

# Labour Force and Annual Population Surveys User conference 2023

Thursday 2 February 2022

## Research paper abstracts

### Session 3a Mobility and transitions

#### **Obstacles to transitions between occupations with similar skill requirements: A multidimensional model of intragenerational occupational mobility in the United Kingdom**

*Xavier St-Denis and Edward Haddon, National Institute for Scientific Research*

Workers experiencing job loss, especially in sectors with low growth prospects, often need to transition to new occupations to return to employment. Conversely, employers facing labour shortages often need to identify workers with experience in related occupations who could reskill and represent potential hires. In both cases, transitions from one occupation to another will require the least amount of retraining and reskilling if the two occupations have very similar knowledge, skills and abilities requirements.

Precise measures of occupational similarity have been developed using detailed data from sources such as O\*Net or scrapped data from online job postings. This has allowed to quantify the opportunities of mobility to skill-similar occupations faced by different categories of workers. However, the role of other potentially important obstacles to occupational mobility and their impact on occupational transitions have received much less attention in labour market research. More specifically, women and ethnic minorities may experience barriers of entry into occupations where men and white workers are over-represented. In sociology, research identifies large and detailed occupational groupings as capturing meaningful discrete class boundaries that workers are less likely to cross.

In this paper, we use longitudinal data from the five-quarter panels of the UK Labour Force Survey to build large occupational transition matrices. We combine this data with measures of O\*Net skills distance and distance in gender, ethnic, and education occupational composition. Using log-linear models, we find that net of skill distance and class boundaries effects, differences in the occupational share of women, non-White workers, and less educated workers represent significant obstacles to occupational mobility. These effects vary between men and women. In sum, our paper provides novel insights on the topology of intragenerational occupational mobility that goes beyond the traditional focus of studies of occupational transitions in social sciences.

#### **Can workers still climb the social ladder as middling jobs become scarce? Evidence from two British cohorts**

*Fabien Petit, University of Sussex, and Cecilia García-Peñalosa and Tanguy van Ypersele, Aix-Marseille University*

The increase in employment polarization observed in several high-income economies has coincided with a reduction in inter-generational mobility. This paper argues that the disappearance of middling jobs can drive changes in mobility, notably by removing a stepping-stone towards high-paying occupations for those from less well-off family backgrounds. Using data for two British cohorts we

---

examine how the occupational outcomes of children depend on both initial occupations and occupational upgrading during their careers. We find that transitions across occupations are key for mobility and that the effect of parental income on those transitions has become stronger over time. Moreover, the impact of parental income increased the most in the regions where the share of middling employment fell the most, suggesting that greater employment polarization may be one of the factors behind the observed decline in mobility.

## **Trends in women in the engineering workforce between 2010 and 2021**

*Marie Horton, Engineering UK*

### *Introduction*

Women continue to be significantly under-represented in the engineering workforce, despite increased efforts to attract a more diverse group of employees. Our aim was to explore engineering workforce trends over the past decade by gender and find out which, if any, engineering occupations have been more successful in attracting women.

### *Methods*

We used the engineering footprint (an agreed list of Standard Occupational Classification (SOC) and Standard Industry Classification (SIC) codes) to identify the 'core' and 'related' engineering workforce. For each annual datapoint, we collated four quarters of LFS data to create a dataset with only waves 1 and 5 used (to avoid double counting of respondents appearing in more than one quarter) and calculated a new person weighting accordingly. From there, we calculated trends in the proportions of female employees from 2010 to 2021 for all engineering, core and related. We then looked at occupations individually to identify areas of large growth or decline.

### *Results*

The percentage of women working in engineering occupations increased from 10.5% in 2010 to 16.5% in 2021 compared to 47.7% in the overall workforce. Notably, the rise in numbers of women continued even when the total number working in engineering fell in 2020, the first year of the Covid-19 pandemic.

In 2021, there were fewer women working in core engineering roles (15.2%) than in related engineering (19.0%). Over three in five (63%) engineering occupations saw an increase in women between 2010 and 2021, but almost one in four (24%) saw decreases, and for over one in ten (13%) there were consistently no female employees.

### *Conclusion*

The LFS data allowed us to see that since 2010, there has been a rise in the number of women across the majority of engineering roles. This is welcome news, but there is still improvement needed, which the LFS will allow us to observe.

## **Session 3b Long term trends and structural dynamics**

### **Long-term trends in part-time work in the UK**

Rachel Scarfe, University of Edinburgh

In this paper I use the Labour Force Survey to document new facts about trends in part-time work in the UK. First, there has been a substantial increase in the percentage of men working part-time since the 1990s as labour markets have become more flexible. At the same time, the female part-time share has generally been fairly stable, or fallen slightly, so that the net effect is a slight increase in the overall part-time share. There has also been an increase in part-time work on the extensive margin; fewer people work very low hours and more work between 20 and 30 hours per week. Second, despite this increase in the quantity of part-time work, the difference in average hourly pay for part-time and full-

time work has steadily decreased. Observing these equilibrium outcomes does not identify whether these changes are caused by changes in workers' preferences for different hours of work or by structural changes that mean that firms now wish to employ more part-time workers. To investigate further, I use the Occupational Information Network (O\*NET) dataset of occupations and tasks, together with the Labour Force Survey, to analyse which tasks and work activities are most closely associated with part-time work.

In the second part of the paper I develop a model of the labour market which can explain both firms' and workers' preferences for part- and full-time work. In the equilibrium of the model, part- and full-time workers undertake different tasks. As a result, the model can endogenously generate earnings that are non-linear in hours worked. The model can be used to disentangle the effects of changes in workers' preferences and in firms' production technologies on the relative quantities and prices of part- and full-time labour.

### **Decomposing the disability employment gaps in the UK: The role of education**

*Mark Bryan, Andrew Bryce, Jennifer Roberts, and Cristina Sechel, University of Sheffield*

Using the Annual Population Survey (APS), we explore the contribution of education to the gap in employment rates between disabled and non-disabled people in the UK (the disability employment gap, DEG). We use Oaxaca decompositions to estimate how much of the DEG is attributable to differences in the qualifications of disabled and non-disabled people (compositional differences), and how much of it reflects structural or other barriers amongst people with the same qualifications. We break down the compositional and structural components into the separate contributions of 11 academic and vocational qualifications. As is well known in the decomposition literature, identification of the structural component is plagued by the issue of which qualification is chosen as the base category. We mitigate this problem using a novel extension of the Oaxaca method that is invariant to the choice of base category. Our analysis moves beyond the usual focus on the overall DEG to consider separate, policy-relevant DEGs by gender, mental and physical health impairments, and more and less severe impairments. We also consider an 'involuntary' DEG defined only for people either active in the labour market or expressing a desire to work (and thus excluding people for whom employment may be inappropriate). Reducing the DEG is current government policy, so we discuss the likely effects of interventions to improve the education levels of disabled people and tackle structural barriers to employment. Our results indicate the likely impact on the size of the DEG and where such interventions may be best targeted.

### **Measuring the impact of Brexit on migration to Wales: from 2016 referendum to 2022 invasion of Ukraine**

*Nuo Jin, Cardiff University*

Brexit has been one of the most eye-catching socioeconomic issues both for UK and Europe. Among a great number of topics regarding Brexit, migration is a significant one which has attracted thousands of economists to analyse. My research focuses on impacts of Brexit on migration from rest of the world to Wales which has higher-than-average proportions of EU migrants in numerous industries among all UK subregions. More specifically, this research divides all migrants to Wales into four categories: 1) EU migrants earning less than £30,000; 2) EU migrants earning more than £30,000; 3) non-EU migrants earning less than £30,000; 4) non-EU migrants earning more than £30,000. My research has found that, according to the final Brexit agreement, Brexit will majorly have impacts on EU migrants. Then, this research employs a fixed effect regression model to revisit how the number and structures of migration to Wales responded to Brexit motion since 2016 Referendum, based on latest data from the Labour Force Survey. Finally, it provides initial forecasts of migration trends in Wales in next 5 years, considering the external factors such as impacts of Covid-19 pandemic and 2022 Invasion of Ukraine on migration decisions based on an optimized spatial DSGE model. Results show that Brexit has causal effects on the reduction of EU migrants in multiple industries, and migrants belonging to Category 1 and 2 in manufacturing industry suffered the most from Brexit in Wales. However, the

---

number of EU migrants and non-EU migrants earning more than £30,000 is expected to increase by 17% and 21% respectively in next 5 years amid the era of uncertainty and the expectation of loosening migration rules in UK.

## Session 4a Methodological innovations

### **UK freeports monitoring and evaluation: Innovative PowerBI APS dashboard**

*Lorena Cruz Serrano and Csaba Pogonyi, Arup*

Arup's UK Freeports Evaluation team are proud to nominate their innovative Annual Population Survey PowerBI dashboard. The team has developed this comprehensive dashboard as part of the UK Freeports Monitoring and Evaluation project, with the purpose of having an at-a-glance tool that presents and compares the counterfactual 'synthetic Freeports' with the treatment Freeport zones across a number of APS indicators.

The Freeports Programme is a flagship government programme that is expected to play an important part in the UK's post-Covid economic recovery and contribute to realising the levelling up agenda, bringing jobs, investment, and prosperity to some of our most deprived communities across the four nations of the UK with targeted and effective support.

The purpose of the Monitoring and Evaluation (M&E) of the Programme is to provide robust findings to assess the effectiveness and impacts of Freeports as a new policy. The M&E will provide accountability to Parliament, the International Trade Committee, and, ultimately, to taxpayers.

The M&E aims to maximise ongoing learning; therefore, in addition to an end-of-programme evaluation, it uses innovative econometric methods to create "No-Freeports Programme" counterfactuals. The most sophisticated method we use is the Synthetic Control Group method, which reaches Level 3 robustness on the Maryland Scientific Scale (<https://whatworksgrowth.org/resources/the-scientific-maryland-scale/>).

Using a Propensity Score Matching algorithm, we estimate weights for control local authorities which are then used to calculate a weighted average for each of the eight Freeport consortiums across England. APS indicators used are unemployment rate, employment rate, high value-added jobs, green jobs and occupational distribution. The calculated Synthetic Freeports are then fed into the PowerBI dashboard which makes it possible for the user to explore the charts on their own and create bespoke comparisons.

### **Heterogeneity in the UK Labour Market: Using Machine Learning to Test Macroeconomic Models**

*Chris Martin and Magdalyn Okolo, University of Bath*

We use machine learning techniques to investigate the main sources of heterogeneity in the UK labour market. A recent theoretical literature argues that accounting for differences in productivity between workers can help resolve some long-standing issues in the analysis of labour markets. This literature assumes that heterogeneity only reflects differences in productivity and not other types of heterogeneity, such as differences in age, sex, ethnicity, location, or the type of contract a worker has. We test this assumption. Applying a clustering algorithm to the 2019Q4 Quarterly Labour Force Survey data, we find that cluster membership is mainly driven by productivity. This finding provides empirical support for the recent theoretical literature. Our results also imply that differences in productivity are systematic rather than purely random; that there is a strong relationship between education and productivity and that UK labour markets are not fully segmented.

---

## Session 4b Subjective wellbeing

### **Investigation of the influence of the Covid-19 pandemic on the wellbeing of the British population using APS data**

*Malgorzata Wojtys and Ayotunde Akinwande, University of Plymouth*

The COVID-19 pandemic has had serious impacts on many people's physical and emotional wellbeing and its effects are still felt by many till date. This research investigated the impact of the pandemic on the wellbeing of the British people in terms of the four wellbeing indices: anxiety, happiness, life satisfaction and feeling that the things done in life are worthwhile. The 2018/2019 Annual Population Survey (APS) was used as the pre-pandemic data and compared to 2020/2021 APS data collected during the pandemic. Twelve key independent variables were included in the multivariate linear regression models to explain the wellbeing indices for the pre-pandemic and pandemic data sets, respectively. The comparison of results between the two data sets showed a clear negative trend in the wellbeing of the British population during the pandemic. In addition, the nature of the relationship between wellbeing and ethnicity changed during the pandemic. Moreover, the disparities in wellbeing between genders and between groups with different education levels were found to be greater during the pandemic.

### **Subjective wellbeing in different occupations in UK in 2012-2022**

*Simona Tenaglia, What Works Centre for Wellbeing*

The time we spend in paid employment is a major part of life in the UK. For people who are employed, work takes up a larger portion of the day than any other activity - including sleep. Moreover, works are an important source of social interactions and friendships. It is therefore no surprise that work is a major factor in our wellbeing. The converse - that wellbeing is an important part of our work - remains less true. Despite the UK's strong track record and history in measuring wellbeing, people are poorly armed with information about the subjective wellbeing associated with a particular job or career.

In this paper we will take a look at wellbeing by occupation, how it's changed over time and how it's been affected by the pandemic. We'll also look at the determinants of wellbeing within occupations by running an OLS regression where several socio demographic variables, an occupation variable and the gross week pay are used as covariates. We analyse wellbeing corresponding to various standard occupations code using data from the Annual Population Survey (APS) collected from April 2012 to March 2022 and the Annual Survey of Hours and Earnings (ASHE) for the year 2020.

We found a drop of wellbeing during the Covid period, that started to recover in 2021-2022. We also found a positive relationship between the 2020 gross annual salary and mean life satisfaction over the period 2015-2020. OLS regression confirms that, other things equal, personal wellbeing is highest among younger and older people, and that women are more satisfied, happier and find things are doing more worthwhile than men. Moreover, those who are married or in a civil relationship show higher Life satisfaction, Happiness and Worthwhileness than single and that employees show higher Life Satisfaction and lower Anxiety with respect to unemployed and inactive. Finally, looking at different occupations, we saw that Managers and Directors present the highest levels of Life Satisfaction, the second highest level of happiness after the Skilled Trades Occupations, and the second highest levels of Worthwhileness after Caring , Leisure and Other Services Occupations. Workers in managerial and professional occupations are also those who show the highest levels of Anxiety. This information can be useful not only for those seeking to enter the labour market and for employers, but also in designing policy interventions for groups showing lower levels of well-being.