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UK estimates of top income shares: Note on revised methods

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1. Introduction

The top fiscal income shares published in the *World Inequality Database*, WID.world are revised back to 1996-97 using data contained in the Survey of Personal Incomes (SPI) Public Use Tapes, augmented with data from the Family Resources Survey and the UK government's Benefit Expenditure and Caseload Tables.

The series targets an assessable income definition in both the numerator and denominator, which includes all income assessable for income taxation. This does not include capital gains, though we also compute top shares which include capital gains (see Advani and Summers (2020) for further information on methodology for this series). Assessable income also excludes any form of income that is exempt from Income Tax, e.g. ISAs and non-taxable benefits.

When interpreting the top income share estimates since 2009, the issue of income-forestalling or income-delaying in response to changes in the top rate of income tax should be taken into account. In March 2009, it was announced by the Labour Government that the top rate was to be raised from 40 to 50 per cent with effect from April 2010, and this led to "considerable forestalling" of income in 2009-10 (Seely, 2014). In March 2012, it was announced by the Conservative Government that the top rate was to be reduced to 45 per cent with effect from April 2013, which again provided an incentive for income to be moved between tax years, in that case from 2012-13 to 2013-14.

Dividend forestalling prior to the 7.5pp increase in marginal effective dividend tax rates in 2016-17 (announced in July 2015) should also be taken into account when interpreting top shares, resulting in an increase in dividends in 2015-16 and a fall the following year (OBR, 2017, Box 4.3).

Tax years are referred to using the earlier date as in the database, so 2008-09 is referred to as 2008 for example.

2. Population control total

The control total for the population is based on the number of adults aged 15 and over, taken from the ONS mid-year population estimates:

1996	46.882 million	2004	49.012 million	2012	52.491 million
1997	47.020 million	2005	49.507 million	2013	52.798 million
1998	47.184 million	2006	49.958 million	2014	53.189 million
1999	47.400 million	2007	50.434 million	2015	53.579 million
2000	47.682 million	2008	50.887 million	2016	53.971 million
2001	48.006 million	2009	51.278 million	2017	54.233 million
2002	48.330 million	2010	51.706 million	2018	54.524 million
2003	48.660 million	2011	52.169 million		

Use of a 15+ population control total is consistent with the previous fiscal income series published in WID.world (Alvaredo, 2017), though the Distributional National Accounts guidelines now favour a population control which includes adults aged 20 and over (Alvaredo et al., 2020). We do not provide a fiscal income series using a 20+ population control, as the age bins provided in the tax data are insufficiently granular to make this possible: we cannot exclude individuals aged less than 20 from either the numerator or the denominator, which is likely to downward bias top shares which use a 20+ population control to define the population size of the numerator (see Advani, Summers and Tarrant, 2021, for a discussion).

3. Income control total

The control total for income could be obtained in two different ways, as Atkinson (2012) explains. One approach is to use the national accounts figure for total household income, summing the income components which are relevant to obtain the desired definition of income. Alternatively, one could use the SPI income total and add the income of the non-taxpaying population. Prior to 2009, the control total for the WID UK fiscal income series was constructed using an SPI-based approach (Atkinson, 2007). Until the current revision, the income totals for the post-2009 period were constructed using a national accounts-based approach (Alvaredo, 2017). In this update to the series, we revise previous income control totals using a modified SPI-based method for each year since 1996-97. In a separate working paper (Advani, Summers and Tarrant, 2021), we examine the relative merits of the two approaches and argue that the SPI-based method out-performs the national accounts approach in terms of serving three of the four desirable criteria which a good fiscal income series ought to possess: comparability between the numerator and denominator; comparability over time; and practical sustainability.

The revised method for constructing the income control is as follows: total income is calculated for those earning above the standard personal allowance using microdata from the SPI. This is augmented with the estimated total income of those earning below the standard personal allowance using data from the Family Resources Survey. We use the individual-level income component variables available in the FRS to construct a fiscal income variable which corresponds to the SPI income definition (the formula for this is set out in Table 1). The total income of individuals whose fiscal income is below the standard personal allowance is then estimated using FRS survey weights.

Table 1: Formula for defining assessable income in the FRS
Assessable income = Gross income from employment
+ Gross income from self-employment (including partnerships)
+ Gross income from private, occupational, and overseas pensions
+ Gross income from taxable benefits (Carer's allowance, JSA, ESA (contributory),[1] Incapacity benefit, Bereavement Allowance/Widow's pension/Widowed Parent's Allowance, Statutory Sick Pay, Statutory Maternity Pay, Statutory Adoption Pay, Statutory Paternity Pay)
+ Gross state pension income
+ Gross investment income (interest on current accounts, NBS direct saver and investment accounts, gov. gilt-edged stock, unit/investment trusts, stocks, shares, bonds, pensioner guaranteed bonds, profit sharing, fixed rate savings/guaranteed income, basic accounts, credit unions, income from property rentals, royalties, and income received as a sleeping partner)

The estimated total for incomes below the personal allowance is added to the total SPI income of those earning above the personal allowance, which is based on the "total income (TI)" variable available in the Public Use Tapes. Prior to computing the SPI income total for those earning above the standard personal allowance, an adjustment is applied to the SPI dividends variable, which is included in total income. This adjustment is made to account for the notional tax credit which was available on dividends from shares in UK (and some foreign) companies until 2016-17. Until 1999, a 20% tax credit represented the tax already paid on profits made by UK companies under Advanced Corporation Tax (ACT). In 1999, ACT was abolished, but the (now notional) tax credit remained in place at a 10% rate, before being abolished altogether in 2016-17. Until 2016-17, dividends in the SPI have been grossed up by the dividend tax credit amount, though this tax credit amount does not represent any dividends actually received by individuals. To avoid creating a discontinuity in 2016-17, we retrospectively remove the notional dividend credit as far back as 1999-00 by reducing the SPI dividend variable by 10%. In addition, we deduct PSAV_XS "Amount saved towards your pension in excess of the Annual Allowance" from TI in 2011-12, as this component is not included in TI in other years. We exclude taxpayers who are not UK resident.

To account for under-reporting of benefit income in the FRS (see Corlett et al., 2018), we adjust benefit income components of the SPI+FRS upwards to match admin totals for benefit expenditure, where a comparable expenditure target is available.[2] Total government expenditure on taxable benefits including Incapacity Benefit, ESA (contributory), JSA, Carer's allowance, and the State Pension are taken from the Benefit Expenditure and Caseload Tables (Spring 2020).

The formula for constructing the SPI-based income control is set out in Table 2.

[1] Contributory ESA payments (taxable) are combined with income-based ESA payments (non-taxable) in the FRS. To estimate the share of total ESA payments that are contributory, we multiply this income component by the share of ESA payments that are contributory in each year according to the Benefit Expenditure and Caseload Tables (Spring 2020).
[2] This comparison cannot be made for Statutory Sick Pay/Statutory Maternity Pay, which are combined with other sources of income in the SPI. However, we expect the extent of under-reporting to be small for these benefit types as entitlement is concentrated among those with income above the personal allowance. Moreover, a comparison cannot be made for Bereavement Allowance/Widow's Pension/Widowed Parent's Allowance, as these benefits are combined with other taxable benefits in the expenditure tables.

Table 2: Formula for constructing total income

SPI-based income total = Total income above the standard personal allowance (SPI, after dividend adjustment)
 + Total fiscal income below the standard personal allowance (FRS)
 + Benefits adjustment (Benefit Expenditure and Caseload Tables)

The SPI-based pre-tax income totals for 1996-97 to 2018-19 (1996-2018 in the database) are:

1996	£465,318 million	2004	£725,986 million	2012	£967,135 million
1997	£503,186 million	2005	£791,608 million	2013	£1,025,162 million
1998	£535,923 million	2006	£843,380 million	2014	£1,041,585 million
1999	£572,906 million	2007	£905,771 million	2015	£1,116,097 million
2000	£629,443 million	2008	*no SPI PUT data*	2016	£1,140,885 million
2001	£648,690 million	2009	£918,473 million	2017	£1,175,959 million
2002	£659,903 million	2010	£905,749 million	2018	£1,215,998 million
2003	£662,389 million	2011	£941,829 million		

4. Numerator

The previous UK fiscal income series was constructed by applying Pareto interpolation methods to the Personal Income Statistics tabulations, as outlined in Atkinson (2005). We depart from this methodology by constructing a numerator directly from the SPI microdata. Individuals are ranked according to their total pre/post-tax fiscal income. Aggregate income of the top X% is estimated as the total income of the top N (weighted) individuals, whose survey weights sum to X% of our population control total. We adjust the survey weight of the lowest-earning individual for whom the cumulative sum of survey weights among individuals with at least that level of income just exceeds our population target, in order to hit the population target exactly. See Advani, Summers and Tarrant (2021) for further details.

5. Results

The pre-tax shares (%) of the top groups for 1996-97 to 2018-19 (1996-2018 in the database) are:

Year	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.05%
1996	40.3%	27.5%	12.2%	8.8%	4.2%	3.1%
1997	39.9%	27.4%	12.4%	8.9%	4.2%	3.1%
1998	40.7%	28.3%	12.9%	9.4%	4.6%	3.4%
1999	40.8%	28.4%	13.0%	9.5%	4.7%	3.5%
2000	40.6%	28.5%	13.4%	9.8%	4.9%	3.5%
2001	41.0%	28.7%	13.2%	9.6%	4.7%	3.4%
2002	40.6%	28.2%	12.8%	9.3%	4.4%	3.2%
2003	41.2%	28.8%	13.2%	9.5%	4.6%	3.3%
2004	40.7%	28.5%	13.2%	9.6%	4.7%	3.4%
2005	41.5%	29.4%	14.2%	10.4%	5.2%	3.8%
2006	41.9%	30.0%	14.8%	11.0%	5.6%	4.1%
2007	42.1%	30.4%	15.2%	11.5%	6.0%	4.5%
2008*						
2009	42.6%	30.7%	15.7%	12.0%	6.6%	5.0%
2010	40.7%	28.5%	13.4%	9.8%	5.0%	3.7%
2011	41.0%	28.8%	13.5%	9.9%	5.0%	3.7%
2012	40.5%	28.5%	13.1%	9.5%	4.8%	3.5%
2013	41.4%	29.7%	14.6%	11.0%	5.8%	4.4%

2014	41.0%	29.3%	14.2%	10.6%	5.6%	4.2%
2015	41.3%	29.9%	14.9%	11.4%	6.2%	4.7%
2016	40.5%	29.0%	14.1%	10.6%	5.6%	4.2%
2017	40.6%	29.2%	14.4%	10.9%	5.8%	4.4%
2018	40.4%	29.0%	14.3%	10.8%	5.8%	4.4%

**Statistics for 2008 are unavailable as the SPI has not yet been published.*

Post-tax shares are constructed by deducting the total income tax liability of individuals in the SPI, and the National Insurance contributions paid by individuals in the SPI and FRS (excluding employers' contributions[3]). We deduct the actual income tax liability of individuals as recorded in the SPI. To estimate NICs payable, we apply the NICs schedule applicable in each year to the relevant income-source variables in the SPI and FRS. This differs from the previous definition of post-tax income, which deducted income tax paid but not National Insurance contributions.

Our post-tax income control includes and adjustment for under-reported benefit income which is equivalent to the addition made to the pre-tax series (Table 2). We do not attempt to deduct tax paid on this income. However, as these benefit payments are concentrated at the bottom of the income distribution, we expect that the amount of tax due on this income will be insignificant relative to the income control total.

The post-tax shares (%) of the top groups for 1996-97 to 2018-19 (1996-2018 in the database) are:

Year	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.05%
1996	36.6%	24.4%	10.2%	7.3%	3.4%	2.5%
1997	36.4%	24.4%	10.4%	7.4%	3.5%	2.6%
1998	37.0%	25.0%	10.8%	7.7%	3.7%	2.7%
1999	37.0%	25.0%	10.8%	7.8%	3.8%	2.8%
2000	36.7%	25.0%	11.1%	8.0%	3.9%	2.8%
2001	36.9%	25.0%	10.9%	7.9%	3.8%	2.7%

[3] We deduct Class 1 Primary (employee), Class 2 and Class 4 National Insurance Contributions, but not Class 1 Secondary (employer).

2002	36.6%	24.6%	10.6%	7.6%	3.6%	2.5%
2003	37.1%	25.1%	10.9%	7.8%	3.7%	2.7%
2004	36.7%	24.8%	11.0%	7.9%	3.8%	2.8%
2005	37.4%	25.7%	11.8%	8.6%	4.2%	3.1%
2006	37.9%	26.3%	12.4%	9.2%	4.6%	3.4%
2007	38.0%	26.5%	12.7%	9.5%	4.9%	3.7%
2008*						
2009	38.3%	26.7%	13.0%	9.9%	5.4%	4.1%
2010	36.2%	24.3%	10.4%	7.4%	3.6%	2.7%
2011	36.1%	24.2%	10.3%	7.4%	3.6%	2.6%
2012	35.5%	23.7%	10.0%	7.0%	3.4%	2.5%
2013	36.1%	24.6%	11.1%	8.2%	4.3%	3.3%
2014	35.8%	24.4%	10.9%	8.0%	4.1%	3.1%
2015	35.9%	24.7%	11.4%	8.6%	4.6%	3.5%
2016	35.3%	24.0%	10.7%	7.9%	4.1%	3.1%
2017	35.3%	24.1%	10.9%	8.1%	4.3%	3.3%
2018	35.1%	23.9%	10.8%	8.0%	4.3%	3.3%

**Statistics for 2008 are unavailable as the SPI has not yet been published.*

In addition to these fiscal income series, we also construct top shares of pre-tax income including realised taxable capital gains. The series including gains is constructed using self-assessment microdata on reported gains accessed via the HMRC Datalab. Further details on the methodology can be found in Advani and Summers (2020). The income control total is as described in Table 2, with the addition of aggregate capital gains reported in self-assessment, obtained from the Datalab. This excludes non-taxable capital gains and taxable gains received by individuals with small gains below the Annual Exempt Amount. No estimate is available for the aggregate amount of unreported small taxable gains.

Top shares of pre-tax income plus gains for 1996-97 to 2017-18 (1996-2017 in the database) are:[4]

Year	Top 1%	Top 0.1%	Top 0.01%
1996	14.1%	5.5%	2.2%
1997	14.2%	5.5%	2.2%
1998	15.6%	7.0%	3.5%
1999	15.3%	6.6%	3.0%
2000	14.7%	6.0%	2.4%
2001	13.7%	5.1%	1.8%
2002	14.6%	6.0%	2.4%
2003	14.4%	5.7%	2.2%
2004	14.8%	6.0%	2.4%
2005	15.6%	6.8%	3.0%
2006	17.0%	8.0%	3.7%
2007	19.1%	9.9%	5.0%
2008*			
2009	16.9%	8.0%	3.8%
2010	14.7%	6.2%	2.5%
2011	14.5%	6.0%	2.4%
2012	14.2%	5.8%	2.3%

[4] Estimates for 2018-19 that include capital gains are not currently available.

2013	15.7%	7.1%	3.0%
2014	16.5%	7.5%	3.2%
2015	17.3%	8.3%	3.6%
2016	16.4%	7.7%	3.4%
2017	17.3%	8.3%	3.7%

**Statistics for 2008 are unavailable as the SPI has not yet been published.*

References

Advani, A. & Summers, A., 2020. Capital Gains and UK Inequality. *World Inequality Lab Working Paper 2020/09.*

Advani, A., Summers, A. & Tarrant, H., 2021. Measuring UK top incomes. *CAGE Working Paper 490.*

Alvaredo, F., 2017. UK Estimates of Top Income Shares 2012-2014 and 2014-2015: Note on Methods. *WID.world Technical Note.*

Alvaredo, F. et al., 2020. *Distributional National Accounts Guidelines 2020: Concepts and Methods used in the World Inequality Database.* s.l.:WID.world Working Paper.

Atkinson, A. B., 2005. Top incomes in the UK over the 20th century. *Journal of the Royal Statistical Society,* 168(2), pp. 325-343.

Atkinson, A. B., 2007. The Distribution of Top Incomes in the United Kingdom 1908-2000. In: A. B. Atkinson & T. Piketty, eds. *Top Incomes over the Twentieth Century. A Contrast Between Continental European and English-Speaking Countries.* Oxford: Oxford University Press, pp. 82-140.

Atkinson, A. B., 2012. UK Estimates of Top Income Shares 2009-2010: Revised Note on Methods. *WID.world Technical Note.*

Atkinson, A. B. & Ooms, T., 2015. UK Estimates of Top Income Shares 2012-2013: Note on Methods. *WID.world Technical Note.*

Corlett, A., Clarke, S., D'Arcy, C. & Wood, J., 2018. *The Living Standards Audit 2018,* s.l.: Resolution Foundation.

OBR, 2017. *Economic and fiscal outlook,* s.l.: Office for Budget Responsibility.

ONS, 2014. Changes to National Accounts: Review of the Non-Profit Institutions Serving Household Sector. May.

Seely, A., 2014. *Income Tax: The Additional 50p Rate,* s.l.: House of Commons Library Standard Note, SN 249.