# How has the relationship between pay and productivity in the UK transformed in recent decades?

A study on the commonly held belief that greater productivity will translate to greater living standards.

> "Productivity isn't everything, but, in the long run, it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.

— Paul Krugman, *The Age of Diminished Expectations*, 1990
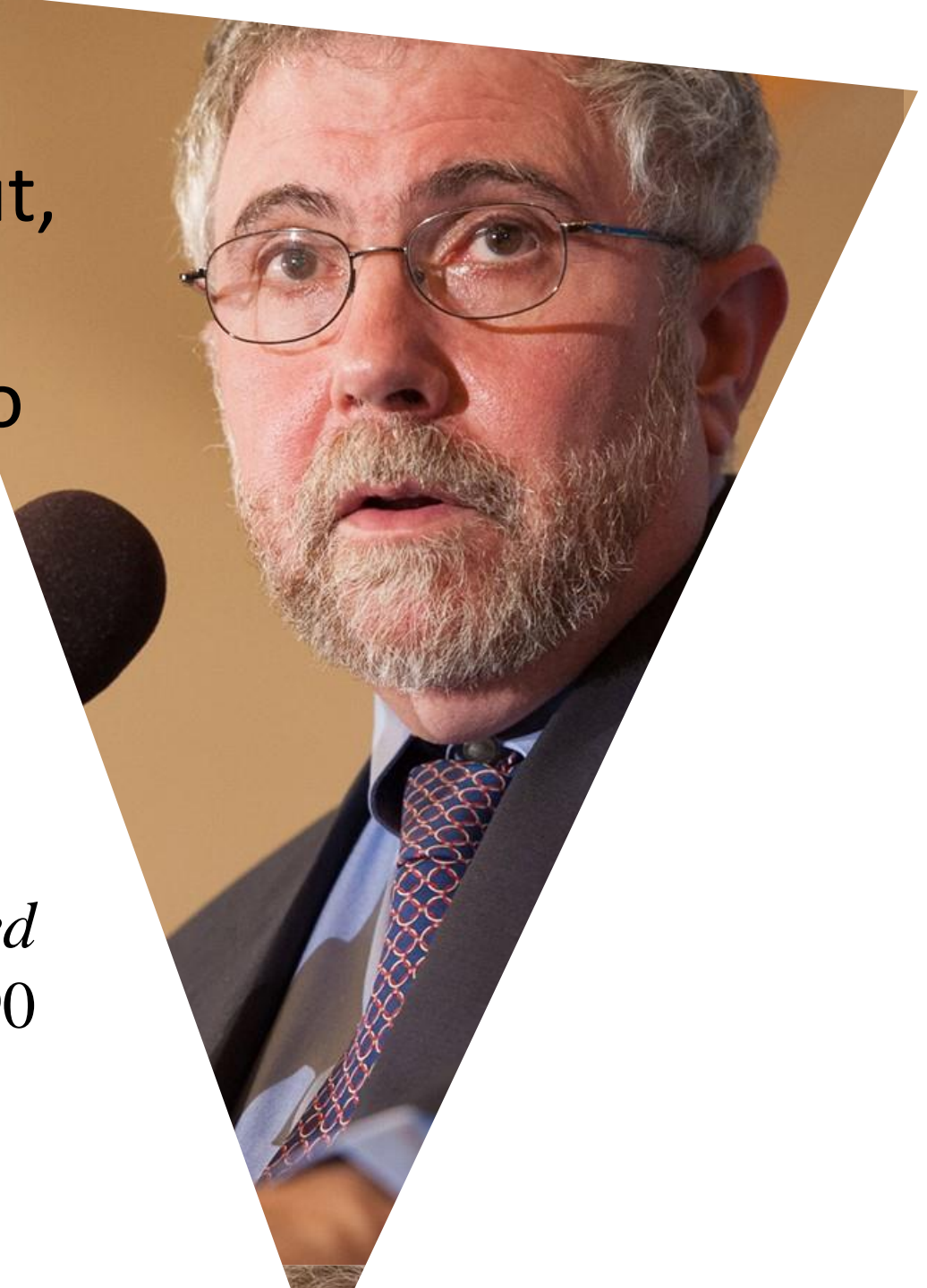
Outline

- Motivation and policy climate,

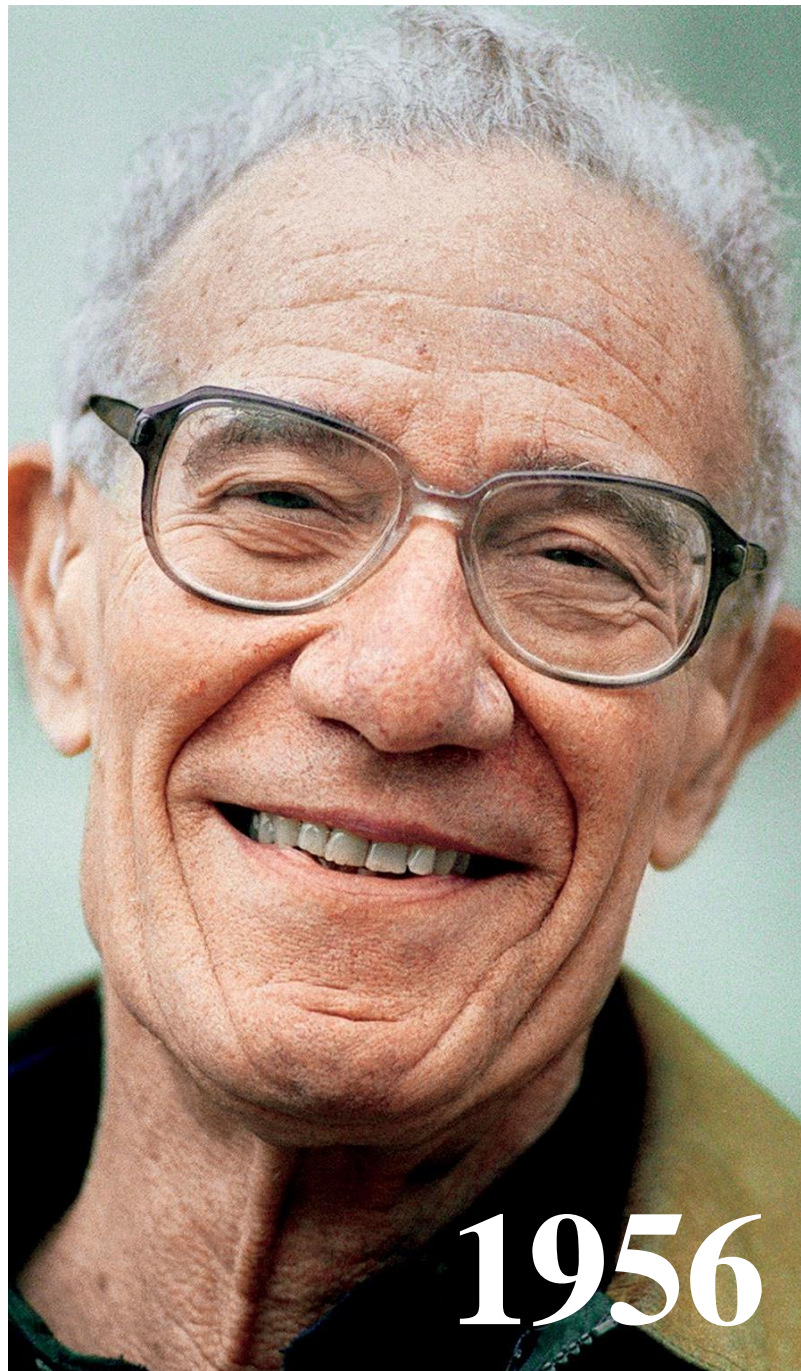- Existing literature and value added,

- Empirical Strategy,

- Data and results,

- Discussion of findings, policy prescriptions, and future research.
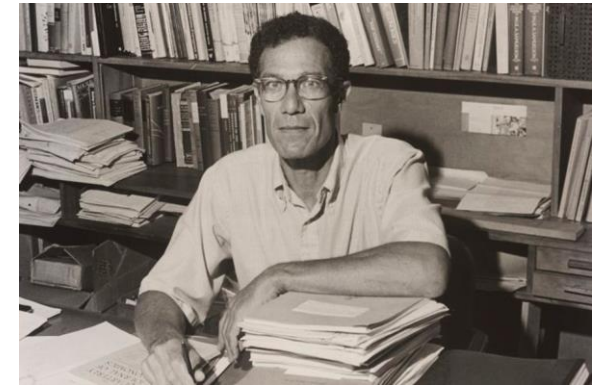
Motivation

1990   1956   2024

Rachel Reeves, *Mais Lecture*, 2024

" **At root, productivity remains the key medium term determinant of wages.** It is the collapse in our productivity growth which explains our wage stagnation.

The 'coupled', or 'linked', view of wages and productivity

In other words, a rise in productivity will lead to a rise in wages.
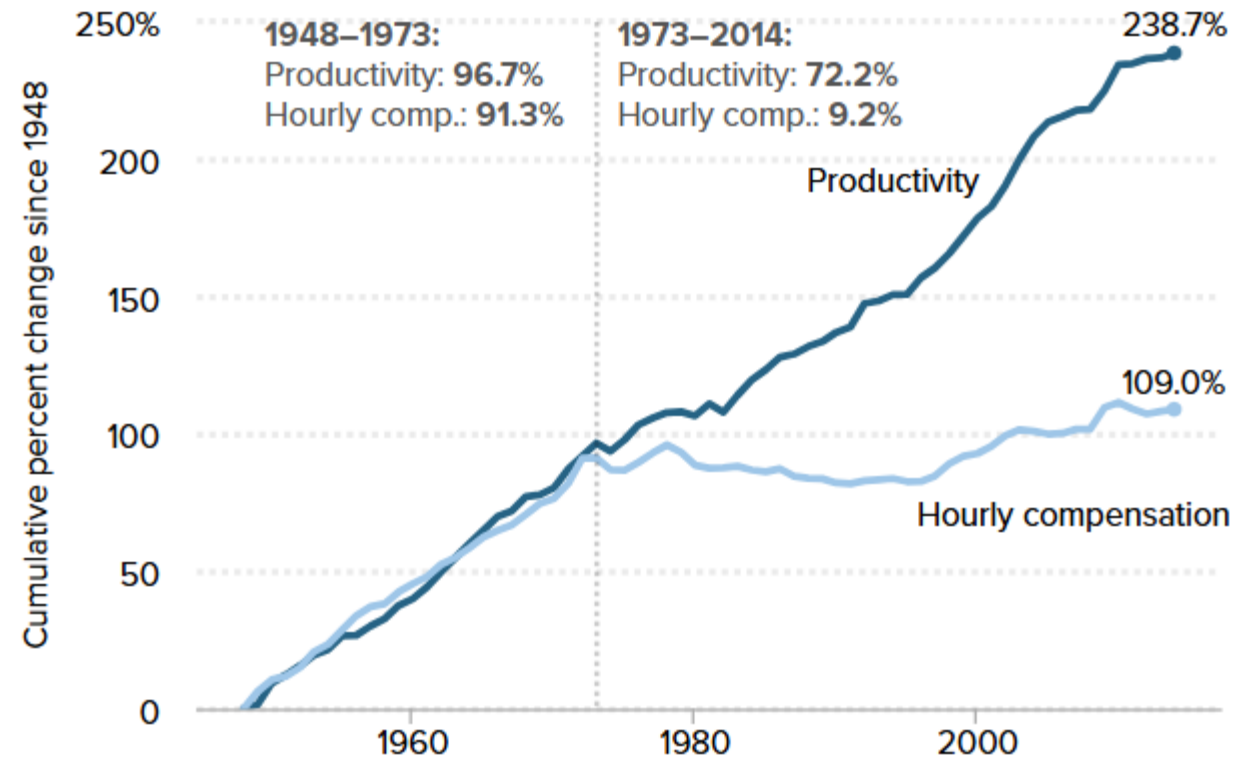

On the other hand, we have:

… the 'decoupled', or 'delinked', view of wages and productivity

The Productivity–Pay Gap

Understanding the Historic Divergence Between Productivity and a Typical Worker's Pay

Report • By **Josh Bivens** and **Lawrence Mishel** • September 2, 2015

Disconnect between productivity and a typical worker's compensation, 1948–2014

1948–1973:
Productivity: **96.7%**
Hourly comp.: **91.3%**

1973–2014:
Productivity: **72.2%**
Hourly comp.: **9.2%**

238.7%

Productivity

109.0%

Hourly compensation

Cumulative percent change since 1948

Joe Biden, 2021

" [...] and then along came 1979 and everything began to change. **Productivity in the country has grown almost four times faster than pay since 1979.** That means that workers have been giving much more to their employers' bottom lines than they've gotten back in their pay-checks.

My study did not restrict its investigation to one income measurement.

Median and **mean** gross earnings, and **total labour compensation**, are investigated with respect to productivity.

The UK does not collect data on 'production/non-supervisory' worker pay, but this is approximated by the median gross earnings rate.
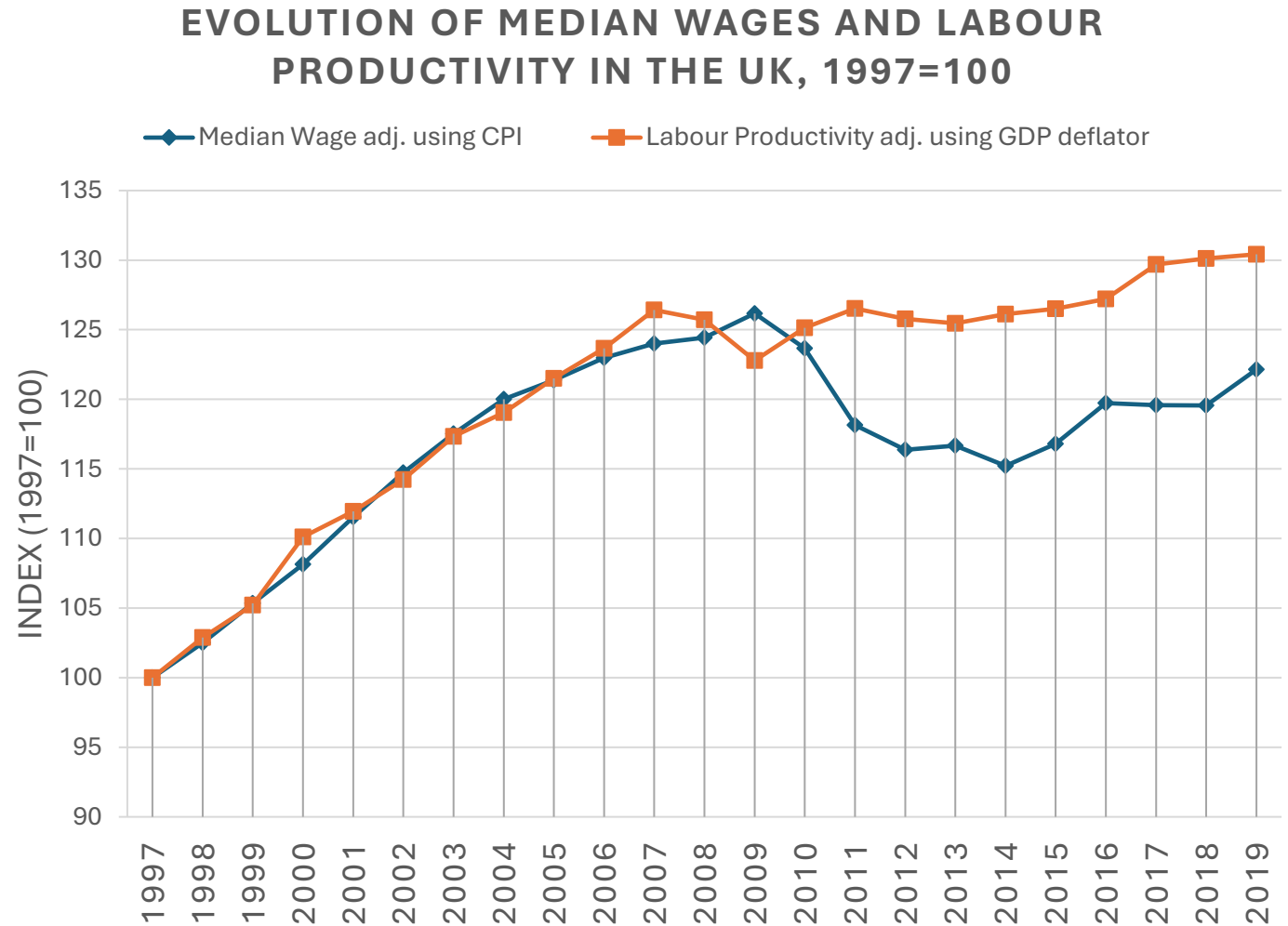
Key Terminology

- Gross Earnings vs. Labour Compensation?
  - Gross earnings designates untaxed income.
  - Labour Compensation includes gross earnings, plus non-wage benefits, such as bonuses and pension contributions.

Policy Climate

The state of productivity-pay divergence in the UK

Looking at **hourly median gross earnings**.

EVOLUTION OF MEDIAN WAGES AND LABOUR PRODUCTIVITY IN THE UK, 1997=100

Median Wage adj. using CPI — Labour Productivity adj. using GDP deflator

INDEX (1997=100)

The state of productivity-pay divergence in the UK

Looking at **all income types**.

Productivity and Pay, 1997-2019

- Median Wage adj. with consumer prices
- Average Wage, adj. with consumer prices
- Gross productivity
- Average Total Labour Compensation adj. with consumer prices

Index 1997=100
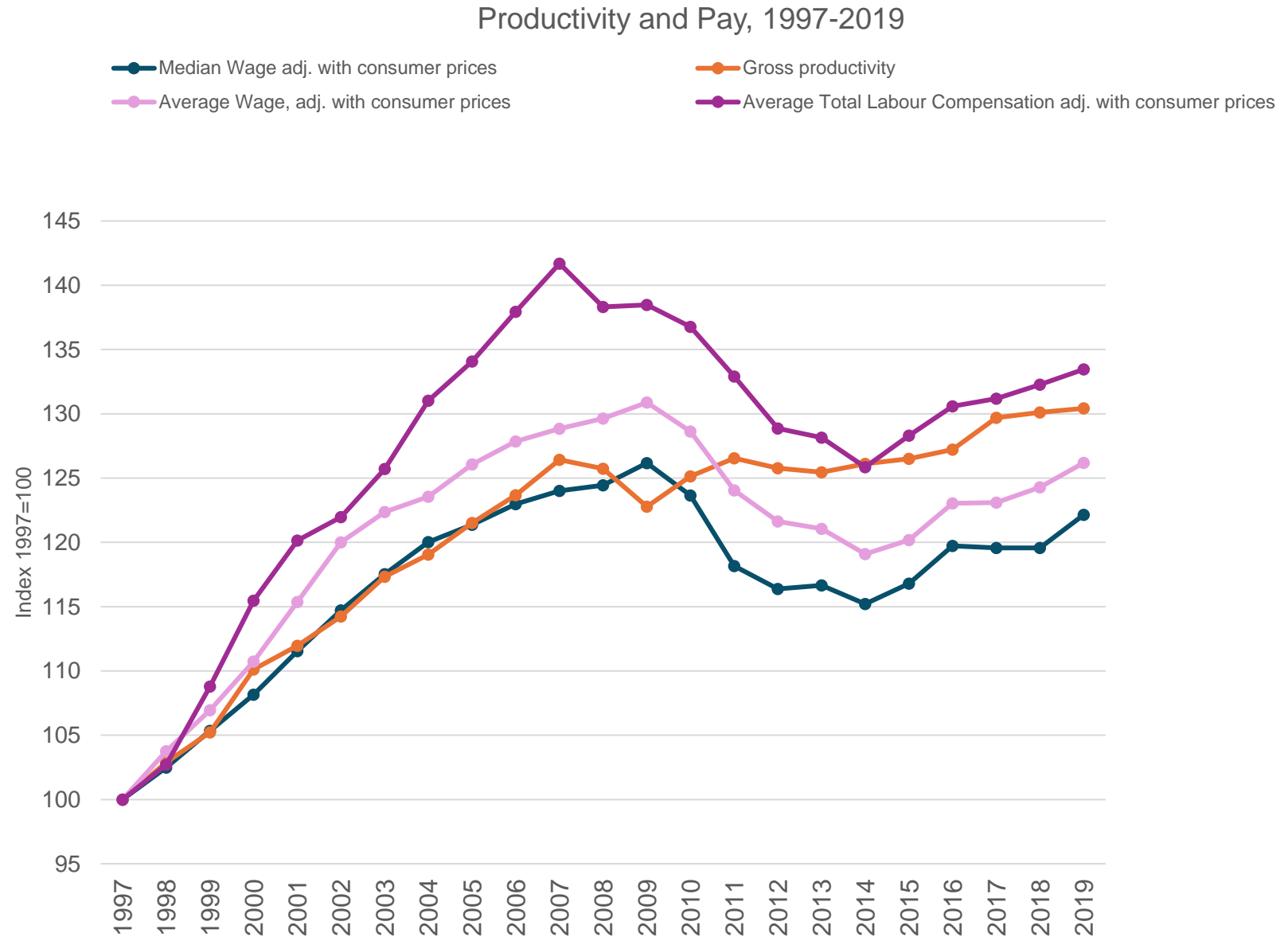
Existing Academic Literature on the UK's pay-productivity gap

Divergence of Pay and Productivity

- Divergence is mainly due to a rise in income inequality. (Pessoa & Van Reenen, 2013; Teichgraber & Van Reenen, 2021)

- 1% increase in productivity leads to **either an insignificant, 0.151%, and 0.225% increase in median wages** at the firm, industry, and local labour market levels, respectively. (Ciarli, Salgado & Savona, 2018)

- A **1% increase in productivity led to a 0.35% and 0.26% increase in median wages**, across a 5-year and 10-year time horizon, respectively. (Ciarli, Di Ubaldo & Savona, 2021)

# How can these problems be remedied for fuller analysis?

- Incorporate **lags** and **controls (inflation, unemployment)** and perform **quantitative analysis** (Stansbury & Summers, 2018; Pasimeni, 2018; Brocek, 2019; Nasir et al., 2022).

- Elasticities of **0.72%** (Stansbury & Summers, 2018) and **1.54%** (Brocek, 2019) are found for **median wages**.

Value Added

Brocek (2019) approaches a good level of analysis, however there are still problems.

- The timeframe only spans from **1999-2017**,
  - I expand to **1997-2019**
- Brocek (2019) does **not undergo** any **robustness checks**,
- **Does not control for inflation**
- **Does not investigate** mean wages or labour compensation as dependent variables.
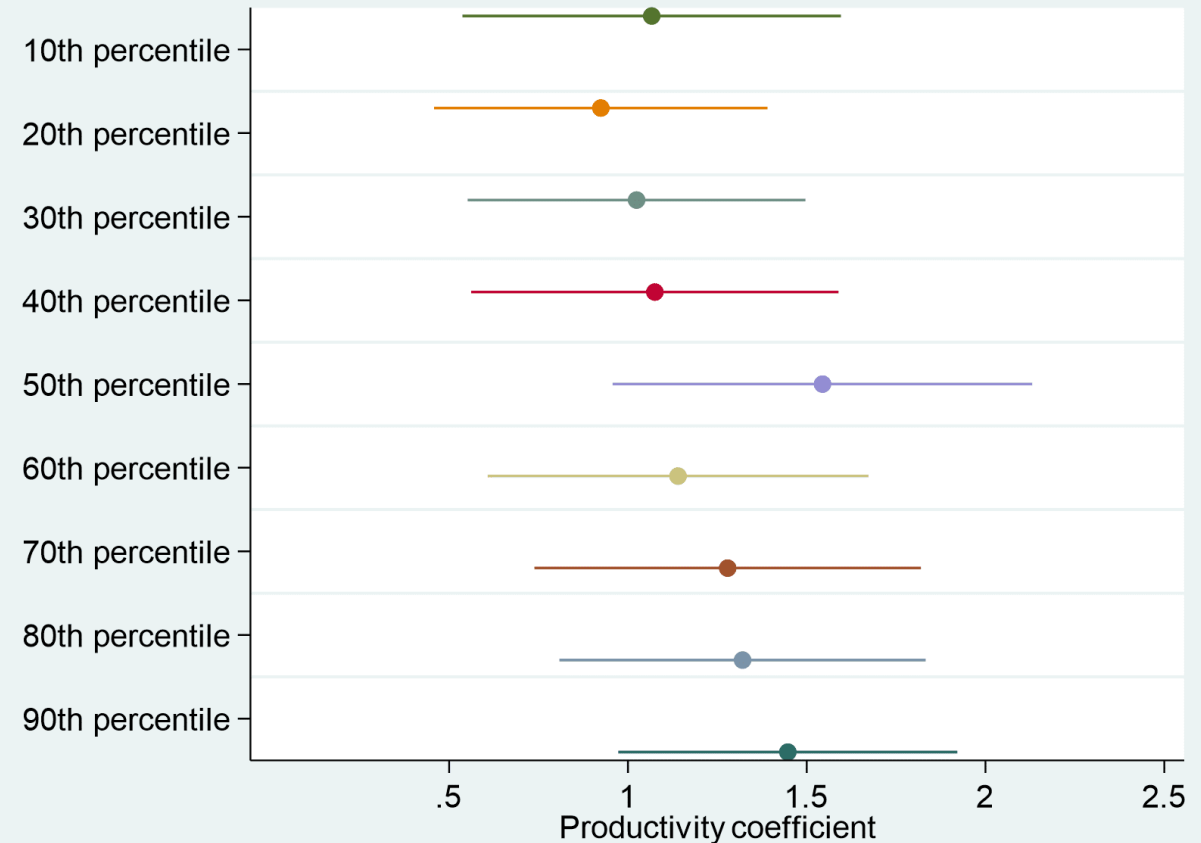
Empirical Strategy

Baseline Model

$$\Delta\log wages_t = \beta_0 + \beta_1 \Delta\log prod_t + \beta_2 \Delta unemp_t + \beta_3 \Delta unemp_{t-1} + \beta_4 \Delta inf + \epsilon_t$$

Accounting for lagged effects

Variables are estimated in 3-year moving average form to account for lagged effects.

$$\frac{1}{3}\sum_{0}^{2} \Delta \log wages_{t-i}$$

$$= \beta_0 + \beta_1 \frac{1}{3}\sum_{0}^{2} \Delta \log prod_{t-i}$$

$$+ \beta_2 \frac{1}{3}\sum_{0}^{2} \Delta unemp_{t-i}$$

$$+ \beta_3 \frac{1}{3}\sum_{0}^{2} \Delta unemp_{t-i-1}$$

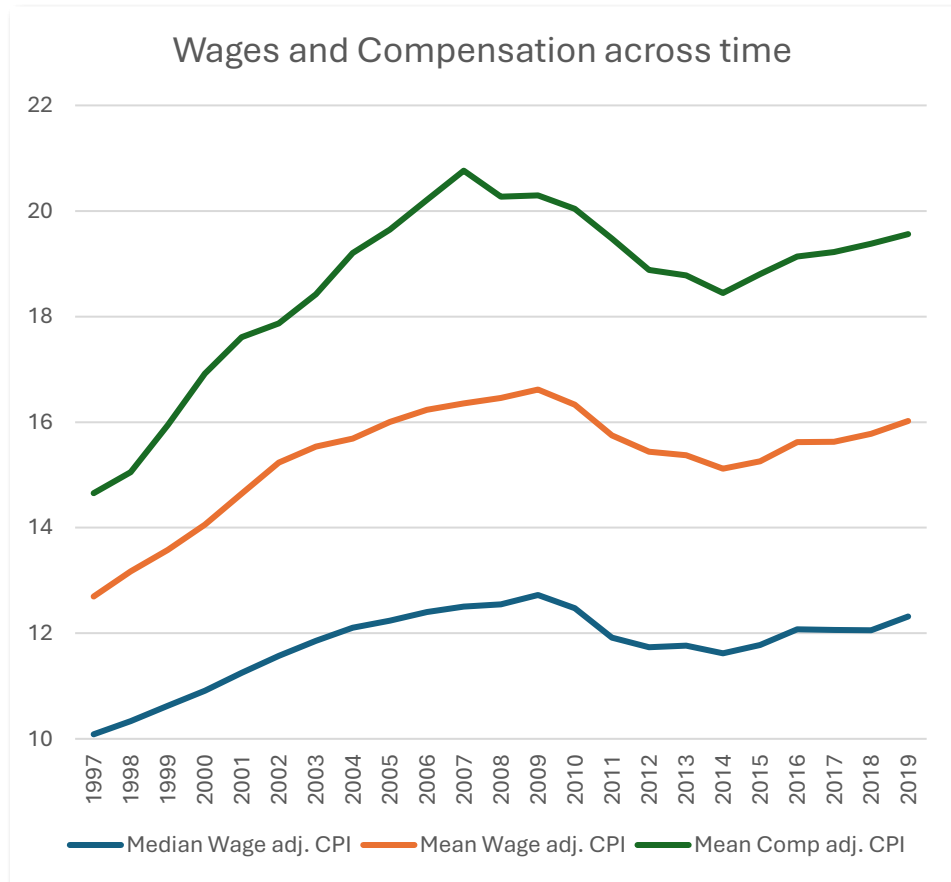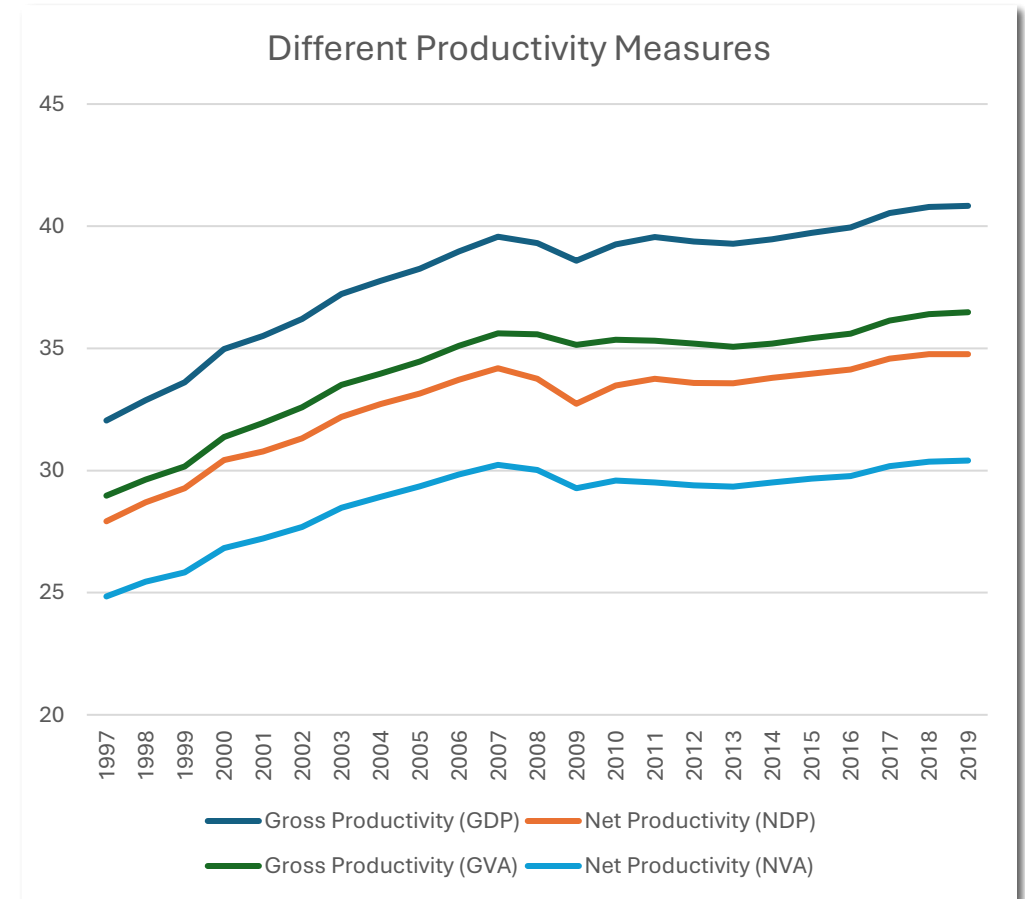$$+ \beta_4 \frac{1}{3}\sum_{0}^{2} \Delta inf + \epsilon_t$$

Data

Data
Data is varied for robustness tests.

Median Total Labour Compensation is not available in the UK.

Wages and Compensation across time — Median Wage adj. CPI, Mean Wage adj. CPI, Mean Comp adj. CPI

2015 prices

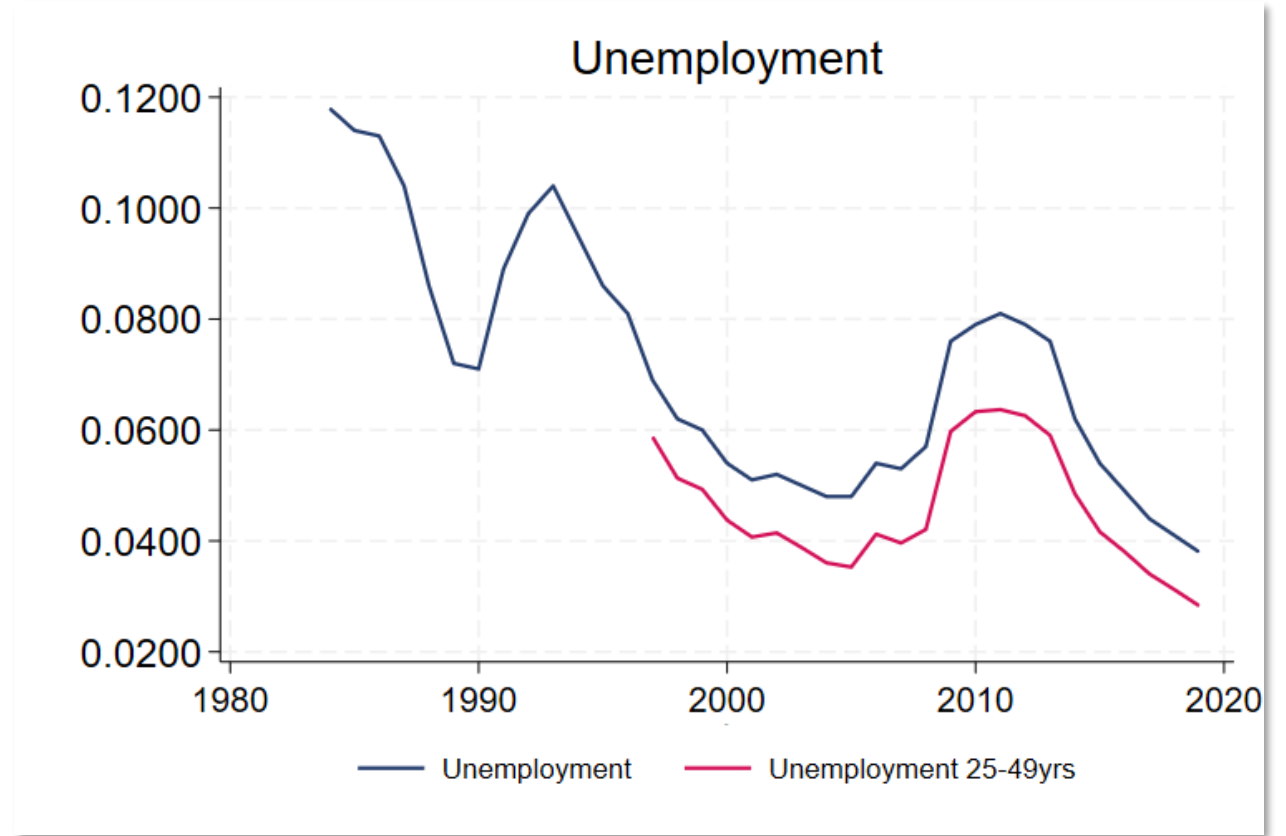Different Productivity Measures — Gross Productivity (GDP), Net Productivity (NDP), Gross Productivity (GVA), Net Productivity (NVA)

2019 prices

Data
Some data shown dates before 1997.
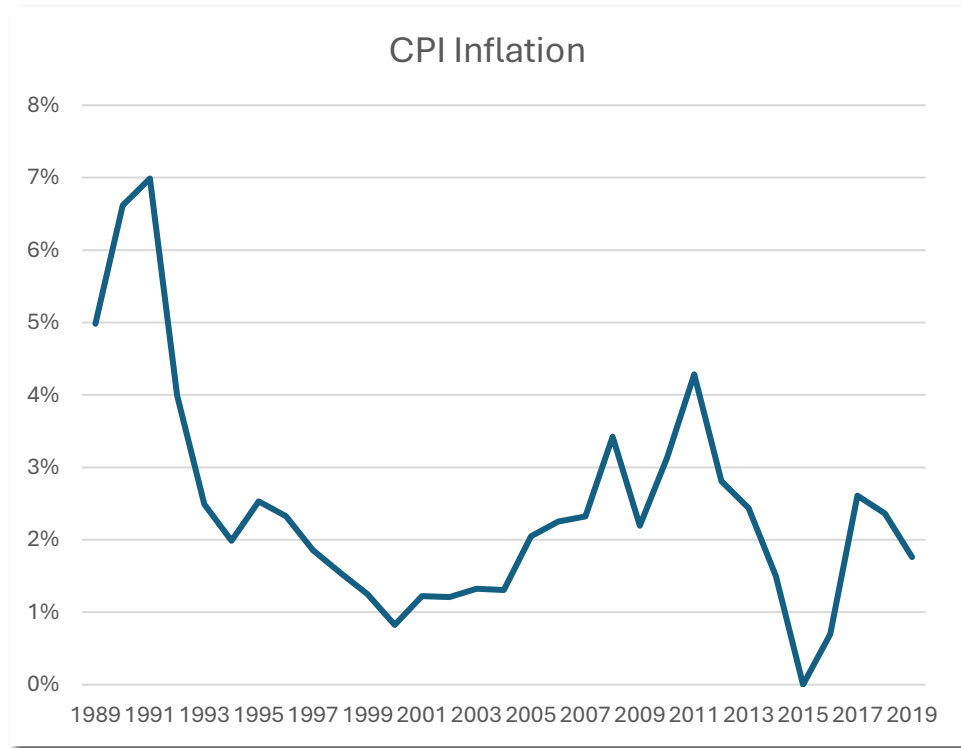
Results

Results – Baseline

Productivity effect on wage growth across the income distribution.
Baseline Regression
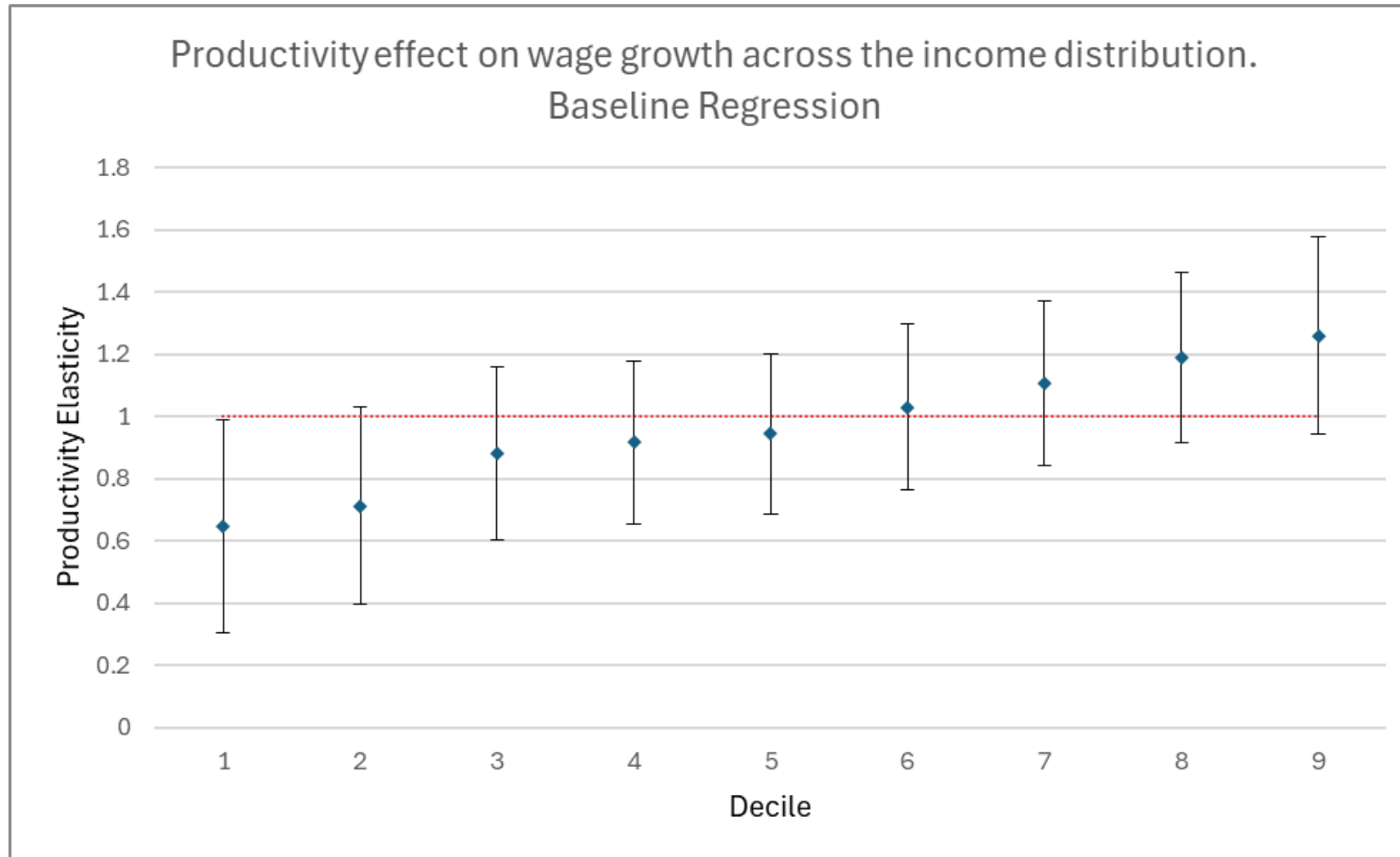
Results – Alternate Specifications

Productivity Effects, Alternative Specifications
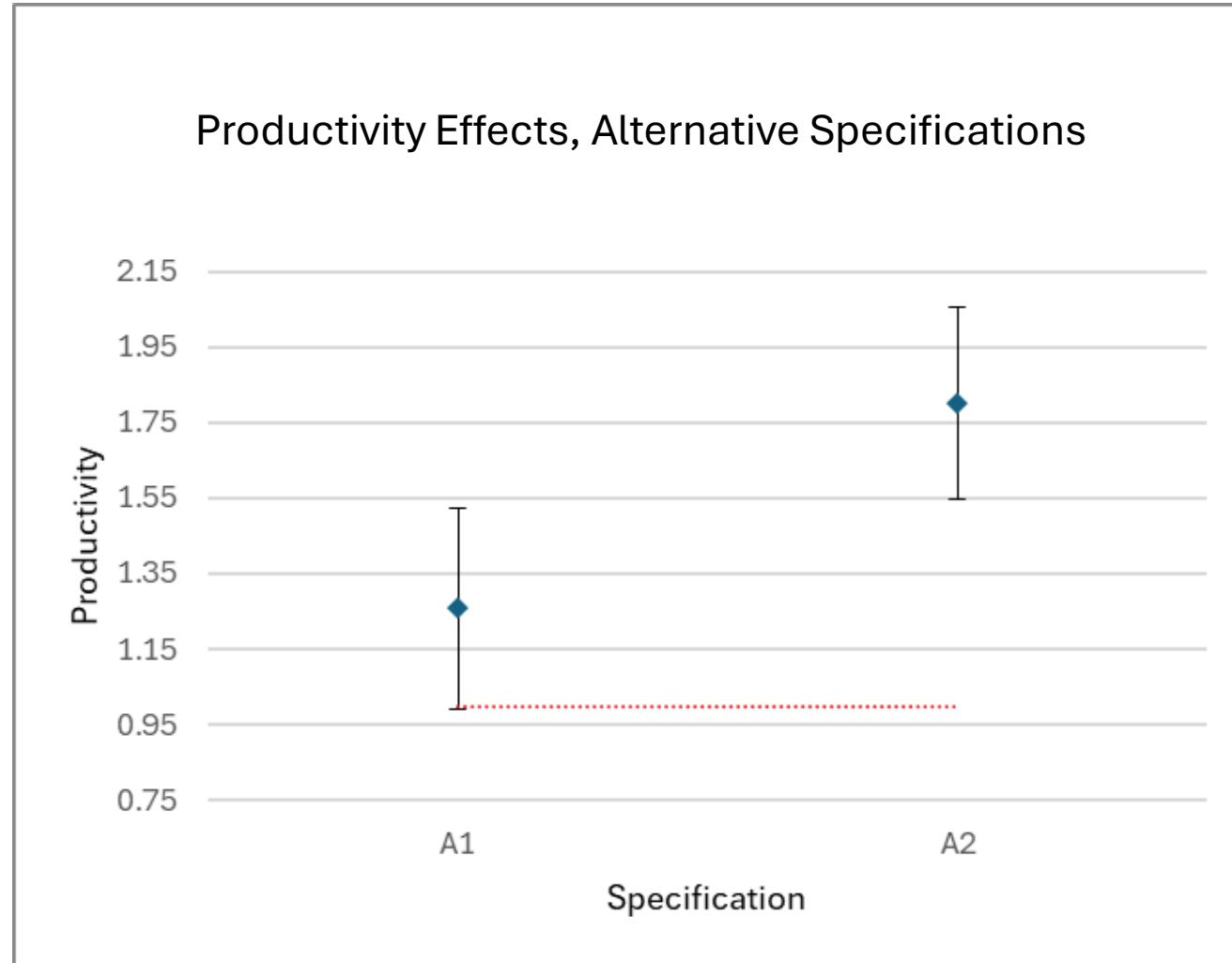
Main Findings

- There is **strong correlation between wage growth and productivity**, at both the average and median levels. As such, labour's share of income has certainly increased.

- The 'linkage' or 'coupled' assertion made by Krugman, Reeves, and Solow are **supported by the evidence: productivity is the dominant determinant of wages.**

- **Examining lagged effects** is both theoretically justified and produces significant, positive results.

- **Unemployment and inflation** also have significant effects on wage growth.

Main Findings

- **Inequality effects are significant** – lower income deciles benefit less on average, via wage growth, from average labour productivity growth.

- **Why do these inequality effects exist?** At the moment, the answer is not clear.

Labour Bargaining Power

- In their analyses, Pasimeni (2018) and Nasir et al. (2022) argue that the unemployment regression coefficient also captures the effects of labour bargaining power.

- This viewpoint borrows from *efficiency wages* theories (Stiglitz & Shapiro, 1984; Akerlof & Yellen, 1990)

Labour Bargaining Power

- Increasing labour bargaining power is **not a straightforward way** to increase real wages.

- Conflict theories of inflation imply that **greater labour bargaining power can cause wage-price or price-wage spirals to emerge during pay disputes**.

- Existing research from Blanchard (2004) suggests that **if trust exists between labour and capital groups, wage-price spirals can be avoided even with high union density**.

Policy, to summarise:

Increasing productivity is critical if policy makers are aiming to boost living standards, wages, and total labour compensation.

Keeping inflation and unemployment low also helps real wage growth.

Greater labour bargaining power will help too; however, this must be paired with active policies to strengthen trust.

Weak labour bargaining power likely explains growing pay-productivity divergence.

Future Research

Improvements to the methodology

and gaps for further research.

Further investigation is needed to examine labour productivity distribution.

This tells us: **will more labour bargaining power reduce inequality effects**, or is **labour productivity distribution itself unequal?**

Depending on the answer, **redistribution policies might therefore be most credible way to ease income inequality**.

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