World Inequality Lab – Technical Note N° 2021/04

2021 DINA Regional Update for Middle East

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Technical Note – 2021 DINA regional update for Middle East

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This note presents the latest changes made in the construction of Distributional National Accounts (DINA) for Middle Eastern countries, detailing each step of the method, in direct continuity of Moshrif (2020) and Alvaredo et al. (2017). Combining household surveys, national accounts and income tax data, we construct income distribution for the period 1980-2021. The first attempt at creating distributional accounts for Middle East was done by Alvaredo et al (2017). Using the same household survey data, we have revised the methodology for distributing missing capital income and updated the series with recent published survey data and novel data sources like PovcalNet. The latter is a tool designed by the World Bank to evaluate global poverty. This source allowed us to extend our series, and analyze inequality trends for the past few decades, thus confirming that the Middle East remains the most unequal region in the World.

As demonstrated by the cases of Saudi Arabia - which had to be regionally imputed - and Oman - which only has one survey year available -, we still face some limitations in measuring income inequality due to lack of data transparency for both survey and fiscal data, and the low quality of available survey data.

Step 1: Preparing tabulated and micro survey data

Our data presents itself in various ways. Since tax data is only available for Lebanon in the Middle East, most of our series are derived from income and consumption surveys, that can either be obtained in the form of micro data (Syria, Yemen, Egypt, Iraq, Jordan, and Iran) or tabulated data (all others), see Table 1 for details. It is important to point out that for some countries, we have combined those micro survey data with tabulated data in order to cover as many years as possible on the 1980-2020 period.

a. Household micro survey data

Using Household micro survey data, we first estimated the full income distribution. However, to avoid having negative income values at the bottom of the distribution or missing income at the top of the distribution (the smaller percentiles within the top 1%), we trimmed the top and the bottom of the distribution. Then, we used generalized Pareto interpolation[3] to estimate the distribution shapes, and output them in the form of 127 generalized percentiles distributions. Also, for years where both micro and tabulated survey data were available, we went forward and used micro survey data to estimate the income distribution.

b. From consumption to income tabulated surveys

Some of the surveys in our sample presented data on consumption instead of income, which is the case of Bahrain, Kuwait, Qatar and UAE. In order to correct it, we need to harmonize the income concept for all countries and years. Thus, we started by computing income-consumption ratios from series where both concepts were available, and then we applied them to consumption series from regions with similar characteristics (e.g. Gulf countries ratios were used to derive Kuwait's income distributions).

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[3] For generalized Pareto interpolation the online tool gpinter can be used (https://wid.world/gpinter/) or the eponymous R package. For details on the procedure see Blanchet et al. (2021).

c. Integrating PovcalNet data

An important contribution with regards to previous DINA estimates for Middle East is the use of PovcalNet data, which is tabulated survey data, mostly measured in terms of consumption. To integrate those data with the existent inequality series, we derive the ratio between the two sources on common years, and rescaled PovcalNet series to match the estimates based on survey data. When no common years were at hand, we compute the ratio on any two close years (e.g. for UAE, the ratio was computed from the 2009 imputed income and the 2013 PovcalNet survey consumption).

For Iran, inequality estimates using PovcalNet data overlapped with inequality estimates using micro survey data. For that reason, we combined directly both datasets to produce the full income distribution, without rescaling the former.

Step 2: Top fiscal correction using Lebanese tax data

We take advantage of the availability of fiscal data from Lebanon to account for the underestimation of top incomes that is inherent to survey data, because of its self-reporting nature. Correction factors are computed for every g-percentile, ranging from 1 below the 80th percentile to around 2.5 at the very top. We then multiply bracket averages and threshold by these coefficients.

Step 3: Missing capital income

The distribution of missing capital income follows the latest recommendations of the DINA Guidelines. Retained earnings of corporations are distributed following the quantile ratio method, using a finer quantile function (hyperbolic) than in previous years, which avoids extreme values 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. Surprisingly, this step decreases inequality in most of the countries in our sample. This is due to the base series being extremely unequal and French and US wealth distribution thus flattening the distribution. We expect this to be corrected in future updates, where the wealth distribution would ideally be estimated using economies with closer characteristics.

Step 4: Imputation of missing years

As the data suffer from huge gaps between conducted surveys, we linearly interpolate the bracket averages and thresholds for the years we have no data for. Second, we extrapolate both backwards and forwards to cover the whole period from 1980 to 2020 for each country assuming constant inequality levels. This implies we have the same inequality levels for countries that have only one year of survey data (Oman). Moreover, we average Gulf countries distributions to impute the Saudi Arabia distribution, and the Middle East series are constructed by aggregating all our series and reranking them in 127 g-percentiles.

Step 5: Rescaling to match national income

We use aggregate variables to rescale the average income to match national income and wealth, in the distribution of retained earnings. National wealth is derived from a globally computed wealth-income ratio.

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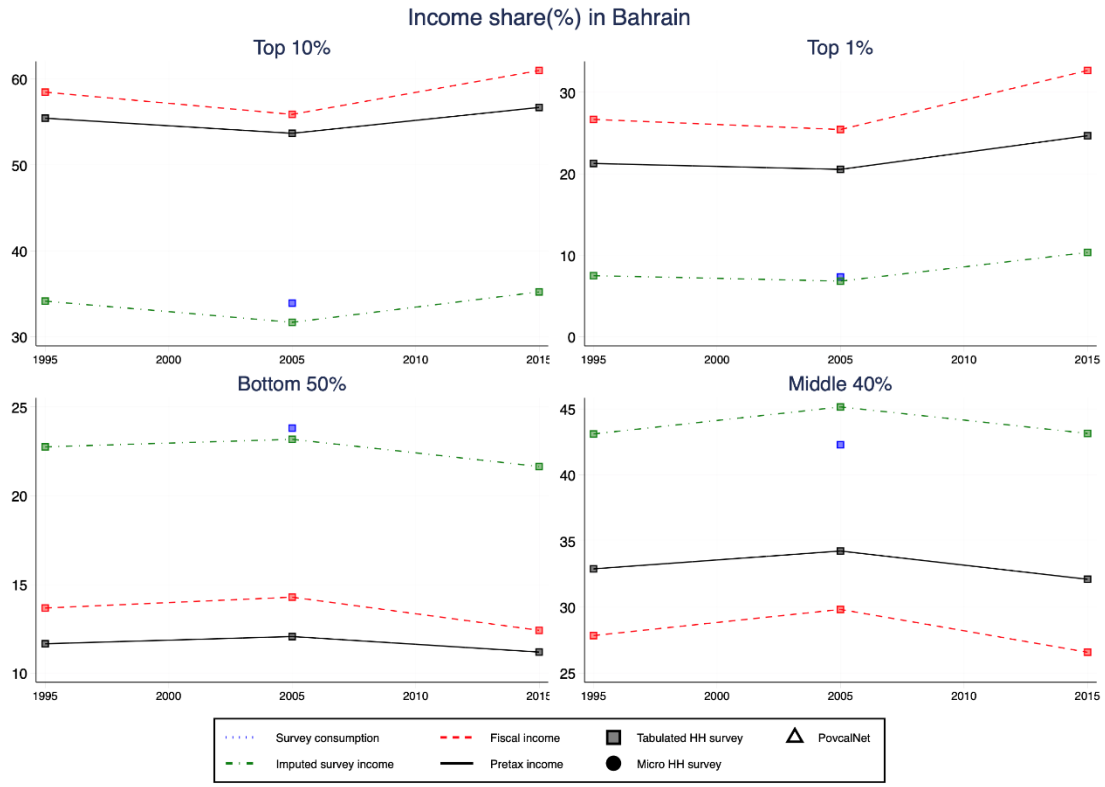
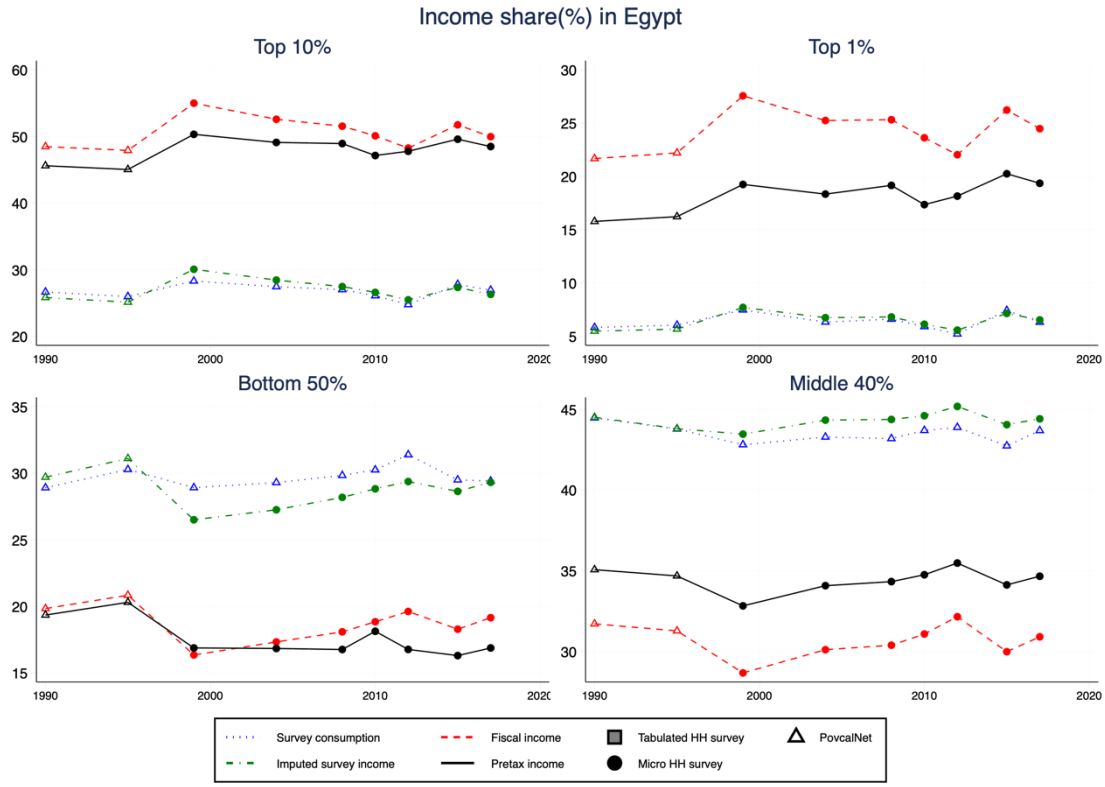
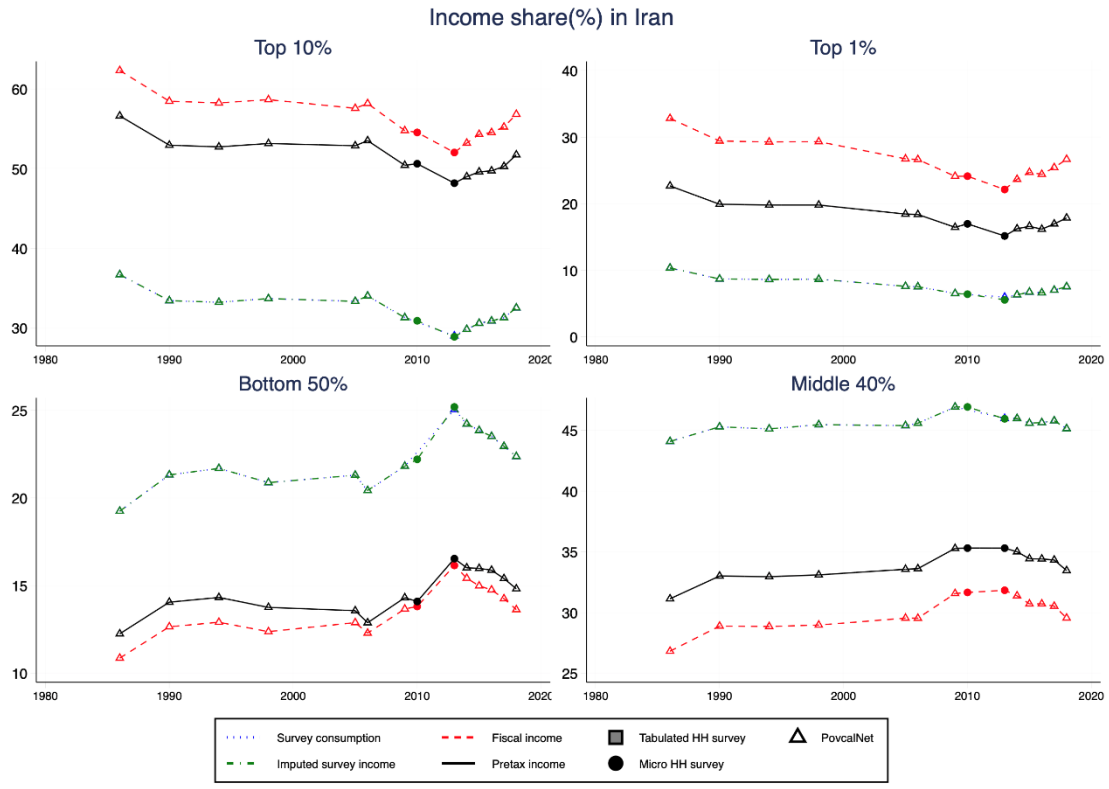
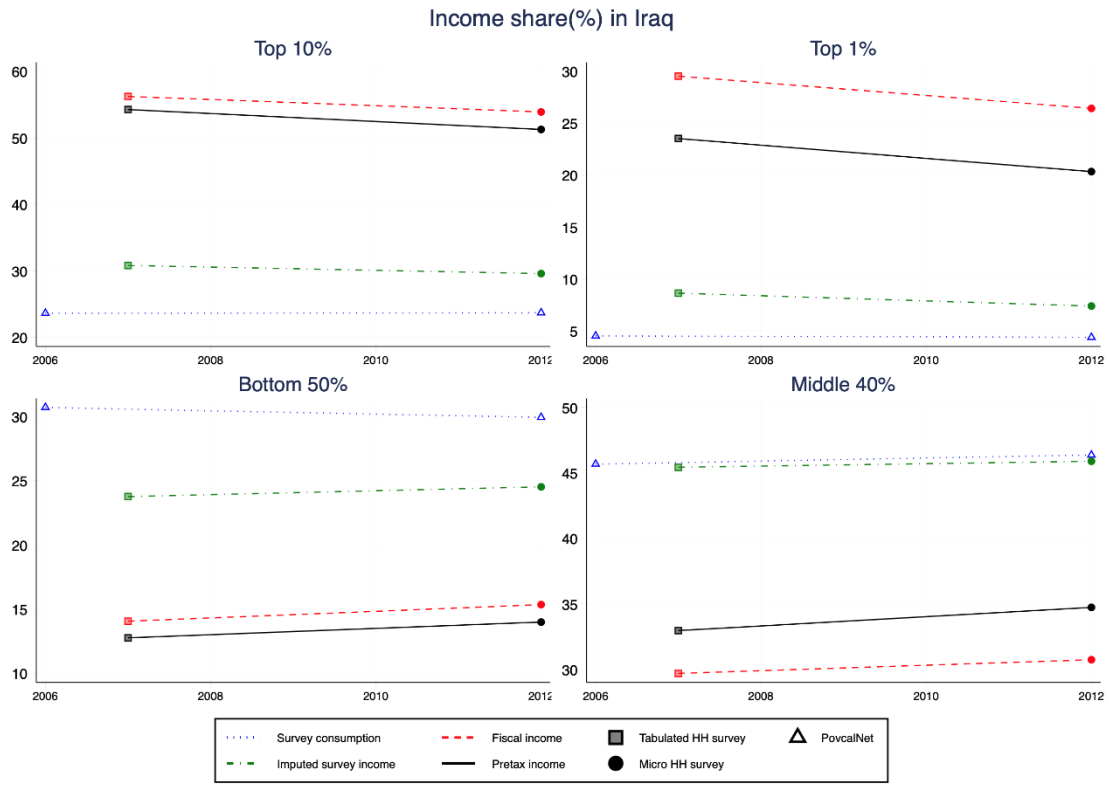
Table 1: Survey years available in Middle East

Country	Survey Years	Format	New micro HH survey data	New PovcalNet survey data
Lebanon	2007-2016	Tabulation		
Jordan	1986, 1992, 2002, 2006, 2008, 2010, 2013	Micro-data and tabulation		1986
Palestine	1996-1998, 2004-2007, 2009-2011, 2016	Micro-data and tabulation		2016
Iran	1986, 1990, 1994,1998, 2005, 2006, 2009, 2010, 2013-2018	Micro-data and tabulation		1986, 1990, 1994,1998, 2005, 2006, 2009, 2014-2018
Turkey	1987, 1994, 2002-2019	Micro-data and tabulation		2017-2019
Egypt	1990, 1995, 1999, 2004, 2008, 2010, 2012, 2015, 2017	Micro-data and tabulation	2017	1990, 1995
Iraq	2007, 2012	Micro-data	2012	
Syrian Arab Republic	1996, 2003, 2004	Micro-data and tabulation		1996, 2003
Yemen	1998, 2006, 2014	Micro-data and tabulation		1998, 2014
United Arab Emirates	1998, 2009, 2013, 2014, 2018	Tabulation		2013, 2014, 2018
Bahrain	1995, 2005, 2015	Tabulation		
Oman	2010	Tabulation		
Qatar	2007, 2012	Tabulation		
Kuwait	2007, 2013	Tabulation		
Saudi Arabia	None	None		
Israel	1979, 1986, 1992, 1997, 2001, 2005, 2007, 2010, 2012, 2014, 2016	Tabulation		


Income share(%) in Bahrain
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income
Tabulated HH survey
Micro HH survey
PovcalNet


Income share(%) in Egypt
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income
Tabulated HH survey
Micro HH survey
PovcalNet


Income share(%) in Iran
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income
Tabulated HH survey
Micro HH survey
PovcalNet


Income share(%) in Iraq
Top 10%
Top 1%
Bottom 50%
Middle 40%
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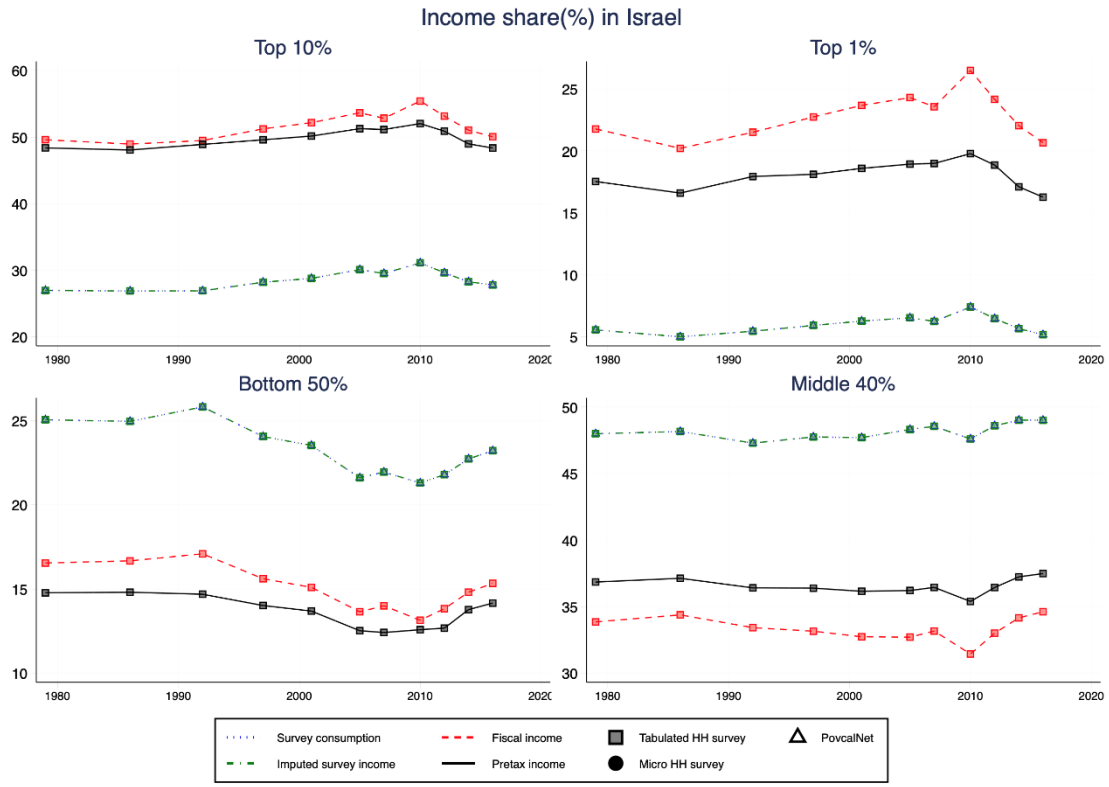
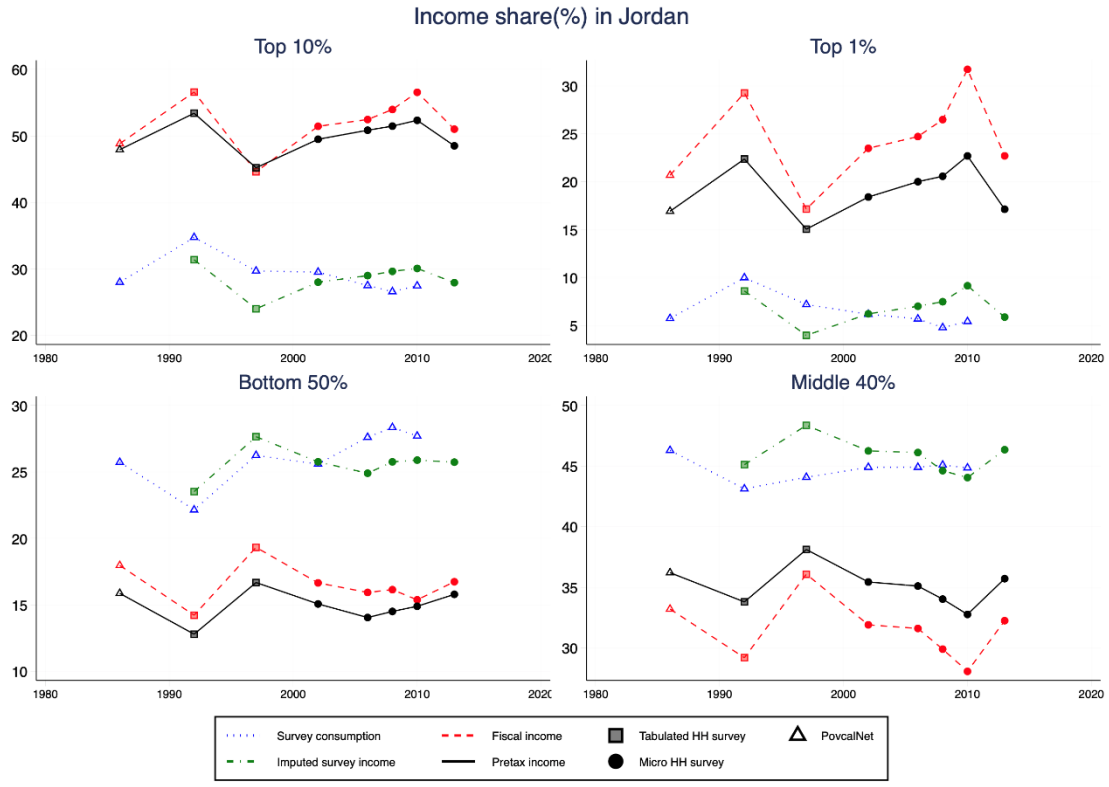
Imputed survey income
Fiscal income
Pretax income
Tabulated HH survey
Micro HH survey
PovcalNet


Income share(%) in Israel
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income
Tabulated HH survey
Micro HH survey
PovcalNet


Income share(%) in Jordan
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Top 1%
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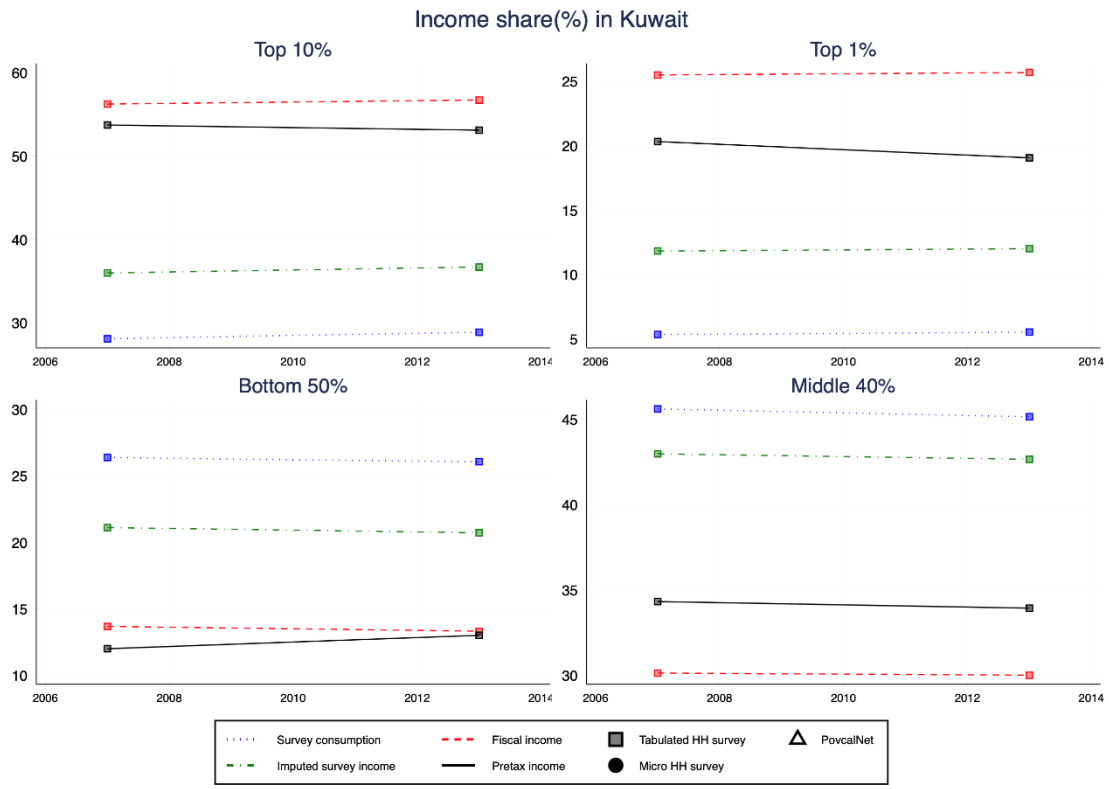
Fiscal income
Pretax income
Tabulated HH survey
Micro HH survey
PovcalNet


Income share(%) in Kuwait
Top 10%
Top 1%
Bottom 50%
Middle 40%
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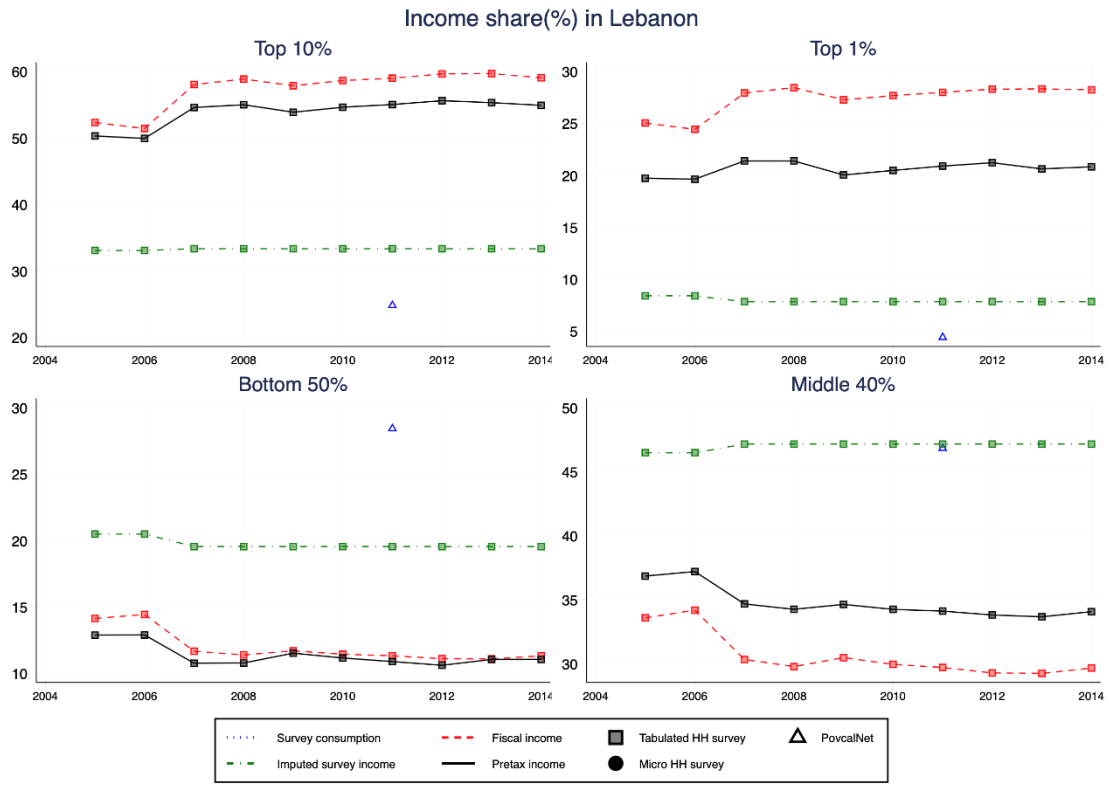
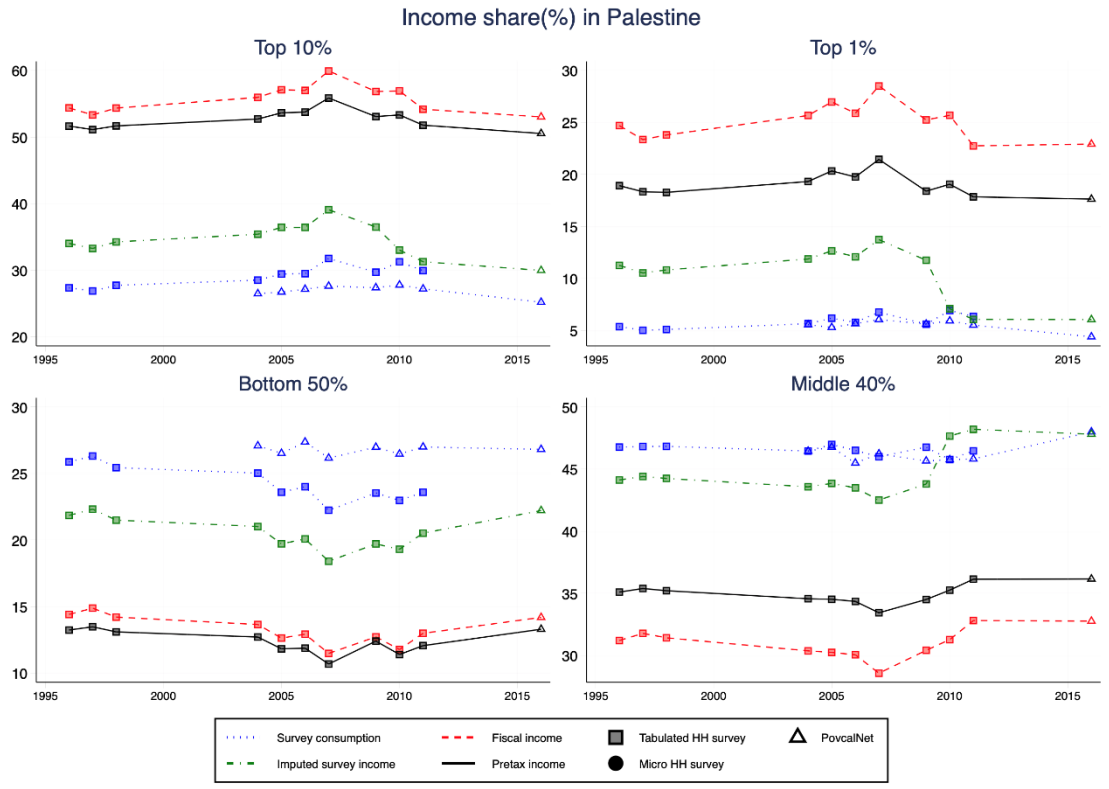
Fiscal income
Pretax income
Tabulated HH survey
Micro HH survey
PovcalNet


Income share(%) in Lebanon
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income
Tabulated HH survey
Micro HH survey
PovcalNet

Income share(%) in Oman
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income
Tabulated HH survey
Micro HH survey
PovcalNet


Income share(%) in Palestine
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
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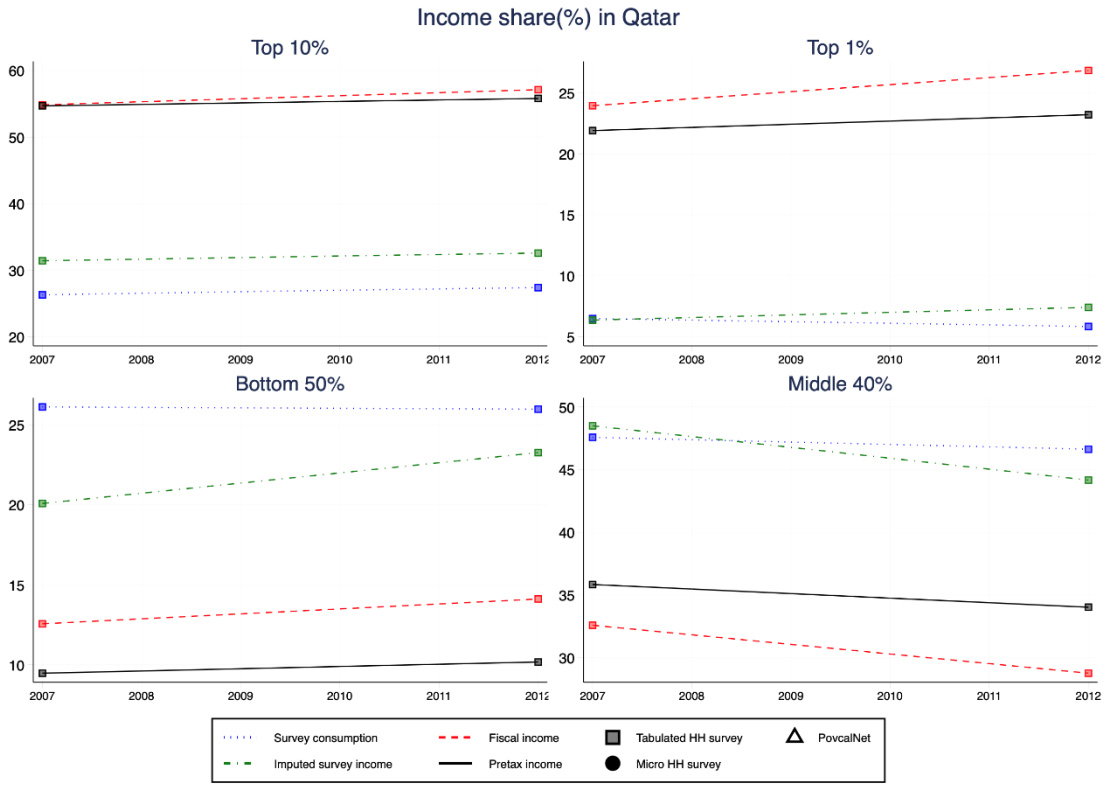
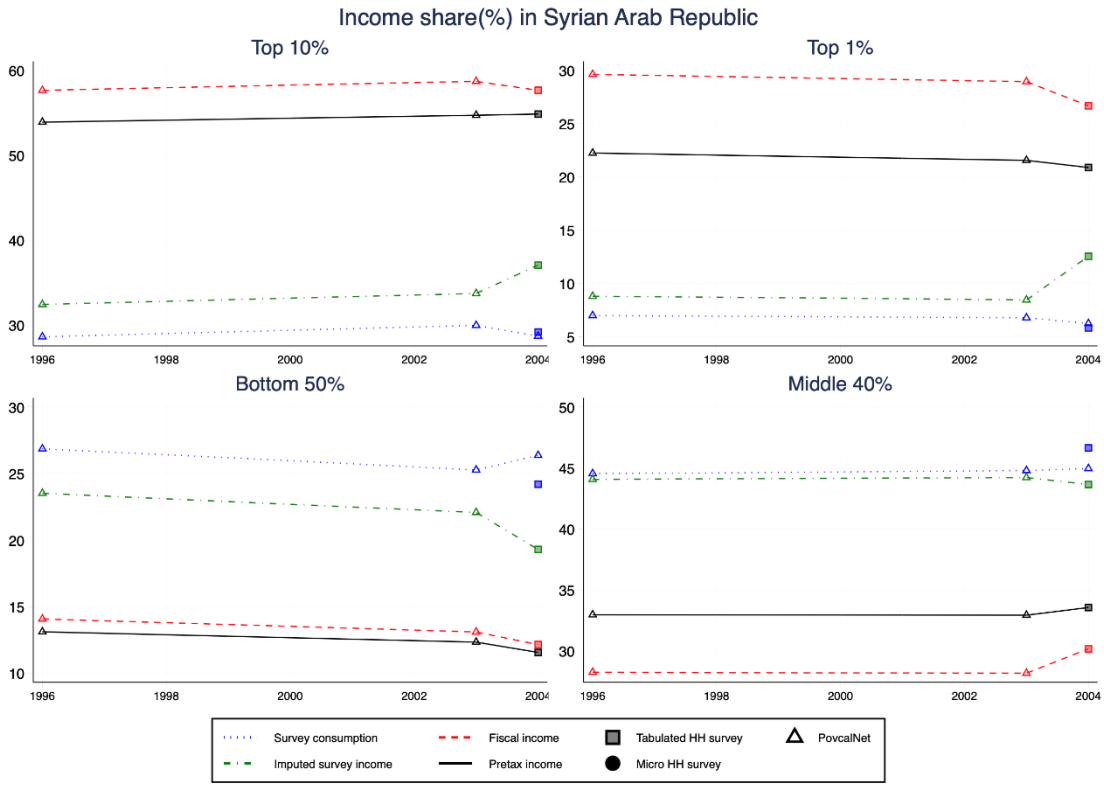
Pretax income
Tabulated HH survey
Micro HH survey
PovcalNet


Income share(%) in Qatar
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income
Tabulated HH survey
Micro HH survey
PovcalNet

Income share(%) in Saudi Arabia
Top 10%
Top 1%
Bottom 50%
Middle 40%
Survey consumption
Imputed survey income
Fiscal income
Pretax income
Tabulated HH survey
Micro HH survey
PovcalNet


Income share(%) in Syrian Arab Republic
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Bottom 50%
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Micro HH survey
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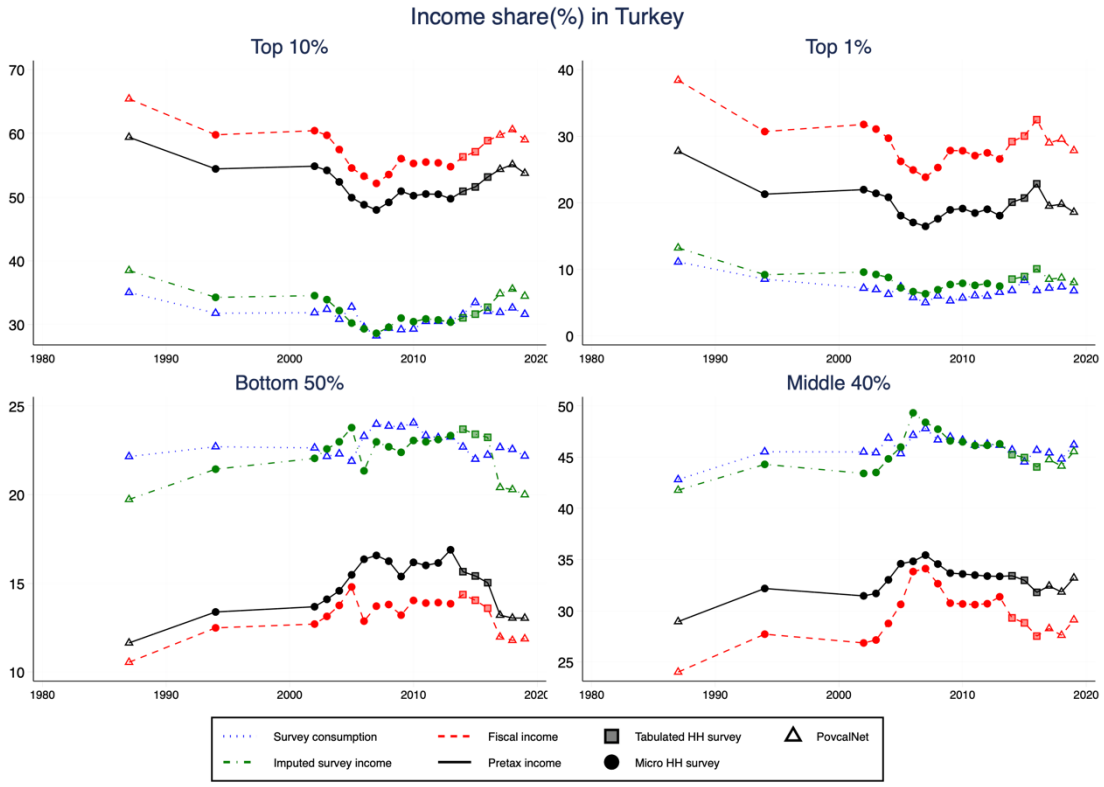
Income share(%) in Turkey
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Bottom 50%
Middle 40%
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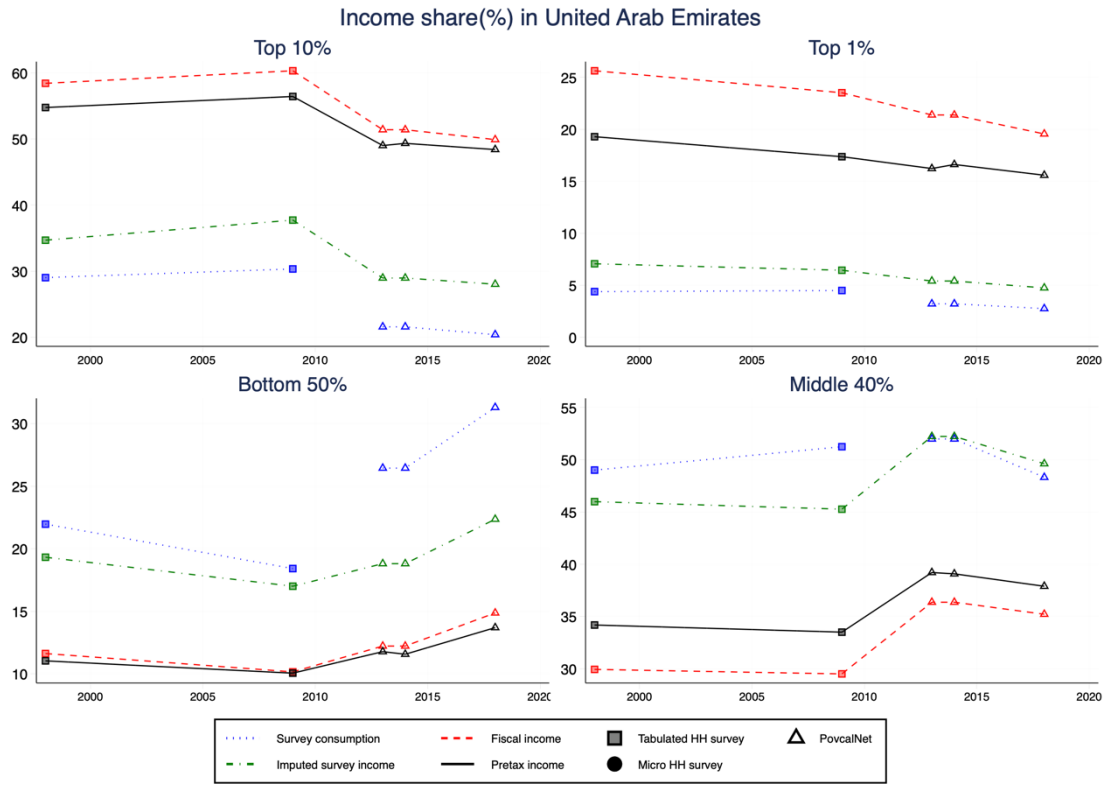
Income share(%) in United Arab Emirates
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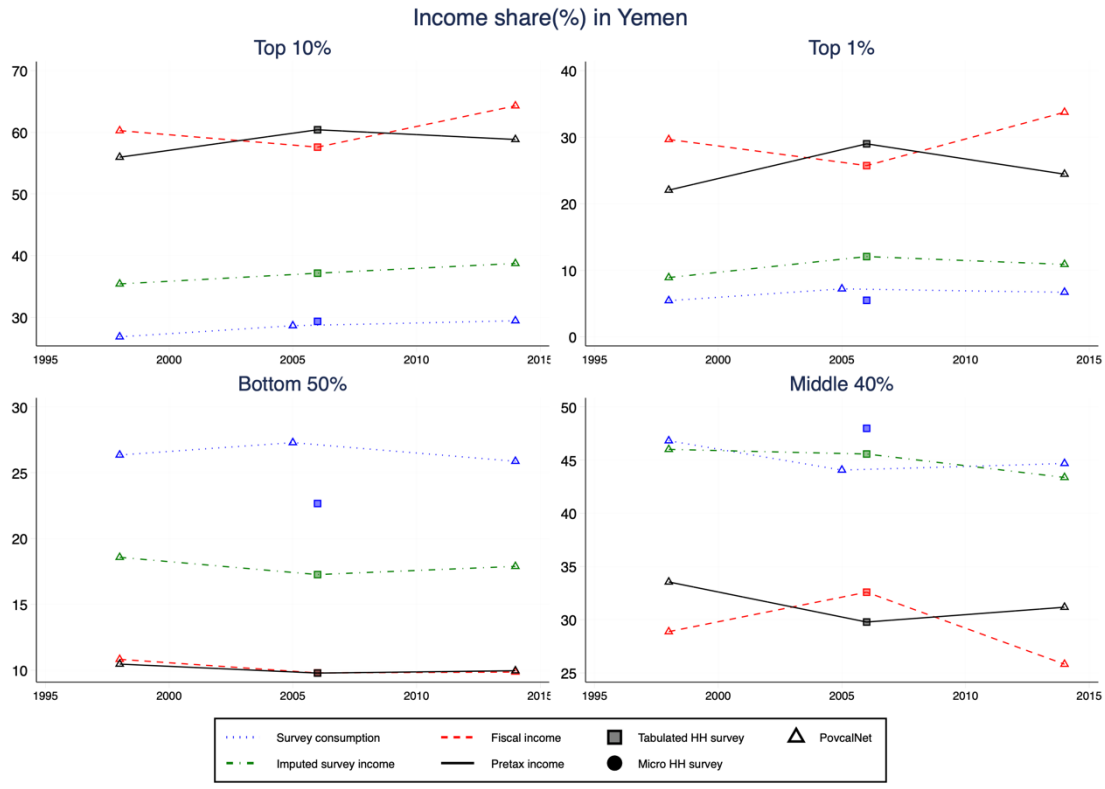
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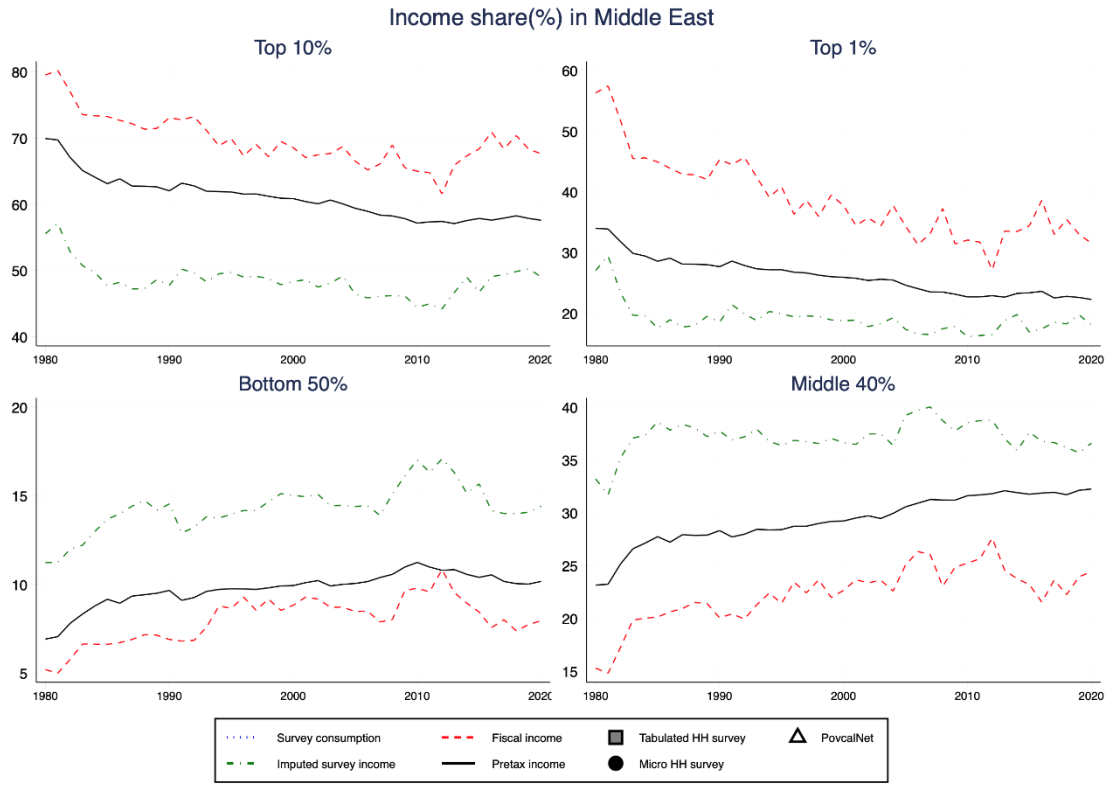
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