

## Income Inequality Series for the Middle East

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## Technical Note

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In this note, we provide a step-by-step guide on how the Distributional National Accounts (DINA) for Middle East countries were constructed. Combining household surveys, national accounts, income tax data and wealth data, we construct income distribution for the period 1990-2019.

I have extended the Middle East' income series to the most recent year (2019). A distributional series was first developed by (Alvaredo, Assouad, & Piketty, 2019). Due to data limitations in terms of accessibility, we have used the same survey data as in the original paper, but applying a different method of distributing missing capital income, described in the DINA guidelines (Alvaredo, et al., 2020).

All in all, better quality survey data and more fiscal transparency is needed to better measure income inequality in this region.

Beside those countries, I have added new inequality series for Israël, that follows the same methodology steps below starting Step 2, but using Povcalnet survey tabulations instead of microdata from National Statistical Offices.

In the following, I describe the methodology step by step:

### **Step 1: Household Income survey**

Income survey data are scarce in the Middle East regardless of the country's level of the wealth. Access to micro data is difficult and we rely on survey tabulations for some countries to construct income distribution. In table 1 documents the data availability per country and the type of data used. All country-specific surveys are treated by

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generalized Pareto interpolation.<sup>2</sup> This way we estimate the full distribution of raw survey income for all countries expressed as generalized percentiles. For Saudi Arabia, no survey has been identified, the country's level of inequality is imputed as a regional average of all gulf countries (Bahrain, Kuwait, Oman, Qatar, UAE). For Israël, only Povcalnet income survey tabulations are available. They were harmonized using gpinter to have a full distribution with generalized percentiles.

### **Step 2: Fiscal correction of the top of the distribution using micro tax data from Lebanon**

Survey data is self-reported and it underestimates the inequality at the top of the distribution. For this reason, income tax data is used. Due to data limitation, no tax data exist for the Middle East except for Lebanon.

Income correction factors were computed using Lebanese income tax data. The correction factor is the fiscal/survey ratio, computed at the level of each g-percentile and then we took the average for the whole period. This factor is later multiplied by thresholds, bracket averages and top averages for the top 20% of the survey distribution. We assigned a coefficient of 1 for the bottom 80% of the distribution as this is the case for Lebanon.

### **Step 3: Linear interpolation between survey 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 1990 to 2019 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 (these are Iraq, Yemen, Syria and Oman).

### **Step 4: Distributing missing capital income using information from National Accounts.**

We followed a different method to distribute tax-exempt capital income than Gumbel Copula followed in the paper (Alvaredo, Assouad, & Piketty, 2019). To go from the distribution of tax-corrected household income to the distribution of national income, we impute the missing components of income, mainly retained earnings of corporations, and distribute it over household income using the quantile ratio method, described in DINA guidelines (Alvaredo, et al., 2020).

In this step, we impute how much missing capital income accrues to different income groups, depending on two factors: the level of capital income inequality and the dependency between labor and capital income. Due to lack of wealth data in the region and assuming that survey data only covers labor income, we rely on external estimate of capital income marginal distribution. Using wealth distribution from US and France, we impute how much missing capital income is attributed to each income group. This way, we account for missing capital income accruing to different income groups especially those at the top and we distribute it over household income from survey distribution in the Middle East.

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<sup>2</sup> 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. (2018).

## Step 5: Upgrading proportionally the series to match average net national income

After distributing retained earnings across g-percentiles, we rescale income proportionally so it would match national accounts aggregates.

Table 1. Household surveys used in the 2020 Middle East update (1990 - 2019)

Country	Survey years	Format
Lebanon <sup>3</sup>	2007	Tabulation
Jordan	1992, 2002, 2006, 2008, 2010, 2013	Micro-data and tabulation
Palestine	1996-1998, 2004-2008, 2010-2011	Micro-data
Iran	2010, 2013	Micro-data
Turkey	1994, 2002-2016	Micro-data and tabulation
Egypt	1999, 2004, 2008, 2010, 2012, 2015	Micro-data
Iraq	2007	Micro-data
Syrian Arab Republic	2004	Micro-data
Yemen	2006	Micro-data
United Arab Emirates	1998, 2009	Tabulation
Bahrain	1995, 2005, 2015	Tabulation
Oman	2010	Tabulation
Qatar	2007, 2012	Tabulation
Kuwait	2007, 2013	Tabulation
Saudi Arabia	None	None
Israel	1992, 1997, 2001, 2005, 2007, 2010, 2012, 2014, 2016	Povcalnet Tabulation

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<sup>3</sup> Lebanon has only one year of survey tabulation, yet fiscal micro data is available between 2005 and 2014, making Lebanon the only Arab country with tax data (Assouad, 2017).