

The share of Capital Income in National Income has not been increasing anymore in the UK since 1987: an update of Figure 6.1. of T. Piketty's "Capital in the Twenty-First Century"

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Executive summary:

The most recent update of the UK national accounts suggests that since 1987 **the share of Capital Income in the National Income has not been increasing anymore**. On the contrary, it was roughly stable from 1987 to 1998, then decreased by 7% from 1998 to 2009, and finally remained stable after 2009. This is consistent with World Inequality Database's update, but not with T. Piketty's observations in "*Capital in the Twenty-First Century*". We show that the main reason for the change are major revisions in the evaluation of the imputed rent component in the Capital Income.

N.B.: this share decreased again in 2020, but that year is ignored because of Covid disruptions.

Summary:

In "*Capital in the Twenty-First Century*"², T. Piketty shows that, based on national account data, the value and income of capital, as a proportion of National Income, decreased from 1914, then increased from the 1950's, reaching today a level similar to that at the start of the 20th century.

The UK Office of National Statistics (ONS) publishes revisions of its national accounts annually. T. Piketty used the national account data published in 2011. In this report, we update his results using the most recent version of the UK national accounts published in 2021, which **include yearly data from 1987 to 2020**.

We show firstly that the share of Capital Income in the National Income has fallen on average from 1990 to 2010. Analyzing the time series without averaging, we show secondly that three time periods can be clearly distinguished after 1987: (i) 1987-1998: relative stability; (ii) 1998-2009: sharp ~7% decrease; (iii) 2009-2019: relative stability. This is consistent with World Inequality Database's updates.

Further, analyzing the different components of the Capital Income, we show that these changes are mainly due to significant revisions of the imputed rents within the household property part of Capital Income. At first, this component was largely underestimated, and it then decreased sharply.

Quantitatively, **the average impact of the imputed rents revision on the share of Capital Income is estimated to be about 60% in the 1987-1998 period and 55% for the 1987-2010 period**.

1. The share of Capital Income in National Income has fallen on average from 1990

Figure 6.1 of "*Capital in the Twenty-First Century*" shows every ten years from 1770 to 2010 the split of Capital and Labor Incomes as percentages of the UK National Income. The data used are the results of aggregates from different historical times series:

- 1855-1948: historical national accounts series established by Feinstein (1972) with adjustments as described in T. Piketty's formula³.
- 1948-2010: mainly UK national accounts data from Blue Book 2011, when available, or otherwise through adjustments⁴.

As the main purpose of this report is to show the impact of UK national accounts revisions on Figure 6.1 in T. Piketty's book, we limit ourselves to updating that figure with the latest available data, published in 2021 by the UK ONS for the period from 1987 to 2020, see Figure 1. While T. Piketty's share of Capital Income suggests a **slight increase** from ~24% to ~27% in the period 1990 to 2010, our update in Figure 1 indicates a **sharp decrease** (from ~34% to 27%). In the following sections, we investigate the origin of this drastic change, using the full time series without averaging (as in Figure 6.1 each data point is a ten-year average).

¹ The analyzes and points of view are those of their author and do not commit the company.

² Editions du Seuil, 2013.

³ See at <http://piketty.pse.ens.fr/files/PikettyZucman2013.zip>, UK.xls file's comments of PikettyZucman2013Data folder.

⁴ See at <http://piketty.pse.ens.fr/files/PikettyZucman2013.zip>. UK.xls files' comments of PikettyZucman2013Data folder.

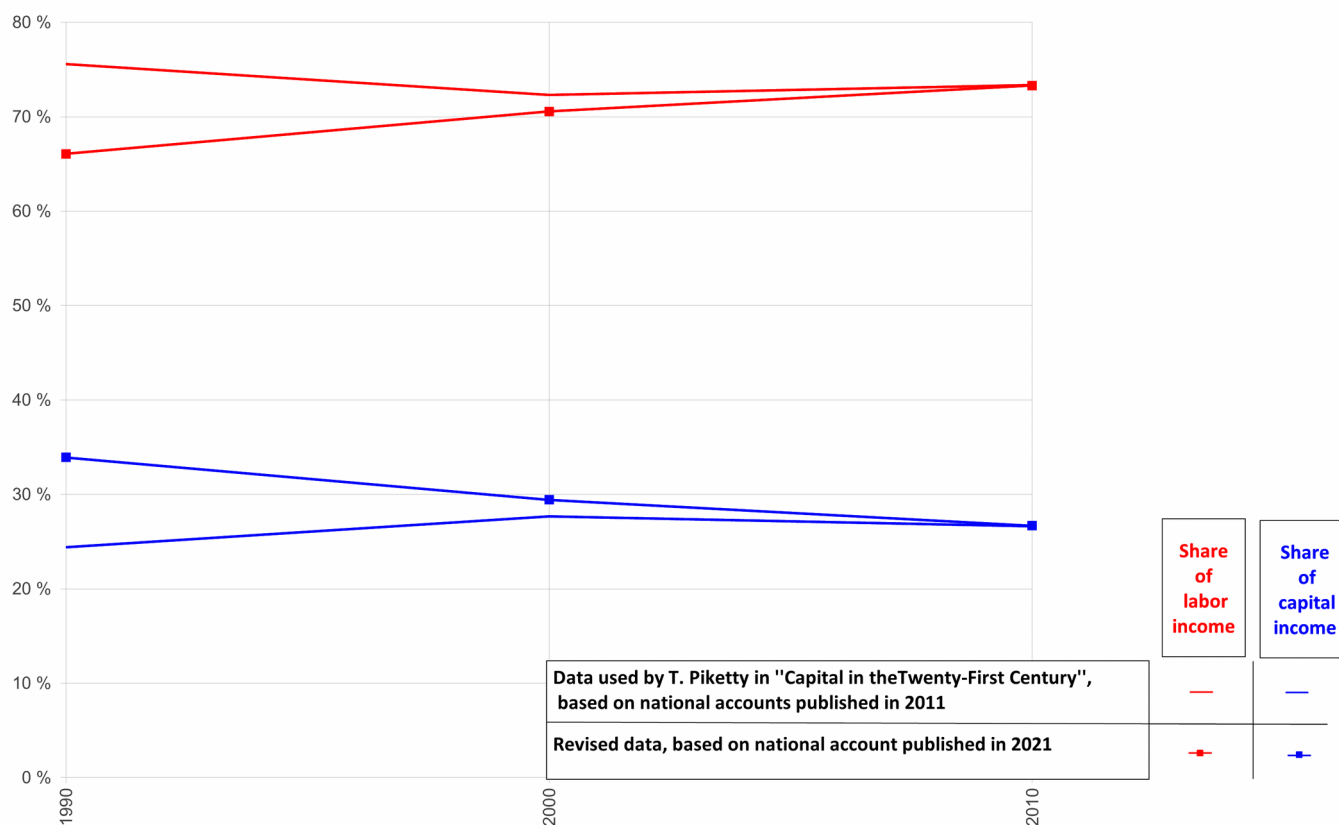


Figure 1: Update of Figure 6.1 in the “Capital in the Twenty-First Century” by T. Piketty. The data points are ten-year averages, with some adjustments (see tab TS6.1 generating Figure 1 in tab G6.1 of file <http://piketty.pse.ens.fr/files/capital21c/xls/Chapitre6TableauxGraphiques.xls>). T. Piketty used the UK national account data published in 2011 (from Blue Book 2011⁵), and year 2010 is an average of only two years (2009 and 2010). For the 2021 update, we used for 2010 ten years of data (from 2009 to 2018, consistent with T. Piketty’s analysis).

2. The Share of Capital Income in National Income was stable in 1987-1998 and 2009-2019, but fell sharply from 1998 to 2009

The full time series update shows in Figure 2 that three time periods can be distinguished from 1987 for the evolution of the share of Capital Income in National Income:

- 1987-1998: relative stability,
- 1998-2009: a ~7% decrease,
- 2009-2019: relative stability.

In Figure 3, one can see World Inequality Database’s update of the share of Capital Income in National Income from 1987 to 2019. It shows the same trend and very close values.

⁵See in <http://piketty.pse.ens.fr/files/capitalisback/CountryData/UK/> “BlueBook2011(Nov2011).pdf” file, and commentary in tab DataUK1 of UK.xls file in PikettyZucman2013Data folder at <http://piketty.pse.ens.fr/files/PikettyZucman2013.zip> “1948-2010: official 2011 UK national accounts Blue Book (BB) series, downloaded and pasted directly in April 2012 from on-line tables available on ONS website”.

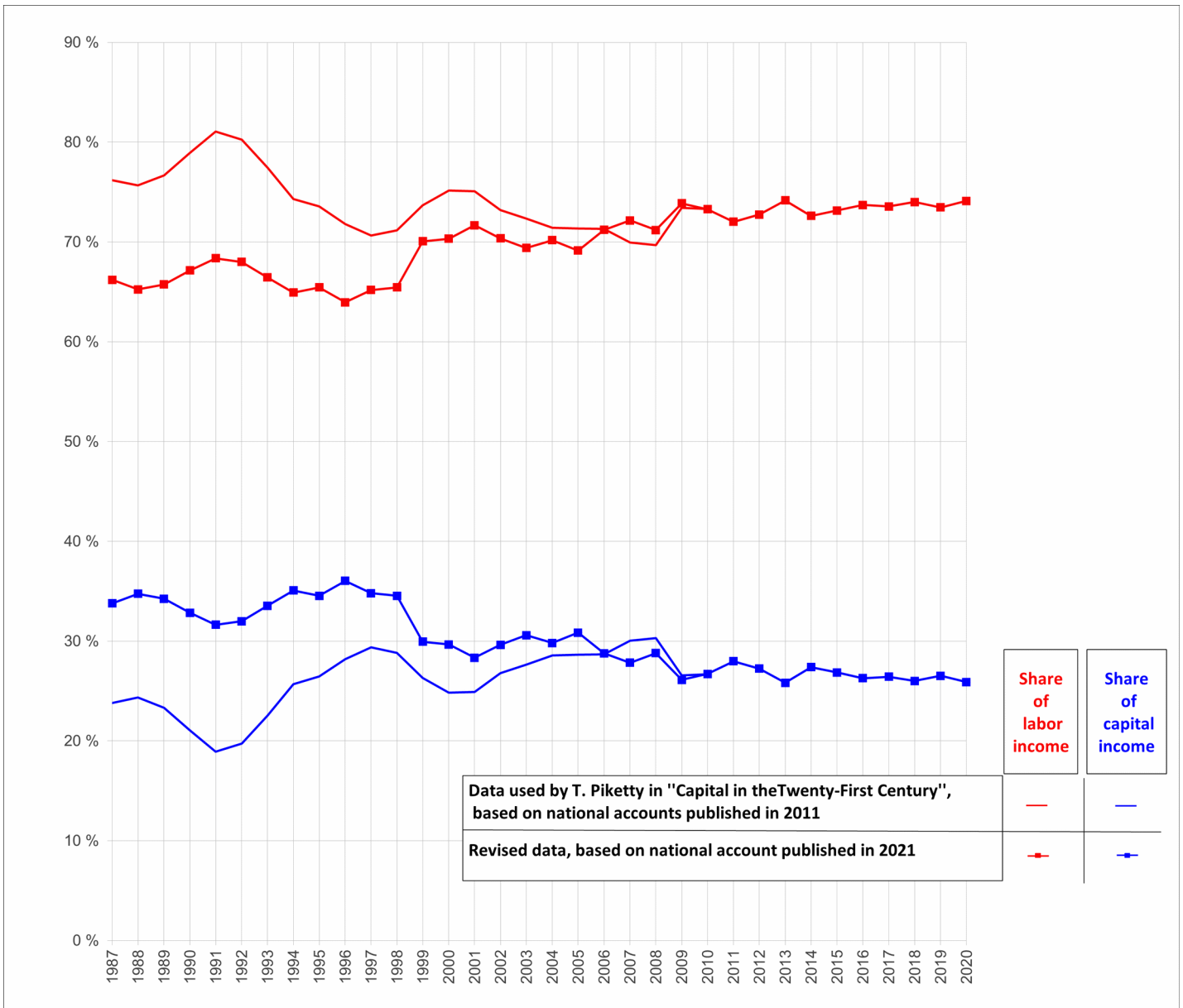


Figure 2: Update of Figure 6.1. of the "Capital in the Twenty-First Century" by T. Piketty with all years

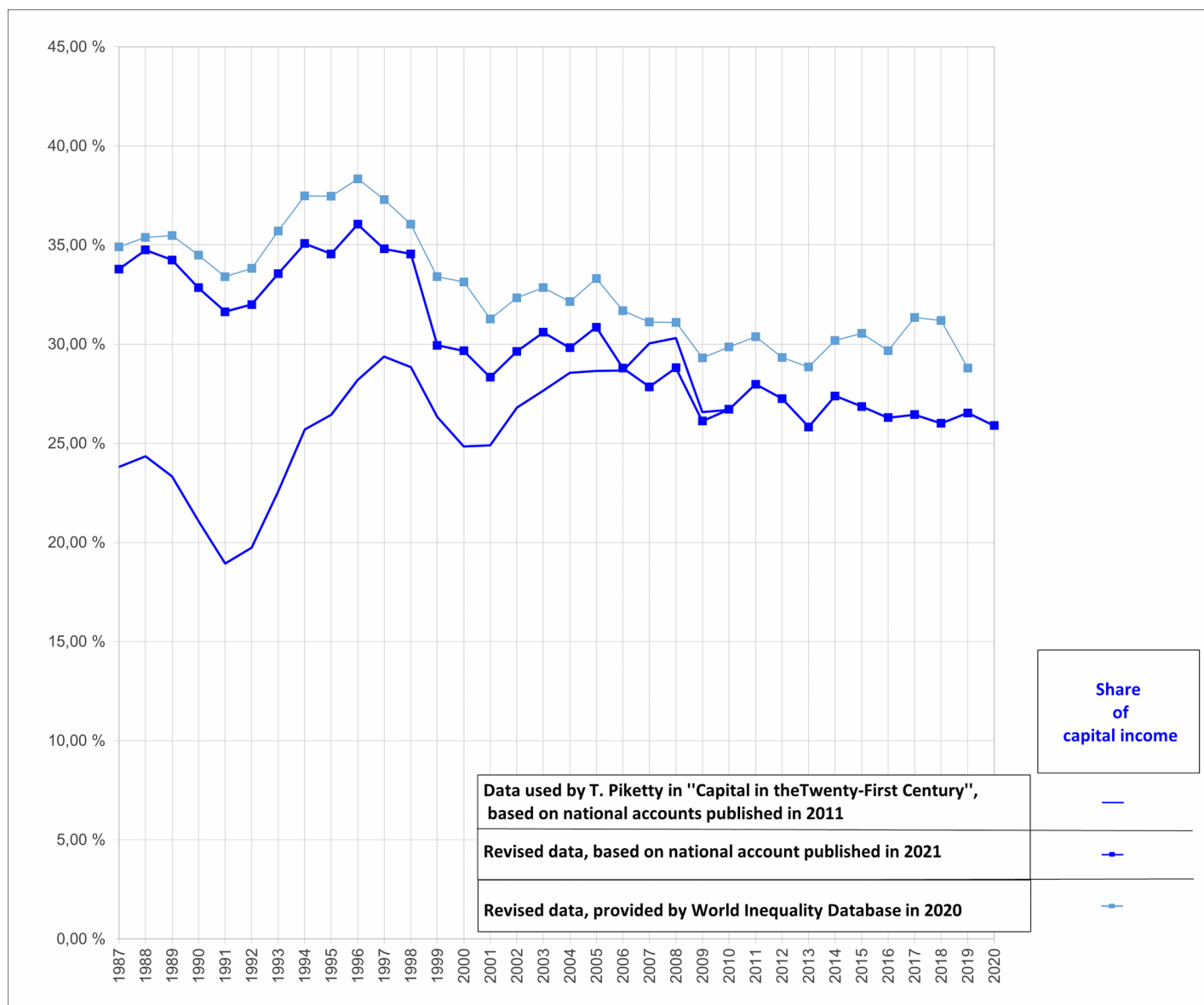


Figure 3: Updates of Figure 6.1. of the “Capital in the Twenty-First Century” by T. Piketty with all years from 1987, based on national account published in 2021 and [World Inequality Database methodology](#)

3. The decrease of the share of Capital Income in the National Income is mainly due to important households' property capital income revisions

In this section we investigate why the share of Capital Income decreases in the time period 1998-2009. To do so, we separate the shares of Capital and Labor incomes according to their different components, consistent with the analysis of T. Piketty (see <http://piketty.pse.ens.fr/files/PikettyZucman2013.zip> and UK.xls file's comments in tab DetailsUK of PikettyZucman2013Data folder).

3.1 Analysis of the main components of Capital Income

Figure 4 shows the shares of corporate, housing, non-corporate, foreign and government capital incomes using both the UK national account data published in 2011 and in 2021.

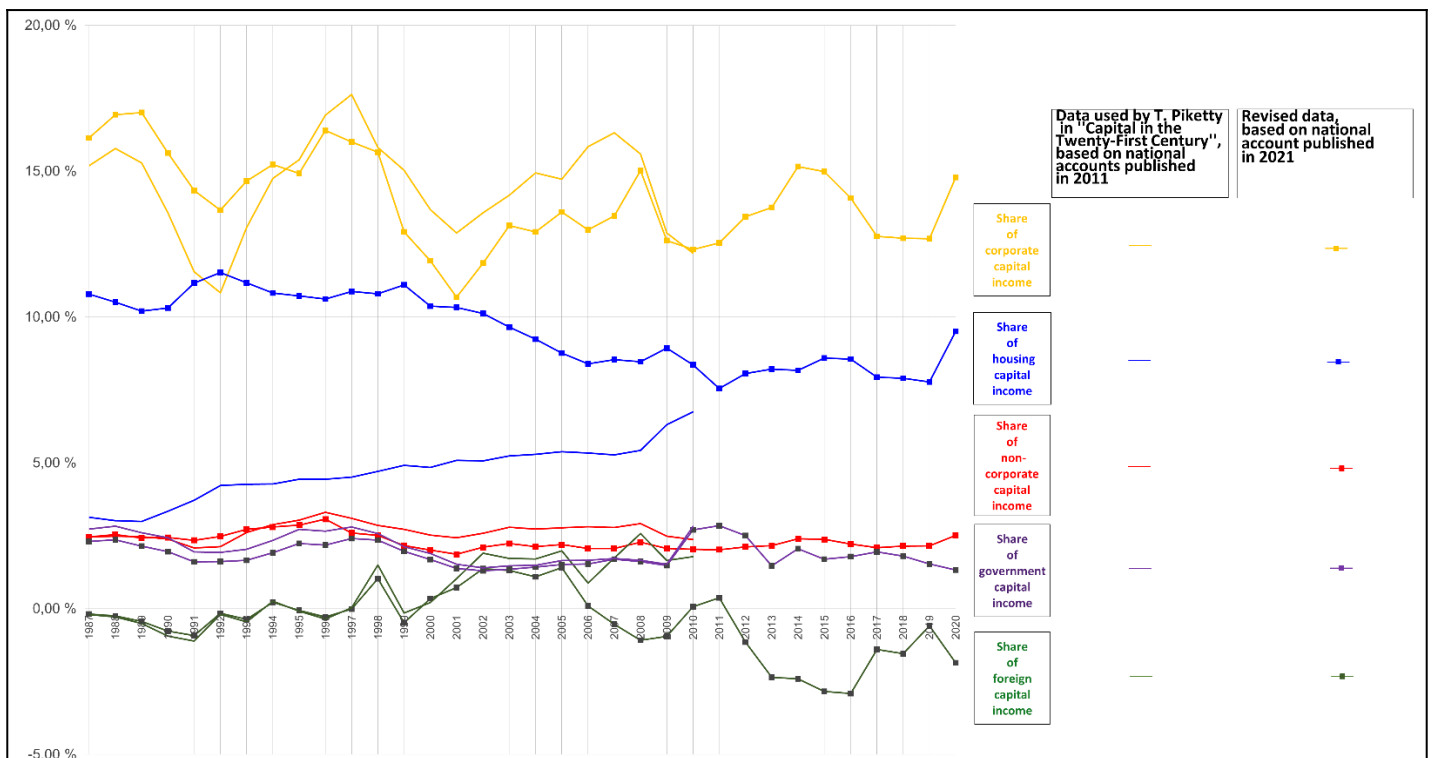


Figure 4: Main components of Capital Income as percentage shares, using data from UK national accounts published in 2011 and 2021

Table 1 presents a summary of the [Mean Absolute Percentage Errors](#) (MAPE) in the comparison of the 2011 and 2021 evaluations. We also report the minimal and maximal absolute percentage errors in the 1987-2010 time period. The MAPE for the share of Capital Income is around **25%**, with values ranging from 0% to 67%.

We can see that the 2021 update impacts mainly two components:

- a **drastic revision of the share of housing capital income**: firstly, its value was initially largely underestimated using the 2011 data compared to using the 2021 data (3% vs 11% for example in 1987); secondly, the updated 2021 version then shows a **decrease** from 1987 to approximately 2011, **before staying flat**, while the 2011 version showed an increase up to 2010. The **MAPE in that period** is around **136%**, with a minimal value around 26% and a maximal value in the year 1987 of 257%.
- a **decrease in the share of foreign capital income starting from 2006**: the 2011 version showed an increase from 1999, while the 2021 version displays a gradual decrease to finally reach a strictly negative value. The **MAPE in that period** is around **57%**, with a minimal value around 8% and a maximal value of 221%.

	Share of Capital Income	Share of housing capital income	Share of foreign Capital Income	Share of non-corporate Capital Income	Share of corporate Capital Income	Share of government Capital Income
Minimal absolute percentage of errors for 1987-2010 period	0%	26%	8%	0%	1%	1%
Maximal absolute percentage of errors for 1987-2010 period	67%	257%	221%	24%	28%	15%
MAPE for 1987-2010 period	25%	136%	57%	13%	10%	9%

Table 1: Summary of the MAPE for capital share components evaluated using 2011 and 2021 ONS data.

The main revision concerns the share of housing capital income. It appears that the UK Office of National Statistics introduced in 2016 some improvements to the sources and methods for evaluating **imputed housing rents** (effective from Blue Book 2016), which is the main reason for the revisions of the subsequent share of housing capital income observed⁶. As they explain in their [article](#), “*Their effect [the improvement] is to raise the level of the estimates of imputed rental and to lower the growth of the pre-2010 series. Because of this lower growth rate pre-2010, the series diverge most in the earliest periods.*”, which can indeed be observed in Figure 5.

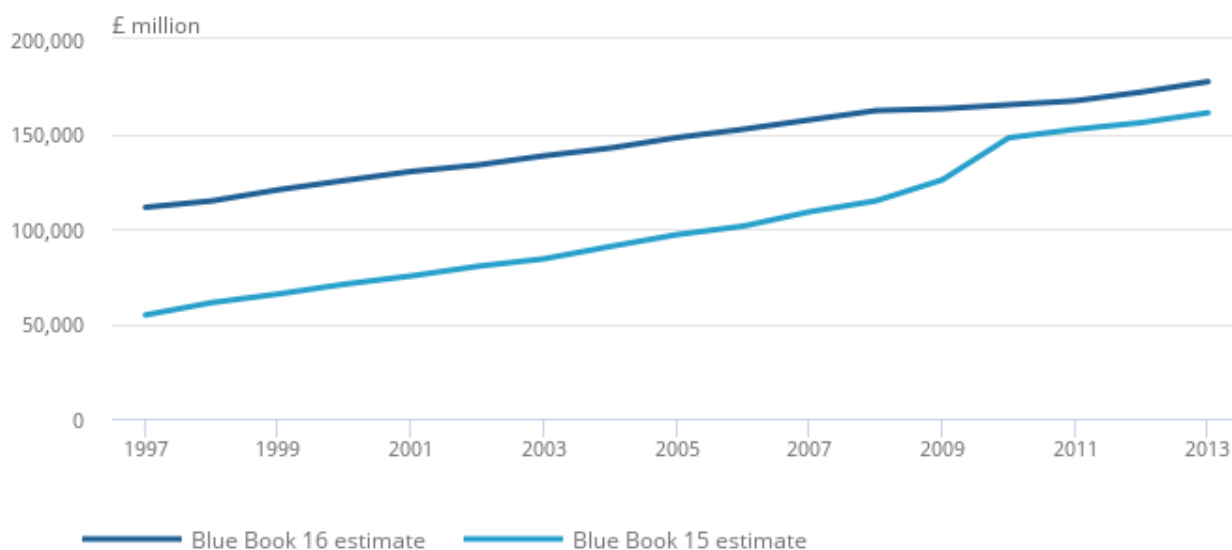


Figure 5: Imputed rentals for housing, in the UK, current price, 1997 to 2014. Source: [Office for National Statistics](#) (named Figure 2 in their website).

Neglecting correlations between the different components potentially introduced by the revisions, we roughly estimate the impact of the 2021 revision on the share of Capital Income for each component separately keeping all others equal. We use as a measure of this impact the MAPE over the 1987-2009 time period.

To be more precise, T. Piketty defines the share of Capital Income in the National Income (to draw Figure 6.1 in the “*Capital in the Twenty-First Century*”) as follows:

$$Y_{Kt} = \frac{Y_{Kct} + Y_{ht} + Y_{Kset} + FY_{Kt}}{1 - T_{pt} - FT_{pt}}$$

where:

- Y_{Kt} is the share of Capital Income (excluding government interests) over the National Income,
- Y_{Kct} is the share of corporate Capital Income in the National Income,
- Y_{ht} is the share of housing Capital Income in the National Income,

⁶More precisely, as explained by the ONS in this [article](#), « *These changes lead to significant improvements in the estimates of imputed rental. The administrative data is more comprehensive than the survey data previously used and allows us to improve the conceptual consistency between the data collected and the estimates being calculated.* ». Concretely, in T. Piketty UK.xls file's, it impacts drastically the QWLU time series in the DataUK tab.

- Y_{Kset} is the share of the non-corporate Capital Income in the National Income,
- FY_{Kt} is the share of foreign Capital Income in the National Income,
- T_{pt} are the product taxes,
- FT_{pt} are the foreign product taxes.

Hence, Y_{Kt} can be seen as a function f of these principal components:

$$Y_{Kt} = \frac{Y_{Kct} + Y_{ht} + Y_{Kset} + FY_{Kt}}{1 - T_{pt} - FT_{pt}} = f(Y_{Kct}, Y_{ht}, Y_{Kset}, FY_{Kt}, T_{pt}, FT_{pt})$$

The impact of the revision of a given component on the share of capital income in the time period 1987-2009 is estimated by computing the ratio of its contribution to the sum of absolute values of contributions of all components using 2011 and 2021 data. Indeed, at first order one can estimate that at date t :

$$f(Y_{Kct}^{2021}, Y_{ht}^{2021}, Y_{Kset}^{2021}, FY_{Kt}^{2021}, T_{pt}^{2021}, FT_{pt}^{2021}) - f(Y_{Kct}^{2011}, Y_{ht}^{2011}, Y_{Kset}^{2011}, FY_{Kt}^{2011}, T_{pt}^{2011}, FT_{pt}^{2011}) \\ \approx dY_{Kct} \frac{\partial f}{\partial Y_{Kct}} + dY_{ht} \frac{\partial f}{\partial Y_{ht}} + dY_{Kset} \frac{\partial f}{\partial Y_{Kset}} + dFY_{Kt} \frac{\partial f}{\partial FY_{Kt}} + dT_{pt} \frac{\partial f}{\partial T_{pt}} + dFT_{pt} \frac{\partial f}{\partial FT_{pt}}$$

where X^{2011} indicates that the 2011 ONS data are used for evaluating X . Hence, for evaluating the impact of the 2021 revision of the share of housing capital income in the national income Y_{ht} at date t we calculate:

$$\frac{|dY_{ht}|}{|dY_{Kct}| + |dY_{ht}| + |dY_{Kset}| + |dFY_{Kt}| + \frac{|dT_{pt}|}{1 - T_{pt} - FT_{pt}} + \frac{|dFT_{pt}|}{1 - T_{pt} - FT_{pt}}}$$

The impact of the revision over a period is finally evaluated as the mean of impacts at each date of the period. For example, between 1987 and 2010, we calculate:

$$IMPACT(Y_{ht}) = \frac{1}{23} \sum_{t=1987}^{2010} \frac{|dY_{ht}|}{|dY_{Kct}| + |dY_{ht}| + |dY_{Kset}| + |dFY_{Kt}| + \frac{|dT_{pt}|}{1 - T_{pt} - FT_{pt}} + \frac{|dFT_{pt}|}{1 - T_{pt} - FT_{pt}}}$$

We calculate this impact over the years 1987-2010 for the main components Y_{Kct} , Y_{ht} , Y_{Kset} and FY_{Kt} . As can be seen above in below Table 2, the largest impact is for the share of housing capital income, Y_{ht} (55%). **It should be noticed that the impact of Y_{ht} is much larger if restricting the calculation to 1987-1998 (60%).**

Please note that this estimate of the impact is conservative. An alternative definition could also be to estimate impacts by replacing absolute values by squared terms. In such case, the impact Y_{ht} is even larger (around 79% in 1987-2010; 85% in 1987-1998; and 74% in 1998-2010).

Impact of housing capital income update, Y_{ht}	55%
Impact of foreign capital income update, FY_{Kt}	8%
Impact of non-corporate capital income update, Y_{Kset}	4%
Impact of corporate capital income update, Y_{Kct}	13%
Impact of product tax update, T_{pt}	14%
Impact of foreign product tax update, FT_{pt}	5%

Table 2: Summary of the impacts of the main component updates on the capital share for the 1987-2009 period.

The table does not provide the impact of the government capital income update, as Y_{kt} is defined excluding government interests.

3.2 Analysis of the main components of Labor Income

Figure 6 shows the shares of corporate, government, self-employment, and foreign labor incomes using UK national account data published in 2011 and 2021.

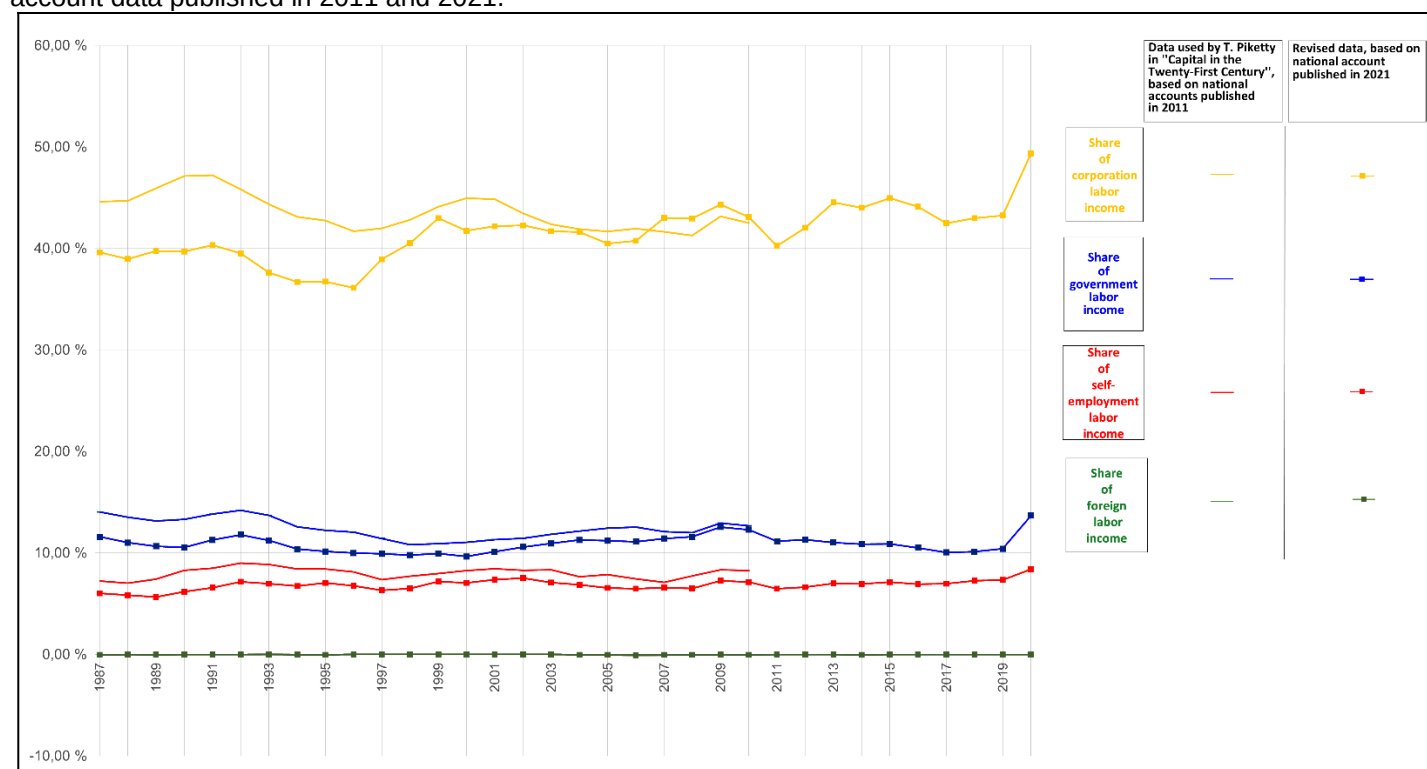


Figure 6: Main components of Labor Income as percentage shares, using data from UK national accounts published in 2011 and 2021

Table 3 presents a summary of the MAPE in the comparison of the 2011 and 2021 evaluations. We also report the minimal and maximal absolute percentage errors in the 1987-2010 time period. **The MAPE for the share of Labor Income is around 8%**, with values ranging from 0% to 16%.

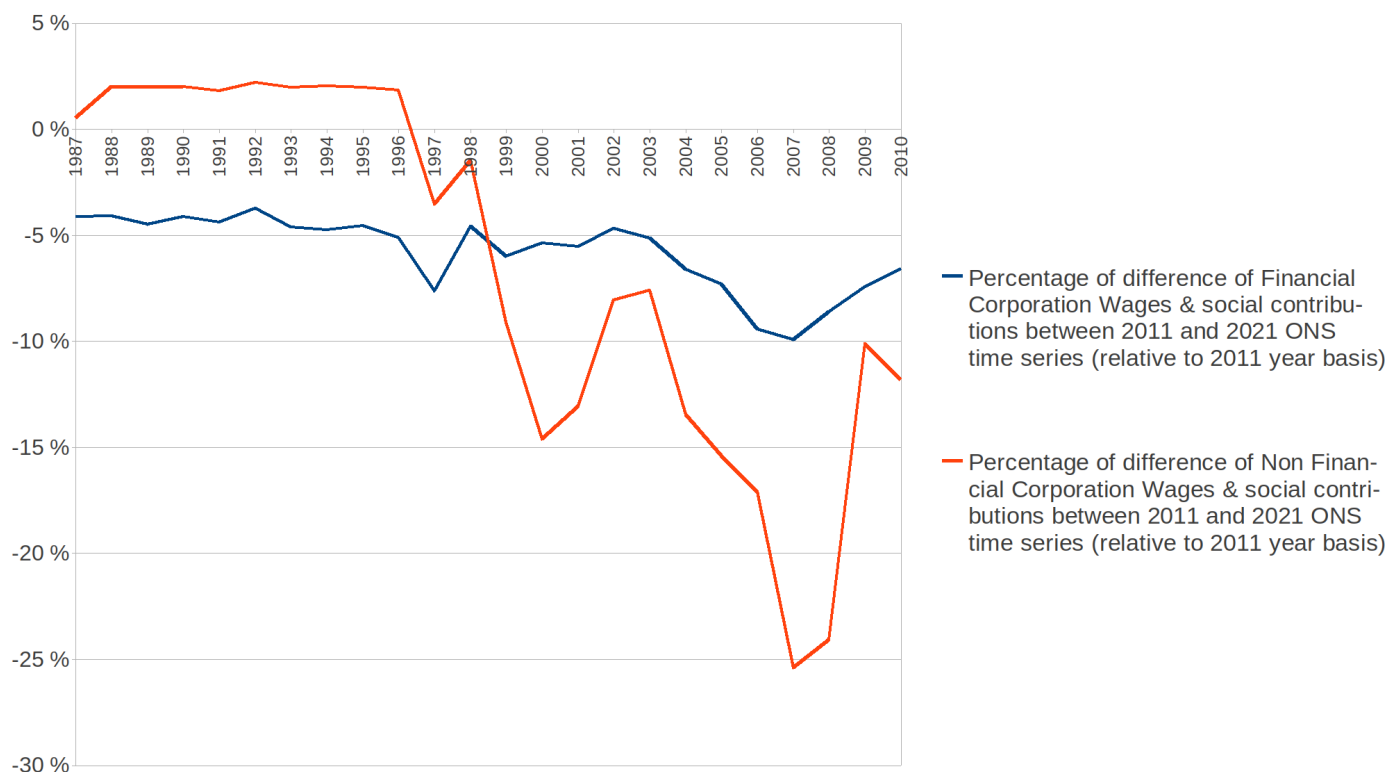
We can see that the 2021 update impacts quantitatively mainly two components:

- a decrease of the share of self-employment labor income. The **MAPE in that period** is around **13%**, with values ranging from 4% to 21%,
- a decrease of the share of foreign labor income. The **MAPE in that period** is around **10%**, with values ranging from 3% to 15%.

	Share of Labour Income	Share of self-employment Labor Income	Share of foreign Labor Income	Share of government Labor Income	Share of corporation Labor Income
Minimal absolute percentage of errors for 1987-2010 period	0%	4%	3%	1%	1%
Maximal absolute percentage of errors for 1987-2010 period	16%	21%	15%	17%	12%
MAPE for 1987-2010 period	8%	13%	10%	10%	6%

Table 3: Summary of the MAPE for labor share components evaluated using 2011 and 2021 ONS data.

We notice another significant impact from the 2021 update: **an increase rather than a decrease of the share of corporate labor income** (from ~40% in 1987 to ~43% in 2019 in 2021 version, vs. ~45% in 1987 to ~43% in 2010). This change of slope is explained by upward revisions of both Financial and Non-Financial Corporation Wages and social contributions⁷. Figure 7 shows the percentage difference between the 2011 and 2021 data for the 1987-2010 period. We can see that the changes are more important in recent years.

**Figure 7: Percentage difference of Corporation Wages and social contributions of Financial and Non Financial Corporations between 2011 and 2021 ONS data for the 1987-2010 period.**

As for the share of Capital Income in National Income we estimate using the MAPE the impact of the 2021 revision for each component separately keeping all others equal. More precisely, T. Piketty defines the share of labor income as follows, and it can be written as a function g of its main components:

$$Y_{Lt} = \frac{Y_{Lct} + Y_{gt} + Y_{Lset} + FY_{Lt}}{1 - T_{pt} - FT_{pt}} = g(Y_{Lct}, Y_{gt}, Y_{Lset}, FY_{Lt}, T_{pt}, FT_{pt})$$

where:

- Y_{Lt} is the share of labor income over the national income,
- Y_{Lct} is the share of corporation labor income in the national income,
- Y_{gt} is the share of government labor income in the national income,
- Y_{Lset} is the share of self-employment labor income in the national income,
- FY_{Lt} is the share of foreign labor income in the national income.

We calculate this impact over the years 1987-2009 for the main components Y_{Lt} , Y_{Lct} , Y_{gt} , Y_{Lset} and FY_{Lt} .

As can be seen in Table 3 and Table 4 below, even though the MAPE for the share of corporate labor income Y_{Lct} is relatively modest (8%) over the 1987-2009 period, it has the largest impact (36%) in the share of labor income Y_{Lt} . Indeed, this component is the largest contribution to Y_{Lt} . The impact of Y_{Lct} is even much larger if restricting the calculation to 1987-1998 (40%).

⁷ These two time series are respectively the FCFV and NHCR time series of tab DataUK in UK.xls's T. Piketty file.

Impact of self-employment labor income update, Y_{iset}	17%
Impact of foreign labor income update, FY_{Lt}	0%
Impact of government labor income update, Y_{gt}	17%
Impact of corporation labor income update, Y_{lct}	36%
Impact of product tax update, T_{pt}	22%
Impact of foreign product tax update, Ft_{pt}	8%

Table 4: Summary of percentage change difference (in absolute value) between UK labor share components using the 2011 and 2021 bases for 1987-2010 time period.

4. Conclusion

T. Piketty shows that the distribution of capital being more concentrated than that of income, a growth of capital income faster than that of labor income increases income inequalities. Yet, for about the last 35 years, we observe in the United Kingdom that the share of Capital Income in the National Income has decreased. **It thus cannot be concluded in this case that concentration of capital ownership has tended to increase income inequality in the past few decades.** Of course, this does not prejudge the evolution of the latter since labor income inequalities may have increased at the same time independently. **In conclusion, it would be of great interest if the charts of "Capital in the Twenty-First Century" were updated with more recent data,** which would be consistent with the research spirit of T. Piketty's work. Indeed, the retrospective national stock accounts (including annual and consistent balance sheets) of developed countries are, as T. Piketty and G. Zucman say, "still in their infancy", while being nonetheless "the best data for studying wealth accumulation"⁸. Taking into account the continuous improvement of the data and the impact for the modelling is of paramount importance for addressing accurately the different macro-economic questions raised.

⁸Thomas Piketty, Gabriel Zucman, Capital is Back: Wealth-Income Ratios in Rich Countries 1700–2010, *The Quarterly Journal of Economics*, Volume 129, Issue 3, August 2014, Pages 1255–1310, <https://doi.org/10.1093/qje/qju018>