Labour Compensation and Productivity in the UK: How does decoupling vary by sector and its theoretical implications.

Outline:

* Introduction 500
  + Kaldor, Sraffa, Neoclassical Growth Models.
  + Divergence between productivity and compensation in the US since 1970s, in the EU since 1993, in Japan since X (any other interesting countries to consider? South America? Africa? Rest of Asia?)
  + Pasimeni writes: [using the same deflator is better for estimating the changes in functional income distribution] – this is exactly what the paper is supposed to do; many papers gloss over this angle and focus instead on purchasing power.
* Lit Review 750
  + See below
  + Most literature clearly finds a decoupling,
* Analysis 1500
  + Econometric analysis: use Pasimeni’s method.
    - It’s simple, very applicable to a single country.
    - Also refresh on Ciarli, Di Ubaldo, Savona
  + Visual representation of labour share changes
    - Use Brill et al.’s method for visualisation. Labour costs are given in nominal terms which gives the chance to deflate according to both CPI and PPI and observe changes.
    - Teichgraeber says that the difference in deflators is very small – this is odd, considering the tax wedge would likely be bigger in the UK than the US?
* Evaluation 2000
  + What do results mean for Sraffa, Kaldor, and Neoclassical growth models?
  + What could be improved?
    - Self employed incorporation (reference Teichgraeber and any papers he mentions which outline how to incorporate the productivity/compensation of self-employed).
* Conclusion 500

250 words to spare if needed.

Plan:

* In neoclassical economics the labour share of income is equal to its marginal productivity. In other words, the more capital intensive an industry is, the higher the rate of profit should be; the more labour intensive an industry is, the lower the rate of profit should be.
* Empirically, labour compensation has been decoupled from labour productivity. If this is the case, it calls into questions the theoretical underpinnings of the aggregate production function.
* There are alternative theories of distribution, such as the Sraffian view, which posits that the rate of profit is exogenously determined and not connected to output. Instead, a given rate of profit will determine distribution.
  + Kaldor posited that the stability of the labour-capital compensation ratio was a “stylised fact” of economies.
* Alternatively, it could be the case that industries are simply becoming more capital intensive, such that increases in productivity are due to capital and consequently the compensation is shifted toward capital income.
  + This theory comes from the neoclassical production function.
* Understanding the connection between productivity and compensation is important: if the two become decoupled, then increases in productivity do not simply lead to an increase in the standard of living, however this is the current mainstream consensus.
* (Ciarli, Di Ubaldo, & Savona, 2021) run a regression on productivity and wages not including compensation. My analysis would include compensation but would not be an econometric model, instead a visual model outlining where the labour share has fallen or risen plus the difference in deflators.
* Eurostat data comprises of 2001-2022.
  + Could do two periods: 2001-2007 and 2007-2019.
    - This would allow us to see more concrete changes in decoupling pre- and post-financial crisis.
  + Finally one analysis of both.
* **While median wages cannot be combined with weights to cross SIC03 SIC07 boundary, productivity can. Therefore, SIC07 productivity numbers can be back-converted and 1997-2007 and 2008-2019 can be analysed separately.**

New Plan:

* Investigate net and gross decoupling in the UK.
* Make a novel contribution by using moving averages and distributed lag models so that productivity effects are not only measured contemporaneously but also into the future.
* Find the pass-through rate of productivity on mean and median wages,
  + Best: find pass-through rate on ALL different quintiles – shouldn’t be too hard.
* Also run the same regression on different industries and find a linkage between capital intensive and technological innovative industries and pass-through rates.
* Check for robustness by calculating productivity based on both gross and net output (VA or TP), rather than just one or the other.
  + Reference Summers paper for why this is important.

Notes on sources:

* Di Ubaldo & Savona (2021)
  + Inequality *due to* labour productivity has decreased.
    - Effects of labour productivity on median wages were higher than on the average wage.
  + Slough and Heathrow are strongly lagging behind
  + In most sectors there is no statistical significance between labour productivity and wages, but there are a few key sectors that explain most of the productivity.
* Teichgraeber & Van Reenen (2021)
  + There appears to be no mean decoupling,
  + Median decoupling is mostly explained through changes to inequality,
  + Non-wage compensation and self-employment present challenges for the determination of the gap.
* (Brill, Holman, Morris, Raichoudhary, & Yosif, 2017)
  + Want to recreate their methodology and graphs for the UK (something no other paper has done)
* Pasimeni (2018)
  + They acknowledge the importance of deflating by the output deflator in order to study the “relative functional distribution of income” however prefer to still deflate by different deflators in order to investigate standard of living (i.e., the tax wedge).
  + Their econometric analysis is interesting but cannot tell us the relationship between marginal labour productivity and its income share.
    - Possibilities of mirroring econometric analysis.
* Stansbury and Summers (2015)
  + p 10:
    - Net productivity can account for depreciation – changing depreciation rates may result in a higher divergence for a clear reason.
      * Net productivity is calculable.
* The Blue Book
  + Output prices are those received as part of the production process, rather than the price associated with a unit of output. This means that blue book statistics and current output prices show the income to firms which is available to be distributed amongst different factors, rather than the gross income, some of which is levied as tax.

Data Sources:

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| --- | --- | --- | --- |
| **ID** | **Title** | **Link** | **Notes** |
| 01 | Labour Cost Index, **Nace Rev 2 Categories**, *Quarterly*, Eurostat | [link](https://ec.europa.eu/eurostat/databrowser/view/lc_lci_r2_q__custom_15260113/default/line?lang=en) | Includes all labour costs, so potentially more useful than [05], but only goes from 2001-2020 |
| 02 | Labour Cost Index, **Nace Rev 2 Categories**, *Yearly*, Eurostat | [link](https://ec.europa.eu/eurostat/databrowser/view/lc_lci_r2_a__custom_15260097/default/line?lang=en) |
| 03 | Gross Value Added by Industry, **SIC07**, *Quarterly*, ONS | [link](https://www.ons.gov.uk/file?uri=/economy/grossdomesticproductgdp/compendium/unitedkingdomnationalaccountsthebluebook/2021/supplementarytables/bb2102industrialanalysis.xlsx) | Used in [SIC03 SIC07 Compensation].xlsx for productivity/compensation initial analysis |
| 04 | EARN03: Average Weekly Earnings by Industry, **SIC07**, *Yearly*, ONS | [link](https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/averageweeklyearningsbyindustryearn03) | Has less categories than [03] so [05] was used instead for higher depth of analysis. |
| 05 | ASHE: Earnings and hours worked, industry, **SIC07**, *Categorised Yearly*, ONS | [link](https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/industry2digitsicashetable4) | Used in [SIC03 SIC07 Compensation].xlsx for productivity/compensation initial analysis |
| 06 | EARN07: Average Weekly Earnings by Industry, **SIC07**, *Yearly*, ONS | [link](https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/grossweeklyearningsbyindustryearn07) | Condensed Industry categories, only 15 which can make it useful for **broad analysis**. |
| 07 | SIC07 Documentation, ONS | [link](https://www.ons.gov.uk/methodology/classificationsandstandards/ukstandardindustrialclassificationofeconomicactivities/uksic2007) | Includes SIC03-SIC07 weighted tables and correlation. |
| 08 | Output Prices Indices for different sectors | [Agricultural Price Index, *Monthly*, ONS](https://www.gov.uk/government/statistics/agricultural-price-indices) | Includes 1988-2023, I/O table probably best |
| 09 | [Manufactured Output Price Index, *Monthly,* ONS](https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/gb7s/ppi) | 1957-2024 |
| 10 | [Mining and Quarrying (B), *Monthly*, ONS](https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/gb9u/ppi) | Needed for (B)  [This stretches back farther but isn’t specifically output PPI](https://www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/l2kr/bb) |
| 11 | [All Services Gross Sector SPPI, *Quarterly* ***or Yearly***, ONS](https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/k8zu/sppi) | Individual SPPIs can be found by searching for SPPI on ONS. |
| 12 | [Water Supply (E), *Monthly, Quarterly, Yearly*, ONS](https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/gb9z/ppi) | Needed for (E)  [This stretches back farther but is not specifically output prices](https://www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/l2n2/ukea) |
| 13 | [Electricity, gas, steam, and air conditioning (D), *Monthly, Quarterly, Yearly,* ONS](https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/gb9w/ppi) | Needed for (D)  [This one stretches back farther but is not specifically output prices.](https://www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/l2mw/bb) |
| 14 |  | Construction output price indices, *Monthly*, ONS |  |
| 15 | Input-output supply and use tables | [link](https://www.ons.gov.uk/economy/nationalaccounts/supplyandusetables/datasets/inputoutputsupplyandusetables) | Can be used to make my own PPI for each SIC07 industry… |
| 16 | Index of Services, *Monthly*, ONS | [link](https://www.ons.gov.uk/economy/economicoutputandproductivity/output/datasets/indexofservicesandmaincomponentsto4dp) | Index of GVA in all services 1998-2022  Can be used to isolate growth in sector T. |
| 17 | Construction Cost Missing Indices | [2012 Q3](https://www.gov.uk/government/statistics/bis-quarterly-constuction-price-and-cost-indices-3rd-quarter-2012)  [2012 Q4](https://www.gov.uk/government/statistics/bis-quarterly-construction-price-and-cost-indices-quarter-4-2012)  [2013 Q1](https://www.gov.uk/government/statistics/bis-quarterly-construction-price-and-cost-indices-quarter-1-2013)  [2013 Q2](https://www.gov.uk/government/statistics/bis-quarterly-construction-price-and-cost-indices-quarter-2-2013)  [2013 Q3](https://www.gov.uk/government/statistics/bis-quarterly-construction-price-and-cost-indices-quarter-3-2013)  [2013 Q4](https://www.gov.uk/government/statistics/bis-quarterly-construction-price-and-cost-indices-quarter-4-2013) |  |
| 18 | CPI | [link](https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/d7bt/mm23) |  |
| 19 | GDP Deflator | [link](https://www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/l8gg/qna) |  |
| 20 | Experimental Industry Deflators | [link](https://www.ons.gov.uk/economy/inflationandpriceindices/datasets/experimentalindustrydeflatorsuknonseasonallyadjusted) |  |

**Methodological Notes:**

* **Yearly OpH numbers were found by taking an average of all quarters across the whole year**
* **Productivity changes depending on whether data comes from LFS or national accounts. National accounts is preferred due to LFS methodology.**

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| [**Total GVA versus GVA excluding imputed rental income**](https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/articles/regionalandsubregionalproductivityintheuk/february2020#:~:text=per%20hour%20worked.-,Total%20GVA%20versus%20GVA%20excluding%20imputed%20rental%20income,NUTS%20regions%20accompanying%20the%20release.)  **The headline productivity calculations in this article use total GVA as a measure of output. This includes all components of GVA and is in line with national productivity estimates.**  **However, it can be argued that not all GVA components are equally relevant when assessing labour productivity, as some elements of GVA are not directly related to the input of labour. In particular, imputed household rental incomes, such as imputed rental values capturing the value of housing services accruing to owner-occupiers, could be excluded from the total GVA to obtain a measure of output more closely related to the measurable labour input.**  **Therefore, we have also provided data that exclude imputed household rentals from the GVA(B) "nominal" used in the productivity calculations. These data are discussed in the "Alternative results excluding rental income" section of this article and are also available in the datasets for NUTS regions accompanying the release.** |

**Todo:**

* **Run some preliminary regressions on compensation and productivity using Pasimeni’s method and note results.**
* **Fully connect SIC03 and SIC07 using a coherent methodology**
  + **Use majority employee percentage and discard when unsure/undecided?**
* **Apply PPI deflation on a per industry basis.**

# References

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