

Is the link between labour productivity and wage growth still alive in the UK?

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UK labour productivity rose steadily at an average rate of 2.2% per year prior to 2008, but has failed to return to its pre-crisis trend since then.

Productivity matters. One reason it matters is through its links to the real wage that is affordable to employers. As productivity rises it takes fewer hours of work to produce the same amount of output. This allows employers to increase wages. Higher real wages enable workers to afford higher levels of consumption, enjoy more leisure, and potentially invest more in their health and education.

Figure 1: Labour productivity, mean and median real hourly wages (1997 - 2017)

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Source: ASHE, ONS, author calculations.

Figure 1 plots UK labour productivity (GDP per hour worked), alongside median real hourly wages over the period 1997-2017. The break in trend is clear. However, while labour productivity has continued to grow albeit at a slower rate, the median real hourly wage, the key indicator of earnings of the typical UK worker, has fallen over the post-financial crisis years. It would appear that the link between labour productivity and median real wages has changed.

This raises a number of questions:

- How strong is the link between labour productivity and real wage growth for the median worker in the UK?
- Are there any differences between different points of the wage distribution or sectors

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of the UK economy?

- Do these findings have any implications for policymakers?

In this blog we'll take a look at each of these and see what the data tell us.

How strong is the link between labour productivity and wages for the typical UK worker?

Using data from the Annual Survey of Hours and Earnings we have estimated the strength of the link between labour productivity growth and wage growth.

More specifically, for each income decile, we regress the change in the 3-year moving average of log median wage on the change in the 3-year moving average of log labour productivity.

We also include the 3-year moving average of the unemployment rate and lagged unemployment rate as control variables in our regressions.

We find that a 1 percentage point increase in labour productivity growth is associated with a 1.54 percentage point increase in median real wage growth over the period 1999 to 2017.

However, a test for parameter stability provides evidence of a structural break in the estimated productivity parameters in 2009.

This result implies that the relationship between labour productivity growth and wage growth is marginally weaker in the post crisis years, i.e. during the period of the "productivity puzzle". It is possible that other factors, orthogonal to productivity, such as low unionisation rates or labour hoarding by companies, could have contributed to the difference in the relationship in post-crisis years (Ciarli et al., 2018).

Nonetheless, despite the effect being a weaker relationship, it is evident that productivity still influences real wage growth for the median UK worker.

Are there differences in the relationship across different percentiles of the wage distribution?

We run separate regressions for real wage growth at each decile of the wage distribution.

Figure 2 shows that the estimated productivity coefficients for each decile are always close

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to 1, and in every case the 95% confidence interval indicates that the individual estimates are not significantly different to 1.

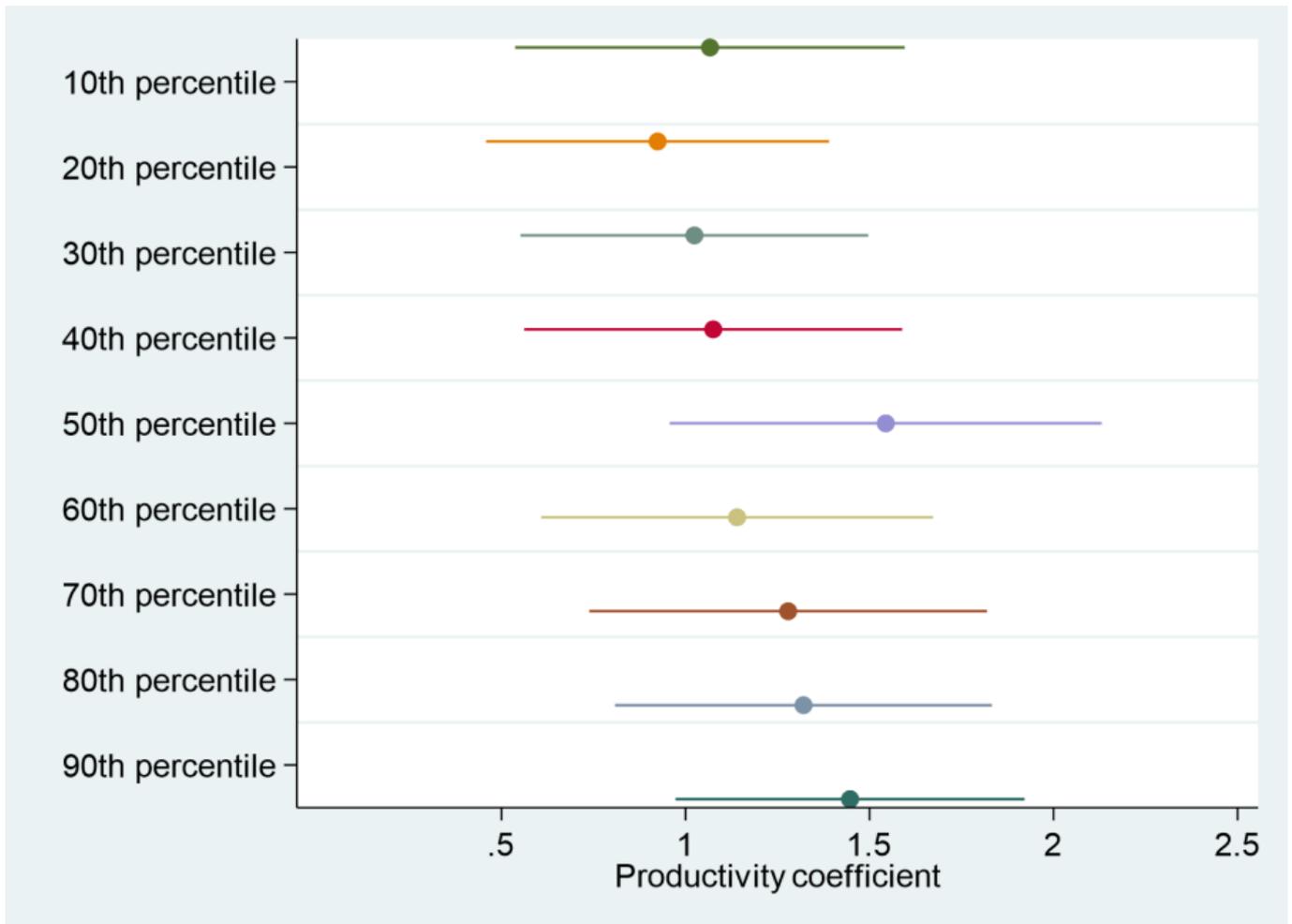
These results suggest that the link between labour productivity growth and real wage growth is alive and well for each decile of the wage distribution.

However, there are notable differences across deciles in the estimated strength of the relationship.

For example, for a worker at the 90th percentile of the earnings distribution a 1 percentage point increase in labour productivity growth translates into an estimated 1.45 percentage point increase in wage growth. However, for a worker at the 20th percentile an equivalent sized increase in productivity growth only translates into a 0.92 percentage point increase in wage growth.

Figure 2: Estimates of the strength of the relationship between labour productivity growth and wage growth across the wage distribution

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Source: ASHE, ONS, author calculations.

Note: The chart shows productivity coefficient estimates and 95% confidence intervals obtained from regressions run for each decile of the wage distribution. More specifically, for each decile, we regress the change in the 3-year moving average of log wage on the change in the 3-year moving average of log labour productivity. We include the 3-year moving average of the unemployment rate and lagged unemployment rate as control variables in our regressions. None of the estimated coefficients is significantly different from 1.

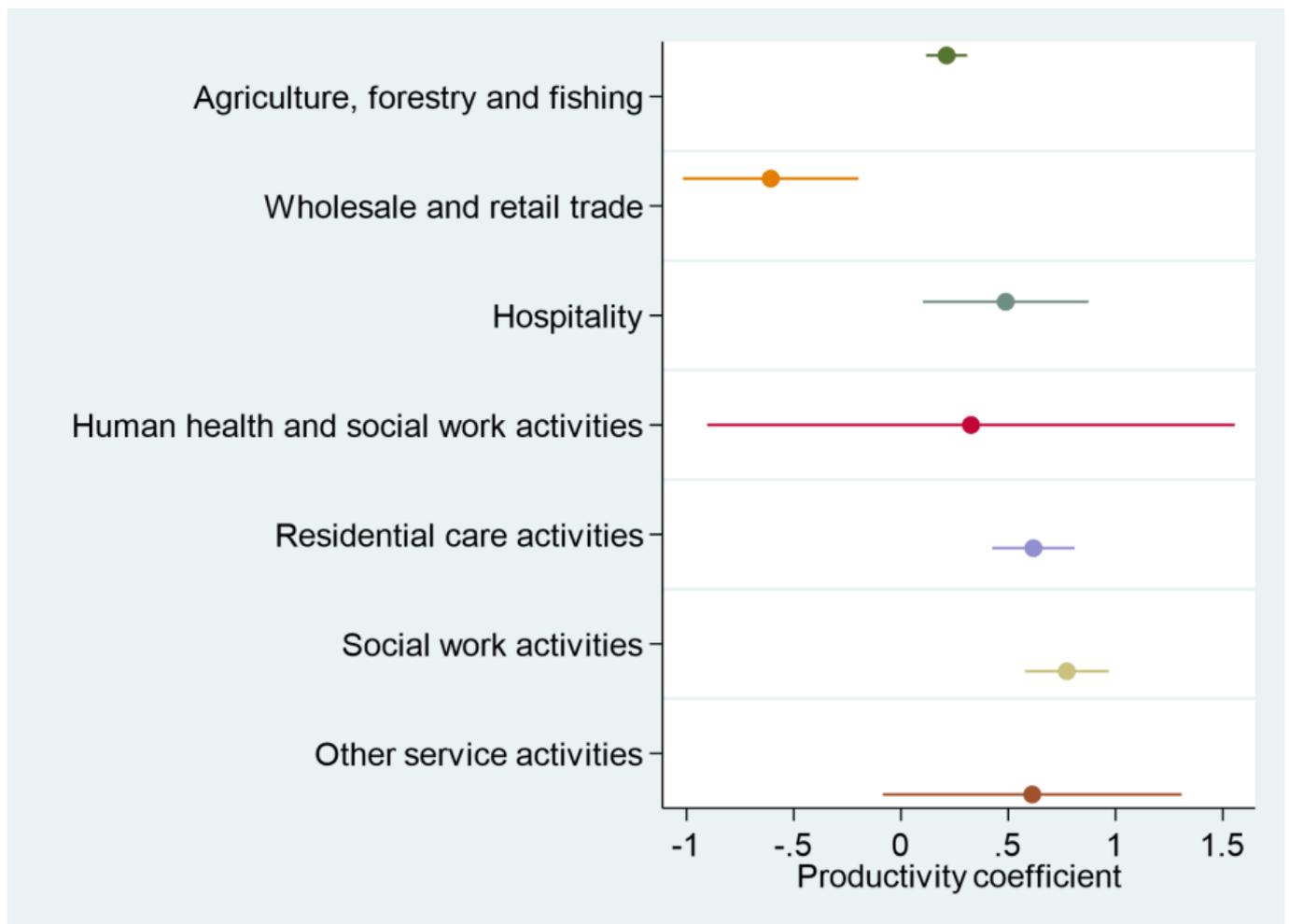
Does the relationship between labour productivity and real wages hold in sectors where low pay is prevalent?

The productivity gap the UK has with other developed economies is particularly large in sectors in which low-paid work is relatively more prevalent.[\[1\]](#)

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Figure 3 shows the strength of the link between labour productivity growth and real wage growth in these sectors. (It is worth pointing out that in principle, examining occupational data would be preferable, but since the relevant occupational data in ASHE are only available over a much shorter period, we restrict our analysis to sectoral data.)

Figure 3: Estimates of the strength of the relationship between labour productivity growth and wage growth for low-paid sectors of the UK economy



Source: ASHE, ONS, author calculations.

Note: Note: The chart shows productivity coefficient estimates from regressions of each sector's real wage growth on labour productivity growth. As before, we regress the change in the 3-year moving average of log wage on the change in the 3-year moving average of log labour productivity in each sector and include the 3-year moving average of the

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unemployment rate and lagged unemployment rate as control variables in the regressions.

The results suggest that the relationship is much weaker for all low-paid sectors than for the median wage or across the deciles of the wage distribution.

The expected positive relationship is not evident for the wholesale and retail sector and is weak and insignificant in the other services sector. A weak but significant positive relationship is found in agriculture, forestry and fishing. The productivity coefficient is very imprecisely estimated for health and social work activities, given that the 95% confidence interval spans a wide range that includes 0 and 1.

However, further disaggregating into residential care and social work sub-sectors we see their real wage growth is influenced by productivity growth, but that the estimated coefficients are significantly below 1, so the relationship is weaker than found at the median of the wage distribution.

Policy implications

We have demonstrated that the relationship between labour productivity growth and median real wage growth is alive in the UK, but has weakened since the financial crisis.

However, if we look beyond the median, we find that this result masks a substantial degree of variation across deciles of the wage distribution and in sectors where low-pay is prevalent. The link is weaker at lower deciles of the wage distribution in comparison to higher deciles.

Furthermore, the expected significant positive relationship is not evident within the wholesale and retail sector. While the positive relationships between labour productivity growth and real wage growth are significant but much weaker than those found for the median worker in agriculture, forestry and fishing, hospitality, and in residential and social care.

Closing the productivity gap the UK is a policy objective of the UK government. The UK's industrial strategy has become a mantra for solving the UK's productivity woes. Our results suggest that whilst closing the productivity gap will benefit workers, the effects are likely to differ depending upon what sectors are targeted. In particular, closing the productivity gap does not look likely to feed through to the same rate of real wage growth in some of UK's most vulnerable sectors. A more granular approach focusing on strengthening the link between real wage growth and labour productivity growth may be necessary in sectors

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where the relationship is weak, particularly if the intention is to secure broad-based gains for all-earners.

These results are also particularly relevant to the Scottish Government which has made inclusive growth one of its key economic policy objectives. The OECD (2018) argue that increasing public spending on active labour market policies, such as work-experience programmes can raise the labour share of national income and support the transmission mechanism of productivity gains to wages. Complementary labour market policies conducive to inclusive growth could help ensure that those who are the most vulnerable are not left behind.

References

Ciarli, T., Salgado, E. and Savona, M. (2018) *Do Low-Wage Workers Benefit from Productivity Growth Recovery?*, Joseph Rowntree Foundation.

Forth, J. and Rincon Aznar, A. (2018) *Productivity in the UK's low-wage industries*, National Institute for Economic and Social Research.

OECD (2018) *Decoupling of wages from productivity: What implications for public policies?*, Chapter 2 of the *World Economic Outlook*, OECD.

[1] Forth and Rincon Aznar (2018) have identified industrial sectors in the UK where at least one quarter of the workforce are low-paid (constituting gross hourly earnings below two-thirds of the UK median earnings)