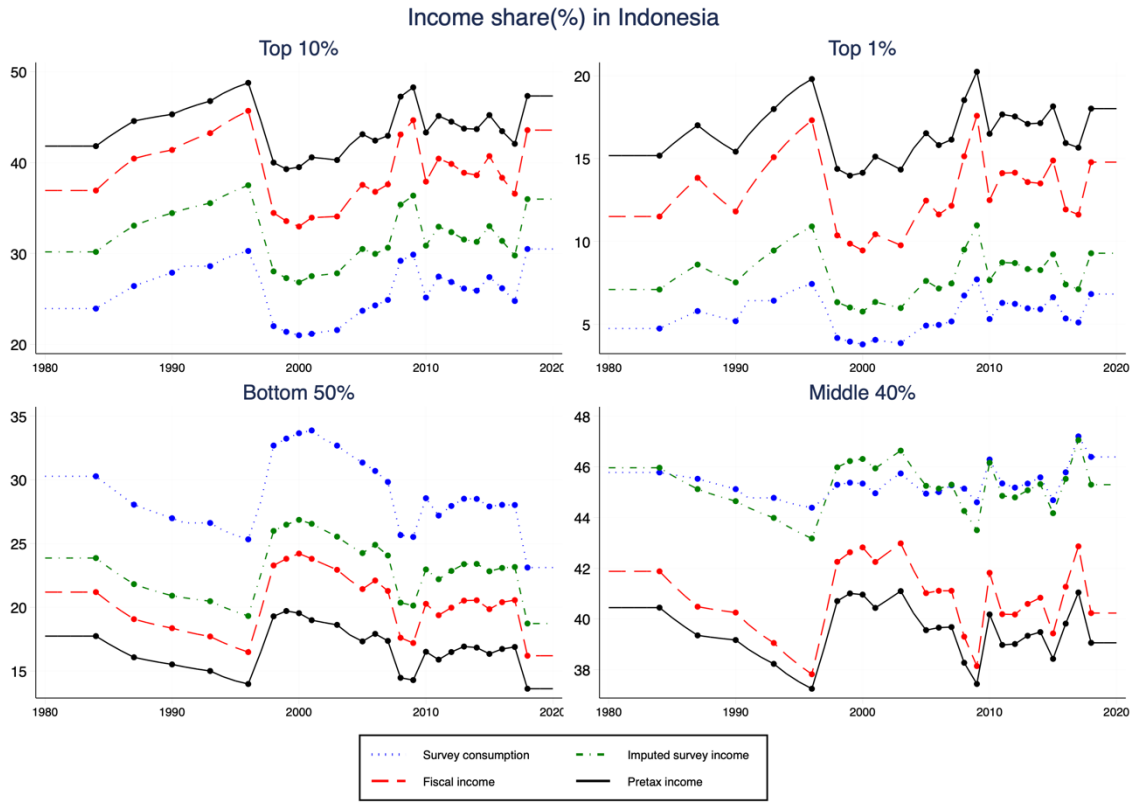

Income share(%) in Tajikistan
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income


Income share(%) in Timor-Leste
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income


Income share(%) in Turkmenistan
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income


Income share(%) in Uzbekistan
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income

Income share(%) in Viet Nam
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income


Income share(%) in Indonesia
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income