Article

Coronavirus and the impact on payroll employment: experimental analysis

Experimental analysis of the impact of the coronavirus on population in labour market statistics.

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1 . Main points

- The reduction in non-UK nationals during the coronavirus (COVID-19) pandemic period is smaller for payroll employees than for equivalent Labour Force Survey (LFS) data.

- This suggests that LFS-based estimates are likely to significantly overstate the change in the non-UK national population.

- Further analysis of the data will be used to inform a reweighting of the LFS in the summer, and also will contribute to ongoing work to develop new methods for measuring population and migration.

2 . Overview

There is significant public and policy interest in how the UK labour market has been affected by the coronavirus (COVID-19) pandemic. One aspect of this is how the non-UK workforce is changing.

To shed new light on this topic, today we have published new data using the HM Revenue and Customs (HMRC) Real Time Information system, which is the source of our monthly employee payroll statistics. By linking this to data from HMRC's Migrant Worker Scan, this tells us about the nationality of employees when they were given a National Insurance Number (NINo). We infer nationality from this to produce estimates of the numbers of EU and non-EU national payrolled employees in the UK. This can then be compared with the Labour Force Survey (LFS) estimates, which ask for nationality.

We set out our analysis of what these new data are telling us, what this means in the context of our wider statistics based on the LFS, and the further work we are doing to provide a picture of how the UK population as a whole is changing.

3 . Impact of the pandemic on the Labour Force Survey

The Labour Force Survey (LFS) provides estimates for a range of labour market outputs and topics. The sample of approximately 40,000 households is intended to be representative of the entire household population of the UK over any three consecutive months. People are interviewed in five consecutive quarters, with the first interview generally being face-to-face and subsequent interviews via telephone.

As an immediate response to the coronavirus (COVID-19) pandemic, in March 2020, the Office for National Statistics (ONS) suspended face-to-face interviews and moved to telephone interviews. This change led to a reduced response rate and introduced some non-response bias issues. We have already been adapting our methods to ensure the survey continues to be as representative as possible of the population as a whole.

The initial concern was differential change in level of response by households depending on their housing tenure (for example, whether the household owned, were buying, or were renting their accommodation). We appeared to have too many owner occupiers and too few renters responding to the survey compared with pre-pandemic levels.

To address this potential bias, we introduced an additional control in relation to household tenure in the weighting. This improved the quality of our employment estimates and improved the coherence between LFS estimates of employment and HM Revenue and Customs (HMRC) Pay As You Earn (PAYE), Real Time Information (RTI) estimates since the start of the pandemic.

Although the tenure adjustment introduced into the weighting has improved the quality of the estimates, some anomalies remain when considering estimates broken down by some socio-demographic factors, in particular, country of birth and nationality.

LFS data indicated a big fall in the non-UK-born population between Quarter 1 (Jan to Mar) and Quarter 3 (July to Sept) 2020, and a large increase in the UK-born population. However, the latter is a consequence of the way we weight the survey to constrain to a fixed population size.

The LFS is weighted to the official population projections by age, sex and geography. These projections are based on mid-year population estimates that take the previous census and roll it forward each year to take account of the numbers of births, deaths and migration. As the current population projections used by the LFS are 2018-based, they are based on demographic trends that pre-date the coronavirus pandemic.

4 . Real-time tax data by nationality

Latest data

As part of the labour market release for March 2021, we have, for the first time, additional analysis of Real Time Information tax data matched with the Migrant Worker Scan (MWS). This gives us additional insight into the change in the non-UK national population, although limited to payrolled employees. RTI data do not suffer from non-response bias in the same way as a survey such as the LFS, but the data are not specifically collected for the purpose of measuring the labour market or population so understanding the data and underlying definitions is important [1].

Estimates of non-UK nationals in employment obtained using LFS data show a year-on-year fall to October to December 2020 of over 550,000, which is equivalent to 15% of the non-UK nationals in employment. This is a much bigger change when compared with the RTI-based growth rates (Table 1), which show a reduction of 4% per cent over the same period, and suggests that LFS estimates alone may be significantly overstating the fall in the number of non-UK nationals. It should also be noted that LFS data also include self-employment as well as employees and a different comparison may emerge from looking just at the LFS employee count.

The larger fall in the number of non-UK nationals measured by the LFS is in large part caused by increased bias stemming from differential non-response between UK and non-UK nationals that the additional tenure constraint introduced in 2020 has not totally removed. That is, that the move to a telephone-based survey still means a lower level of response from non-UK nationals.

Table 1: Estimates broken down by nationality from LFS and PAYE RTI, UK

	LFS employment (thousands) of which:					RTI (thousands) of which:				
	Total	Non-UK	EU	Non-EU	UK	Total	Non-UK	EU	Non-EU	UK
Levels										
Jan to Mar 2019	32,641.1	3,697.8	2,380.9	1,316.9	28,942.8	28,827.6	4,240.4	2,444.2	1,796.3	24,587.1
Apr to Jun 2019	32,751.7	3,660.6	2,368.4	1,292.2	29,084.2	28,880.5	4,342.6	2,498.5	1,844.2	24,537.8
Jul to Sep 2019	32,802.5	3,589.1	2,237.7	1,351.4	29,209.3	28,926.6	4,352.7	2,477.9	1,874.8	24,573.9
Oct to Dec 2019	32,983.2	3,654.1	2,309.7	1,344.4	29,325.3	28,982.1	4,401.7	2,488.4	1,913.3	24,580.4
Jan to Mar 2020	32,997.6	3,736.8	2,367.1	1,369.7	29,250.9	29,016.5	4,381.7	2,457.5	1,924.2	24,634.7
Apr to Jun 2020	32,592.1	3,467.8	2,153.7	1,314.1	29,107.4	28,419.4	4,354.7	2,431.0	1,923.7	24,064.7
Jul to Sep 2020	32,514.6	3,160.9	1,874.2	1,286.7	29,351.7	28,260.4	4,282.8	2,362.8	1,920.0	23,977.5
Oct to Dec 2020	32,441.2	3,091.6	1,831.2	1,260.3	29,346.9	28,177.4	4,223.9	2,304.4	1,919.5	23,953.4
Change on year										
Jan to Mar 2020	356.5	39.0	-13.8	52.8	308.2	188.9	141.3	13.3	128.0	47.6
Apr to Jun 2020	-159.6	-192.8	-214.7	21.9	23.3	-461.0	12.0	-67.4	79.5	-473.1
Jul to Sep 2020	-287.8	-428.3	-363.5	-64.7	142.5	-666.2	-69.8	-115.1	45.2	-596.4
Oct to Dec 2020	-541.9	-562.5	-478.5	-84.0	21.5	-804.8	-177.8	-184.0	6.2	-627.0
Percentage change on year										
Jan to Mar 2020	1.1%	1.1%	-0.6%	4.0%	1.1%	0.7%	3.3%	0.5%	7.1%	0.2%

Apr to Jun 2020	-0.5%	-5.3%	-9.1%	1.7%	0.1%	-1.6%	0.3%	-2.7%	4.3%	-1.9%
Jul to Sep 2020	-0.9%	-11.9%	-16.2%	-4.8%	0.5%	-2.3%	-1.6%	-4.6%	2.4%	-2.4%
Oct to Dec 2020	-1.6%	-15.4%	-20.7%	-6.3%	0.1%	-2.8%	-4.0%	-7.4%	0.3%	-2.6%

Source: Office for National Statistics – Labour Force Survey, HMRC Pay As You Earn, Real Time Information

Notes

1. Note that nationality is reported by individuals when they register for a National Insurance Number (NINo). This means that if an individual subsequently changes nationality to become a UK citizen, this is not reflected in the RTI or MWS analysis presented here. There are further definitional and coverage differences between RTI and LFS, and both sources may also include people (such as some short-term migrants) who are not covered in the definition of "usual residence" used in ONS official population estimates.

2. A three-month rolling average of RTI payrolled employees has been constructed for this comparison.

3. LFS data are for total employment and include self-employment as well as unpaid family workers and government supported trainees.

Within the RTI data, we also observe that there are differing patterns for EU and non-EU nationals. In the year to October to December 2020, there was a decrease in EU payroll employees of 7% while non-EU were virtually unchanged. However, the change in non-EU nationals is not consistent across the UK. London showed a decrease in EU nationals on payrolls over the year to October to December 2020, while every other region in England, and country in the UK saw an increase for this group.

The pattern of the RTI data showing larger increases and/or smaller decreases when compared with the LFS is repeated throughout the pandemic period in 2020.

What we can infer from these data

The RTI data itself might give us some insight into the changing populations of UK and non-UK nationals in the UK. In particular, differences in the changes between different groups within RTI might be a useful indicator of shifts in the wider population, although it is important to note again here that RTI is limited to payroll employees only.

We might see differential changes in the number of RTI employees who are UK, EU or non EU nationals for two main reasons:

- people who are EU or non-EU nationals have a differential propensity to lose their jobs during the pandemic compared with UK born people; this could be because of the sectors where EU and non-EU nationals are most likely to work and/or other characteristics

- a change in the underlying population of that group in the country

There is a marked difference between the change in RTI employees who are EU and non-EU nationals. As noted, in the year to October to December 2020, the number of EU nationals on RTI fell by 7%, while it grew marginally for non-EU nationals. We saw a similar difference in growth rates in the year to July to September 2020. To the degree that these differentials are indicators of population change, this might suggest a shift in the non-UK population from EU national to non-EU national people.

We can also compare the position of UK and non-UK nationals, where we do not see a particularly marked difference in their growth rates. In the year to July to September 2020, there was a 2.4% fall in UK nationals on RTI and 1.6% fall in non-UK nationals. For the year to October to December 2020, the figures we see are for falls of 2.6% and 4% respectively. This might suggest a slight shift in population towards UK nationals but we would need to understand what is also happening to the non-payroll parts of the population.

Notes for: Real-time tax data by nationality

1. Note that nationality is reported by individuals when they register for a National Insurance Number (NINo), which means that if an individual subsequently changes nationality to become a UK citizen, this is not reflected in the RTI and MWS analysis presented here. There are further definitional and coverage differences between RTI and LFS, and both sources may also include people (such as some short-term migrants) who are not covered in the definition of "usual residence" used in Office for National Statistics (ONS) official population estimates.

5 . Employment data

Employments from Pay As You Earn Real Time Information: Ad hoc estimates of payrolled employees by NUTS1 region and nationality, seasonally adjusted
Dataset | Released on 23 March 2021
Ad hoc monthly estimates of PAYE RTI employees by nationality and geographical region (NUTS1), nationality determined using the Migrant Worker Scan.

EMP06: Employment by country of birth and nationality
Dataset | Released on 23 February 2021
Employment levels and rates by country of birth and nationality. These estimates are usually updated in February, May, August and November.

6 . Future developments

The Real Time Information (RTI) data suggest that there is non-response bias in the Labour Force Survey (LFS). We will therefore be looking to use this new RTI analysis, and other administrative data, to reweight the LFS. The additional analysis provided at a regional and country level will also help provide greater insights into how the impacts of the pandemic have affected different areas of the UK.

In addition, we have been continuing our wider work to use administrative data and new methods to understand how the population and migration are changing through the pandemic and provide earlier insights on this important topic. We know no single data source has the answer, so we are working across the Government Statistical Service (GSS) to bring in further data sources as these become available.

We plan to publish an update on this work on population and migration in April 2021. This will provide insights on population in its own right, but also form the basis for the reweighting of the LFS over the summer. Our work is iterative so we will continue to share our developments along the way and welcome feedback from our users. Please contact labour.market@ons.gov.uk with any comments.

7 . Related links

Understanding the impact of Covid-19 on UK population
Blog | Released 25 January 2021
Understanding how international migration has changed over the past 12 months, how the Office for National Statistics (ONS) is meeting the challenge, and what that means for our population, migration and labour market statistics.