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Measuring Inequality in the Middle East, 1990-2016:

The World's Most Unequal Region?

Appendix

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Measuring Top Incomes in the Middle East: 1990-2016

The World's Most Unequal Region?

Appendix *

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This appendix supplements our paper and describes the full set of data files and computer codes (AAP2017.zip) that were used to construct the series.

The zip file AAP2017.zip includes the following files (in addition to the pdf files of the main paper and present appendix):

- AAP2017MainFiguresTables.xlsx : figures and tables presented in the main paper

- AAP2017MainFiguresTables_NoLinks.xlsx : figures and tables presented in the main paper without outside links to other files

- AAP2017Appendix.xlsx : figures and tables presented in the appendix

- AAP2017Appendix_NoLinks.xlsx.xlsx : figures and tables presented in the appendix without outside links to other files

Appendix A. Data construction

In order to estimate the entire income distribution of the Middle East, we first gather available income data to estimate the raw survey distribution for each country, over the period. Table A1 summarizes the survey sources used in this paper. When we could not access micro-data, we use survey income tabulations extracted from survey reports published online by the national statistical offices. Raw statistical data are given the directory "HouseholdSurveyData". The Stata format do-files used to generate the raw survey distributions can be found in Gpinter/Do/IncomeSurveySeries (do_"countryname"). For countries with tabulated data only, the excel files "Input/`*countryname*'IncomeDistribution.xlsx" include the computations to derive input files to be used with the "Gpinter" (Generalized Pareto interpolation) web interface (http://wid.world/gpinter). In what follows, we briedly present the databases and methodology used.

1. Egypt, Iraq, Jordan and Palestine

We have access to survey micro-data for seven countries. For Egypt, Iraq, Jordan, and Palestine we use the harmonized databases created by the Economic Research Forum (OAMDI initiative) and take the households total disposable income as income concept. For some years and countries, we have additional variables (as the expenditure on taxes and levies, or imputed rental income) that we include to approach the pre-tax, post-replacement income concept defined in Alvaredo et al. (2016)[1]. All computations can be found in each country specific do file, in Gpinter/Do/IncomeSurveySeries. The variables available are presented in the sheet "ERFHarmonization", in the excel file "CleaningMicroData.xlsx".

[1] Pension income (and other replacement income such as unemployment insurance) is included in income, while pension contributions (and other social contributions financing

2. Turkey

For Turkey, we use the Household Budget Survey micro-data for the years 1994, 2002 and 2013. As explained in the main paper, the Turkish micro-data are more detailed so that we can adjust the income variable to approach the pre-tax, post-replacement income concept. The sheet “TurkeyHBSIndivHarmonization”, in “CleaningMicroData” presents how we computed the income variable.

For the years 2014-2016, we use tabulations on per capita income computed with the Income and Living Conditions Survey and available online on the Turkish Statistical Institute website. The raw data and computations can be found in the directory “HouseholdSurveyData/Turkey”.

3. Iran

For Iran, we used micro-data publicly available online on the website of the Statistical Center of Iran, for the years 2010 and 2013. The micro data distinguish between Rural and Urban areas. We therefore used the Gpinter “merge option” to infer the national income distribution per adult. The raw data and computations can be found in the directory “HouseholdSurveyData/Iran”.

4. Gulf-countries

For Gulf countries, only tabulations published by national statistical offices are available. They systematically distinguish between “National” and “Foreigner” populations. Using the Gpinter interface, we derive the per adult income distribution for each sub-group of the population over the period. The merge option enables us to correct for sampling issues (noted in the Kuwaiti data by El Katiri et al., 2011, but that we find in other Gulf countries) and the fact that foreigners are systematically under

sampled in survey data. We directly weight the distribution by the adult population of each sub-group. Details about the estimation of the share of foreigners in the total population are presented in the excel file “GulfCountries.xlsx” (directory HouseholdSurveyData). Table A2 displays inequality statistics derived from survey data for foreigners, nationals and the entire population of Gulf countries. Taking into account foreigners increases inequality in all countries and for all years. Note however that the distinction between the two populations can only be done at the survey distribution level, as we afterwards normalize the series to the national average income per adult and loose track of the differential in average income between the two populations. We therefore still highly underestimate income inequality within these countries.

5. Saudi Arabia

Three household surveys have been conducted in Saudi Arabia, in 1999, 2007 and 2013, but the reports published by the statistical office do not contain exploitable information on the income or expenditure distribution. We therefore proceed as follow. First, we take the average standardized distributions of income computed with available survey data in other Gulf countries, that is we divide all thresholds and bracket averages for all 127 generalized percentiles by average wealth, and we compute the arithmetic average for the five countries, over the period. It seems unjustified to adjust this average Bahrain-Kuwait-Oman-Qatar-UAE normalized distribution to Saudi Arabia directly as it would imply that Saudi Arabia inequality levels follow the same trends as the other countries. Given its weight in the Middle East in terms of population and income, we attribute the most equal Bahrain-Kuwait-Oman-Qatar-UAE normalized distribution (the year 2008) that we adjust to the Saudi per adult national income over the period. Note however that this procedure is rather

conservative, given that published Gini coefficients (51.3 and 45.9 in 2007 and 2013 for the Saudi population) are greater than what is observed in other countries (see Table A2).

6. Countries with information on expenditure only: Syria, Yemen, and Kuwait

Finally, for Syria Yemen and Kuwait, only information on expenditure is available. We therefore proceed as follow. First, we use the Palestinian micro-data, for which both household income and expenditure are available, to compute the residual saving rates by g-percentile, that is, for each g-percentile, we compute the ratio of income over expenditure and we apply these ratio to the Syrian and Yemeni expenditure distributions. For Kuwait, we first derive the ratios between income and expenditure by g-percentile using Bahraini and Emirati tabulations, for which tabulations are available for both the income and expenditure distributions. We compute these correction coefficients for the foreigner and national populations and apply them to the expenditure distribution of each sub-group of the Kuwaiti population (see do_CoefficientExpGulfCountries).

7. Other issues: unit of observation and cleaning procedure

Two additional remarks on the procedure are in order. First, as explained in the main paper, we take as unit of observation the adult individual, aged 20 years and more. For all countries with micro-data, with the exception of Iran, we estimate the number of adults in each household, using information on the household type or the age of household members in the case of Turkey. We then normalize the total adult population in the survey data to the demographic figures gathered in WID.world and deduce the income per adult. For Iran, we divide household income by the

household size multiplied by an estimate of the adult population in each area (Urban and Rural, see do_Iran for more details).

Finally, for countries with tabulations only, the number of adults by income bracket is rarely available. We therefore divide household income in each group by the average household size multiplied by the share of adults in the entire economy, assuming that the income distribution per adult is the same as the household distribution. We do the same when the average household size per bracket is available[2].

The second issue concerns the cleaning of the survey micro-data. All hypotheses made and comparison between variants can be found in "CleaningMicroData.xlsx", in the directory "HouseholdSurveyData". For each country, we dismiss the observations for which the ratio between the income and the average income is greater than what is observed on average for other years and countries.

Appendix B. Income and wealth distribution series

[2] Note however that dividing by the average household size could change the order of the group, or merge some group, resulting in a loss of information. In this case, we divide each income group by the overall average household size.

Our detailed income and wealth distribution series are given in the directory **AAP2017DistributionSeries,** within the zipped directory AAP2017.zip. This directory includes our benchmark distribution series (GpinterIncome/Output) as well as alternative series, the complete computer codes and raw material publicly available (household survey tabulations and billionaire data) that we used to construct these series. For more details on the organization of these files, see ReadMeAAP2017DistributionSeries.pdf and other "ReadMe" files within each directory. The main robustness checks and variant series are presented in **AAP2017Appendix.xlsx** and are summarized on Figures B5-B17, which we briefly describe in the following.

Appendix B.1 Income distribution series

The general methodology to construct our income distribution series is summarized in the main paper (Section 3) and consists of three steps: in step 1 we use survey data and generalized Pareto interpolation techniques (Blanchet, Fournier and Piketty, 2017) to estimate survey income distributions for each country; in step 2 we use the Lebanese fiscal data to correct the top of these distributions and obtain corrected estimates of the distribution of fiscal income, by g-percentile; in step 3 we use national accounts and wealth data in order to include tax-exempt capital income (such as undistributed profits, imputed rent and other "non-fiscal income") and to obtain corrected estimates of the distribution of pre-tax national income by g-percentile. We then aggregate each country specific distribution using the merge option in the *Gpinter* interface.

In the following, we discuss a number of additional issues about variant series and robustness checks. We focus on the regional distribution. The effect of each

correction on within-country inequalities is broadly the same as in Lebanon, to a large extent by construction and details about variants on national distributions can be found in Assouad (2017).

Figures B1-B4 display the main results of the papers and the impact of the two corrections. Two facts stand out. First, the impact of the fiscal correction is larger than the one of the wealth correction. Second, both corrections do not change the trends. Furthermore, as one can see by comparing Tables A1, B3 and B4, the difference in magnitude of the fiscal correction for each country comes, first, from the initial survey inequality levels and second, from the ratio between total survey income and total national income, which can be very low by international standards for some countries (Table A1). Given that, we focus on variants on the fiscal correction when we aggregate the series.

Appendix B.1.1 Fiscal Data Correction

Regarding the fiscal-data correction, we choose in our benchmark series to apply the same average upgrade factors by g-percentile (estimated using the Lebanese fiscal data over the 2005-2014 period) to the entire 1990-2016 period. In the absence of alternative data to correct the top of the survey distributions, it seems reasonable to apply the Lebanese correction coefficients to other countries[3]. Nevertheless, it would clearly be unjustified to assume that the correction follows the same trends as Lebanon[4].

[3] An alternative way to correct the top of the survey distribution is to apply upgrades factors from other countries for which such series exist, as China or Russia. We rather assume that the countries of the region are more comparable to Lebanon (institutions in place, quality of survey data etc.). Additionally, the correction concerns country-specific survey distributions with their own trends, which make the assumption more reasonable.

[4] As discussed in Assouad, 2017, Lebanon has undergone major political instability during the 2005-2014 period, culminating in 2006 with the Israeli July war. The trends in the fiscal

Details about the Lebanese fiscal micro-files, their limits and how to combine them with survey data are provided by Assouad (2017). In particular, the fiscal micro files are based upon a "taxable income" concept (i.e. income subject to income tax, after a number of deductions allowed by tax legislation) that may be significantly smaller than "fiscal income" (defined as the sum of all income items legally subject to taxation, before any deduction) due to large deductions and exemptions. We therefore compute the fiscal correction coefficients by assuming that the ratio between taxable income and fiscal income is equal to r=80%. Figures B5-B8 display variants with r=60% and r=90% for the Middle East series and for Lebanon. The impact at the country level is greater than at the regional level[5], or in other words, the effect of the correction and the hypotheses made does not cumulate when we aggregate countries together.

Figures B9-B10 show the effect of the correction profile chosen to compute the correction coefficients (that is to link the survey data at the bottom to the fiscal data at the top of the distribution). The profile chosen does not have a large impact on income shares.

The way we estimate our upgrade factors is described in files CompCorrectionCoeffLeb.xlsx and "do_ComputationCorrCoeffAllCountries". We obtain the file CorrectionCoefficientsAllCountries.xlsx that is used to apply the correction to all countries (see do file "do_CorrectionAllCountries"). Figures B11 and B12 display the Pareto curves of the final series computed with different profiles, and figures B13 the Pareto curves of our benchmark series for selected years. Our correction leads to smooth curves comparable to what is observed in other countries.

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data may correspond to a variation in tax evasion behaviors rather than real changes in top income shares.

[5] Although it is higher in Lebanon than in other countries due to its smaller share of total survey income over national income.

Appendix B.1. 2 Missing capital income correction

As explained in the main paper (section 2.2), we proceed to a second correction accounting for the missing capital incomes. There are two steps. The first one is to estimate the amount of capital income missing. For Lebanon, they are estimated using national accounts and public finance reports and represent 20% of national income. For other countries, in absence of better data, we assume that they represent 10% of national Income, a rather conservative amount given the low ratios between total fiscal income and total national income observed (see excel file ShareNationalIncome.xlsx). The second step consists in re-allocating these amounts to estimate the distribution of total personal income. To do so, we first assume that they follow the same distribution as wealth, that we estimate using billionaires data (see Appendix B.2 below). Second, we use the family of Gumbel copulas to estimate the joint distribution of fiscal income and missing capital income.

The effect of each hypothesis made during the last step on national distributions is explained in detail for the Lebanese case in Assouad (2017). We nevertheless provide robustness check on hypothesis on the size of the billionaires' family to estimate the wealth distribution that is used to reallocate the missing capital income (see section B.2 below). As shown in Figures B14 and B15, this has a small impact on the series, smaller than the effect on each national distribution.

Finally, Figures B16 and B17 show the series according to alternative definition for the Middle East (without Turkey, without Iran or without Gulf countries). For the two first, this has no effect on our main conclusion. As the main driving force behind the extreme concentration of income in the Middle East is the differential in per adult

income between oil-rich countries and other population-rich countries, our series without Gulf countries are way below our benchmark estimates. Note that the level of inequality stays nevertheless very high with the top 1% and top 10% of the population accounting for almost 25 and 56% of total income respectively.

Appendix B.2 Wealth distribution series

Regarding the distribution of missing capital income, we assume it follows the same distribution as wealth. Wealth data are very limited in the Middle East. Unlike other countries, where we can use a combination of sources and methods, all we have in the region at this stage is billionaire data. The estimation procedure is the same for all countries and described in detail in Assouad (2017). We discuss here some issues concerning rich list data.

To construct our billionaires' data, we combine two main sources: Forbes and Arabian Business Rich Lists. With the exception of Lebanon, billionaires' wealth does not seem particularly high in the Middle East by international standards. Rich Lists nevertheless do not take into account the wealth of state rulers, which may create a bias particularly significant in the region[6]. We include additional sources on leaders' wealth (see excel file "BillionairesData.xlsx, sheets "ForbesRoyalsDictators" and "OtherSources"). The data remain however limited, as state leaders' wealth included do not cover all ruling families and are often available for limited time periods (for example, we have information on the Assad family's wealth for two years only). This leads to very variable estimates of the share of billionaires' wealth to national income, which do not display any trends. We therefore use the average share of billionaires' wealth in national income over the period to estimate the 2016 wealth distributions,

[6] Politicians' wealth is included only if the wealth comes from activities realized before coming to power.

that we adjust to the average wealth per adult in the period 1990-2016 period (see excel file BillionairesData.xlsx, sheets “Stata” and the do file do_gpinter_MEWealth).

For countries without billionaires’ data -Iran Jordan Palestine Yemen - we simply upgrade the average standardized US-France-China distribution of wealth to each country specific average wealth, estimated as described in Assouad (2017) by multiplying the national income by the average wealth/income ratio for countries with available data reported in WID.world.

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Table A1. Household surveys used in this paper (1990-2016)

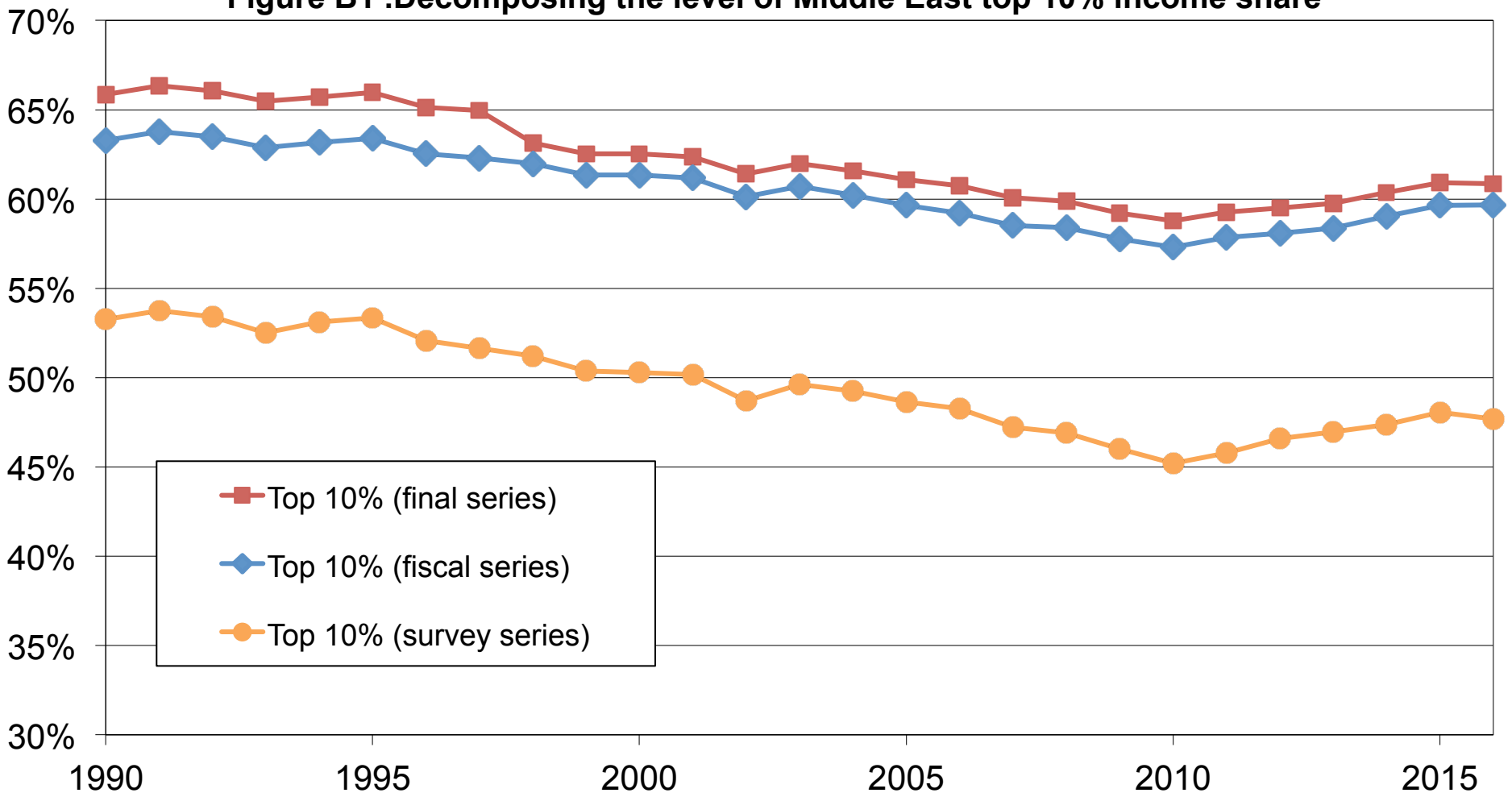
	Survey years	Average ratio (total survey income)/(total national income)	Format
Turkey	**1994, 2002-2016**	**43%**	micro-data and tabulation
Iran	**2010, 2013**	**49%**	micro-data
Egypt	**1999, 2004, 2008, 2010, 2012, 2015**	**40%**	micro-data
Iraq-Syria-Other (non-Gulf)	**1992-2013**	**53%**	
Iraq	*2007*	*60%*	micro-data
Syria	*2004*	*56%*	micro-data
Jordan	*1992, 2002, 2006, 2008, 2010, 2013*	*70%*	micro-data and tabulation
Lebanon	*2007*	*37%*	tabulation
Palestine	*1996-1998, 2004-2008, 2010-2011*	*65%*	micro-data
Yemen	*2006*	*33%*	micro-data
Gulf Countries	**1995-2013**	**30%**	
Saudi Arabia	*N/A*	*30%*	*N/A*
Oman	*2010*	*29%*	tabulation
Bahrain	*1995, 2005, 2015*	*37%*	tabulation
UAE	*1998, 2009*	*39%*	tabulation
Kuwait	*2007, 2013*	*21%*	tabulation
Qatar	*2007, 2012*	*23%*	tabulation

Table A2. Gulf-Countries Income Inequality Series: nationals vs foreigners in the survey data

Country	Year	Group	Bottom 50%	Middle 40%	Top 10%	Top 1%	Gini	P10/ average	P50/ average	P90/ average	P99/ average	Pareto b(10%)	Pareto b(50%)	Pareto b(90%)	Pareto b(99%)
Bahrain	1995	*Nationals*	24%	45%	30%	7%	39%	34%	75%	168%	487%	3.2	2.0	1.7	1.3
		Foreigners	21%	41%	38%	8%	46%	28%	70%	197%	535%	3.9	2.3	1.8	1.6
		Total	23%	43%	34%	7%	42%	29%	72%	179%	511%	3.7	2.2	1.8	1.5
	2005	*Nationals*	30%	44%	26%	6%	31%	47%	88%	159%	398%	2.3	1.6	1.6	1.5
		Foreigners	20%	44%	37%	7%	46%	34%	60%	197%	585%	3.2	2.7	1.8	1.3
		Total	23%	45%	32%	7%	40%	33%	71%	178%	503%	3.3	2.2	1.7	1.4
	2015	*Nationals*	30%	44%	26%	6%	31%	47%	88%	159%	398%	2.3	1.6	1.6	1.5
		Foreigners	20%	44%	37%	7%	46%	34%	60%	197%	585%	3.2	2.7	1.8	1.3
		Total	23%	45%	32%	7%	41%	33%	71%	180%	515%	3.3	2.2	1.7	1.3
Kuwait	2007	*Nationals*	31%	47%	23%	4%	28%	51%	83%	158%	318%	2.1	1.7	1.4	1.4
		Foreigners	31%	44%	25%	6%	29%	50%	88%	154%	387%	2.1	1.6	1.6	1.6
		Total	22%	44%	34%	7%	43%	36%	63%	202%	487%	3.0	2.5	1.6	1.4
	2013	*Nationals*	34%	45%	21%	5%	24%	58%	89%	145%	293%	1.8	1.5	1.4	1.6
		Foreigners	36%	41%	23%	5%	23%	54%	94%	134%	349%	2.0	1.4	1.6	1.5
		Total	22%	43%	35%	7%	44%	33%	56%	227%	468%	3.3	2.8	1.5	1.5
Oman	2010	*Nationals*	20%	49%	31%	6%	43%	26%	77%	199%	443%	4.2	2.1	1.5	1.3
		Foreigners	13%	44%	42%	10%	56%	16%	55%	219%	677%	7.0	3.1	1.9	1.6
		Total	17%	48%	35%	7%	50%	12%	64%	213%	519%	9.3	2.6	1.6	1.4
Qatar	2007	*Nationals*	28%	47%	25%	5%	33%	34%	79%	172%	353%	3.2	1.8	1.4	1.3
		Foreigners	22%	50%	28%	5%	41%	18%	81%	196%	374%	6.1	1.9	1.4	1.3
		Total	20%	48%	31%	6%	45%	25%	71%	198%	460%	4.4	2.2	1.5	1.4
	2012	*Nationals*	28%	47%	24%	4%	32%	40%	86%	170%	327%	2.7	1.7	1.4	1.2
		Foreigners	27%	47%	26%	4%	34%	36%	82%	175%	338%	3.0	1.8	1.4	1.3
		Total	23%	44%	33%	7%	41%	31%	73%	181%	522%	3.5	2.1	1.7	1.4
UAE	1998	*Nationals*	27%	47%	26%	5%	34%	37%	86%	164%	376%	2.9	1.7	1.5	1.4
		Foreigners	20%	43%	37%	8%	46%	28%	64%	199%	554%	3.9	2.5	1.8	1.4
		Total	19%	46%	35%	7%	46%	26%	63%	209%	521%	4.2	2.5	1.6	1.4
	2009	*Nationals*	20%	52%	27%	4%	42%	28%	68%	215%	332%	3.9	2.3	1.3	1.1
		Foreigners	18%	45%	37%	5%	48%	34%	55%	234%	493%	3.2	3.0	1.5	1.1
		Total	17%	45%	38%	6%	50%	30%	53%	233%	497%	3.6	3.1	1.6	1.3

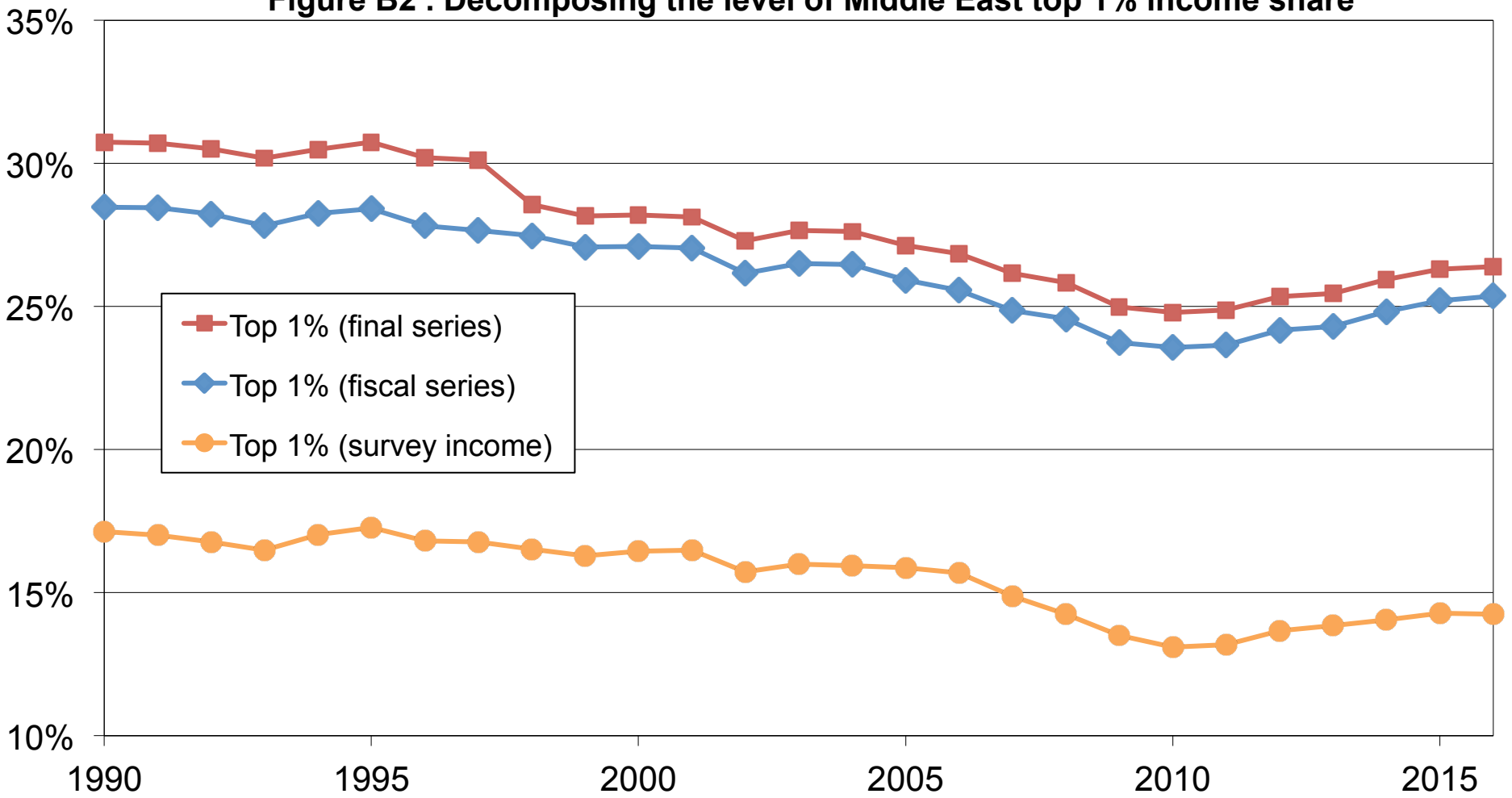
Source: Authors' computations using survey data.

Figure B1 .Decomposing the level of Middle East top 10% income share



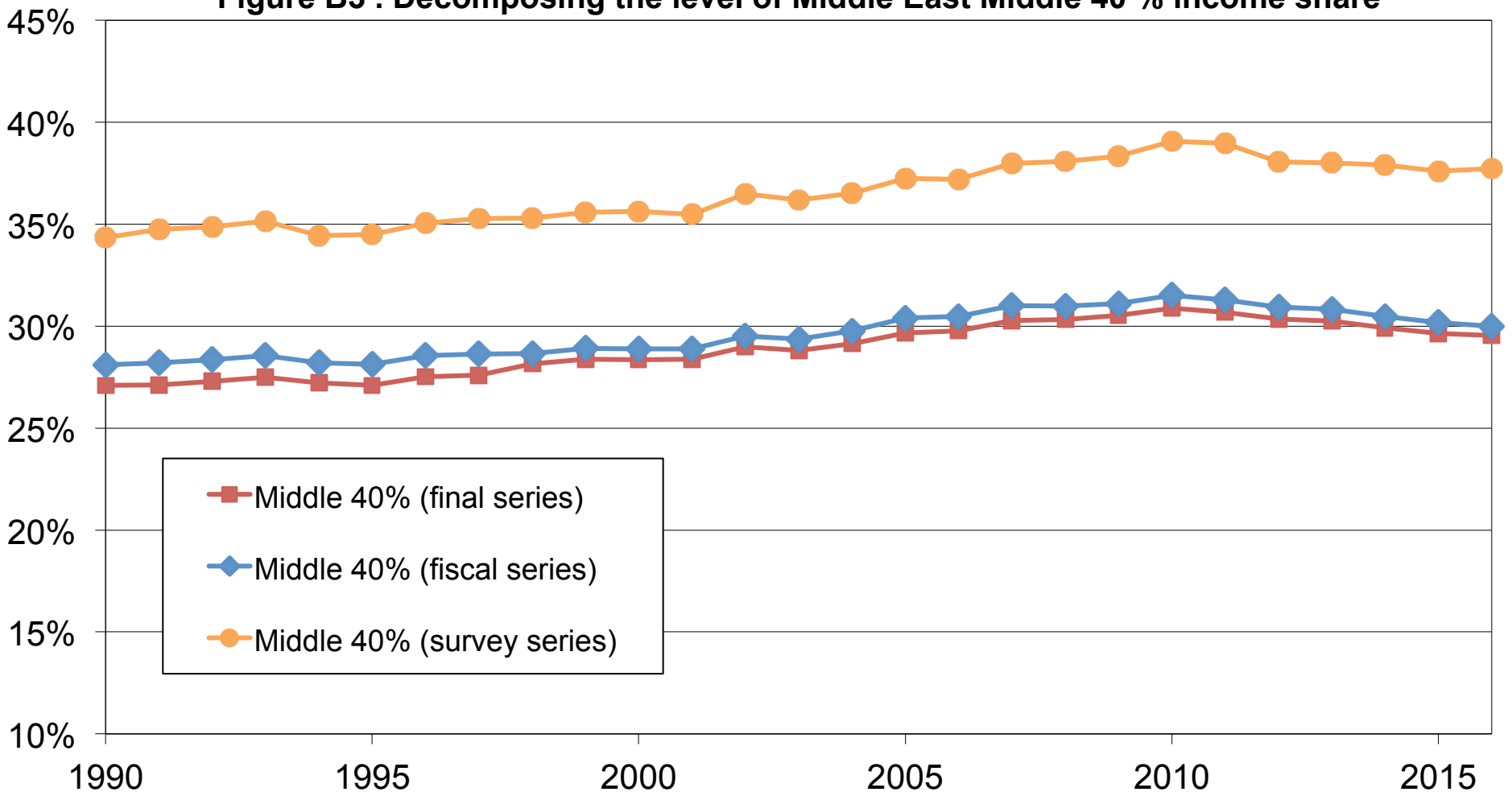
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-plit adults aged 20 and more (income of households divided equally among adult members). National income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (but anchors national distributions to per adult national income). Series in market exchange rate.

Figure B2 . Decomposing the level of Middle East top 1% income share



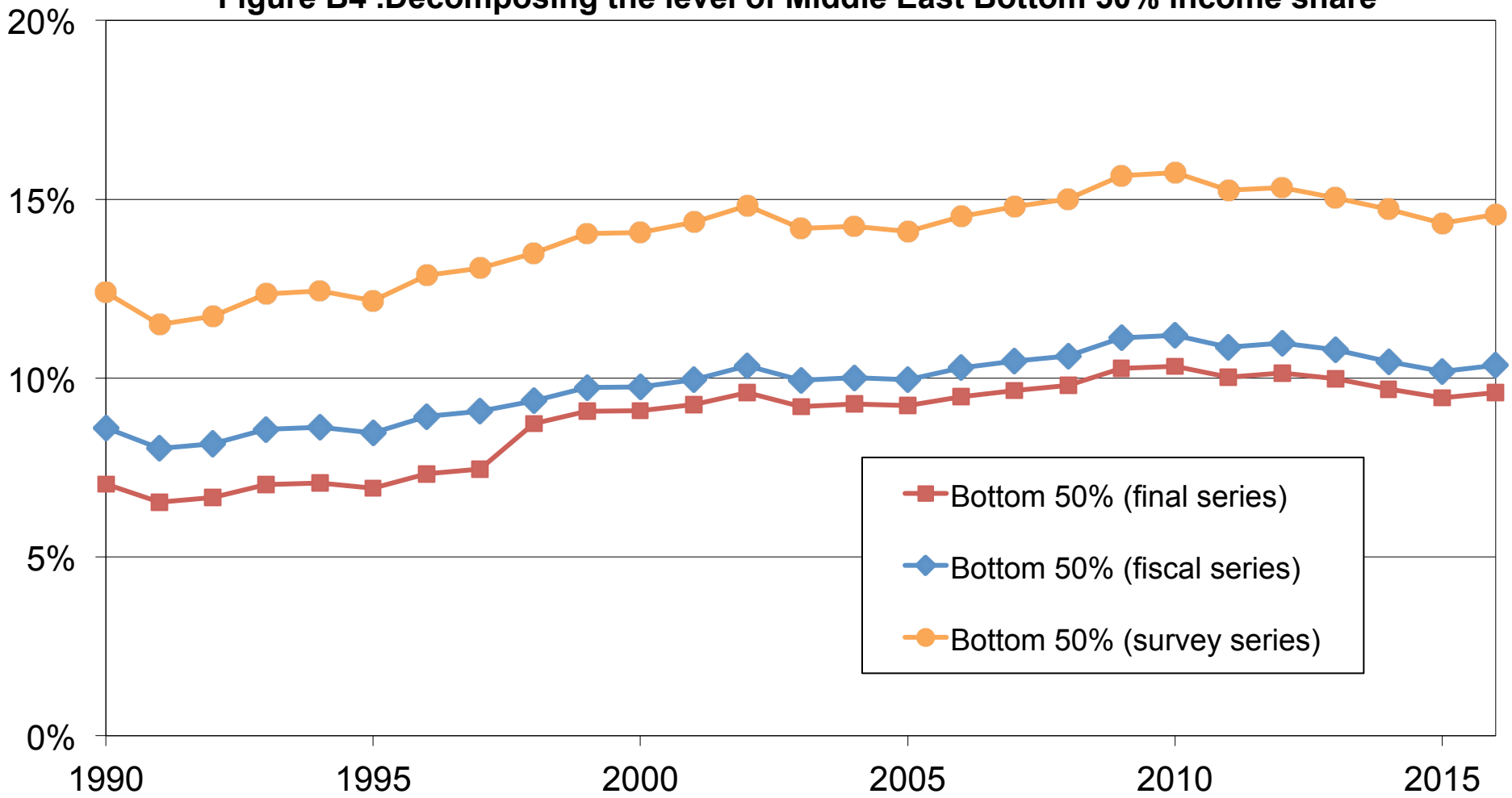
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-plit adults (income of households divided equally among adult members). National income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (but anchors national distributions to per adult national income). Series in market exchange rate.

Figure B3 . Decomposing the level of Middle East Middle 40 % income share



Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-plit adults (income of households divided equally among adult members). National income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (but anchors national distributions to per adult national income).Series in market exchange rate.

Figure B4 .Decomposing the level of Middle East Bottom 50% income share



Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-plit adults (income of households divided equally among adult members). National income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (but anchors national distributions to per adult national income).Series in market exchange rate.

Table B3. Country-Level Income Inequality Series: Income Shares and Other Indicators for the Survey Distribution

Country	Year	Bottom 50%	Middle 40%	Top 10%	Top 1%	Gini	P10/ average	P50/ average	P90/ average	P99/ average	Pareto b(10%)	Pareto b(50%)	Pareto b(90%)	Pareto b(99%)
Bahrain	1995	23%	43%	34%	7%	42%	29%	72%	179%	511%	3.7	2.2	1.8	1.5
	2005	23%	45%	32%	7%	40%	33%	71%	178%	503%	3.3	2.2	1.7	1.4
	2015	23%	45%	32%	7%	41%	33%	71%	180%	515%	3.3	2.2	1.7	1.3
Egypt	1999	26%	43%	30%	8%	36%	41%	76%	163%	481%	2.6	1.9	1.8	1.6
	2004	27%	44%	28%	7%	35%	41%	78%	164%	448%	2.6	1.9	1.7	1.5
	2008	28%	44%	27%	7%	33%	44%	80%	162%	425%	2.4	1.8	1.6	1.6
	2010	29%	45%	26%	6%	31%	45%	83%	161%	400%	2.4	1.7	1.5	1.5
	2012	29%	45%	25%	6%	31%	45%	83%	160%	373%	2.4	1.7	1.5	1.5
	2015	29%	44%	27%	7%	33%	44%	81%	157%	432%	2.4	1.8	1.7	1.7
Iran	2010	22%	47%	31%	7%	41%	27%	76%	183%	458%	4.0	2.0	1.6	1.5
	2013	25%	46%	29%	6%	37%	34%	79%	176%	431%	3.2	1.9	1.6	1.4
Iraq	2007	24%	44%	32%	10%	40%	32%	76%	168%	511%	3.3	2.0	1.8	1.9
Jordan	1992	24%	45%	31%	9%	40%	32%	75%	172%	478%	3.4	2.0	1.7	1.8
	2002	26%	47%	27%	6%	35%	37%	80%	174%	378%	2.9	1.9	1.5	1.5
	2006	26%	47%	28%	6%	36%	35%	81%	180%	392%	3.1	1.8	1.5	1.4
	2008	27%	46%	28%	6%	35%	39%	81%	172%	396%	2.8	1.8	1.6	1.4
	2010	26%	43%	31%	9%	37%	36%	78%	158%	498%	3.0	1.9	1.9	1.9
	2013	26%	46%	28%	6%	36%	35%	81%	175%	401%	3.1	1.8	1.5	1.5
Kuwait	2007	22%	44%	34%	7%	43%	36%	63%	202%	487%	3.0	2.5	1.6	1.4
	2013	22%	43%	35%	7%	44%	32%	55%	226%	467%	3.3	2.8	1.5	1.5
Lebanon	2005	20%	46%	33%	8%	45%	27%	72%	196%	486%	4.1	2.2	1.6	1.7
	2007	20%	47%	33%	8%	46%	23%	70%	203%	499%	4.7	2.3	1.6	1.6
Oman	2010	17%	48%	35%	7%	50%	12%	64%	213%	519%	9.3	2.6	1.6	1.4
Palestine	1996	22%	49%	29%	5%	41%	26%	77%	197%	400%	4.2	2.0	1.4	1.3
	1997	22%	49%	29%	5%	41%	26%	77%	197%	400%	4.2	2.0	1.4	1.3
	1998	22%	49%	29%	5%	41%	26%	77%	197%	400%	4.2	2.0	1.4	1.3
	2004	21%	48%	30%	6%	42%	24%	77%	188%	439%	4.5	2.0	1.5	1.3
	2005	20%	49%	31%	6%	44%	23%	74%	204%	438%	4.8	2.1	1.5	1.4
	2006	21%	48%	31%	6%	43%	24%	74%	192%	444%	4.6	2.2	1.6	1.3
	2007	19%	48%	33%	7%	46%	21%	70%	203%	479%	5.2	2.3	1.6	1.4
	2008	20%	49%	31%	6%	44%	24%	72%	198%	434%	4.6	2.2	1.5	1.3
	2010	20%	48%	33%	7%	45%	22%	71%	200%	475%	4.9	2.3	1.6	1.4
	2011	20%	48%	31%	6%	44%	23%	73%	199%	439%	4.7	2.2	1.5	1.4
Qatar	2007	20%	48%	31%	6%	45%	25%	71%	198%	460%	4.4	2.2	1.5	1.4
	2012	23%	44%	33%	7%	41%	31%	73%	181%	522%	3.5	2.1	1.7	1.4
SaudiArabia	2008	20%	46%	34%	7%	45%	27%	65%	205%	490%	4.1	2.5	1.6	1.4
Syria	2004	21%	49%	30%	5%	42%	25%	75%	200%	343%	4.3	2.1	1.4	1.5
Turkey	1994	21%	44%	34%	9%	44%	28%	70%	180%	559%	3.9	2.2	1.8	1.6
	2002	22%	43%	35%	10%	43%	29%	70%	177%	584%	3.7	2.2	1.9	1.6
	2003	23%	44%	34%	9%	42%	30%	71%	174%	576%	3.6	2.2	1.9	1.6
	2004	23%	45%	32%	9%	41%	29%	74%	177%	496%	3.7	2.1	1.7	1.8
	2005	24%	46%	30%	7%	40%	30%	78%	177%	467%	3.6	2.0	1.6	1.5
	2006	25%	46%	29%	7%	38%	33%	78%	174%	458%	3.3	1.9	1.6	1.5
	2007	25%	46%	29%	6%	37%	33%	80%	173%	425%	3.3	1.9	1.6	1.5
	2008	25%	46%	30%	7%	38%	33%	79%	171%	434%	3.3	1.9	1.7	1.6
	2009	24%	45%	31%	8%	40%	31%	76%	172%	523%	3.5	2.0	1.7	1.5
	2010	25%	45%	30%	8%	39%	33%	77%	172%	472%	3.3	2.0	1.7	1.7
	2011	24%	45%	31%	8%	39%	33%	76%	174%	486%	3.3	2.0	1.7	1.6
	2012	25%	45%	31%	8%	39%	34%	76%	173%	459%	3.2	2.0	1.7	1.7
	2013	25%	44%	30%	7%	38%	36%	77%	168%	446%	3.0	2.0	1.7	1.7
	2014	24%	45%	31%	9%	40%	34%	77%	168%	478%	3.3	2.0	1.8	1.8
	2015	23%	45%	32%	9%	40%	33%	76%	168%	489%	3.3	2.0	1.8	1.8
	2016	23%	44%	33%	10%	41%	33%	75%	164%	507%	3.3	2.1	1.9	2.0
UAE	1998	19%	46%	35%	7%	46%	26%	63%	209%	521%	4.2	2.5	1.6	1.4
	2009	17%	45%	38%	6%	50%	30%	53%	233%	497%	3.6	3.1	1.6	1.3
Yemen	2006	21%	49%	30%	5%	42%	25%	76%	203%	349%	4.4	2.1	1.4	1.5

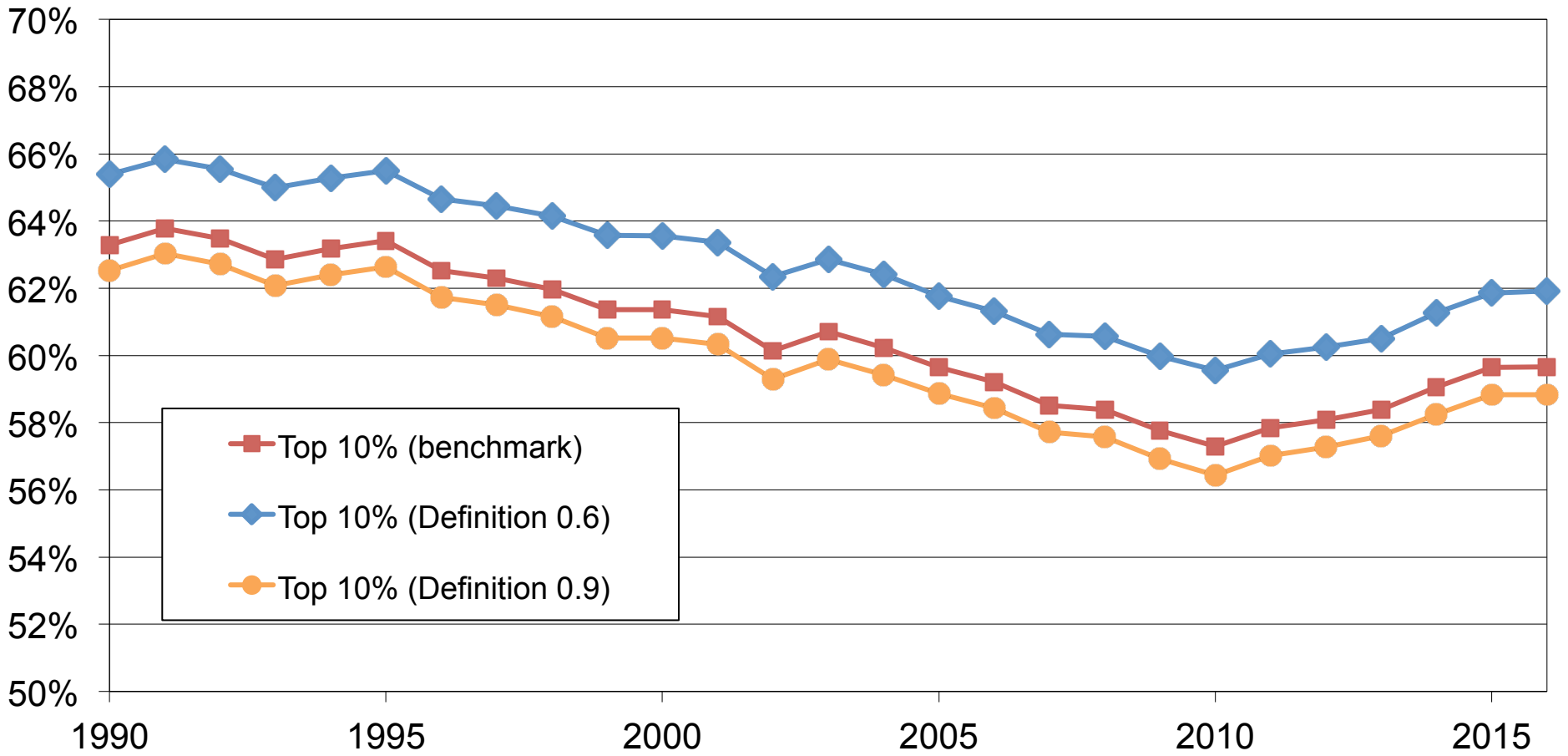
Distribution of survey income (before taxes and transfers, except pensions and unempl. insurance) among adults, combining only survey and national income data.

Table B4. Country-Level Income Inequality Series: Income Shares and Other Indicators for the Fiscal Distribution

Country	Year	Bottom 50%	Middle 40%	Top 10%	Top 1%	Gini	P10/ average	P50/ average	P90/ average	P99/ average	Pareto b(10%)	Pareto b(50%)	Pareto b(90%)	Pareto b(99%)
Bahrain	1995	15%	32%	53%	17%	59%	20%	49%	176%	807%	5.5	3.5	2.8	2.1
	2005	16%	34%	50%	16%	56%	23%	50%	178%	813%	4.7	3.4	2.7	1.9
	2015	16%	33%	51%	16%	57%	23%	49%	180%	827%	4.8	3.4	2.7	1.9
Egypt	1999	19%	32%	49%	18%	53%	28%	53%	165%	782%	3.8	3.1	2.8	2.3
	2004	19%	34%	47%	16%	51%	29%	56%	169%	743%	3.7	2.9	2.6	2.2
	2008	20%	34%	46%	16%	50%	32%	57%	167%	710%	3.4	2.8	2.6	2.3
	2010	21%	35%	43%	14%	48%	33%	61%	170%	676%	3.3	2.6	2.4	2.1
	2012	22%	36%	43%	14%	47%	33%	61%	171%	639%	3.3	2.5	2.4	2.2
	2015	21%	34%	46%	17%	50%	31%	58%	162%	719%	3.4	2.7	2.7	2.4
Iran	2010	16%	35%	49%	16%	57%	19%	53%	185%	744%	5.8	3.2	2.5	2.2
	2013	18%	35%	47%	15%	53%	24%	56%	181%	716%	4.5	2.9	2.4	2.1
Iraq	2007	16%	32%	52%	21%	58%	22%	51%	164%	804%	5.0	3.3	3.0	2.7
Jordan	1992	16%	33%	51%	20%	57%	22%	52%	171%	762%	5.0	3.3	2.8	2.6
	2002	19%	36%	45%	13%	51%	27%	58%	183%	640%	4.0	2.8	2.3	2.1
	2006	19%	36%	45%	14%	52%	25%	59%	188%	661%	4.3	2.8	2.3	2.0
	2008	19%	35%	45%	14%	51%	28%	58%	180%	667%	3.9	2.8	2.4	2.1
	2010	18%	32%	50%	21%	55%	24%	54%	156%	795%	4.5	3.1	3.0	2.7
	2013	19%	36%	46%	14%	52%	25%	59%	182%	673%	4.3	2.8	2.4	2.1
Kuwait	2007	15%	32%	52%	16%	59%	25%	43%	200%	775%	4.4	3.9	2.5	2.0
	2013	15%	32%	53%	16%	60%	22%	38%	221%	739%	4.9	4.5	2.3	2.1
Lebanon	2005	16%	37%	47%	16%	56%	21%	55%	192%	676%	5.3	3.0	2.3	2.4
	2006	16%	38%	46%	16%	55%	21%	56%	192%	662%	5.2	3.0	2.3	2.4
	2007	13%	34%	52%	18%	61%	16%	48%	198%	785%	7.0	3.7	2.5	2.3
	2008	13%	34%	53%	19%	62%	16%	47%	198%	801%	7.1	3.7	2.5	2.3
	2009	13%	34%	52%	18%	61%	16%	48%	199%	799%	7.0	3.7	2.5	2.2
	2010	13%	34%	53%	18%	62%	16%	47%	200%	814%	7.1	3.7	2.5	2.2
	2011	13%	34%	53%	18%	62%	15%	46%	199%	817%	7.2	3.8	2.5	2.2
	2012	13%	33%	54%	18%	62%	15%	45%	200%	831%	7.3	3.8	2.6	2.2
	2013	13%	33%	54%	18%	62%	15%	45%	200%	832%	7.3	3.9	2.6	2.2
	2014	13%	34%	53%	18%	62%	15%	46%	199%	813%	7.2	3.8	2.5	2.3
Oman	2010	11%	35%	53%	16%	64%	8%	43%	208%	815%	13.8	4.1	2.4	2.0
Palestine	1996	16%	38%	47%	12%	55%	19%	56%	205%	669%	5.8	3.0	2.2	1.8
	1997	16%	38%	47%	12%	55%	19%	56%	205%	669%	5.8	3.0	2.2	1.8
	1998	16%	38%	47%	12%	55%	19%	56%	205%	669%	5.8	3.0	2.2	1.8
	2004	15%	37%	48%	13%	56%	17%	55%	193%	726%	6.4	3.1	2.3	1.8
	2005	14%	37%	49%	14%	58%	16%	52%	207%	717%	6.9	3.3	2.2	2.0
	2006	15%	37%	49%	13%	58%	17%	52%	195%	728%	6.5	3.3	2.4	1.8
	2007	13%	35%	51%	15%	60%	15%	49%	201%	767%	7.5	3.6	2.4	2.0
	2008	14%	37%	49%	13%	58%	17%	51%	201%	713%	6.6	3.4	2.3	1.8
	2010	14%	35%	51%	16%	60%	15%	49%	199%	761%	7.1	3.5	2.4	2.1
	2011	14%	36%	49%	14%	58%	16%	51%	201%	716%	6.8	3.4	2.3	2.0
Qatar	2007	14%	36%	49%	15%	59%	18%	50%	200%	749%	6.2	3.4	2.3	2.0
	2012	16%	33%	51%	17%	57%	21%	50%	180%	835%	5.1	3.4	2.7	2.0
SaudiArabia	2008	14%	34%	52%	15%	60%	18%	45%	202%	781%	5.9	3.9	2.4	2.0
Syria	2004	15%	38%	47%	12%	56%	18%	54%	207%	573%	6.0	3.1	2.1	2.1
Turkey	1994	14%	32%	54%	20%	60%	19%	47%	173%	869%	5.9	3.7	2.9	2.4
	2002	15%	31%	54%	21%	60%	19%	47%	170%	902%	5.7	3.6	3.0	2.4
	2003	15%	31%	54%	21%	59%	20%	48%	168%	897%	5.4	3.5	3.0	2.3
	2004	16%	33%	52%	20%	58%	20%	50%	174%	785%	5.5	3.3	2.8	2.5
	2005	17%	35%	49%	17%	56%	21%	55%	179%	760%	5.2	3.1	2.6	2.2
	2006	18%	35%	48%	16%	54%	23%	56%	178%	756%	4.7	3.0	2.5	2.1
	2007	18%	35%	47%	15%	53%	24%	57%	179%	707%	4.6	2.9	2.5	2.1
	2008	18%	34%	48%	16%	54%	23%	56%	174%	712%	4.8	3.0	2.6	2.3
	2009	17%	34%	50%	18%	56%	22%	53%	172%	842%	5.0	3.2	2.7	2.1
	2010	17%	33%	49%	18%	55%	23%	54%	173%	763%	4.7	3.1	2.7	2.4
	2011	17%	33%	50%	18%	56%	23%	53%	174%	785%	4.8	3.2	2.7	2.2
	2012	17%	33%	50%	18%	56%	24%	53%	174%	741%	4.6	3.1	2.7	2.5
	2013	18%	33%	49%	17%	55%	25%	54%	170%	725%	4.4	3.1	2.7	2.4
	2014	16%	33%	50%	20%	56%	23%	53%	167%	764%	4.7	3.2	2.8	2.6
	2015	16%	33%	51%	20%	57%	23%	52%	165%	776%	4.8	3.2	2.9	2.6
	2016	16%	32%	53%	23%	58%	22%	50%	159%	792%	4.9	3.4	3.1	2.8
UAE	1998	13%	34%	53%	17%	61%	17%	43%	204%	818%	6.3	4.0	2.5	2.0
	2009	11%	33%	56%	14%	64%	20%	35%	224%	773%	5.5	5.0	2.3	1.9
Yemen	2006	15%	38%	47%	13%	56%	18%	54%	210%	581%	6.2	3.1	2.1	2.2

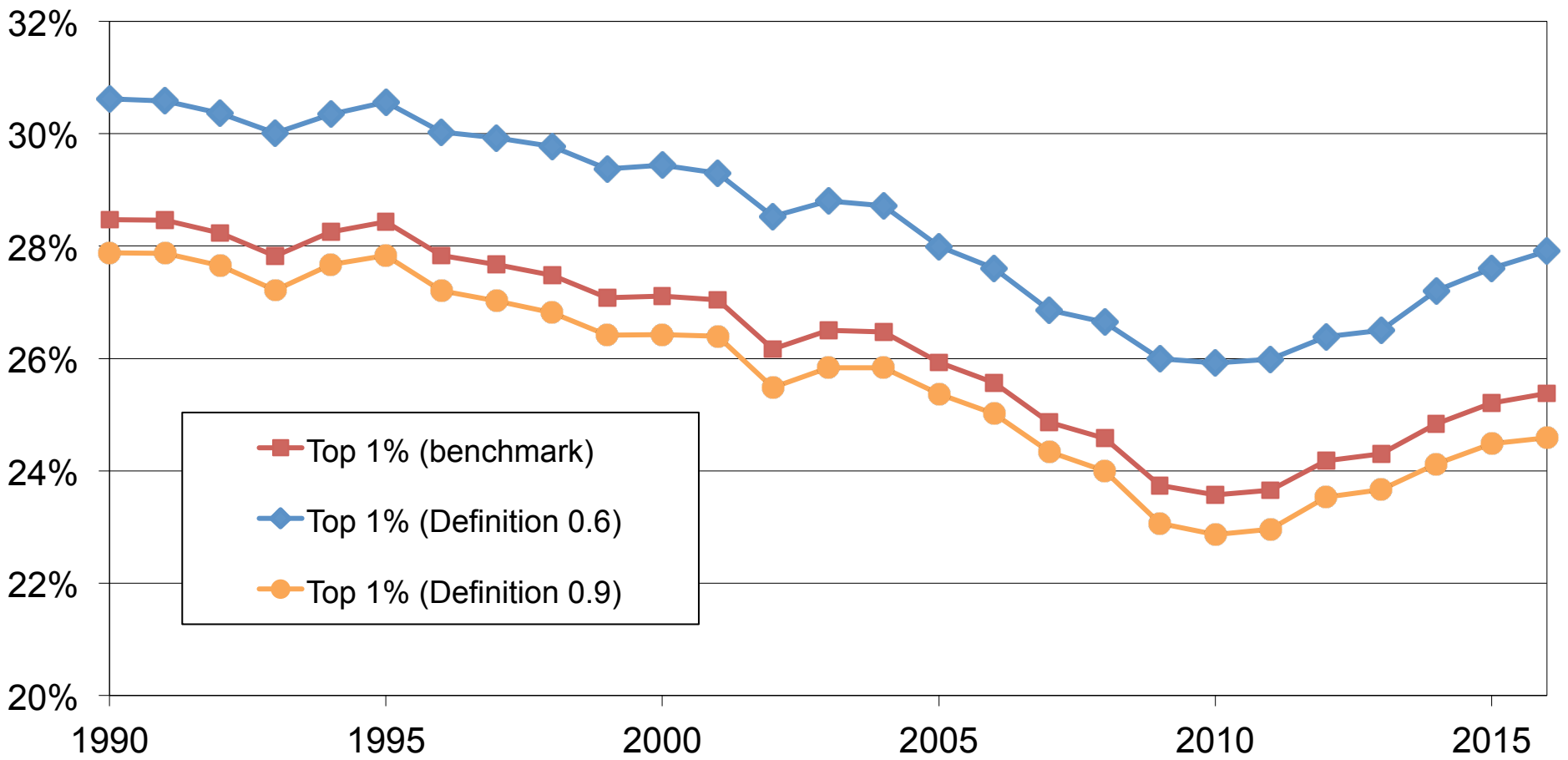
Distribution of fiscal income (before taxes and transfers, except pensions and unempl. insurance) among adults. Fiscal series combine survey, fiscal and national income data.

Figure B5 . Top 10% income share in the Middle East, 1990-2016: impact of the tax correction (1)



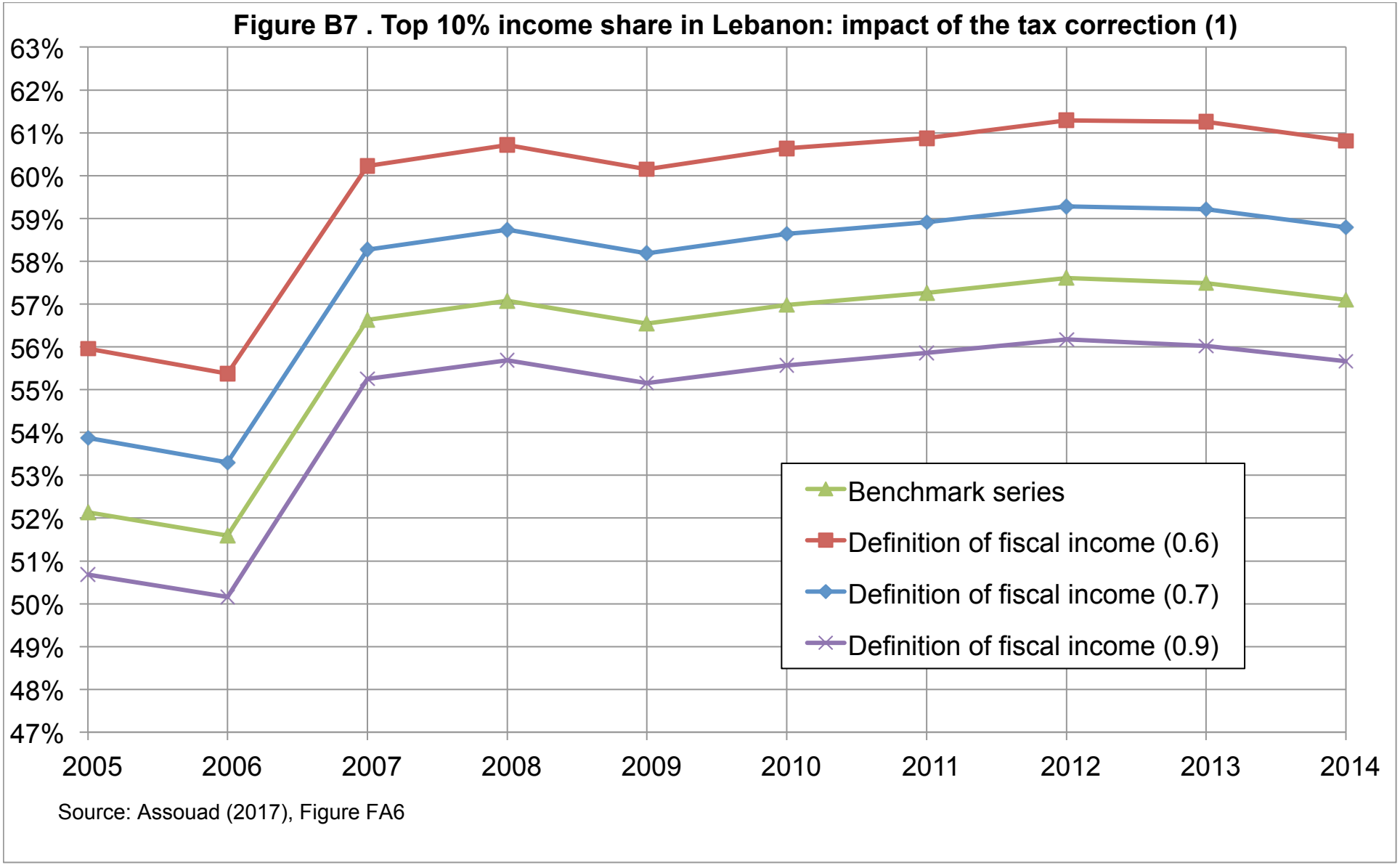
Distribution of fiscal income estimates (fiscal series combine survey and income tax data but do not use wealth data to allocate tax-exempt capital income), series in market exchange rate. The variants is on the definition of fiscal income (assuming that the taxable income the micro-files equals 60, 80 and 90% of fiscal income - 80% is the benchmark assumption).

Figure B6 . Top 1% income share in the Middle East, 1990-2016: impact of the tax correction (1)



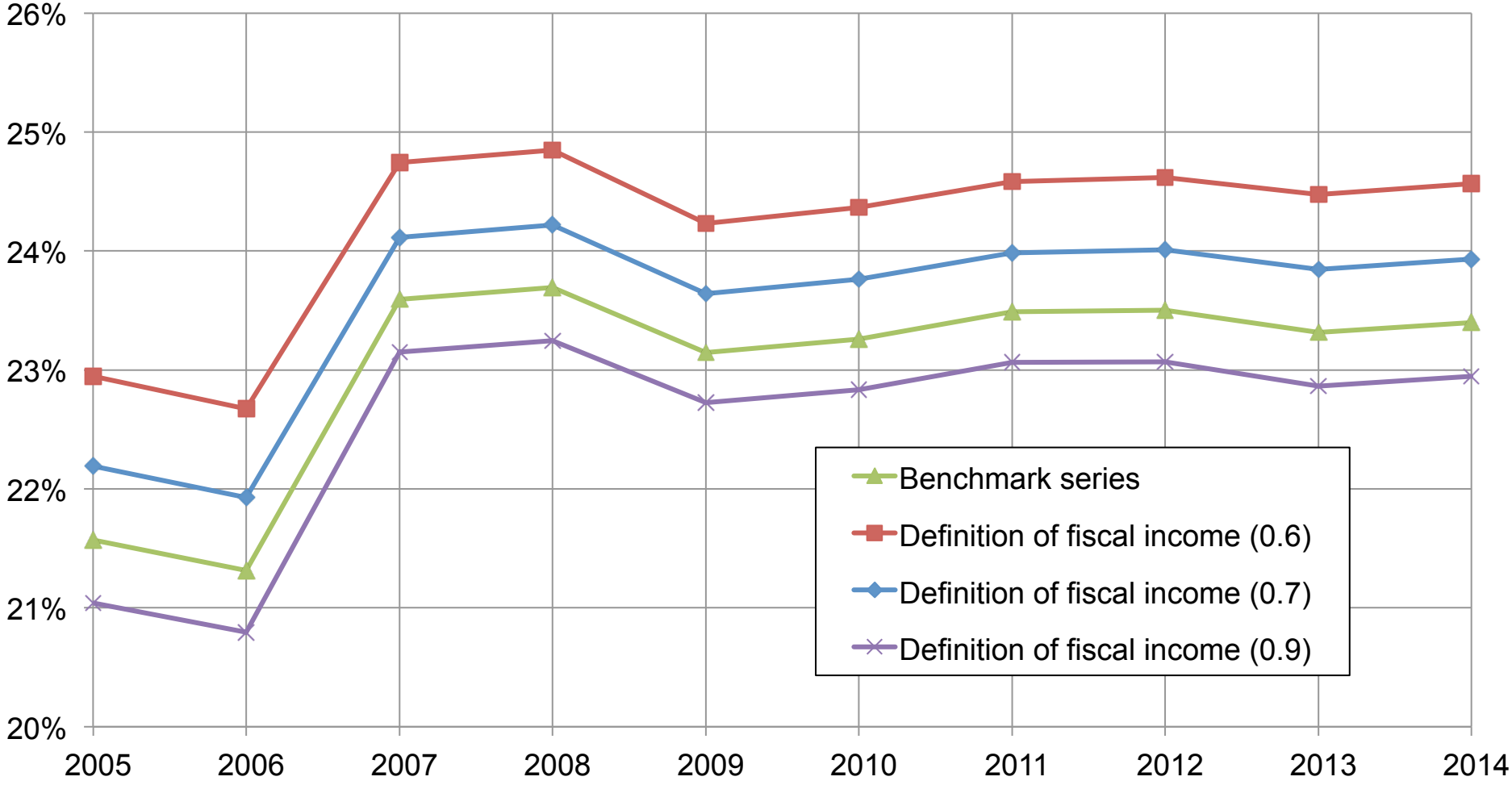
Distribution of fiscal income estimates (fiscal series combine survey and income tax data but do not use wealth data to allocate tax-exempt capital income), series in market exchange rate. The variants is on the definition of fiscal income (assuming that the taxable income the micro-files equals 60, 80 and 90% of fiscal income - 80% is the benchmark assumption).

Figure B7 . Top 10% income share in Lebanon: impact of the tax correction (1)



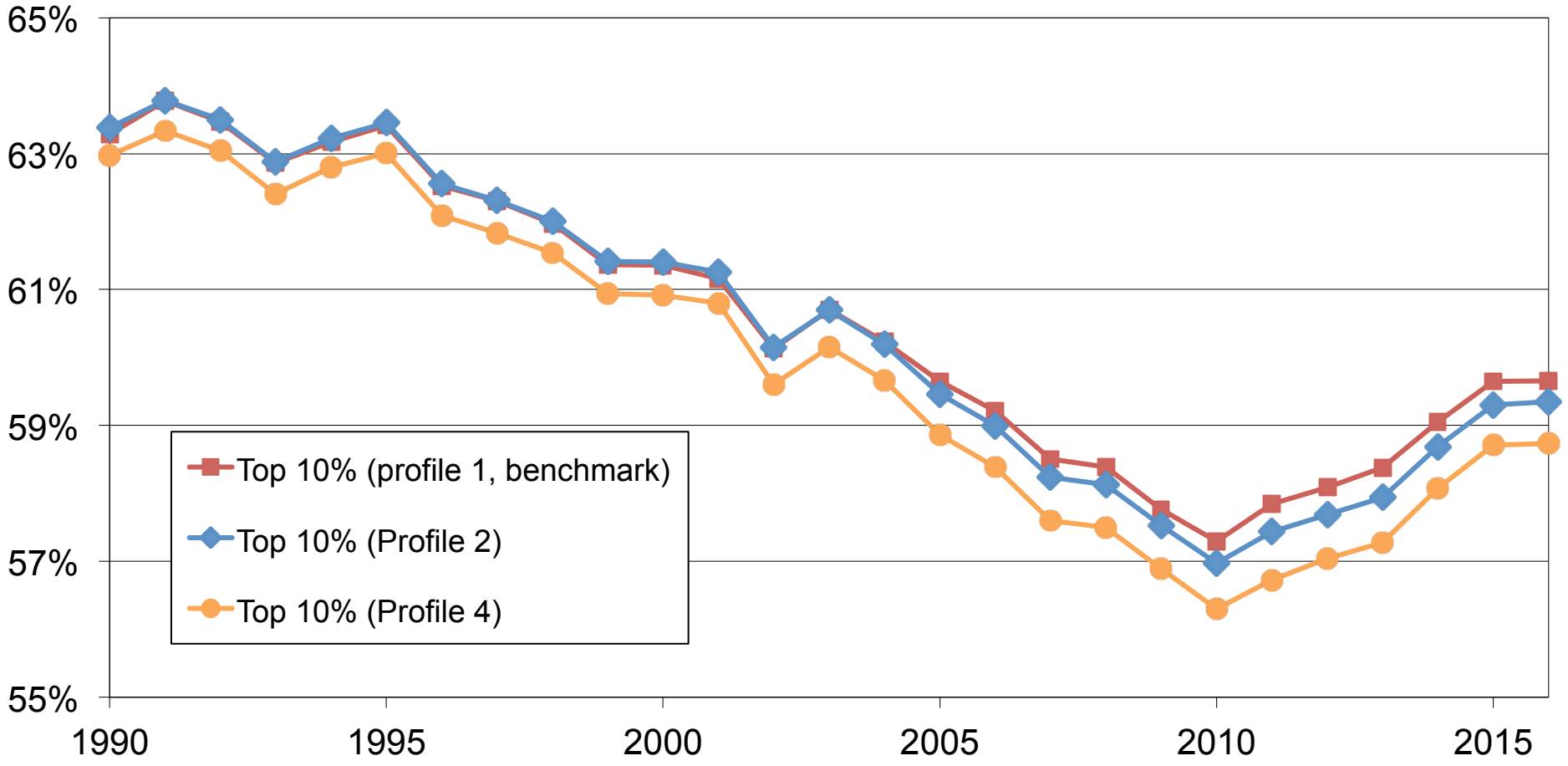
Source: Assouad (2017), Figure FA6

Figure B8 . Top 1% income share in Lebanon: impact of the tax correction (1)



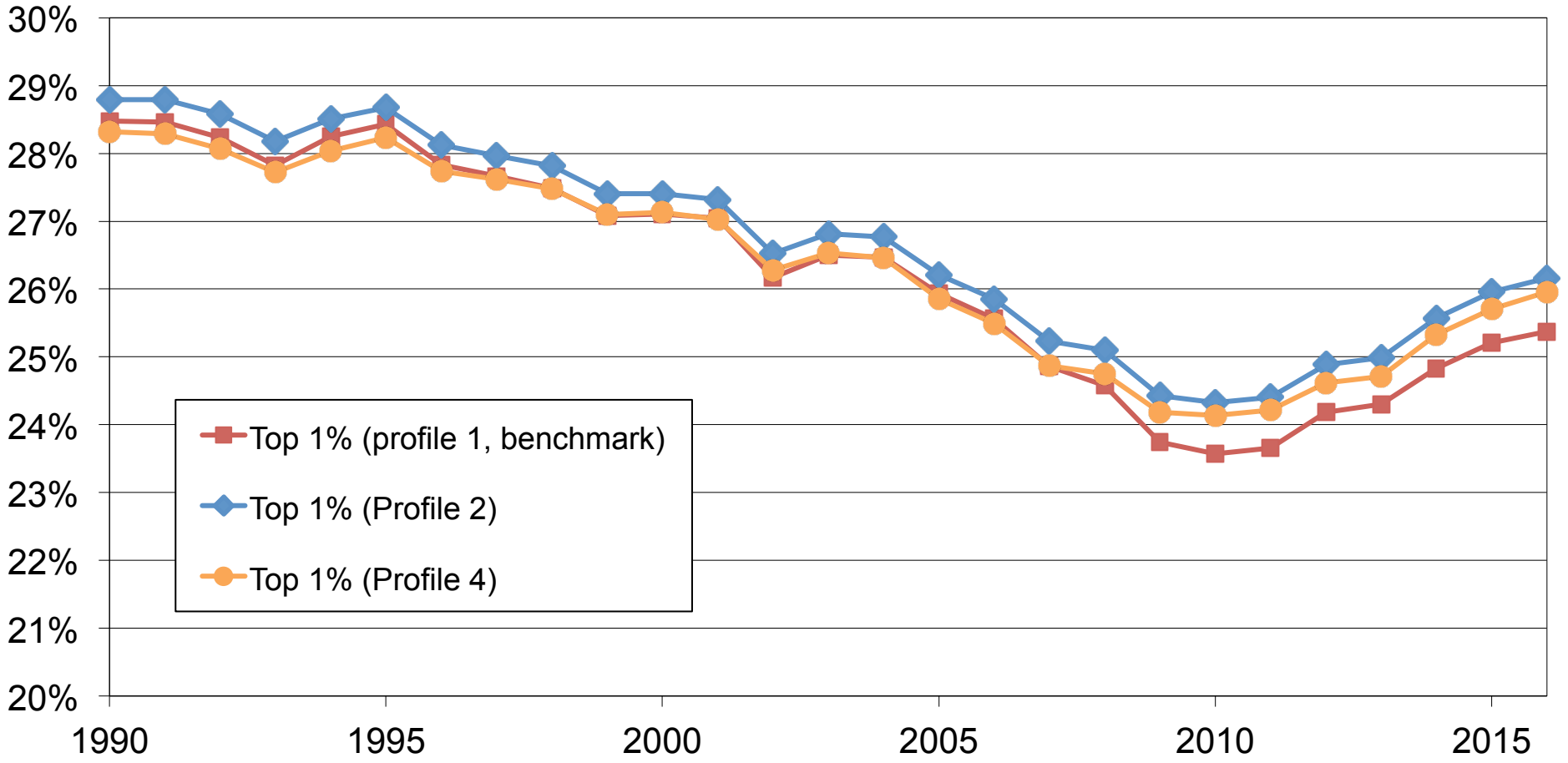
Sources: Assouad (2017), Figure FA7

Figure B9 . Top 10% income share in the Middle East, 1990-2016: impact of the tax correction (2)



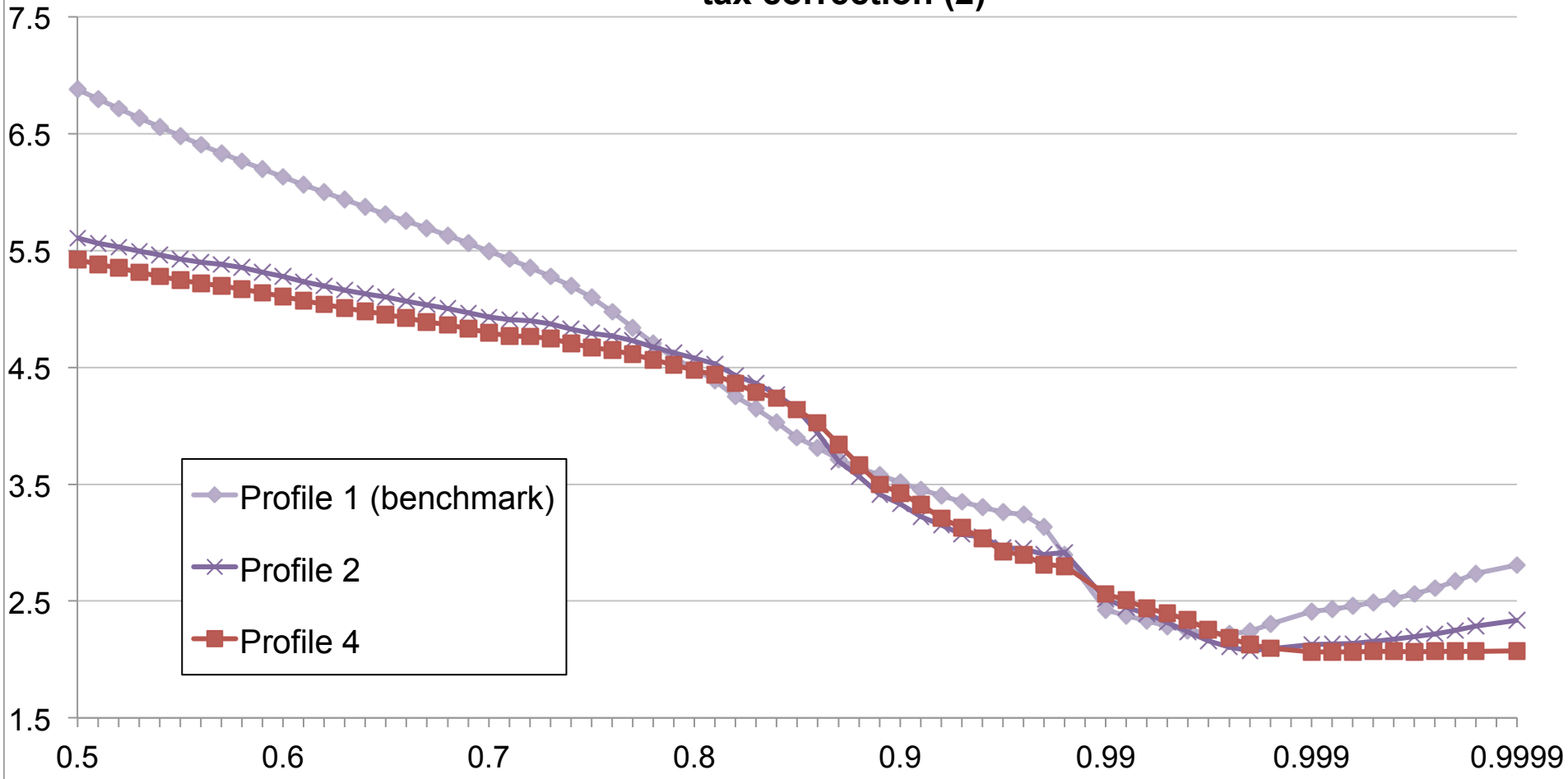
Distribution of fiscal income estimates (fiscal series combine survey and income tax data but do not use wealth data to allocate tax-exempt capital income). Series in market exchange rates. The variant is on the profile of correction chosen to link the survey and the fiscal data.

Figure B10 . Top 10% income share in the Middle East, 1990-2016: impact of tax correction (2)



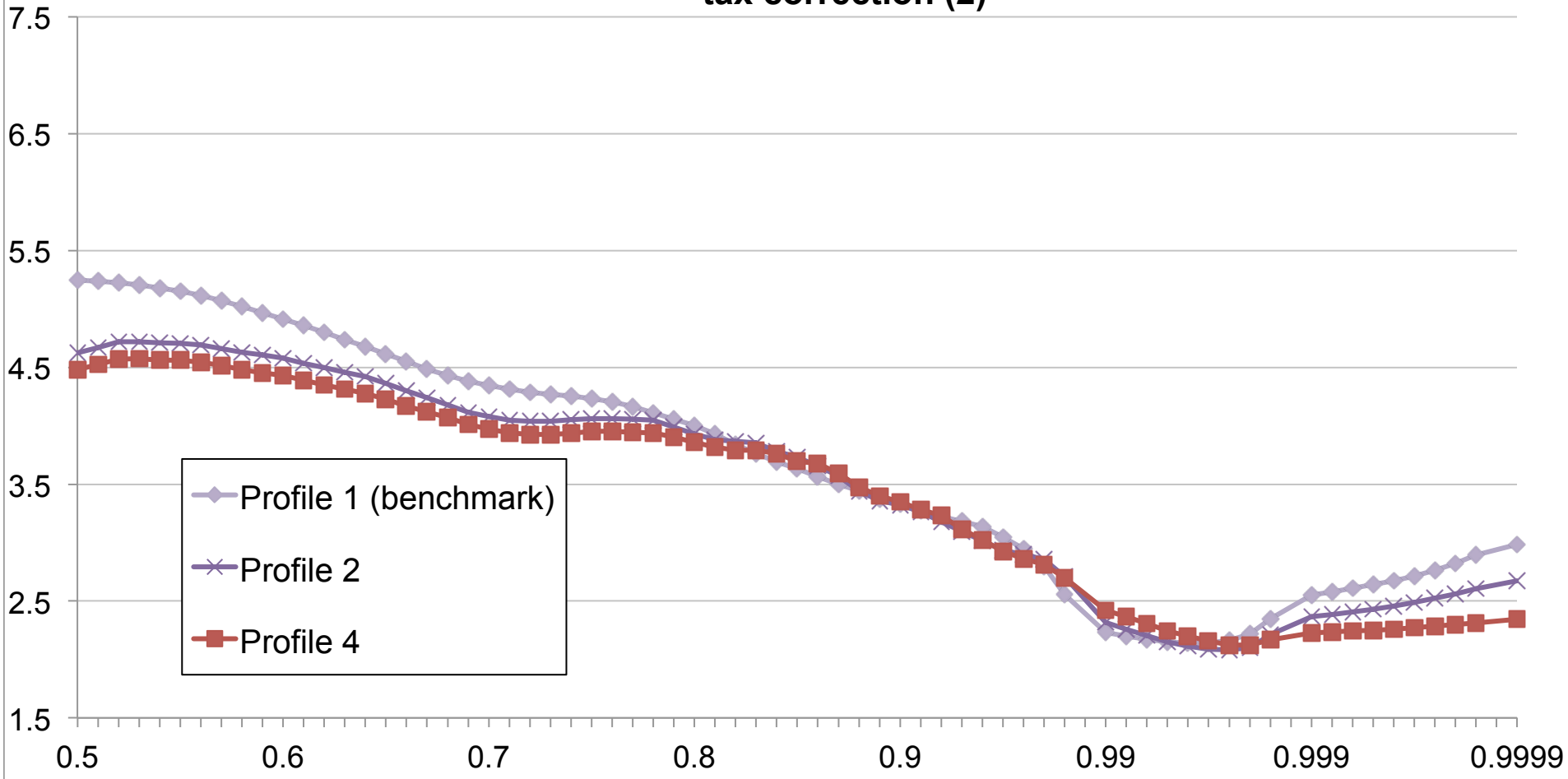
Distribution of fiscal income estimates (fiscal series combine survey and income tax data but do not use wealth data to allocate tax-exempt capital income), series in market exchange rate. The variant is on the profile of correction chosen to link the survey and the fiscal data.

Figure B11 . Pareto coefficients curves in the Middle East, 1990: impact of tax correction (2)



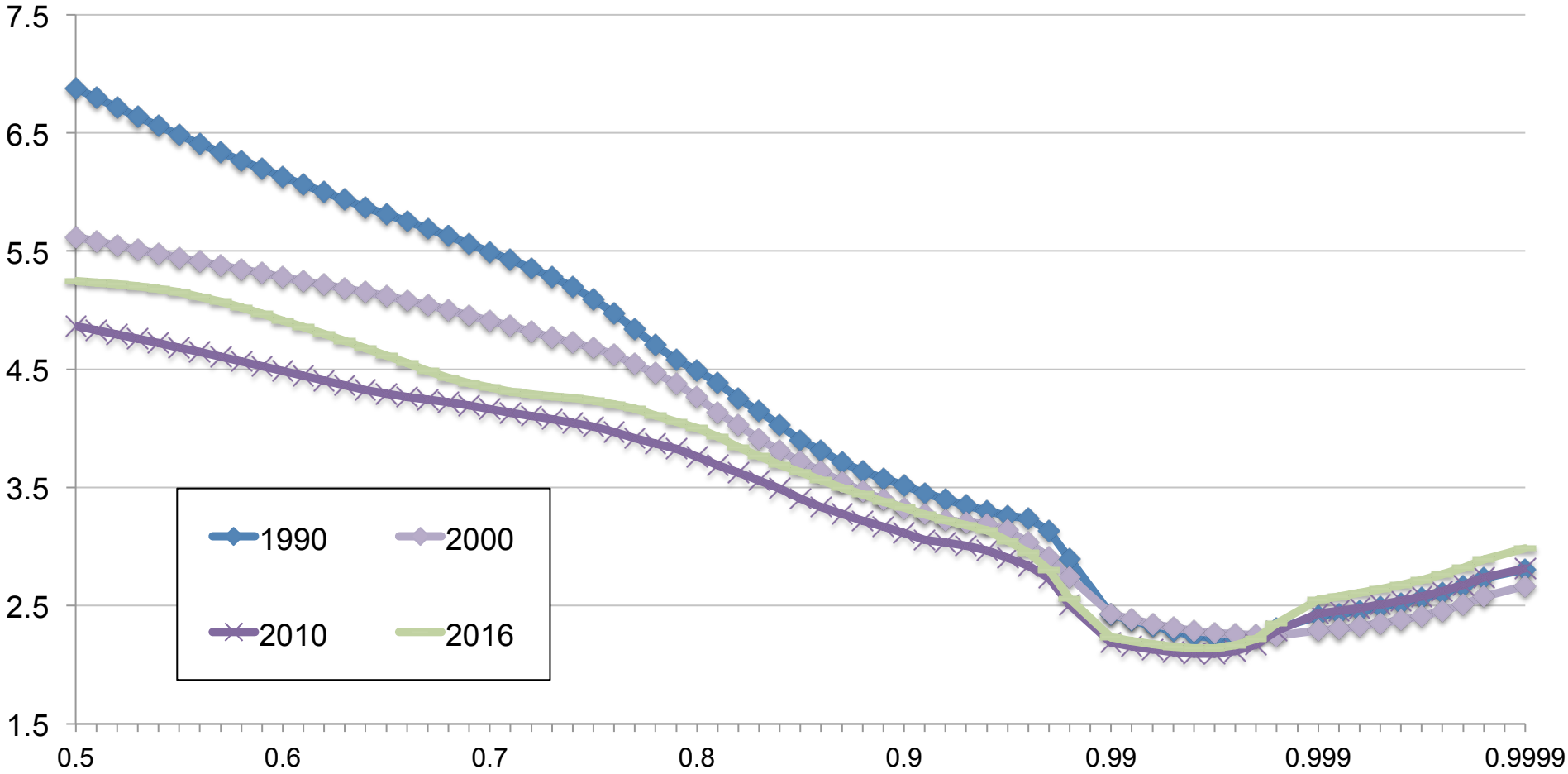
Distribution of fiscal income income among equals-plit adults (household income divided by the number of adults in the household for the bottom of the distribution). Fiscal income estimates combine surve and fiscal data, normalized to the total average income per adult (from WID.world).

Figure B12 . Pareto coefficients curves in the Middle East, 2016: impact of tax correction (2)



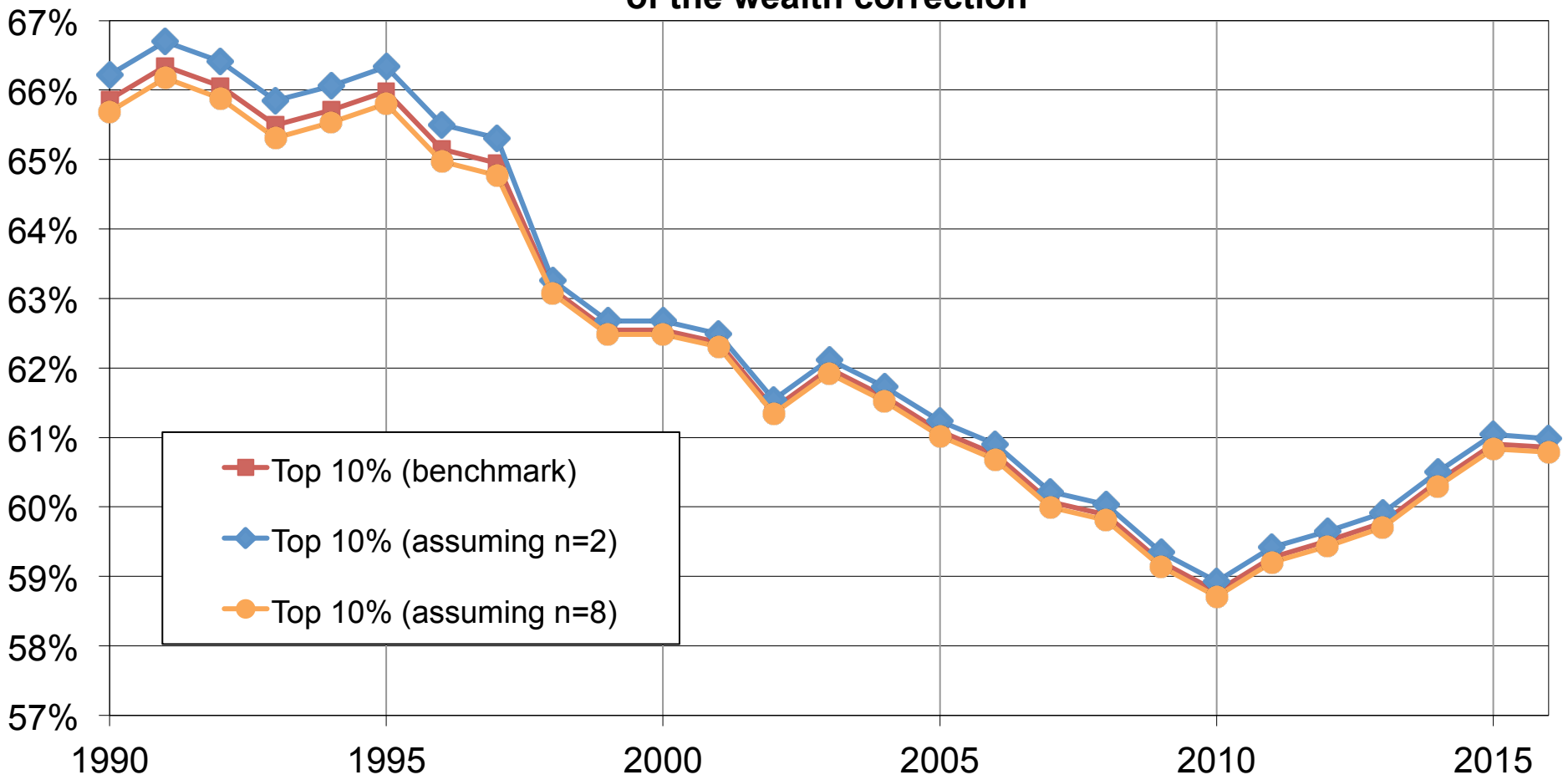
Distribution of fiscal income income among equals-plit adults (household income divided by the number of adults in the household for the bottom of the distribution). Fiscal income estimates combine survey and fiscal data, normalized to the total average income per adult (from WID.world).

Figure B13. Inverted Pareto curves in the Middle East in selected years, final benchmark distribution



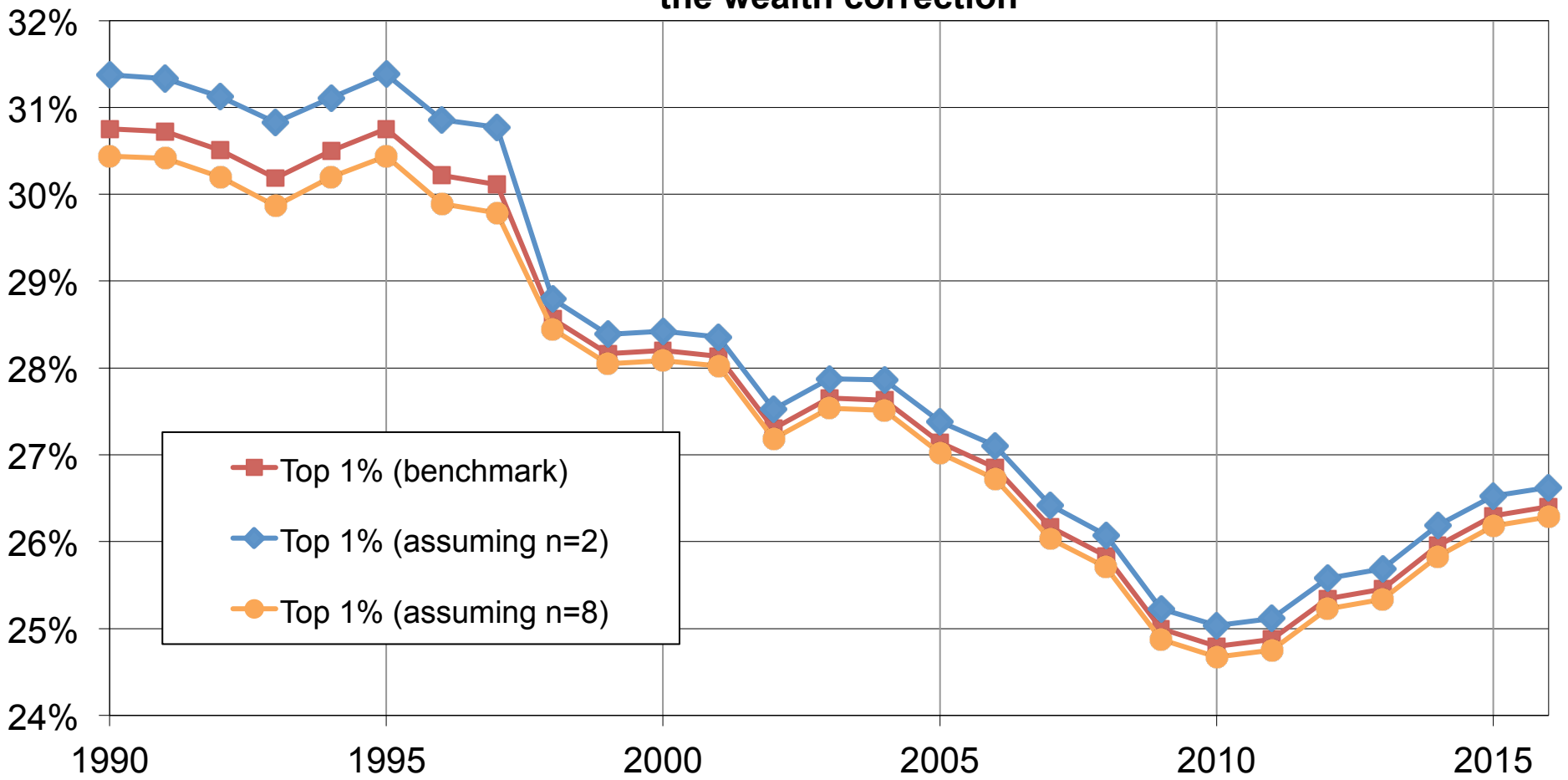
Distribution of fiscal income income among equals-plit adults (household income divided by the number of adults in the household for the bottom of the distribution). Fiscal income estimates combine survye and fiscal data, normalized to the total average income per adult (from WID.world). Series in market exchange rate.

Figure B14 . Top 10% income share in the Middle East, 1990-2016: impact of the wealth correction



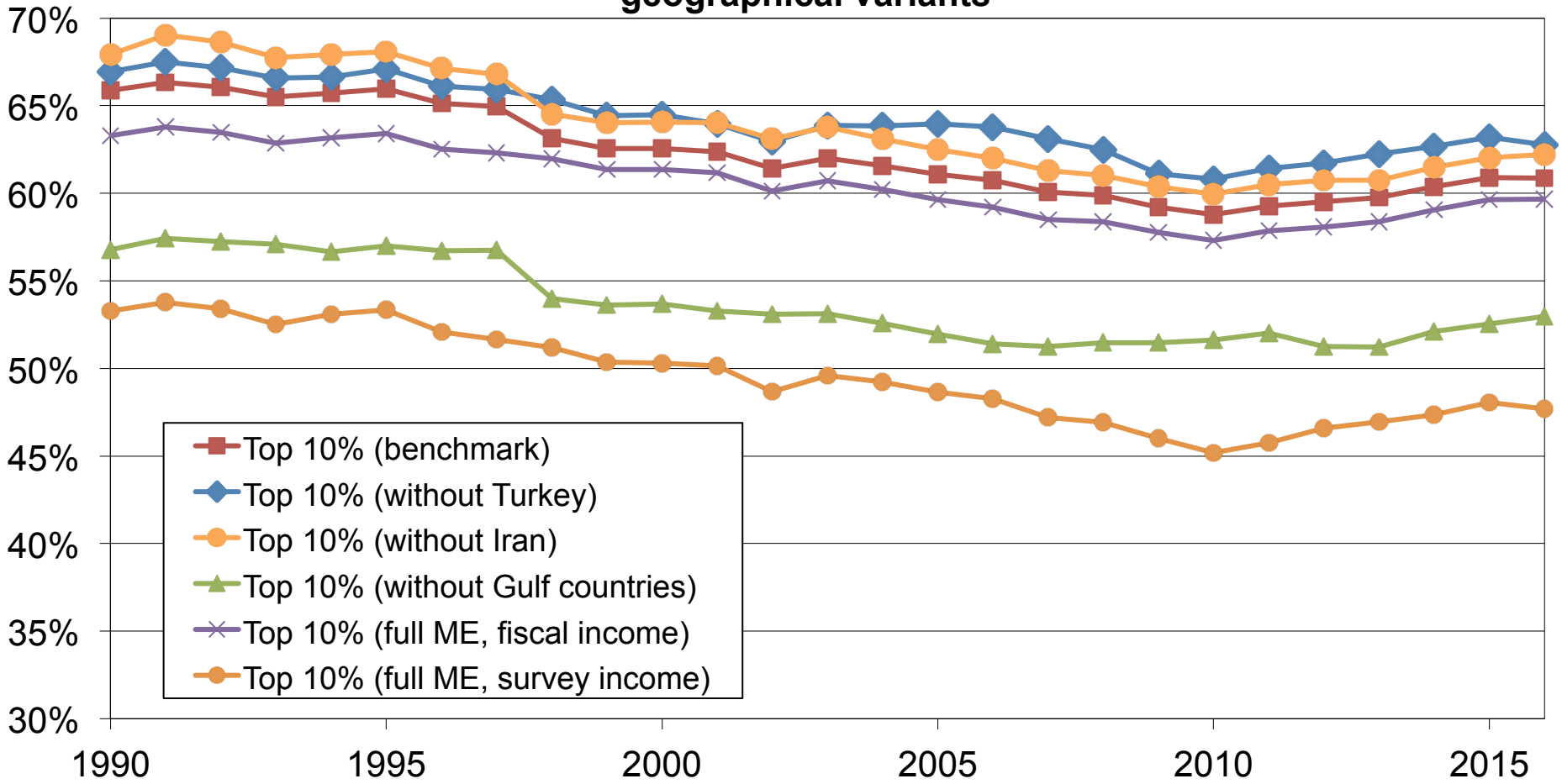
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-plit adults (income of households divided equally among adult members). National income estimates combine survey, fiscal, wealth and national accounts data. Series in market exchange rate.The variant is on the size of billionaires' families (n= 2 or 8 adults), that defines different wealth distributions, used to re-reallocate missing capital in the last correction.

Figure B15 . Top 1% income share in the Middle East, 1990-2016: impact of the wealth correction



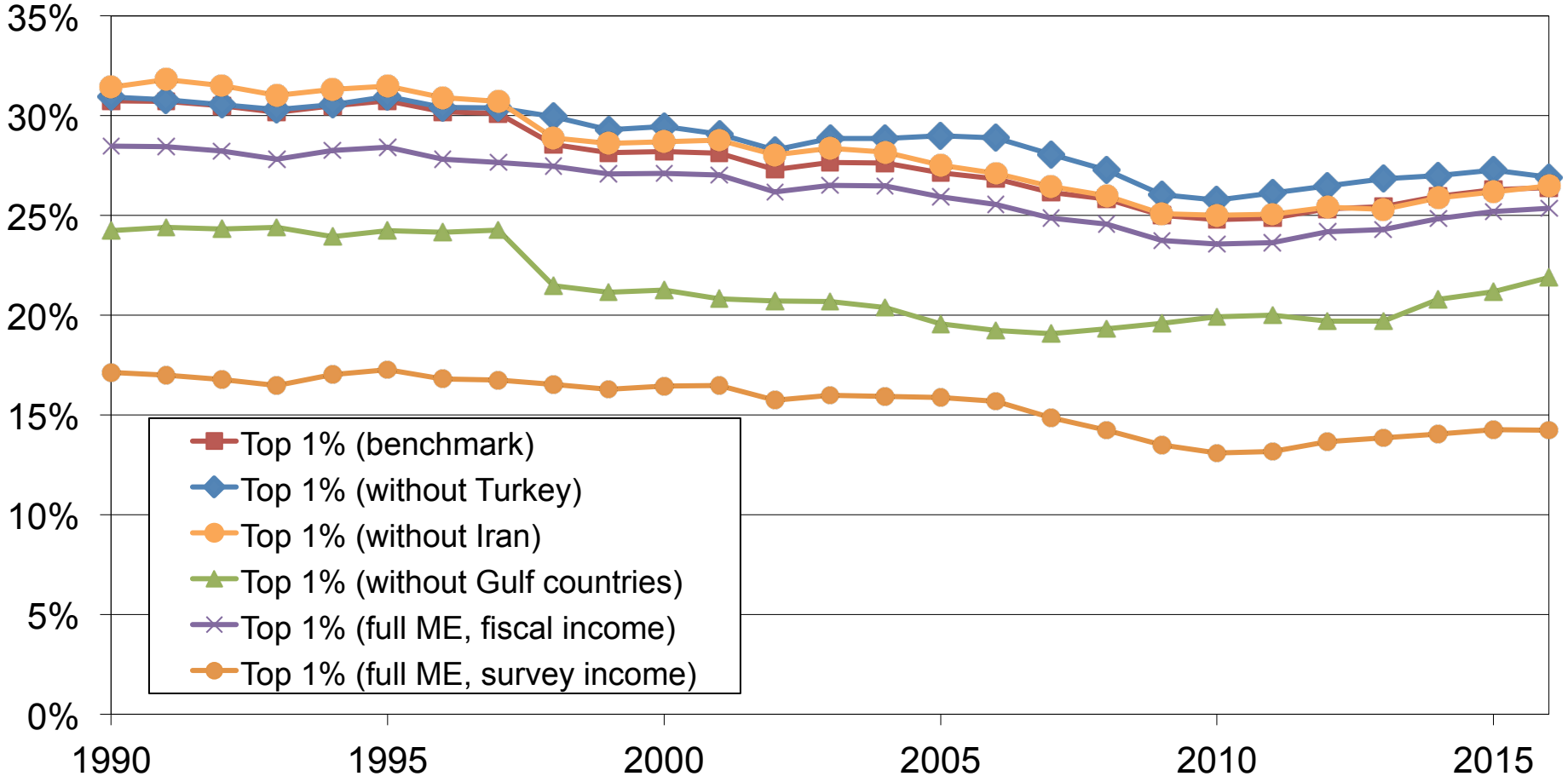
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-plit adults (income of households divided equally among adult members). National income estimates combine survey, fiscal, wealth and national accounts data. Series in market exchange rate.The variant is on the size of billionaires' families (n= 2 or 8 adults), that defines different wealth distributions, used to re-reallocate missing capital in the last correction.

Figure B16 . Top 10% income share in the Middle East, 1990-2016, geographical variants



Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-plit adults (income of households divided equally among adult members). National income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (but anchors national distributions to per adult national income). Series in market exchange rate.

Figure B17 . Top 1% income share in the Middle East, 1990-2016



Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-plit adults (income of households divided equally among adult members). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (but anchors national distributions to per adult national income). Series in market exchange rate.