# ONLINE APPENDICES: NOT FOR PUBLICATION UNLESS REQUESTED

## Appendix A: Data

This Appendix summarises information about data sources and the different series we use. Table A-1 provides more detailed information, including links to the datasets if they are publicly available.

### Office for National Statistics (ONS) / National Accounts

All ONS series can be accessed via the website of the ONS (see series codes in Table A-1).[1]

- **Wages and salaries (employees):** These are basic gross wages of employees, including bonuses and overtime pay (for details see Table A-1). The number in the national accounts is an annual aggregate for all employees. To get to an hourly measure, we divide by total hours worked (see below). The ONS mostly bases the series on official tax records / HMRC data (with small adjustments).[2]
- **Compensation of employees:** This equals series D.11 Wages and Salaries plus D.12 Social Contributions (following national accounting conventions). For the wages and salaries part, see above. The social contributions component is also based on HMRC data and pension surveys that give information on pension entitlements.
- **Nominal GDP:** Reflects total value of goods and services produced in the UK economy.
- **Nominal GVA:** Similar to GDP, but excludes product taxes and includes product subsidies. GDP = GVA + product taxes – product subsidies
- **Nominal NDP:** Net domestic product equals GDP minus depreciation of capital.
- **Total hours worked per week:** These are total number of hours worked per week by all workers (i.e. employees, self-employed, and others). The data is officially provided in the UK national accounts, but is based on LFS estimates

[1] A glossary with definitions of many different terms used in the following can be found on the ONS's website: https://www.ons.gov.uk/economy/grossdomesticproductgdp/compendium/unitedkingdomnationalaccountsthebluebook/2017/glossary (last accessed on 14 July 2021).

[2] For very recent years where tax data is not yet fully available ONS uses data from the Average Weekly Earnings (AWE) survey and other sources to create proxies. This only affects 2019 in our analysis.

- **Mixed income:** The aggregate of different flows generated by unincorporated business that are owned by households (sole proprietors). For details, see Table A-1. It includes both self-employed individuals as well as partnerships (so-called quasi-corporations), which for example include doctors that work under the National Health Service (NHS). The data are adjusted for undeclared income and include tax-deductible interest payments as well as and employers' contributions to the NHS pension fund. This is mostly based on HMRC tax data. An exception is made for agricultural HMRC data, which is substituted out with data from the UK government's department for Environment, Food, and Rural Affairs (DEFRA).[3]
- **Gross operating surplus:** We take the gross operating surplus of corporations. This can be interpreted as the surplus coming from production of goods/services by corporations before adjusting for property income flows.
- **Consumer Price Index (CPI) deflator:** A measure of inflation by looking at the prices of a basket of the same goods over time. The ONS only provides CPI estimates from 1988 onwards. As a result, we use the CPI deflator from the OECD statistics database (see below) throughout the paper and only make use of the ONS's CPI in the Appendix. The ONS's headline measure for inflation is the Consumer Price Index including owner occupiers' housing costs (CPIH). This series also does not go back consistently far enough, so we use the similar CPI instead.[4]
- **GDP deflator:** Deflator to convert nominal (current price) GDP to real (chain volume) GDP. Unlike the CPI, there is no fixed basket of goods to calculate inflation.[5]
- **GVA deflator:** Deflator to convert nominal (current price) GVA to real (chain volume) GVA. Unlike the CPI, there is no fixed basket of goods to calculate inflation.[6]

[3] For more information, see: https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/articles/nationalaccountsarticles/areviewofhouseholdsmixedincomeestimatesandplansforupcomingimprovements (last accessed on 14 July 2021)

[4] For more information, see: https://www.ons.gov.uk/economy/inflationandpriceindices/bulletins/consumerpriceinflation/march2021 (last accessed on 14 July 2021)

[5] For more information, see: https://www.ons.gov.uk/economy/nationalaccounts/supplyandusetables/articles/nationalaccountsdeflatorstrategy/september2020 (last accessed on 14 July 2021)

[6] For more information, see: https://www.ons.gov.uk/economy/nationalaccounts/supplyandusetables/articles/nationalaccountsdeflatorstrategy/september2020 (last accessed on 14 July 2021)

**OECD**

- **Employment numbers:** Total employment numbers (ETONC) come from "Dataset 3. Population and employment by main activity" for all years. Employee numbers (EEMNC) come from the same dataset for year 1983 and after. Pre-1983, employee numbers are approximated via growth rates of employee numbers in "Trade Union Dataset". The number of self-employed is calculated as total employment minus employees.
- **Consumer Price Index (CPI) deflator:** For CPI methodology, see ONS description. The OECD CPI goes back further in time.
- **Cross country comparison of self-employed rates:** Taken from the OECD statistics database. The OECD definition for self-employment is: *"Self-employment is defined as the employment of employers, workers who work for themselves, members of producers' co-operatives, and unpaid family workers. The latter are unpaid in the sense that they lack a formal contract to receive a fixed amount of income at regular intervals, but they share in the income generated by the enterprise. Unpaid family workers are particularly important in farming and retail trade. All persons who work in corporate enterprises, including company directors, are considered to be employees. Self-employment may be seen either as a survival strategy for those who cannot find any other means of earning an income or as evidence of entrepreneurial spirit and a desire to be one's own boss. Employed people are as those aged 15 or over who report that they have worked in gainful employment for at least one hour in the previous week or who had a job but were absent from work during the reference week.*"[7]

**Annual Survey of Hours and Earnings (ASHE) / New Earnings Survey (NES)**

ASHE is based on a panel of 1% of employees that are selected randomly by the last two digits of their National Insurance (Social Security) number. ASHE covers about 180,000 jobs in 2018, making it the largest micro survey used in this paper. Employee jobs are weighted to population totals by using LFS data. ASHE was first constructed in 2004. Outliers are not edited. Before 1997, data come from NES, a survey which covers people in the "PAYE system". A major difference between ASHE and NES is that ASHE includes more low-paid jobs and has imputations for non-responses. For the period between 1997 and 2003, initial data come

[7] https://data.oecd.org/emp/self-employment-rate.htm (last accessed on 16 July 2021)

from NES, but are adjusted with ASHE methodology. Further methodology changes were made in 2006 and 2011, inter alia with changes in the sample size. Apart from methodological changes.

Mean and median hourly pay from ASHE were provided to us by Whittaker (2019). This is defined as "...gross pay before tax, national insurance or other deductions and exclude earnings in kind". It includes pay for overtime work and is very similar to the ONS data, the notable difference is the exclusion of benefits in kind. These are hourly values, so there is no need to divide by total hours worked.

**Labour Force Survey (LFS) / General Household Survey (GHS)**

LFS currently covers about 40,000 households and is conducted quarterly. As it is a voluntary survey for employees, it suffers from relatively low response rates compared to administrative data (about 60%), so weights are included to correct for this. People are asked about earnings, demographics, education, social mobility, their health, and other topics. This is a much broader spectrum of questions than in the ASHE survey. LFS data exclude all earnings above £100 per hour.[8] Due to this top coding and because high earners are less likely to respond, average earnings in LFS are believed to be somewhat downward-biased.

LFS was first conducted in 1973. However, in years before 1992, questions about wages are less comprehensive and the survey was conducted bi-annually. For this reason, we use wage data from the General Household Survey (GHS)[9] before 1992 and splice them together as in Pessoa and Van Reenen (2013).

The definition of earnings is similar to ONS wages and salaries, although it excludes benefits in kind. These are given as hourly values. We use data from the October-December quarter.

Whereas LFS does not collect income data for the self-employed, it does provide shares in employment. A solo self-employed person in LFS is defined as being self-employed and not employing other workers.

[8] This aims to reduce bias due to incorrect responses because a household member can answer questions for another member of the household (which may lead to inaccuracies).

[9] GHS was last conducted in 2007 and had a smaller sample size than LFS.

**Family Resources Survey (FRS)**

We accessed the FRS through the UK Data Service. It comes from the UK's Department for Work and Pensions.

The survey was launched in 1992, and data is first available for the financial year 1993/1994. It has since been running on a yearly basis. 38,967 households were invited to participate in Great Britain for the 2018/2019 year (it only covered Great Britain pre-2002 and now also includes Northern Ireland), and less than 60% took part.[10] Respondents are asked a large amount of questions on household characteristics (age, marital status etc.), income, hours, etc. We draw on the FRS's self-employed as well as employee income data, hours worked, and employment status.

There have been changes to variable definitions or labelling over time. Most of these changes occurred in the 1990s. As a result, we start our analysis in 1997. When slight changes in variable labelling or definitions where made afterwards, we do not observe major breaks in the data.

In FRS, the distinction between employees and self-employed follows the definition of the International Labour Organization (ILO). An employee is defined as someone who has an arrangement with an employer and gets a wage or salary in return. Self-employed are defined as people who have regular working activities, but are not working for an employer (responsible for themselves). If people hold multiple jobs (e.g. an employee job and a self-employed job), FRS identifies the main job of someone as the job which the respondent states as her main activity, or otherwise the job which takes more hours per week.[11] This is how we classify the job type of a person. If a person works on multiple jobs, we take the sum of income/hours of all these jobs to build aggregate values.

*Self-employed income* is defined as "The total amount of income received from self-employment GROSS of tax and national insurance payments, based on profits where individual considers themselves as running a business, on estimated earnings/drawings otherwise" (official definition of variable *INCSEO2*). This is a weekly measure.

*Employee income:* We take the variable *UGRSPAY* . If a person can consult a payslip, it is defined as "Gross wage/salary shown on payslip" (definition of variable *GRWAGE* which is used to record a person's wage if she can report wages from a payslip). If no payslip is available, wages are derived from several other variables. This is a weekly measure.

[10] Sampling frameworks in Great Britain and Northern Ireland differ slightly. Our analysis includes both data from Great Britain and Northern Ireland.

[11] These information come from the FRS 2019-20 Background and Methodology guide, available at UKDS.

*Shares in total employment:* We use different variables to classify people as solo or non-solo self-employed. First, we classify someone as self-employed if the variable *ETYPE* (indicating employment type) is greater than 1 (and as employees if *ETYYPE==1*). We label someone as solo self-employed if *ETYPE* >1 and *EMPOWN*==1 (the latter indicating that someone works on its own). Analogously, we label someone as non-solo self-employed if *ETYPE* >1 and *EMPOWN*==2 (the latter indicating that someone employs other workers).

*Total hours worked:* These are usual hours worked per week (including paid overtime). We create our own hours variable by taking the sum of *USUHR* (usual hours worked, no overtime) and *POTHR* (paid overtime hours). FRS also has a variable showing unpaid overtime hours. However, we decide not to take this into account because we are worried that they might be inaccurately measured. This also corresponds to the methodology the data providers use to generate headline hours variables (no unpaid overtime is included). We are not taking pre-defined hours variables provided by the data provider because these variables have seen changes definition over time. Including unpaid overtime hours in the analysis leads to a slight upward shift of average hours worked by all three groups, but trends do not change much.

## Table A-1: Summary of data sources

| Source | Name | Description | Notes | Website |
|---|---|---|---|---|
| ONS | Wages and salaries (employees) | Basic wages, cost-of-living allowances, and other guaranteed and regularly paid allowances. It also includes:<br>i) enhaced rates of pay for overtime, night work, hazardous circumstances.<br>ii) bonuses and gratuities regularly paid<br>iii) remuneration for time not worked<br>iv) bonuses and gratuities paid (productivity, Christmas, holydays, transport, etc)<br>v) payments in kind (meals, vehicles, provision of workplace creches, etc) | Definition of this wage measure and the others (ASHE, GHS/LFS) are similar. Differences between them must be due to sample bias, differences in the way surveys are conducted, Scott's modifications in the surveys, and adjustments made in the ONS measures that are not explicit. This measure is heavily based on HMRC tax data. To convert this to hourly wages, we divide by total hours worked of employees. ONS identifier: NQAU, date downloaded: 27/04/21 | https://www.ons.gov.uk/ |
| | Compensation of employees | It is equal to Wages and salaries plus social contributions (incurred by employers in order to ensure their employees are entitled to social benefits). This latter account includes:<br>vi) employer contribution to statutory social security schemes or to private funded social insurance schemes<br>vii) unfunded employee social benefits paid by employers in the form of: (a) children's, spouse's, family, education or other allowances in respect of dependants; (b) payments made to workers because of illness, accidental injury, maternity leave, etc.; (c) severance payments | This measure is heavily based on HMRC tax data.ONS identifier: DTWM, date downloaded: 27/04/21 | |
| | GDP (nominal) | Nominal gross domestic product | ONS identifier: YBHA, date downloaded: 27/04/21 | |
| | GVA (nominal) | Gross value added (GVA) is equal to GDP, minus taxes on products (for example, value added tax, alcohol duty), plus subsidies on products. | ONS identifier: ABML, date downloaded: 27/04/21; use series NZHC (product subsidies) and NZGW (product taxes) to see where differences between GDP and GVA come from | |
| | Total hours worked | Data from UK national accounts, estimates based on LFS. | We multiply weekly hours worked with 52 to get approximate annual hours. To separate total hours worked into employee/self-employed hours, we multiply total hours worked with the employee share/self-employed share in the respective year (see OECD section). ONS identifier: YBUS, date downloaded: 27/04/21 | |
| | Mixed income | Gross mixed income: "the aggregate of a variety of flows of value and rewards accrued by unincorporated businesses owned by households, namely sole proprietors. It contains an element of remuneration for work done by the owner or other members of the household that cannot be disassociated from their profit as an entrepreneur. Mixed income excludes imputed rentals from owner-occupied housing, as this is captured elsewhere in the national accounts." it covers self-employed individuals and quasi-corporarations. The ONS makes an adjustment for undeclared income. | For more information, see: https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/articles/nationalaccountsarticles/areviewofhouseholdsmixedincomeestimatesandplansforupcomingimprovements ONS identifier: QWLT, date downloaded: 27/04/21 | |
| | Gross operating surplus | Gross operating surplus of corporations, defined as: "The balance on the generation of income account. Households also have a mixed income balance. It may be seen as the surplus arising from the production of goods and services before taking into account flows of property income." | Used to create factor share via ONS (2018) to approximate share of labour income of self-employed in mixed income. ONS identifier: CGBY, date downloaded: 27/04/21 | |
| | CPI | Consumer Price Index. Official ONS series only availabe from 1988 onwards. Growth rates from OECD CPI series applied for years pre-1988. | Source of OECD CPI series for years pre-1988: https://data.oecd.org/price/inflation-cpi.htm ONS identifier: D7BT, date downloaded 27/04/21 | |
| | GDP deflator | Implied GDP deflator | ONS identifier: YBGB, date downloaded: 27/04/21 | |
| | GVA deflator | Implied GVA deflator | ONS identifier: CGBV, date downloaded: 27/04/21 | |
| OECD | Total employment/number of employees/number of self-employed | Used to derive the share of employees/self-employed in total employment. Total employment numbers (ETONC) come from "Dataset 3. Popultation and employment by main activity" for all years. Employee numbers (EEMNC) come from the same dataset for year 1983 and after. Pre-1983, employee numbers are approximated via growth rates of employee numbers in "Trade Union Dataset". The number of self-employed is calculated as total employment minus employees. | Downloaded on 18/03/21 | https://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE3<br>https://www.oecd-ilibrary.org/employment/data/trade-unions/union-members-and-employees_data-00323-en |
| | CPI | Consumer Price Index | Used in baseline analysis. Downloaded on 25/02/21 | https://data.oecd.org/price/inflation-cpi.htm |
| ASHE/NES | Mean and median hourly pay | Defined as "...gross pay before tax, national insurance or other deductions and exclude earnings in kind".<br>Similar to ONS wages, although it does not include benefits in kind. | ASHE is different from GHS/LFS, it is derived from employers' records (not from survey over workers). ASHE is based on a panel of 1% of employees that are selected randomly by the last two digits of their National Insurance (Social Security) number. ASHE was first conducted in 2004. For 1997-2003, NES data with weighting from ASHE is used. Apart from the change in 2004, there have been chnanges in methodology in 2006, 2008, and 2011 (changes in sample size, inter alia to cover more low-paid jobs). | Provided by resolution foundation and most recent public release (NOMIS).<br>https://www.nomisweb.co.uk/ |
| GHS/LFS | Mean and median hourly earnings | Similar to ASHE. Also does not include benefits in kind. | LFS began in 1973 when it was bi-annual. It switched to being annual in 1983 and quarterly in 1992. The exact numbers of respondents have changed over time. It was 60,000 per quarter in 1992 and is currently about 40,000. For example, in 2017. Part of the time series include all the UK, while part includes only GB. LFS excludes earnings above £100/hour (to avoid false responses because someone can report earnings of other members of the household, which my lead to inaccuracies). This leads to a known underestimation of earnings in levels in LFS. Data for 1997 to 2019 come from most recent public releases. We apply growth rates of data used in Pessoa and Van Reenen (2013) for years pre-1997. | https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/distributionofgrosshourlyearningsofemployeesearn08<br>https://beta.ukdataservice.ac.uk/datacatalogue/series/series?id=2000026 |
| LFS | Shares in total employment | Share of employees in total employment. | Data obtained from Giulia Giupponi. | https://beta.ukdataservice.ac.uk/datacatalogue/series/series?id=2000026 |
| FRS | Employee income | Defined as "gross wage/salary shown on payslip" (weekly). | Variable name: UGRSPAY, converted to hourly income by dividing by total hours worked. We present data as 3-year moving averages to reduce volatility, with an exception for 1997 and 2019. Only adults between the age of 18 to 65 considered. | https://beta.ukdataservice.ac.uk/datacatalogue/series/series?id=200017 |
| | Self-employed income | Defined as "the total amount of income received from self-employment GROSS of tax and national insurance payments, based on profits where individual considers themselves as running a business, on estimated earnings/drawings otherwise" (weekly). We divide self-emplyed income by type of self-employed. | Variable name: INCSEO2, converted to hourly income by dividing by total hours worked. We present data as 3-year moving averages to reduce volatility. Only adults between the age of 18 to 65 considered. | |
| | Shares in total employment | Share of employees, solo self-employed, and self-employed with employees in total employment. | Solo self-employed: people who identify themselves as self-employed and do not have employees. Self-employed with employees: people who identify themselves as self-employed and do employ at least one person. Only adults between the age of 18 to 65 considered. | |
| | Total hours worked | Usual amount of hours worked per week | Variable name: USUHRS and POTHR. Only adults between the age of 18 to 65 considered. | |

***Note:*** *Updated from Pessoa and Van Reenen (2013).*

# Appendix B Additional Analyses

## B1 Extended decoupling analysis (1972 until 2019)

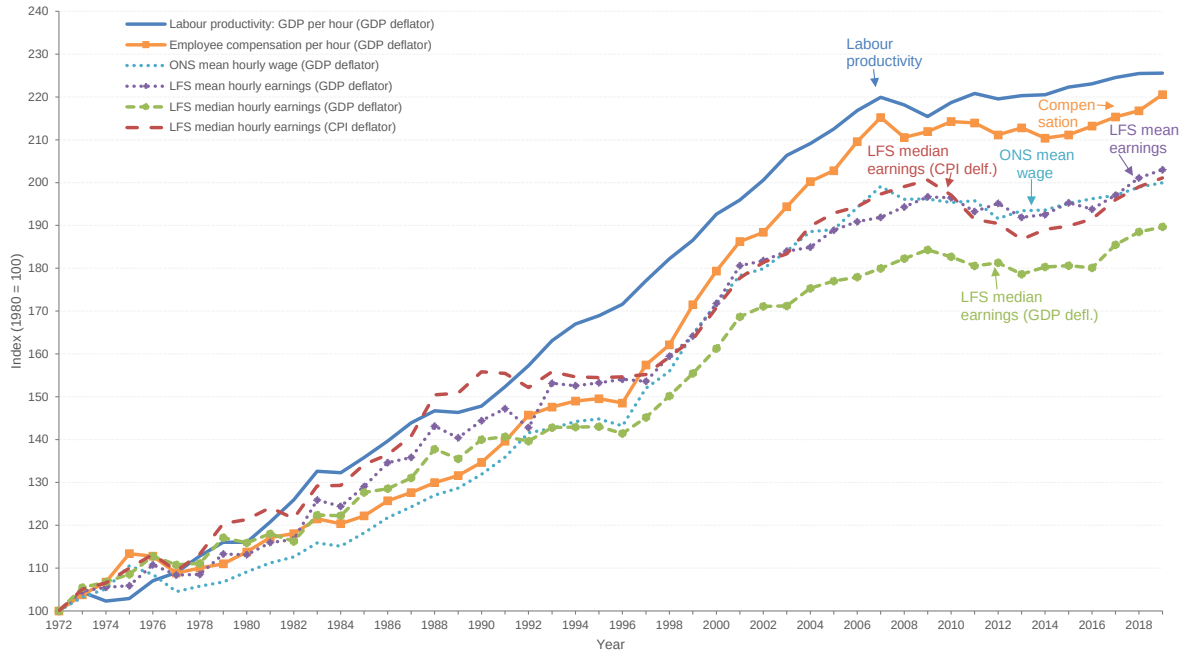
In the following, we extend the decoupling analysis back to 1972. It is important to note that data availability for years pre-1980 is limited, which makes it necessary to make more assumptions. This particularly holds for data covering the workforce composition (e.g. share of employees in total employment). As a result, the following analysis is likely to be more imprecise than the one in Section 2 of the main paper. This is the reason why we choose to present our baseline analysis in the main paper with 1980 as base period.

Figure B-1 shows the corresponding overall decoupling picture with all its different components, Figure B-2 provides the decomposition in 2019, and Figure B-3 displays the decoupling decomposition over time. We find an overall decoupling of labour productivity and LFS median hourly wages (deflated by the CPI deflator) of 24.5 percentage points between 1972 and 2019. Note that this is about 4 percentage points *less* than our results in Section 2. Non-wage compensation is the most important contributor (20.6 percentage points)[12], followed by inequality (13.3 percentage points). The deflator difference is now substantial with negative 11.4 percentage points. We now observe net decoupling of 5 percentage points.

This indicates that it matters which year is used as the base year in the analysis. However, the main implications from Section 2 of the main paper are generally consistent with the ones in this section: inequality and non-wage compensation explain most of overall decoupling.

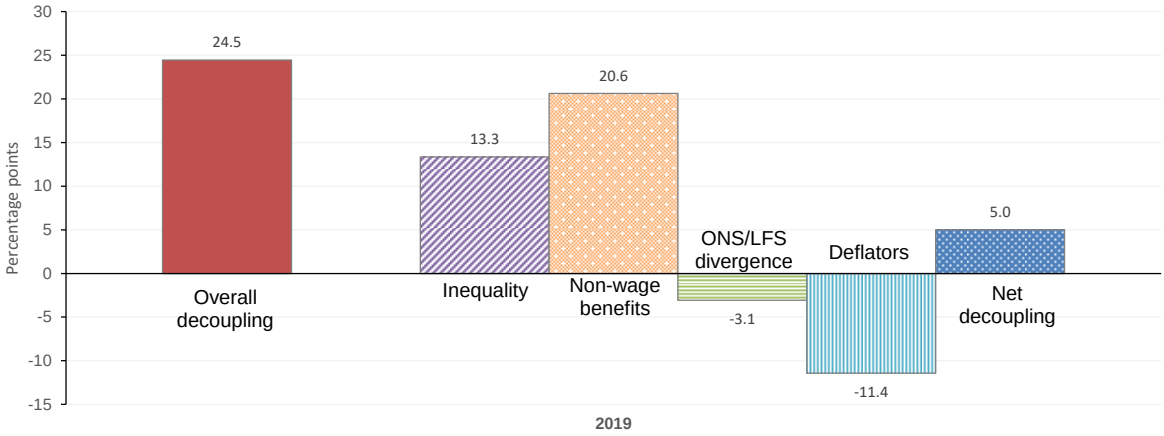
[12] This is mostly driven by substantial increases in employers' national insurance contributions pre-1980 (average annual increase of 21% between 1972 and 1980, compared with an average annual increase of 6% between 1980 and 2019).

**Figure B-1: Detailed decoupling analysis over time in the UK over a longer time period (1972 until 2019)**




***Note:*** *LFS, ONS, and OECD data (see Appendix A for details). All values are shown as an index, with the base year 1972 equalling 100. This graph is an extension of the analysis in Section 2 of the main paper by a couple of years. Labour productivity is total GDP divided by total hours worked deflated by the GDP deflator. Employee compensation is divided by total hours worked by employees deflated by the GDP deflator. ONS mean wage are total annual wages and salaries earned by employees divided by total hours worked by employees. Mean earnings from LFS are deflated by the GDP deflator, and median earnings are deflated by GDP deflator and CPI deflator respectively.*

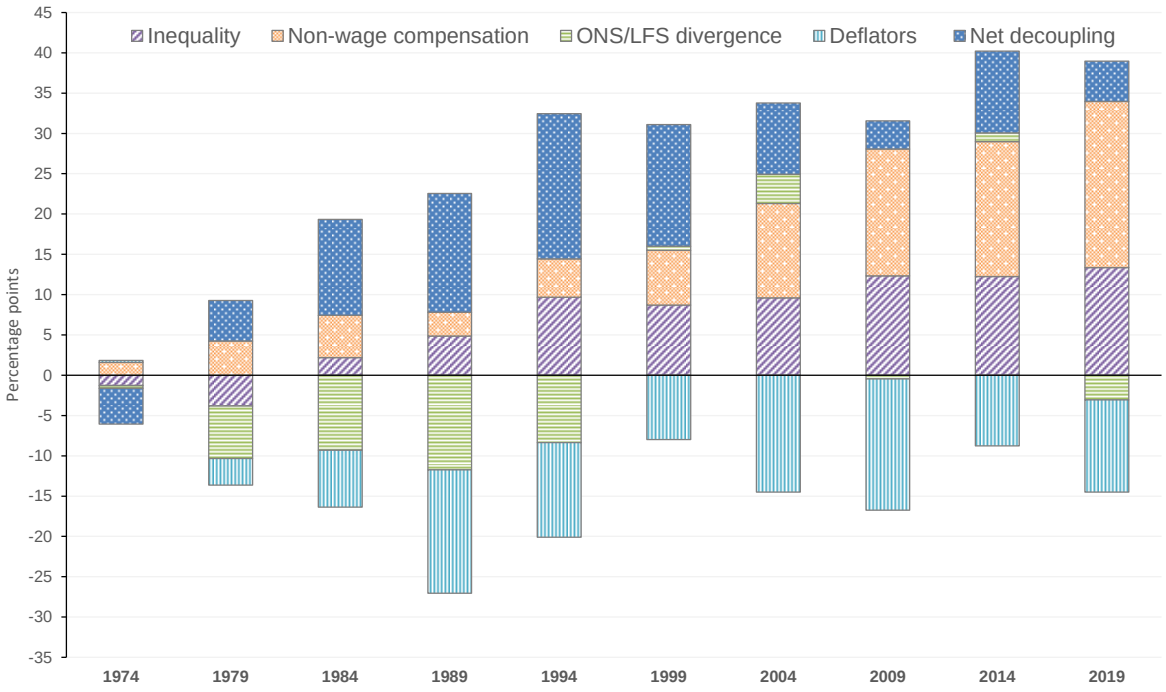
**Figure B-2: Decoupling decomposition in the UK (1972 until 2019, differences in 2019 only)**




***Note:*** *Decomposition the decoupling analysis in Figure B-1 into its single components. Values shown are the percentage point differences between the growth rates from 1972 until 2019 of selected series. Overall decoupling refers to the difference between GDP per hour (GDP deflator) and LFS median hourly earnings (CPI deflator); Inequality to the difference between LFS mean hourly earnings (GDP deflator) and LFS median hourly earnings (GDP deflator); Non-wage compensation to the difference between employee compensation per hour (GDP deflator) and ONS mean hourly wage (GDP deflator); ONS/LFS divergence to the difference between ONS mean hourly wage (GDP deflator) and LFS mean hourly earnings (GDP deflator); Deflators to the difference between LFS median*

*hourly earnings (GDP deflator) and LFS mean hourly earnings (CPI deflator); Net decoupling to the difference between GDP per hour (GDP deflator) and employee compensation per hour (GDP deflator).*

**Figure B-3: Decoupling decomposition in the UK (1972 until 2019, differences in selected years)**

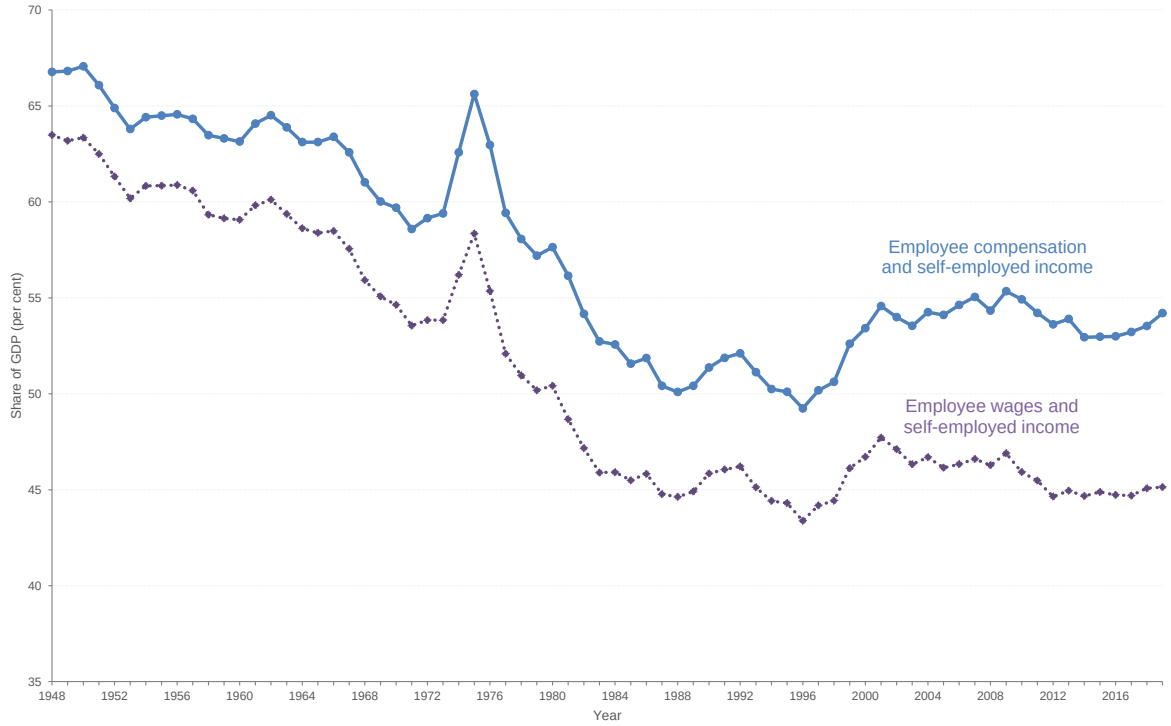



***Note:*** *Decomposition of the decoupling analysis in Figure B-1 into its single components. Values shown are the percentage point differences between the growth rates from 1972 until different subsequent years of selected series. Inequality refers to the difference between LFS mean hourly earnings (GDP deflator) and LFS median hourly earnings (GDP deflator); Non-wage compensation to the difference between employee compensation per hour (GDP deflator) and ONS mean hourly wage (GDP deflator); ONS/LFS divergence to the difference between ONS mean hourly wage (GDP deflator) and LFS mean hourly earnings (GDP deflator); Deflators to the difference between LFS median hourly earnings (GDP deflator) and LFS mean hourly earnings (CPI deflator); Net decoupling to the difference between GDP per hour (GDP deflator) and employee compensation per hour (GDP deflator).*

As we observe differences between the analyses with different base years, we now extend the analysis of the UK labour share by more than 30 years in Figure B-4. The blue line corresponds to the blue line in Figure 8 of the main paper, showing employee compensation and adjusted mixed income over GDP. We observe that over the aggregate period from 1948 to 2019, the share of compensation and adjusted mixed income in GDP has fallen by about 12 percentage points (from 66.8 to 54.2%). The fall has been even more substantial when looking at the period from 1948 to 1996: the labour share fell by more than 17 percentage points during this time, with an all-time low of less than 50% in 1996. Subsequent growth of compensation and mixed income have led to an increase afterwards. Comparing this to wages and adjusted mixed income as a share of GDP (i.e. excluding non-wage compensation for employees, the purple line), we observe that the trends look very similar. From 1948 until 1996, the difference

between the blue and the purple line has risen from about 3 to approximately 6 percentage points. As could be seen in the decoupling analysis, the difference has risen to more than 10 percentage points until 2019. This indicates that the notable divergence between wages and compensation observed in our decoupling analysis is a more recent phenomenon.

**Figure B-4: Labour share of GDP in the UK, estimated via different methods (1948 until 2019)**



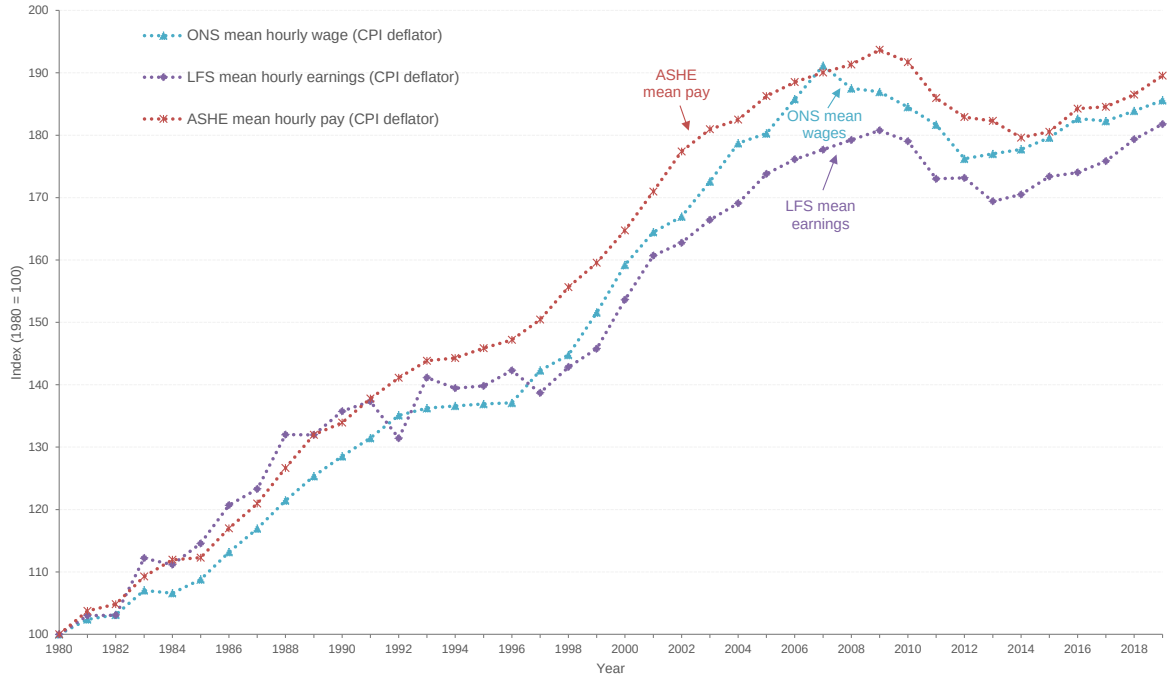

***Note:*** *Data from ONS (see Appendix A for details). The solid line with circles (blue) shows compensation and adjusted mixed income (an estimate for self-employed income that can be classified as labour income) over GDP. The dotted (purple) line shows wages and adjusted mixed income over GDP, i.e. it excludes non-wage compensation of employees (such as employers' pension contributions, employers' national insurance payments etc.).*

## B2 Decoupling analysis with ASHE instead of LFS data

Our analysis in Section 2 of the main paper showed that there are differences between trends in the ONS's national accounts data and LFS data for wages and salaries. Whereas ONS estimates are heavily based on HMRC data, the LFS is a survey. To assess how the results of the decoupling analysis change if a different survey than LFS is taken; we use this section to reproduce the decoupling analysis with administrative data from ASHE instead of LFS.

Figure B-5 compares trends in the growth of mean hourly wages from ASHE, LFS and ONS between 1980 and 2019 (all series are deflated by the CPI deflator). We observe that ASHE mean hourly wages have grown the most (by about 90%, compared with about 86% growth in ONS wages and about 82% growth in LFS wages). LFS wages have seen similar growth to ASHE wages until the beginning of the 1990s, and have grown slower afterwards.

**Figure B-5: Growth of mean hourly wages from ASHE, LFS, and ONS (1980 until 2019)**

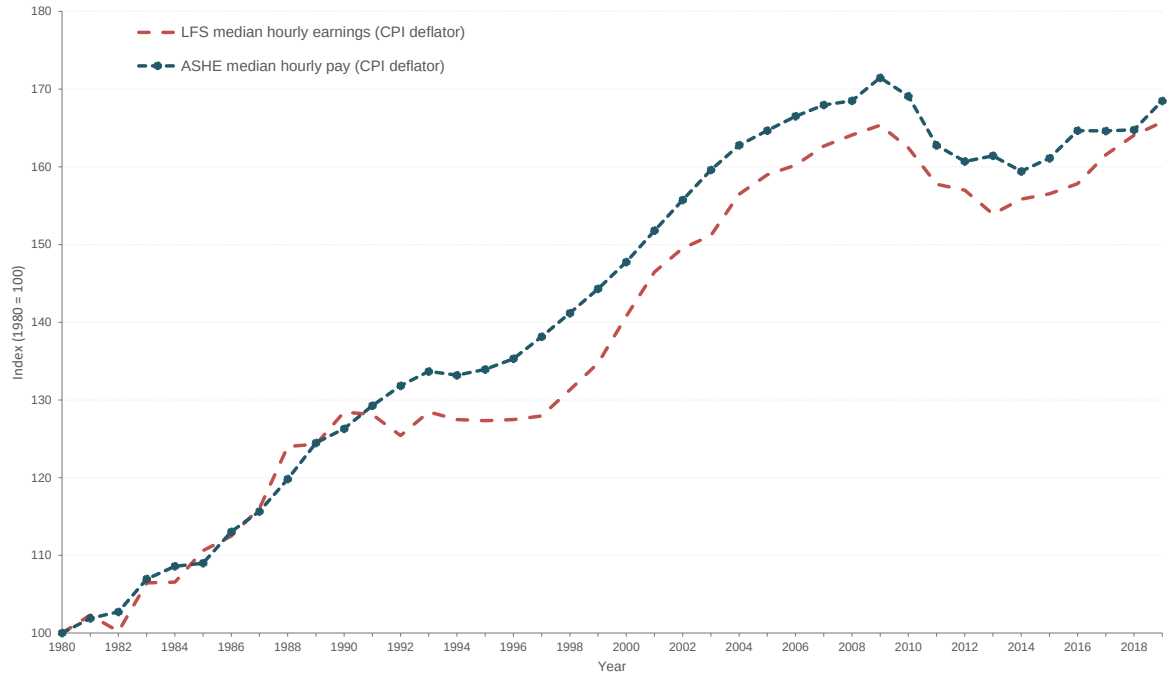



***Note:*** *Shown are mean hourly earnings from ONS, LFS, and ASHE (see appendix for details of similarities/differences between the data sources). All values are shown as an index, with the base year 1980 equalling 100.*

Looking at median wages in Figure B-6, we see that a similar difference between ASHE and LFS wages occurs in the beginning of the 1990s. Interestingly, LFS median hourly wages have grown faster than ASHE median hourly wages in more recent years. Overall, ASHE median hourly wages have increased by about 68%, and LFS median wages by about 66% from 1980 to 2019.[13]

[13] Note that there is no *median* wages and salaries series from the ONS (in the national accounts). This is the main reason why we have to use survey data from LFS and ASHE.

**Figure B-6: Growth of median hourly wages from ASHE and LFS (1980 until 2019)**



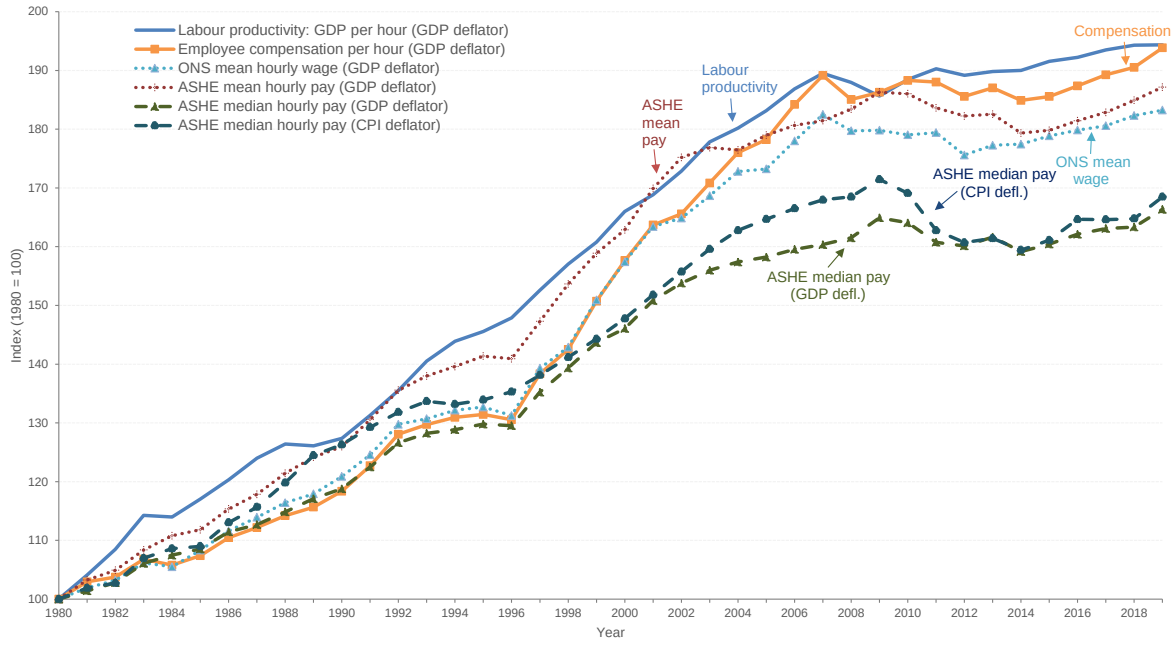

***Note:*** *Shown are median hourly earnings from LFS and ASHE (see Appendix A for details of similarities/differences between the two surveys). All values are shown as an index, with the base year 1980 equalling 100. Note that median earnings from ONS are not available.*

This shows that there are some differences between trends in LFS and ASHE wage data. In particular, ASHE data suggest faster growth of wages, which may reflect better coverage of high earners.

Figure B-7 shows decoupling trends over time when using ASHE data, Figure B-8 reports the decoupling decomposition in 2019, and Figure B-9 illustrates the decoupling decomposition over time. Using ASHE wages, we get an overall decoupling number of 25.9 percentage points (see Figure B-8), 2.7 percentage points less than the number we observed when we used LFS wages in the main paper. This is due to a faster growth of ASHE median wages compared with LFS median wages (see Figure B-6). Note from Figure B-8 that the contribution of non-wage compensation, deflators, and net decoupling towards overall decoupling does not change (the switch from LFS to ASHE data does not affect these). We observe a larger inequality figure compared with the results in Section 2 of the main paper - using ASHE wages, the inequality component amounts to 20.8 percentage points, 5 percentage points more than results based on LFS data suggest. As a result, inequality now explains an even larger share of overall decoupling compared with the LFS analysis (about 80 percent rather than 60 percent). As could be seen in Figure B-5, ASHE mean wages have grown faster than ONS mean wages, turning the sign of the LFS/ASHE and ONS divergence component.

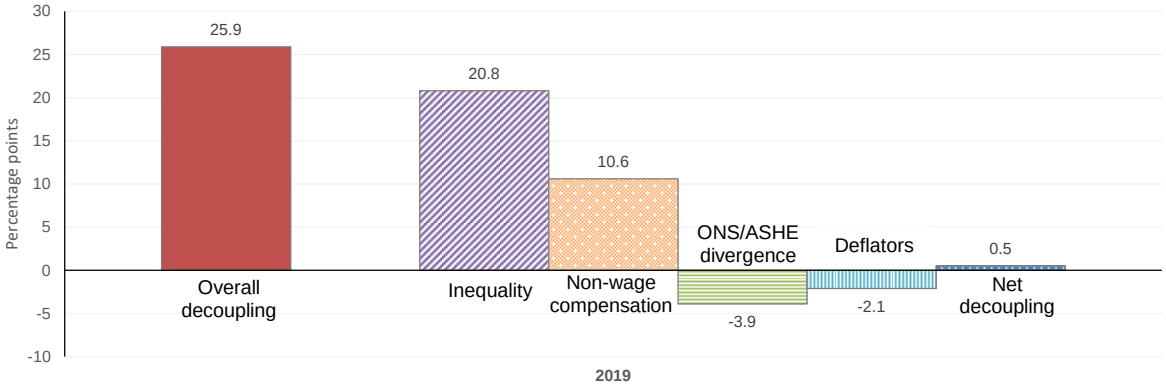
In summary, the exact contributions of some factors to overall decoupling change by a couple of percentage points when switching from LFS to ASHE wages. However, the overall picture seems consistent: the increase in inequality is the most important factor to explain overall decoupling, followed by the increase in non-wage compensation. Comparing Figure B-9 and the corresponding graph in the main part of the paper, we also do not observe major differences in the trends of the single components' contributions towards overall decoupling (with the exception of the LFS/ASHE and ONS divergence component).

**Figure B-7: Detailed decoupling analysis over time in the UK with ASHE wages (1980 until 2019)**



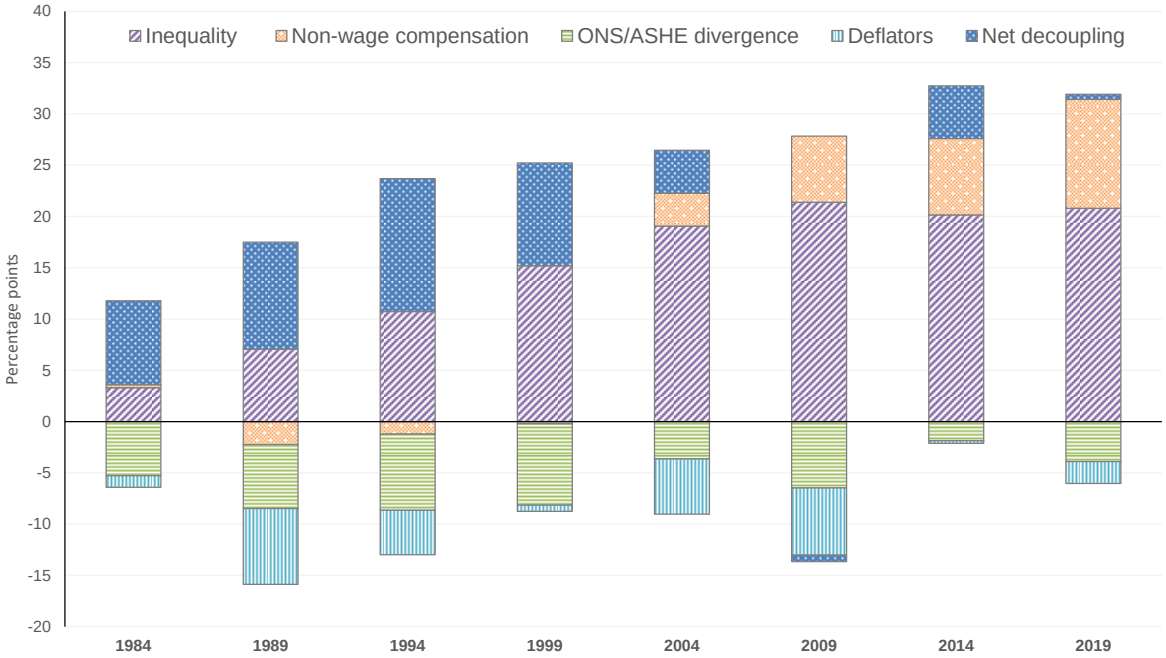

***Note:*** *ASHE, ONS, OECD data (see Appendix A for details). All values are shown as an index, with the base year 1980 equalling 100. This graph shows wage data from ASHE instead of LFS. Labour productivity is total GDP divided by total hours worked deflated by the GDP deflator. Employee compensation is divided by total hours worked by employees deflated by the GDP deflator. ONS mean wage are total annual wages and salaries earned by employees divided by total hours worked by employees. ASHE mean and median pay come from the Annual Survey of Hours and Earnings (ASHE). For conceptual differences between LFS and ASHE, see the data overview in Appendix A.*

**Figure B-8: Decoupling decomposition in the UK with ASHE wages (1980 until 2019, differences in 2019 only)**




***Note:*** *Decomposition of the decoupling analysis in Figure B-7 into its single components. Values shown are the percentage point differences between the growth rates from 1980 until 2019 of selected series. Overall decoupling refers to the difference between GDP per hour (GDP deflator) and LFS median hourly earnings (CPI deflator); Inequality to the difference between LFS mean hourly earnings (GDP deflator) and LFS median hourly earnings (GDP deflator); non-wage compensation to the difference between Employee compensation per hour (GDP deflator) and ONS mean hourly wage (GDP deflator); ONS/ASHE divergence to the difference between ONS mean hourly wage (GDP deflator) and ASHE mean hourly pay (GDP deflator); Deflators to the difference between ASHE median hourly pay (GDP deflator) and ASHE mean hourly pay (CPI deflator); Net decoupling to the difference between GDP per hour (GDP deflator) and Employee compensation per hour (GDP deflator).*

**Figure B-9: Decoupling decomposition in the UK with ASHE wages (1980 until 2019, differences in selected years)**



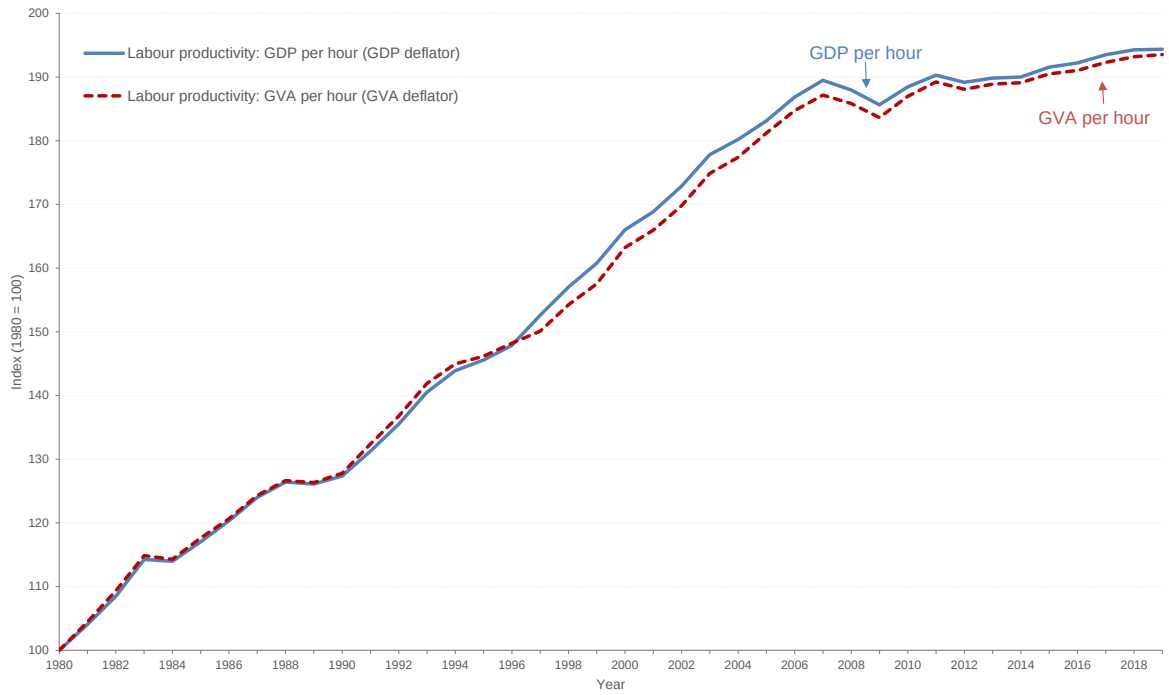

*Note: Decomposition of the decoupling analysis in Figure B-7 into its single components. Each bar represents a selected year between 1980 and 2019. Values shown are the percentage point differences between the growth rates from 1980 until the selected year of different series. Inequality refers to the difference between LFS mean hourly earnings (GDP deflator) and LFS median hourly earnings (GDP deflator); non-wage compensation to the difference between Employee compensation per hour (GDP deflator) and ONS mean hourly wage (GDP deflator); ONS/ASHE divergence to the difference between ONS mean hourly wage (GDP deflator) and LFS mean hourly earnings (GDP deflator);*

*Deflators to the difference between LFS median hourly earnings (GDP deflator) and LFS mean hourly earnings (CPI deflator); Net decoupling to the difference between GDP per hour (GDP deflator) and Employee compensation per hour (GDP deflator).*

## B3 Using Gross Value Added (GVA) instead of GDP

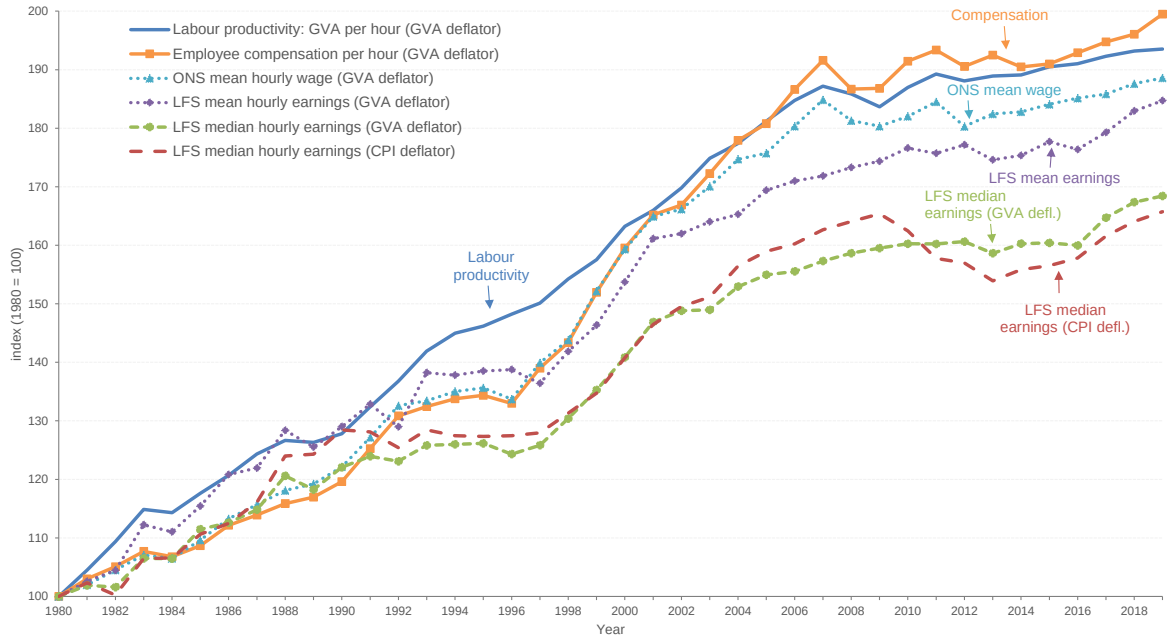
A potential challenge to the decoupling analysis is to use Gross Value Added (GVA) instead of GDP to measure labour productivity. Figure B-10 shows the growth rates of GDP (deflated by the GDP deflator) and GVA (deflated by the GVA deflator) per hour. We observe that real GDP has grown slightly faster than real GVA, but the difference is minor (less than 1 percentage point). Importantly, in nominal terms, GDP has grown substantially more than GVA over the last 40 years. This is because product taxes have grown substantially over the period, whereas product subsidies have not grown much (remember that GDP is defined as GVA plus product taxes less product subsidies).

**Figure B-10: Growth of GDP and GVA per hour (1980 until 2019)**




***Note:*** *Data from ONS (see Appendix A for details). The graph compares growth of GDP (deflated by the GDP deflator) and GVA (deflated by the GVA deflator) per hour. GDP equals GVA plus taxes on products less subsidies on products.*

**Figure B-11: Detailed decoupling analysis in the UK over time with GVA instead of GDP (1980 until 2019)**

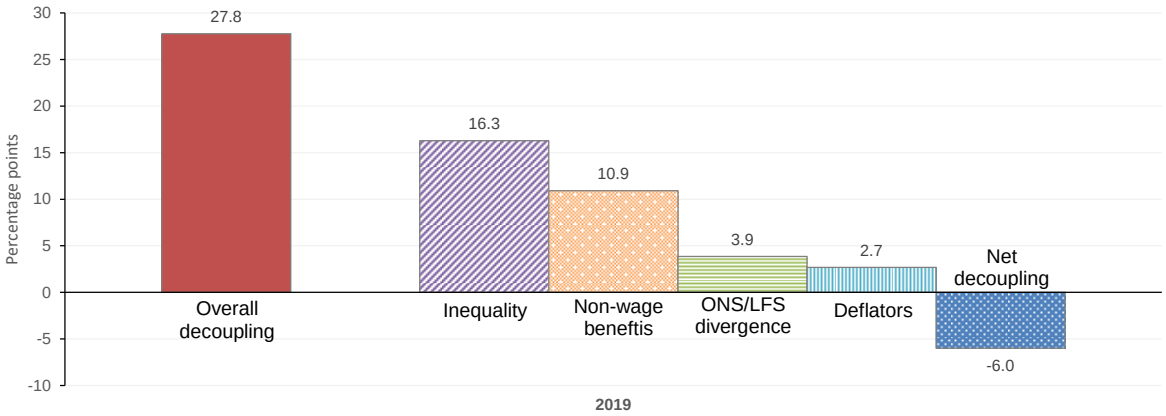



***Note:*** *LFS, ONS, and OECD data (see Appendix A for details). All values are shown as an index, with the base year 1980 equalling 100. This graph uses GVA per hour instead of GDP per hour as the measure for labour productivity. Consequently, wherever the GDP deflator was used previously, it is replaced with the GVA deflator. Labour productivity is total GVA divided by total hours worked deflated by the GVA deflator. Employee compensation is divided by total hours worked by employees deflated by the GVA deflator. ONS mean wage are total annual wages and salaries earned by employees divided by total hours worked by employees, deflated by the GVA deflator. LFS Mean earnings are deflated by the GVA deflator, and LFS median earnings are deflated by GVA deflator and CPI deflator respectively.*

Figure B-11 shows the decoupling analysis with GVA per hour as the productivity measure. Importantly, we use the GVA deflator to deflate the series for which we used the GDP deflator before, leading to changes in their growth rates compared with results in Section 2 of the main paper. A notable difference compared with the previous analyses occurs when looking at the growth of employee compensation (orange line) and GVA per hour/labour productivity (blue line): from 2005 onwards, the aggregate growth rate of employee compensation lies above the one of labour productivity. In 2019, net decoupling amounts to negative 6 percentage points, i.e. employee compensation has grown by 6 percentage points more than labour productivity. This is due to the relatively slow growth of nominal GVA compared with nominal GDP. Figure B-12 summarises this: Overall decoupling now amounts to 27.8 percentage points, 0.8 percentage points less than when taking GDP. The deflator component now contributes 2.7 percentage points to overall decoupling (i.e. GVA prices have increased less than consumer prices), whereas the deflator component amounted to negative 2.1 percentage points in Section 2 of the main paper.

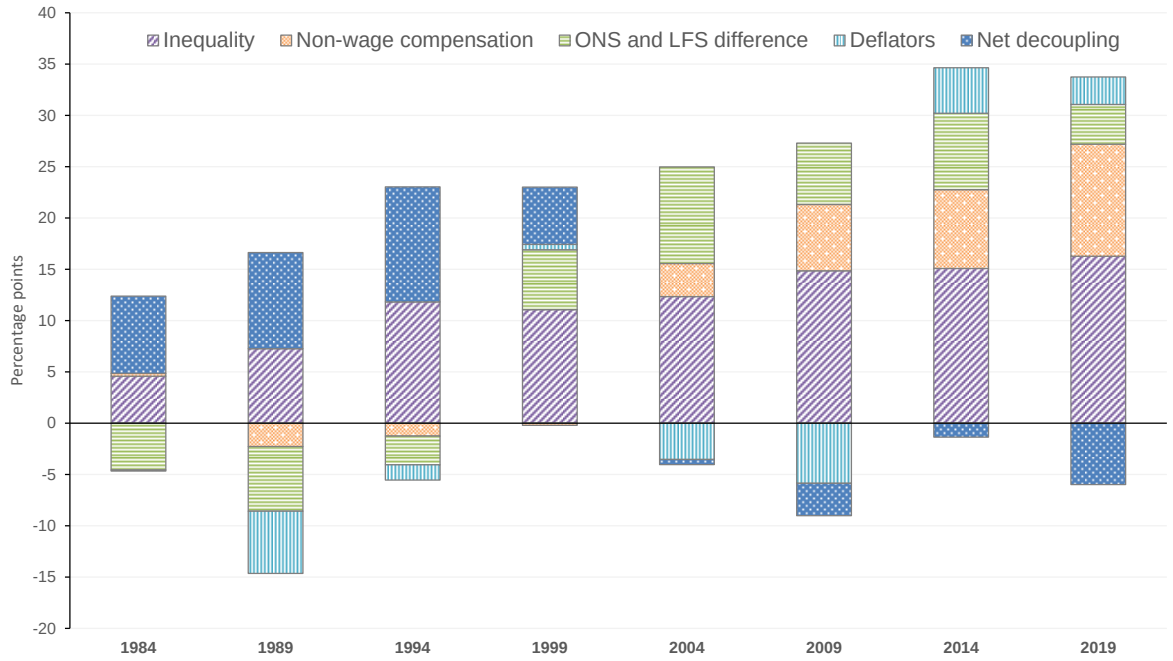
The evolution of the different decoupling components over time is shown in Figure B-13. Notably, there has been substantial net decoupling until the mid-1990s when using GVA. Faster growth of compensation compared with labour productivity afterwards has led to negative net decoupling.

**Figure B-12: Decoupling decomposition in the UK with GVA instead of GDP (1980 until 2019, differences in 2019 only)**




***Note:*** *Decomposition of the decoupling analysis in Figure B-11 into its single components. Values shown are the percentage point differences between the growth rates from 1980 until 2019 of selected series. Overall decoupling refers to the difference between GVA per hour (GVA deflator) and LFS median hourly earnings (CPI deflator); Inequality to the difference between LFS mean hourly earnings (GVA deflator) and LFS median hourly earnings (GVA deflator); non-wage compensation to the difference between employee compensation per hour (GVA deflator) and ONS mean hourly wage (GVA deflator); ONS/LFS divergence to the difference between ONS mean hourly wage (GVA deflator) and LFS mean hourly earnings (GVA deflator); Deflators to the difference between LFS median hourly earnings (GVA deflator) and ASHE mean hourly earnings (CPI deflator); Net decoupling to the difference between GVA per hour (GVA deflator) and employee compensation per hour (GVA deflator).*

**Figure B-13: Decoupling decomposition in the UK with GVA instead of GDP (1980 until 2019, differences in selected years)**



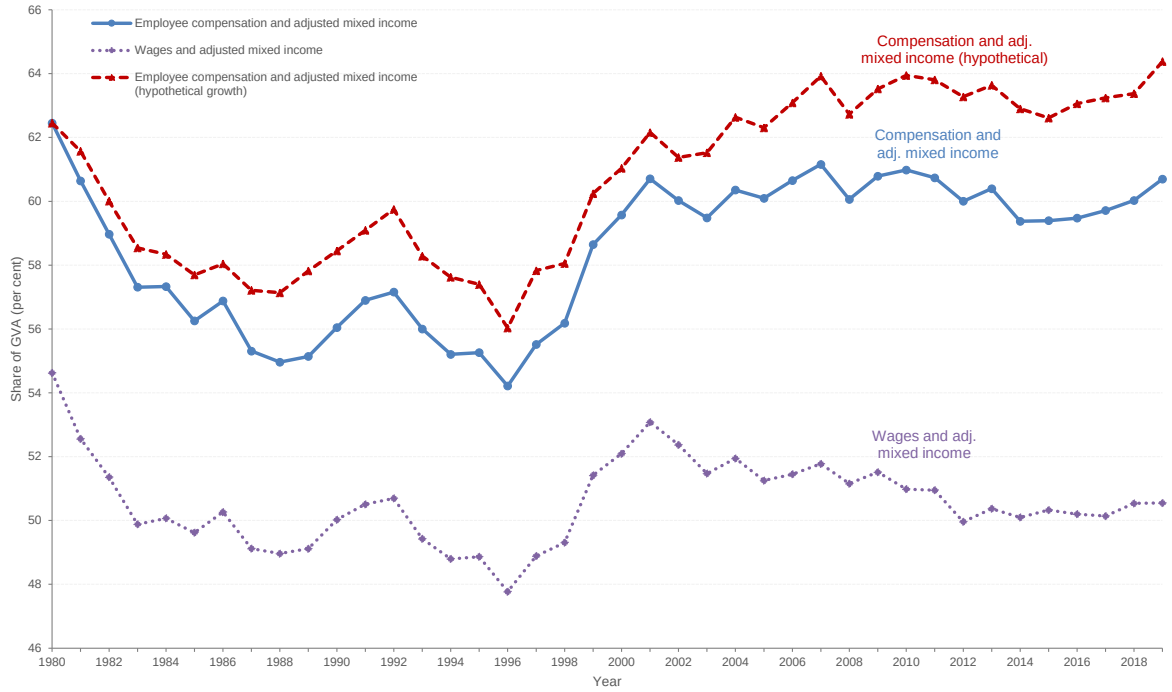

***Note:*** *Decomposition of the decoupling analysis in Figure B-11 into its single components. Each bar represents a selected year between 1980 and 2019. Values shown are the percentage point differences between the growth rates from 1980 until the selected year of different series. Inequality refers to the difference between LFS mean hourly earnings (GVA deflator) and LFS median hourly earnings (GVA deflator); non-wage compensation to the difference between Employee compensation per hour (GVA deflator) and ONS mean hourly wage (GVA deflator); ONS/LFS divergence to the difference between ONS mean hourly wage (GVA deflator) and LFS mean hourly earnings (GVA deflator); Deflators to the difference between LFS median hourly earnings (GVA deflator) and LFS mean hourly earnings (CPI deflator); Net decoupling to the difference between GVA per hour (GVA deflator) and employee compensation per hour (GVA deflator).*

## Labour share using GVA

Using GVA instead of GDP also leads to changes in the labour share. Whereas our labour share calculations in Section 3 of the main paper were based on GDP, we now redo the analysis with GVA. Figure B-14 shows the results. These are the same methods used in Section 3 of the main paper and colours coincide. The first notable difference is that the labour share of GVA is higher than that of GDP for all methods. This is simply because of the lower level of GVA compared with GDP (e.g. the method using compensation and adjusted mixed income leads to estimates of 62.5% in 1980 and 60.7% in 2019, whereas this amounts to 57.6% and 54.2% when using GDP). The smaller fall in absolute terms of the GVA measure can be explained by the slower growth of GVA compared with GDP over time. With GVA, we observe a 1.8 percentage point fall in the labour share from 1980 to 2019 (note that the fall amounted to 3.4 percentage points when we used GDP). If mixed income had grown at the rate of compensation per hour (red line), we would have observed an increase of almost 2 percentage points (from 62.5% in 1980 to 64.4% in 2019). Although the magnitude of the fall or increase in the labour

share changes when switching from GDP to GVA, the key observation does not change: the relatively slow growth in mixed income compared with compensation has led the labour share to end up below its potential.

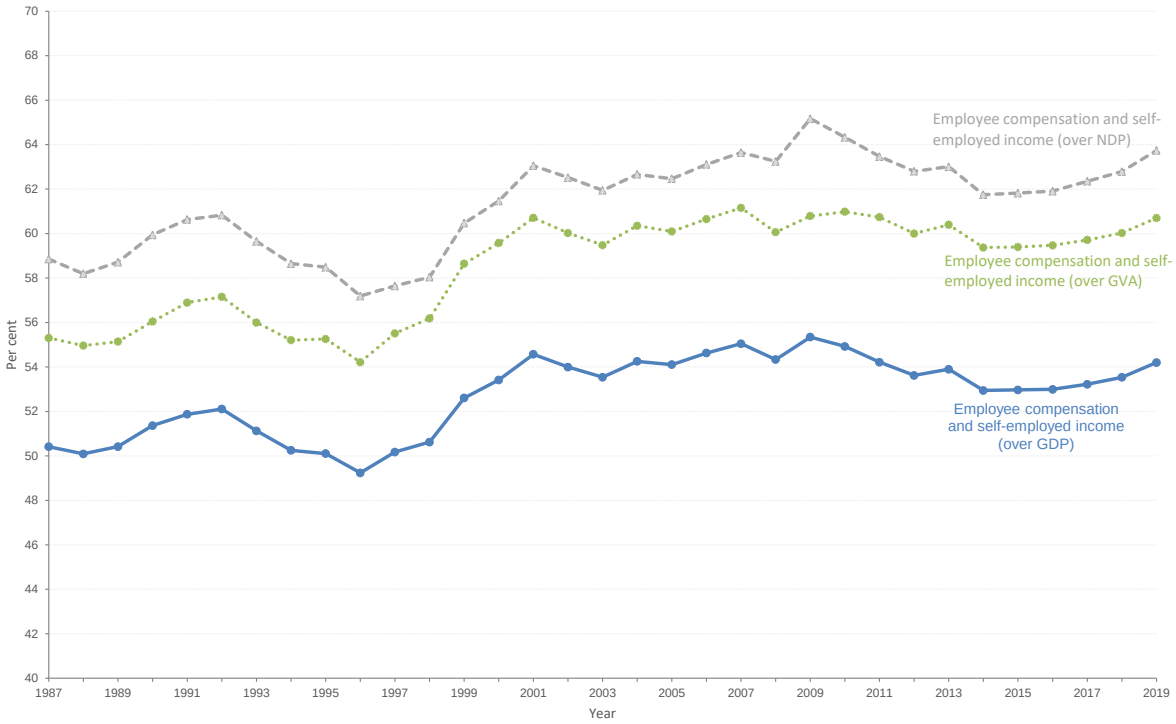
**Figure B-14: Labour share of GVA in the UK, estimated via different methods (1980 until 2019)**




***Note:*** *Data from ONS (see Appendix A for details). We use GVA instead of GDP to calculate the labour share in this graph. The solid (blue) line shows compensation and adjusted mixed income over GVA. The dotted (purple) line shows wages and adjusted mixed income over GVA, i.e. it excludes employers' social contributions. The red (dashed) line takes the value of the blue series in 1980, and then applies a hypothetical growth rate for the years after. The hypothetical growth rate stems from the decoupling analysis in Figure B-11, and equals the growth of employee compensation per hour over growth of GVA per hour. This is to approximate how the labour share could have evolved if all workers (including self-employed) had experienced growth of income equal to that of employees.*

Figure B-15 additionally compares the labour share calculated with GDP, GVA, and net domestic product (NDP). NDP is GDP less depreciation. The graph starts in 1987 due to limited data availability of the NDP series. We observe that levels are different, but trends in the three different labour share measures look very similar.

**Figure B-15: Labour share of GDP, GVA, and NDP (1987 until 2019)**



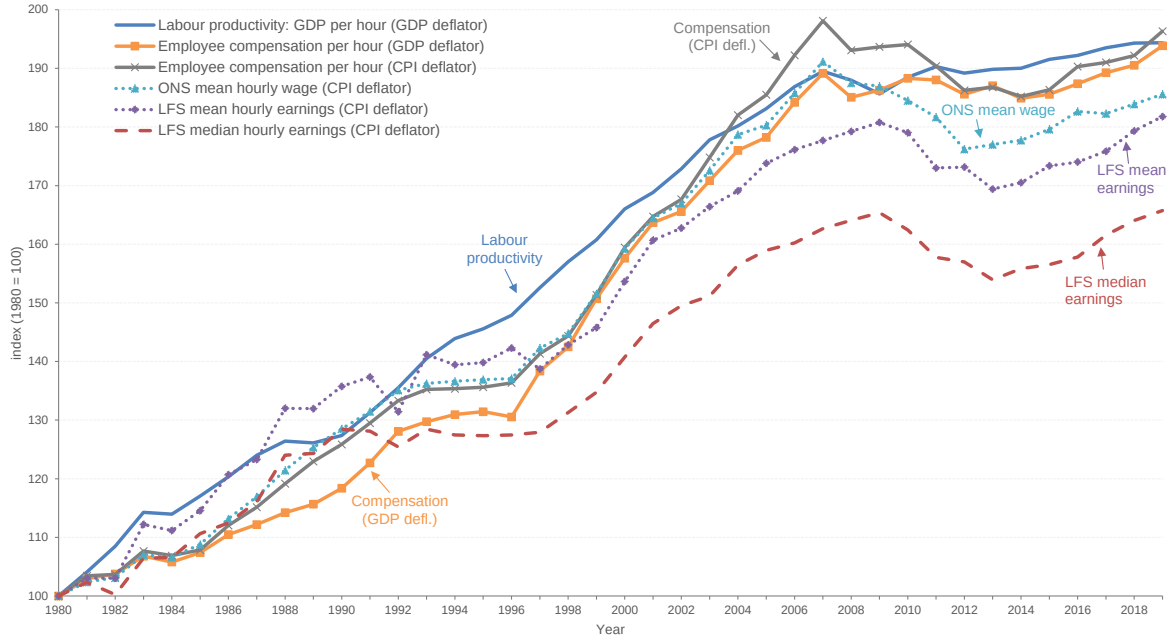

***Note:*** *Data from ONS (see Appendix A for details). The graph shows employee compensation and labour mixed income as a share of GDP (blue line), GVA (green line), and NDP (grey line). As the ONS's net domestic product (NDP) only starts in 1987, this graph shows a shorter time period than previous graphs.*

## B4 Alternative ordering of the decoupling analysis

In the decoupling analysis in Section 2 of the main paper we do the switch from CPI deflator to GDP deflator at LFS median earnings. The decision where to perform the deflator switch is somewhat arbitrary, but does influence final results. We decide to do the switch at median earnings in Section 2 of the main paper to allow for easier interpretability of the results. However, in this section of the Appendix, we show what happens if the switch from CPI deflator to GDP deflator is done at employee compensation per hour. Note that there would be a couple of other possibilities, namely switching at LFS mean earnings, ONS mean earnings, or GDP per hour. We checked all different options and did not find notable changes in the results (this is in line with the findings of Nolan, Roser, and Thewissen, 2019 who check all different possibilities in their decoupling analysis and do not find major differences). Note that overall decoupling will not change regardless where the deflator switch is done, only the contribution of the single components changes. Figure B-16, Figure B-17, and Figure B-18 show the results of the decoupling analysis with the deflator switch at employee compensation. Comparing results with those in Section 2 of the main paper, we do not observe major

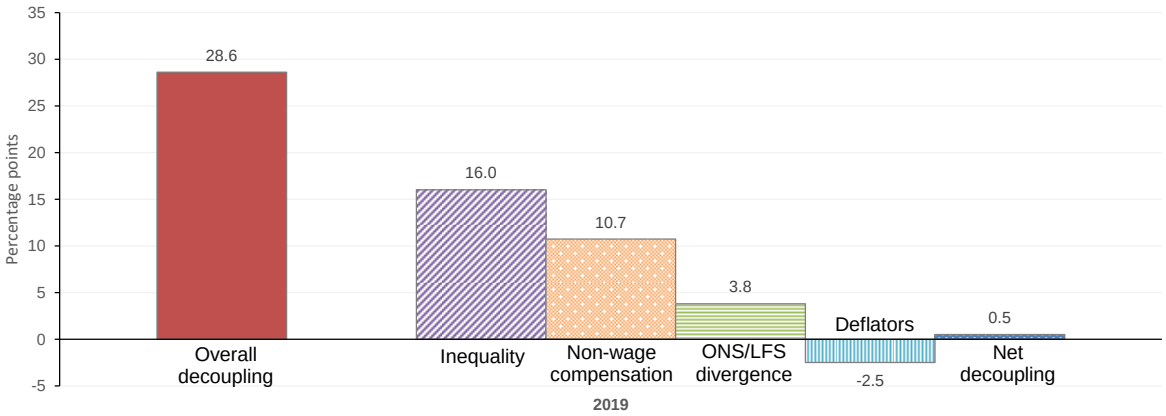
differences. From Figure B-17, Figure B-17, andFigure B-18 we see that the largest difference occurs at the deflator component (now negative 2.1 percentage points and negative 2.5 percentage points previously). All other components do not change by more than 0.2 percentage points.

**Figure B-16: Detailed decoupling analysis in the UK over time with deflator difference at employee compensation (1980 until 2019)**



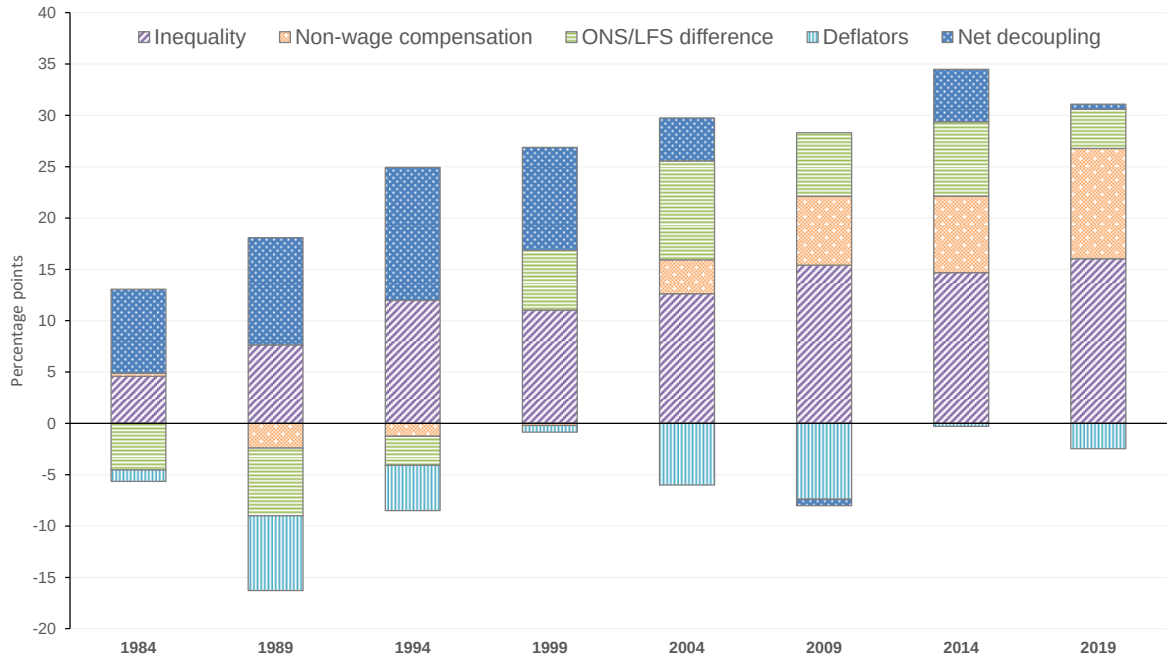

***Note:*** *LFS, ONS, and OECD data (see Appendix A for details). All values are shown as an index, with the base year 1980 equalling 100. The switch from CPI deflator to GDP deflator is done at employee compensation. Labour productivity is total GDP divided by total hours worked deflated by the GDP deflator. Employee compensation is divided by total hours worked by employees deflated by the GDP deflator. ONS mean wage are total annual wages and salaries earned by employees divided by total hours worked by employees, deflated by the CPI deflator and GDP deflator respectively. LFS mean and median earnings are deflated by the CPI deflator.*

**Figure B-17: Decoupling decomposition in the UK with deflator difference at employee compensation (1980 until 2019, differences in 2019 only)**




***Note:*** *Decomposition of the decoupling analysis in Figure B-16 into its single components. Values shown are the percentage point differences between the growth rates from 1980 until 2019 of selected series. Overall decoupling refers to the difference between GDP per hour (GDP deflator) and LFS median hourly earnings (CPI deflator); Inequality to the difference between LFS mean hourly earnings (CPI deflator) and LFS median hourly earnings (CPI deflator); non-wage compensation to the difference between employee compensation per hour (CPI deflator) and ONS mean hourly wage (CPI deflator); ONS/LFS divergence to the difference between ONS mean hourly wage (CPI deflator) and LFS mean hourly earnings (CPI deflator); Deflators to the difference between employee compensation per hour (GDP deflator) and employee compensation per hour (CPI deflator); Net decoupling to the difference between GDP per hour (GDP deflator) and employee compensation per hour (GDP deflator).*

**Figure B-18: Decoupling decomposition in the UK with deflator difference at employee compensation (1980 until 2019, differences in selected years)**




***Note:*** *Decomposition of the decoupling analysis in Figure B-16 into its single components. Values shown are the percentage point differences between the growth rates from 1980 until different subsequent years of selected series. Inequality refers to the difference between LFS mean hourly earnings (CPI deflator) and LFS median hourly earnings (CPI deflator); non-wage compensation to the difference between Employee compensation per hour (CPI deflator) and ONS mean hourly wage (CPI deflator); ONS/LFS divergence to the difference between ONS mean hourly wage (CPI deflator) and LFS mean hourly earnings (CPI deflator); Deflators to the difference between LFS median hourly earnings (GDP deflator) and LFS mean hourly earnings (CPI deflator); Net decoupling to the difference between GDP per hour (GDP deflator) and employee compensation per hour (GDP deflator).*

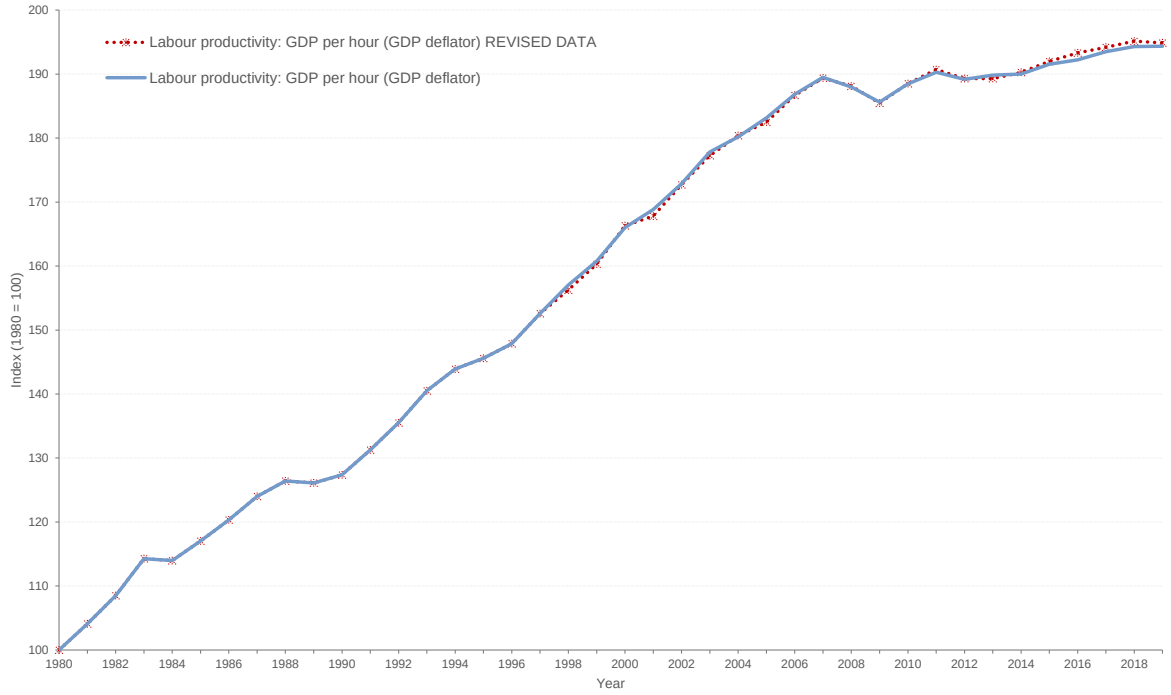
## B5 Decoupling analysis with revised June 2021 GDP data

The ONS has published revisions to its GDP estimates in June 2021 (for data from 1998 onwards).[14] These revisions are only published in preliminary and are not (yet) incorporated in the official GDP series on the ONS website (as of July 2021). In particular, the ONS has revised GDP growth before the financial crisis downwards on average, and growth after the financial crisis upwards on average. As a result, we do not observe major changes in our decoupling analysis on the 1980-2019 period as whole when we use the updated data. Figure B-19 compares labour productivity growth based on the data we have been using throughout the paper (blue line), and labour productivity growth based on the updated data (dotted red line). We observe that the overall growth rate does change minimally (less than 1 percentage point).

14 https://www.ons.gov.uk/economy/nationalaccounts/supplyandusetables/articles/impactofbluebook2021changesoncurrentpriceandvolumeestimatesofgrossdomesticproduct/2021-06-28, last accessed on 27 July 2021

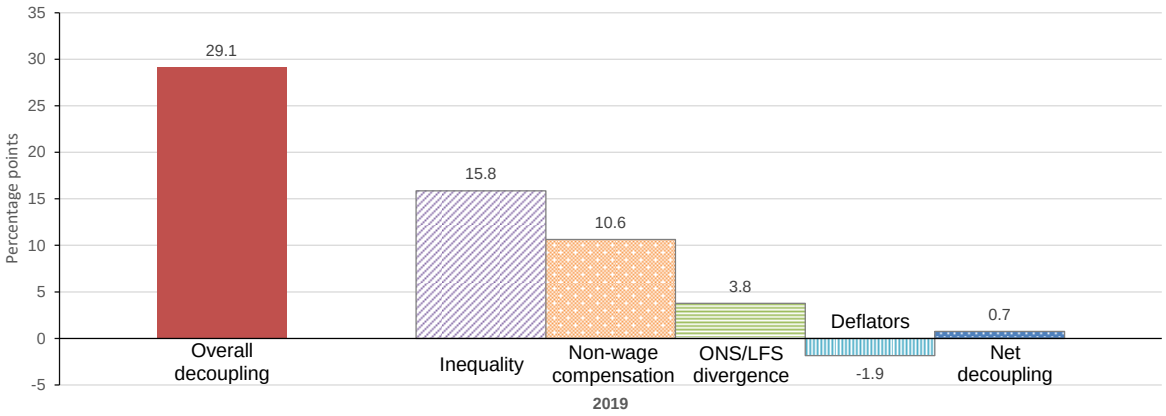
Figure B-20 shows the resulting decoupling decomposition. We observe slightly higher overall decoupling (29.1 percentage points in contrast to 28.6 percentage points in our baseline analysis). This can be explained by a slightly higher net decoupling and deflator difference (note that the deflator difference is smaller in absolute terms now).

**Figure B-19: Growth of labour productivity in the UK with old and revised data (1980 until 2019)**




***Note:*** *ONS data (see Appendix A for details). All values are shown as an index, with the base year 1980 equalling 100. The blue line shows the labour productivity measure from the main part of the paper. The red line displays the same measure with updated data. The ONS published first revisions to GDP data that will be officially implemented in the upcoming (2021) national accounts in June 2021. The revisions include a new double deflation approach.*

**Figure B-20: Decoupling decomposition in the UK with revised GDP data (1980 until 2019, differences in 2019 only)**

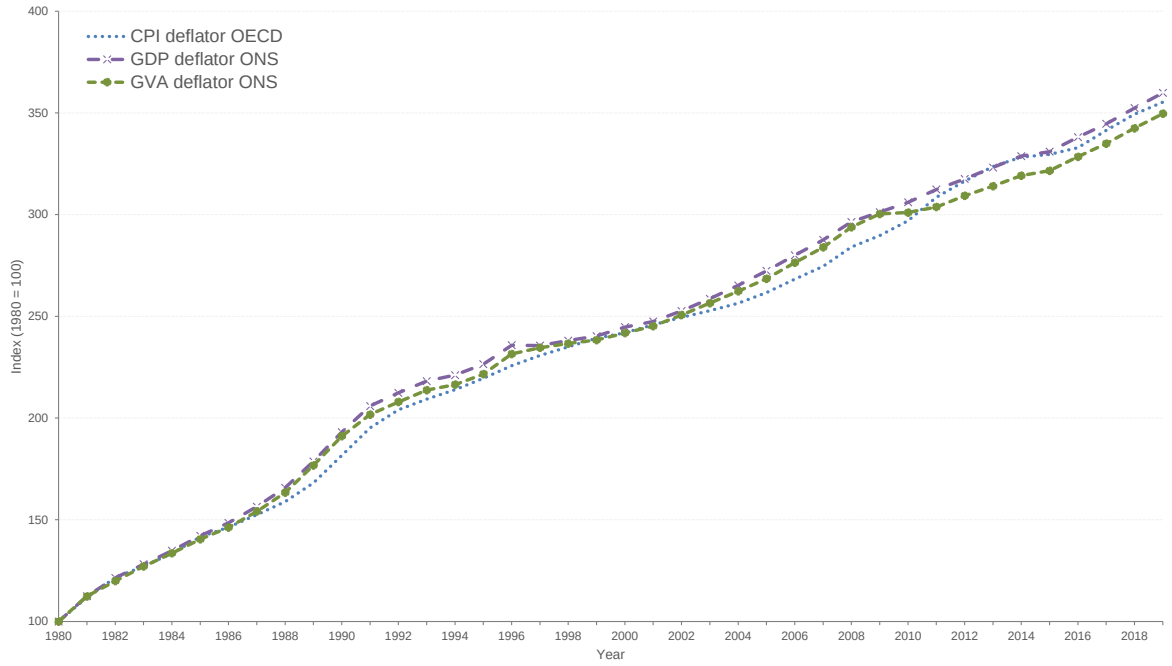



***Note:*** *Decomposition of the decoupling analysis with revised GDP data into its single components. Values shown are the percentage point differences between the growth rates from 1980 until 2019 of selected series. Overall decoupling refers to the difference between GDP per hour (GDP deflator) and LFS median hourly earnings (CPI deflator); Inequality to the difference between LFS mean hourly earnings (GDP deflator) and LFS median hourly earnings (GDP deflator); non-wage compensation to the difference between employee compensation per hour (GDP deflator) and ONS mean hourly wage (GDP deflator); ONS/LFS divergence to the difference between ONS mean hourly wage (GDP deflator) and LFS mean hourly earnings (GDP deflator); Deflators to the difference between LFS median hourly earnings (GDP deflator) and LFS median hourly earnings (CPI deflator); Net decoupling to the difference between GDP per hour (GDP deflator) and Employee compensation per hour (GDP deflator).*

## B6 Producer vs. Consumer Price Deflators

Figure B-21 compares the growth of CPI deflator, GDP deflator, and GVA deflator. These differences could already be observed in the previous decoupling analyses. We observe that the GDP deflator has grown the most over the aggregate period from 1980 until 2019, followed by the CPI deflator. Growth in the GVA deflator has slowed down since the financial crisis, leading to a decoupling of the growth rates of GDP and GVA deflator around that time. Note that higher growth rates of a deflator corresponds to slower growth rate of the series that is deflated, e.g. looking at Section 2 in the main paper, we observe that LFS median earnings deflated by the GDP deflator have grown less than LFS median earnings deflated by the CPI deflator from 1980 until 2019 (and the GDP deflator has grown more during this time period).

**Figure B-21: Growth of CPI-, GDP-, and GVA deflator (1980 until 2019)**

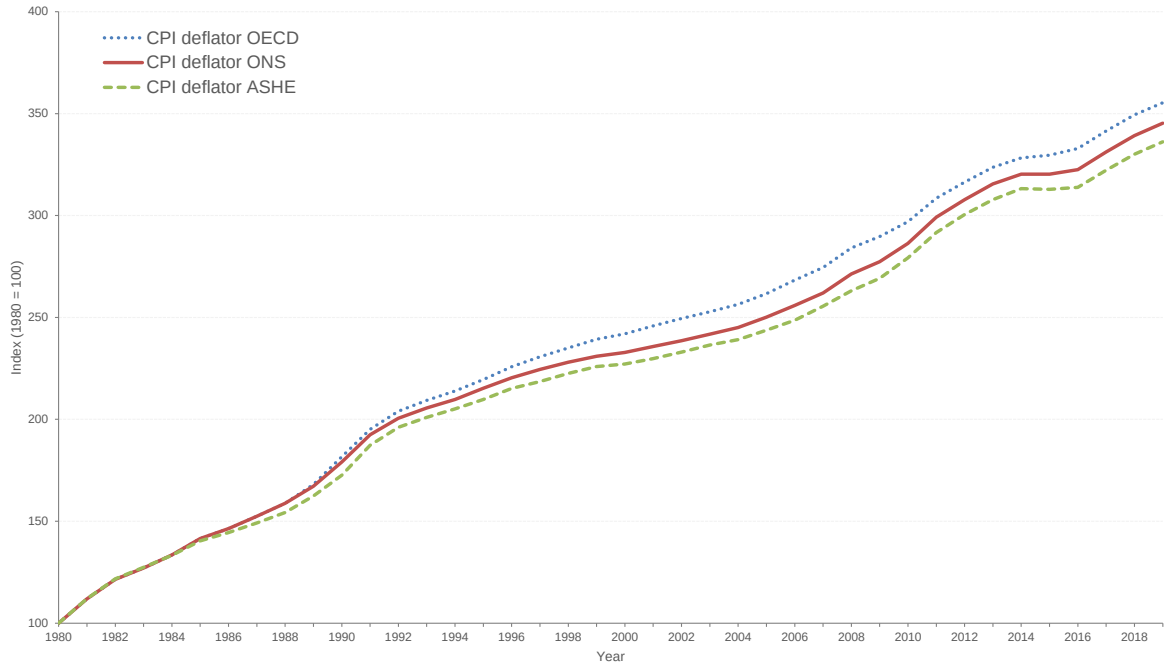



***Note:*** *Data from ONS and OECD (see Appendix A for details). All values are shown as an index, with the base year 1980 equalling 100. Shown are growth rates of the different deflators that are used throughout this paper: whenever we refer to CPI deflator, we take the CPI deflator from the OECD; whenever we refer to GDP deflator, we take the GDP deflator ONS; whenever we refer to GVA deflator, we take the GVA deflator ONS (unless stated otherwise).*

Apart from differences between CPI and GDP/GVA deflators, there are also substantial differences between CPI deflators from different data sources. In the main sections of this paper, we use an OECD series as our standard CPI deflator. There are several other sources that provide CPI deflator estimates, e.g. the ONS or ASHE. We decide to take the ONS CPI deflator because it is a consistent series back to 1980. In contrast, the CPI deflator data from the ONS is only available from 1988 onwards. A comparison of CPI deflators from OECD, ONS, and ASHE are provided in Figure B-22. Due to the data limitations of the ONS CPI deflator before 1988, we approximate the ONS CPI deflator by using growth rates of the OECD CPI deflator for years pre-1988. Figure B-22 shows that the CPI deflator from ONS has grown fastest (i.e.

a series deflated by this CPI grows slower compared with series deflated by the other CPI deflators).

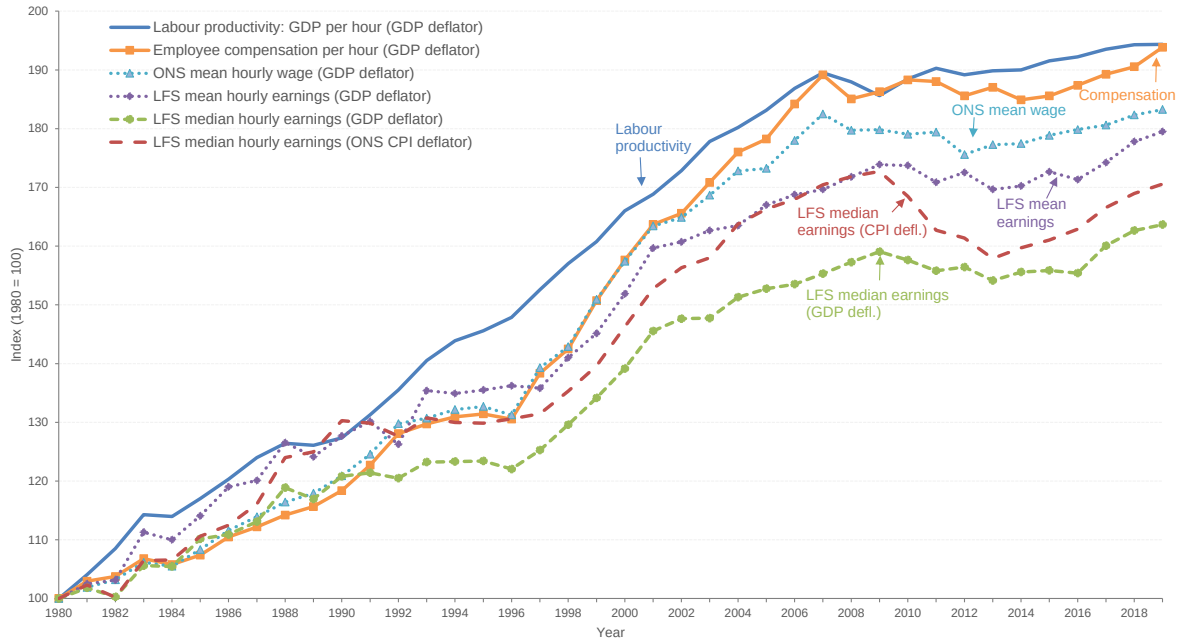
**Figure B-22: Growth of CPI deflators from different data sources (1980 until 2019)**




***Note:*** *Data from OECD, ONS, and ASHE (see Appendix A for details). All values are shown as an index, with the base year 1980 equalling 100. CPI deflator OECD is used throughout this paper whenever we refer to "CPI deflator". To compare the CPI deflator with CPI deflators from other data sources, this figure shows the growth rates of CPI deflators from OECD, ONS, and ASHE. Due to limited data availability, growth of the CPI deflator from ONS and OECD is the same pre-1988 (see Appendix A for details).*

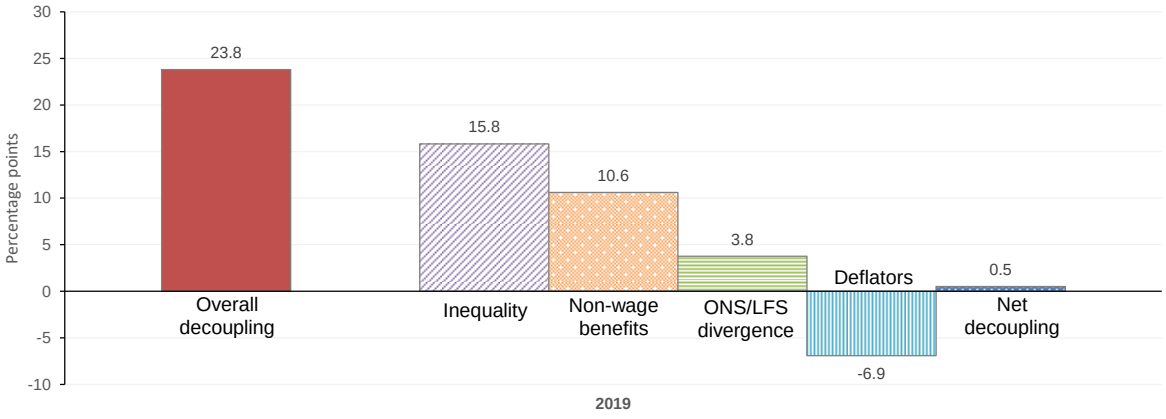
The choice which CPI deflator to use therefore influences the results of the decoupling analysis. The corresponding decoupling graphs are shown in Figure B-23, Figure B-24, and Figure B-25. Notably, we observe less overall decoupling when using the ONS CPI deflator instead of the OECD CPI deflator (23.8 percentage points compared with 28.6 percentage points in Section 2 of the main paper). This is because the ONS CPI deflator suggests slower growth in consumer prices compared with the OECD CPI deflator, thus leading to faster growth of LFS median earnings deflated by the CPI deflator compared with the results in Section 2 of the main paper. The deflator component now amounts to -6.9 percentage points (compared to -2.1 percentage points in Section 2 of the main paper, thus explaining the difference of 4.8 percentage points in the overall decoupling numbers).

**Figure B-23: Detailed decoupling analysis with ONS CPI deflator (1980 until 2019)**



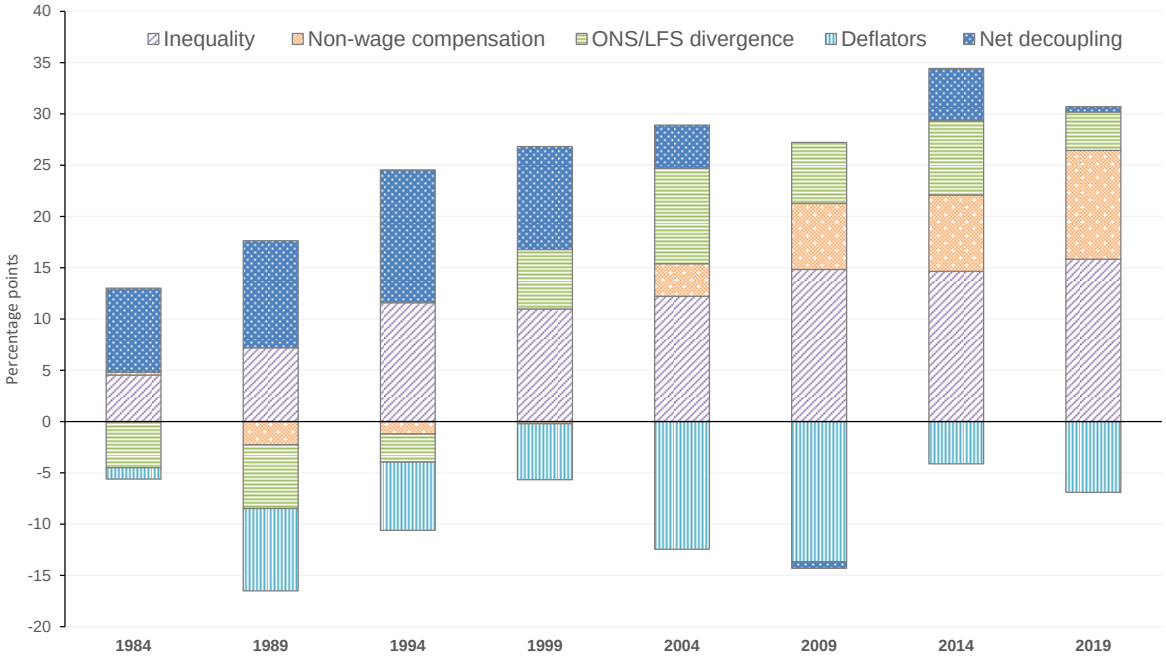

***Note:*** *ONS and OECD data (see Appendix A for details). All values are shown as an index, with the base year 1980 equalling 100. Labour productivity is total GDP divided by total hours worked deflated by the GDP deflator. Employee compensation is divided by total hours worked by employees deflated by the GDP deflator. ONS mean wage are total annual wages and salaries earned by employees divided by total hours worked by employees, deflated by the GDP deflator. LFS mean hourly earnings are deflated by the GDP deflator. For median hourly earnings, we provide one series deflated by the GDP deflator and one deflated by the CPI deflator from the ONS.*

**Figure B-24: Decoupling decomposition with ONS CPI deflator (1980 until 2019, differences in 2019 only)**




***Note:*** *Decomposition of the decoupling analysis with the CPI deflator from the ONS (instead of the CPI deflator from the OECD that was used before) into its single components. Values shown are the percentage point differences between the growth rates from 1980 until 2019 of selected series. Overall decoupling refers to the difference between GDP per hour (GDP deflator) and LFS median hourly earnings (CPI deflator); Inequality to the difference between LFS mean hourly earnings (GDP deflator) and LFS median hourly earnings (GDP deflator); Non-wage compensation to the difference between employee compensation per hour (GDP deflator) and ONS mean hourly wage (GDP deflator); ONS/LFS divergence to the difference between ONS mean hourly wage (GDP deflator) and LFS mean hourly earnings (GDP deflator); Deflators to the difference between LFS median hourly earnings (GDP deflator) and LFS mean hourly earnings (CPI deflator); Net decoupling to the difference between GDP per hour (GDP deflator) and employee compensation per hour (GDP deflator).*

**Figure B-25: Decoupling decomposition with ONS CPI deflator (1980 until 2019 differences in selected years)**

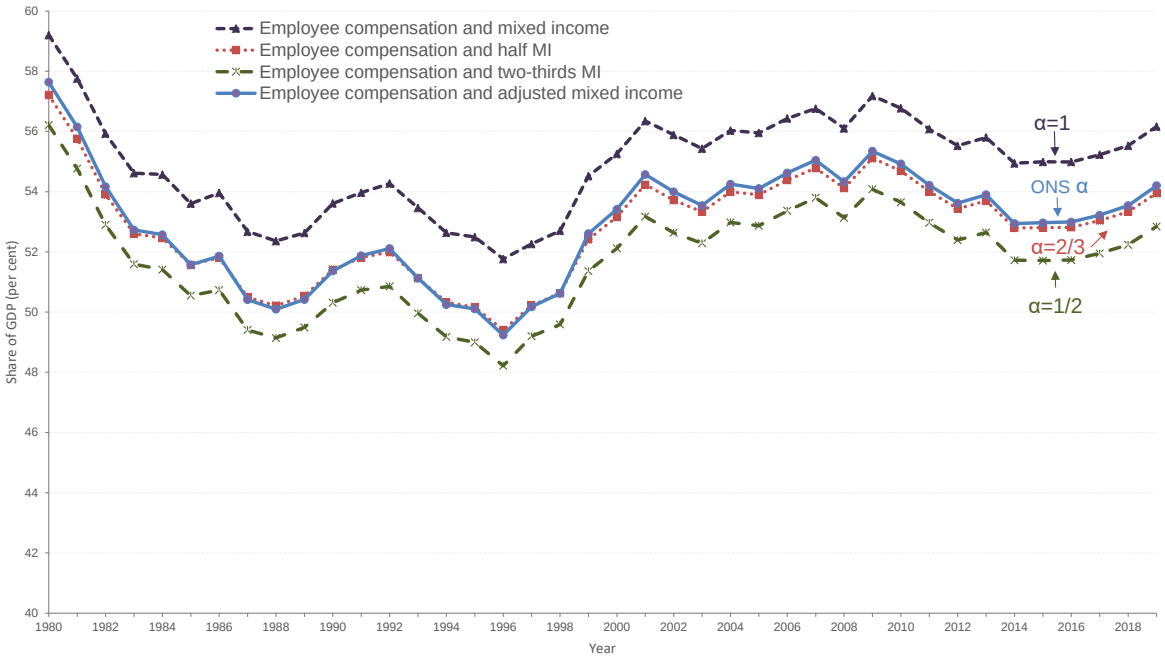



***Note:*** *Decomposition of the decoupling analysis with the CPI deflator from the ONS (instead of the CPI deflator from the OECD that was used before) its single components. Values shown are the percentage point differences between the growth rates from 1980 until different subsequent years of selected series Inequality refers to the difference between LFS mean hourly earnings (GDP deflator) and LFS median hourly earnings (GDP deflator); Non-wage compensation to the difference between employee compensation per hour (GDP deflator) and ONS mean hourly wage (GDP deflator); ONS/LFS divergence to the difference between ONS mean hourly wage (GDP deflator) and LFS mean hourly earnings (GDP deflator); Deflators to the difference between LFS median hourly earnings (GDP deflator) and LFS mean hourly earnings (CPI deflator); Net decoupling to the difference between GDP per hour (GDP deflator) and employee compensation per hour (GDP deflator).*

## B7 Different alphas for labour share estimations

There are many possibilities how one could approximate the share of labour income in total self-employed income. In the main part of this paper, we used the official ONS method (a so-called time-varying alpha). Figure B-26 shows labour share estimations with different alphas (which are used to estimate the share of labour income in total mixed income of the self-employed). We use four different alphas, namely alpha=1, alpha=2/3, alpha=1/2, and the ONS alpha described in the main part of the paper. Note that the first three alphas are constant over time. As we can see, lines with higher alphas show a higher labour share of GDP. However, trends of the labour share estimates with time-constant alphas and the estimate with the time-varying alpha ("ONS method") look almost identical. This is the key message from the comparison. The only circumstance under which our interpretations of the trends in the labour share would be substantially wrong would be if the "true" alpha actually varies substantially more over time.

**Figure B-26: Labour share of GDP in the UK estimated with different alphas (1980 until 2019)**




***Note:*** *Data from ONS. Apart from the time-varying alpha that follows the method of ONS (2018), we also use constant alphas (1/2, 2/3, and 1) to approximate labour income in total mixed income.*

## B8 Analysis excluding employers' social contributions

From the decoupling analysis in Section 2 of the main paper we know that employee compensation per hour has seen faster growth than hourly ONS wages. The extent to which the

increase in employers' social contributions, especially contributions towards defined pension systems, benefit employees is ambiguous Adrjan and Bell (2018). As a result, we may overestimate growth in employee income when using employee compensation as the standard measure. As a robustness check, we repeat the analysis from Section 3 of the main paper with wages and salaries instead of employee compensation (i.e. we exclude employers' social contributions).

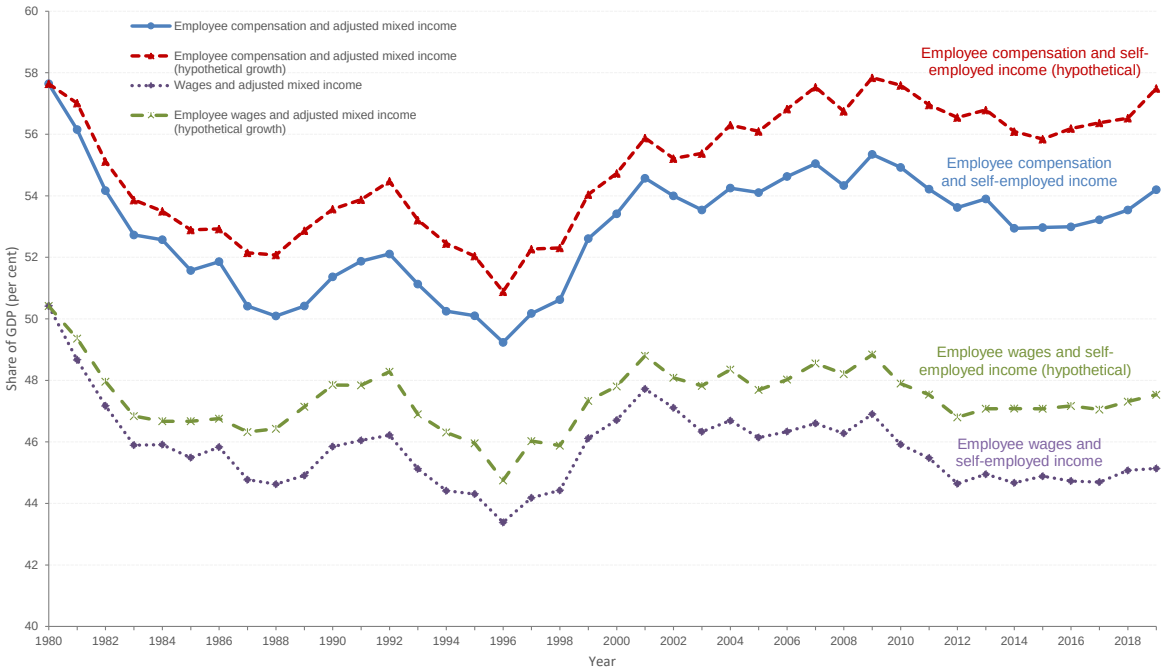
Figure B-27 shows the corresponding graph from Section 3 of the main paper (Figure 6) with an additional line depicting the growth of average wages and salaries of employees. Similar to the hourly growth rates in our decoupling analysis, average compensation has grown faster than average wages and salaries (per employee). Still, we get a difference in growth rates between average wages and salaries and average mixed income of 49 percentage points (down by 10 percentage points when taking average compensation). Thus, even when excluding employers' social contributions from employee income, we observe substantially lower growth in average mixed income.

Similarly, the hypothetical labour share analysis does not change much if we do the analysis excluding employers' social contributions. Figure B-28 extends Figure 8 from Section 3 of the main paper by adding the hypothetical trend of the labour share that would have been observed if adjusted mixed income had grown at the same rate hourly wages and salaries (green line). It takes the same value as the purple line in 1980, and applies the hypothetical growth rate after. Whereas the purple line sees a fall of 5.3 percentage points between 1980 and 2019 (from 50.4% to 45.1%), the green line only falls by 2.9 percentage points from 50.4% to 47.5%). Thus, even when excluding employers' social contributions from our calculations, we observe that the relatively slow growth in self-employed income has led to the labour share being below its potential.

**Figure B-27: Growth of average employee compensation, employee wages, and mixed income (1980 until 2019)**


***Note:*** *Data from ONS (see Appendix A for details). All values are shown as an index, with the base year 1980 equalling 100. Average compensation is employee compensation divided by number of employees, average wages and salaries is ONS wages and salaries divided by number of employees, and average mixed income is total mixed income divided by the number of self-employed. All series are deflated by the CPI deflator. Mixed income is defined as "the aggregate of a variety of flows of value and rewards accrued by unincorporated businesses owned by households, namely sole proprietors. It contains an element of remuneration for work done by the owner or other members of the household that cannot be disassociated from their profit as an entrepreneur. Mixed income excludes imputed rentals from owner-occupied housing, as this is captured elsewhere in the national accounts."*

**Figure B-28: Labour share of GDP in the UK, estimated via different methods (1980 until 2019)**




***Note:*** *Data from ONS (see Appendix A for details). The solid line with circles (blue) shows compensation and adjusted mixed income over GDP. The dotted (purple) line shows wages and adjusted mixed income over GDP, i.e. it excludes non-wage compensation of employees (such as employers' pension contributions, employers' national insurance payments etc.). The red (dashed) line takes the value of the blue series in 1980, and then applies a hypothetical growth rate for the years after. The green (dashed) line takes the value of the purple series in 1980, and then applies a hypothetical growth rate for the years after. The hypothetical growth rate stem from the decoupling analysis, and equals the growth of employee compensation per hour over growth of GDP per hour and growth of ONS wages and salaries per hour over GDP per hour respectively. This is to approximate how the labour share could have evolved if all workers (including self-employed) had experienced growth of income equal to that of employees.*

## Appendix C: Details of Analysis of Self Employed (SE)

### C1 Calculating hypothetical labour shares if SE income grew as fast as that of employees

This subsection explains the methodology used to calculate the hypothetical labour share. Let $s_t^E$ be the share of employees in total employment, $h_t$ = hours worked, and $LS_t$ = the labour share calculated by the ONS (2018). Denote real compensation in year *t* with $CoE_t$, real GDP with $GDP_t$, and corresponding growth rates from base year-to-year *t* with $g$. The hypothetical growth rate of the labour share $g_{\widetilde{LS}}$ equals growth of hourly compensation over growth of GDP per hour:

$$g_{\widetilde{LS_t}} \equiv \frac{g\frac{CoE_t}{s_t^E * h_t}}{g\frac{GDP_t}{h_t}} = \frac{\frac{CoE_t * s_t^E * h_t}{CoE_0 * s_0^E * h_0}}{\frac{GDP_t * h_0}{GDP_0 * h_t}} = \frac{CoE_t}{CoE_0} * \frac{GDP_0}{GDP_t} * \frac{s_0^E}{s_t^E}.$$

Hence, we get the hypothetical labour share, $\widetilde{LS_t}$, via growth of labour share multiplied with its initial value:

$$\widetilde{LS_t} = g_{\widetilde{LS_t}} * LS_0 = \frac{CoE_t}{CoE_0} * \frac{GDP_0}{GDP_t} * \frac{s_0^E}{s_t^E} * LS_0.$$

Note that without the term $\frac{s_0^E}{s_t^E}$ we would simply apply the growth rate of the labour share, which does not include any adjustment for self-employment income (i.e. employee compensation over GDP). The term $\frac{s_0^E}{s_t^E}$ leads to a simple adjustment for changes in the share of the self-employed in total employment. When the employee share falls (the share of self-employed goes up), i.e., $s_t^E < s_0^E$, the growth rate of the hypothetical labour share is adjusted upwards. We thus get a labour share under the hypothesis that the income of self-employed grew at the same rate as employee compensation per hour.

### C2 Contribution of self-employed to the slower growth of average worker compensation

The structure of the weighted average income $\bar{Y}_t$ allows us to conduct a hypothetical analysis. We approximate how the average income $\bar{Y}_t$ could have grown if its single input components had not changed or had changed hypothetically. Most importantly, we are interested in understanding the effect on the average income $\bar{Y}_t$ of two elements.

(i) The increase in the share self-employed among all workers in the economy.

(ii) The slower growth of average income of self-employed compared with average income of employees.

The growth rate of the average income per worker from year 0 to year *t* (as shown in Figure 9 of the main paper) is:

$$\frac{\bar{Y}_t}{\bar{Y}_0} = \frac{(1-s_t^M)*Y_t^E + s_t^M * Y_t^M}{(1-s_0^M)*Y_0^E + s_0^M * Y_0^M}.$$

To understand the effect of (i) on average income per worker, we fix the share of self-employed among all workers in the base year (year 0) and let all other variables change as they did. Formally, this leads us to the following hypothetical growth rate:

$$\frac{\bar{Y}_t^{shares}}{\bar{Y}_0} = \frac{(1-s_0^M)*Y_t^E + s_0^M * Y_t^M}{(1-s_0^M)*Y_0^E + s_0^M * Y_0^M}.$$

To understand the effect of (ii), we assume that average income per self-employed had grown at the same rate as the average income per employee. Formally, the corresponding hypothetical growth rate can be written as:

$$\frac{\bar{Y}_t^{growth}}{\bar{Y}_0} = \frac{(1-s_t^M)*Y_t^E + s_t^M * \tilde{Y}_t^M}{(1-s_0^M)*Y_0^E + s_0^M * Y_0^M},$$

where $\tilde{Y}_t^M = \frac{Y_t^E}{Y_0^E} * Y_0^M$ is the hypothetical average income of self-employed in year *t*.

Finally, we combine (i) and (ii) to estimate the growth of average income if the share of the self-employed had stayed fixed and the income of self-employed had increased at the same rate as the income of employees:

$$\frac{\bar{Y}_t^{shares,growth}}{\bar{Y}_0} = \frac{(1-s_0^M)*Y_t^E + s_0^M * \tilde{Y}_t^M}{(1-s_0^M)*Y_0^E + s_0^M * Y_0^M}.$$

This coincides with the growth of average employee income (red line in Figure 9 of the main paper). This gives us the opportunity to interpret (i) and (ii) as the contributors towards the difference between weighted average income and employee income, and we can assess their importance.

**Table C-1: Growth of average income per worker in UK over different time periods, actual and hypothetical**

| | | (i) **Actual** | (ii a) | (ii b) Hypothetical values | (ii c) |
|---|---|---|---|---|---|
| Time period | | **Average income per worker** | Average income per worker holding shares fixed in base year | Average income per worker (hypothetical mixed income) | Average income per worker (shares fixed and hypothetical mixed income) |
| 1980-2019 | Growth (%) | **73.0** | 78.5 | 81.1 | 83.5 |
| | Difference with actual (pp) | - | 5.5 | 8.2 | 10.5 |
| 1997-2019 | Growth (%) | **32.2** | 33.7 | 33.3 | 34.6 |
| | Difference with actual (pp) | - | 1.4 | 1.1 | 2.4 |

***Note:*** *Column (i) shows growth rates of average income per worker (equivalent to the blue line in Figure 9 of the main paper) for different time periods. The other columns are based on hypothetical calculations. In column (ii a), the employee/self-employed shares are held fixed in the base year (all other variables change normally). In column (ii b), it is assumed that mixed income per worker grew at the same rate as employee compensation (all other variables change normally). Column (ii c) combines these two hypothetical calculations, and the resulting growth rates correspond to those of average employee compensation.*

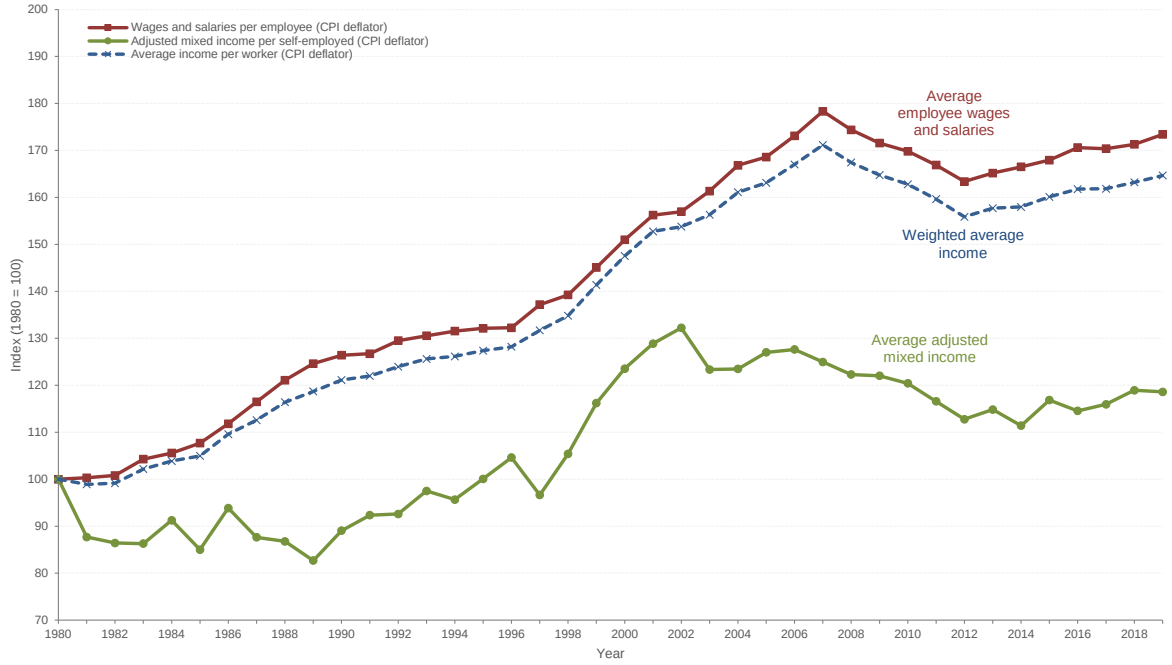
Table C-1 presents the results of the analysis for two time periods: 1980 to 2019 and 1997 to 2019. For each of the two time periods, it shows the percent growth as defined above, and the difference in percentage points of the respective measure with the growth of the actual average income per worker.

Looking at the overall period from 1980 to 2019, from column (i) we see that average income per worker $\bar{Y}_t$ has grown by 73%. When holding the share of self-employed fixed in the base year, we get a hypothetical growth rate of 78.5% (column (ii b)). This is a 5.5 percentage point difference compared with average income per worker. Column (ii b) tells us that if the average income of the self-employed had increased at the same rate as the income of employees, the income of the average worker would have grown by 81.1% (these are 8.2 percentage points more than the actual growth). Combining the two hypothetical calculations (column (ii c)), we get the growth of employee income (83.5%). Hence, from 1980 to 2019, it seems that the relatively slow growth in average self-employed income has been more important than the increase in the share of self-employed. The largest part of the gap between the growth of employee compensation and the growth of average income can be explained by the relatively slow growth of average mixed income.

Table C-1 also provides the same analysis for the sub-period from 1997 to 2019. From 1997 to 2019, the increase in the share of self-employed explains a slightly larger share of the difference between growth of average income and growth of employee income.

We also repeat the previous hypothetical analysis excluding non-wage compensation. Figure C-1 shows growth rates of average employee wages and salaries, average adjusted mixed income, and the average of the two (weighted by their shares in total employment). Table C-2 shows results of the corresponding hypothetical analysis.

**Figure C-1: Growth of wages and salaries per employee, adjusted mixed income per self-employed, and average income per worker (1980 until 2019)**




***Note:*** *Data from ONS (see Appendix A for details). All values are shown as an index, with the base year 1980 equalling 100. The dashed (blue) line, weighted average income, is average wages and salaries plus average adjusted mixed income, weighted by the share of employees and self-employed respectively. Note that average employee wages and salaries exclude employers' social contributions.*

**Table C-2: Growth of average income per worker in UK over different time periods, actual and hypothetical (excluding employers' social contributions for employees)**

| | | (i) **Actual** | (ii a) Hypothetical values | (ii b) Hypothetical values | (ii c) Hypothetical values |
|---|---|---|---|---|---|
| Time period | | **Average income per worker** | Average income per worker holding shares fixed in base year | Average income per worker (hypothetical mixed income) | Average income per worker (shares fixed and hypothetical mixed income) |
| 1980-2019 | Growth (%) | **64.7** | 68.6 | 72.6 | 73.4 |
| | Difference with actual (pp) | - | 3.9 | 7.9 | 8.7 |
| 1997-2019 | Growth (%) | **25.1** | 26.1 | 25.4 | 26.4 |
| | Difference with actual (pp) | - | 1.0 | 0.4 | 1.4 |

*Note: Column (i) shows growth rates of average income per worker (equivalent to blue line in Figure C-1) for different time periods. The other columns are based on hypothetical calculations. In column (ii a), the employee/self-employed share are held fixed in the base year (all other variables change normally). In column (ii b), it is assumed that mixed income per worker grew at the same rate as employee wages and salaries (all other variables change normally). Column (ii c) combines these two hypothetical calculations, and the resulting growth rates correspond to those of average employee wages and salaries.*

## C3 Additional FRS graphs and Analyses

### ONS and FRS comparison

**Figure C-2: Comparison of ONS and FRS employee wage growth, 1997-2019**


***Note:*** *Data from ONS and FRS. All values are shown as an index, with the base year 1997 equalling 100. Growth rates are calculated from 3-year moving averages (i.e. the average of the first lag, the year itself, and the first lead). Exceptions are made for the years 1997 and 2019, where we use a 2-year average due to data limitations. ONS wages and salaries are defined as basic wages including payments in kind, benefits, etc. FRS employee income is defined as gross income shown on payslip.*

Figure C-2 and Figure C-3 compare trends in ONS and FRS data. Figure C-2 shows the growth rates of ONS and FRS average employee wages. Overall, trends in employee income look extremely similar in the FRS compared to ONS data. Both show a growth rate of about 25% between 1997 and 2019.

**Figure C-3: Comparison of ONS and FRS self-employed income growth, 1997-2019**


***Note:*** *Data from FRS .All values are shown as an index, with the base year 1980 equalling 100. Growth rates are calculated from 3-year moving averages (i.e. the average of the first lag, the year itself, and the first lead). Exceptions are made for the years 1997 and 2019, where we use a 2-year average due to data limitations. Weighted average income is average weekly income of solo SE plus average weekly income of non-solo SE, weighted by their respective shares in self-employment. We use shares from LFS. Income of self-employed in FRS is defined as "the total amount of income received from self-employment GROSS of tax and national insurance payments, based on profits where an individual considers themselves as running a business, on estimated earnings/drawings otherwise".*

Figure C-3 shows the corresponding picture for self-employed income.[15] In contrast to the trends for employee income, we do observe more differences here. From 1997 to the start of the financial crisis, FRS average self-employed income shows faster growth than the ONS. However, the drop of average self-employed income in FRS in the course of the financial crisis and its aftermath are substantially higher in FRS compared with ONS. Average SE income in the ONS data grows by about 11% 1997-2019, whereas it has only grown by about 2% in the FRS.

[15] It is average weekly income of solo self-employed plus average weekly income of non-solo self-employed, weighted by their respective shares in self-employment. Note we use LFS weights as these are more reliable, but FRS weights give a similar story.

The reasons for the differences between the two data sources for the self-employed are not clear. First, it could be changes in the sampling structure of FRS which is not fully captured by the sampling weights. But the similarity in income trends for the employed in Figure C-2 suggests this is unlikely to be the case (unless the sampling response rates for the self-employed to the FRS have changed in a peculiar way). Second, FRS is a relatively small sample, so it may just represent sampling variation and indeed, it is clear that FRS self-employed income looks more volatile over the business cycle. Third, since ONS is based on tax data, it might be that the self-employed are underreporting income more than they do in FRS, so the latter is actually more accurate. In any case, this difference should be born in mind in interpreting the FRS specific analysis that follows.

**Figure C-4: Comparison of ONS and FRS self-employed income growth with unadjusted data, 1997-2019**

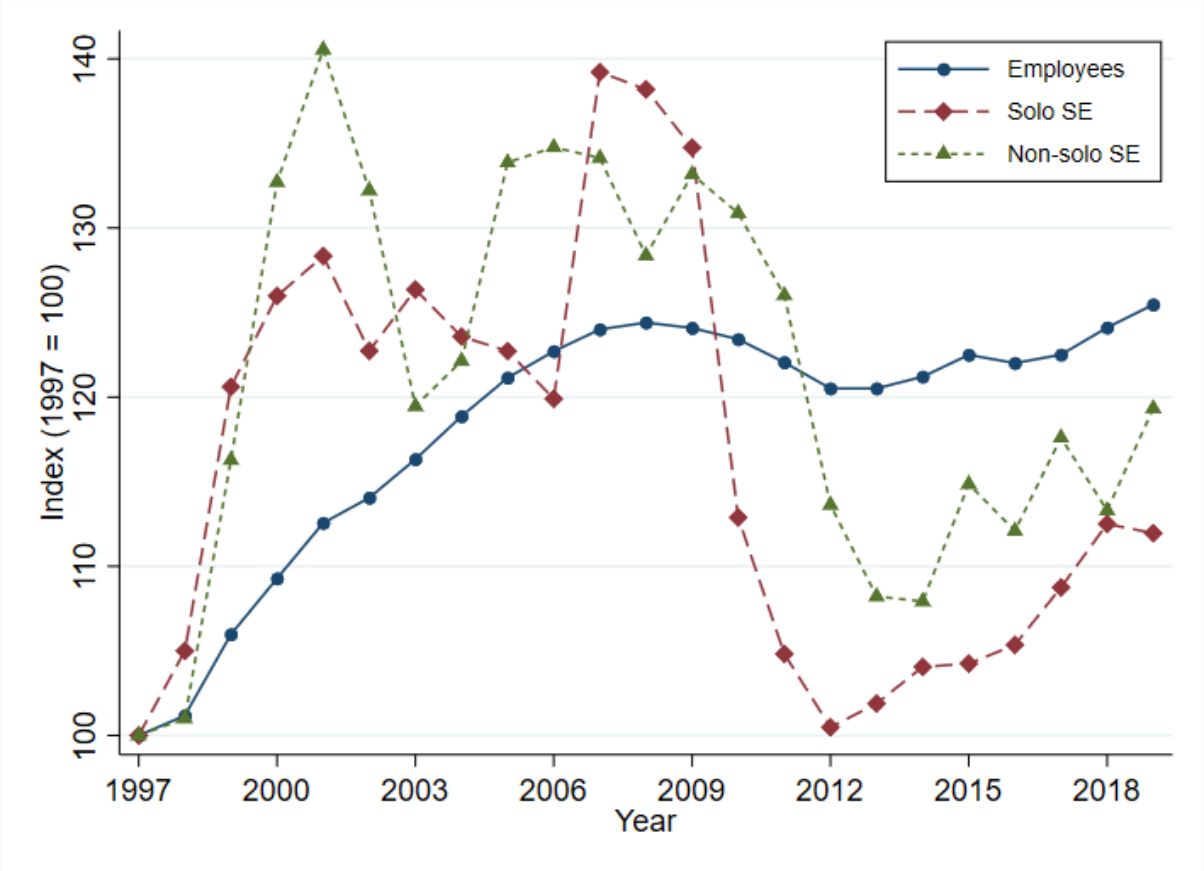

***Note:*** *This is an unadjusted version of Figure C-3. In contrast to Figure C-3, the raw data is used to calculate the growth (i.e. no moving averages).*

The SE series look more alike if we do not smooth the series and use the unadjusted data. We observe higher volatility in the FRS data before the financial crisis, but trends after the crisis look similar.

## Indexed income graphs

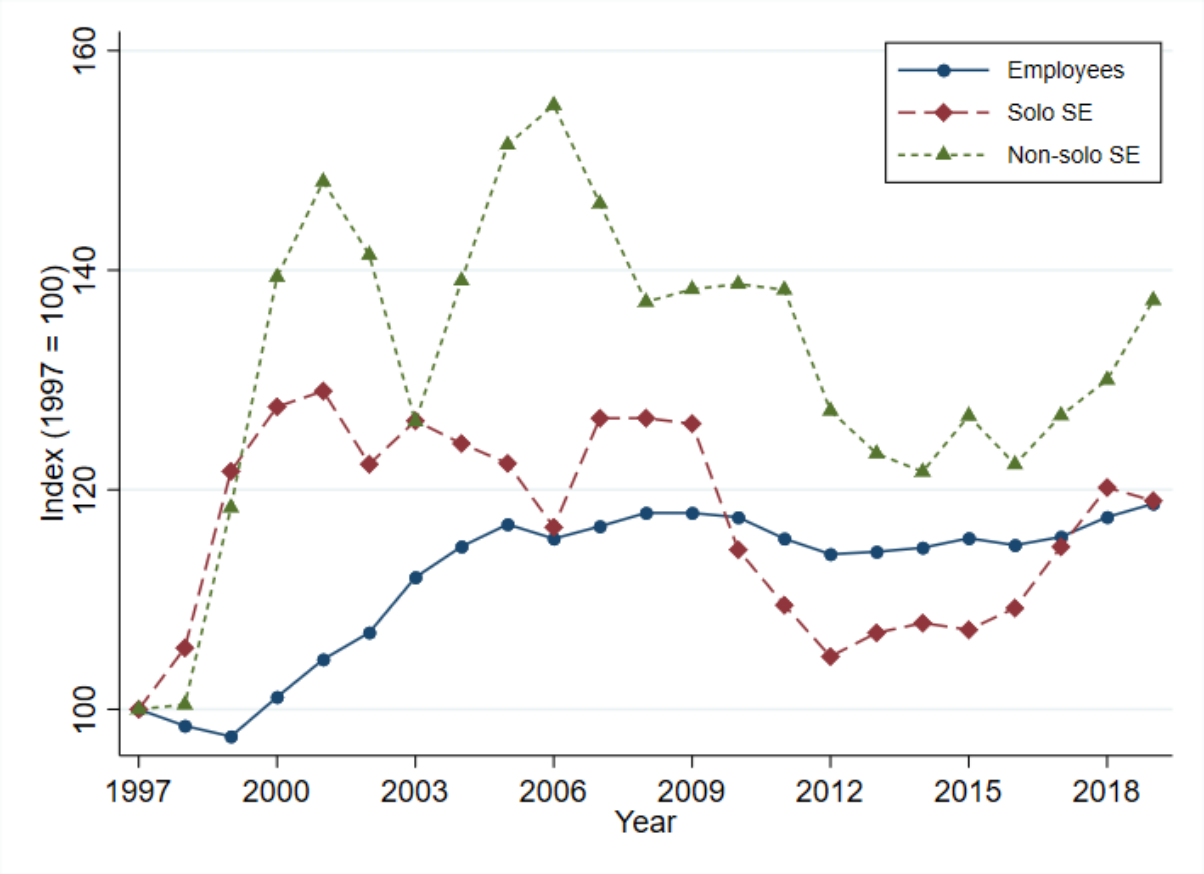
Figure C-5 and Figure C-6 show growth rates behind Panels A and C of Figure 12 in the main paper. We observe that for average weekly income, employees have experienced the highest growth. For average hourly income, the average non-solo SE has experienced substantially higher income growth than both employees and solo SE. The graphs also illustrate the sharp drop in income the SE experienced in the course of the financial crisis (note that the drop in weekly income is larger than that in hourly income).

**Figure C-5: Growth of mean weekly income by worker type, 1997-2019**




***Note:*** *This graph is an indexed version of Figure 12, Panel A in the main paper. It shows the growth (1997 = 100) of mean real weekly income of employees, solo SE, and non-solo SE between 1997 and 2019.*

**Figure C-6: Growth of mean hourly income by worker type, 1997-2019**

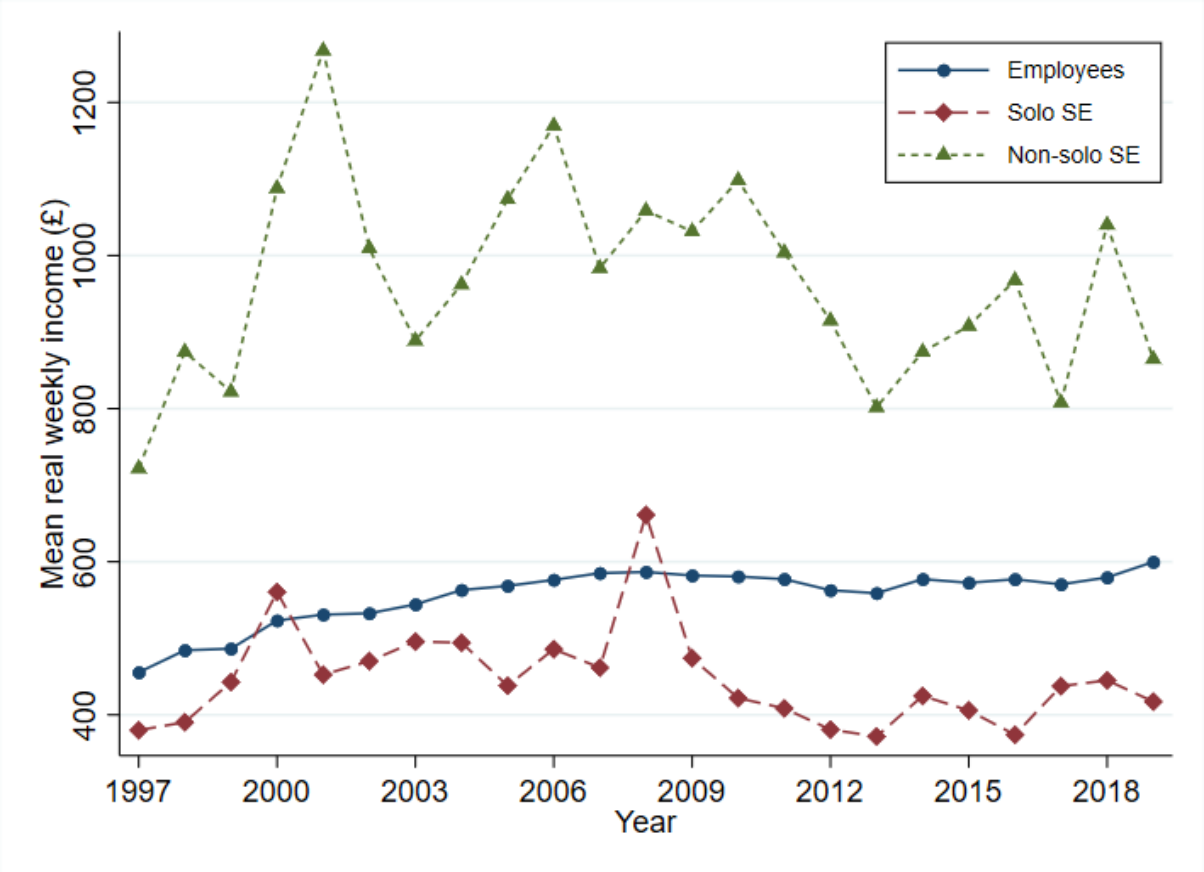



***Note:*** *This graph is an indexed version of Figure 12, Panel C in the main paper. It shows the growth (1997 = 100) of mean real hourly income of employees, solo SE, and non-solo SE between 1997 and 2019.*

## Unadjusted income graphs

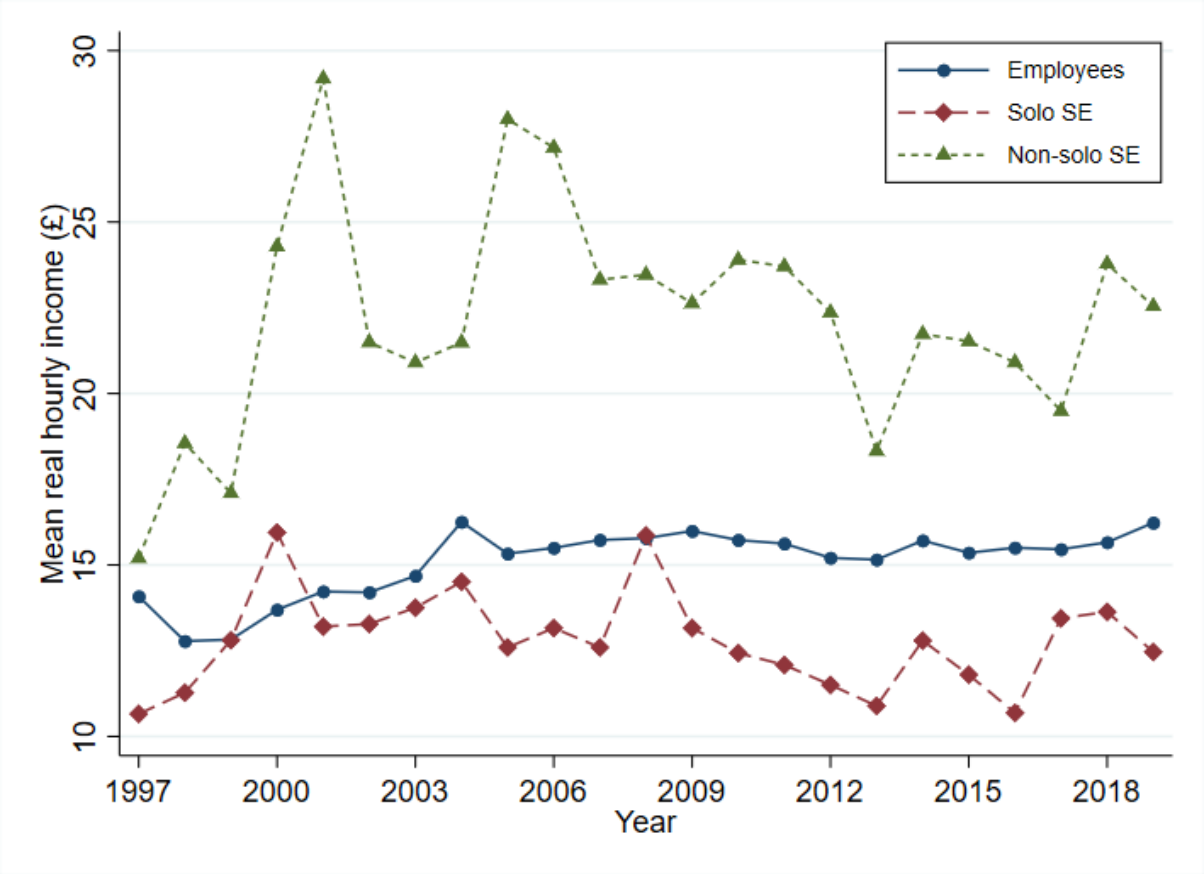
Figure C-7 and Figure C-8 show unadjusted mean real weekly and hourly income (i.e. no moving averages are used). This serves as a comparison with Panels A and C in Figure 12 of the main paper, which use moving averages.

**Figure C-7: Mean real weekly income by worker type (FRS, 1997 until 2019), raw data**




***Note:*** *Data from Family Resources Survey (FRS). Employee income is gross wages/salaries of employees as shown on their payslip. Income of self-employed is defined as "the total amount of income received from self-employment GROSS of tax and national insurance payments, based on profits where individual considers themselves as running a business, on estimated earnings/drawings otherwise. In contrast to figures in the main part of the paper, no 3-year moving average is used.*

**Figure C-8: Mean real hourly income by worker type (FRS, 1997 until 2019), raw data**

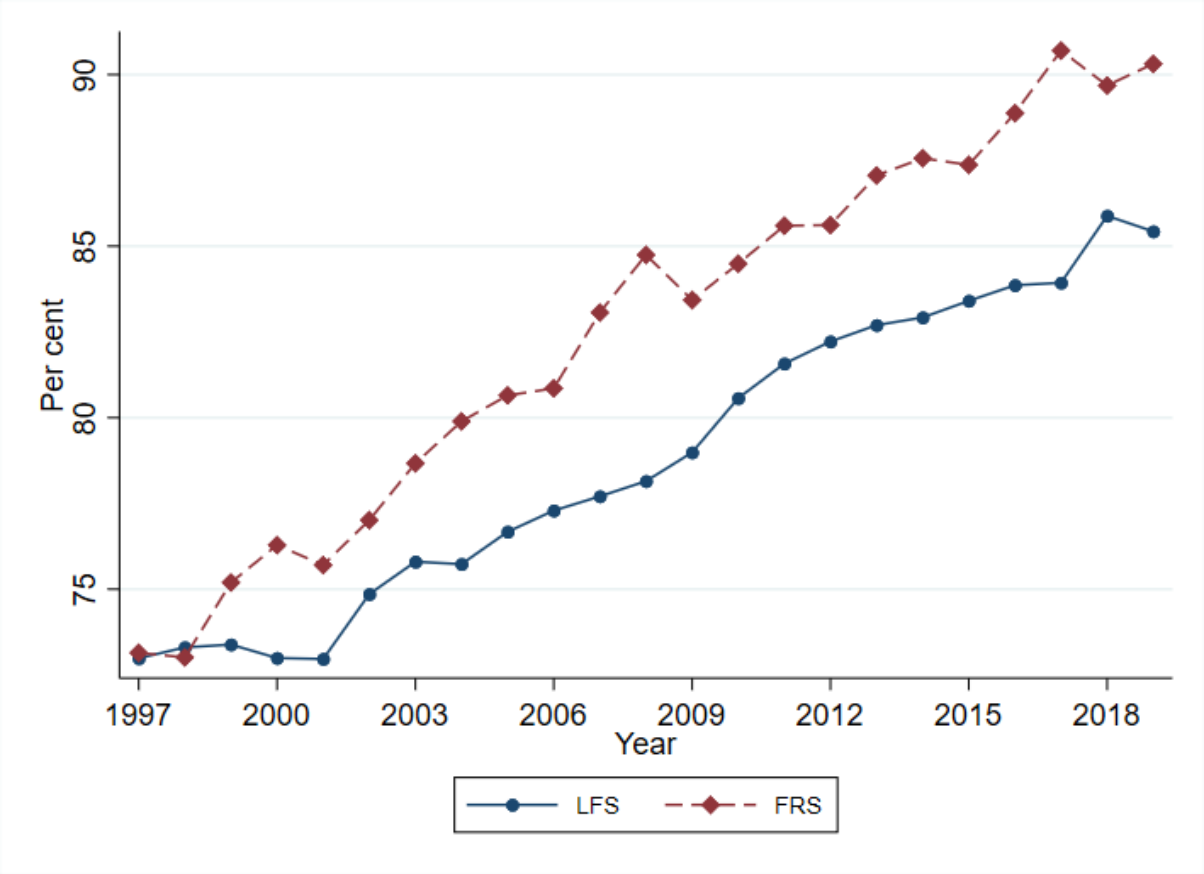



***Note:*** *Data from Family Resources Survey (FRS). Employee income is gross wages/salaries of employees as shown on their payslip. Income of self-employed is defined as "the total amount of income received from self-employment GROSS of tax and national insurance payments, based on profits where individual considers themselves as running a business, on estimated earnings/drawings otherwise. Income is converted to hourly values by dividing total income by total hours. In contrast to figures in the main part of the paper, no 3-year moving average is used.*

## Comparison of LFS and FRS solo self-employment rates

Figure C-9 compares the share of self-employed based on LFS and FRS data. We see that FRS data suggest a larger increase in the solo self-employment rate between 1997 and 2019 (from 73 to 90%) than LFS (from 73 to 85%). The divergence seems to occur in the beginning of the time period.

**Figure C-9: Share of solo self-employed in total self-employment (FRS), 1997 until 2019**




***Note:*** *Data from FRS and LFS. Shown is the share of solo self-employed in total self-employment from 1997 until 2019 by data source. The blue line shows the share from LFS, and the red line the share from FRS.*

The red line in Figure C-10 displays average income of the self-employed (weighted by the shares in self-employment from FRS). We observe a larger gap between trends of self-employed income from ONS and FRS when using FRS shares (that is because the larger increase of solo self-employed as suggested by FRS data leads to relatively slower growth of average self-employed income).

**Figure C-10: Comparison of ONS and FRS self-employed income growth, 1997 to 2019 (all data from FRS)**


***Note:*** *Data from FRS (see Appendix A for details). All values are shown as an index, with the base year 1980 equalling 100. Growth rates are calculated from 3-year moving averages (i.e. the average of the first lag, the year itself, and the first lead). Exceptions are made for the years 1997 and 2019, where we use a 2-year average due to data limitations. Weighted average income is average weekly income of solo self-employed plus average weekly income of non-solo self-employed, weighted by their respective shares in self-employment. In this graph, we use shares from FRS as weights.*

## C4 Hypothetical analysis of self-employed income

We have identified two factors that could explain the relatively slow growth of average income of the self-employed (average hours worked and increase in share of solo SE in total self-employment). In this subsection, we want to assess the importance of the second mechanism, the increase in the share of solo SE in total self-employment. To do this, we create a weighted average income measure for the self-employed similar to that in Appendix C2.

Analogous to the analysis in Appendix C2, define $Y_t^S$ as the average income of solo SE and $Y_t^N$ as the average income of non-solo SE.[16] Further, let $s_t^S$ be the share of SE without employees (solo SE) and $s_t^N = (1 - s_t^S)$ the share of non-solo self-employed. Now define $\bar{Y}_t^{self}$ as the average income per self-employed, with $\bar{Y}_t^{self} = s_t^S Y_t^S + s_t^N Y_t^N$.

[16] Note that whereas levels in Section 3 were annual ones, we use weekly income in the current analysis. This does not make a difference under the assumption that weeks worked per year have stayed constant over time.

The growth of the average income per self-employed person from year 0 to year t is

$$\frac{\bar{Y}_t^{self}}{\bar{Y}_0^{self}} = \frac{s_t^S * Y_t^S + (1 - s_t^S) * Y_t^N}{s_0^S * Y_0^S + (1 - s_0^S) * Y_0^N}.$$

To identify the effect of the change in the share of the solo SE on average income of self-employed, we fix the share of solo self-employed among all self-employed in year 0 and let all other variables change as they did. Formally, this leads us to the following hypothetical growth rate:

$$\frac{\bar{Y}_t^{self,shares}}{\bar{Y}_0^{self}} = \frac{s_0^S * Y_t^E + (1 - s_0^S) * Y_t^N}{s_0^S * Y_0^E + (1 - s_0^S) * Y_0^N}.$$

In a next step, we assume that average income of solo SE had grown at the same rate as the average income of non-solo SE. Formally, the hypothetical growth rate can be written as:

$$\frac{\bar{Y}_t^{self,growth}}{\bar{Y}_0^{self}} = \frac{s_t^S * \widetilde{Y_t^S} + (1 - s_t^S) * Y_t^N}{s_0^S * Y_0^S + (1 - s_0^S) * Y_0^N},$$

where $\tilde{Y}_t^S = \frac{Y_t^N}{Y_0^N} * Y_0^S$.

**Table C-3: Growth of average income per self-employed, actual and hypothetical**

| | | (i) Actual weekly | (ii a) Hypothetical weekly | (ii b) Hypothetical weekly |
|---|---|---|---|---|
| Time period | | Average income per self-employed | Average income per self-employed (shares fixed in base year) | Average income per self-employed (hypothetical non-solo income) |
| 1997-2019 | Growth (%) | 2.1 | 15.2 | 7.0 |
| | Difference with actual weekly (pp) | - | 13.1 | 4.9 |

***Note:*** *Column (i) shows growth rates of average income per self-employed. In column (ii a), the shares of solo self-employed/non-solo self-employed in total self-employment are held fixed in the base year (all other variables change normally). In column (ii b), it is assumed that the average income of non-solo self-employed grew at the same rate as the average income of solo self-employed (all other variables change normally).*

Table C-3 summarises the results of the analysis. Column (i) shows the actual growth of average self-employed income, and columns (ii a) and (ii b) show the results of the two hypothetical scenarios. For the period from 1997 to 2019, fixing the share of solo self-employed leads to a 13.1 percentage point higher growth compared with the unadjusted average income per self-employed. Remember from Section 3 of the main part of the paper that the share of solo self-employed has increased by more than 10 percentage points in this period. Without such an increase, the average income of SE would hypothetically have grown by 15.2% (compared to 2.1% otherwise).

Results in column (ii b) show what our analysis in the main part of the paper indicated already. Weekly income of non-solo self-employed has grown at a marginally higher rate than income solo self-employed, resulting in positive growth of the average income measure when we apply the non-solo growth rate to solo income (4.9 percentage point difference compared with the unadjusted average income measure).

As a cross-check, we conduct the same hypothetical analysis with shares of solo SE in total self-employment from FRS. Table C-4 summarises the results for the 1997-2019 period. Holding shares fixed now leads to an even larger increase in the growth of the average self-employed income. This is because FRS data suggest a larger increase in solo SE, the group who earn substantially less on average than the non-solo SE.

**Table C-4: Growth of average income per self-employed, actual and hypothetical (based on FRS shares)**

| | | (i) Actual weekly | (ii a) Hypothetical weekly | (ii b) Hypothetical weekly |
|---|---|---|---|---|
| Time period | | Average income per self-employed | Average income per self-employed (shares fixed in base year) | Average income per self-employed (hypothetical non-solo income) |
| 1997-2019 | Growth (%) | -2.9 | 15.1 | 2.3 |
| | Difference with actual weekly (pp) | - | 18.0 | 5.2 |

***Note:*** *Column (i) shows growth rates of average income per self-employed. In column (ii), the shares of solo self-employed/non-solo self-employed in total self-employment are held fixed in the base year (all other variables change normally). In column (iii), it is assumed that the average income of non-solo self-employed grew at the same rate as the average income of solo self-employed (all other variables change normally).*

In conclusion, it is the decrease in average hours worked and the change in the composition of the group of self-employed that are important in explaining the slow growth of average self-employed income.