

The 'low pay penalty' associated with part-time employment and its gendered implications

Madeline Nightingale

Green Templeton College

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Abstract: ***the 'low pay penalty' associated with part-time employment and its gendered implications***

Madeline Nightingale, Green Templeton College

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Rather than looking across the earnings distribution as a whole (the 'average worker model'), this thesis investigates the implications of working part time for men and women at the lower end of the distribution. Focusing on the UK, the thesis is comprised of four stand-alone papers, each of which explores a different aspect of the relationship between part-time employment and low pay. The results show that men and women who work part time are considerably more likely to be low paid, and less likely to progress out of low pay, than their full-time counterparts. Few previous studies of part-time employment include men in the analysis, or consider how the implications of working part time may differ according to gender. This thesis shows that the part-time 'low pay penalty' is, in fact, more pronounced for men than for women. However, women are disproportionately affected in the sense that they work part time in greater numbers. The analysis shows that part-time work has historically played, and continues to play, a crucial role in shaping gender inequality in low pay. However, there has been a sustained decline in the importance of part-time employment as a contributing factor to the gender gap in low pay for UK employees. The thesis provides robust estimates of the relationship between part-time employment and low pay across a range of European countries for the first time. Far from being a quirk of the UK labour market, the part-time 'low pay penalty' is observed in most, if not all, European countries. However, there is considerable variation in the extent to which part-time workers face a higher risk of low pay compared to full-time workers. This variation appears to be more closely related to the incidence of low pay than to cross-national differences in working time practices.

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List of Abbreviations

AI	Artificial Intelligence
BHPS	British Household Panel Survey
CTC	Child Tax Credit
EEA	European Economic Area
EES	European Employment Strategy
EGP	Erikson–Goldthorpe–Portocarero class schema
ESeC	European Socio-economic Classification
EU	European Union
EU-LFS	EU Labour Force Survey
EU-SILC	European Union Statistics on Income and Living Conditions
IFS	Institute for Fiscal Studies
ILO	International Labour Organization
ISCO	International Standard Classification of Occupations
KHB	Karlson, Holm and Breen decomposition method
LFS	Labour Force Survey
LPT	Low Pay Threshold
METR	Marginal Effective Tax Rate
NACE	Nomenclature des Activités Économiques dans la Communauté Européenne
NLW	National Living Wage
NMW	National Minimum Wage
NS-SEC	National Statistics Socio-economic Classification
OECD	Organisation for Economic Cooperation and Development
OLS	Ordinary Least Squares
RCT	Randomised Controlled Trial
ESES	European Structure of Earnings Survey
SIC	Standard Industrial Classification
SPL	Shared Parental Leave
UC	Universal Credit
USOC	Understanding Society
ZHC	Zero-hours contract

List of Country Codes

AT	Austria
BE	Belgium
BG	Bulgaria
CH	Switzerland
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	The Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom
US	United States of America

I. Thesis introduction and overview

Introduction

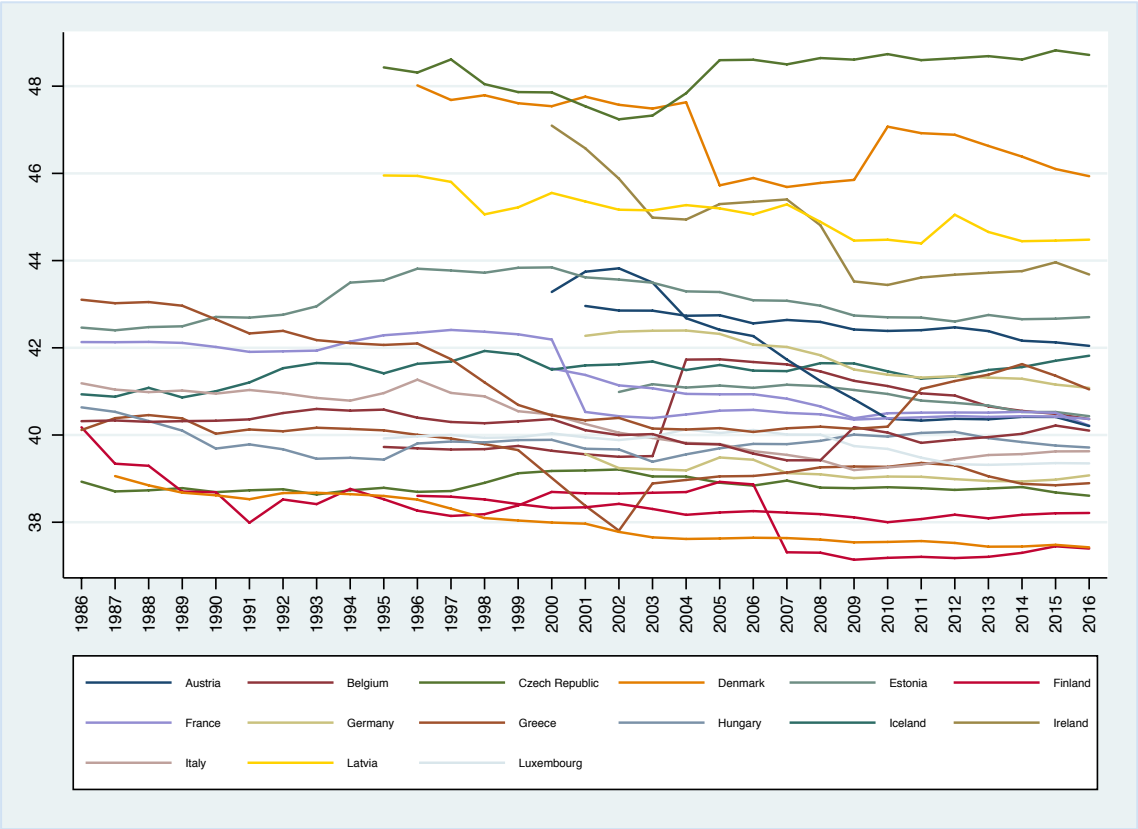
The issue of who should be employed and how much paid work they should be doing has been central to policy debates throughout the twentieth and twenty-first centuries. In 1930, John Maynard Keynes penned an essay, 'Economic Possibilities for our Grandchildren', in which he predicted a drastic reduction in working time in response to technological advancements.

> *'I would predict that the standard of life in progressive countries one hundred years hence will be between four and eight times as high as it is to-day... For many ages to come the old Adam will be so strong in us that everybody will need to do some work if he is to be contented… But beyond this, we shall endeavour to spread the bread thin on the butter - to make what work there is still to be done to be as widely shared as possible. Three-hour shifts or a fifteen-hour week may put off the problem for a great while. For three hours a day is quite enough to satisfy the old Adam in most of us!'* (Keynes, 2010: 321–332).

Keynes is not alone in advocating a reduction in working time as a means of achieving social goals: redistributing work, tackling unemployment, promoting health and wellbeing and creating more time for leisure and civil society activities (Kallis et al., 2013; New Economics Foundation, 2010). Inspired by this idea, policy makers in certain countries and regions have experimented with reducing the standard working week. In 2008 the US State of Utah introduced a four-day week for public sector workers (New Economics Foundation, 2010), and trials in both Sweden and Finland have implemented a six-hour work day (Anttila et al., 2005; Barck-Holst et al., 2017). To date, experiments of this kind remain few and far between and are limited in scope and duration. By and large, Keynes' vision has not come to fruition: in all advanced economies, the standard working week remains considerably longer than 15 hours.

This is not to deny the reality of historical change in working time practices. During the Great Depression in the 1930s, President Roosevelt introduced the 40-hour workweek as a form of work sharing (Kallis et al., 2013), a pattern now common across the developed world. The roots of the 40-hour week go back even further, stemming from the labour movement that arose in response to the Industrial Revolution. The International Labour Organisation (ILO) Hours of Work Convention of 1919 established an eight-hour day as standard, although this agreement was based on a six-day working week (48 hours in total). In many countries working hours have been high on the agenda in social dialogue, with trade unions pushing for a reduction in standard working hours, often as a compromise to avoid job losses (ILO, 2006). In addition to numerous regulations at the national level, working hours are limited by international agreements including the Universal Declaration of Human Rights and the European Social Charter (ILO, 2007). The decline in full-time working hours has slowed or even reversed in recent decades (ILO, 2006; Kallis et al., 2013). In 2016 the average number of hours worked weekly by full-time employees was 40.4 in OECD countries (OECD, 2016a) and 41.4 in EU Member States (Eurostat, 2016). In most European countries average working hours for full-time employees have remained fairly stable in recent years, as shown in Figure I-I.

Figure I-I. Average weekly working hours per person employed full time in European countries 1986-2016

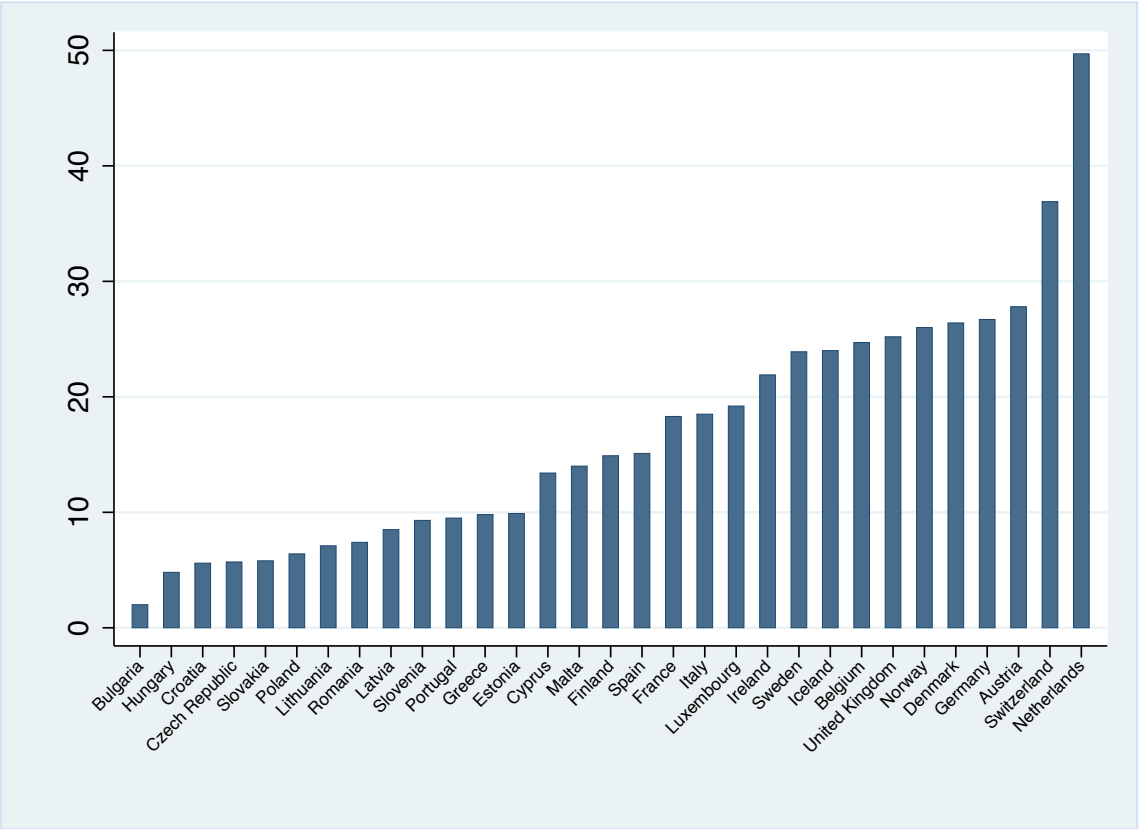


Notes: Data come from the OECD database 1986-2016; reflects usual weekly working hours rather than working hours in a specific week; working hours relate to the main job only if more than one job is held; full-time employment is defined as usual working hours of more than 30 hours per week in the main job.

In many countries, stability in full-time working patterns has been accompanied by a diversification of working time arrangements. A number of factors underlie this trend, including increasing rates of female labour force participation, labour market deregulation and the shift from manufacturing to services. In some countries, there has been an expansion of long working hours, particularly in professional and managerial occupations (Kallis et al., 2013; Kuhn and Lozano, 2008). At the other end of the spectrum, many countries have experienced strong

growth in part-time employment, a trend associated with, although not solely attributable to, rising rates of female labour force participation. Across the OECD, 20.4 per cent of workers are classed as part time (OECD, 2016a). Across EU Member States, the average is 18.9 per cent (Eurostat, 2016), although this masks substantial variation, as shown in Figure I-II. At one extreme, half of all employees (49.7 per cent) in the Netherlands are classed as part time (Eurostat, 2016), a country described as the world's first 'part time economy' (Visser, 2002). At the other extreme, fewer than 5.0 per cent of workers in Bulgaria and Hungary are classed as part time (Eurostat, 2016). Rather than a transitional phase on the road to gender-neutral patterns of labour market participation, or a temporary means of boosting employment rates, part-time employment has emerged as an entrenched and enduring feature of the European labour landscape.

Figure I-II. Part-time employment as a share of total employment in European countries in 2016; percentages



Notes: Data come from Eurostat/EU-LFS; figures represent part-time workers as a percentage of all workers aged 15-64 in employment; part-time employment defined according to how the respondent describes their employment situation.

Part-time employment may, as Keynes suggests, be an equalising force - a means of redistributing paid work and encouraging groups with weaker attachment to participate in the labour market (OECD, 2010). On the other hand, part-time employment may be a source of labour market stratification and division. This thesis is situated in a wider literature concerned with the potential for part-time employment to create and exacerbate social and economic divisions. Working part time rather than full time is associated with various disadvantages or 'penalties' (Fagan et al., 2013; OECD, 2010). Rather than being evenly distributed

across the working age population, part-time employment is structured by age, gender, parental status and social class. Penalties associated with working part time therefore fall disproportionately on certain groups, perpetuating and exacerbating social divisions. Across Europe, it is disproportionately women who work part time, and this trend is crucial to understanding gender inequality in labour market outcomes. The issue lies at the intersection of gender and class since part-time employment is differentially undertaken by women with different educational qualifications (Connolly et al., 2016) and from different socio-economic backgrounds (Bruegel and Perrons, 1998; Warren, 2003). Part-time work also contributes to the 'motherhood penalty'[1] (Budig et al., 2016; Harkness and Waldfogel, 1999; Misra et al., 2010; OECD, 2012), where women who do not become mothers out-earn those who do. More recently, concerns have also been raised about the implications of part-time employment for certain groups of men, such as low-skilled workers and new labour market entrants (Belfield et al., 2017; Gardiner and Gregg, 2017).

This thesis focuses primarily on the nature and implications of working part time in the UK. The rationale for focusing on the UK is partly practical, based on access to high quality cross-sectional and longitudinal data. Substantively, the UK is a particular concern because it pairs a large and predominantly female part-time workforce with a comparatively unequal and unregulated labour market. Although the UK is the primary focus, comparisons are drawn with other countries in the comparative paper, and in the literature cited throughout.

[1] Previous research (Harkness and Waldfogel, 1999; Joshi et al., 1999) has identified the propensity of mothers in the UK to work in low-paid part-time jobs as a major contributing factor to the 'family gap' or the 'motherhood penalty' – and one that appears to be increasing in importance.

Reflecting the availability of cross-national data and previous literature, these comparisons are made primarily with other European and OECD countries. As well as being limited in scope geographically, the analysis in this thesis is tied to a particular point in time. With one exception (the analysis of the gender gap in low pay), the aim is not to explore over-time change, but to describe the present day situation. This being so, the empirical analysis simply makes use of the most recent wave (or waves) of data available. The issue of how far this period of time may be considered atypical is addressed in the discussion section.

Penalties and premiums associated with working part time

Whilst there is no universally agreed definition of job 'quality' (Dahl et al., 2009), part-time jobs have been shown to lag behind full-time jobs across a range of dimensions (Fagan et al., 2013; OECD, 2010). Part-time 'penalties' in relation to earnings, training, union membership and job security have been highlighted across a range of OECD countries (OECD, 2010). There is some evidence to suggest that 'mini jobs' of only a few hours per week (also referred to as marginal part-time work[2]) are particularly disadvantaged in comparison to full-time employment. In the UK, workers in mini jobs have been found to be more often involuntary[3] (Warren and Walters, 1998) and under-employed[4] (Fagan, 2001) compared to part-time workers with longer working hours. Analysis of the

[2] Marginal part-time work has been defined as working less than 15 (McGinnity and McManus, 2007), 16 (Fagan, 2001; Warren and Walters, 1998) or 20 (Eurofound, 2009) hours per week. The phrase is sometimes used interchangeably with mini jobs, although this has a specific interpretation in Germany where it refers to a job paying €450 or less per month which is exempt from employee tax and social security contributions.
[3] Involuntary part-time workers are those who work part time because they are unable to find a full-time job.
[4] Under-employment refers to a situation where the individual would prefer to work longer hours.

European Working Conditions Survey (2005) showed that across Europe 40.0 per cent of those working less than 20 hours per week would prefer to work longer hours (Eurofound, 2009). McGinnity and McManus (2007) have estimated that in the UK working 15-34 hours per week is associated with an earnings penalty of 10 per cent compared to working full time, whereas working 1-14 hours per week is associated with an earnings penalty of 18 per cent. Some have argued that the full-time/part-time dichotomy obscures differences between part-time workers as much as it reveals differences between full-time and part-time workers (Warren and Walters, 1998). Although the analysis in this thesis focuses on differences between full-time and part-time workers, it also considers whether part-time workers in mini jobs are distinctive.

Before delving into part-time penalties, it is important to recognise that there may also be advantages or 'premiums' associating with working part time. In most countries, part-time workers reported lower work-related stress and greater control of working hours than full-time workers (OECD, 2010). These factors are likely to contribute to the puzzle of high job satisfaction for women working part time. In the UK, women working part time have reported higher levels of job satisfaction than women working full time (Gregory and Connolly, 2008; Hakim, 1991; Zou, 2015). Across a range of OECD countries, job satisfaction was similar for full-time and part-time workers (with the exception of 'involuntary' part-time workers, who reported low levels of job satisfaction) (OECD, 2010). There appears to be a trade-off, with some workers, predominantly women, accepting penalties associated with part-time employment as the price to pay for certain advantages (Gregory and Connolly, 2008; OECD, 2010; Walters, 2005). This is not to say that part-time penalties should not be a cause for concern. It should not be

necessary to make sacrifices in earnings and other benefits in order to secure, for examples, a satisfactory work-life balance and manageable stress levels. Others have warned against taking preferences and satisfaction levels at face value, since these may be 'adaptive', shaped by life experiences and expectations (Sen, 1999). Qualitative research from the UK has demonstrated that job preferences and satisfaction levels are fluid and malleable (Himmelweit and Sigala, 2004; Walters, 2005). High satisfaction reflects not only an objective weighing up of pros and cons, but in many cases recognition in that better outcomes are not feasible or achievable: in the words of Walters (2005), 'making the best of a bad job'.

Two main strands of literature examine penalties associated with working part time rather than full time. The first focuses on occupational segregation - the fact that part-time jobs are disproportionately present in lower-skilled sectors and occupations. Individuals seeking part-time employment are likely to be confronted with an inferior set of job choices; in effect they do not participate in the same labour market as those seeking full-time employment. The segregation of part-time jobs has been found to be particularly pronounced in the UK (Fagan and Rubery, 1996; Matteazzi et al., 2014; Petrongolo and Manning, 2008; Warren, 2010). Given this occupational segregation, opportunities to move between full-time and part-time hours are often limited. Analysing data from the 1958 birth cohort study, Dex and Bukodi (2012) found that almost half of women in the UK moving from full-time to part-time employment experienced occupational downgrading - i.e. they transitioned to a lower-skilled occupation, or an occupation for which they were over-qualified. Analysing change over the period 1980-2001, another study found that, although fewer women were transitioning to part-time employment after childbirth, the occupational penalties associated

with this had increased over time (Dex et al., 2008). Occupational downgrading associated with part-time work has been found to be particularly common for high-skilled women (Connolly and Gregory, 2008; Dex and Bukodi, 2012) and those working in male-dominated sectors (Dex and Bukodi, 2012). Qualitative research from the UK has highlighted long working hours and work intensity as key factors pushing women into working 'below their potential' in lower-skilled jobs (Dick, 2010; Grant et al., 2006; Warren et al., 2010).

The second strand of literature examines the part-time earnings gap - the fact that individuals working part time earn less than comparable individuals working full time. This phenomenon has been examined in a range of country contexts including the UK (Neuburger et al., 2011; Petrongolo and Manning, 2008), Germany (Tonurist and Pavlopoulos, 2014), Belgium (Jepsen et al., 2001) and Norway (Hardoy and Schøne, 2006), as well as in several comparative studies (Bardasi and Gornick, 2008; Matteazzi et al., 2014; McGinnity and McManus, 2007; O'Dorchai et al., 2007; Wolf, 2001). In order to distinguish low pay from low earnings[5], studies generally compare the average hourly wage of full-time and part-time workers. Two broad-level explanations for the part-time wage gap dominate this literature. The first is the fact that, as has been discussed already, part-time jobs are different to full-time jobs, disproportionately located in low-paying areas of the labour market. The second is that workers who take part-time jobs are different to workers who take full-time jobs. The distinction between the two is important, since if wage gaps are purely a product of the type of individuals who tend to work part time rather than full time then they may be

[5] In other words, to distinguish low remuneration from low earnings due to shorter working hours or intermittent employment.

considered less problematic. In contrast, if part-time workers receive lower pay because they have restricted labour market choices, this strengthens the case for interventions to improve part-time job opportunities, or to reduce the rate of part-time employment.

The fact that workers who take part-time jobs are different to workers who take full-time jobs can be approached as a selection problem. Selection bias refers to a situation where there are differences between two groups being compared other than the distinction on which the comparison is based (Angrist and Pischke, 2015). These differences confound the comparison being made, making it difficult to know whether variation in the outcome of interest is truly a product of the point of difference in which we are interested. Part-time workers may earn less per hour than full-time workers simply because they have lower earnings capacity, rather than because they work part time. According to estimates from Bardasi and Gornick (2008), differences in human capital account for over a quarter (27.3 per cent) of the gap in average hourly wages between women working full time and part time in the UK. A more recent study also found that worker-specific factors such as education and labour market experience accounted for between a quarter and a third (29.6 per cent) of the part-time wage gap for women in the UK (Matteazzi et al., 2014). This literature has focused predominantly on women, but one study found that human capital variables accounted for a similar proportion (31.4 per cent) of the part-time wage gap for men in the UK (O'Dorchai et al., 2007).

Aside from differences in human capital, part-time workers are sometimes thought to be distinctive in relation to their attitudes and preferences. This

perspective is most closely associated with Catherine Hakim (Hakim, 1991, 1995, 2002). Hakim's 'preference theory' (Hakim, 2002) argues that in advanced economies women have genuine choices about how to arrange their work and family life. Hakim characteristics three ideal-typical groups of women: 'work-centred' women who opt for full-time careers, 'home-centred' women choose to stay at home and 'adaptive' women who choose to work part time (Hakim, 2002). These fundamental dispositional differences, she argues, accounts for the 'grateful slaves' phenomenon i.e. 'women being disproportionately pleased with the worst jobs' (Hakim, 1991: 101). From the perspective of preference theory, unequal labour market outcomes between full-time and part-time workers are a product of part-time workers prioritising home and family life over professional success. Part-time workers may earn a lower hourly wage than full-time workers because they do not *want* to earn more; or rather, because they are willing to accept lower wages as a trade-off for spending more time on non-market activities such as child care and domestic work. The idea that inequality is a product of poor quality part-time jobs rather than the characteristics of part-time workers is, according to Hakim, a 'feminist myth' (Hakim, 1995: 429).

Hakim's ideas have proved controversial, and preference theory is not short of critics. The theory has been accused of ignoring the fluidity and mutability of work preferences. Rather than reflecting innate dispositions, work orientations change according to employment and domestic circumstances (Fagan, 2001; Ginn et al., 1996), an argument backed up by qualitative research with women in the UK (Himmelweit and Sigala, 2004; Walters, 2005). Analysing BHPS data, Himmelweit and Sigala (2004) found that women frequently changed their preferences and behaviour with regards to employment. Other critics have

drawn attention to the fact that work preferences are shaped by the prevailing institutional arrangements (Fagan, 2001; Fagan and Rubery, 1996; Gash, 2008; Himmelweit and Sigala, 2004; Walters, 2005) and cultural values (Edwards and Duncan, 1997; Pfau-Effinger, 1998). The ability to make choices in line with preferences depends on a woman's class position (Walters, 2005), particularly in the UK where outsourcing care work requires considerable financial capital. Hakim's theory may also overstate the importance of work preferences. Analysing longitudinal data from the UK, Germany and the Netherlands, Yerkes (2013) found that preferences were not as important as other factors such as individual and household circumstances in predicting women's labour market behaviour. In particular, Hakim's contention that 'it is women part-timers' low expectations which are responsible for the poor quality of their jobs' (Ginn et al., 1996: 170) has been widely rejected.

Although Hakim's argument that poor quality part-time employment is a 'feminist myth' (Hakim, 1995: 429) has been widely criticised, the notion that part-time workers are distinctive in relation to their attitudes and preferences has proved more enduring. According to Kan (2007), there is some empirical support for preference theory, at least in relation to married women in the UK. Analysing BHPS data, she found that married women with 'work-centric' attitudes were more likely to work continuously or predominantly full-time, and that for these women the presence of dependent children in the household posed less of a barrier to full-time employment. Preferences in relation to time spent on paid work, family care and other activities are often thought to be a major factor contributing to part-time wage gaps (Matteazzi et al., 2014), even if these preferences are shaped by institutional factors (McGinnity and McManus, 2007).

The difficulty is that the kind of 'psychological variables' that Hakim argues are important (Hakim, 1991: 113) are rarely available in existing data sets. Previous studies have used a Heckman selection model to adjust for unobserved factors such as attitudes and preferences in estimating the part-time wage gap (Bardasi and Gornick, 2008; Ermisch and Wright, 1993; Hardoy and Schøne, 2006; Matteazzi et al., 2014; McGinnity and McManus, 2007; Petrongolo and Manning, 2008). Mixed results are observed in the literature with regard to whether this component accounts for the part-time wage gap in a meaningful way. Matteazzi et al (2014) found this component to be important in Austria, Italy and Poland, but not in the UK, whereas McGinnity and McManus (2007) found it to be significant in the UK and the US, but not in West Germany.

The notion that workers who take part-time jobs are different to workers who take full-time jobs is almost exclusively applied to women. Apart from a small number of studies (Hirsch, 2005; O'Dorchai et al., 2007; Russo and Hassink, 2005), the part-time wage gap for men has been largely ignored. Preference theory (Hakim, 2002) has little to say about why men work part time, and this issue has been curiously absent from the ensuing debate. Evidence is largely restricted to quantitative labour force data identifying higher rates of involuntary part-time employment for men than for women (OECD, 2010). If anything, the assumption made about male part-time employment is that this is always a forced or constrained choice and never freely chosen. The reality is likely to be more complex, and the literature would benefit from qualitative research where men are asked to comment on the complexities and nuances of their working time decisions. If, however, part-time workers are distinctive in relation to attitudes and preferences, then this may apply to men as well as women.

As discussed above, one of the key explanations for part-time wage gaps is that part-time jobs are different to full-time jobs. The majority of previous studies find that job-specific factors are more important than worker-specific factors in accounting for the part-time wage gap (Bardasi and Gornick, 2008; Jepsen et al., 2001; Matteazzi et al., 2014; Petrongolo and Manning, 2008). Manning and Petrongolo (2008) found that occupation was by far the most important explanatory factor in accounting for the gap in average hourly pay for women working full-time and part-time in the UK. Another comparative study found that job characteristics were decisive in accounting for the part-time wage gap in Austria, Poland, Italy and the UK, particularly vertical segregation i.e. the unequal distribution of part-time jobs across the occupational hierarchy (Matteazzi et al., 2014). Job characteristics were particularly important in the UK: their inclusion increased the total variance explained from 29.7 per cent (for a model with only controls relating to worker and household characteristics) to 89.0 per cent (Matteazzi et al., 2014). For men, too, job characteristics appear to be particularly important in accounting for the part-time wage gap. O'Dorchai et al (2007) found that for men in the UK the explained variance jumped from 31.4 per cent to 72.7 per cent after adding in control variables relating to job characteristics. In accounting for the part-time wage gap for men, job characteristics were more important in the UK than in the other countries studied (Belgium, Denmark, Italy, Spain and Ireland) (O'Dorchai et al., 2007).

A common finding is that the 'unexplained' or residual part-time wage gap (i.e. that which can not be attributed to differences in characteristics) is small, or even non-existent. After controlling for a full set of covariates, previous studies identify almost no part-time wage gap in in countries such as the UK (Petrongolo

and Manning, 2008; Warren and Lyonette, 2015), Belgium (Jepsen et al., 2001), Austria, Poland and Italy (Matteazzi et al., 2014). In some countries, although not in the UK, controlling for a full set of covariates appears to result in a part-time earnings premium. For women, this phenomenon has been observed in Sweden (Bardasi and Gornick, 2008), Austria, Italy and Poland (Matteazzi et al., 2014), and for men in Denmark (O'Dorchai et al., 2007). The importance of job-specific factors, along with the small or non-existent residual wage gap, suggests that within occupations the part-time wage gap is generally small or non-existent. It is not always possible to explain all the variance in earnings between full-time and part-time workers, however. In the UK, the residual wage gap has been estimated to fall between 3 (Petrongolo and Manning, 2008) and 10 per cent (Bardasi and Gornick, 2008; Matteazzi et al., 2014) for women, and to sit around a quarter (27.3 per cent) for men (O'Dorchai et al., 2007).

In studies where a residual or 'unexplained' component is identified, this is difficult to interpret substantively. This component may, in part, reflect discrimination against part-time workers. Part-time workers are often thought to experience discrimination or 'flexibility stigma' as a result of violating 'ideal worker' norms. The ideal worker tends to be characterised by total devotion and job commitment, continuous employment and long working hours (Wheatley, 2017).

> *'In the invidious comparison with full-time . . . [employees], the part-timer is often seen as less dedicated and less professional – a "time deviant"'* (Fuchs Epstein et al., 1999: 29).

Discrimination is difficult to demonstrate statistically, however, since unexplained wage gaps may also stem from unobserved differences between the

two groups of workers. Studies utilising experimental designs have provided more robust evidence for discrimination against part-time workers in the US (Pedulla, 2016; Vandello et al., 2013), as well as in EU Member States such as Germany (Beham et al., 2017), where following the Directive on Part-time Work (1997) it is illegal to discriminate against part-time workers. For instance, Vandello and colleagues (2013) presented respondents with hypothetical scenarios of workers seeking flexible work arrangements after the birth of a child. Workers who sought reduced work hours were given worse job evaluations and awarded lower pay than identical workers who maintained traditional hours. Aside from discrimination, however, the 'unexplained' component may reflect unobserved differences in skills and productivity, or disparities in labour market experience and job conditions such as access to training and networking opportunities.

Looking beyond average earnings: the part-time 'low pay penalty'

The studies discussed so far all examine the part-time gap in average hourly pay i.e. they compare the average full-time worker to the average part-time worker. This is an intuitive place to start because it enables a straightforward comparison of the levels of remuneration associated with full-time and part-time employment. The gap in average hourly pay does not tell us everything, however, and focusing exclusively on this measure may obscure heterogeneity across the labour market. The unique contribution of this thesis is that it looks beyond average earnings, focusing on the gap between full-time and part-time workers in low pay. It is one of the few pieces of research to go beyond the 'average worker model' in considering penalties associated with part-time

employment. Specifically, this thesis investigates these issues in relation to the lower end of the earnings distribution, focusing on the part-time 'low pay penalty'. The reasons for this are two-fold: firstly, that earnings penalties associated with part-time employment may be particularly steep for low earners, and secondly, because of the growing importance of low pay in shaping other social and economic outcomes.

One reason to look beyond average earnings is that part-time employment may be distinctive, and incur steeper penalties, at the lower end of the wage distribution. It has long been recognised that part-time workers are not a homogenous group. A distinction is sometimes made between part-time jobs designed to retain or attract staff, and those created for other reasons such as optimal staffing and flexibility (Tilly, 1992). Across a broad range of countries, part-time jobs designed to retain or attract staff tend to be better quality than those created by employers to suit their own purposes (Fagan et al., 2013). The type of part-time jobs available, therefore, may vary substantially across different parts of the labour market. It may be precisely in areas of the labour market where low pay is more common, such as retail and hospitality (D'Arcy et al., 2014), that employers create part-time jobs to suit their own needs. According to recent evidence from Germany (Tonurist and Pavlopoulos, 2014), wage penalties associated with part-time employment are steepest for low earners. Quantile regression analysis showed that it was only at the lowest earnings deciles that part-time workers received lower returns for the same personal and job characteristics. The authors conclude:

> *'Ignoring the differences between the various parts of the wage distribution and focussing on average effects that has been the dominant approach in the*

literature, conceals the very different function of part-time employment at the various strata of the wage distribution' (Tonurist and Pavlopoulos, 2014: 20).

The decision to focus on the lower end of the earnings distribution also reflects wider concerns about the incidence of low pay, and its implications for workers and their families. In the UK, as in many other OECD countries, the wage distribution has grown more unequal in recent decades (Checchi and Salverda, 2014; OECD, 2008), a trend often linked to globalisation and technological developments. Globalisation and offshoring have resulted in many medium-skilled jobs (notably in manufacturing) being relocated to countries in which operational running costs are lower, a process compounded by technological change. The skills-biased technological change (SBTC) hypothesis holds that technological advances favour skilled over unskilled labour (see Card and DiNardo, 2002 for an overview of this literature). The SBTC hypothesis has been nuanced to capture differences between routine and non-routine tasks in lower-skilled occupations (Autor et al., 2003; Autor and Dorn, 2009). Automation has been centred on routine and repetitive tasks, whereas other physical and interpersonal tasks associated with lower-skilled work (table-waiting, personal service etc.) have proved difficult to computerise (Autor and Dorn, 2009). The result is a 'hollowing out' of the labour market (Goos et al., 2009; Goos and Manning, 2007), in which growth in high- and low-skilled occupations is accompanied by a decline in middle-tier occupations. In many countries, these structural changes have been accompanied by a decline in collective bargaining institutions (Visser, 2006; Visser and Checchi, 2011), which have historically played an important role in compressing wage distributions in European countries (Checchi and Salverda, 2014; Visser and Checchi, 2011). In a context in

which labour markets are becoming more unequal, the fate of low-paid workers is more relevant than ever. The economic crisis and the austerity agenda have driven low pay up the political agenda, with growing concern about in-work poverty, food bank use and over-indebtedness.

Another reason to hone in on the lower end of the wage distribution is that the consequences of a 'low pay gap' are likely to be more severe than an 'average pay gap'. Earnings are a major component of household income, and low pay may contribute to inadequate financial resources at the household level. A 2012 study showed that in European countries and US states with relevant legislation, full-time employment in a minimum wage job was often insufficient to bring household income above the poverty line[6] (Marx et al., 2012). The situation is complex, since the relationship between low pay and in-work poverty is mediated by household composition (Maître et al., 2012; Marx et al., 2012; Marx and Nolan, 2012; Marx and Verbist, 1998). In several European countries, including the UK, earnings for a single adult working full time were sufficient to avoid poverty, whereas this was rarely the case for sole breadwinners or lone parents (Marx et al., 2012). It is primarily low-paid workers who are the sole or primary earner in the household who are at risk of poverty, particularly if there are dependent children in the household. The negative implications for low pay are not restricted to an increased risk of experiencing in-work poverty, however. Low pay may be regarded as a form of latent dependency (Peña-Casas and Ghailani, 2011) or a hidden vulnerability (Orloff, 1993), limiting the capacity of individuals to form autonomous households. In this way, low pay contributes to

[6] Following the official Eurostat definition, the poverty line was set at 60 per cent of median equivalised household income in each country.

various forms of financial dependency, for instance the dependency of spouses or partners on one another (Istenič et al., 2018), and of young people on their parents (Rainsford et al., 2018). Low-paid workers dependent on the earnings and resources of others are in a vulnerable position if their circumstances change, and in the long run these individuals may find themselves with inadequate income, savings and pensions entitlements.

Empirical evidence on the relationship between part-time employment and low pay is thin on the ground, partly because studies of low pay sometimes restrict the sample to full-time workers (Cappellari and Jenkins, 2008; Maître et al., 2012). This is generally the case if low pay is measured in relation to monthly or annual earnings, where it is not possible to distinguish low pay from low earnings due to short working hours. In studies in which low pay is measured with reference to hourly earnings part-time employment has been found to be predictive of low pay (Lucifora et al., 2005; Simon et al., 2004; Ward and Ozdemir, 2015). Less well understood is why part-time workers are over-represented among the low paid. This is important to establish, since it is far more concerning if working part time disadvantages the individual than if it is simply the case that disadvantaged individuals tend to work part time. The situation is arguably rather different if part-time workers experience low pay at higher rates because they are predominantly young and low skilled than if they are older, with moderate to high levels of human capital, yet nonetheless employed in low-paying sectors and occupations. This thesis provides new evidence on the relationship between part-time employment and low pay by decomposing the part-time 'low pay gap' for UK workers, assessing how far it can be attributed to differences in worker-specific and job-specific factors.

Low pay dynamics and pay progression

It is one thing if low pay is a predominantly transitory state associated with labour market entry, but quite another if workers are trapped in 'low paid careers' (McKnight and Stewart, 2015) spanning years or even decades. Experienced over the long term, low pay has serious consequences for lifetime earnings (Brewer, Dias, et al., 2012), pension entitlements (Sefton et al., 2011) and vulnerability to financial shocks. A long spell of low-paid employment has greater consequences for household income than a short spell (D'Arcy et al., 2014). Concern with progression for low-paid workers has been further strengthened by labour market polarisation associated with technological change and the shift from manufacturing to services (Goos et al., 2009; Goos and Manning, 2007). 'If the middle rungs of the career ladder are growing weaker, making meaningful upward progress may become more of a remote prospect for low paid workers' (D'Arcy et al., 2014: 10). Given these developments, it is particularly important to understand whether low pay is enduring or transitory, and for whom.

Some groups (for instance, labour market entrants) may be very likely to progress out of low-paid employment, whereas others face 'low paid careers' (McKnight and Stewart, 2015). Previous research has examined characteristics associated with the probability of escaping low pay and the duration of low pay spells (Cai, 2015; Clark and Kanellopoulos, 2013; D'Arcy et al., 2014; Knabe and Plum, 2013; McKnight and Stewart, 2015; Phimister et al., 2006; Phimister and Theodossiou, 2009; Silva et al., 2011; Sloane and Theodossiou, 1996; Stewart and Swaffield, 1999; Uhlendorff, 2006). Age, gender, household circumstances, geographical

location, human capital, job tenure and labour market experience, firm size, trade union status and fixed-term employment, as well as part-time working, have all been shown to influence the probability of escaping low pay. Several studies have identified state dependence in low pay (Cappellari and Jenkins, 2008; Clark and Kanellopoulos, 2013; Stewart, 2007; Stewart and Swaffield, 1999), where the probability of progressing to higher wages declines with the length of time spent low paid. State dependence suggests that low-paid work may be limited in its potential to augment human capital and improve employment prospects (Stewart, 2007).

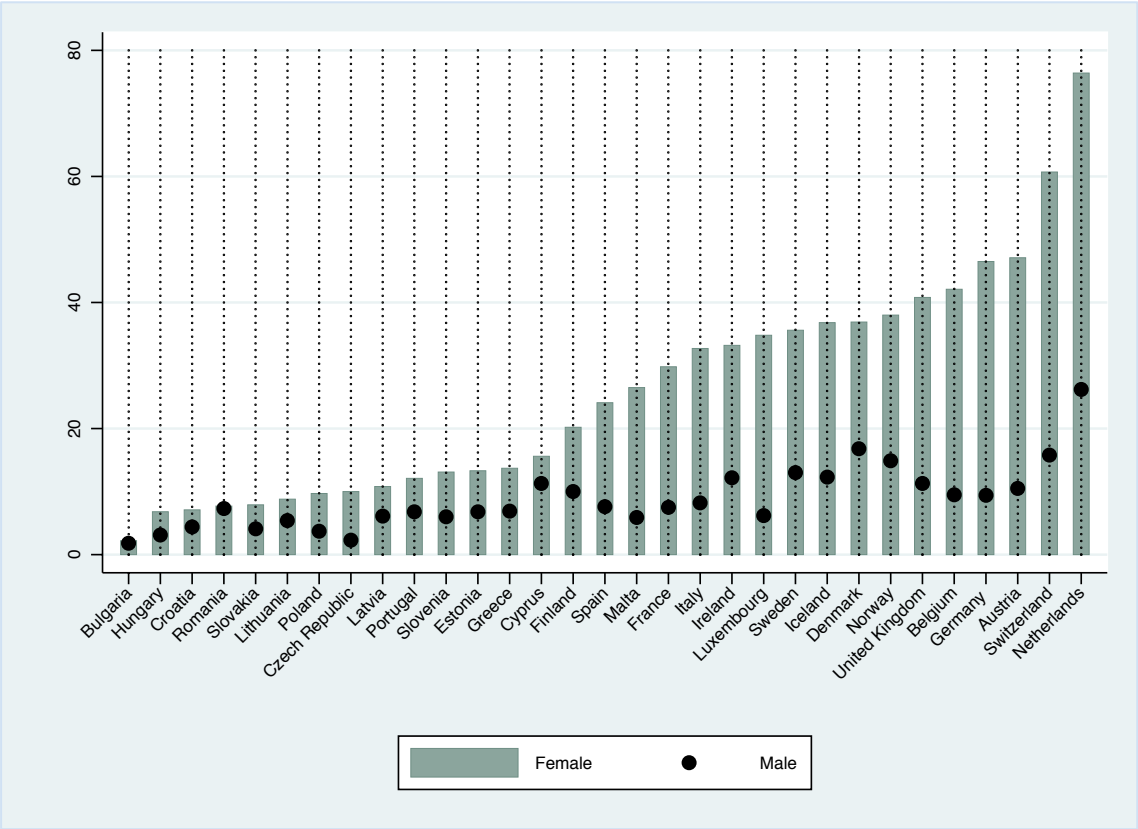
Relatively few studies of low pay dynamics estimate the effect of working part time relative to full time. Some studies restrict the sample to full-time workers, or men working full time (Cappellari and Jenkins, 2008). Others include both full-time and part-time workers in the sample, but do not include this as a parameter in the model (Pavlopoulos and Fouarge, 2010; Phimister et al., 2006; Stewart and Swaffield, 1999). Phimister and Theodossiou (2009) found that all things being equal part-time workers in the UK had *shorter* spells of low-paid employment than full-time workers. However, this was largely because working part time increased the probability of exiting employment, whether to unemployment or inactivity. Working part time rather than full time exerted a negative effect on the probability of progressing on to higher wages, a finding echoed elsewhere (D'Arcy et al., 2014; McKnight and Stewart, 2015; Sloane and Theodossiou, 1996). This thesis extends this line of analysis by considering transitions between full-time and part-time employment. It examines for the first time how moving between part-time and full-time employment (and *vice versa*) affects the likelihood of escaping low pay. Do part-time workers who transition to full-time

employment continue to exit low pay less frequently than full-time workers (strengthening the case for interpretations that foreground worker-specific factors such as skills, abilities and motivation), or are their prospects markedly improved? Previous literature in this area has not considered this question, which is addressed for the first time here.

Part-time employment and gender

In most advanced economies, part-time employment shows a highly gendered pattern. As shown in Figure I-III, in almost all European countries women were more likely than men to work part time in 2016, although the size of the discrepancy varied considerably. Differences have also been observed in the point of the lifecycle at which men and women tend to work part time, and their reasons for doing so (Eurofound, 2006; Fagan et al., 2013). For women, part-time work has been found to be closely associated with parenthood and other caring commitments (Dias et al., 2018; Eurofound, 2006), representing a means of reconciling work and family life. As Hakim (1995) has pointed out, however, the popularity of part-time employment among women extends far beyond their childbearing years. For men, part-time employment more often functions as a means of transitioning into or out of the workforce (Fagan and Walthery, 2014). Recent analysis from the Institute for Fiscal Studies (IFS) found that men in the UK rarely adjust their working hours in response to parenthood (Dias et al., 2018). Across OECD countries, men are estimated to be 1.3 times more likely than women to be involuntary part-time workers (OECD, 2010: 214).

Figure I-III. Part-time employment as a share of total employment for male and female employees in European countries in 2016; percentages



Notes: Data come from Eurostat/EU-LFS; figures represent part-time workers as a percentage of all male/female workers aged 15-64 in employment; part-time employment defined according to how the respondent describes their employment situation.

Men are often overlooked in the literature on part-time employment, ostensibly due to the small number of men working part time, but perhaps also because of a lingering perception of part-time employment as a 'women's issue'. Only one comparative study has examined the gap in average hourly pay for men working full time and part time (O'Dorchai et al., 2007). This six-country study identified a particularly large part-time wage gap for men in the UK and Ireland. According to evidence from the US (Hirsch, 2005) and the Netherlands (Russo and Hassink, 2005), the part-time gap in average hourly pay is greater for men than for women,

but this has not yet been established for the UK context. These studies remain the exception, however; the majority of previous studies on part-time employment, particularly those related to the earnings gap, are restricted to women only (Bardasi and Gornick, 2008; Hardoy and Schøne, 2006; Matteazzi et al., 2014; McGinnity and McManus, 2007; Neuburger et al., 2011; Petrongolo and Manning, 2008; Wolf, 2001).

Attitudes are starting to shift, with growing recognition of part-time work as an issue with ramifications for men as well as women. A recent report from the IFS has highlighted a growing correlation between working hours and wages for men in the UK, driven by a fall in the number of hours worked by low-paid men (Belfield et al., 2017). Research from the Resolution Foundation (Gardiner and Gregg, 2017) has drawn attention to rapid growth in part-time employment for younger cohorts of men in the UK. Despite this recent flurry of concern, however, the evidence base on male part-time employment remains under-developed. There is relatively little precedent in the literature for conducting separate analysis for men and women to assess how the effect of working part time relative to full time varies according to gender (for exceptions see Hirsch, 2005; OECD, 2010; Phimister and Theodossiou, 2009; Russo and Hassink, 2005). A key contribution of this thesis is to conduct separate analysis for men and women, exploring whether the relationship between part-time employment and low pay differs according to gender. This is motivated by an awareness that men and women differ in their labour market behaviour, including in relation to part-time work, and therefore the nature and implications of working part time may be different for men and women.

This thesis also addresses the implications of part-time employment for gender equality in low pay. Although a great deal of progress has been made towards gender equality, unequal labour market outcomes between men and women persist. Summarising this literature, Gregory (2012: 285) observes that:

> *'[Women's] employment opportunities are still often inferior, and concentrated into a relatively narrow range of activities; they remain underrepresented in prestige professions and "top jobs"; they typically receive lower pay; and they feature disproportionately among the low paid'.*

This literature has focused predominantly on the gap in average hourly wages for men and women (the gender pay gap). In most advanced economies the gender pay gap has narrowed considerably over time, a trend largely attributable to changes in the characteristics of male and female employees (Joshi et al., 2007; Weichselbaumer and Winter-Ebmer, 2005). Technological change is also thought to play a role in expanding labour market opportunities for women, with the shift from manufacturing to services biased in favour of women (Galor and David, 1996; Olivetti and Petrongolo, 2016). To date, no country in the world has achieved gender parity in earnings. Evidence from the US (Blau and Kahn, 2007; Cha and Weeden, 2014) and Europe (O'Reilly et al., 2015) suggests that progress towards gender equality in pay may have slowed or stalled in recent years. The puzzle for researchers lies not only in understanding how the earnings position of women has improved, but also in identifying barriers to further progress.

The gender pay gap has historically been driven by differences in human capital, occupational position and labour market behaviour, as well as a sizable 'unexplained' component sometimes attributed to discrimination. Characteristics have tended to converge over time, although some differences have proved more enduring than others. In many countries, women now have a comparable, or

even higher, educational profile compared to men. Studies from the US (Blau and Kahn, 2007; Mandel and Semyonov, 2014) and the UK (Dias et al., 2018) have found that educational qualifications now make a negative contribution to the gender pay gap - i.e. the gap would be larger if men and women had the same educational profile. Sex segregation in the labour market has also declined over time (Dex et al., 2008), with greater representation of women in higher-skilled occupations. Occupational segregation still persists, however, and has been found to make a major contribution to the gender pay gap in the UK (Gregory, 2012), as well as in the US (Levanon and Grusky, 2016; Mandel and Semyonov, 2014). Some have argued that this issue is symptomatic of a larger problem, in which occupations traditionally dominated by women are systematically under-valued and under-paid (Dex et al., 2000; Grimshaw and Rubery, 2007; Rubery, 2017).

The disproportionate care burden placed on women is known to be a major contributing factor to the gender pay gap. Dias and colleagues (2018) found that it is still common for women in the UK to temporarily withdraw from the labour market or to reduce their working hours in response to parenthood. It is, however, less common than it once was for women to exit employment. In the UK, as it is in many European countries, 'gender is [now primarily] differentiated by time rather than participation and nonparticipation in paid labor' (Mutari and Figart, 2001: 38). Gender differences in working hours and part-time employment are of central importance in understanding inequality between different groups of women (e.g. the motherhood penalty) (Budig et al., 2016; Joshi et al., 1999; Misra et al., 2010), as well as between women and men (Dias et al., 2018). Across OECD countries, the gender pay gap is estimated to be considerably larger, in

some cases doubling or tripling, if all workers are considered, compared to focusing on full-time workers (OECD, 2012). In the UK, it has been estimated that the gender pay gap of 22 per cent is reduced to just 10 per cent after controlling for years of experience in full-time and part-time employment (Dias et al., 2018). US studies have identified a trend whereby working hours are an increasingly important determinant of the gender pay gap (Cha and Weeden, 2014; Mandel and Semyonov, 2014).

Gender inequality in the labour market cannot be fully understood by looking at averages. It is also important to consider the extent to which women are under-represented at the highest levels of management ('glass ceilings') and over-represented in low-paid and low status jobs ('sticky floors'). Quantile regression analysis has shown that in the UK the gender pay gap is fairly consistent across the wage distribution (Arulampalam et al., 2007; Christofides et al., 2013). Gender inequality in low pay is a particular concern, however, given the negative implications of earning low wage discussed earlier. Previous literature has identified being female as a risk factor for low pay (Grimshaw, 2011; Lucifora et al., 2005; Mason et al., 2008; McKnight and Stewart, 2015; Simon et al., 2004; Ward and Ozdemir, 2015), but the reasons for this have rarely been explored. One study (Asplund and Persson, 2000) examined the extent to which the gender gap in low pay in several European countries could be attributed to differences in characteristics. However, this study was restricted to employees working full time. By the authors' own admission, this is a selective sample, and one that is likely to understate the true scale of the issue. The analysis is this thesis advances the literature by estimating the contribution of part-time employment to the gender gap in low pay for UK employees. Previous studies have conducted

similar analysis for the gender gap in average hourly pay (Dias et al., 2018), but this is the first to apply this approach to the gender gap in low pay.

Part-time employment and social class

In addition to foregrounding gender issues, the analysis in this thesis examines the intersection between part-time employment and social class. Previous research has drawn attention to part-time employment as a classed as well as gendered phenomenon (Warren, 2003). In the UK, it is more often women and men from lower socio-economic groups who work part time rather than full time (Bruegel and Perrons, 1998; Warren, 2003; Warren et al., 2010). To some extent, this may reflect preferences regarding working time and priorities regarding the importance of paid work and other activities. It is also to a large extent a product of differential opportunities to participate in the labour market. Out-sourcing care and other domestic responsibilities is as much a product of privilege as of preferences. If part-time employment is a path often chosen under constraints (Fagan et al., 2013; Gash, 2008), then these constraints are felt most keenly by those with the fewest resources. Social class position may also affect the ability to find full-time work. In the most recent recession, it was predominantly working class individuals, particularly men, who experienced growth in work-time under-employment (Warren, 2015). In various ways, therefore, part-time employment is both shaped by and contributes to social class inequalities.

Social class is a contested concept, and one that has been understood and operationalized in a variety of different ways. In a Marxist sense, class reflects a basic division between the owners of the means of production and others (Giddens, 1996). Class is more commonly used in a Weberian sense, to refer to

social groups distinctive in their opportunities or 'life chances' (Weber, 1948). Neo-Weberian analyses of social class often focus on occupation as a key variable structuring opportunities and life chances. "It is market position, and especially position in the occupational division of labour, which is fundamental to the generation of social inequalities. The life chances of individuals are largely determined by their position in the labour market and occupation is taken to be its central indicator" (Harrison et al., 2009: 4). The type of job we do to a large extent determines our earnings capacity, prestige and social standing and is therefore essential in understanding social and economic inequality. Occupation-based class schemas are not without their critics, however. The approach has been accused of downplaying other sources of social stratification such as gender, race, wealth and capital, as well as concepts such as class consciousness (Crompton, 2010). Nevertheless, there is broad consensus in the literature that occupational position matters as a source of social stratification.

There are a number of ways of measuring and classifying occupations as a source of social stratification. Some analysts have focused on occupational prestige (Treiman, 1976), based on subjective assessment of the relative status of different occupations. The limitation of this approach is that it relies on subjective assessments ('prestige' may mean different things to different people). Looking for more objective ways of classifying occupational groups, others have looked to the educational and earnings profile of different occupational groups (Ganzeboom et al., 1992). In combining different aspects such as education and earnings, however, it is unclear what precisely is being measured, and why (Bukodi et al., 2011). There is also the issue that education and earnings are frequently outcomes of interest, posing a potential endogeneity problem.

Occupational skill level[7] provides an objective means of classifying occupations without muddying the water by incorporating associated factors such as earnings and education into the measure (Harrison et al., 2009). In general, more skilled occupations are associated with higher wages, better fringe benefits, job security and more autonomy in work. Schemas such as Standard Occupational Classification (SOC) in the UK, and the International Standard Classification of Occupations (ISCO) developed by the ILO, are commonly used to identify occupational groups on this basis.

Occupational measures such as SOC and ISCO do not purport to measure social class, but they have been used as the basis for class schemas. In this thesis, social class is measured according to the European Socio-economic Classification (ESeC) scheme (Harrison and Rose, 2006) and the UK-specific National Statistics Socio-Economic Classification (NS-SEC) scheme (ONS, 2005). Taking occupational groups (ISCO and SOC, respectively) as their base, these class schemas also take into account social relationships in the workplace. This approach to measuring social class, based on the work of John Goldthorpe and colleagues (see Erikson et al., 1979; Goldthorpe, 2007), is well validated by prior research (Evans, 1992; Evans and Mills, 1998; Mills and Evans, 2000; Rose and Harrison, 2007, 2009; Rose and Pevalin, 2003; Williams, 2017). The Goldthorpe approach makes a basic distinction between two ideal-typical employment relations: the labour contract and the service relationship. The labour contract is a basic exchange of money for time or effort (often an hourly wage). This set-up is characteristic of occupations in which skill requirements are rudimentary and

[7] That is, the level of skill required to carry out the job's duties, not the level of skill possessed by the jobholder.

generic, and output easily monitored. A more long-term, diffuse exchange – the service relationship - tends to prevail in contexts where it is more difficult to monitor or quantify the value of labour. The service relationship also reflects the greater value of employees who possess specific skills, knowledge and expertise ('asset specificity'). From this perspective, low pay is expected to be primarily associated with employment situations governed by the labour contract (working class, and to some extent intermediate occupations), and rare in those in which the service relationship prevails (professional and managerial occupations).

The four empirical papers in this thesis all incorporate social class as a control variable using ESeC or NS-SEC coding - i.e. they take into account the potential role of social class in mediating the relationship between part-time employment and low pay. To put it another way, the analysis seeks to understand whether even within social class groups part-time workers are more likely than full-time workers to experience low pay (or to remain low paid). Decomposition analysis is used to estimate the contribution of social class to inequality in low pay risk between different labour market groups (full-time workers and part-time workers; men and women). The analysis examines the extent to which part-time workers are more likely than full-time workers to be low paid because they are unevenly distributed across social class groups. From this perspective, part-time employment can be thought of as exacerbating and reinforcing socio-economic inequality, affecting not only the hours and wages of part-time workers but also their 'life chances' in a broader sense.

Placing the UK in comparative perspective

This thesis focuses primarily on the UK, a country that has been characterised as having an pervasive 'low pay culture' (Inman, 2017). The UK has relatively high earnings inequality in comparative perspective, an outcome linked to its restricted labour market regulation and weak collective bargaining institutions (Checchi and Salverda, 2014; Christian Dreger et al., 2015; Eurofound, 2015; LLoyd et al., 2008). Skills-biased technological change has resulted in further polarisation between 'lovely' and 'lousy' jobs in the UK labour market (Goos and Manning, 2007). Despite the introduction of a National Minimum Wage (NMW) in 1999, the UK has a high share of low-paid jobs (Lucifora and Salverda, 2012; Simon et al., 2004). In 1997 the UK government set up the Low Pay Commission specifically to advise on issues relating to low-paid employment. The UK also has a high share of part-time employment, with a quarter (25.2 per cent) of workers in the UK identifying as part time rather than full time (Eurostat, 2016). Looking beyond average earnings, as is one of the main contributions of this thesis, is particularly important in highly unequal labour markets such as the UK, in which part-time employment may have very different implications for labour market 'insiders' and 'outsiders'.

Given the distinctiveness of the UK labour market compared to the rest of Europe, the research findings may not extend to other national contexts. The part-time 'low pay penalty' may be a quirk of the UK labour market, or a predominantly Anglo-Saxon phenomenon. Other European countries are said to be governed by different production regimes (Hall and Soskice, 2001) or employment regimes (Gallie, 2007), resulting in divergent labour market

outcomes. The relationship between part-time employment and low pay may be rather different in countries where the wage distribution is more compressed, and low pay is relatively rare. European countries have also been found to differ widely in relation to part-time employment: how many workers are part time rather than full time, who works part time and the extent to which this choice is involuntary or otherwise constrained (Anxo et al., 2005; Fagan et al., 2013; Mutari and Figart, 2001). In comparative perspective, the UK has a large and highly feminised workforce. Part-time employment may have quite different implications elsewhere, for instance in Eastern European countries where there is more of a tradition of women continuing to work full time after they have children (Fagan et al., 2013). The relationship between part-time employment and low pay may also be quite different in countries in which the majority of part-time workers are involuntary. The analysis in this thesis provides for the first time robust estimates of the relationship between part-time employment and low pay across a range of different European countries.

Thesis overview

Thesis structure

The overarching objective of this thesis is *to better understand the nature of the relationship between part-time employment and low pay, and its gendered implications.* A number of research objectives are identified under this rubric, addressed in four stand-alone empirical papers. In order for the papers to function as stand-alone articles, there is a certain amount of repetition across the thesis. Certain aspects of the research topic and design (for instance, the discussion of previous

literature, concepts, data and variables) are discussed more than once in order for each paper to be self-contained and meaningful as a stand-alone entity.

Paper #1) The first paper conducts analysis for the UK context, using data from the Labour Force Survey (LFS) 2012-2016. The primary aim of this paper is *to understand how far the relationship between part-time employment and low pay for UK employees is a product of self-selection into part-time work.* Within the component attributable to selection, this paper aims *to establish the relative importance of worker- and job-related characteristics*. The third and final aim is *to understand how the relationship between part-time employment and low pay differs for men and women in the UK*.

Paper #2) Using longitudinal data from Understanding Society (Usoc) and the British Household Panel Survey (BHPS) 2001-2017, the second paper aims *to understand how working part time relative to full time affects the probability of progressing to higher wages for low-paid employees in the UK*. This paper also aims *to establish how transitioning between part-time and full-time employment affects the probability of progressing out of low pay*. In parallel with the previous paper, the third aim is *to explore gender differences in the implications of working part time rather than full time for progression out of low pay*.

Paper #3) The third paper uses twenty-one years of LFS data (1996-2016) to explore the significance of part-time employment for the gender gap in low pay using a three-fold decomposition. The aim is firstly *to understand how the gender gap in low pay for UK employees changed over this period*, and, secondly, *to estimate the contribution of part-time employment to this differential*. The final aim of this paper is *to understand how far change over time in the contribution of part-time*

employment to the gender gap in low pay can be attributed to (i) shifts in the gender composition of the part-time workforce and (ii) change in the effect of working part time relative to full time on the risk of low pay.

Paper #4) The fourth paper places the UK in comparative perspective, using data from the European Structure of Earnings (ESES) 2014 survey. The first aim of this paper is *to provide robust estimates of the relationship between part-time employment and low pay in different European countries*. The second aim is *to explore whether there are gender differences in the relationship between part-time employment and low pay in each country studied*. The third aim is *to explore whether countries can be said to differ systematically (i.e. according to measurable aspects of the national environment) in the effect of working part time relative to full time on the risk of low pay*.

Results in the main text of the thesis are restricted to the most relevant findings, but further results and robustness checks can be found in the Appendices (there is a separate Appendix for each empirical paper). The four empirical papers are followed by a discussion that draws together the results, outlining key findings and policy implications. The discussion section also reflects on limitations to the empirical analysis, as well as directions for future research. A brief conclusion follows offering a concise summary of the thesis, outlining its main findings and contribution.

Definition and measurement of key concepts

The two focal concepts – low pay and part-time employment – both impose a dichotomy on a continuum. Naturally, this is an over-simplification (Warren and Walters, 1998), but one that offers advantages in terms of parsimony and ease of interpretation. The starting point for this study is not that each hour worked per

week augments earnings in a linear fashion. It is rather that working less than standard full-time hours – i.e. working part time – affects earnings, and more specifically the probability of being low paid. There is, for instance, no reason to expect the effect for working ten hours per week to be twice the size as that for working twenty hours per week - at least, not in a straightforward or proportional fashion. As is standard in the literature, a binary variable distinguishes between employees working full time and part time.

The number of hours considered to constitute part-time work differs across countries, sectors and occupations, presenting a measurement challenge. Some studies use a standard hours cut-off, such as the 30 hours per week threshold recommended by the OECD (van Bastelaer et al., 1997). A different approach recommended by Eurostat is to rely on the respondent's own assessment of their employment situation. After all, it is this relative difference, rather than distance from an arbitrary cut-off, that is likely to have the strongest implications for the individual's position in the prevailing earnings distribution. This thesis uses the Eurostat approach (self-defined status) where possible, and an hours-based threshold (<30 hours per week) elsewhere. Where possible, robustness checks estimate the sensitivity of the results to the choice of measure. To address the criticism that the full-time/part-time dichotomy obscures the distinctiveness of 'mini jobs' of only a few hours per week (Warren and Walters, 1998), robustness checks are conducted where possible.

There is no universally accepted definition or measure of what it means to be low paid. In order to distinguish low remuneration from low work intensity, this thesis focuses on hourly pay (also referred to as wages) rather than annual or

monthly earnings. In countries with statutory wage floors, low pay is sometimes defined as earning at or below the minimum wage (Skinner et al., 2002; Warren et al., 2010). However, statutory minimum wages are decided based on a number of different policy considerations, with adequate or 'fair' wages only part of the equation. Such a definition would also complicate international comparisons, since citizens of one country might appear better off than another simply because their welfare state is less generous. Criticisms can also be made of measures based on a specific share of the wage distribution, such as the bottom 10 or 20 per cent. By definition, this approach identifies a fixed proportion of the workforce as low paid, obscuring cross-national differences and change over time (Lucifora et al., 2005). This is clearly unsatisfactory, particularly in cases in which cross-national comparisons and over-time change are of interest.

Low pay is most commonly defined in relative terms, as a distributional measure related to average earnings. This approach allows rates of low pay to differ across countries and over time, enabling researchers to examine the determinants of low pay. The low pay threshold (LPT) is generally set according to the median rather than the mean because it is less sensitive to the presence of outliers in the distribution. Two-thirds of the median hourly wage is the most commonly used LPT, endorsed by the European Commission and the OECD (Lucifora and Salverda, 2012). The LPT is sometimes set according to the median wage for full-time employees. For instance, the OECD collect data on the share of employees earning less than two-thirds of the median wage for full-time employees (OECD, 2016a). This approach reflects the positioning of full-time employment as the norm, an increasingly out-dated perspective in modern labour markets, where part-time employment is often widespread (Lucifora and Salverda, 2012). This

approach is clearly unsatisfactory for the purposes here – i.e. comparing rates of low pay for full-time and part-time workers – since it partially obscures the phenomenon of interest. Throughout this thesis, low pay is defined as hourly earnings below two-thirds of the median wage for all employees.

Ambitions and limitations

The four papers in this thesis conduct quantitative analysis of existing data sets to examine these issues and provide new insights into the relationship between part-time employment and low pay. Although there is a large amount of relevant literature, few previous studies have touched on these issues directly, and the aim is to make a novel, if modest, contribution to scholarship. The statistical techniques used in the thesis, outlined in more detail in each of the empirical papers, are designed to eliminate confounding factors as far as possible, and to ensure that relationships identified are genuine. There are limits to what can be inferred from observational data, however, that are worth making explicit at the start. A well-designed Randomised Controlled Trial (RCT) can effectively eliminate selection bias, since the groups being compared differ only in the treatment and its consequences (Angrist and Pischke, 2015). An RCT is not always feasible, affordable or even ethical, however, as is the case here (for one thing, working hours are a personal choice, and cannot be imposed by an investigator). In non-experimental research, the possibility of selection bias can be minimised, but not eliminated. There is always a possibility of omitted variable bias using observational data, where unobserved factors confound the interpretation of relationships (Winship and Morgan, 1999). As such, the analysis in this thesis cannot, and does not claim to, identify causal relationships. The aim

is rather to provide sophisticated descriptive analysis that points to potential causal pathways.

II. Paper #1: *Looking beyond average earnings: why are male and female part-time employees in the UK more likely to be low paid than their full-time counterparts?*

Abstract

This article uses Labour Force Survey (LFS) data 2012-2016 to examine why male and female part-time employees in the UK are more likely to be low paid than their full-time counterparts. Previous studies have focused predominantly on the part-time gap in average hourly wages, whereas this article moves beyond the 'average worker model' to explore how these issues play out at the lower end of the earnings distribution. A series of probit regressions estimate the effect of working part time relative to full time on the risk of being low paid for male and female employees. The part-time low pay gap is then decomposed using the KHB method to assess the relative importance of worker-specific factors, job-specific factors and unobserved selection. The part-time low pay penalty is found to be just as large, if not larger, for men compared to women. For both men and women, differences in worker-specific characteristics account for a relatively small proportion of the part-time low pay gap. Of greater importance is the unequal distribution of part-time jobs across the labour market, in particular the close relationship between part-time employment and social class. Particularly for men, a large 'unexplained' component is identified, indicating that even with a similar human capital and labour market profile part-time workers are more likely than full-time workers to be low paid.

Introduction

It is widely recognised that 'part-time work is not just a bit less of the same thing' (Hakim, 2001: 58), but a form of employment that tends to confer disadvantages

or 'penalties' (Fagan et al., 2013; OECD, 2010). This article focuses on an under-explored dimension of this issue, namely the relationship between part-time employment and low pay. Rather than focusing on the part-time gap in average hourly wages, which is the dominant approach in the literature, this article explores how these issues play out at the lower end of the earnings distribution. Using data from the UK Labour Force Survey (LFS), the analysis examines why workers who identify as part time rather than full time are more likely to be low paid. Low pay is here defined as earning below two-thirds of the median hourly wage, and the distinction between full-time and part-time employment is based on the respondent's own assessment of their employment situation. The analysis explores the relative importance of worker- and job-specific factors in accounting for the part-time low pay penalty, as well as unobserved differences relating to selection into part-time employment. Contributing to a small but growing evidence base on part-time employment for men (see, for instance Belfield et al., 2017; Gardiner and Gregg, 2017; O'Dorchai et al., 2007), this article conducts separate analysis for men and women, allowing for gender differences in the relationship between part-time employment and low pay.

Why focus on low pay?

Previous literature has focused predominantly on the gap in average hourly earnings between full-time and part-time workers (Bardasi and Gornick, 2008; Hardoy and Schøne, 2006; Jepsen et al., 2001; Matteazzi et al., 2014; McGinnity and McManus, 2007; Neuburger et al., 2011; O'Dorchai et al., 2007; Petrongolo and Manning, 2008). However, 'focussing on average effects . . . [as] has been the dominant approach in the literature, conceals the very different function of part-

time employment at the various strata of the wage distribution' (Tonurist and Pavlopoulos, 2014: 20). Some have posited a dualistic structure for the part-time labour market, polarised between 'good' and 'bad' part-time jobs (Tilly, 1992). One recent study from Germany (Tonurist and Pavlopoulos, 2014) identifies variation across the earnings distribution in the part-time wage gap. At the top end of the distribution, the gap is fully accounted for by differences in worker and job characteristics, whereas at the lower end of the distribution part-time workers receive lower returns for the same characteristics. One reason to focus on low pay rather than average earnings is therefore that earnings penalties associated with part-time employment may be particularly steep for low earners.

Another reason to hone in on the bottom end of the earnings distribution is the precarious nature of low-paid employment. Earnings are a major component of household income, and low pay may contribute to inadequate financial resources at the household level. The situation is complex, since the relationship between low pay and in-work poverty is mediated by household composition. Across Europe, low-paid workers who are the sole or primary earner in the household face high rates of in-work poverty (Marx et al., 2012; Marx and Nolan, 2012; Marx and Verbist, 1998). Low-paid workers who are second earners are often lifted out of poverty by the earnings of others (Marx and Nolan, 2012). The negative implications for low pay are not restricted to an increased risk of experiencing in-work poverty, however. UK research shows that low pay has serious consequences for lifetime earnings (Brewer, Dias, et al., 2012), pension entitlements (Sefton et al., 2011) and vulnerability to financial shocks. Low pay may be regarded as a form of latent dependency (Peña-Casas and Ghailani, 2011) or a hidden vulnerability (Orloff, 1993), limiting the capacity of individuals to

form autonomous households. In this way, low pay contributes to various forms of financial dependency, for instance the dependency of spouses or partners on one another (Istenič et al., 2018), and of young people on their parents (Rainsford et al., 2018).

Working part time rather than full time has been recognised as a risk factor for low pay (Lucifora et al., 2005; Lucifora and Salverda, 2012; Simon et al., 2004; Ward and Ozdemir, 2015). This article advances the literature by exploring why this association exists. Rather than being disadvantaged by working part time, individuals who take up this form of employment may simply have characteristics that predispose them to being low paid. Previous studies have found that compared to full-time workers, part-time workers have weaker human capital, and therefore lower earning potential (Bardasi and Gornick, 2008; Matteazzi et al., 2014). According to Catherine Hakim, part-time workers also have lower work motivation than full-time workers (Hakim, 1991, 1995, 2002). Hakim's preference theory (Hakim, 2002) argues that unequal labour market outcomes are a result of part-time workers prioritising home and family life over professional success. According to Kan (2007), there is some empirical support for preference theory, at least in relation to married women in the UK. Her analysis found that women with work-centric attitudes were more likely to work continuously or predominantly full-time, and that for these women the presence of dependent children in the household posed less of a barrier to full-time employment. Preferences in relation to time spent on paid work, family care and other activities are often thought to be a major factor contributing to part-time wage differentials (Matteazzi et al., 2014), even if these preferences are shaped by institutional factors (McGinnity and McManus, 2007).

Hakim's preference theory has been widely criticised for ignoring the malleability of work preferences (Himmelweit and Sigala, 2004), and the degree to which they are shaped by institutional and cultural constraints (Fagan, 2001; Gash, 2008). More generally, there has been push back against the idea that unequal labour market outcomes are driven by the characteristics of part-time workers. Other analysts emphasise the importance of labour market segregation; the fact that part-time jobs are disproportionately located in lower-paying sectors and occupations (Matteazzi et al., 2014; Petrongolo and Manning, 2008). The most appropriate policy response may be rather different if part-time workers experience a higher risk of low pay because they are predominantly young and low skilled, than if they are older, with moderate to high levels of human capital, yet nonetheless are employed in low-paying sectors and occupations. To inform this debate, a central aim of this article is to establish the relative explanatory power of worker-specific and job-specific factors. In exploring these relationships, two initial research questions are identified:

1) How far can we account for the relationship between part-time work and low pay by taking into consideration the characteristics of employees working full time and part time?

2) Of the component attributable to characteristics, what is the relative importance of worker- and job-related characteristics?

Why conduct a gendered analysis?

There is growing recognition that part-time work is an issue with ramifications for men as well as women. The Institute for Fiscal Studies (IFS) have highlighted a growing correlation between working hours and wages for British men, driven

by a fall in the number of hours worked by low-paid men (Belfield et al., 2017). Research from the Resolution Foundation (Gardiner and Gregg, 2017) highlights rapid growth in part-time employment for younger cohorts of men. Despite this recent flurry of concern, the evidence base on male part-time employment remains under-developed. One comparative study analysed the gap in average hourly wages for men working full time and part time in six European countries (O'Dorchai et al., 2007), identifying a particularly large wage gap in the UK. Evidence from the Netherlands (Russo and Hassink, 2005) and the US (Hirsch, 2005) has shown that the gap in average hourly wages between full-time and part-time workers is greater for men than for women. Overall, however, the literature on wage penalties associated with part-time employment for men is sparse compared to the corresponding literature for women.

Although part-time employment is increasingly common for men in the UK (Belfield et al., 2017), around three-quarters of part-time employees are female (OECD, 2016a). Research also shows that men and women tend to work part time at different stages of the life cycle, and for different reasons (Eurofound, 2006; Fagan et al., 2013). Women often switch to part-time hours when they have their first child, whereas working hours for men are largely unaffected by household circumstances (Dias et al., 2018). For men, part-time employment often functions as a means of transitioning into or out of the workforce (Fagan and Walthery, 2014). Men are also more likely than women to be involuntary part-time workers - i.e. to work part time because they cannot find a full-time job (OECD, 2010). In light of these differences, the nature and implications of working part time might differ for men and women, a possibility addressed by the third research question:

3) How does the relationship between part-time employment and low pay differ for men and women?

Data

The analysis draws on the Labour Force Survey (LFS), the largest household panel survey in the UK. The LFS interviews around 41,000 randomly sampled UK households each quarter, with demographic and employment information collected for all individuals in the household. Due to data availability, only interviews relating to the spring quarter (April – June) are analysed here. The LFS has a rotating panel design, and each household stays in the survey for five consecutive quarters. Earnings questions are asked at the first and final interviews for each household, but to avoid double counting only observations relating to the final interview for each household are analysed. The most recent five years of LFS data (2012 – 2016) are pooled to ensure a sufficient sample size for men working part-time. Standard errors are adjusted to account for the clustering of individuals in households and data are weighted to obtain population estimates.

The sample is comprised of employees aged 16 and over, excluding those in full-time education. A small proportion of employees hold more than one job (~4 per cent), but in these instances the analysis relates to the main job only. Self-employed workers are not included in the analysis due to difficulties estimating earnings from self-employment. In addition, working part-time may mean something different, or indeed not be meaningful at all, in the context of self-employment. Earnings for apprentices are also taken to be a separate issue, and

not included in the analysis. Reflecting the gendered nature of part-time employment, male and female employees are treated as separate samples.

Measurement of key concepts

Low pay is approached as a relative concept, defined as receiving gross hourly earnings below two-thirds of the median. The relative approach is preferred to identifying a fixed proportion of the earnings distribution as low paid because the implications of being in, for instance, the bottom ten per cent of earners will differ according to the overall level of dispersion in the earnings distribution (Lucifora and Salverda, 2012). Earning substantially below the societal average always has serious implications for economic security, in both the immediate and long term. To avoid outliers having undue influence, relative measures are generally tied to the median rather than the mean. Two-thirds of the median is the cut-off used by Eurostat, the OECD and the majority of academic studies in this area, and is the approach followed here. Although the primary comparison being made is within-gender (e.g. women working part-time compared to women working full-time), the threshold is set according to median earnings for all employees. The variable for gross hourly earnings is constructed based on usual weekly working hours and earnings during the reference week. Paid overtime is included on the basis that overtime payments have a substantial

impact on the adequacy of earnings[8]. In response to high and non-random missing data on the earnings variable, multiple imputation is performed (Rubin, 2004). Robustness checks show that similar results are produced without data imputation, suggesting that this step does not introduce bias into the results (for more information see Appendix A, and robustness checks in Tables AVII and AVIII).

The focal explanatory variable distinguishes between employees working full time and part time. Previous literature on part-time employment is split between those who base this distinction on how workers describe their employment situation (e.g. Bardasi and Gornick, 2008) and those who tie it to a specific hours threshold (e.g. McGinnity and McManus, 2007). The distinction between full-time and part-time employment is here based on how respondents describe their employment situation. After all, it is relative difference, rather than distance from an arbitrary cut-off, that is likely to have the strongest implications for the individual's position in the prevailing earnings distribution. Robustness checks show that using an alternative definition of part-time employment as working fewer than 30 hours per week does not alter the conclusions (see Tables AVII and AVIII in Appendix A). The value of operationalizing working hours as a dichotomy has been questioned on the grounds that workers in marginal part-

[8] For some workers, overtime will be associated with a different (more generous) rate of pay compared to regular hours of work. One balance, the decision was made to include these payments since they may have a substantial effect on the adequacy of earnings. The difficulty with this is that some groups of workers may disproportionately benefit from overtime payments (for instance, unionized workers in the public sector), and this may confound the interpretation of full-time/part-time wage differentials. 4.5 per cent of part-time workers in the sample received overtime payments, compared to 6.4 per cent of full-time workers. Reassuringly, however, conducting the analysis separately for workers who did not receive overtime payments did not alter the conclusions of the study.

time jobs (i.e. jobs of only a few hours per week) may be particularly disadvantaged in relation to full-time workers (Fagan and Rubery, 1996; Warren and Walters, 1998). In this instance, however, there is no difference between workers in marginal and other part-time jobs (see Table AIX in Appendix A) and no further disaggregation is offered.

Descriptive statistics in Table II-I show that men and women working part-time earn on average a lower hourly wage than those working full-time (for men £12.78 compared to £15.43; for women £10.76 compared to £13.17). They also have on average a far higher probability of being low paid than full-time workers. 39.9 per cent of women working part time are low paid compared to 18.5 per cent of women working full time. For men the gap is even greater, with 40.9 per cent of part-time workers low paid compared to 12.2 per cent of full-time workers. The statistical analysis that follows seeks to explain this part-time low pay gap, assessing how far it can be attributed to the personal and job characteristics of individuals working full time and part time.

Table II-I. Descriptive statistics relating to the earnings of male and female employees working full time and part time in the UK 2012-2016

		Female employees		*Male employees*	
		Mean or %	*Confidence Interval*	*Mean or %*	*Confidence Interval*
Mean hourly wage	Part time	10.76 (0.17)	10.41 – 11.10	12.78 (0.77)	11.26 – 14.30
	Full time	13.17 (0.12)	12.93 – 13.41	15.43 (0.08)	15.27 – 15.60
Proportion low paid	Part time	39.87 (0.59)	38.72 – 41.04	40.88 (1.26)	38.43 – 43.38
	Full time	18.52 (0.39)	17.76 – 19.30	12.23 (0.27)	11.70 – 12.79

Notes: data source LFS 2012-2016; standard errors in parentheses; average hourly wage is the mean across the entire earnings distribution and can be interpreted in pounds sterling; low pay is the proportion earning below two-thirds of the median hourly wage and should be interpreted as a percentage.

Methodology

The effect of working part time relative to full time on the probability of being low paid is estimated in a series of nested probit regressions. Due to difficulties interpreting coefficients for binary response models (Mood, 2010), average marginal effects are presented here. It is not possible to completely eliminate the possibility of omitted variable bias and therefore the article does not claim to identify causal relationships. Causal interpretations are also challenging because the direction of causality is ambiguous. The first model, Model 1, estimates the raw effect of working part time relative to full time, without controlling for covariates. The second model adjusts for worker-specific factors – i.e. the fact that full-time and part-time workers differ in ways that are related to their earning potential. Control variables in Model 2 are age, health status (a dummy variable for having a work-limiting health condition), education (highest educational qualification), job tenure and household type.

The third model, Model 3, controls for job-specific factors in addition to the worker-specific factors captured in Model 2. Control variables introduced in Model 3 are social class (NS-SEC coding[9]), contract type (temporary or permanent), industry (SIC '07 coding[10]), sector (public or private) and employer size[11]. The inclusion of social class as a covariate reflects the fact that part-time employment in the UK is a classed phenomenon, disproportionately undertaken by women and men from lower socio-economic groups (Warren, 2003). Following Goldthorpe and colleagues (see: Erikson et al., 1979; Goldthorpe, 2007), social class is measured according to the labour market position of individuals. This approach has been criticised for downplaying other sources of stratification such as gender, race and wealth, and for ignoring aspects of social class such as class consciousness (Crompton, 2010). Nevertheless, labour market position is clearly an important source of social stratification, shaping opportunities and life chances, and the Goldthorpe approach is well validated by prior research (Rose and Harrison, 2009; Rose and Pevalin, 2003). The social class approach differs from occupational measures such SOC or ISCO[12] in taking into account social relationships in the workplace as well as the degree of skill or expertise associated with an occupation. However, occupational groups are used to approximate the social relations that are the basis of social class. From a social class perspective, low pay is expected to be primarily associated with employment conditions governed by 'the labour contract', a basic exchange of

[9] National Statistics Socio-economic Classification (NS-SEC)
[10] The Standard Industrial Classification (SIC) coding scheme.
[11] Based on the number of employees at the individual's workplace; does not include employees working for the same employer at a different site.
[12] Standard Occupational Classification (SOC) and International Standard Classification of Occupations (ISCO).

money for time, characteristic of occupations in which skill requirements are rudimentary and generic, and output easily monitored (routine and manual occupations). Low pay is expected to be rare in situations where the 'service relationship' prevails (managerial and professional occupations), in which employers have incentives to build long-term relationships with employees.

As discussed earlier, differences in attitudes or preferences might have a bearing on the relative risk of low pay for full-time and part-time workers, if, for instance, part-time workers are more willing to accept low-paid work as a means of securing a non-demanding and flexible role. This kind of self-selection into part-time employment is more difficult to control for statistically, since data sets generally do not include variables relating to work attitudes or preferences. Although it is not possible to measure work preferences directly, Model 4 uses a selection model to adjust for factors such as these that remain unobserved. Originally developed by Heckman (1979), selection models have been adapted for non-linear models (Van de Ven & Van Praag, 1981). The first step involves the creation of a latent variable i.e. a variable that is estimated rather than directly observed. In this case, the latent variable (the selection correction term) captured an individual's propensity to be in (full-time) employment. This is estimated relative to the probability of being non-employed, and therefore the sample for the selection equation includes those not currently in employment. The selection correction term reflects all factors contributing to this propensity, including traits such as work preferences that do not feature as explanatory variables. This selection correction term is then included as an explanatory variable in the main regression model.

Previous studies have estimated self-selection into full-time and part-time employment using a multinomial logit (Bardasi and Gornick, 2008), ordered probit (Ermisch and Wright, 1993; Matteazzi et al., 2014) or bivariate probit model (Ermisch and Wright, 1993). Following Ermisch and Wright (1993), the selection equation here is a bivariate probit jointly estimating (i) the probability of being in employment (relative to non-employment) and (ii) the probability of being employed full-time (relative to non-employment/part-time employment) as a function of age, health, and household type. To function effectively, selection models require at least one variable that predicts selection but is unrelated to the final outcome. If this restriction is not met, selection is identified only though the non-linearity of the correction factor and the model is in danger of suffering from collinearity (Puhani, 2000). For women, two additional variables are included to capture the number of young children in the household. For men, an additional variable identifies those who were economically inactive one year ago. It is well known that previous unemployment spells increase the risk of low pay (Stewart and Swaffield, 1999). However, men who were economically inactive one year ago are not necessarily at greater risk of low earnings; this group might include individuals finishing full-time education, re-entering employment after taking early retirement or recovering from a period of ill-health. Robustness checks confirm that these variables predict employment status, but are unrelated to the risk of low pay (see Table AV in Appendix A).

After running the regressions, decomposition analysis is used to understand the relative importance of different explanatory factors in contributing to the part-time gap in low pay. The traditional approach to decomposing wage gaps is the Blinder-Oaxaca procedure (Blinder, 1973; Oaxaca, 1973). This method

decomposes wage gaps into two components: a part 'explained' by differences in characteristics and a part that remains 'unexplained' after taking these differences into account. Rather than a traditional Blinder-Oaxaca decomposition, the Karlson, Holm and Breen (KHB) method is used here to eliminate bias from rescaling (Karlson et al., 2012). The KHB method adjusts for the fact that coefficients for nested binary response models are not measured on the same scale, due to changes to the distribution and variance of error terms. Sensitivity analysis (see Table AVIII in Appendix A) shows that in this case similar results are produced using the KHB and Blinder-Oaxaca methods. This stage of the analysis estimates the explanatory power of (i) worker-specific factors (ii) job-specific factors and (iii) the selection correction term, as well as (iv) the size of the 'unexplained' component. In addition to these aggregate estimates, detailed decomposition is used to identify the separate contribution of each variable. The selection correction term is treated separately to other explanatory variables because this parameter is estimated rather than directly observed[13] (for a discussion of this issue see: Neuman and Oaxaca, 2004).

Results and discussion

The average marginal effect of working part time relative to full time on the risk of low pay for male and female employees across Models 1 to 4 is shown in Table II-II. For both male and female employees, the raw effect of working part time relative to full time on the risk of low pay is positive and highly significant in Model 1. In this model, the marginal effect is slightly larger for men (AME = 0.22,

[13] The issue with treating this factor as a 'worker characteristic' is that it reflects unobserved factors captured in the error term (which might include job- as well as worker-specific factors) as well as the effect of variables such as age and education.

$p < 0.001$) than for women (AME = 0.21, $p < 0.001$). The first research question asks how far we can account for this effect by taking into consideration the characteristics of employees working full time and part time. The inclusion of control variables relating to worker-specific factors in Model 2 results in a reduction of the average marginal effect for working part time relative to full time (AME = 0.15, $p < 0.001$ for women; AME = 0.15, $p < 0.001$ for men). Particularly for female employees, there is a sizable reduction in the effect associated with the inclusion of control variables relating to job-specific factors in Model 3 (AME = 0.07, $p < 0.001$ for women; AME = 0.11, $p < 0.001$ for men). There is relatively little change in Model 4 (AME = 0.06, $p < 0.001$ for women; AME = 0.10, $p < 0.001$ for men), which controls for sample selection, indicating that unobserved factors are not of great importance. These results suggest that differences in the personal and job characteristics of full-time and part-time workers go some way in accounting for the part-time low pay gap. However, it is not possible to 'explain away' the effect, which for both male and female employees remains statistically significant in Model 4.

Table II-II. Comparison of the average marginal effect of working part time relative to full time on the risk of low pay for male and female employees in the UK 2012-2016 across Models 1-4.

	Female employees			
	M1	*M2*	*M3*	*M4*
Part time (ref: full time)	0.21 (0.01)***	0.15 (0.01)***	0.07 (0.01)***	0.06 (0.01)***
Observations	16,605	16,565	16,482	16,482
	Male employees			
	M1	*M2*	*M3*	*M4*
Part time (ref: full time)	0.22 (0.01)***	0.15 (0.01)***	0.11 (0.01)***	0.10 (0.01)***
Observations	15,586	15,547	15,466	15,466

Notes: data source LFS 2012-2016; average marginal effects with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001. *Model comparison*: M1 includes no controls; M2 controls for worker characteristics (age, health status, education, job tenure and household type); M3 controls for job characteristics (social class, contract type, public/private sector, industry and employer size) in addition to worker characteristics; M4 controls for selection bias in addition to worker and job characteristics.

Average marginal effects for other explanatory variables in the full model (Model 4) are shown in Table II-III[14]. The probability of being low paid is lower for older age groups compared to the youngest age group (16-24), and (for men only) for workers who have a work-limiting health condition compared to those who do not (AME = 0.04, $p < 0.001$). Workers educated to degree level are less likely to experience low pay than other groups, particularly those with no educational qualifications (AME = 0.27, $p < 0.001$ for women; AME = 0.28, $p < 0.001$ for men). Social class is one of the strongest predictors of low pay, with workers employed

[14] The effect of explanatory variables is consistent across Models 2-4, and therefore no further results are shown.

in intermediate occupations, but particularly those employed in routine and manual occupations (AME = 0.38, $p < 0.001$ for women; AME = 0.14, $p < 0.001$ for men), disadvantaged compared to the professional and managerial classes. The probability of being low paid is higher for workers on a temporary than those on a permanent contract (AME = 0.04, $p < 0.001$ for women; AME = 0.07, $p < 0.001$ for men), and for those work for small- or medium-sized employer compared to a large employer. Working in the private sector is associated with an increased risk of low pay compared to working in the public sector (AME = 0.05, $p < 0.001$ for women; AME = 0.04, $p < 0.001$ for men), as is working in industries such as distribution, hotels and restaurants compared to manufacturing and construction (the reference group). The selection correction term is non-significant, indicating that modelling low pay without adjusting for selection does not produce biased estimates.

Table II-III. Results from the full model (Model 4) estimating the effect of measured characteristics and selection on the risk of low pay for male and female employees in the UK 2012-2016; average marginal effects

		Female employees	*Male employees*
Focal explanatory variable			
Work status	Part-time	0.06 (0.01)***	0.10 (0.01)***
Demographic variables			
Age	16-24 (ref)		
	25-34	-0.10 (0.01)***	-0.13 (0.02)***
	35-44	-0.13 (0.01)***	-0.17 (0.01)***
	45-54	-0.13 (0.01)***	-0.19 (0.01)***
	55+	-0.12 (0.01)***	-0.18 (0.01)***
Health	Work-limiting condition	0.01 (0.01)	0.04 (0.01)***

Family structure	Single adult (ref)		
	Couple, no children	-0.02 (0.01)*	-0.01 (0.01)
	Couple with children	0.01 (0.01)	-0.01 (0.01)
	Lone parent	0.02 (0.01)	0.00 (0.02)
Human capital variables			
Highest educational qualification	Degree (ref)		
	Higher education	0.02 (0.01)	0.02 (0.01)*
	GCE/A-level	0.08 (0.01)***	0.03 (0.01)***
	GCSE grades A*-C	0.13 (0.01)***	0.09 (0.01)***
	Other	0.19 (0.01)***	0.15 (0.01)***
	None	0.27 (0.02)***	0.28 (0.02)***
Job tenure (in years)		-0.01 (0.00)***	-0.01 (0.00)***
Labour market variables			
Social class	Managerial and professional (ref)		
	Intermediate	0.08 (0.01)***	0.03 (0.01)**
	Routine and manual	0.38 (0.01)***	0.14 (0.01)***
Contract	Temporary	0.04 (0.01)***	0.07 (0.01)***
Sector	Private	0.05 (0.01)***	0.04 (0.01)***
Industry	Agriculture, energy and water	-0.02 (0.03)	0.01 (0.01)
	Manufacturing & construction (ref)		
	Distribution, hotels and restaurants	0.09 (0.01)***	0.06 (0.01)***
	Transport and communication	-0.02 (0.02)	0.03 (0.01)**
	Banking, finance and insurance	0.00 (0.01)	0.04 (0.01)***
	Education, health, administration	0.06 (0.01)***	0.05 (0.01)***
Employer size	1-10 employees	0.09 (0.01)***	0.20 (0.01)***
	11-49 employees	0.05 (0.01)***	0.05 (0.01)***
	50+ employees (ref)		
Selection correction term		-0.01 (0.02)	0.03 (0.02)
Observations		16,482	15,466
Log likelihood		-3679752.2	-3084925.6

Notes: data source LFS 2012-2016; average marginal effects with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001.

The third research question asks how the relationship between part-time employment and low pay differs for men and women. Across Models 1 to 4, the marginal effect for working part time relative to full time is similar for men and women, or even slightly larger for men. Comparing effect sizes across non-linear models may be misleading, since the variance of the underlying latent variable is not fixed (Allison, 1999; Mood, 2010). To test whether the effect of working part time is mediated by gender, Model 3 was run with the inclusion of an interaction term (results can be found in Table AVI in Appendix A). This identified a significant negative interaction between being female and working part time, indicating that the positive effect of working part time relative to full time (i.e. the extent to which it increases the risk of low pay) is greater for men than for women.

Research question two concerns the relative importance of different worker- and job-related characteristics in accounting for the part-time low pay gap. Decomposition results in Table II-IV show that worker characteristics account for 7.9 per cent of the part-time low pay gap for women, and 13.0 per cent for men. Table II-V breaks this down into the contribution of each variable, showing that this is largely attributable to differences in the educational qualifications of full-time and part-time employees. Differences in the qualifications account for 12.7 per cent of the part-time low pay gap for women and 7.9 per cent for men. Job characteristics are of greater importance than worker characteristics, accounting for 50.0 per cent of the part-time low pay gap for women and 33.3 per cent for men. For women, the low pay gap would be reduced by 41.5 per cent if the social class positions of full-time and part-time workers were comparable. The over-representation of part-time workers in small workplaces accounts for 10.4 per

cent of the gap for men and 7.3 per cent for women. For both men and women, segregation across sectors and industries has a small or negligible effect.

Table II-IV. Results from a KHB decomposition of the full-time/part-time gap in the risk of low pay for male and female employees in the UK 2012-2016; mediation percentages

	Female employees	*Male employees*
Characteristics component	57.72	46.25
Worker characteristics	*7.94*	*12.95*
Job characteristics	*49.78*	*33.30*
Selection correction term	20.08	13.12
Unexplained	22.20	40.63
Total	100.00	100.00
Observations	16,482	15,466

Notes: data source LFS 2012-2016; the characteristics component describes the combined importance of worker- and job-related characteristics.

Table II-V. Results from a detailed KHB decomposition identifying the contribution of each variable to the full-time/part-time gap in the risk of low pay for male and female employees in the UK 2012-2016; mediation percentages

	Female employees	*Male employees*
Worker characteristics		
Age group	-3.88	-3.24
Health condition	0.13	1.81
Family structure	-1.11	0.63
Highest qualification	12.70	7.92
Job tenure	0.10	5.83
Job characteristics		
Social class	41.47	16.39
Temporary contract	0.82	4.70
Industry	-0.02	1.88
Sector	0.21	-0.06
Employer size	7.30	10.39
Selection correction term	20.08	13.12
Unexplained	22.20	40.63
Total	100.00	100.00
Observations	16,482	15,466

Note: data source LFS 2012-2016.

The distinctiveness of this study is that it focuses on the part-time gap in low pay rather than average earnings. This being so, it is helpful to consider continuities and discontinuities between these results and those of other studies looking at the part-time gap in average hourly wages. In identifying a greater role for job characteristics relative to worker characteristics, the results are aligned with the previous literature on part-time wage gaps (Bardasi and Gornick, 2008; Jepsen et al., 2001; Matteazzi et al., 2014; Petrongolo and Manning, 2008). The study departs from previous literature in the size of the 'unexplained' component

identified. After controlling for a full set of covariates, previous studies find no effect for working part time relative to full time on average hourly wages in the UK (Petrongolo and Manning, 2008; Warren and Lyonette, 2015), Belgium (Jepsen et al., 2001) and Poland and Italy (Matteazzi et al., 2014). In contrast, working part time relative to full time does exert an effect on the likelihood of being low paid, even after controlling for a rich set of covariates. A large 'unexplained' component is identified, particularly for men, amounting to 40.6 per cent of the low pay gap for men and 22.2 per cent of the corresponding gap for women.

The question that arises is why the part-time gap in low pay is more difficult to account for than the gap in average earnings. One possible explanation is that discrimination against part-time workers is most pronounced for low-paid workers, and low-paid men in particular. This cannot be established for certain using observational data, since even using a selection model it is not possible to rule out the possibility of differences between full-time and part-time workers not captured by the covariates in the model. Studies utilising experimental designs provide more robust evidence for discrimination against part-time workers in countries such as Germany (Beham et al., 2017) and the US (Pedulla, 2016; Vandello et al., 2013), and future research might apply similar techniques to the UK context. Aside from discrimination, the 'unexplained' component may stem from differences in skills and productivity, disparities in labour market experience and job conditions such as access to training and networking opportunities. The 'unexplained' component may also reflect temporal processes not captured by this kind of cross-sectional analysis. The duration of time working part time is likely to have an effect above and beyond working part time

at a point in time. Part-time workers may also accrue, or be perceived to accrue, less experience on the job, being passed over for promotions as a result. Research from the Netherlands shows that part-time wage gaps grow over the life course due to a lower incidence of promotions for part-time workers (Russo and Hassink, 2005).

In examining the role of self-selection into full-time and part-time employment, this study contributes to a long-standing debate in the sociological literature concerning how penalties associated with part-time employment should be understood. Are part-time workers simply a 'selected' group whose labour market disadvantage is a product of their skills, abilities and preferences, or do penalties associated with part-time work go beyond this? Only a modest proportion (less than 15 per cent) of the differential risk of low pay faced by full-time and part-time workers can be attributed to worker characteristics. The selection correction factor, reflecting an individual's propensity to be in (full-time) employment, is found to be of some importance, accounting for 20.1 per cent of the part-time low pay gap for women and 13.1 per cent for men. However, this should not necessarily be taken as evidence in support of preference theory (Hakim, 2002). This factor may, as preference theory would suggest, reflect differences between full-time and part-time employees in work preferences and motivation. However, these preferences may well be adaptive (Gash, 2008), shaped by institutional and cultural constraints (McGinnity and McManus, 2007). Alongside preferences, the selection correction factor may reflect barriers to full-time employment, for instance childcare responsibilities, health-related factors and cultural pressures. The precise nature of the selection

correction term remains opaque, and it is important not to read too much into this component.

Overall, job-related factors are found to be more important than worker characteristics in account for the part-time low pay penalty. This finding supports the conclusion drawn elsewhere (Warren and Walters, 1998) that the full-time/part-time dichotomy is more useful in distinguishing between different types of jobs than between different types of workers. Labour market segregation is sometimes positioned as part of the 'fair' component of part-time wage gaps, in that it can be accounted for with reference to job characteristics. However, segregation in the labour market reflects not only different tastes and preferences but also the fact that part-time jobs are not available, or are hard to come by, in certain sectors, occupations and workplaces. Conversely, workers in other areas of the labour market may be forced into part-time employment by a lack of full-time opportunities. From the perspective of part-time employment sometimes being an enforced or constrained 'choice' (Gash, 2008), this component may be interpreted differently. Part-time employment may be viewed as limiting the opportunities of these workers to access higher skilled and better paid job opportunities.

The need to address the issue of poor quality part-time jobs in the UK has been highlighted by the Women and Equalities Select Committee (House of Commons, 2016), as well as organisations such as the ILO (Fagan et al., 2013). The UK already has legislation in place mandating equal treatment of full-time and part-time workers, introduced following the EU Directive on Part-Time Work (1997). Equal treatment requires a comparable full-time worker (Fagan et al., 2013), and

as we have seen a large part of the issue is that full-time and part-time workers are located in different types of jobs. Arguably, more could be done to open up access to 'good quality' part-time jobs in the UK. The right to request a change in working hours for parents was introduced in 2003, and this was further expanded in 2014 to apply to all employees who have worked for a minimum of six months in the same role. There may be scope to improve and diversify part-time work opportunities by making flexible working (including part-time employment) available at the point of recruitment (House of Commons, 2016; Rubery, 2017), or placing greater restrictions on the circumstances under which employers can refuse flexible working requests (Anderson, 2003). Improving the 'quality' of part-time jobs can only be part of the solution, however, since the analysis here shows that even within the same type of jobs part-time workers are more likely than full-time workers to be low paid.

Part-time jobs are disproportionately low paid jobs, and even within the same type of jobs part-time workers are more likely than full-time workers to be low paid. The impact of this is not felt uniformly across the labour market, but disproportionately affect certain groups. The association between part-time employment and low pay is found to be just as strong, if not stronger, for men compared to women. At the same time, women are disproportionately affected because they work part time in greater numbers. Patterns of full-time and part-time employment make a major contribution to the gender pay gap (Dias et al., 2018), and may go some way in accounting for the over-representation of women in low-paid work (Gregory, 2012). Part-time employment is a classed as well as gendered phenomenon (Warren, 2003), and this issue disproportionately affects workers from lower socio-economic groups. We have seen that the distribution of

part-time jobs according to social class contributes to the gap in low pay between full-time and part-time workers. Another way of looking at this issue is that part-time employment reinforces and perpetuates inequalities according to social class. Given their over-representation in part-time employment, the low pay penalty associated with working part time rather than full time falls disproportionately on men and women in routine and manual (working class) occupations.

Conclusion

This article examines why male and female part-time employees in the UK are more likely to be low paid than their full-time counterparts. This disparity is found to be just as large, if not larger, for men compared to women, reinforcing the importance of bringing men into the discussion around part-time employment. Worker characteristics are found to be less important than job characteristics in accounting for the part-time low pay penalty. Controlling for workers' estimated propensity to be in full-time employment adds explanatory power, but the factors underpinning this propensity remain opaque. The most important explanatory factor in the analysis is the unequal distribution of part-time workers across social class groups. The results reinforce the need to improve access to 'good quality' part-time jobs in managerial and professional occupations. At the same time, a large 'unexplained' component indicates that even within the same type of jobs part-time workers are more likely than full-time workers to be low paid.

The results are interpreted in light of the potential for part-time employment to reinforce inequality in low pay according to gender and social class. Future

research might consider how part-time employment interacts with other intersectional factors, for instance whether the part-time low pay penalty is particularly steep for part-time workers who have a disability, or those who are from an ethnic minority background. There is also a need for further research to explore how the duration of part-time employment affects the risk of low pay and the probability of progressing on to higher wages. The large 'unexplained' component of the part-time low pay penalty for men also warrants further investigation. Several possible explanations are offered, but there are limits to what can be inferred from observational data. Experimental designs could be utilised to establish whether there is a discriminatory element to this component, and qualitative research could add greater insight into how men working part time are viewed in the workplace.

III. Paper #2: *Stepping-stone or dead end: to what extent does part-time employment enable progression out of low pay for male and female employees in the UK?*

Abstract

Using data from Understanding Society and the British Household Panel Survey 2001-2017, this article explores the relationship between working part time and progression out of low pay for male and female employees in the UK. In addition to estimating the effect of working full time and part time at a point in time, the analysis presents a novel contribution in exploring how transitions between full-time and part-time employment affect the probability of escaping low pay. Low pay is defined as earning below two-thirds of the median hourly wage, and part-time workers are identified according to whether the individual works fewer than thirty hours per week in their main job. The results show that working part time relative to full time decreases the likelihood of progression out of low pay. However, part-time workers who transition to full-time employment experience similar rates of progression to full-time workers. The negative effect of working part time on progression out of low pay is broadly similar for men and women (if anything, the effect is more pronounced for men). However, women are more at risk of becoming trapped in low pay in the sense that they tend to work part time for longer periods of time than men, particularly if they have children.

Introduction

This article seeks to understand how working part time rather than full time influences the duration of low-paid employment and the probability of

progressing out of low pay[15]. Almost a quarter (23.7 per cent) of UK employees describe their employment situation as part time rather than full time (Eurostat, 2016), yet few previous studies of low pay dynamics distinguish between full-time and part-time workers. Existing evidence is even sparser regarding how transitions between part-time and full-time employment affect the probability of escaping low pay, the effects of which are also modelled here. Using panel data from the British Household Panel Survey (2001-2008) and Understanding Society (2010-2017) (Knies, 2017), this article uses a discrete-time event history approach to estimate the probability of progressing to higher wages relative to remaining on a low wage for employees[16] in the UK. Low pay is defined as earning below two-thirds of the median hourly wage, and part-time employees are identified according to whether the individual works fewer than thirty hours per week in their main job. The data set is comprised of person-year observations relating to low-paid employees who are 'at risk' of experiencing the event (entering higher-paid employment). Reflecting the gendered nature of part-time employment, separate analysis is conducted for men and women.

Part-time employment and low pay dynamics

Previous research shows that in the UK, as in many other advanced economies, the probability of being low paid decreases with age, job tenure and labour market experience (Lucifora et al., 2005; Lucifora and Salverda, 2012). We might

[15] The analysis focuses on the probability of escaping low pay, rather than pay progression more generally. Although it is important to understand how people's earnings trajectories fare after escaping low pay (for instance, whether they remain just at or above the low pay threshold, fall back into low pay, or continue to progress on to higher earnings), this falls outside the scope of the current article.

[16] The analysis does not include self-employed workers, for reasons discussed below.

therefore expect workers to escape low pay as they grow older, gaining skills and experience. On the other hand, dual labour market theorists emphasise the segmented nature of modern labour markets. Given the increasing dearth of middle-tier jobs in the UK (Goos and Manning, 2007), it may be the case that low-paid jobs do not act as a stepping-stone, but instead trap workers in 'low wage careers' (McKnight and Stewart, 2015: 19). Low pay experienced over the long term is likely to have more severe consequences than a short spell on low wages. Experienced over the long term, low pay has serious consequences for lifetime earnings (Brewer, Dias, et al., 2012), pension entitlements (Sefton et al., 2011) and vulnerability to financial shocks. A long spell of low-paid employment has greater consequences than a short spell for household income (D'Arcy et al., 2014). It is therefore important to understand whether low pay is enduring or transitory, and for whom.

The literature on low pay dynamics examines how personal characteristics influence the duration of low pay spells. This literature highlights considerable heterogeneity across the labour market: whilst for some people low-waged employment is a transitory state, for others it is a sustained, long-term condition. Groups in the UK labour market identified as being at risk of longer spells of low-paid employment include women (Sloane and Theodossiou, 1996; Stewart and Swaffield, 1999), low-skilled workers (Cappellari and Jenkins, 2008; D'Arcy et al., 2014; D'Arcy and Finch, 2017; Phimister and Theodossiou, 2009; Stewart and Swaffield, 1999) and people with disabilities (D'Arcy et al., 2014; D'Arcy and Finch, 2017). There is some evidence to suggest that workers in rural areas are disadvantaged compared to those in urban areas (Phimister et al., 2006). Individuals working in the private sector and certain industries in particular,

such as sales and hospitality, have been shown to face barriers to progression out of low pay (D'Arcy et al., 2014; D'Arcy and Finch, 2017). Across all industries, workers in low-skilled jobs and those based in small establishments (Sloane and Theodossiou, 1996; Stewart and Swaffield, 1999) are more at risk of long spells of low pay. Unionised workers experience on average shorter spells of low-paid employment than those who are not union members (Stewart and Swaffield, 1999).

Some studies of low pay dynamics restrict the sample to full-time workers, or even to men working full time (Cappellari and Jenkins, 2008). Others include both full-time and part-time workers in the sample, but do not include this as a parameter in the model (Pavlopoulos and Fouarge, 2010; Phimister et al., 2006; Stewart and Swaffield, 1999). Where it is included as a covariate, working part time has been found to have a negative effect on the probability of progressing out of low pay for workers in the UK (D'Arcy et al., 2014; D'Arcy and Finch, 2017; Phimister and Theodossiou, 2009; Sloane and Theodossiou, 1996). In addition to estimating the effect of working part time relative to full time on the probability of escaping low pay, this article extends this line of analysis to consider part-time to full-time transitions. It examines whether part-time workers continue to face barriers to progression out of low pay if they transition to working full time. If this is the case, then it offers some support for the idea that part-time workers earn less than full-time workers because of unobserved skills, abilities and predispositions. This line of thinking is most closely associated with Catherine Hakim (Hakim, 1991, 1995, 2002), who has argued that women working part time earn less than those working full time because they have lower levels of ambition and motivation. Although this argument has many critics (Fagan, 2001; Ginn et

al., 1996), the idea that part-time wage differentials are partly a product of unobserved characteristics is widely accepted as credible (Bardasi and Gornick, 2008; Matteazzi et al., 2014; McGinnity and McManus, 2007; Nightingale, 2018a; Petrongolo and Manning, 2008). If, in contrast, part-time workers cease to be at a disadvantage if they transition to full-time employment, then this casts doubt on this idea, suggesting instead that lower rates of progression out of low pay for part-time workers are a product of the nature of jobs available on a part-time basis and/or the way in which part-time workers are treated in the labour market. Two research questions are identified initially:

1) How does working part time influence the probability of progressing on to higher wages for low-paid employees in the UK?

2) How does transitioning between full-time and part-time employment affect the probability of progressing on to higher wages for low-paid employees in the UK?

When it comes to part-time employment, there are reasons to expect differences according to gender. As well as being a highly feminised form of employment (around three-quarters of employees working part time in the UK are female), research shows that men and women in the UK tend to work part time at different stages of the life cycle, and for different reasons (Eurofound, 2006; Fagan et al., 2013). For women, part-time work is often associated with parenthood, whereas men rarely adjust their working hours in response to parenthood (Dias et al., 2018). For men more than women, part-time employment functions as a means of transitioning into or out of the workforce (Fagan and Walthery, 2014). Men are also more likely than women to be classed as involuntary part-time workers - i.e. to work part time because they cannot find a

full-time job (OECD, 2010). Although male part-time workers have historically been overlooked in the literature, there is growing concern about the low wages received by men working part time in the UK (Belfield et al., 2017; Nightingale, 2018a) and elsewhere in Europe (O'Dorchai et al., 2007; Russo and Hassink, 2005). Here, men are included in the analysis, but separate analysis is conducted for men and women in order to explore potential gender differences. The third and final research question relates to gender differences in the relationship between part-time employment and progression out of low pay:

3) How does the relationship between working part time and progression out of low pay differ for male and female employees in the UK?

Data and descriptive statistics

Data come from Understanding Society[17] (Usoc) and its predecessor the British Household Panel Survey (BHPS), and the sample is comprised of low paid employees in the UK. Respondents from the BHPS became part of the Understanding Society sample from its second wave (Knies, 2017). The two data sets are linked, creating an unbalanced panel of fourteen waves spanning the calendar years 2001 – 2017[18] (henceforth referred to as USoc/BHPS). An unbalanced panel describes a data set in which not all longitudinal units (in this case, individuals) are represented at all waves. The uneven representation of individuals across waves reflects both panel attrition and the recruitment of new respondents to the panel. Since those dropping out of the USoc/BHPS sample are

[17] Also known as the UK Household Longitudinal Study (UKHLS).
[18] It is not possible to further extend the observation window whilst conducting analysis at the UK level. Between 1991 and 2000 the BHPS sample was restricted to GB; NI sample was included for the first time in 2001.

not randomly distributed (Lynn et al., 2012; Uhrig, 2008), there is a danger of bias from panel attrition. Caution is therefore required in generalizing the results to the UK population. The analysis relates to employees only, and does not consider the situation of self-employed workers. This is due to concerns about the accuracy of self-reported earnings from self-employment (D'Arcy and Gardiner, 2014). In addition, working part time may mean something different, or indeed not be meaningful at all, in the context of self-employment. Reflecting the gendered nature of part-time employment, male and female employees are treated as separate samples.

Data are interval-censored, based on information collected at annual interviews. Although information is available in USoc/BHPS about changes in employment status between one interview and the next, this does not include earnings. Earnings data is captured only at the time of the interview, and by necessity this is assumed to be representative of the intervening period. The data set is comprised of person-year observations relating to low-paid employees who are 'at risk' of experiencing the event (entering higher-paid employment). Employees who did not experience low pay, amounting of 76.0 of women and 87.9 per cent of men (see Table BII in Appendix B), are not included in the analysis. The dependent variable captures whether low-paid employees continue to be low paid in the following year, or whether they progress on to higher wages. This transition is modelled as a function of characteristics, including information about the duration of the current low pay spell. In situations in which the individual has more than one job (7.4 per cent of person-year observations for employees), the analysis relates to the main job only.

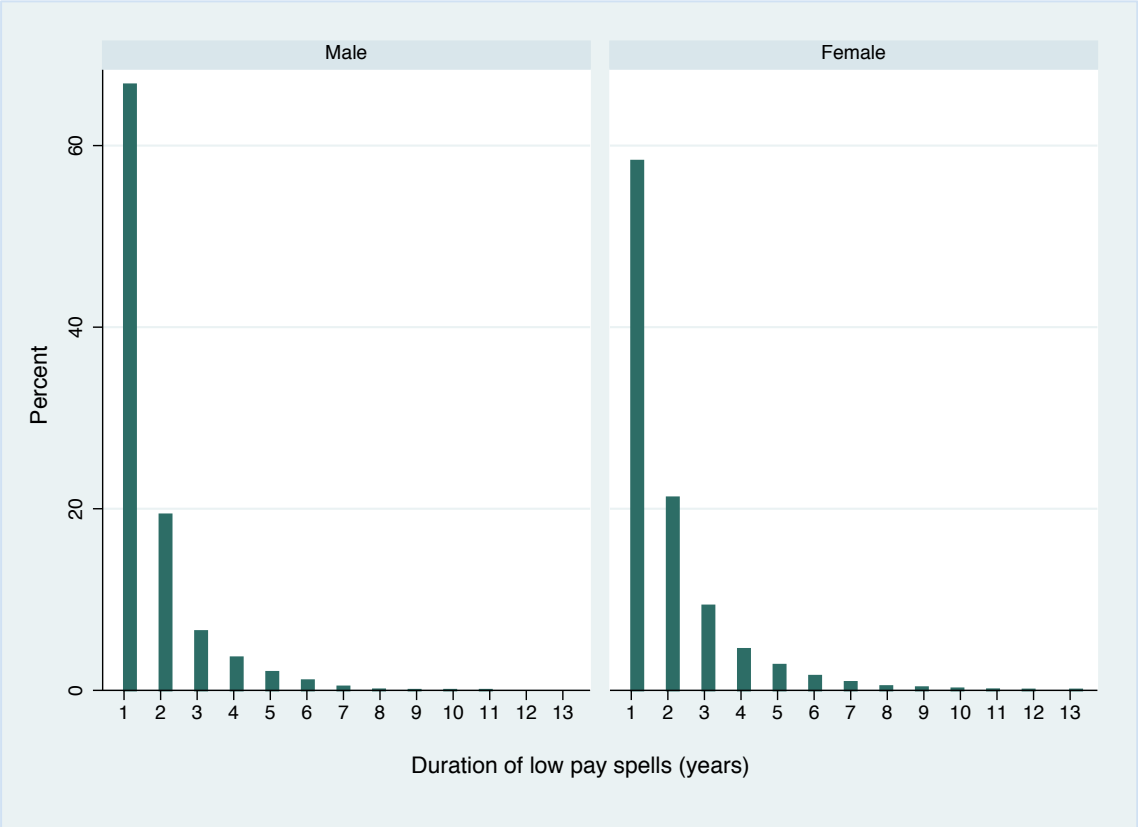
In order to distinguish low remuneration from low work intensity, this article focuses on hourly pay (also referred to as wages) rather than annual or monthly earnings. Hourly pay is calculated based on information about gross monthly earnings and working hours (including paid overtime). To avoid bias from a temporary change in circumstances, calculations are based on usual earnings and working hours[19]. Overtime payments are included because for some workers these have a substantial impact on take-home pay. Calculations include earnings data imputed by the Institute for Social and Economic Research (Knies, 2017), resulting in a low level of missing data. A relative approach to measuring low pay is taken, recognising that earning substantially below the prevailing societal standard is likely to have serious consequences. The definition of low pay is tied to the average wage, with low pay threshold set at two-thirds of the median hourly wage for employees in each wave. This measure of low pay aligns with previous literature, as well as official statistics produced by the European Commission and the OECD.

The majority of sample members (i.e. low-paid employees) experience just one spell of low-paid employment, but some experience multiple spells (up to five, as shown in Table BII in Appendix B). The distribution of low pay spells for male and female employees is shown in Figure III-I (also see Table BIII in Appendix B). The majority of low pay spells are short in duration: for women, 57.6 per cent of low pay spells last for only one year; for men, the proportion is 67.0 per cent. For

[19] The sample includes employees taking parental leave, who may be earning below their usual pay level. It is likely that these respondents would offer their pre-parental leave earnings as their 'usual' earnings, but this cannot be established for certain. In any case, this is unlikely to represent a source of bias due to small numbers (parental leave accounts for 0.3 per cent of all person-year observations for employees).

both men and women, the median spell duration is one year, although the mean is slightly higher (1.9 years for women and 1.6 years for men). Although the majority of low pay spells are short in duration, the longest recorded spell is 13 years for women and 11 years for men. This strengthens the case for investigating the determinants of spell duration i.e. to better understand the factors influencing who falls into the majority for whom low pay spells are short in duration and who falls into the minority for whom they are enduring.

Figure III-I. Distribution of low pay spell durations for male and female employees in the UK 2001-2017; percentages



Note: Data source: USoc/BHPS 2001-2017; this graph represents the duration of low pay spells, not the duration of time spent low paid by an individual.

Part-time workers are here identified as those who work fewer than 30 hours per week, a measure recommended by the OECD (van Bastelaer et al., 1997). This differs from the approach recommended by Eurostat, which is to rely on the respondent's own assessment of their employment situation. This approach is not possible using the USoc/BHPS data set, which does not contain information about self-described full-time/part-time status. Some have questioned the usefulness of a dichotomy distinguishing between full-time and part-time workers on the grounds that workers in marginal part-time jobs (i.e. jobs of only a few hours per week) may be particularly disadvantaged (Warren and Walters, 1998), including in relation to pay (McGinnity and McManus, 2007). Sensitivity analysis shows that all things being equal, workers in marginal part-time jobs (1-14 hours per week) exit low pay at lower rates than those in regular part-time jobs (15-29 hours per week), but this effect is only statistically significant for women (see Table BVI in Appendix B). The second focal explanatory variable distinguishes between full-time and part-time employees (defined as above) whose status remains consistent in the following year (i.e. the year in which they do or do not exit low pay), and those who transition to the other category.

Table III-I displays descriptive statistics for the two focal explanatory variables in the main analysis. For both men and women, the proportion of person-year observations classed as part time rather than full time is considerably higher for low-paid employees than for employees in general. A clear majority of full-time and part-time employees remain in the same category in the following year. Full-time/part-time transitions are slightly more common for low-paid employees than for employees in general, and for women compared to men.

Table III-I. Distribution of dependent variables (full-time/part-time employment and transitions between full-time/part-time employment) across person-year observations for male and female employees in the UK 2001-2017; percentages

		Female employees		*Male employees*	
		All	*Low paid*	*All*	*Low paid*
1	Part time	39.0	57.3	7.3	20.5
	Full time	61.0	42.7	92.7	79.5
2	Part time, remaining part time	35.1	52.2	5.6	17.0
	Part time, transitioning to full time	3.9	5.1	1.7	3.5
	Full time, remaining full time	57.4	38.2	91.1	76.4
	Full time, transitioning to part time	3.6	4.6	1.7	3.5
Observations (person-years)		46,302	11,325	41,924	5,209

Notes: Data source: USoc/BHPS 2001-2017; sample restricted to employees / low paid employees

Methodology

Low pay spells are modelled using a discrete-time event history[20] approach. Two separate models are specified: Model 1 estimates the effect of working part time relative to full time, and Model 2 disaggregates full-time and part-time workers into those who remain in their current state and those who transition to the other state. The discrete-time approach treats each time unit in which the individual is 'at risk' as a separate observation. The data set is comprised of person-year observations for low-paid employees at time t who may transition to higher-paid employment at time t+1. The analysis takes the form of a binary response model, where the probability of escaping low pay at each observation is modelled as a

[20] Also known as survival analysis and hazard modelling

function of episode duration and covariates (Allison, 1982; Jenkins, 2008). The logistic and complementary log-log link functions are the most commonly used models. The complementary log-log model is used here because it offers the advantage that exponentiated coefficients can be interpreted as hazard ratios (Jenkins, 2008). The discrete-time hazard rate is the conditional probability that progression out of low pay will occur, given that it has not already occurred. Hazard ratios displayed in the regression tables compare the hazard rate for two groups, for instance the probability of progressing out of low pay for part-time workers compared to full-time workers.

Given the existence of a 'low pay no pay' cycle (Stewart and Swaffield, 1999), it is important not to conflate exiting employment (to unemployment, inactivity or self-employment) with progression out of low pay. This is particularly important given the subject matter at hand: previous research shows that part-time workers are more likely than full-time workers to transition out of the labour market (Phimister and Theodossiou, 2009). As a result, part-time workers experience on average shorter low pay spells than full-time workers, despite being less likely to progress on to higher wages (Phimister and Theodossiou, 2009). Previous researchers have modelled multiple low pay exits as competing risks using a multinomial logit model (Pavlopoulos and Fouarge, 2010; Phimister and Theodossiou, 2009; Silva and Lima, 2016). In cases in which substantive interest lies in a particular event type, as is the case here, it is possible to apply a binary response model, treating other event types as censored (Allison, 1982). For the sake of simplicity the latter approach is followed, modelling the probability of progressing to higher wages relative to remaining on a low wage.

Event history analysis offers the advantage of being able to incorporate information from right-censored cases - i.e. spells for which the end is not observed (Allison, 1982). Left-censored cases present more of a challenge, and are omitted from the analysis. Another advantage of the event history approach is the ability to model duration dependence (Longhi and Nandi, 2015) - i.e. estimating whether the duration of time spent in a state or condition itself influences the probability of transition. Previous studies highlight duration dependence in low pay, where the probability of progressing to higher wages decreases with the length of the spell (Cappellari and Jenkins, 2008; Clark and Kanellopoulos, 2013; Stewart, 2007; Stewart and Swaffield, 1999). The effect of duration may not be strictly linear, and to allow for this spell duration is modelled as a piecewise constant baseline (1 year, 2-3 years, 4-5 years, 6-7 years and 8+ years).

In addition to spell duration, the regression models control for personal and job characteristics associated with progression out of low pay[21]. Control variables relating to the individual worker are age, education and job tenure. Women are often thought to face challenges to pay progression associated with household circumstances, in particular caring responsibilities, and therefore the control variables are added to capture household composition and the number of dependent children in the household[22]. Job and firm level controls are social

[21] Other characteristics such as trade union membership, urban/rural location and health/disability status are associated with progression out of low pay in previous studies but are not available (or cannot be measured in a consistent way) in the USoc/BHPS data set.
[22] The number of dependent children (natural children, adopted children and step children) in the household aged under 16.

class, contract type (temporary or permanent), industry of work, employer size[23], sector (public or private) and the share of part-time workers in the occupation. Social class is measured according to the European Socio-economic Classification (ESeC)[24] coding scheme (Harrison and Rose, 2006), which is based on the approach developed by John Goldthorpe and colleagues (Erikson et al., 1979; Goldthorpe, 2007). The Goldthorpe approach uses occupational groups as a proxy for social relations in the labour market thought to be decisive in shaping the opportunities and life chances of individuals. From a social class perspective, low pay is expected to be primarily associated with employment conditions governed by 'the labour contract', a basic exchange of money for time, characteristic of occupations in which skill requirements are rudimentary and generic, and output easily monitored. Arrangements of this kind predominate in routine and manual (working class) occupations, and to some extent in intermediate occupations; they are rare in professional and managerial occupations (the salariat). Grounding social class in occupational groups is not without its critics (Crompton, 2010), but the Goldthorpe approach is widely used and well validated by prior research (Rose and Harrison, 2009; Rose and Pevalin, 2003).

[23] Based on the number of employees at the individual's workplace; does not include employees working for the same employer at a different site.

[24] Given that the analysis focuses on the UK, a more obvious choice might be the National Statistics Socio-economic Classification (NS-SEC), a social class schema used elsewhere in this thesis. ESeC and NS-SEC share a common conceptual basis, but NS-SEC is specific to the UK. The rationale for using ESeC was that missing data was higher for SOC coding (on which NS-SEC is based) than for ISCO coding (on which ESeC is based). Since there is no reason to expect controlling for ESeC vs. NS-SEC to produce different results (the two are very similar), ESeC was the preferred choice.

When modelling the effect of transitions between full-time and part-time employment, additional covariates are included to reflect job and occupational change. Existing evidence shows that workers who change jobs are more likely to experience pay progression than those who stay in the same job (Connolly and Gregory, 2008). This may be because changing employers improves prospects for escaping low pay, or because changing employers is often associated with upward occupational mobility (i.e. moving to more skilled or prestigious job). Importantly for the purposes here, it is relatively common for transitions between full-time and part-time employment to be associated with occupational mobility (Connolly and Gregory, 2008; Dex et al., 2008; Dex and Bukodi, 2012). To adjust for these factors, Model 2 includes control variables identifying employer and occupational change. These variables are only available in the later waves of the data set, and Model 2 is run on a reduced sample of nine waves. A dummy variable distinguishes between those who have a new employer in the following year (i.e. the year in which they do or do not escape low pay) and those who remain with the same employer. Occupational change is measured according to the individual's occupational group (ISCO-88[25] coded to 3 digits) in each year, disaggregated into no change, upward mobility and downward mobility (reflecting whether the new occupation is higher or lower skilled than the previous occupation).

In addition to controlling for measured covariates, both Model 1 and Model 2 take account of unobserved heterogeneity (or 'frailty'). Some low-paid workers will have a higher propensity to progress on to higher wages than others, and the reasons for this variability may not be fully captured by covariates. Taking

[25] The International Standard Classification of Occupations (ISCO).

unobserved heterogeneity into account is particularly important because the data set contains repeated spells (i.e. more than one low pay spell for the same individual), and there is likely to be a correlation between spell durations for the same individual. To adjust for individual-specific, time-invariant unobservable characteristics the model includes a random component, which is assumed to be normally distributed. The presence of unobserved heterogeneity is assessed by performing a likelihood ratio test for the random effect (rho). If the rho term is not statistically significant from zero, there is no evidence that the time-invariant unobserved characteristics of individuals influence the hazard rate.

Results and discussion

The first research question asks how working part time rather than full time influences the probability of progressing out of low pay for men and women in the UK. Hazard ratios for Model 1, shown in Table III-II, show that all things being equal, both male and female part-time workers have a lower probability compared to their full time counterparts of escaping low pay (OR = 0.66, $p < 0.001$; OR = 0.83, $p < 0.01$, respectively). These odds reflect the difference between (male/female) full-time and part-time workers holding constant a range of measured characteristics, as well as time-invariant unobserved heterogeneity. In answer to the third research question, which relates to how the relationship between working part time and progression out of low pay differs for men and women, the hazard ratio associated with working part time is larger for men than for women. Supplementary analysis (see Table BV in Appendix B) assesses whether the effect of working part time relative to full time on the likelihood of progression out of low pay is mediated by gender. The results show that there is

no statistically significant interaction between gender and working part time, suggesting that gender differences are relatively modest.

Table III-II. Model 1 results (full time vs. part time): hazard ratios from a discrete-time model estimating the probability of progressing out of low pay for male and female employees in the UK 2001-2017

		Female employees	*Male employees*
Work status	Part time (ref: full time)	0.83 (0.05)**	0.66 (0.07)***
Age	16-24 (ref)		
	25-34	1.24 (0.11)*	1.37 (0.15)**
	35-44	1.35 (0.12)***	1.60 (0.20)***
	45-54	1.17 (0.10)*	1.51 (0.19)**
	55+	1.02 (0.11)	1.06 (0.14)
Highest educational qualification	Degree (ref)		
	Higher education	0.96 (0.12)	0.91 (0.18)
	GCE/A-level	0.83 (0.08)	1.08 (0.16)
	GCSE grades A*-C	0.78 (0.08)*	0.91 (0.13)
	Other	0.67 (0.08)***	0.97 (0.16)
	None	0.65 (0.08)***	0.81 (0.133)
Household type	Single adult (ref)		
	Lone parent household	0.88 (0.11)	0.76 (0.14)
	Couple, no children	1.02 (0.11)	1.13 (0.15)
	Couple with children	1.00 (0.11)	1.05 (0.14)
	Other household	0.76 (0.09)*	0.96 (0.13)
Number of children in the household		0.96 (0.03)	1.02 (0.05)
Job tenure (in years)		0.99 (0.01)*	1.00 (0.01)
Social class	Salariat (ref)		
	Intermediate	0.93 (0.08)	1.01 (0.13)
	Working class	0.74 (0.06)***	0.80 (0.09)
Share part time in occupation		0.99 (0.00)***	1.00 (0.00)
Contract	Temporary (ref: permanent)	0.83 (0.09)	0.92 (0.12)
Sector	Private (ref: public)	0.67 (0.04)***	0.73 (0.09)*
Industry	Manufacturing, construction (ref)		
	Agriculture, energy water	1.21 (0.34)	1.08 (0.21)
	Hotels and restaurants	0.77 (0.08)*	0.81 (0.09)*
	Transport and communication	0.98 (0.17)	1.08 (0.15)
	Banking, finance insurance	1.19 (0.15)	1.02 (0.15)
	Education, health, administration	0.93 (0.10)	0.85 (0.12)
Size	25+ employees (ref: <25)	1.16 (0.06)**	1.33 (0.10)***

Duration of low pay spell	1 year (ref)		
	2-3 years	0.78 (0.04)***	0.80 (0.07)*
	4-5 years	0.72 (0.07)**	0.60 (0.10)**
	6-7 years	0.54 (0.08)***	0.44 (0.14)*
	8+ years	0.27 (0.07)***	0.11 (0.11)*
Constant		0.99 (0.19)	0.51 (0.12)**
Rho		0.07 (0.03)*	0.10 (0.05)*
Log likelihood		-4115.7318	-1919.8522
Observations (person-years)		8,091	3,361
Observations (individuals)		2,697	1,495

Notes: Data source: USoc/BHPS 2001-2017; sample restricted to employees; hazard ratios (exponentiated coefficients) with standard error in parenthesis; significance testing: * p <0.05; ** p <0.01; *** p <0.001.

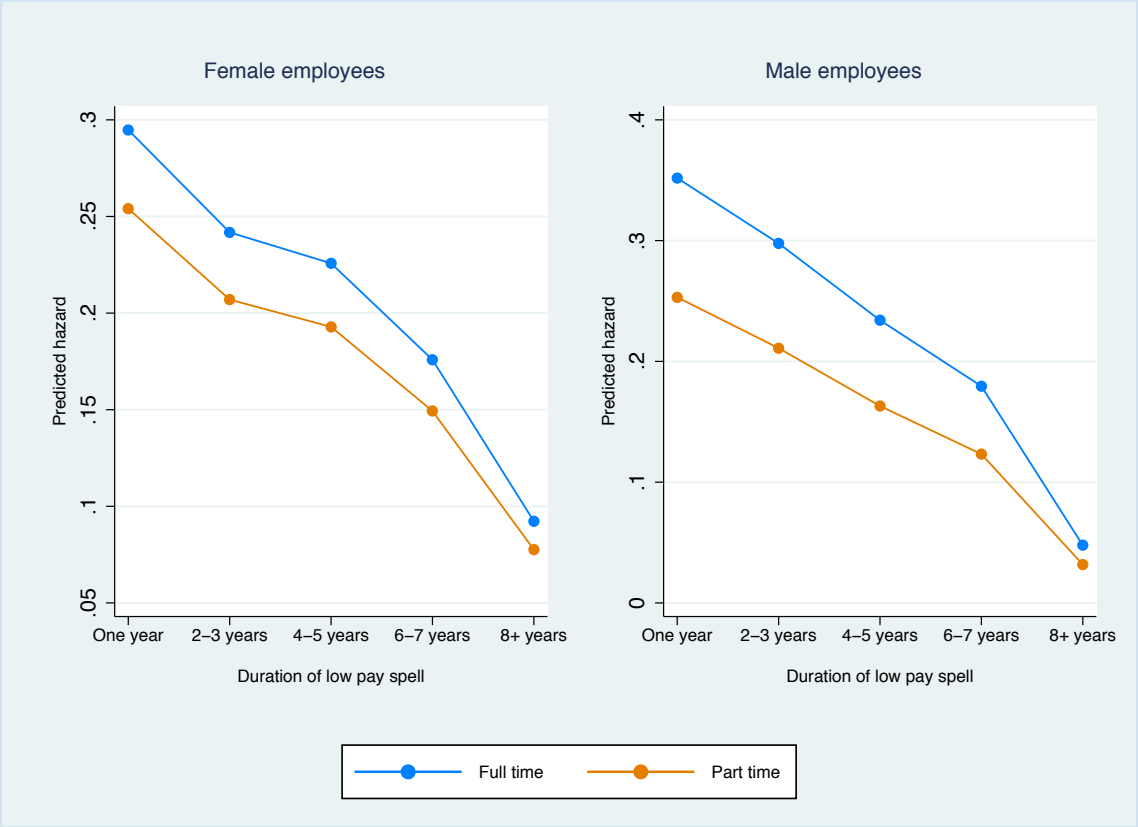
Other results in Table III-II show that for women, the probability of escaping low pay varies according to age, education, job tenure, social class, sector, and industry. Women with no formal qualifications are far less likely than those educated to degree level to progress out of low pay (OR = 0.65, $p < 0.001$), as are members of the working class compared to the salariat (OR = 0.74, $p < 0.001$). Women are less likely to progress out of low pay in the private sector compared to the public sector (OR = 0.67, $p < 0.001$), and more likely to progress out of low pay if they work for a large employer compared to a small employer (OR = 1.16, $p < 0.01$). For men, fewer factors are statistically significant in predicting progression out of low pay. Aside from sector, industry and employer size, age is an important factor for men. In particular, men aged 35-44 and 45-55 are far more likely than those aged 16-24 to exit low pay (OR = 1.60, $p < 0.001$; OR = 1.51, $p < 0.01$, respectively). For both men and women, exiting low pay is relatively uncommon towards the end of working life, with no statistically significant difference between workers aged 55 and over and those aged 16-24. For both men and women, the rho term is statistically significant (OR = 0.07, $p < 0.05$; OR =

0.10, $p < 0.05$, respectively), providing evidence of individual-level unobserved heterogeneity affecting progression out of low pay.

For both men and women, the odds of exiting low pay are highest in the first year of the spell, and decline thereafter. The odds of progressing out of low pay are, for instance, much lower in the eighth (or more) year of the spell compared to the first year (OR = 0.11, $p < 0.05$ for men; OR = 0.27, $p < 0.001$ for women). This suggests that there is a scarring effect associated with low-paid employment, whereby spending several years on a low wage decreases the chance of progressing to higher wages. The effect of working part time relative to full time also appears to vary according to spell duration. Predicted hazard rates for full-time and part-time employees at different spell durations are shown graphically in Figure III-II. At all spell durations, the odds of progressing out of low pay are higher for full-time workers compared to part-time workers. For both men and women, including an interaction between working part time and spell duration does not show a statistically significant association (see Table BIV in Appendix B), indicating that hazard rates can be calculated based on the main effects model. However, Figure III-II shows that, particularly for men, the gap between full-time and part-time workers is largest for spells of only one year, and declines with the duration of the low pay spell. There is, in short, some indication that the main disadvantage associated with working part time rather than full time is that it decreases the likelihood of a very short spell of low pay, or a quick exit. For workers who have been low paid for a period of several years, the distinction between full-time and part-time employment is less important. This may be because workers who have been low paid for several years are a distinctive group, regardless of whether they work full time or part time. This

distinctiveness may relate to unobserved worker or job characteristics, or simply the scarring effect associated with several years of low-paid employment.

Figure III-II. Predicted hazard of progression out of low pay according to spell duration for male and female employees working full time and part time in the UK 2001-2017



Notes: Data source: USoc/BHPS 2001-2017; compares the likelihood of exiting low pay (for higher pay) for male/female employees working full time and part time according to the length of time they have been low paid; predicted hazards calculated based on the results of Model 1 shown in Table II-III.

The final research question concerns how transitioning between full-time and part-time employment affects the probability of progressing out of low pay for male and female employees. This is assessed in a second regression model, Model 2, selected results for which are shown in Table III-III. Compared to the

reference group (full-time workers who remain working full time), part-time workers who remain working part time have lower odds of progressing out of low pay (OR = 0.67, $p < 0.01$ for men; OR = 0.80, $p < 0.01$ for women). In contrast, part-time workers who transition to full-time employment have similar odds of escaping to low pay to the reference group (OR = 1.01, $p > 0.05$ for men; OR = 0.93, $p > 0.05$ for women). Men transitioning from full-time to part-time employment have lower odds of escaping low pay than full-time workers who remain working full time (OR = 0.74, $p > 0.05$), but the effect is non-significant. For women the odds are slightly higher for full-time workers transitioning to part-time employment[26], but the difference is not statistically significant (OR = 1.14, $p > 0.05$). Model 2 also controls for whether the individual changes employers and/or occupations. For both men and women changing employers does not affect the odds of progressing out of low pay, but changing occupations does. Workers who move to a higher-skilled occupation are considerably more likely to escape low pay than those who remain in the same occupation (OR = 1.39, $p < 0.01$ for men; OR = 1.52, $p < 0.001$ for women).

[26] Although it is not statistically significant, the positive direction of this effect for women (OR = 1.14, $p > 0.05$) is somewhat surprising given the association between part-time employment and low pay. Given that working part time relative to full time decreases the odds of exiting low pay, the expectation would be for switching from full-time to part-time employment to reduce opportunities for progression out of low pay. Since the effect is small and non-significant, this result may simply reflect a quirk of the data. However, there may also be other factors at play. One possible explanation, for instance, is that women switching from full-time to part-time employment may combine this with a move from the private to the public sector, which, as shown in Table III-II, is associated with improved prospects for progression out of low pay.

Table III-III. Selected Model 2 results (full-time/part-time transitions): hazard ratios from a discrete-time model estimating the probability of progressing out of low pay for male and female employees in the UK 2004-2017

		Female employees	*Male employees*
Status change	Full time - full time (ref)		
	Part time - part time	0.80 (0.06)**	0.67 (0.10)**
	Part time - full time	0.93 (0.12)	1.01 (0.21)
	Full time - part time	1.14 (0.14)	0.74 (0.16)
Employer change	Change (ref: no change)	1.10 (0.11)	1.01 (0.14)
Occupation change	No change (ref)		
	Move to higher-skilled	1.52 (0.15)***	1.39 (0.18)**
	Move to lower-skilled	1.12 (0.11)	1.00 (0.13)
Constant		1.37 (0.33)	0.61 (0.18)
Rho		0.07 (0.04)*	0.08 (0.07)
Log likelihood		-2483.0437	-1124.0195
Observations (person-years)		4,536	1,855
Observations (individuals)		1,750	913

Notes: Data source: USoc/BHPS 2004-2017; sample restricted to employees; hazard ratios (exponentiated coefficients) with standard error in parenthesis; significance testing: * p <0.05; ** p <0.01; *** p <0.001.

The negative effect of working part time relative to full time on the odds of progressing out of low pay highlighted in Table III-II may, in part, reflect the profile of people who select into part-time work. Preference theory (Hakim, 2002) argues that part-time workers are fundamentally more 'home-centred' than full-time workers, and therefore have a preference for less demanding roles. Perhaps part-time workers simply have a preference for, or at least are more accepting of, low-waged jobs since this allows them to spend more time on non-market activities such as care and domestic work? Part-time workers may progress out of low pay less often than full time workers simply because they are less motivated to do so. If we accept the idea of fundamental dispositional differences of this

kind, these would presumably be fairly stable characteristics over time, i.e. they would follow individuals between jobs, including transitions between full-time and part-time employment. However, results in Table III-III show that part-time workers experience the same odds of escaping low pay to full-time workers if they transition to full-time employment. This suggests that fixed and stable preferences are unlikely to be the main factor driving lower rates of progression out of low pay for part-time workers. One of the main criticisms of preference theory is that it treats preferences as fixed and static, when in reality they are moulded by circumstances (Fagan, 2001). It is possible that preferences are important, but that rather reflecting fixed characteristics of individuals, they are liable to change in response to external circumstances. An experience such as job loss for a spouse or partner, for instance, may prompt a part-time worker to switch to full-time employment, but at the same time increase their motivation to secure a higher hourly wage.

In assessing these relationships, the aim is to shed light on whether part-time employment in the UK functions as a stepping stone, or rather whether it often represents a dead-end for low-waged workers. There is insufficient evidence here to frame part-time employment as a dead-end; clearly, some workers do progress out of low pay whilst working part time. However, all things being equal, low-paid workers who work part time rather than full time are less likely progress on to higher earnings. For some workers, switching to full-time employment appears to be the 'stepping stone' that is needed to progress out of low pay. Certainly, switching to full-time employment offers superior opportunities for progression out of low pay than remaining part time, even after adjusting for employer and occupational change. A key point of concern therefore is people

who work part time for long spells of time. Supplementary analysis examines how personal characteristics affect the duration of part-time employment spells, using the same data set and methodological approach used in the main analysis (see Table BIX and Figure BI in Appendix B). Workers found to be most at risk of long spells of part-time employment are lower-skilled women who have dependent children in the household.

The results in this article have drawn attention to a lack of progression opportunities for low-paid part-time workers in the UK. Previous research has drawn attention to a lack of progression opportunities for low-paid workers in the UK more generally (Brewer and Finch, 2018; Centre for Social Justice, 2018; D'Arcy et al., 2014; D'Arcy and Finch, 2017; European Commission, 2018). In order to promote progression opportunities for low-skilled workers, the European Commission have called on the UK government to shift from a 'work first' approach, towards prioritising skills development and better job matching (European Commission, 2018). There may also be scope to stimulate in-work progression through the conditionality element of Universal Credit (UC)[27] (Brewer and Finch, 2018; European Commission, 2018; Taylor et al., 2017), although this depends on the extent to which employers are willing to offer higher-paid opportunities (European Commission, 2018).

How, though, to improve progression opportunities for low-paid part-time workers specifically? One approach might be to focus on areas of the labour market where progression out of low pay is more difficult and part-time workers

[27] Depending on earnings, as well as personal and household circumstances, workers may be required to seek longer working hours and/or better-paid job opportunities under UC. If they do not meet requirements such as job-search activities, these workers will face sanctions.

are over-represented. The Resolution Foundation and the Joseph Rowntree Foundation have both called on the government to work with employers, particularly in sectors such as retail and hospitality, to develop progression pathways to address this issue (D'Arcy et al., 2014; Ussher, 2016). The organisation Timewise has recently launched a pilot scheme, *Retail Pioneers*, aimed at enabling career progression for part-time workers in the retail sector (Timewise, 2017). The organisation will start by working with five major retailers[28] to identify constraints to working part time in managerial roles, and to help redesign job roles to enable progress from the shop floor into management. Although the pilot has not yet been evaluated, initiatives of this kind could go some way in reducing disparities between full-time and part-time workers in progression out of low pay.

Planned changes to the National Minimum Wage (NMW) may also affect opportunities to progress out of low-paid work. Introduced in 2016, the UK National Living Wage (NLW) will see the minimum wage rise to 60 per cent of the median wage for workers aged 25 and over by 2020 (Low Pay Commission, 2017). Although the NLW is likely to reduce the overall incidence of low pay, it could make pay progression more difficult since a large proportion of workers will be earning at or just above the statutory minimum in a context in which employers are adapting to a hike in wage costs (Brewer and Finch, 2018; D'Arcy et al., 2014; Rubery, 2017). It is unclear therefore what effect the NLW will have on the part-time gap in progression out of low pay. If it reduces the incidence of low pay, the NLW is likely to disproportionately benefit part-time workers, bringing their earnings more in line with full-time workers. However, the end

[28] B&Q, COOK, Dixons Carphone, Tesco and The John Lewis Partnership.

result may be a large number of part-time workers earning at or just above the statutory minimum wage. Clearly, there is a need to understand the earnings trajectories of part-time workers beyond whether or not they cross the low pay threshold. Research from the Resolution Foundation shows that workers in the UK often fall back into low pay after progressing on to higher pay (D'Arcy et al., 2014; D'Arcy and Finch, 2017). Long-term earnings trajectories fall outside the scope of the current article, but supplementary analysis (see Tables BVII and BVIII in Appendix B) shows that the negative effect of working part time relative to full time is more pronounced for 'sustained' low pay exits (defined as earning a higher wage for three consecutive years) than for low pay exits in general. Further research is needed to evaluate the effect of the NLW on the part-time gap in progression out of low pay, and the gap in access to higher earnings more generally.

Conclusion

This article examines the relationship between working part time relative to full time and progression out of low pay for male and female employees in the UK. Holding constant a range of measured covariates as well as spell duration and unobserved individual-level heterogeneity, working part time relative to full time decreases the likelihood of progressing out of low pay for both men and women. Prospects for escaping low pay appear to be improved by switching from part-time to full-time employment, even adjusting for employer and occupational change. For some workers, switching to full-time employment appears to be the 'stepping stone' that is needed to progress out of low pay. There is therefore a particular concern with people who work part time for long

periods of time. Workers in this group are more often women than men, and women with dependent children in particular. The results draw attention to the need to focus on part-time workers in particular when it comes to initiatives to enable progression out of low pay, and the discussion section reflects on the potential for sector-specific initiatives to improve prospects for low-paid part-time workers in the UK.

IV. Paper #3: *Part-time employment and the gender gap in low pay for UK employees: what changed over the period 1996 – 2016?*

Abstract

Using data from the Labour Force Survey (LFS), this article assesses the contribution of part-time employment to the gender gap in low pay for UK employees over the period 1996 to 2016. Rather than looking at the gender gap in average hourly wages, the dominant approach in the literature, this article focuses on the lower end of the earnings distribution. The outcome of interest is the relative probability of being low paid for female and male employees, with low pay defined as earning below two-thirds of the median hourly wage. The article tracks the evolution of the gender gap in low pay over the reference period, and examines how far the gender gap in each year can be attributed to differences between men and women in part-time employment. The results show that the gender gap in low pay declined over the period 1996 to 2016, but in recent years has plateaued or even widened. There has been a sustained decline in the importance of part-time employment as a contributing factor to the gender gap in low pay. This appears to be largely due to the fact that the link between part-time employment and low pay has become weaker over time. Shifts in the gender composition of the part-time workforce are found to be less important. None the less, part-time work continues to play a crucial role in shaping gender inequality in low earnings for UK employees. The continued gender divide in part-time employment offsets advancements made by women elsewhere, stalling progress towards gender parity in low earnings.

Introduction

Despite profound change in patterns of female labour force participation and rapid advancements in human capital attainment, gender inequality in the labour market persists. This article focuses on one aspect of this inequality: the gender

gap in low pay (the relative risk of being low paid for women and men in employment). It examines change over time (1996-2016) in the size and determinants of the gender gap in low pay for UK employees. Building on recent evidence from the US and the UK highlighting the importance of working hours for gender inequality in labour market outcomes (Cha and Weeden, 2014; Dias et al., 2018), the analysis focuses on part-time employment. The results show that gendered patterns of full-time and part-time employment are of central importance in understanding the gender gap in low pay for UK employees. In all years analysed, part-time employment is the most important observable factor contributing to the gender gap in low pay. None the less, there has been a sustained decline in the contribution of part-time employment to the gender gap in low pay. This appears to be largely due to the fact that the link between part-time employment and low pay has become weaker over time. Shifts in the gender composition of the part-time workforce are found to be fairly marginal, and less important as a determinant of this trend.

Background: gender inequality and low pay

An extensive literature examines inequality in labour market outcomes between men and women (for an overview: Gregory, 2012). Gender inequality in the labour market is most commonly approached in terms of the gap in average hourly earnings between men and women (the gender pay gap). This measure has received a large amount of academic and political attention. The UK government recently introduced mandatory gender pay gap reporting for organisations with 250 employees or more, requiring them to report the gap in average hourly wages between male and female staff (Equality Act, 2010). In

addition to average differences between men and women in in the labour market, it is important to understand the extent to which women are under-represented at the highest levels of management ('glass ceilings') and over-represented in low paid and low status jobs ('sticky floors'). In the UK, the gender pay gap is fairly consistent across the wage distribution (Arulampalam et al., 2007). This article focuses on gender differences in the risk of low pay (the gender gap in low pay) on the grounds that this gender differential is likely to have particularly severe consequences. Earning a low wage is linked to an elevated risk of in-work poverty, particularly if the individual is the sole or primary earner in their household (Maître et al., 2012; Marx and Nolan, 2012), and within the household may result in financial dependency.

It is well established that women are over-represented at the lower end of the wage distribution. The Low Pay Commission estimate that three out of five UK employees paid the statutory minimum wage are women (Low Pay Commission, 2017). Less well understood is why women are over-represented among low-wage earners. A large number of studies explore the determinants of the gender gap in average wages (Chevalier, 2007; see for instance: Dias et al., 2018; Harkness, 1996; OECD, 2012), but these findings do not necessarily extend to low wage earners. Asplund and Persson (2000) examine the extent to which differences in characteristics account for the gender gap in low pay in several European countries, but their analysis is restricted to employees working full time. By the authors' own admission, this is a selective sample and one that is likely to understate the scale of the issue. This article aims to advance the literature by examining the determinants of the gender gap in low pay for UK

employees. In doing so, it focuses on one aspect in particular: gender differences in full-time and part-time employment.

Across Europe, 'the assumptions of the male-breadwinner family are being supplanted by a hegemonic model in which gender is differentiated by time rather than participation and nonparticipation in paid labor' (Mutari and Figart, 2001: 38). It is increasingly rare for women in the UK to withdraw from the labour market entirely (Dex et al., 2008; Dias et al., 2018), as they might have done in previous generations, but women remain far more likely than men to work part time (Dias et al., 2018). In the UK, women are also less likely than men to work long hours (Kodz et al., 2003). These differences in labour market behaviour, closely linked to the gendered division or market and non-market work, are crucial to understanding gender inequality in contemporary labour markets. Working hours matter, not just because part-time workers will receive lower monthly or annual earnings than full-time workers due to shorter working hours, but because all things being equal part-time workers earn less per hour than full-time workers (Neuburger et al., 2011; Petrongolo and Manning, 2008) and are more likely to be low paid, defined as earning below two-thirds of the median hourly wage (Nightingale, 2018a).

Differences in full-time and part-time employment are known to contribute to gender inequality in the labour market. Across OECD countries, the gender pay gap is considerably larger, in some cases doubling or tripling, if all workers are considered, compared to focusing on full-time workers (OECD, 2012). In the UK, analysis from the Institute for Fiscal Studies (IFS) estimates that differences in working hours account for up to two-thirds of the gender pay gap (Dias et al.,

2018). A recent report from the Women and Equalities Select Committee highlights career penalties associated with part-time employment as a major contributing factor to the gender pay gap (House of Commons, 2016). Contributing to this literature, this article estimates the contribution of part-time employment to the gender gap in low pay. This focus is motivated by awareness that in the UK part-time employment is a classed as well as gendered phenomenon (Warren, 2003), disproportionately undertaken by women from lower socio-economic groups. Differences in full-time and part-time employment may therefore be particularly important in accounting for gender inequality at the lower end of the earnings distribution.

There are a number of reasons for exploring over-time change in the contribution of part-time employment to the gender gap in low wages. The proportion of men in the UK who work part time rather than full time has grown in recent years (Gardiner and Gregg, 2017), partly in response to the 2008/2009 economic crisis (Grimshaw and Rafferty, 2011). Analysis from the IFS highlights growth in the number of low-paid part-time jobs for men (Belfield et al., 2017). In short, the part-time workforce in the UK may have become less female-dominated over time. Changes to national policy may also have shaped the relationship between part-time employment and low wages. Following the EU Directive on Part-Time Work (1997), the UK government introduced new legislation in July 2001 mandating equal treatment for employees working full time and part time. Further legislation was introduced in April 2003 to promote flexible working opportunities, including part-time work. Initially restricted to parents, the right to request a change in working hours was expanded in 2014 to apply to all employees with 26 weeks continuous service. These interventions may have

helped to widen access to good quality part-time jobs (Fagan et al., 2013), reducing the number of part-time workers who are low paid. In light of these developments, this article examines whether there is evidence that part-time employment is becoming less important as a determinant of the gender gap in low pay.

The first aim of this article is to describe the evolution of the gender gap in low pay over the last twenty years. The first research question asks: how did the gender gap in low pay for UK employees change over the period 1996-2016? The second research question concerns the contribution of part-time employment to this differential: how has the contribution of part-time employment to the gender gap in low pay for UK employees changed over the period 1996- 2016? If the contribution of part-time employment to the gender gap in low pay has shifted over time, there are two possible explanations. The first is that the gender composition of the part-time workforce has shifted over time, becoming more or less female-dominated. The second is that the effect of working part time relative to full time on the risk of low pay has changed over time. The third research question seeks to disentangle these factors, asking: how far is this change attributable to (a) shifts in the gender composition of the part-time workforce and (b) change in the effect of working part time relative to full time on the risk of low pay?

Data and variables

Data come from the Labour Force Survey (LFS), the largest household panel survey in the UK. The LFS interviews around 41,000 randomly sampled UK households each quarter, with demographic and employment information

collected for all individuals in the household. The survey has a rotating panel design, and each household stays in the survey for five consecutive quarters. Questions about earnings are asked only at the first and final interviews for each household. Quarterly data is pooled to create a data set for each calendar year, but only observations relating to the final interview for each household are analysed, to avoid double counting. The analysis is conducted using 21 years of data, covering the period 1996 to 2016[29]. The sample is comprised of employees aged 16 and over[30], and data are weighted to obtain population estimates. Self-employed workers are not included in the analysis due to difficulties in estimating earnings from self-employment with precision. A small proportion of employees hold more than one job (~4 per cent), but in these instances the analysis relates to the main job only.

In order to distinguish low remuneration from low work intensity, the focus is on hourly pay (also referred to as wages) rather than annual or monthly earnings. Low pay is based on gross hourly wages and includes paid overtime, on the basis that this may have a substantial impact on take-home pay. Low pay is defined in relative terms, as a distributional measure tied to the average hourly wage. The relative approach is preferred to focusing on a fixed proportion of the wage

[29] Three calendar quarters are omitted due to missing data: quarter 1 (January – March) 1999, 2001 and 2004. This is because data for key variables are not available (atypical earnings in Q1 1999, earnings and social class in Q1 2001, education in Q1 2004).

[30] No upper age limit is imposed, but the number of respondents over retirement age is small (just 1.9% of the sample are aged 65 or over). Workers in this age group might be excluded on the basis that they are likely to receive a pension, with implications for the adequacy of earnings. However, individuals in this age group may well not find themselves with adequate income (indeed, this may well be why they are engaged in paid employment). Limiting the sample to individuals traditionally regarded as being of working age would also have gendered implications, since it is predominantly men who use part-time employment to transition out of the labour force.

distribution since the implications of being located in the bottom segment of the wage distribution will vary according to the overall degree of dispersion (Lucifora and Salverda, 2012). In setting a relative threshold, the median is selected over the mean because it is less sensitive to the presence of outliers in the distribution. Whilst somewhat arbitrary, setting the threshold at two-thirds of the median hourly wage aligns with the majority of previous studies in this area, including official statistics produced by Eurostat and the OECD. The dependent variable, low pay, is defined as earning below two-thirds of the median hourly wage for employees in each year. Due to the non-negligible proportion of missing data on hourly pay, multiple imputation is performed (Rubin, 2004), producing predicted values adjusted for variation across 20 imputed data sets. Sensitivity checks show that similar results are produced without this data imputation step (see Table CVI in Appendix C), indicating that it does not introduce bias into the results.

Male and female employees are identified according to how the respondent describes their gender[31]. To work part time rather than full time is a subjective concept, and the precise number of hours considered to constitute part-time work varies across sectors, occupations and individuals. Eurostat statistics are compiled based on whether the individual describes their own employment situation as part time rather than full time (Eurostat, 2016). This is the approach used here, on the basis that relative difference, rather than distance from an arbitrary cut-off, is likely to have the strongest implications for the individual's position in the prevailing earnings distribution. Sensitivity checks show that

[31] There is no option in the Labour Force Survey to indicate non-binary gender identity.

similar results are produced using an hours-based definition of working fewer than 30 hours per week (see Table CVI in Appendix C), an alternative measure recommended by the OECD (van Bastelaer et al., 1997). In short, the conclusions in this article appear to be robust regarding how part-time employment is defined and measured.

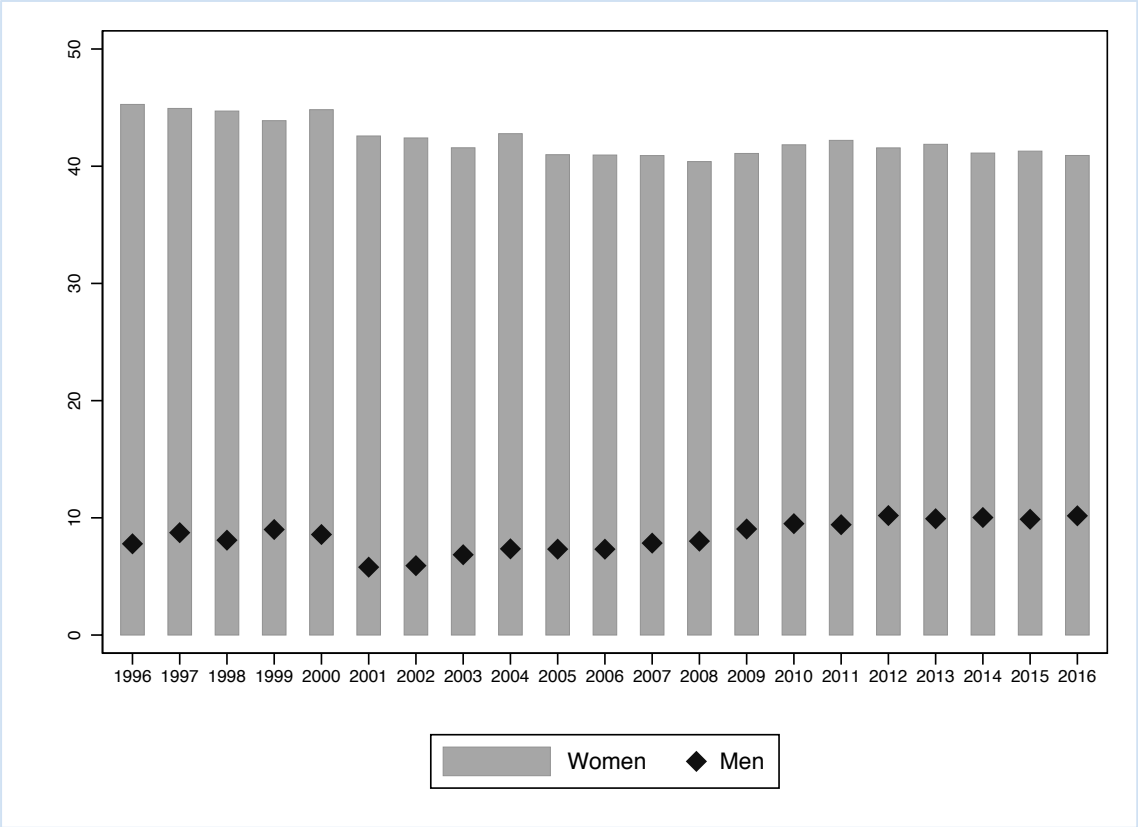
Table IV-I shows descriptive statistics relating to working hours and part-time employment for male and female employees in the UK pooled across all calendar years 1996 to 2016. The mean number of hours worked per week is 30.17 for women, compared to 40.52 for men. The standard deviation of hours worked per week is slightly higher for women (11.46) than for men (10.34). A far higher proportion of women (42.45) than men (8.31) identify as part time rather than full time. Comparing the proportion of men and women working part time rather than full time in each calendar year (Figure IV-I), there has been an increase in the proportion of men working part time over this period, whereas for women there has been a slight decline. Previous research draws attention to an increase in part-time employment for men associated with the economic crisis (Grimshaw and Rafferty, 2011), but this trend appears to have pre-dated the crisis years. Change is modest, however, and women remain far more likely than men to work part time. The analysis that follows seeks to understand how these patterns contribute to the gender gap in low pay.

Table IV-I. Descriptive statistics on working hours for male and female employees in the UK 1996-2016 based on a pooled sample of all calendar years

	Women	*Men*
Mean weekly working hours (standard deviation)	30.17 (11.46)	40.52 (10.34)
25th percentile, weekly working hours	21.00	37.00
50th percentile (median), weekly working hours	35.00	40.00
75th percentile, weekly working hours	38.00	45.00
Identify as part time rather than full time (%)	42.45	8.31
Observations	349,648	337,852

Notes: data source LFS 1996-2016; sample pooled across all years.

Figure IV-I. Proportion (%) of male and female employees in the UK who identify as part time rather than full time in each year 1996-2016



Note: data source LFS 1996-2016

Methodology

Research question one asks: how did the gender gap in low pay for UK employees change over the period 1996-2016? To answer this question, a separate logistic regression is fitted for each calendar year, estimating the effect of being female relative to male on the probability of being low paid. The first set of results relates to the raw or unadjusted gender gap i.e. a model in which gender is the only explanatory variable. The second model calculates the adjusted wage gap, holding constant other individual, household and job characteristics known to be predictive of low pay (Lucifora and Salverda, 2012; Simon et al., 2004; Ward and Ozdemir, 2015). Plotting relative odds (odds ratio) of low pay for female and male employees over the reference period (1996 – 2016) shows the evolution of the gender gap in low pay over time.

Other explanatory variables in the second model are age, education (highest qualification), job tenure (in years), marital status, a dummy variable for being a single parent[32], work status (full time or part time), social class, contract type (temporary or permanent), sector (public or private), industry and employer

[32] The decision to accept a low-paid job may be influenced by household circumstances. The presence of a spouse or a partner may be influence the probability of being low paid, captured here with a dummy variable identifying married/cohabiting workers (cohabitation is conflated with legal marriage on the grounds that residence and income pooling rather than legal status is likely to drive this effect). The LFS household type variable is not available for all waves in the reference period and is therefore not included as a covariate. It is possible to construct a dummy variable to identify single parents based on being unmarried (as defined above) with dependent children in the household. This variable is included on the grounds that single parents may face constrained labour market decisions and therefore feature disproportionately among the low paid. This may also contribute to the gender gap in low pay, since women are more likely than men to become single parents.

size[33]. Social class is measured here according to the UK National Statistics Socio-economic Classification (NS-SEC) (ONS, 2005). Following Goldthorpe and colleagues (see: Erikson et al., 1979; Goldthorpe, 2007), NS-SEC distinguishes social class groups based on occupational skill level and skill-specialisation, and the type of employment relations engendered by variation therein. Grounding measures of social class in occupational groups has been criticised for downplaying other sources of stratification such as gender, race and wealth (Crompton, 2010). None the less, there is a broad consensus that occupational position is important as a source of social stratification (including gender inequality), and for the purposes here it is likely to be closely linked to low pay. From a social class perspective, low pay is expected to be primarily associated with employment conditions governed by 'the labour contract', a basic exchange of money for time, characteristic of occupations in which skill requirements are rudimentary and generic, and output easily monitored (routine and manual occupations). Low pay is expected to be rare in situations where the 'service relationship' prevails (managerial and professional occupations), in which employers have incentives to build long-term relationships with employees.

The second research question centres on the importance of the focal explanatory variable, asking: how has the contribution of part-time employment to the gender gap in low pay for UK employees changed over the period 1996-2016? This is assessed by decomposing the results of the logistic regression for each year. The Blinder-Oaxaca method decomposes wage gaps into a portion 'explained' by differences in characteristics and an 'unexplained' component. Originally

[33] Based on the number of employees at the individual's workplace; does not include employees working for the same employer at a different site.

designed as a decomposition method for linear models (Blinder, 1973; Oaxaca, 1973), the procedure has been adapted for non-linear models (Fairlie, 2006; Yun, 2004). The non-linear approach was extended by Yun (Yun, 2004) to allow for detailed decomposition, identifying separately the contribution of each variable. The traditional Blinder-Oaxaca approach selects one group as the comparison group and one group as the reference group, but switching the reference group may alter the results. One solution is to weight the estimates from a pooled sample of the two groups (Neumark, 1988; Oaxaca and Ransom, 1994). This is the approach followed here, with the addition of a group indicator as recommended by Jann (Jann, 2008). Decomposition results are sensitive to the choice of reference category when non-linear predictors are included in the model. Following a method developed by Yun (Yun, 2005), estimates for non-linear predictors reflect an average calculated by switching the reference group.

Decomposition analysis compares coefficients across two nested models, in this case the unadjusted and adjusted gender gap in low pay. The extent to which coefficients can be compared across binary response models (nested or otherwise) is a contentious point in the literature (Allison, 1999; Buis, 2015; Kuha and Mills, 2017; Mood, 2010). Comparing coefficients across non-linear models is often considered problematic because the residual variance of the underlying latent variable is not fixed. Coefficients from nested non-linear models are not measured on the same scale (the rescaling issue), and therefore a naïve comparison of coefficients may be misleading (Karlson et al., 2012). The Karlson, Holm and Breen (the KHB method) calculates mediation effects net of rescaling (Karlson et al., 2012; Kohler et al., 2011), whereas the traditional Blinder-Oaxaca approach does not. In this case, however, the KHB and Blinder-Oaxaca

decomposition methods produce very similar results (see Table CVI in Appendix C). To maintain consistency with previous literature on gender wage gaps, Blinder-Oaxaca results are reported in the main text.

The third research question asks: how far is change attributable to (a) shifts in the gender composition of the part-time workforce and (b) change in the effect of working part time relative to full time on the risk of low pay? This is evaluated using a simple 'shift-share' decomposition adapted from the poverty literature (de Beer, 2007; Horemans et al., 2015). Change in the low pay rate for men and women over the reference period (1996 – 2016) is decomposed into three components: (1) change in the risk of low pay associated with working part time (2) change in the risk of low pay associated with working full time and (3) change in the share of part-time employment (see Appendix C for more information on this aspect of the methodology). This analysis is run separately for men and women, and does not address the gender gap directly. However, it does give an indication of how far these factors have contributed to change in the relative risk of low pay for men and women. These results should be taken as indicative only, however, since the counterfactual rests on fairly simplistic assumptions and does not address the possibility of reverse causality (de Beer, 2007).

Results and discussion

Figure IV-II plots the relative odds of being low paid for male and female employees in each year. In answer to the first research question (how did the gender gap in low pay for UK employees change over the period 1996-2016?), the unadjusted gender gap in low pay declined over the reference period. In 1996, the odds of being low paid are shown to be 2.9 times higher for women than men; in

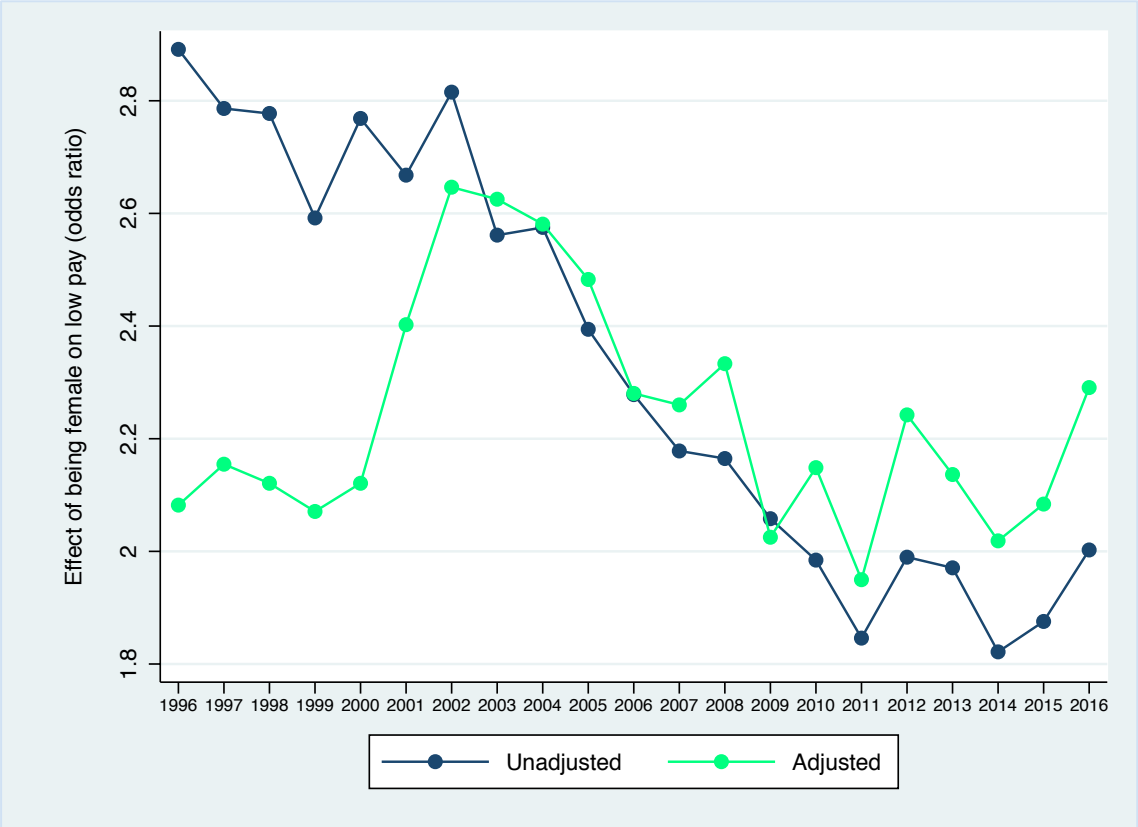
2016, the corresponding figure is 2.0. Supplementary analysis (see Table CII in Appendix C) confirms a significant interaction between gender and time in predicting low pay. The total (unadjusted) gap declines steadily until around 2010, after which it fluctuates. Contrary to the narrative of continuous, albeit slow, progress towards gender equality, we appear to be no closer to narrowing the gender gap in low pay than we were in 2010. This result chimes with previous studies on the gender gap in average wages, which highlight slow or stalled progress in recent years (Blau and Kahn, 2007; Cha and Weeden, 2014; O'Reilly et al., 2015). In relation to gender wage gaps, it is important to understand, not only how progress has been achieved, but also why it has stalled and what the remaining barriers are.

The adjusted gender gap[34] in Figure IV-II reflects the effect of being female after controlling for differences in the observed characteristics of men and women in employment. This component is difficult to interpret substantively, since it will subsume the effect of any unobserved predictors. It is not possible to label or interpret this component as gender discrimination, although this may be a contributing factor. It is interesting to note that until the early 2000s the adjusted gender gap in low pay is consistently lower than the unadjusted gap, whereas the reverse is true in later years. Towards the end of the reference period, the gender

[34] The sharp increase in the adjusted coefficient around 2001/2002 presents something of a puzzle. This component subsumes all unobserved factors affecting the gender gap in low pay, and the rise may reflect unobserved changes to the composition of men and women in employment. This trend should not necessarily be read as indicative of an increase in discrimination against women, although this could play a role. This trend could also stem from an issue with the data, although there are no known continuity issues regarding LFS sampling or measurement over this period.

gap in low pay persists despite women being less likely than men to exhibit characteristics associated with an increased risk of low pay[35].

Figure IV-II. Relative odds (odds ratio) of being low paid for female relative to male employees in the UK for each year 1996-2016



Notes: data source LFS 1996-2016; the unadjusted odds (Model 1) reflect the raw effect of being female relative to male on the probability of being low paid; the adjusted odds (Model 2) reflect this effect after controlling for age, education, job tenure, marital status, single parent status, part-time employment, social class, contact type, sector, industry and employer size.

[35] We know this because the adjusted coefficient is larger than the unadjusted coefficient from 2009 onwards. This indicates that if men and women in employment had the same measured characteristics, then the gender gap in low pay would increase.

Trends in Figure IV-II are based on aggregating the effect of all measured characteristics. The next stage of the analysis disaggregates this component to answer the second research question: how has the contribution of part-time employment to the gender gap in low pay for UK employees changed over the period 1996-2016? For illustrative purposes, Table IV-II displays results from Blinder-Oaxaca decompositions of the gender gap in low pay for the first (1996) and final (2016) years of the reference period. In 1996, the gender gap is partly attributable to women's weaker educational profile and social class position, as well as their shorter job tenure, and over-representation in small workplaces. The most important explanatory factor in 1996 is women's greater propensity than men to work part time. The only characteristic in which women are advantaged compared to men is their over-representation in the public sector. By 2016, the picture has changed markedly, and most characteristics have moved towards a neutral or reverse effect. Women are now in a slightly stronger position than men in terms of their educational and social class profile, and differences in job tenure are attenuated. Effects for industry and employer size lie in the same direction as in 1996, but are more modest. Women are still relatively protected from low pay by their greater propensity to work in the public sector, although the effect is weaker than in 1996. In 2016, part-time work remains the most important explanatory factor in accounting for the gender gap in low pay.

Table IV-II. Results from a Blinder-Oaxaca decomposition of the gender gap in low pay for UK employees in 1996 and 2016; mediation percentages

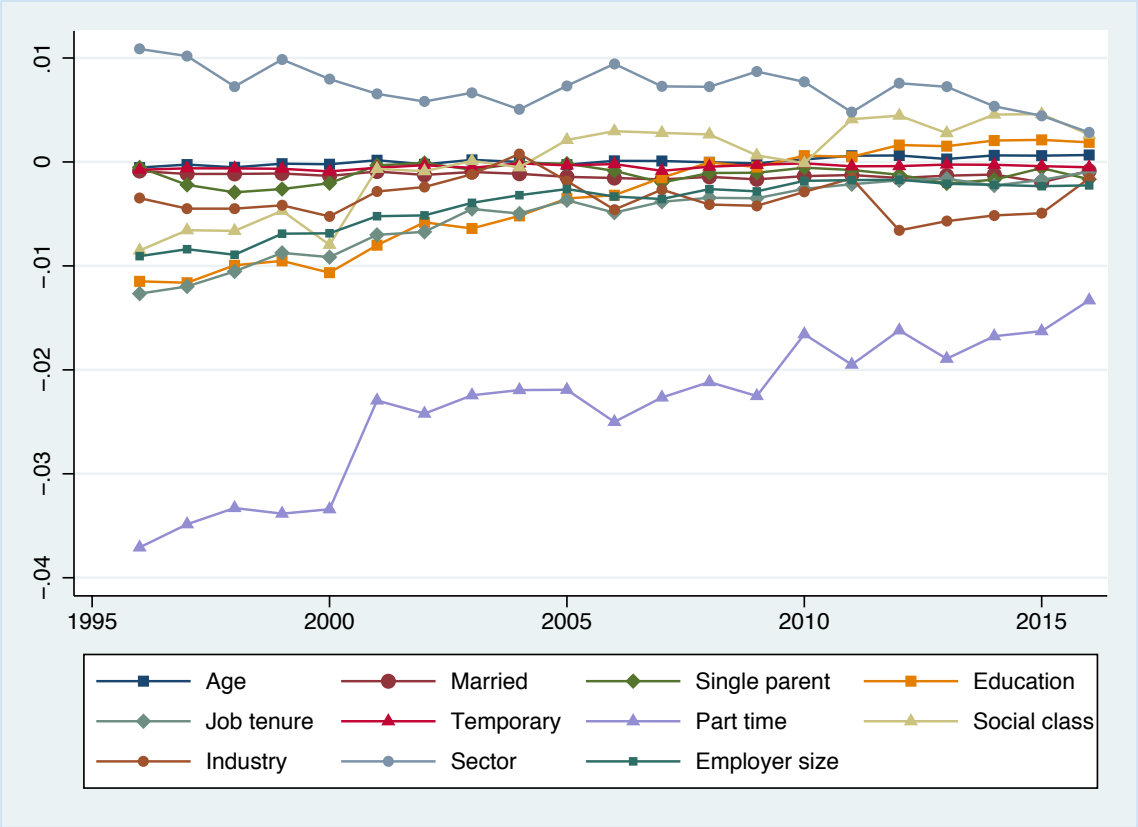
	1996 (%)	*2016 (%)*
Age	0.32	-0.60
Marital status	0.52	0.77
Single parent	0.31	1.50
Education	6.73	-1.70
Job tenure	7.42	0.84
Temporary contract	0.44	0.46
Part time	21.71	12.00
Social class	4.99	-2.37
Industry	2.04	1.42
Sector	-6.36	-2.56
Employer size	5.31	2.03
Observations	34,577	29,404

Notes: data source LFS 1996 and 2016; mediation percentages express the size of the estimated coefficient for each variable as a proportion of the total gender gap; negative percentages indicate that women are disadvantaged relative to men in relation to each characteristic, with disadvantage here indicating a higher probability of low pay. Positive percentages indicate that men are disadvantaged compared to women.

Figure IV-III displays decomposition results for all years of the reference period (1996-2016). The overall picture that emerges is one of convergence; gender differences in relation to observed characteristics have eroded over time. As women participate in the labour force in ever-greater numbers, and catch up with men in terms of human capital, the gender gap in low pay has narrowed. Women are now in a stronger position than men to escape low pay in terms of their educational and social class profile. In terms of measurable differences (unobserved factors such as discrimination are not addressed here), by the end of the reference period there are only two respects in which women are disadvantaged relative to men. Women are over-represented in low-paying

industries (e.g. distribution, hotels and restaurants) around the period 2012 to 2015, but this appears to be a temporary effect. Of far greater importance is the fact that women are more likely than men to work part time. In seeking to explain the persistence of gender inequality in low pay, we must look to the gendered division of market and non-market work, of which the over-representation of women in part-time work is a key manifestation.

Figure IV-III. Results (coefficients) from a Blinder-Oaxaca decomposition of the gender gap in low pay for UK employees, 1996-2016



Notes: data source LFS 1996-2016; negative coefficients indicate that women are disadvantaged relative to men in relation to each characteristic, with disadvantage here indicating a higher probability of low pay; positive coefficients indicate that men are disadvantaged compared to women.

At the same time as highlighting continued inequality, Figure IV-III shows a sustained decline in the effect for working part time relative to full time in the decomposition analysis. Differences in part-time work have become demonstrably less important over the last two decades as a contributing factor to the gender gap in low pay. The third research question asks how far this change is attributable to (a) shifts in the gender composition of the part-time workforce and (b) change in the effect of working part time relative to full time on the risk of low pay?) To inform this discussion, Table IV-III displays results from a shift-share decomposition of the change in low pay risk for male and female employees. The results show that men face a higher risk of low pay in 2016 compared to 1996 partly because more of them are working part time. Conversely, lower rates of part-time employment for women contribute to a lower risk of low pay at the end of the reference period compared to the beginning. The overall effect of these compositional changes is modest, however. Of greater importance is the steep decline in the risk of low pay associated with working part time for both men and women (for men, this offsets the growth in part-time employment). This is consistent with previous research identifying a decline in the size of the part-time wage gap (i.e. the gap in average hourly wages between full-time and part-time workers) in low- and medium-skilled occupations in the UK (Elsayed et al., 2017). For men, there has also been an increase in the risk of low pay associated with working full time over this period.

Table IV-III. Shift-share decomposition of the change in low pay risk for male and female employees in the UK 1996-2016

		Women	*Men*
Percentage change in low pay 1996 – 2016.		-5.02	1.37
Attributable to:	Change in the risk of low pay associated with working part time	-3.56	-2.11
	Change in the risk of low pay associated with working full time	-0.54	2.62
	Change in the share of part-time employment	-0.91	0.86

Note: data source LFS 1996-2016

These results support the idea that change has been driven by improvements in the earnings position of part-time relative to full-time employees. This improvement occurred despite the effects of the economic crisis of 2008-2009. In the UK, the crisis was associated with growth in part-time employment, and involuntary part-time employment in particular (Fagan and Walthery, 2014; Grimshaw and Rafferty, 2011; Horemans et al., 2015). In contrast to previous recessions, men were equally as likely as women to reduce their hours or switch from full-time to part-time employment (Grimshaw and Rafferty, 2011). For men in particular, growth was associated with a rise in involuntary part-time employment and underemployment (Grimshaw and Rafferty, 2011; Warren, 2015). There may therefore have been an increase in the number of low-paid part-time jobs for men (Warren and Lyonette, 2015). Over the reference period as a whole, however, there was a steep decline in the risk of low pay associated with working part time for men (Table IV-III). An intensification of the relationship

between part-time employment and low pay during the crisis years appears to have been insufficient to offset this general trend.

Further research is needed to establish exactly why part-time employment become less closely linked to low pay over the period 1996 to 2016, but changes to national policy may offer some clues. The introduction of a national minimum wage in 1999 disproportionately benefited part-time workers, attenuating the negative effect of working part time relative to full time on pay progression (Phimister and Theodossiou, 2009). Over this period there have been a number of interventions aimed at improving the quality of part-time jobs (Fagan et al., 2013). The coefficient for working part time declines sharply between 2000 and 2001 (Figure IV-III), around the time that equal treatment legislation was introduced in the UK. This suggests that prior to July 2000 part-time workers were treated less favourably in relation to pay, and that some degree of adjustment took place in response to the legislation. Although not explicitly formulated as a tool designed to promote gender equality, the 2001 legislation was partly intended to improve the position of female workers (Bleijenbergh et al., 2004; Freedland and Kilpatrick, 2004). The right to request a change of working hours was designed to open up opportunities for part-time work across all sectors and occupations (Fagan et al., 2013), and may also have contributed to these trends. There may be other factors at play another than changes to national policy, however. Factors such as technological advancements have been shown to contribute to an erosion of the differences in job tasks performed by full-time and part-time workers, resulting in lower wage differentials between the two groups (Elsayed et al., 2017).

Given the direction of change, it is pertinent to consider how far these trends will go i.e. whether part-time employment will eventually become irrelevant to the gender gap in low pay. Albeit speculative, the answer must surely be no. Firstly, changes to the gender composition of the part-time workforce have been modest at best. The uptake in part-time employment for men has been driven to a large extent by a lack of opportunities for full-time work. The main impetus behind women's part-time employment, namely caring for dependent children, continues to have no effect on working hours for men (Dias et al., 2018). There is, in short, no reason to expect part-time employment to be undertaken in equal numbers by men and women in the near future. Secondly, there are limits to how far legislation can be used to improve the quality of part-time jobs. Equal treatment relates to a comparable worker in a comparable job, whereas full-time and part-time workers are to a large extent located in different types of jobs (Fagan et al., 2013). The effect of anti-discrimination legislation also depends on how strictly it is enforced, and how willing workers are to raise complaints. The right to request part-time hours might be strengthened by making it available at the point of recruitment (House of Commons, 2016), and by placing greater restrictions on the circumstances under which employers can refuse (Anderson, 2003). Ultimately, however, there are limits to how far labour market regulation can be used to improve and equalise part-time jobs.

Beyond the suggestion of improving access to good quality part-time jobs, the results reinforce the need to critically assess the role of part-time employment in the UK economy i.e. to consider the role of broader cultural and institutional factors in shaping the gendered distribution of paid and unpaid work. Although reasons for working part time are numerous and complex, widespread use of

part-time employment for women in the UK is often associated with parenthood (Dias et al., 2018). Using fuzzy set ideal-type analysis, Ciccia and Bleijenbergh assess how closely childcare policies in European countries adhere to different models of care (Ciccia and Bleijenbergh, 2014). More than any other country, the UK is found to embody the 'one and a half breadwinner' model, in which there is limited investment in childcare provision and publicly funded care hours are limited. Limited childcare provision is just one way in which social policy in the UK has tacitly endorsed, if not actively promoted, a part-time role for some women (Daly, 2011). Effects are classed as well as gendered, since women from lower socioeconomic groups are less well positioned to access private services (McDowell et al., 2005). This brings us back to the rationale for focusing on the gender gap in low pay rather than looking across the wage distribution as a whole. It is disproportionately women from lower socio-economic groups who work part time rather than full time (Warren, 2003), and this trend is crucial to understanding the differential risk of low pay faced by women and men in employment.

Conclusion

This article assesses the contribution of part-time employment to the gender gap in low pay for UK employees, exploring over-time change across the period 1996 to 2016. The results show that part-time employment has declined in importance over the last twenty years as a contributing factor to the gender gap in low pay. This is largely because the link between part-time employment and low pay has become weaker over time. Shifts in the gender composition of the part-time workforce are found to be less important. Nevertheless, part-time employment

remains the most important observable factor contributing to the gender gap in low pay. Women have caught up, or even exceeded, men in other respects, such as educational qualifications and social class. In terms of observable factors (unobserved processes such as discrimination are not addressed here), the gendered 'one and a half' earner model offsets advancements made by women elsewhere, stalling progress towards gender parity in low earnings.

The fact that women are on average more likely than men to work below standard full-time hours is one aspect of this issue; another is that women are less likely than men to work long hours (Kodz et al., 2003). In the US, growth in overwork (defined as working 50 or more hours per week) and increasing returns to overwork are major trends working against gender convergence in pay (Cha and Weeden, 2014). Given the disproportionate burden of care and domestic work on women, men are on average better placed than women to take advantage of labour market rewards attached to long working hours. Future research might explore whether this long hours effect also works against gender equality in the UK, the flip side to the part-time effect identified in this article. The two issues are closely related, since women working part time in the UK often cite the long working hours of a partner as part of their rationale for doing so (Warren et al., 2010). If gender equality is to be realised, there is a clear need to address inequality in working time. The results in this article suggest that as long as women continue to disproportionately work part time rather than full time, they will continue to be over-represented at the lower end of the earnings distribution.

V. Paper #4: *A quirk of the UK labour market or a pan-European phenomenon? Exploring variation across Europe in the part-time 'low pay penalty' for male and female employees*

Abstract

Using data from the European Structure of Earnings Survey (ESES) 2014, this article explores variation across 23 EU and EEA countries in the relationship between part-time employment and low hourly pay for male and female employees. This study is the first to provide robust estimates of the part-time 'low pay penalty' across Europe, and to disaggregate this analysis by gender. Low pay is here defined as earnings below two-thirds of the median hourly wage in each country, and part-time workers are identified according to whether they work fewer hours than the prevailing workplace norm. In all countries analysed, part-time workers are more likely than full-time workers to be low paid, and the part-time low pay gap is greater for men than for women. Considerable cross-national variation is identified, however, and the analysis seeks as far as possible to account for this variation. There is little evidence to suggest that country differences are linked to the prevalence of part-time employment, or to the extent to which this is feminised and/or involuntary. There is, however, evidence that the part-time low pay penalty is more pronounced in countries with a higher overall incidence of low pay.

Introduction

Rather than a transitional phase on the road to gender-neutral patterns of labour market participation, or a temporary means of boosting employment rates, part-time work has emerged as an entrenched and enduring feature of the European labour landscape. No clear consensus has emerged about whether this is a positive development offering workers greater flexibility and choice, a driver of

labour market inequality and precariousness, or indeed both. Use of part-time employment has been promoted by the European Union and many national governments as a means of increasing the labour force participation of women and other groups (Buddelmeyer et al., 2004; OECD, 2010). The European Employment Strategy (EES), now subsumed within the Europe 2020 Growth Strategy, calls for the creation of 'more and better jobs' (Gilles Raveaud, 2007), but part-time employment arguably sits at a point of tension between these two goals. Part-time employment can be a means of stimulating employment and widening participation (OECD, 2010), but the jobs created are often inferior in terms of earnings, job security and career progression in relation to full-time jobs (Fagan et al., 2013; OECD, 2010).

The degree to which part-time employment entails disadvantages or 'penalties' is known to vary across countries (Bardasi and Gornick, 2008; Fagan et al., 2013; Matteazzi et al., 2014; McGinnity and McManus, 2007; OECD, 2010). In the UK, part-time workers are considerably more likely than full-time workers to be low paid, and this 'low pay penalty' cannot be fully accounted for by the different characteristics of the two groups of workers (Nightingale, 2018a). Drawing on a sample of 23 EU and EEA countries from the European Structure of Earnings Survey (ESES) 2014, this article examines cross-national variation in the part-time low pay penalty. It asks whether this phenomenon is unique to the UK labour market, or part of a broader trend across Europe. In order to distinguish low remuneration from low work intensity, the focus is on hourly pay (also referred to as wages) rather than annual or monthly earnings. Low pay is defined as earnings below two-thirds of the median hourly wage in each country, and part-time workers are identified according to whether employer identifies the

employee as working fewer hours than the prevailing workplace norm The analysis is restricted to employees only, and does not extend to self-employed workers. In conducting separate analysis for male and female employees, this article contributes to a small but growing evidence base on how the implications of working part time may differ for men and women (Hirsch, 2005; Nightingale, 2018a; Russo and Hassink, 2005).

Background and research aims

Across a range of country contexts, employees working part time earn on average a lower hourly wage than those working full time (Bardasi and Gornick, 2008; Hardoy and Schøne, 2006; Jepsen et al., 2001; Matteazzi et al., 2014; McGinnity and McManus, 2007; Neuburger et al., 2011; O'Dorchai et al., 2007; Petrongolo and Manning, 2008; Wolf, 2001). The dominant approach in the literature has been to compare the average hourly wage for employees working full time and part time. However, there is growing evidence to suggest that earnings penalties associated with working part time rather than full time are steepest for low earners. In Germany, it is primarily at lower earnings quantiles that part-time workers receive lower returns (in terms of hourly pay) for their characteristics (Tonurist and Pavlopoulos, 2014). In the UK, there is a substantial part-time 'low pay penalty', whereby even with similar levels of human capital and occupying comparable labour market positions part-time workers are more likely than full-time workers to be low paid (Nightingale, 2018a). This 'low pay penalty' is a particular concern because of the links between low pay and other outcomes such as household poverty, financial dependence and the inability to accrue savings and pension entitlements.

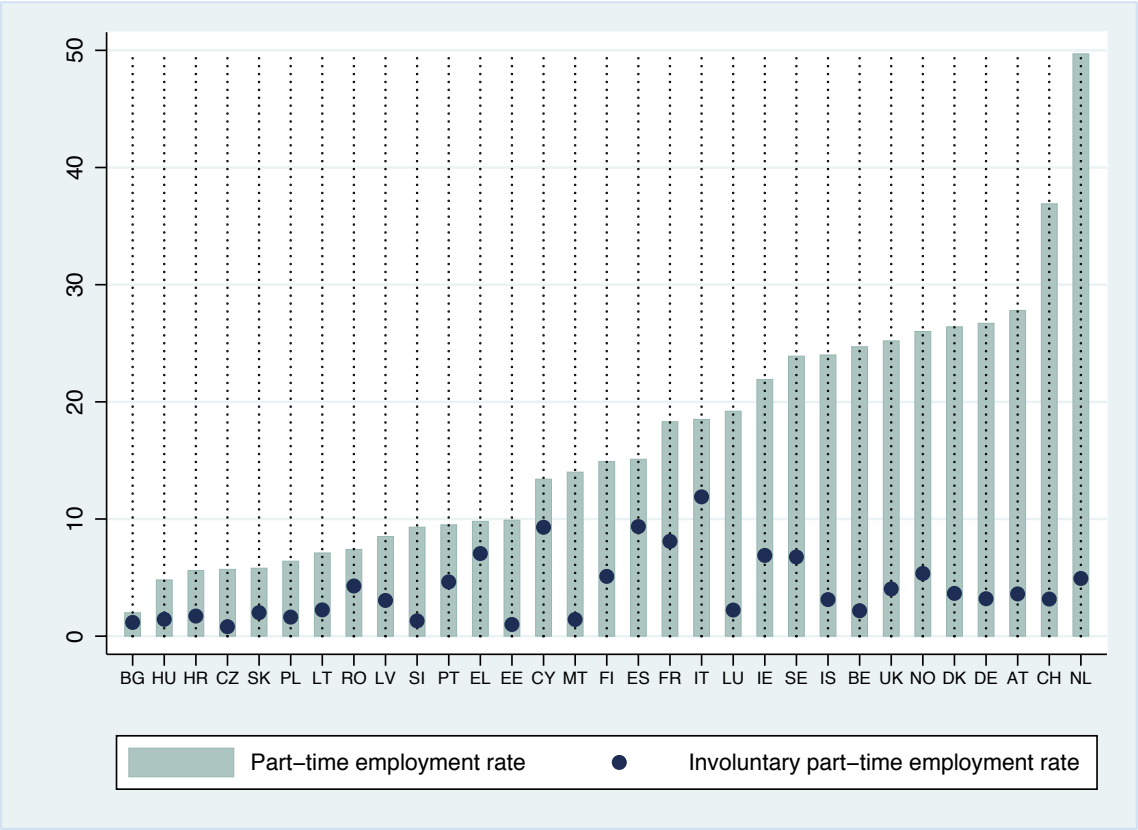
The first aim of this article is to provide robust estimates of the relationship between working part time and low pay in different European countries. In their analysis of the characteristics associated with low-waged employment, Ward and Ozdemir (2015) compare the proportion of full-time and part-time employees who are low paid in different European countries, identifying considerable cross-national variation. In France, for instance, the odds of being low paid are 2.5 times higher for part-time workers than for full-time workers, whereas in the Netherlands the odds are 0.8 times lower. This study does not account for contextual factors such as the composition of the part-time workforce, the type of jobs undertaken on a part-time basis, and the institutional environment in which part-time employment is embedded. These factors are likely to vary across different European countries, confounding interpretation of cross-national differences. The present article provides the first comparative estimates whilst adjusting as far as possible for the fact that part-time workers may be a 'selected' group, with lower earning capacity and/or located in low-paying areas of the labour market. The effect of working part time relative to full time on the probability of being low paid in each country is estimated after controlling for factors such as age, human capital, social class and industry of work.

The second aim of this article is to explore whether there are gender differences in the strength of the association between part-time employment and low pay in each country under study. Not only is part-time employment female-dominated in most European countries, but on average men and women tend to work part time at different stages of the life cycle, and for different reasons. Part-time work for women is often associated with parenthood and other caring commitments, representing a means of reconciling paid work and family life (Dias et al., 2018;

Eurofound, 2006). For men, part-time employment more often functions as a means of transitioning into or out of the workforce (Eurofound, 2006; Fagan and Walthery, 2014). Men are more likely than women to be classed as involuntary part-time workers, i.e. to work part time because they cannot find a full-time job (OECD, 2010). The nature and implications of working part time may therefore differ on average for men and women. Analysis of labour force data from the UK shows that the relationship between part-time employment and low pay is stronger for men than for women (Nightingale, 2018a). The present article extends this line of analysis by exploring whether this pattern is replicated in other European countries, or whether cross-national differences emerge.

The third research aim is to explore whether country differences in the relationship between part-time employment and low pay show up in a systematic way i.e. whether counties differ in this regard according to macro-level characteristics. One relevant factor may be variation across Europe in working time arrangements or 'working time regimes' (Mutari and Figart, 2001). There is considerable variation across Europe in the share of part-time employment, as shown in Figure V-I. Widespread use of part-time working arrangements might suggest additional motives beyond accommodating worker preferences, for instance employer use of part-time employment to create a cheaper and more flexible pool of workers (Allaart and Bellmann, 2007; Fagan et al., 2013; Tijdens, 2002). On the other hand, countries with a high share of part-time employment, for instance the Netherlands, may have gone further to regulate and equalise this form of employment (Fagan et al., 2013; Visser, 2002; Yerkes and Visser, 2006).

Figure V-I. Part-time employees and involuntary part-time employees as a proportion of all employees in European countries in 2016; percentages



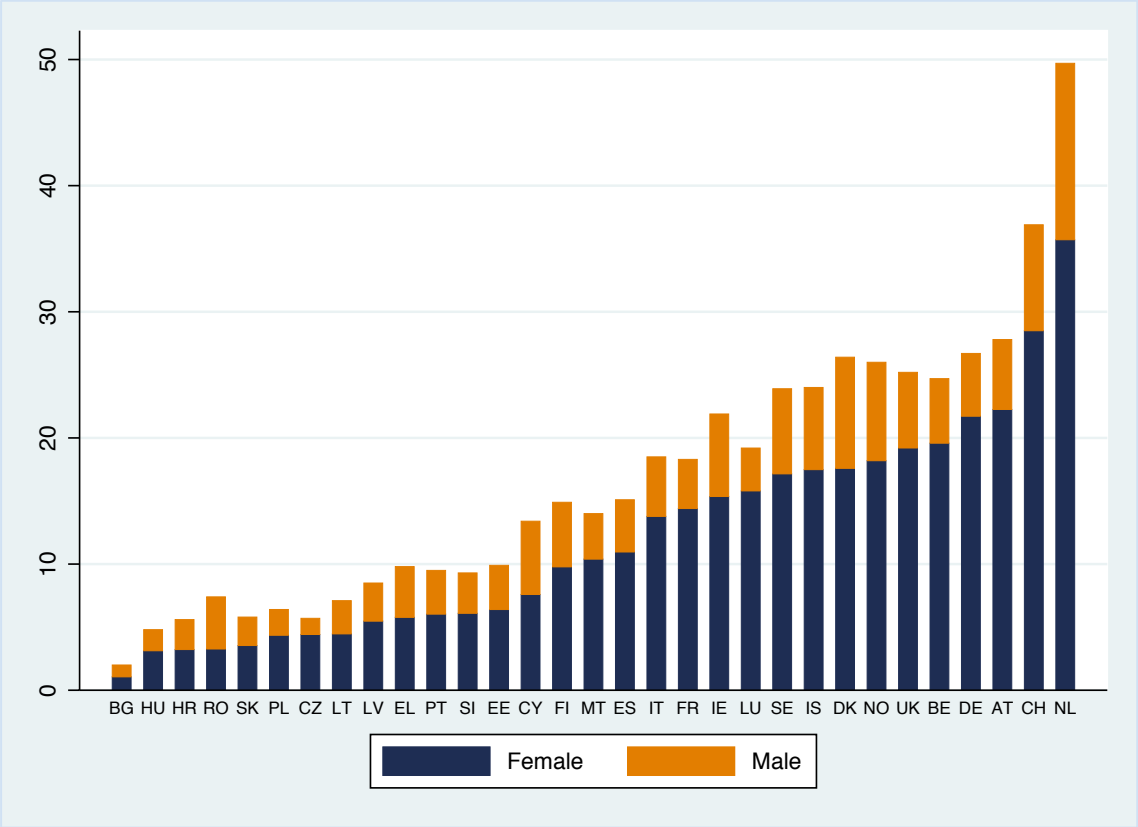
Notes: data source Eurostat (EU-LFS) 2016; part-time employment defined as the proportion of employees in each country who identify as part time rather than full time; involuntary part-time employment defined as the proportion of employees in each country who declare that they work part time because they are unable to find full-time work; both expressed as a proportion of total employment.

Of greater importance than how many part-time jobs exist in the labour market may be how these jobs come about and in whose interests they are created. Part-time jobs are said to be of better quality when they are driven by a retention strategy, designed to attract or retain employees who prefer shorter working hours (Fagan et al., 2013; Tilly, 1992). Jobs created as part time by employers to suit their own interests (e.g. flexibility and cost-cutting) are more likely to be low

paid and otherwise poor quality jobs. The most widely used indicator of the 'type' of part-time jobs in the economy is the share of involuntary part-time employment. In most advanced economies, involuntary part-time employment represents a relatively small proportion of total part-time employment (OECD, 2010); however, in several Southern and Eastern European countries (Greece, Cyprus, Italy, Spain, Romania, Bulgaria) the majority of part-time workers are classed as involuntary, as shown in Figure V-I. In countries such as these, part-time jobs may be relatively undesirable (for instance, being disproportionately low paid) and/or driven by employer needs to a greater extent than employee preferences. Working part time is therefore expected to incur a steeper risk of low pay in countries where there is a high share of involuntary part-time employment.

Given continued gender inequality in European labour markets, the extent to which part-time employment is female-dominated may also influence the extent to which it is disproportionately low paid. Compared to men, women tend to be segregated into lower-paying occupations (Gregory, 2012; Levanon and Grusky, 2016; Mandel and Semyonov, 2014), and female-dominated occupations tend be under-valued and under-paid (Grimshaw and Rubery, 2007; Rubery, 2017). As a result, part-time jobs may be disproportionately low paid in countries in which it is predominantly women who take up this form of work. To a greater or lesser degree, women make up the majority of part-time workers in all European countries, with the exception of Romania (Figure V-II). The female skew in part-time employment is on average more pronounced in countries where the part-time employment rate is higher (see Figure V-II and Table V-II).

Figure V-II. Part-time employees as a proportion of all employees in European countries in 2016, split into male and female part-time employment; percentages

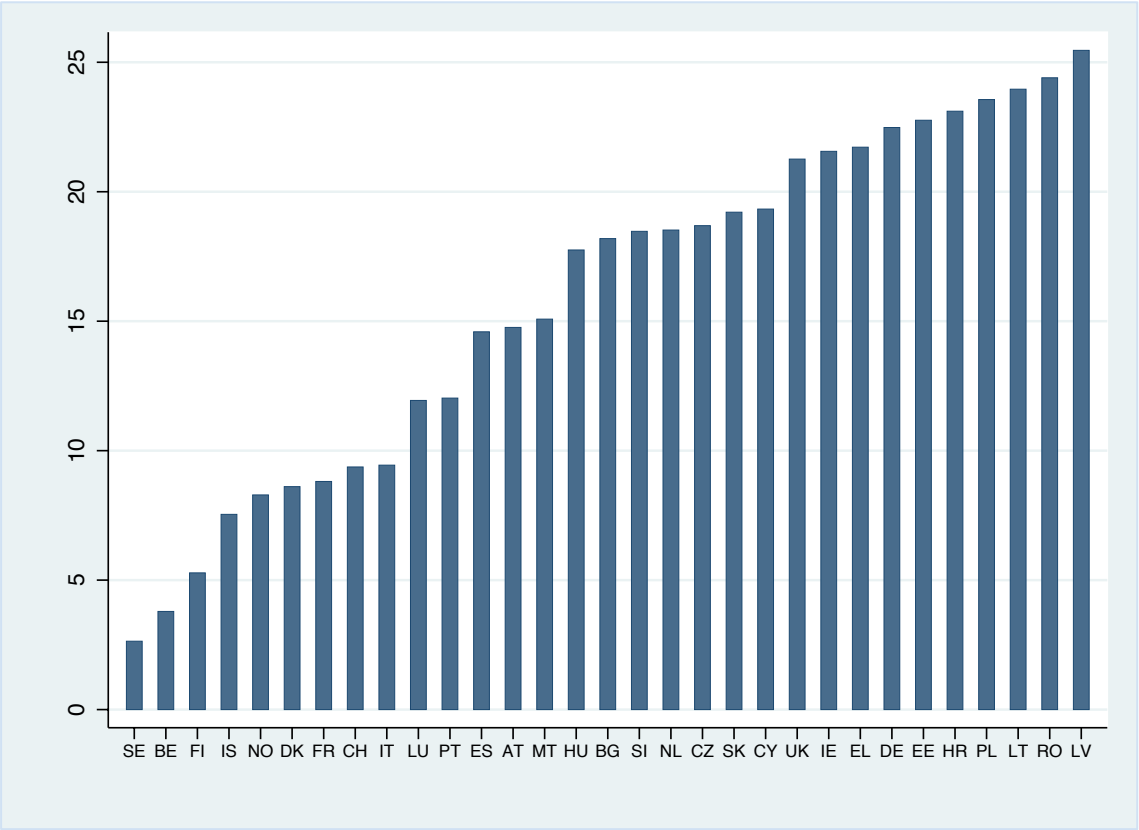


Notes: data source Eurostat (EU-LFS) 2016; part-time employment rate defined as the proportion of employees in each country who identify as part time rather than full time. Reflects the proportion of part-time workers who are male and female, rather than the proportion of men and women who work part time.

The relationship between part-time employment and low pay may also be influenced by the overall wage structure and incidence of low pay. European countries differ widely in the dispersion of earnings and the incidence of low pay (Checchi and Salverda, 2014; Lucifora et al., 2005; Maître et al., 2012). A number of different factors contribute to this between-country variation, including differences in education and skills and in the structure of the economy (e.g. the

relative balance of manufacturing and services), as well as in wage-setting institutions such as minimum wage legislation and collective bargaining institutions (Checchi and Salverda, 2014; Lucifora et al., 2005; Lucifora and Salverda, 2012). In countries in which the incidence of low pay is high, low pay may be more dispersed across the labour force and less concentrated among certain groups (low-skilled workers, migrants, women, part-time workers etc.). On the other hand, factors that reduce the incidence of low pay at the country level may disproportionately benefit less advantaged groups, reducing labour market inequalities. The gender pay gap, for instance, is largest in counties with a high degree of wage inequality (Blau and Kahn, 2003). On this basis, the part-time low pay penalty might be expected to be greatest in countries with a high incidence of low pay. As shown in Figure V-III, countries with a large share of low-waged employment include several post-Socialist countries (Poland, Latvia, Lithuania, Romania, Estonia), as well as the UK, Ireland, Croatia, Germany and Spain.

Figure V-III. Low-paid employees as a proportion of all employees in European countries in 2014; percentages



Notes: data source Eurostat (ESES) 2014; low pay defined as earning below two-thirds of the median hourly wage for employees (excluding self-employed workers and apprentices) in each country

Data and methodology

Individual-level data come from the most recent wave of the European Structure of Earnings Survey (ESES), a harmonized multi-national data set. The sample is comprised of employees in 23[36] EU and EEA countries, drawn from a stratified sample of workplaces or administrative records in the year 2014. The unit of

[36] One country, Hungary, is excluded from the analysis as an outlier. The result for Hungary sits far apart from the rest, and is inconsistent with previous research and sensitivity checks using EU-SILC (for more information, see Appendix D).

analysis is the individual, and data are weighted to obtain population estimates. Self-employed workers are not included in the ESES, and the analysis therefore relates to employees only[37]. The ESES pairs a large sample size with low rates of missing data on earnings. Collected from employer records and/or administrative data, the ESES provides more reliable earnings data than surveys relying on respondent recall (e.g. EU-SILC, EU-LFS). The main disadvantage of collecting data from employers is relatively sparse demographic information. Another disadvantage of ESES data is non-universal coverage: it is not mandatory to include workplaces with fewer than 10 employees, or those in public administration, defence and social security (NACE Rev. 2 category O). On balance, however, the benefits of reliable, harmonized earnings data are felt here to outweigh these limitations. Sensitivity checks show that for countries where all industrial sectors are represented, the exclusion of workers in public administration does not substantively alter the results (see Figure DVII in Appendix D).

Low pay is based on gross hourly wages and includes paid overtime on the basis that this may have a substantial impact on total pay[38]. The dependent variable does not identify a fixed proportion of wage earners (for instance, the bottom ten or twenty per cent), since the implications of being located at a certain point in

[37] Apprentices are included in the ESES, but this group is excluded from the analysis on the grounds that in many European countries separate processes govern wage setting for apprentices. Official Eurostat statistics also omit apprentices when calculating the share of low wage earners (based on ESES data), see:
http://ec.europa.eu/eurostat/statistics-explained/index.php/Earnings_statistics

[38] Including overtime in estimates of low pay is the most common approach in the literature, including official Eurostat estimates (see link above). The threshold of two-thirds of the median wage is also by far the most common measure of low pay present in the academic literature.

the wage distribution will differ according to the overall level of dispersion. Fixing the low pay threshold to the average wage is a better way of capturing problematically low earnings, particularly in comparative research (Lucifora and Salverda, 2012). In setting a relative threshold, the median is selected over the mean because it is less sensitive to the presence of outliers in the distribution. Whilst somewhat arbitrary, setting the threshold at two-thirds of the median hourly wage aligns with the majority of previous research in this area, including statistics produced by Eurostat and the OECD (Eurostat, 2016; OECD, 2016a). The dependent variable, low pay, is defined as earnings below two-thirds of the median hourly wage including overtime for employees in each country.

There are two main approaches to measuring part-time employment in the literature. The first is to use a standard hours cut-off, such as the 30 hours per week threshold used by the OECD (van Bastelaer et al., 1997). The second approach, and the approach recommended by Eurostat, is to rely on the respondent's own assessment of their employment situation. This is the preferred approach here, recognising that it is relative difference, rather than distance from an arbitrary cut-off, that is likely to have the strongest implications for the individual's position in the prevailing earnings distribution. In the ESES, part-time employees are identified according to whether they work below standard full-time hours in their place of work. This employer-designated status may not necessarily align with how employees see themselves, but supplementary analysis (see Table DVI in Appendix D) shows a strong correlation between ESES estimates based on employer-designated status and Eurostat estimates based on employee-designated status (EU-LFS data) (r = 0.85). There is also a strong correlation between the main measure of part-time employment in the ESES

(employer-designated) and an alternative measure in the ESES based on a cut-off of 30 hours per week (r = 0.96). Supplementary analysis shows that the conclusions are robust to the choice between these two measures (see Figure DVI in Appendix D).

The first stage of the analysis estimates the country-specific effect of working part time relative to full time on the probability of being low paid for male/female employees. Two logistic regressions are run for each country (one for men, one for women), incorporating a range of controls at the individual level. Control variables are designed to adjust for differences in the characteristics of full-time and part-time employees that might predispose the latter group towards low-waged work. Control variables are: age, educational level, social class, sector (public/private) and industry of work. Social class is here measured according to the European Socio-economic Classification (ESeC) coding scheme (Harrison and Rose, 2006). Following Goldthorpe and colleagues (see: Erikson et al., 1979; Goldthorpe, 2007), ESeC distinguishes social class groups based on occupational skill level and skill-specialisation, and the type of employment relations engendered by variation therein. The Goldthorpe approach uses occupational groups as a proxy for social relations in the labour market thought to be decisive in shaping the opportunities and life chances of individuals. From a social class perspective, low pay is expected to be primarily associated with employment conditions governed by 'the labour contract', a basic exchange of money for time, characteristic of occupations in which skill requirements are rudimentary and generic, and output easily monitored. Arrangements of this kind predominate in routine and manual (working class) occupations, and to some extent in

intermediate occupations; they are rare in professional and managerial occupations (the 'salariat').

Regrettably, it is not possible to control for all factors that might affect the relative probability of being low paid for full-time and part-time workers. The limited number of explanatory variables in the first-stage regression analysis reflects the sparse demographic information in the ESES. It is not possible, for instance, to control for household factors that might affect the probability of being low paid. It is also not possible to control for self-selection into full-time and part-time employment using a two-step Heckman approach, since the ESES sample is restricted to those already in employment[39]. This method, often applied to wage differentials, adjusts estimates according to a latent variable reflecting the individual's propensity to be in (full-time) employment. This propensity is modelled relative to non-employment[40], and therefore requires a sample wider than employees (for more information, see: Matteazzi et al., 2014; Nightingale, 2018a). As a result of these omissions, the results should be interpreted with a caveat in mind that it is not possible to eliminate the possibility of selection bias. Based on previous evidence, however, the most important predictors of low pay (age, education, social class) are included in the model (Lucifora and Salverda, 2012; Nightingale, 2018a).

After running a separate regression for each country, the effect (log-odds ratio) of working part time relative to full time on low pay is compared across countries.

[39] The EU-LFS offers an advantage over the ESES in this regard. The decision to use ESES rather than EU-LFS data is due to the limited earnings information in the EU-LFS (restricted to deciles).

[40] Modelling selection into part-time employment relative to full-time employment (rather than non-employment) would introduce collinearity with the focal explanatory variable.

All effects are gender-specific, since the regression analysis is run separately for men and women. The log-odds ratio associated with working part time relative to full time (for male/female employees) then becomes the dependent variable in the second-stage analysis. The analysis proceeds in two steps rather than using a single multilevel (hierarchical) model, due to the small number of group-level observations (n = 23). A large number of countries are needed to reliably estimate country-level effects using multilevel models: Bryan and Jenkins (2015) suggest a minimum of 25 for linear models and 30 for logit models. A two-step approach in which macro-level predictors are regressed against a dependent variable estimated using individual-level data produces more reliable estimates in situations in which the number of group-level observations is small (Bryan and Jenkins, 2015).

Multivariate estimates are produced alongside bivariate correlations in order to assess whether the covariance of explanatory factors (see Table V-II) introduces bias into the results. Regression analysis also allows effect sizes to be weighted to adjust for variance in sampling errors from first-stage estimates. Rather than standard weighted least squares, standard errors are adjusted based on a method developed by Hanushek (1974) and Lewis and Linzer (2005). This method first estimates the component of the regression residual not due to sampling error, enabling a weight to be constructed that better reflects the importance of this factor. To augment the sample size, the results for men and women are combined[41] to create a sample of 46 observations relating to 23 countries. This decision is motivated by the small-N problem, and informed by exploratory

[41] A dummy variable for gender is included to capture gender differences

analysis showing that similar results are produced running the second-stage regression separately for men and women (see Table DIX in Appendix D).

The sample size remains small for OLS regression, meaning that the second-stage regression results should be interpreted with some caution. The number of observations in a regression model constrains the number of parameters that can be reliably fitted, with a ratio of one explanatory variable for each observation often suggested as a rule of thumb. Given these restrictions, and the large number of political, economic and cultural factors that interact to shape cross-national differences in individual-level outcomes, the potential for omitted variable bias is considerable. It is not possible to eliminate or control for all extraneous sources of cross-national variation and therefore the article does not claim to identify causal effects. Rather than trying to capture the complex interaction of specific institutional and cultural factors, macro-level explanatory variables reflect broad country-level differences. Described in more detail in Table V-I, macro-level variables are: the part-time employment rate, the share of involuntary part-time employment, the proportion of part-time workers who are female and the overall incidence of low pay in each country.

Macro-level variables are based on Eurostat statistics derived from the European Labour Force Survey (EU-LFS) and the European Structure of Earnings Survey (ESES) (Eurostat, 2016). To maintain consistency with the individual-level data, all macro-level variables relate to the year 2014. The part-time employment rate reflects the proportion of employees in each country who define their work situation as part time rather than full time. The share of involuntary part-time employment is the proportion of part-time workers in each country who declare

that they are unable to find full-time work. As shown in Table V-II, there is a modest negative correlation between the part-time employment rate and the share of involuntary part-time employment (r = -0.39). The proportion of part-time workers who are female is derived from Eurostat estimates of the number of male and female part-time workers in each country. Part-time employment is on average more common in countries where it is more female-dominated (r = 0.56). Estimates of the incidence of low pay at the country level are based on Eurostat statistics, based on a threshold of two-thirds of the median hourly wage (i.e. the same measure that is used here). Countries with a higher incidence of low pay have on average a lower part-time employment rate (r = -0.32) and a less feminised part-time workforce (r = -0.45). The analysis that follows seeks to understand whether the size of the part-time low pay penalty relates systematically to these macro-level characteristics. Additional analysis located in Appendix D (Table DX) explores interactions between macro-level variables, which, by and large, are not found to be important.

Table V-I. Descriptive statistics for macro-level variables relating to working time regimes and wage structure for 23 EU and EEA countries 2014

Variable	*Data source*	*Definition*	*Min*	*Max*	*Mean (Std dev.)*
Part-time employment rate	EU-LFS	Proportion of the workforce reporting that their main job is part time	2.5	49.6	15.7 (10.4)
Share of involuntary part-time employment	EU-LFS	Proportion of part-time workers (defined above) unable to find full-time work	9.6	64.5	32.5 (19.5)
Proportion of part-time workers who are female	EU-LFS	Proportion of part-time workers (defined above) who are female	46.8	84.4	68.9 (9.3)
Incidence of low pay	ESES	Proportion of employees who earn under two-thirds of the median hourly wage	2.6	25.5	16.0 (7.0)

Note: all macro-level variables are taken from the Eurostat database and relate to the year 2014

Table V-II. Bivariate correlation matrix for macro-level variables relating to working time regimes and wage structure for 23 EU and EEA countries 2014

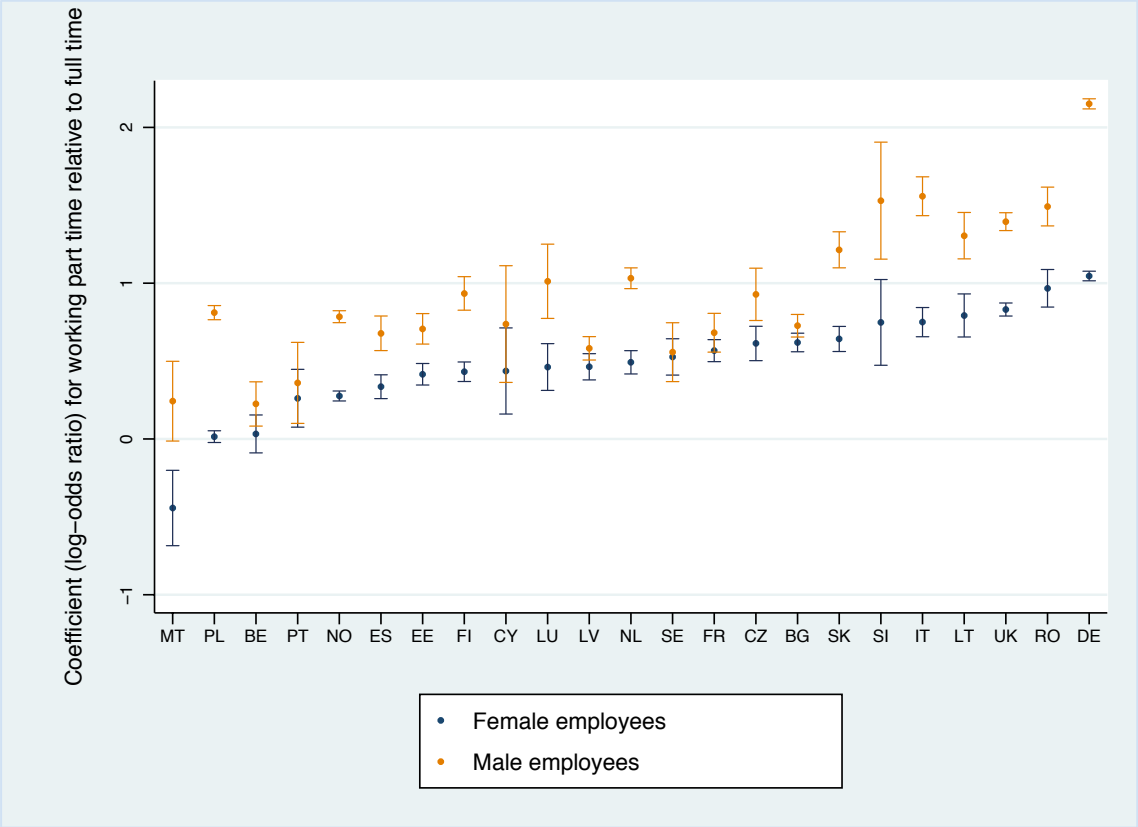
	Part-time employment rate	*Share of involuntary part-time employment*	*Proportion of part-time workers who are female*	*Incidence of low pay*
Part-time employment rate	1	-0.39	0.56	-0.32
Share of involuntary part-time employment	-0.39	1	-0.47	0.04
Proportion of part-time workers who are female	0.56	-0.47	1	-0.45
Incidence of low pay	-0.32	0.04	-0.45	1

Note: all macro-level variables are taken from the Eurostat database and relate to the year 2014

Results and discussion

The first aim of the analysis is to examine how the relationship between part-time employment and low pay varies across different European countries. The estimated effect (log-odds ratio) of working part time relative to full time on the risk of low pay for male and female employees in each country is plotted in Figure V-IV. In almost all cases the effect is positive, indicating that working part time relative to full time increases the risk of low pay. Female employees in Malta represent an exception, for whom working part time relative to full time decreases the probability of being low paid. For women in Belgium and Poland and for men in Malta, the effect is positive but does not differ significantly from zero. There is considerable cross-national variation in the strength of the positive effect, i.e. the extent to which working part time relative to full time increases the risk of low pay. Countries that stand out as having a large effect include Romania, Germany (particularly for men), Italy and the UK. Later on, the analysis addresses whether systematic patterns can be observed in the type of countries that fall into this group.

Figure V-IV. Estimated effect (log-odds ratio) of working part time relative to full time on the risk of low pay for male and female employees in each country in 2014, with 95% confidence intervals



Notes: data source ESES 2014; coefficients (log-odds ratios) with 95% confidence intervals; a coefficient greater than zero indicates that working part time relative to full time increases the likelihood of being low paid; estimated after controlling for age, education, social class, sector and industry of work; estimated separately for men and women.

The second research aim is to understand whether there are gender differences in the strength and direction of the association between part-time employment and low pay. In countries in which working part time increases the risk of low pay for women, it generally also does so for men. There is a strong positive correlation between the log-odds ratios associated with working part time relative to full time for men and women in each country (r = 0.81) (see Figure DI in Appendix

D). The estimated effect of working part time relative to full time is generally greater for men than for women. According to Figure V-IV, the only countries where there is an overlap between in the estimated effect of working part time relative to full time for men and women (i.e. where there do not appear to be gender differences) are Cyprus, Portugal, Belgium, France, Sweden, Bulgaria and Latvia. Comparing log-odds ratios produced by two separate logistic regression models may be misleading, since the residual variance of the underlying latent variable is not fixed (Allison, 1999; Mood, 2010). To test whether there is a gender effect without relying on cross-model comparisons, the analysis is re-run on a pooled sample of all employees with an interaction term added between working part time and being female (see Table DV in Appendix D for full results). The interaction effect is negatively signed in all countries, meaning that the positive effect of working part time relative to full time (i.e. the extent to which it increases the risk of low pay) is greater for men than for women. In two countries (Sweden and Cyprus), the interaction does not differ significantly from zero, whereas in other countries (notably Germany) it is highly significant. To summarise, the evidence shows that working part time relative to full time increases the risk of low pay for men to a greater extend than for women, although the size of this discrepancy varies.

It is difficult to say why the effect of working part time relative to full time on the risk of low pay is greater for men than for women. This may be related to cultural expectations around gender and working time, whereby men to a greater extent than women are expected to work full time and penalised for not doing so. One recent experimental study from the US finds that employees who request shorter working hours are viewed as less 'masculine' (Vandello et al., 2013). Recent

evidence from Germany (Beham et al., 2017) as well as the US (Pedulla, 2016; Vandello et al., 2013) suggests that discrimination against part-time workers is more pronounced for men than for women. Aside from discrimination, there are other possible explanations for this gender differential. Male part-time workers may be a more 'selected' group than female part-time workers in ways that are not fully captured by the covariates in the model. It is well established that men are more likely than women to be involuntary part-time workers (OECD, 2010), and this group of workers in particular may have low earning capacity beyond that captured by the control variables in the model (it is not possible to identify involuntary part-time workers in the ESES sample). The gender differential may also result from male part-time workers being more likely than female part-time workers to be located in areas of the labour market in which low pay is more prevalent, and pay progression more difficult. The consistency of this gendered pattern warrants further investigation, and future research might interrogate why men working part time appear to be particularly disadvantaged in relation to low pay.

In the light of the cross-national variation identified in Figure V-IV, it is pertinent to ask how we might begin to account for it. Why is it that part-time workers in Germany are vastly more likely to be low paid than their full-time counterparts, whereas in Belgium there is little to no difference? The aim of the next stage of the analysis is to start to understand whether countries differ systematically in this regard, i.e. whether there is anything in the labour market or policy context that can help us to understand this variation. As well as examining relationships with specific macro-level variables, this discussion draws on the wider literature on part-time employment to contextualise the findings. Existing literature is most

well developed in relation to countries in in which part-time employment is more common, for instance the Netherlands, Germany, the UK and Sweden. There are greater challenges in understanding the pattern of results for countries where part-time employment is less common, and the evidence base less well developed. It is difficult to offer concrete hypotheses, for instance, about why the part-time low pay penalty is small or non-existent in Malta, or why it is so pronounced in Romania.

Results from the second stage analysis are shown in Table V-III, estimating the relationship between the log-odds ratio for working part time relative to full time for men/women in each country and macro-level characteristics of interest. There is only a weak correlation between the part-time employment rate and the effect of working part time relative to full time on the risk of low pay. Controlling for other variables in an OLS regression, the effect for the part-time employment rate is positive but non-significant. A high share of part-time employment does not always result in a large part-time low pay penalty, as illustrated by the Belgian case. The part-time employment rate in Belgium is comparatively high (23.7 per cent of Belgian employees work part time), yet for both men and women there is only a small gap in the risk of low pay between employees working full time and part time. Conversely, stark inequalities between part-time and full-time workers can co-exist with a high share of part-time work. Countries with a large part-time low pay penalty include those in which part-time employment is relatively uncommon (e.g. Romania) and those in which it is widespread (e.g. Germany and the UK). It does not appear to matter how many part-time jobs exist in the labour market; the issue may be more a product of the type of sectors and/or

occupations in which these jobs are located, the type of individuals who 'select' into them, and the way in which part-time workers are treated by employers.

Table V-III. Bivariate correlations and OLS regression estimating the effect of macro-level characteristics on the country-specific effect of working part time relative to full time on the risk of low pay in 2014; coefficients

	r	*Coefficient*
Part-time employment rate	0.05	0.09 (0.05)
Share of involuntary part-time employment	0.03	0.06 (0.07)
Proportion of part-time workers who are female	-0.05	0.04 (0.08)
Incidence of low pay	0.32	0.19 (0.07)***
Male	0.49	0.45 (0.11)***
Constant		0.49 (0.07)***
R2		0.38
Observations	46	46

Notes: dependent variable estimated using ESES 2014; explanatory variables from Eurostat 2014; bivariate correlations and OLS coefficients with standard errors in parentheses; significance testing: * p <0.10; ** p <0.05 *** p <0.01

There is little indication that the part-time low pay penalty is related to the proportion of part-time workers classed as involuntary. In the regression analysis, the effect of the share of involuntary part-time employment on the estimated effect of working part time relative to full time on the risk of low pay is positive but non-significant. That is, countries in which a higher proportion of those working part time do so involuntarily have on average a larger part-time penalty, but the relationship is weak. Working part time carries a steep low pay penalty in some countries in which the vast majority of part-time workers are not classified as involuntary, for instance Germany and the UK. This may be because involuntary part-time employment does a poor job of capturing the phenomenon

it is intended to measure. It is notoriously difficult to separate choice and constraint in working time decisions (Gash, 2008), and this measure of involuntary part-time employment, whilst widely used, is known to have limitations (OECD, 2010). Even for part-time workers classed as 'voluntary', the decision to work part time may still have been highly constrained. Part-time workers (particularly women) are known to often accept the disadvantages associated with this form of employment as a trade-off for certain advantages (OECD, 2010). Whether these part-time workers are truly 'voluntary' in the sense of having a meaningful, appealing and viable alternative in their situation remains an open question.

There is a weak negative correlation between the effect of working part time relative to full time on the probability of being low paid and the proportion of part-time workers in each country who are female. Holding other macro-level characteristics constant in an OLS regression, this variable is positively signed. This change in direction may be because of covariance between the proportion of part-time workers who are female and other macro-level variables (see Table V-II). For instance, the gap in low pay risk between full-time and part-time workers may be on average smaller in countries in which part-time employment is more female-dominated simply because these countries tend to have a lower share of involuntary part-time employment. In the regression analysis this variable is non-significant, but the positive sign of the coefficient indicates that the part-time low pay penalty is greater in countries in which part-time employment is more female-dominated. This is not universally the case, however, since Romania has a part-time workforce that is slightly skewed towards men, yet has one of the largest part-time low pay penalties. Other countries in which the part-time low

pay penalty is pronounced have a female-dominated part-time workforce (e.g. Germany, Italy and the UK).

The results so far suggest that the part-time low pay penalty is not a product of the amount or type of part-time jobs in the labour market, or who takes these jobs (men or women). The three variables used as indicators of 'working time regimes' – the part-time employment rate, the proportion of part-time workers who are female and the proportion of part-time workers who are involuntary – all have a small or negligible effect on the estimated effect of working part time relative to full time on the risk of low pay. Other aspects of 'working time regimes' may also be relevant, but are more difficult to measure or quantify in a consistent way. One relevant factor may be whether there is a minimum threshold for employer and/or employee social security contributions. In contexts in which earnings (or hours) below a certain threshold are not subject to social security contributions, this may stimulate the creation of part-time jobs. Arrangements of this kind may create progression traps for employees (disincentives to increase hours and/or earnings), or incentives for employers to create part-time jobs as a cost-saving exercise. This is most evident in Germany, where under the 'mini job' system employees earning below 450 Euros per month are exempt from tax and social security contributions. Evidence suggests that the mini job policy has promoted the creation of marginal (short hour) part-time jobs, the vast majority of which are low paid (Weinkopf, 2009, 2014). Although employers must still pay social security contributions, in practice they often pass the costs on to employees by offering lower wages (until 2015 there was no statutory minimum wage in Germany) and few or no employment benefits (Rubery and Grimshaw, 2016; Weinkopf, 2009, 2014). Another country

with a large part-time low pay penalty, the UK, also has a threshold[42] under which employees and employers pay no social security contributions (McGinnity and McManus, 2007). Policies of this kind may promote job creation, but in addition reinforce and exacerbate inequalities between full-time and part-time workers.

When it comes to the relationship between part-time employment and low pay, the incidence of low pay appear to be more important than the extent and nature of part-time employment. There is a positive correlation between the incidence of low pay and the size of the part-time low pay penalty. The corresponding effect in the regression analysis is positive and statistically significant. The countries with a large part-time low pay penalty may differ in the extent and nature of part-time employment, but (with the exception of Italy) they share a high incidence of low pay. As shown in Figure V-III, some European countries do have a low overall incidence of low pay. It is largely the Nordic countries (Sweden, Finland, Iceland, Denmark and Norway) that fall into this group, with the addition of Belgium. In addition to the influence of the structure of the labour market, the low incidence of low pay in these countries is likely to be partly a product of wage-setting institutions such as minimum wage legislation and collective bargaining activities, which are correlated with the incidence of low pay at the country level (Checchi and Salverda, 2014; Lucifora et al., 2005). In contexts such as these in which institutional factors limit the incidence of low-

[42] In the UK, employees earning under the primary threshold of £162 per week pay no national insurance contributions. Those earning between the Lower Earnings Limit of £116 per week and the primary threshold do not pay contributions, but are entitled no claim some benefits. In situations where employees earn below the secondary threshold, also set at £162 per week, employers do not pay national insurance contributions.

waged employment, growth in part-time employment may not result in a large part-time low pay penalty. The concern lies more with countries that pair a large part-time workforce with a large low-wage sector, notably Germany and the UK.

The association between the part-time low pay penalty and the overall incidence of low pay may help to account for the position of the Netherlands in the middle of the distribution. As the world's first 'part-time economy' (Visser, 2002), the Netherlands is often held up as an example of a country in which part-time employment has been fully integrated and equalised (Anxo et al., 2005; Fagan et al., 2013; Yerkes and Visser, 2006). The 1982 *Wassenaar Agreement* between trade unions and employer organisations was pivotal in securing broad acceptance of reducing working hours (and increasing part-time employment) as a means of boosting employment (Fagan et al., 2013). Dutch unions have since the 1980s been active, supportive and inclusive in relation to the issue of part-time employment (Visser, 2002; Wolf, 2001; Yerkes and Visser, 2006), and part-time workers are well integrated into the collective bargaining system (Fagan et al., 2013; Visser, 2002). These results shows that for both men and women in the Netherlands (and particularly for men), working part time relative to full time considerably increases the risk of being low paid. This unexpected result may be related to the increase in the incidence of low pay in the Netherlands since the 1980s (Lucifora et al., 2005; Lucifora and Salverda, 2012; Salverda et al., 2008). In the reference year for this study (2014), 18.5 per cent of employees in the Netherlands are low paid, compared to an average of 16.0 per cent across all countries in the sample.

In the current climate, European countries are increasingly struggling to contain the expansion of low-paid employment. Globalisation and offshoring have resulted in many medium-skilled jobs (notably in manufacturing) being relocated to countries in which operational running costs are lower. Technological developments have also contributed to structural changes to European labour markets, including rising wage inequality (OECD, 2008) and a growing polarisation between low- and high-paid work (Goos et al., 2009). A large number of middle-tier occupations have been automated, whereas physical and interpersonal tasks associated with lower-skilled work (table-waiting, personal service etc.) have proved difficult to computerise (Autor and Dorn, 2009). The result is a 'hollowing out' of the labour market, with growth in low- as well as high-paid occupations. It is difficult to say what the long-term effects of these developments will be, and no doubt country trajectories will differ according to their labour market and institutional contexts. If the end result is an expansion of low-waged employment, these results indicate that part-time workers may be disproportionately affected. This would have serious implications for groups who are less likely (or able) to work full time, since participation in part-time employment is not uniformly distributed across the labour force, but structured by age, parental status, gender and social class.

Conclusion

This article shows that far from being unique to the UK, the part-time low pay penalty (the gap in the risk of low pay between part-time and full-time workers) is observed across a wide range of European countries. All things being equal, part-time workers almost always face a higher risk of low pay than full-time

workers. The positive effect of working part time relative to full time on the risk of low pay is in all countries analysed found to be greater for men than for women. This finding reinforces the need to better understand the nature and implications of part-time work for men, a group frequently overlooked in the literature. Future research might investigate why this gender differential exists, and why it is more pronounced in some countries than in others. Relevant factors could include the self-selection of men into part-time employment, the areas of the labour market in which men working part time are located, or potentially discrimination against men working part time. At the same time, it is worth noting that in almost all European countries a far higher number of women than men work part time. In this sense, disadvantages associated with working part time relative to full time fall disproportionately on women, contributing to gender inequality in the labour market (Dias et al., 2018; Nightingale, 2018b).

The overall pattern of results (i.e. part-time workers being more likely to be low paid than full-time workers) is consistent across the 23 European countries analysed here (with the exception of women in Malta), but the magnitude of this differential varies greatly. One of the aims of this article is to explore whether country differences in the part-time low pay penalty show up in a systematic way. Country variation in the effect of working part time relative to full time on the risk of low pay is difficult to account for. It does not appear to be a product of the number of part-time jobs in the labour market, or indeed who takes these jobs (men or women) or whether they do so due to a lack of viable alternatives ('involuntary' part-time employment). There is some evidence that a low pay gap is more likely to open up between full-time and part-time workers in labour markets with a high incidence of low pay. In accounting for cross-national

variation in the part-time low pay penalty, what appears to matter is not whether it is a 'part-time economy' but whether it is a 'low-wage economy'. This finding is contextualised in the light of growing polarisation in European labour markets, and the potential for low-wage employment to expand in the future.

There is likely to be far more to the part-time low pay penalty than a simply correlation with the incidence of low pay, however. There is a great deal of country idiosyncrasy not accounted for by the macro-level explanatory variables in this study. Previous literature can help to shed light on potential explanations for country differences, for instance the possible contribution of the 'mini job' system to the steep low pay penalty faced by part-time workers in Germany. For some countries in the sample, the evidence base on part-time employment is thin on the ground. There is a need for future research to build a more comprehensive picture of part-time employment in certain European countries, particularly those in which part-time employment is less common. There is still much to be understood regarding why part-time employment has emerged as a disparate phenomenon across different European labour markets, including the extent to which it is linked to low pay.

VI. Discussion

The discussion section synthesises and evaluates the research findings, contextualises them in the wider literature and draws out policy implications. Reflecting the focus of the four empirical papers, the discussion is primarily orientated towards the UK context, but where relevant draws on a wider literature. The discussion section is structured around key findings from the empirical work, which are analysed in light of their academic and policy relevance. The section ends with a discussion of the limitations of the analysis and directions for future research.

Key findings and policy implications

All things being equal, part-time workers in the UK are more likely to be low paid than their full-time counterparts.

The first empirical paper shows that all things being equal (i.e. controlling for worker and job characteristics, as well as unobserved selection), part-time workers in the UK face a higher risk of low pay than full-time workers. Particularly for men, a large proportion of the part-time 'low pay penalty' remains unexplained i.e. cannot be attributed to measureable differences in worker- and job-related characteristics. These results are important because they inform the debate around whether part-time employment should be encouraged and enabled, or viewed as more problematic. There may be positive effects associated with widespread use of part-time employment. A more diverse set of working time arrangements can offer greater flexibility and choice, enabling workers to adapt their work schedule to suit their needs. There is evidence to

suggest that part-time employment encourages employment, particularly for women[43], contributing to economic growth (Buddelmeyer et al., 2004; OECD, 2010; Salvador et al., 2005). Part-time employment may also help to mitigate job losses in times of economic difficulty (Buddelmeyer et al., 2008). However, positive effects such as these must be weighed against the penalties incurred for individuals, including the 'low pay penalty' examined in this thesis.

Use of part-time employment has been promoted by the European Union and many national governments as a means of increasing the labour force participation of women and other groups (Buddelmeyer et al., 2004; OECD, 2010). In the UK, there has been no formal or explicit policy to promote part-time employment, as there has been, for instance, in the Netherlands (Visser, 2002; Yerkes and Visser, 2006). However, there has been no concerted effort to discourage the use of part-time employment. Some have argued that the policy landscape in the UK has tacitly endorsed, if not actively encouraged, the use of part-time employment, at least for certain groups in society (Daly, 2011). It is not necessarily the case that the outcome, or indeed the aim, of social policy has been to encourage full-time participation for all working-age adults. It is important to consider how social policy shapes patterns of full-time and part-time employment, and for whom, since the evidence in this thesis suggests that this will affect the composition of workers at the lower end of the earnings distribution.

[43] The expansion of part-time employment for women was, for instance, a major contributing factor to the Dutch 'employment miracle' of the 1980s and 1990s (Visser, 2002).

In general, policies that augment earnings are thought to encourage individuals to work, and to work longer hours. Policies of this kind might include minimum wage floors and exemptions from tax and social security contributions. Several policy changes in recent years have aimed at strengthening work incentives. In recent years, the UK tax-free allowance[44] (i.e. the threshold below which no income tax is owed) has risen above inflation. The UK National Minimum Wage (NMW) has also increased in generosity, re-branded in 2016 as a National Living Wage (NLW) (D'Arcy, 2018; Low Pay Commission, 2017). For low earners, these developments strengthen the incentive to be in work because they augment take-home pay. In the case of the tax-free allowance, however, the incentive to work full time is not necessarily strengthened, since additional hours worked above the threshold are subject to taxation (albeit at the basic tax rate of 20 per cent). The minimum threshold for social security contributions (the primary threshold), currently set at £162 per week or £702 per month, operates in a similar way. Minimum thresholds for tax and social security contributions increase the incentive to be in work (relative to unemployment or inactivity), but they do not necessarily incentivise full-time employment (McGinnity and McManus, 2007), particularly for low earners[45].

[44] The tax-free allowance is set at £11,850 in the 2018-2019 tax year.
[45] These effects are most pronounced for individuals earning a low wage, since those on a higher wage may exceed the tax and social security threshold even if they work relatively few hours.

The degree to which social policy incentivises individuals to work full time or part time varies according to household circumstances[46], since certain benefits and services are targeted based on factors such as household income, the presence of dependent children and the earnings and employment status of a spouse or partner. Incentives are often quite different for the first and second earner in a household[47], for parents compared to non-parents, and for single adults compared to those in a couple. Lifecycle analysis shows that work incentives vary considerably across the life course, particularly for women, due to changes in family circumstances (Brewer, Shaw, et al., 2012; Brewer and Shaw, 2018). Groups who are sometimes thought to be incentivised to work part time rather than full time are lone parents and second earners in couple households. Lone parents and second earners often face high marginal effective tax rates (METR)[48] due to the withdrawal of benefits and tax credits if they increase their earnings (Brewer, Shaw, et al., 2012; Brewer and Shaw, 2018). The tax/benefit system in the UK is set up in such a way that not all workers (or potential workers) are incentivised to work full time; for some, it may make more financial sense to work part time.

[46] The term 'household' is here used for convenience, since it is common in the literature to refer to household income and household circumstances. In reality, entitlement for means-tested benefits and services is based on the benefit unit rather than the household. A household may consist of one or more benefit units, defined as a single adult, or a couple living as married, civil partners, cohabitees or same sex partners, and any dependent children. A household comprised of several independent adults, for instance, does not form a single benefit unit; co-residence of this kind does not affect benefit entitlement and is unlikely to influence work incentives.

[47] The idea of a 'second' earner refers to an individual who is not the primary breadwinner in their household, and whose earnings are supplementary to another.

[48] The marginal effective tax rate (METR) refers to the fraction of earnings lost by increased tax liabilities and reduced benefit entitlements for each additional hour worked.

Although designed to enhance work incentives (Department for Work and Pensions, 2010), research suggests that for certain groups Universal Credit (UC)[49] may dampen rather than strengthen work incentives (Brewer et al., 2017). Compared to the current system tax credits system, UC does not require a minimum number of hours to be worked per week. The Resolution Foundation have warned than single parents may be incentivised to reduce their working hours to 5 to 10 hours per week under the new system (Brewer et al., 2017)[50]. There is also, however, an in-work conditionality element of UC that is designed to encourage individuals to increase their working hours and/or secure a higher wage (Brewer and Finch, 2018). Under the new system, simply being in work is not enough; if this is not deemed to bring in sufficient income (meeting the 'conditionality threshold'[51]) claimants face a punitive system of sanctions and fines (Dwyer and Wright, 2014). In this way, UC aims to encourage workers – low-paid part-time workers, in particular – to increase their working hours (Brewer and Finch, 2018). Whether they are able to do so, however, remains an open question. This will depend on the willingness of employers to offer opportunities for full-time work (European Commission, 2018). Many low-paid workers face structural barriers, where the only opportunities available to them are short-hours work, often on temporary or zero-hours contracts. The

[49] Universal Credit (UC) is a unified benefit that will replace six means-tested working-age benefits and tax credits: income-based Jobseeker's Allowance, Housing Benefit, Working Tax Credit, Child Tax Credit, income-related Employment and Support Allowance and Income Support. UC was first piloted in 2013, and is intended to fully replace the existing system by 2022.

[50] The previous tax credits system required single parents to work 16 hours per week to claim, but there is no minimum hours requirement under UC. This is also a product of the way in which UC entitlement decreases as earnings from employment increase.

[51] For a single adult, the conditionality threshold is equivalent to working 35 hours per week on the minimum wage.

conditionality element of UC is tailored according to personal circumstances, meaning that some workers are exempt from this pressure to work full time. A lower conditionality threshold applies to lone parents and 'principle carers' in couple households, and couples have a joint rather than an individual conditionality threshold to meet. Coupled with relatively high taper rates[52], particularly for second earners (Bennett, 2012), some workers may be incentivised under UC to reduce their working hours, or even to withdraw from the labour force entirely (Brewer et al., 2017).

Particularly for women, work incentives are closely related to the availability and affordability of childcare services. Using fuzzy set ideal-type analysis, Ciccia and Bleijenbergh assess how closely childcare policies in European countries adhere to different models of care (Ciccia and Bleijenbergh, 2014). More than any other country, the UK is found to embody the 'one and a half breadwinner' model, with limited public investment in childcare provision and care hours that are limited in duration. The cost of child care in the UK is high (Flynn, 2017; Lewis and West, 2016), but various forms of public support are available for parents. Following the National Childcare Strategy in 1998, governments from across the political spectrum have sought to expand the provision of free 'early years education'. Free provision has always been limited, however, in relation to timing (restricted to school term-time), hours per week[53] and the age of the

[52] The taper rate describes the rate at which UC is withdrawn as earnings increase
[53] In 1998 in England, the offer was 12.5 hours of free early years education per week (for 33 weeks of the year). The number of hours of free provision has been expanded over the years, for instance the Coalition government increased the offer to 15 hours per week in 2010. From 2017, the Conservative government has increased the offer to 30 hours per week for working families.

child[54]. Additional support is available to families on low incomes through the tax credits system e.g. Child Tax Credit (CTC), and more recently through UC[55]. Child care is a devolved issue and the nature of provision varies[56] (Butler and Rutter, 2016; Speight and Roberts, 2017), but generally takes the form of free early years education for certain age groups (restricted in hours and/or timing), with additional support for low-income families.

Although recent decades have seen an expansion of publicly supported child care in the UK, the system is not necessarily designed to support full-time employment for all parents[57]. The precise nature of the offer has varied over time and across the devolved nations, but childcare support has always been limited.

[54] The provision of free early years education in 1998 in England was restricted to four-year-olds. In 2004, provision was expanded to three-year-olds as well as four-year-olds. Under the Coalition government in 2013, provision was extended to two-year-olds from disadvantaged families (the 20 per cent of households with the lowest incomes, extended to 40 per cent in 2014).

[55] Under UC, parents may be able to claim back up to 85 per cent of childcare costs, depending on their earnings (Speight and Roberts, 2017). In order to claim, the individual (and their partner, if they have one) must be in work (unless they have limited work capacity or care for someone with a severe disability). This is different to CTC, which does not require the individual to be in work. Eligibility for both CTC and UC is dependent on the earnings of the individual (and their partner, if relevant); higher-earning families are not eligible to claim. However, higher-earning families can also receive tax relief on childcare costs if their employer participates in the childcare voucher scheme.

[56] In Scotland, three- and four-year-olds (and two-year-olds from disadvantaged families) are eligible for up to 600 free hours of early years education per year. In Wales, three- and four-year-olds are eligible for 10 hours per week of free early years education. Two-year-olds from disadvantaged backgrounds can access 12.5 hours per week as part of the Flying Start scheme. Children in Northern Ireland are eligible for one year of free early years education up to 12.5 hours per week.

[57] It is unclear whether the aim of childcare policy has ever been to promote or enable dual full-time earner families. To a large extent, the provision of free early years education has been motivated by other concerns such as child development and child poverty (Lewis and West, 2016). Childcare provision has been viewed as a tool to increase rates of female labour force participation (Lewis and West, 2016), but it is less clear that encouraging full-time participation for women has been the goal.

In relation to part-time employment, the most relevant limitation relates to the number of hours of free child care or early years education. Historically, the number of hours of free early years education has fallen considerably below full-time working hours[58]. From 2017, the government has pledged to increase the provision of free education for three- and four-year olds in England in 30 hours per week for working families[59] (Butler and Rutter, 2016; Cory, 2015). This offer sits at the threshold of full-time and part-time employment, but represents a step towards enabling full-time employment for parents. However, concerns have been raised about the degree to which this 30-hour offer is feasible or affordable under the current system (Cory, 2015; Lewis and West, 2016; Speight and Roberts, 2017)[60]. Parents have always been expected to pay for any care received which exceeds their free entitlements. Depending on a number of factors, a dual full-time arrangement may remain unaffordable for some families. Low-income families receive additional support, but since this is means-tested this may weaken incentives to work full time (if, for instance, working additional hours would mean that childcare support through CTC or UC is lost).

The discussion around how care responsibilities affect employment decisions has, to date, focused predominantly on caring for dependent children. However, other forms of care may also impede or restrict the labour market participation of women in particular. Caring for elderly parents does not influence employment

[58] In the UK, full-time employment is generally considered to start at 30 hours per week.
[59] The additional offer up to 30 hours per week is only for working families, defined as earning at least the equivalent of 8 hours per week on the minimum wage (if there are two parents in the family, both must be in work).
[60] Research from the Family and Childcare Trust suggests that only a third of local authorities are confident that there will be sufficient childcare available in their area to meet the 30 hours per week offer (Harding et al., 2017).

to the same degree as motherhood, and complete withdrawal from the labour market is rare (Naldini et al., 2016). Nonetheless, workers in the UK, particularly women, are known to reduce their working hours in response to eldercare commitments (Carmichael et al., 2008; Naldini et al., 2016). In the context of population ageing and restrictions on public funding, social care services are increasingly struggling to cope with demand (Local Government Association, 2011; Oliver, 2015). The government concedes that families will need to do more to care for their elderly (Asthana, 2017), a trend that is likely to impose greater restrictions on women's employment. In summary, elder care does appear to contribute to the widespread use of part-time employment in the UK, particularly by women, and may do so to an increasing extent in the future.

To summarise, although strengthening work incentives has been at the forefront of the policy agenda in the UK, work incentives do not uniformly operate in the direction of full-time employment. There has been no formal or explicit policy agenda in the UK to promote part-time employment, or the 'one and a half earner' model for families. Nonetheless, there are 'numerous examples of how welfare and other areas of social policy [in the UK] promote a part-time worker role ' (Daly, 2011: 12). The METR associated with moving from part-time to full-time employment is relatively high for low-waged workers in the UK compared to other OECD countries[61] (OECD, 2010), indicating that the incentive to make this transition is relatively weak. Incentives to work part time versus full time (or not at all) differ markedly across different population groups. Groups for whom

[61] The METR associated with moving from part-time to full-time employment is particularly high for lone parents in the UK compared to other OECD countries.

work incentives are most important[62] (e.g. women, the low-skilled, parents of young children) are often those for whom they are most ambiguous. Due to the conditions under which various forms of public support can be accessed (principally, how this is often linked to household circumstances), lone parents and second earners in couple households often face weaker incentives to work full time. Effects are also structured by income, since higher-income families are better placed to afford private care services and less driven by work incentives created by means-tested benefits (McDowell et al., 2005). It matters whether or not the system enables or encourages full-time employment, and for whom, since this thesis shows that working part time rather than full time incurs a far higher risk of being low paid. This gives pause for thought regarding how the UK government has tacitly allowed, if not actively encouraged, widespread use of part-time employment.

Worker-specific factors are less important than job-specific factors in accounting for the part-time 'low pay penalty' in the UK

Another finding from the first empirical paper is that job-specific factors are more important than worker-specific factors in accounting for the part-time 'low pay penalty' for UK employees. Although the part-time low pay penalty is partly a product of self-selection into part-time employment (i.e. who works part time), it is more closely related to the type of jobs undertaken on a full-time and part-time basis. In highlighting the greater explanatory power of job characteristics relative to worker characteristics, this paper aligns with previous studies that examine the part-time gap in average hourly wages (Bardasi and Gornick, 2008; Jepsen et al.,

[62] I.e. Groups who are more responsive to institutional factors affecting work incentives.

2001; Matteazzi et al., 2014; Petrongolo and Manning, 2008). Compared to other European countries, job characteristics have been found to be particularly important in accounting for the part-time wage gap in the UK (Bardasi and Gornick, 2008; Matteazzi et al., 2014; O'Dorchai et al., 2007). The contribution of this thesis is to show that this pattern also holds at the lower end of the earnings distribution: not only are part-time jobs in the UK *lower-paid jobs*, but they are disproportionately *low-paid jobs*. This study is certainly not the first to draw attention to the issue of poor quality part-time jobs in the UK (see for instance: Fagan et al., 2013; Warren and Lyonette, 2015; Yerkes and Visser, 2006). The government's own Women and Equalities Select Committee has, for instance, described part-time work as 'career death' (House of Commons, 2016: 28). Nevertheless, the issue of poor quality part-time jobs has rarely been high on the political agenda in the UK.

Several relevant pieces of legislation have been introduced in the UK, partly aimed at improving access to 'good quality' part-time jobs (Fagan et al., 2013). Introduced in July 2000, the *Part-time Workers (Prevention of Less Favourable Treatment)* regulations require that employers treat full-time and part-time employees equally (on a *pro rata* basis) in relation to pay (including bonuses and overtime), holiday entitlement and pay, sickness benefits, access to pensions schemes and selection for redundancy. Opportunities for part-time work have also been influenced by flexible working regulations. The 'right to request' flexible working (including part-time work) was partly designed to open up opportunities for part-time work across a broader range of sectors and occupations (Fagan et al., 2013). This legislation, first introduced in the UK in

April 2003, gave parents[63] the right to request a change in working hours, although employers can refuse requests on business grounds. In 2014, this right was extended to apply to all employees with a minimum of 26 weeks' continuous service. To a large degree, however, the impetus for these legislative changes has come from the European Union. Equal treatment legislation was, for instance, only introduced in response to the EU Directive on Part-Time Work (1997), a directive that the UK government tried to block (Bleijenbergh et al., 2004).

There may be scope to further improve the quality of part-time jobs by strengthening labour market regulation. UK legislation on flexible working is relatively weak compared to that in other European and OECD countries (Freedland and Kilpatrick, 2004; OECD, 2010; Yerkes and Visser, 2006), and there have been calls to strengthen it. The right to request part-time hours is not available at the point of recruitment, or during the first six months of employment (Rubery, 2017). The House of Commons Select Committee on Women and Equalities has recommended that in order to widen employment opportunities for those with caring responsibilities and other work-limiting factors, flexible working (including part-time employment) should be made available at the point of recruitment (House of Commons, 2016). There have also been calls to place greater restrictions on the circumstances under which employers can refuse flexible working requests (Anderson, 2003; TUC, 2014).

There may also be scope to reduce the part-time 'low pay penalty' by regulating and restricting burgeoning forms of precarious part-time employment. In the

[63] Parents of children under 6, or disabled children under 18. This legislation was widened in 2007 to apply to carers of disabled adults, and again in 2008 to apply to parents of children under 16.

current climate, a sizable proportion of part-time workers are employed on zero-hours contracts (ZHCs). Although not necessarily undertaken on a part-time basis, ZHCs are associated with shorter working hours and a higher incidence of under-employment[64] (ONS, 2016a; Pennycook et al., 2013; Taylor et al., 2017). Although they can be found across the labour market, these jobs are disproportionately located in lower-paid sectors and occupations such as hotels, restaurants and care work (ONS, 2016a; Pennycook et al., 2013). There have been calls to enhance regulation of ZHCs and many – including the Labour Party – would like to see an outright ban[65] (Labour Party, 2017). Such a move is likely to reduce the incidence of very marginal (short hour) part-time jobs and underemployment, and may reduce disparities in low pay between full-time and part-time workers. In addition, whilst officially classed as freelancers and therefore outside the scope of the current research, workers in the 'gig economy' face similar challenges (Friedman, 2014). In this context, too, greater regulation may weaken the link between part-time work and low pay.

Ultimately, however, there are limits to how far labour market regulation can be used to improve the quality of part-time jobs. It is unrealistic to expect equal treatment legislation to eliminate unequal labour market outcomes for full-time and part-time workers, since the principle of equal treatment requires a comparable full-time worker, who is in practice often lacking (Fagan et al., 2013). A large part of the issue, as the research in this thesis has shown, is that full-time

[64] ONS figures estimate that around a third (31 per cent) of workers on a ZHC would like to work longer hours, compared to one in ten (10 per cent) other workers (ONS, 2016a).

[65] As an alternative to an outright ban on ZHCs, some have suggested creating a separate (and more generous) minimum wage for non-guaranteed hours (Taylor et al., 2017). This would allow employers to use ZHCs, but incentivise them to guarantee hours as far as possible.

and part-time workers are to a large extent located in different jobs, where there is no direct comparator. Extending the right to request flexible working to all employees may go some way to normalising flexible and non-standard working time arrangements, but it will not necessarily dismantle entrenched negative perceptions of part-time workers on the part of both employees and employers (Warren et al., 2010). Strengthening the right of employees to request and access part-time work can only go so far, since employers also create part-time jobs to suit their own needs and purposes, and these employer-driven part-time jobs are more likely to be poor quality than those stimulated by employee demand (Allaart and Bellmann, 2007; Fagan et al., 2013; Tilly, 1992). Aside from these limitations, improving access to 'good quality' part-time jobs can only ever be part of the solution, since the evidence in this thesis shows that even within the same type of jobs part-time workers are more likely than full-time workers to be low paid.

The most important observable factor contributing to the part-time low pay penalty for UK employees is the unequal distribution of part-time employment across social class groups

In recognition of the fact that part-time employment in the UK is a classed as well as gendered phenomenon (Warren, 2003), the analysis in this thesis explores the intersection between low pay, part-time employment and social class. In the four empirical papers, social class is measured according to the approach developed by John Goldthorpe and colleagues (see: Erikson et al., 1979; Goldthorpe, 2007). The Goldthorpe approach positions labour market relations as central to understanding social class in capitalist societies, arguing that it is above all else,

an individual's position in the labour market that determines their opportunities and life chances. Prior research shows that social class schemas based on the Goldthorpe approach (e.g. EGP, NS-SEC, ESeC), are predictive of a wide range of social and economic outcomes (Evans, 1992; Evans and Mills, 1998; Mills and Evans, 2000; Rose and Harrison, 2007, 2009; Rose and Pevalin, 2003; Williams, 2017). The research in this thesis shows that social class is also important in understanding low pay. In the UK and across Europe, low pay is a classed phenomenon, associated predominantly with lower-skilled occupations governed by the 'labour contract' (a basic exchange of money for time or effort, characteristic of occupations in which skill requirements are rudimentary and generic, and output easily monitored). In the UK, the odds of progressing out of low pay are higher for workers in the 'salariat' than those in working class occupations (although this effect is not statistically significant for men).

In the UK, part-time employment, like low pay, is a classed phenomenon. Previous research shows that it is more often women and men from lower socio-economic groups who work part time rather than full time (Warren, 2003; Warren et al., 2010). This is supported by analysis in this thesis (see Table AIII in Appendix A), which shows that a far higher proportion of women working part time than full time are located in routine and manual (working class) occupations (43.9 per cent of women working part time, compared to 22.9 per cent of women working full time). Almost two-thirds (60.9 per cent) of men working part time are in working class occupations, compared to 38.3 per cent of men working full time. This can be seen in two different ways: firstly, that working class men and women are more likely to work part time than other social class groups; and secondly, that part-time workers are more likely than full-time workers to be part

of the working class. The two perspectives are not mutually exclusive, but lend themselves to slightly different interpretations.

The first perspective foregrounds the potential for part-time employment to reinforce and perpetuate inequalities according to social class. Working part time rather than full time in the UK (and in many other European countries) carries a steep 'low pay penalty'. Given their over-representation in part-time employment, this penalty disproportionately affects men and women in routine and manual (working class) occupations. The second perspective foregrounds the potential for social class to reinforce and perpetuate inequalities between full-time and part-time workers. Given the over-representation of part-time jobs in routine and manual occupations, working part time rather than full time (whether by choice or constraint) channels workers towards disproportionately low-paid positions. Decomposing the gap in the risk of low pay between full-time and part-time workers in the UK shows that, particularly for women, this differential is driven by the unequal representation of part-time workers across social class groups. From this perspective, working part time rather than full time affects not just the likelihood of being low paid, but 'life chances' in a broader sense.

In the UK, the association between part-time employment and low pay has become weaker over time

The third empirical paper in this thesis examines the gender gap in low pay for UK employees. The analysis shows that part-time employment has become demonstrably less important as a contributing factor to the gender gap in low pay over the period 1996-2016. Two possible explanations for this are considered:

firstly, it may be due to changes to the gender composition of the part-time workforce (i.e. more men working part time and/or fewer women working part-time), and, secondly, it may derive from the relationship between part-time employment and low pay becoming weaker over time. To disentangle these factors, change over the reference period (1996-2016) in the risk of low pay for men and women is decomposed using a shift-share approach. Changes to the gender composition of the part-time workforce are found to be of modest importance. There has been an increase in the number of men working part time and a decrease in the number of women working part time, but by and large this is not what is driving these changes. Of greater importance is the fact that the relationship between part-time employment and low pay has become weaker over this period. This raises interesting questions about why part-time employment has become less closely linked to low pay over time, how this might relate to the policy context in the UK, and what it means for how these relationships are likely to develop in the future.

There are a number of possible explanations for why part-time employment has become less closely linked to low pay over time. One of the key themes running through this thesis is the issue of selection i.e. the fact that part-time workers may be different to full-time workers in ways that are related to their risk of low pay. It may be that part-time workers in the UK have become a less 'selected' group over time. The analysis seeks to eliminate factors of this kind as far as possible by adding control variables such as age, education and social class. As discussed in more detail in the first empirical paper, however, some differences between the two groups of workers may remain unobserved. The relationship between part-

time employment and low pay may have become weaker over time because these unobserved differences have diminished or become less unidirectional[66].

Selection applies to job-specific factors as well as worker-specific factors. Indeed, there is some evidence to support the idea that differences in the type of jobs undertaken on a full-time and part-time basis have eroded over time. Gallie and Zou (2011) find an increase in the skill requirements of part-time jobs relative to full-time jobs in the UK between 1992 and 2006. This may be because part-time jobs have become more dispersed across the labour market, represented in a wider range of sectors and occupations. However, another study suggests that convergence in full-time and part-time jobs has predominantly taken place within occupations (Elsayed et al., 2017). This study documents a decline in the part-time wage gap[67] for UK employees over the period 1997 to 2012. The authors find that this is largely due to convergence in job tasks between full-time and part-time jobs within occupations, in particular growth in the use of computers in part-time jobs. Part-time employment may have become less closely linked to low pay over time because of wider changes to the labour market, including changes driven by technological developments, which have eroded differences in the type of jobs undertaken on a full-time and part-time basis.

[66] The general expectation is for selection to involve part-time workers being more likely than full-time workers to have personal and job characteristics associated with an increased risk of low pay, although as shown in the first empirical paper it is not necessarily the case that all characteristics operate in this direction. 'Less unidirectional' is here used to mean that this picture may have become more complicated over time, with both full-time and part-time workers disadvantaged in some respects and advantaged in others.

[67] The gap in average hourly wages between full-time and part-time employees, rather than the gap in the risk of low pay as is addressed in this thesis.

Policy changes may also have contributed to the association between part-time employment and low pay becoming weaker over the period 1996-2016. The introduction of a NMW in 1999 disproportionately benefited part-time workers, attenuating the negative effect of working part time relative to full time on pay progression (Phimister and Theodossiou, 2009). Policy changes discussed earlier such as equal treatment legislation (2000) and the right to request a change in working hours (2003) may also have contributed to this trend. It is interesting to note that the coefficient for working part time (i.e. the extent to which it accounts for the gender gap in low pay) declines sharply between 2000 and 2001, suggesting that some degree of adjustment took place in response to the 2000 legislation[68]. There may therefore have been change over this period regarding the treatment of part-time workers and the extent to which they are treated less favourably than full-time workers. Another study found that for women who had their first child around the time of the millennium, earnings penalties associated with transitioning to part-time employment were considerably weaker for those who stayed with the same employer compared to those who switched employers (Neuburger et al., 2011). Although this research does not demonstrate a causal relation with equal treatment legislation, this finding supports the idea that the policy was successful in reducing penalties associated with working part time, at least for those who stayed with the same employer.

As discussed earlier, however, there are likely to be limits to how far legislation of this kind can be used to eliminate disparities in pay and other factors between

[68] This trend both trend pre-dates the 2000 legislation and continues after it has been enacted, suggesting that other factors are also at play. Change pre-dating the legislation may be a product of companies adjusting their pay policies in anticipation of the legislation coming into effect.

full-time and part-time workers. Steps may be taken to strengthen labour market regulation, but ultimately it is difficult to eliminate disparities that arise partly from different types of jobs being created as full time and part time, and for different reasons. It is noteworthy, for instance, that switching to part-time employment is associated with more severe earnings penalties if it is accompanied by a change in employer (Neuburger et al., 2011). This suggests that differences in the types of jobs available on a part-time basis are more significant than unequal treatment within the same job. It is unclear whether the current trajectory will continue (i.e. whether part-time employment will continue to become less closely linked to low pay) or not. There are even certain scenarios under which part-time employment may become more closely linked to low pay in the future, for instance if new technologies displace many of the better quality part-time jobs that have been created in recent years.

All things being equal, part-time workers in the UK are less likely to progress out of low pay than their full-time counterparts

The second empirical paper shows that all things being equal, part-time workers are less likely to progress out of low pay (i.e. to secure higher-paid employment) than full-time workers. However, part-time workers who transition to full-time employment no longer appear to be disadvantaged. There appears to be something about working part time (whether because of the type of jobs available on a part-time basis, or the way in which part-time workers are treated) that makes it more difficult to escape low pay. As well as having a high incidence of low pay in comparative perspective (Lucifora et al., 2005), the UK is known to have issues around progression out of low pay (Brewer and Finch, 2018; Centre

for Social Justice, 2018; D'Arcy et al., 2014; D'Arcy and Finch, 2017; European Commission, 2018). Given the difference in rates of progression out of low pay for full-time and part-time workers, policy interventions to promote pay progression are likely to disproportionately benefit part-time workers.

In order to promote progression opportunities, the European Commission have called on the UK government to shift from a 'work first' approach, towards prioritising skills development and better job matching (European Commission, 2018). The recent peer review on in-work progression as part of the Mutual Learning Programme (Brewer and Finch, 2018; European Commission, 2018) highlights the potential for the in-work conditionality element of UC to promote pay progression. The implicit assumption behind in-work conditionality is that a lack of incentives, rather than a lack of opportunities, is what drives low rates of pay progression for low-paid workers. To be successful, the system requires employers to be willing to offer additional hours and/or opportunities for higher-paid work (European Commission, 2018). This may not be the case, particularly given the recent increase in the number of job opportunities paid at or around the statutory minimum wage (Brewer and Finch, 2018; D'Arcy, 2018). There is then additional pressure for these workers to increase their working hours and/or get a second job, although this too may not be feasible. In addition, inasmuch as it is successful in encouraging workers to access higher-paid employment, the benefits of this will not necessarily extend to those for whom conditionality under UC is weaker, namely lone parents and second earners in couple households (Dwyer and Wright, 2014).

The results in this thesis highlight the need to focus on part-time workers in relation to progression out of low pay, since this issue disproportionately affects them. There may be potential for sector-specific initiatives to improve opportunities for part-time workers to progress out of low pay, since escaping low pay is particularly difficult in sectors such as hospitality and retail (D'Arcy et al., 2014; D'Arcy and Finch, 2017), in which a high proportion of the workforce is part time. The Resolution Foundation and the Joseph Rowntree Foundation have both called on the government to work with employers, particularly in sectors such as retail and hospitality, to develop progression pathways to address this issue (D'Arcy et al., 2014; Ussher, 2016). The organisation Timewise has recently launched a pilot scheme, *Retail Pioneers*, aimed at enabling career progression for part-time workers in the retail sector (Timewise, 2017). This initiative is designed to address the fact that part-time jobs in retail are often viewed as 'dead end' jobs, working with retailers to develop progression pathways for jobs frequently undertaken on a part-time basis. Although the pilot has not yet been evaluated, initiatives of this kind could go some way in reducing disparities between full-time and part-time workers in progression out of low pay.

Cross-national variation in the size of the part-time low pay penalty is more closely linked to the wage structure than to working time regimes

The fourth empirical paper places the UK in comparative perspective, examining how the relationship between part-time employment and low pay varies across 23 EU and EEA countries. All things being equal, part-time workers are more

likely to be low paid than full-time workers in almost all countries analysed[69]. However, there is considerable cross-national variation in the magnitude of this effect. In addition to describing cross-national variation, the paper seeks as far as possible to account for it, running a regression model in which the dependent variable is the estimated effect of working part time relative to full time for men/women in each country and the explanatory variables are macro-level characteristics. The results do not comprehensively account for the determinants of the part-time low pay penalty at the country level (other salient factors may remain observed), but they can be taken as indicative of overall trends. There is little evidence to suggest that country differences are linked to the prevalence of part-time employment, or to the extent to which this is feminised and/or involuntary. There is, however, evidence that the part-time low pay penalty is more pronounced in countries in which there is a higher overall incidence of low pay. Feeding in to the discussion earlier, promoting or enabling part-time employment as a means of boosting employment does not in itself appear to lead to a situation in which working part time is closely linked to low pay. However, much is likely to depend on the nature of the labour market, and the overall incidence of low pay. In countries such as Germany and the UK in which there is a high incidence of low pay, it may be difficult to prevent part-time work from becoming a disproportionately low paid form of employment.

This thesis focuses primarily on the UK, a country in which the part-time low pay penalty is comparatively large. The results of the comparative paper suggest that

[69] Malta represents an exception, where the risk of low pay is lower for part-time workers than for full-time workers for women, and there are no statistically significant differences for men. There are also no statistically significant differences between women who work full time and part time in Belgium and Poland.

this should be interpreted predominantly in light of the high incidence of low-waged employment in the UK labour market (Lucifora et al., 2005; Lucifora and Salverda, 2012; Simon et al., 2004), rather the high incidence of part-time employment (Buddelmeyer et al., 2004; Fagan et al., 2013; OECD, 2010). It is pertinent to ask why the UK has a high incidence of low-waged employment, how this might be reduced in the future, and indeed whether this is feasible at all. As outlined in the introduction section, advanced economies have in recent decades faced common challenges relating to the 'hollowing out' of the labour market (Autor and Dorn, 2009; Goos et al., 2009; Goos and Manning, 2007). Although common patterns can be observed (Goos et al., 2009), these changes are mediated by institutional differences across countries. It is difficult to say for certain why the incidence of low pay is so much higher in the UK (21.3 per cent) than in it is, for instance, in Sweden (2.6 per cent)[70], but differences in national policy may offer some clues.

In many European countries, collective bargaining institutions have historically been, and continue to be, important in shaping the wage distribution (Checchi and Salverda, 2014; Visser and Checchi, 2011). Research shows that strong and centralised collective bargaining institutions are associated with greater compression in the wage distribution (Checchi and Salverda, 2014) and a lower incidence of low pay (Lucifora et al., 2005). Certain groups of workers, part-time workers prominent among them (Robson et al., 1999), may be less well positioned to benefit from collective bargaining activities (Visser and Checchi, 2011). However, some countries have formal extension mechanisms in place to

[70] Figures come from official Eurostat statistics (based on ESES 2014); see Figure V-III.

enable collective agreements to extend 'beyond the wall of membership' (Visser and Checchi, 2011: 231), and this may be of particular benefit to part-time workers, who traditionally have lower rates of trade union membership than full-time workers (OECD, 2010; Visser and Checchi, 2011). In the UK, however, trade union activities are relatively uncoordinated and de-centralised (Mason et al., 2008; Visser, 2016), and there are no formal extension mechanisms of this kind. The trend towards a reduction in union membership[71] has been particularly pronounced in the UK, and the scope and influence of unions have been substantially reduced by a series of legislative reforms (Mason et al., 2008). The collective bargaining system may offer some clues as to why the UK has a comparatively high share of low-waged employment (Lucifora et al., 2005), but there appears to be limited scope to use collective bargaining arrangements to achieve a reduction in the incidence of low pay for UK workers.

Particularly in contexts such as the UK where collective bargaining institutions are relatively weak and de-centralised, statutory minimum wages represent a key tool in limiting the incidence of low pay. Comparative evidence shows that the incidence of low pay is lower in countries with generous statutory wage floors (Lucifora et al., 2005). Evidence shows that the UK NMW has reduced inequality at the lower end of the earnings distribution (Dickens and Manning, 2004; Dolton et al., 2010), although spillover effects further up the wage distribution appear to be relatively small (Dickens and Manning, 2004). Given their over-representation at the bottom end of the wage distribution, part-time workers may benefit disproportionately from interventions to raise wage floors. Comparing rates of

[71] A decline in union membership and/or authority has been documented across a number of different European countries (Visser, 2006; Visser and Checchi, 2011).

pay progression before and after 1999, Phimister and Theodossiou (2009) found that part-time workers were less disadvantaged relative to full-time workers after the introduction of the NMW.

In relation to low pay, the effect of the NMW may be limited by the level at which it is set. The statutory minimum wage in the UK has historically fallen below the threshold of two-thirds of the median generally used to measure low pay (Mason et al., 2008; Robson et al., 1999). Whilst it undoubtedly lessens the severity of low pay, therefore, the NMW may be limited in its capacity to reduce its incidence. This situation may be changing, however, given the introduction of the so-called National Living Wage[72] (NLW) (Low Pay Commission, 2017). First coming into effect in April 2016, the NLW represents an increase in the statutory minimum wage for workers aged 25 and over[73]. Set to be phased in over several years, the aim is to raise the NLW to 60 per cent of the median wage by 2020. As well as representing a substantial increase in the generosity of the minimum wage (for workers aged over 24, at least), the NLW explicitly ties the minimum wage to the median wage for the first time, aligning with the concern regarding 'falling behind' average wages that underpins the measurement of low pay in this thesis. Caveats have been issued about the 60 per cent of the median wage goal being achieved only in suitable economic conditions (Low Pay Commission, 2017), however the NLW has already (D'Arcy, 2018; Low Pay Commission, 2017), and is likely to continue to, reduce the overall incidence of low pay in the UK.

[72] Although it borrows language from it, the National Living Wage is distinct from (and set at a lower level than) the Living Wage as developed by the Living Wage campaign. Calculations for the Living Wage campaign are based on living costs, not the median wage: https://www.livingwage.org.uk/calculation.
[73] The NLW does not apply to workers aged 25 and under, for whom the statutory minimum wage is set at a lower level.

Given their over-representation at the bottom end of the earnings distribution, these changes could have profound implications for part-time workers (D'Arcy, 2018; Jones, 2015), bringing their wages much closer in line with those of full-time workers.

The NLW is not without its critics, however, and some warn of potential unintended consequences. There is often thought to be a trade-off between employment and wages, whereby increases in the minimum wage result in job losses. These fears appear to be largely misplaced, however. Existing evidence shows that employment losses are small, and confined to younger workers (Checchi and Salverda, 2014; D'Arcy, 2018). It has also been suggested that employers may respond to the NLW by reducing working hours for low-paid workers, or by increasing the use of zero-hours contracts (ZHCs) or 'bogus' self-employment (Low Pay Commission, 2017), but to date there is no evidence of these kind of effects (D'Arcy, 2018). Concerns have also been raised about whether the NLW could make pay progression more difficult, since a large proportion of workers will be earning at or just above the statutory minimum[74] in a context in which employers are adapting to a hike in wage costs (Brewer and Finch, 2018; D'Arcy et al., 2014; Jones, 2015; Rubery, 2017). There is some danger of a trade-off between low pay incidence and duration for part-time workers. The NLW may reduce the incidence of low pay for part-time workers, but at the same time make it more difficult for them to progress and secure meaningfully higher earnings. Recent analysis from the Resolution Foundation found evidence of an initial increase in the number of employees earning the statutory minimum after

[74] In the year 2000, around 2 per cent of the UK workforce was paid at or around the statutory minimum wage. This figure has risen substantially over the years, and is projected to rise to 15 per cent by 2020 (Brewer and Finch, 2018).

the introduction of the NLW, but this appears to have been a temporary effect (D'Arcy, 2018). There is, therefore, an indication that employers are maintaining levels of pay progression at the lower end of the earnings distribution, although more evidence is needed on this issue.

To summarise, the large 'low pay penalty' associated with part-time employment in the UK is likely to be related to historically high rates of low pay. This is a rapidly changing area, however, and recent policy developments have had a substantial effect on the wage structure (D'Arcy, 2018). The introduction of the NLW has already, and is likely to continue to, reduce the incidence of low pay, disproportionately benefitting part-time workers. The UK is still a long way from countries such as Sweden, however, where the incidence of low pay is below five per cent (Eurostat, 2016). Unless the UK is able to drastically reduce the incidence of low pay - which it may do, but much is likely to depend on how the NLW is implemented and the economic climate in which this occurs – then the gap in the risk of low pay between full-time and part-time workers is likely to remain pronounced. This ties in with the earlier discussion, where questions were raised about how far the policy environment in the UK has – or should be – promoting part-time employment, or whether steps should be taken to reduce reliance on this form of employment.

In the UK, and in the majority of European countries, the low pay penalty associated with part-time work is greater for men than for women

A consistent finding across several of the empirical papers is that the effect of working part time relative to full time on the risk of low pay is more pronounced

for men than for women. This is the case in the UK[75], and in the majority of European countries (the only exceptions are Cyprus and Sweden, where the gender difference is not statistically significant). As discussed in more detail elsewhere, it is difficult to say exactly why the increased risk of low pay associated with working part time rather than full time is more pronounced for men than for women. This might relate to the profile of men who work part time[76], the areas of the labour market in which these workers are located, or the way in which they are treated by employers. What is clear, however, is that omitting men from the discussion around part-time employment is no longer tenable. There have been previous efforts to integrate men into this discussion (O'Dorchai et al., 2007), but historically the default has often been to focus exclusively on women. Recent publications (Belfield et al., 2017; Gardiner and Gregg, 2017) have drawn attention to the issue of male part-time employment in the UK. The issue has received a fair amount of media attention, with concern expressed about low wages for men working part time (BBC, 2016; Beattie, 2017; Inman, 2017; Jones, 2018). A cynical observer might suggest that this issue had to be viewed from a 'male angle' to achieve this level of media interest, since it has been known for some time that low wages are often an issue for women working part time, and this issue rarely makes headlines.

It is important to be clear about what is, and is not, implied by these results concerning gender. The results show that men, too, face a 'low pay penalty' associated with part-time employment. They do not, however, demonstrate that

[75] In the UK, the negative effect of working part time relative to full time on the probability of escaping low pay is also more pronounced for men than for women, but this difference is not statistically significant.
[76] I.e. the extent to which these men have (potentially unobserved) attributes or characteristics that predispose them to low earnings.

in this regard men are disadvantaged to a greater extent than women. Firstly, it is not possible to rule out selection bias (although, particularly in the first paper, efforts are made to minimise it[77]). It may be that men working part time in particular are a 'selected' group, and that unobserved selection accounts for the greater part-time low pay penalty for men compared to women. Secondly, this issue disproportionately affects women because they work part time in greater numbers than men. It is important not to understate the 'numbers issue', since as outlined in more detail below, part-time employment continues to make a major contribution to female disadvantage in the labour market. The MP Philip Davis has claimed that 'there is also a [reverse] part-time pay gap where women are paid more than men' (BBC, 2016). This may be so, but it should not distract us from very real gender pay gap across the UK labour market as a whole (House of Commons, 2016), one that is profoundly shaped by women's disproportionate involvement in part-time work (Dias et al., 2018).

Part-time employment has historically played, and continues to play an important role in contributing to gender inequality in low pay

The analysis in this thesis shows that gendered patterns of full-time and part-time employment make a major contribution to gender inequality in low pay. Women have caught up, or even exceeded, men in other respects, such as educational qualifications and social class. The gendered 'one and a half' earner model offsets these advancements made by women, stalling progress towards

[77] In the first empirical paper, a Heckman model is used to adjust as far as possible for selection bias. This model adjusts for an individual's propensity to be in (full-time) employment. However, this latent variable may not capture all sources of unobserved heterogeneity between full-time and part-time workers, and therefore it is not possible to rule out selection bias.

gender parity in low earnings. Promoting gender equality is an explicit policy goal of both the European Union and the UK government, although rhetoric in this area has not always been accompanied by substantive policy change. At the European level, commentators have argued that the focus on gender equality has eroded over time (Fagan et al., 2006; Fagan and Rubery, 2017; Smith and Villa, 2010). Concern has shifted to a relatively narrow focus on promoting female employment, motivated primarily by economic priorities rather than an equality agenda. Gender gaps in the quality of employment and earnings have been marginalised and accorded lower importance (Fagan et al., 2006; Fagan and Rubery, 2017). Beginning with the re-launch of the European Employment Strategy (EES) in 2005, this trend pre-dates the 2007/2008 economic crisis (Fagan et al., 2006), although was no doubt exacerbated by it (Fagan and Rubery, 2017; Smith and Villa, 2010; Villa and Smith, 2014). The UK has historically been reluctant to support gender equality initiatives at the European level, prompting concerns about the path of change post-Brexit (Fagan and Rubery, 2017).

The narrative in which part-time employment is promoted or viewed as unproblematic – for instance, holding up the German 'mini job' policy as a model to be followed – must be viewed in this context (Fagan et al., 2006). For some, part-time employment is unambiguously a force for good, with the alternative taken to be high rates of inactivity for women. The primacy awarded to economic outcomes means that getting women into employment is seen as far more important than achieving equal labour market outcomes for men and women - in EES parlance, 'more' rather than 'better' jobs (Smith and Villa, 2010). This hierarchy of policy goals explains why policy in the UK has enabled, if not promoted, a part-time role for many women (Daly, 2011) despite stark warnings

from the Women and Equalities Select Committee that this arrangement perpetuates gender inequality (House of Commons, 2016). If economic concerns were subordinated to issues of equality and fairness, part-time employment would no doubt be viewed differently. The question that arises, then, is whether part-time employment is always inimical to gender equality, or whether there is potential for it to be transformed into an equalising force.

One school of thought holds that widespread use of part-time employment can co-exist with gender equality. In heterosexual couple households, the 'half' an earner in the one and a half earner model need not be a woman. If men and women were equally likely to take on this role, the wider issues outlined in this thesis might prevail but the negative implications for gender equality would dissipate. Part-time employment may also be used in ways other than the 'one and a half earner' model, for instance both members of a couple household working long part-time hours. In contrast to the UK, part-time employment has tended to be viewed more positively by policy-makers in the Netherlands (Visser, 2002; Yerkes and Visser, 2006). The 'combination model' preferred by the Dutch government rests on both male and female care-givers working long part-time hours (Plantenga, 2002). In the ideal of the combination model, part-time employment is instrumental, not only in redistributing working time between men and women, but also in creating equality therein:

> *'Part-time employment is also a core element of the combination model; flexible, non-full-time working hours for both men and women are deemed indispensable to reach gender equality'* (Plantenga, 2002: 55).

The problem with the 'combination model' is that, quite simply, it does not exist. In no country in the world, including the Netherlands, has this gender-neutral

model predicated on widespread part-time employment come to fruition. Even in the Netherlands the majority of part-time workers are women, and women continue to bear unequal responsibility for unpaid care and domestic work (Plantenga, 2002; Yerkes et al., 2010). Qualitative research shows that British women respond positively to the idea of the 'combination model', yet express concerns that the pay and conditions associated with part-time work are insufficient to make this option attractive to men (Warren et al., 2010).

There is evidence of a shift in social attitudes and behaviours in relation to male involvement in child care and other domestic work. Research shows that men in the UK are increasingly expected to, and want to, play an active and involved role in the domestic sphere (Brien, 2005; Crompton and Lyonette, 2008; Lyonette and Crompton, 2015), although this is more evident in relation to child care than housework (Brien, 2005). Time use surveys show that men have on average increased the amount of time they spend on unpaid domestic work (Altintas and Sullivan, 2016; Hook, 2006; Kan et al., 2011; Lader et al., 2006). However, the rate of change is slow, and social expectations and behaviours remain profoundly gendered. In relation to part-time employment, the female skew has become less pronounced over time, largely due to a growing proportion of men working part time. This is generally positioned as a product of poor labour market opportunities and underemployment, rather than as evidence of a shift in male working time preferences (Belfield et al., 2017; Gardiner and Gregg, 2017; Warren, 2015). Between 2001 and 2013, the proportion of 1.5 earner households declined and the proportion of dual full-time earner households increased (Connolly et al., 2016). However, the 1.5 earner arrangement remains widespread in the UK and highly gendered, particularly for those with a lower level of

education (Connolly et al., 2016). There is little evidence to suggest that the dominant 'one and a half earner' model is on course to become gender-neutral, at least not in the immediate future; but could it become so?

Cultural norms and values undoubtedly play a role in impeding radical change in gender roles. Qualitative and quantitative research supports the idea that working reduced hours, let alone becoming a full-time carer, is viewed as violating norms of masculinity. One qualitative study of working time norms in US law firms concludes:

> *'Men rarely consider the possibility of a reduced work schedule; for them it seems impractical, and they know that male peers regard taking it for family reasons as illegitimate – sometimes as unmanly'* (Fuchs Epstein et al., 1999: 5).

A recent experimental study, also from the US, shows that employees who request shorter working hours are viewed as less 'masculine' (Vandello et al., 2013). Esping-Andersen has described changing gender roles in western societies and economies as an 'incomplete revolution' (Esping-Andersen, 2002, 2009):

> *'Ongoing change in gender behaviour is producing an increasingly 'masculine' profile of female biographies. It is fairly clear that changes and adaptations in social behaviour have been pretty much limited to the female side of the gender coin. The egalitarian challenge is unlikely to find resolution unless, simultaneously, the male life course becomes more 'feminine'. In other words, if we want more gender equality our policies may have to concentrate on men's behaviour'* (Esping-Andersen, 2002: 70)

To date, policy decisions have been predominantly orientated towards encouraging women rather than men to change their behaviour with regard to paid employment and care (Yerkes et al., 2010). Increasingly, however, there are calls to use policy to render male biographies more 'feminine', i.e. to incentivise and encourage greater male involvement in unpaid care and domestic work.

The use of institutional arrangements to encourage men to alter their behaviour with regard to balancing paid and unpaid work is a fairly new policy area (Fagan and Norman, 2012). Some European countries, notably the Nordic countries, have used parental leave policy to promote a more gender-equal division of child care (Castro-García and Pazos-Moran, 2016; O'Brien et al., 2007; Ray et al., 2010). The schemes with the highest take-up of paternal leave have a 'daddy quota' and high replacement rates, plus flexibility regarding when and how to take the leave (Fagan and Norman, 2012; OECD, 2016b). Norway, Sweden, Finland and Iceland all have non-transferable parental leave reserved for fathers, and take-up rates in the region of 75-90 per cent (Fagan and Norman, 2012). Evidence supports the idea that this kind of non-transferable 'daddy leave' promotes a more equal distribution of domestic tasks (Bergman and Hobson, 2002; Brandth and Kvande, 1998, 2009; Bünning, 2015; Haas and Hwang, 2008; OECD, 2016b). In contrast, gender-neutral leave policies based on voluntary sharing are used disproportionately by women and are less successful at challenging gender norms. In the UK, Shared Parental Leave (SPL) was introduced in 2014, enabling both parents to take up to six months' paid leave following childbirth or adoption. Take-up has been low, with around five per cent of eligible fathers making use of SPL (CIPD, 2016). Without heeding calls to strengthen SPL to include non-transferable leave, as well bringing benefit generosity and entitlement in line with maternity leave, the impact on gender roles is likely to be modest (Atkinson, 2017).

The culture of long working hours also represents a barrier to redistributing working time between men and women. Long workers hours are relatively common in the UK, and highly gendered (Kodz et al., 2003; TUC, 2015). Often

positioned as the preserve of workers in professional and managerial occupations, long working hours are also common for men working in manual occupations (Warren, 2015). In occupations such as policing in which employees are expected work long hours and be 'ever available', part-time workers, and by extension women, tend to suffer by comparison (Dick, 2010). Qualitative research shows that British women in heterosexual couples often work part time to accommodate the long working hours of their male partners (Warren et al., 2010). Long working hours impede a gender-balanced distribution of care and domestic work, contributing to the dominant 'one and a half earner' arrangement in the UK.

A growing body of evidence points to long working hours as a driver of gender inequality, the flip side of the part-time effect identified in this thesis. In a context in which female labour force participation rates are high and rising, working long hours becomes a means of distinguishing oneself in the workplace – one from which men are disproportionately able to benefit. Analysing US data, Cha and Weeden identify growth in overwork (defined as working 50 or more hours per week) and increasing returns to overwork as a major trend working against gender convergence in pay (Cha and Weeden, 2014). Long working hours also work against greater male involvement in care and domestic work. For fathers in the UK, shorter working hours are associated with greater involvement in child care and housework (Norman, 2010; Smith and Williams, 2007; Tanaka and Waldfogel, 2007). There are major challenges to regulating and restricting long working hours for British workers, however. Unlike elsewhere in Europe, for instance France, Germany and the Netherlands, there is little precedent for a UK

government regulating or placing limits on working hours[78] (Barnard et al., 2003; Fagan and Rubery, 2017; Lewis and Campbell, 2007; Warren et al., 2010).

To summarise, gendered patterns of full-time and part-time employment represent a major barrier to gender equality in contemporary labour markets. One of the most concerning aspects of these patterns is the disproportionate representation of women in low-paid jobs. There seems to be little prospect of achieving gender parity in low earnings if this gendered division of paid and unpaid work continues, i.e. if men continue to disproportionately work long hours and women continue to disproportionately work short hours. There is some cause for optimism: social attitudes are increasingly supportive of gender equality, and time use is moving in a more gender-neutral direction. There is some scope for policy to promote male involvement in caring and domestic work, for instance the introduction of 'daddy leave' quotas for parental leave. Change is incremental, however, and the rate of advance slow. There is little to suggest a 'feminisation' of male biographies: it remains rare for men to choose part-time employment as a means of reconciling paid and unpaid work, and long working hours for men have increased rather than decreased. In the immediate term, it is clear that other interventions are needed alongside efforts to promote gender equality in working time. This thesis highlights the need to focus on dismantling barriers to full-time participation for women, as well as encouraging men to work fewer hours and take on more domestic responsibility.

Summary

[78] For instance, the UK government only agreed to the EU Working Time Directive (1998) only on the grounds that employees were able to opt out of the 48 hours per week maximum.

There are a number of ways in which the empirical findings in this thesis feed into current academic and policy debates. The evidence presented here shows that part-time workers are disadvantaged at the lower end of the earnings distribution, and the discussion section has reflected on some of the groups disproportionately affected by this issue (women, the low-skilled, workers from low-income households). Overall, the results raise questions concerning the extent to which the policy environment in the UK has, or should, promote part-time employment, and for whom. The discussion identifies several respects in which social policy has enabled, if not actively promoted, a part-time role for some working-age adults, the implications of which are both classed and gendered. This is contextualised in light of the relatively unequal labour market in the UK, and the potential for policy change to ameliorate issues around low pay and progression out of low pay.

Limitations of the research

The four empirical papers in this thesis provide more robust and comprehensive evidence on the part-time low pay penalty than has previously been available. Nevertheless, certain caveats must be issued about the limitations of the research and restrictions about the conclusions that can be drawn from it. Research is only as good as the instruments on which it is based, and the analysis for this thesis is based on secondary data sources. Part of the rationale for focusing on the UK is the access that is available to high quality cross-sectional and longitudinal data sets, as well as the opportunity to compare the UK to other countries using harmonised data. The analysis in this thesis is based on the UK Labour Force Survey (LFS), the longitudinal panel surveys Understanding Society (Usoc) and

the British Household Panel Survey (BHPS), as well as the European Structure of Earnings Survey (ESES). All of these surveys are based on large, nationally representative samples (Chandler, 2017; European Commission, 2014; Knies, 2016; Lynn, 2006; Lynn and Knies, 2016). Sampling and non-response present an issue for all surveys, but where possible in these surveys data are weighted to correct for this. The reliability of LFS data is further confirmed by comparing estimates to those from other data sources, including the UK census (Chandler, 2017). The reliability of these survey instruments adds confidence to the results outlined in this thesis, and the conclusions drawn from them. The results are broadly interpreted as representative of the UK labour market, and in the case of the comparative paper, labour markets elsewhere in Europe.

All data sources have limitations, however, and these surveys are no exception. As outlined in the thesis, a limitation of working with the LFS is a relatively high level of missing data on earnings (Skinner et al., 2002). To minimise bias from missing information, multiple imputation is performed (Rubin, 2004). Whilst this process offers superior estimates to those obtained by simply ignoring missing data (Allison, 2002), imputation inevitably introduces some degree of bias. It is reassuring to note that similar results were produced conducting the analysis before and after performing multiple imputation (see Appendix A and Appendix C). Missing earnings data is also an issue for Understanding Society and the BHPS, although in these surveys data are pre-imputed at the data processing stage (Knies, 2016; Lynn, 2006). As longitudinal data sets, Understanding Society and the BHPS also incur a risk of bias from data attrition (Lynn et al., 2012; Lynn and Lugtig, 2016). Drawn from an employer survey and/or administrative data, the ESES has minimal missing data on earnings, and as a cross-sectional data set

there is no danger of bias from attrition. The main limitation is that the ESES does not provide universal coverage of the labour market: the inclusion of workplaces with fewer than ten employees, as well as those in public administration, defence and social security (NACE Rev. 2 category O) is non-mandatory. The presence or absence of these categories of workers differs across countries, potentially introducing bias in cross-national comparisons. For countries for which the sample includes workplaces in public administration, the conclusions are robust to the exclusion of these workers (see Figure DVII in Appendix D) adding support to the conclusions in the comparative paper. However, it is not possible to confirm that the omission of workplaces in public administration in the other countries does not alter the results.

Limitations must also be recognised in relation to the methodologies used in this thesis. A common theme through the analysis is the perennial problem of selection bias. Individuals working full time and part time are likely to be distinctive in ways connected to their earnings, and some of these differences may be difficult to measure and control for. Without a well-designed randomised controlled trial (RCT), it is impossible to eliminate the possibility of omitted variable bias (Angrist and Pischke, 2009, 2015). A well-designed RCT eliminates selection bias because the groups being compared differ only in relation to the treatment and its consequences. Using observational data, it is only ever possible to achieve an approximation of this ideal (Winship and Morgan, 1999). The analysis in this thesis goes further than most studies in using statistical techniques to adjust for selection bias, employing a Heckman selection model and using a random effect to control for individual level time-invariant unobserved heterogeneity. Nevertheless, it is not possible to eliminate the

possibility of omitted variable bias entirely. This thesis therefore does not claim to identify causal relationships, but rather aims to provide sophisticated descriptive analysis.

The possibility of omitted variable bias is arguably strongest in relation to the country-level analysis. Country fixed effects, which are not used here, capture all heterogeneity at the national level and therefore avoid omitted variable bias, absorbing all country-level factors into a single effect (Möhring, 2012). However, the fixed effects approach does not allow researchers to identify how national-level characteristics contribute to country variation (Bryan and Jenkins, 2015), a key aim of the comparative paper. It is possible to estimate specific national-level effects using a multilevel model or a two-step method (Bryan and Jenkins, 2015). The latter approach is the one followed here, due to the small number of country level observations. Whilst this approach has a clear advantage in enabling institutional effects to be estimated, it leaves open the possibility of omitted variable bias.

If the number of characteristics associated with low earnings at the individual level is in itself challenging, the number of salient features at the national level is quite daunting. The availability of comparative datasets produced by Eurostat, the OECD and other bodies makes institutional-comparative analysis possible. Some national differences are simply not possible to measure or quantify in a meaningful way. Other institutional parameters may not be available, or may be simplified out of necessity. It is almost inevitable that comparative measures of country-level characteristics will fail to capture the complex interplay between, for example, different institutional and cultural factors. Limitations of this kind

are characteristic of all macro-comparative research, yet are worth making explicit. This is not to say that macro-comparative analysis of this kind is not helpful or illuminating. On the contrary, it enables researchers to identify salient features of the national environment and to estimate their effects. It is merely to point out that this is the correct interpretation – an estimate that is a necessary over-simplification, offering insight into why countries diverge from one another in relation to an outcome of interest.

Construct validity concerns how well definitions and measures align with their theoretical underpinnings (Bryman, 2012). In relation to this thesis, construct validity describes how accurately the measures of low pay and part-time employment capture the sociological phenomena of interest. Definitions and measures are selected based on theoretical considerations, as well as the importance of aligning with previous research. The question that arises is whether using different definitions and measures would produce divergent results. In relation to how part-time workers are identified, there is good reason to suggest that the answer is no. Where possible, robustness checks estimate the sensitivity of the results to the choice of part-time measure (see Appendix A, Appendix C and Appendix D). Supplementary analysis also explores whether individuals in marginal (short hour) part-time jobs are particularly disadvantaged in comparison to those in full-time jobs (see Appendix A and Appendix B). The results highlight consistency between different measures: relying on self-defined employment status produces similar results to using an hours-based cut-off. Whilst the overall risk of low pay is similar for workers in regular and marginal part-time jobs, all things being equal those in marginal

part-time jobs are less likely to progress out of low pay[79]. In relation to the dependent variable, using an absolute rather than relative measure of low pay might alter the results. However, since this approach does not fit with the theoretical underpinnings of the thesis[80], potential disparities are not a cause for concern. Choosing a different low pay threshold, for instance 50 or 60 per cent of the median wage rather than two-thirds, might also influence the results, but would hamper comparability with existing research.

As well as being limited in scope geographically, the analysis in this thesis is tied to a particular point in time. With the exception of the third empirical paper, the aim is not to explore change over time. The analysis simply makes use of the most recent wave (or waves) of data available. In some respects, the period of time covered by the empirical analysis might be considered atypical. Along with most other advanced economies, the UK economy was hit by the global economic crisis of 2008. The subsequent recession was associated with a rise in unemployment (Grimshaw and Rafferty, 2011; Horemans et al., 2015; Lallement, 2011), underemployment (Bell and Blanchflower, 2013; Heyes et al., 2017; Lallement, 2011; Warren, 2015) and involuntary part-time employment (Horemans et al., 2015). The government austerity drive linked to the recession also undoubtedly influenced employment and wages[81]. The UK recession ended

[79] The difference between workers in marginal and regular part-time jobs is statistically significant for women, but not for men.
[80] As discussed in more detail in the introduction and in the empirical papers, low pay is approached as a relative concept in this thesis because this is a better means of capturing problematically low earnings. Those defined as low paid using an absolute measure (e.g. the bottom ten per cent of wage earners) may have quite a different standard of living depending on cross-country and over-time variation in the dispersion of earnings.
[81] To take one example of an austerity-related policy affecting earnings, for instance, the pay freeze for public sector workers.

in the second quarter of 2009, but its long-term ramifications may be enduring. The analysis in this thesis does not estimate the effect of the economic crisis, a topic covered elsewhere (Gregg and Wadsworth, 2010; Grimshaw and Rafferty, 2011; Horemans et al., 2015; Karamessini and Rubery, 2014; Lallement, 2011; Warren, 2015). The danger is that the atypical economic environment produced by the crisis may represent a source of bias. Given the rise in involuntary part-time employment, the expectation would be for a closer link between part-time employment and low pay during the crisis years. If anything, however, there is evidence that the link between part-time employment and low pay declined over this period. The part-time low pay penalty is certainly not an aberration associated with the crisis, although it may have been influenced by it. The wider relevance of the results is also strengthened by the view that the post-crisis world should be considered the 'new normal' (El-Erian, 2010).

Directions for future research

Although it lies outside the scope of this thesis, low pay for self-employed workers and its relation to working hours is a topic ripe for future research. Throughout the four papers, self-employed workers are not included in the sample, nor do their earnings enter the calculation of the low pay threshold. The thesis makes no claim or inference about the relationship between working hours and low wages for self-employed workers. The decision to focus on employees is primarily driven by data availability and reliability: self-employed workers are not included in the ESES sample, and there are concerns about the accuracy of self-reported earnings from self-employment (D'Arcy and Gardiner, 2014). In addition, working part time may mean something different, or indeed not be

meaningful at all, in the context of self-employment. Self-employed workers comprise a large and growing portion of the UK labour force (European Commission, 2018; ONS, 2016b; Taylor et al., 2017). Growth in dependent or 'false' self-employment (Böheim and Mühlberger, 2009) and the rise of the 'gig economy' (Friedman, 2014) suggest that self-employment may be becoming increasingly precarious, and therefore of great relevance to the issue of low pay. The 'gig economy' in particular has parallels to zero-hours contracts (ZHCs) for employees, frequently characterised by short and uncertain working hours (Pennycook et al., 2013; Taylor et al., 2017). Underemployment for self-employed workers is also a sizable and growing issue (D'Arcy and Gardiner, 2014). In spite of the challenges involved in measuring earnings and working hours for self-employed workers, there is good reason to examine the relationship between the two, particularly in relation to the grey area between employment and self-employment.

Another way in which the research might be expanded is by examining the relationship between part-time employment and low pay in a wider set of countries. Reflecting both data restrictions and the need to select countries with broad political, economic and cultural similarities, the comparative analysis in this thesis is restricted to European countries. It would be interesting, for instance, to explore how these issues play out in the United States, a country with greater wage inequality and weaker labour market institutions than the UK (Blau and Kahn, 1996; Checchi and Salverda, 2014). Research on part-time employment has tended to focus on Anglo-Saxon and Western European countries. This geographical focus is understandable given restrictions on data availability and comparability, yet leaves a substantial gap in our understanding. Part-time

employment is commonplace, accounting for 10 per cent of more of total employment, in a diverse set of countries, including Japan, Indonesia, Chile, Israel, Brazil, Peru and Namibia (Fagan et al., 2013; ILO, 2016; OECD, 2016a). Relatively little is known about the nature and implications of part-time employment in some countries, particularly those in the 'developing' world. Research that does exist - for instance, an exploration of the effect of working part time on job satisfaction in Honduras (López Bóo et al., 2010) - highlights divergence from the findings of previous studies based in the 'developed' world. Future research might explore how the relationship between working time and low wages differs across countries and regions beyond the European variation identified in this thesis.

As well as focusing on a single country context, the UK, this thesis describes social relationships and processes at a specific point in time. The political, economic and social context in which part-time employment is embedded is not static, but in a continual state of flux. This thesis has pointed to several recent or forthcoming policy developments of relevance to this issue, the implications of which will need to be interrogated in future research. The new National Living Wave (NLW) has the potential to radically alter the wage distribution, particularly at the bottom end. Although the NLW is likely to lower the incidence of low pay, concerns have been raised about how this wage compression for low earners will affect opportunities for pay progression (D'Arcy et al., 2014; Rubery, 2017). Research is needed to tease out the effects of the NLW and to establish whether a trade-off between low pay incidence and duration emerges, and for whom. Given the results outlined in this thesis, there is a need to understand how these changes might differentially affect full-time and part-time workers,

and whether part-time workers end up in a more or less precarious position as a result.

The future may – or may not – bring change to gendered working time patterns. The policy landscape is undergoing considerable change in relation to child care and early years education. The expansion of free early years education has the potential to alter gendered patterns of labour force participation, although whether it will do so remains an open question. If policy reforms enable parents to work full time regardless of their household circumstances and income, the implications are likely to be profound. The result may be a decline in the part-time employment rate, and a de-feminisation of the part-time workforce. However, it is far from self-evident that planned reforms will have these kinds of effects. The reforms may not go far enough in the number of hours offered, or they may be implemented in an ineffective or piecemeal way. The potential for change is also likely to be limited by entrenched gender norms regarding working time, as well as the long working hours culture in many sectors and occupations. Future research will need to grapple with these issues, evaluating whether change to the institutional and cultural environment results in a smaller and/or less female part-time workforce, or whether this phenomenon remains resistant to change.

Technological advance represents a key driver of change, particularly in relation to labour market outcomes. Technical developments have already radically altered the structure of labour markets, producing greater inequality and polarisation (Goos et al., 2009; Goos and Manning, 2007). Projections indicate that between 2015 and 2020 technological and socio-demographic change will create 2

million jobs globally, but will also displace 5.1 million (World Economic Forum, 2016). In the ineluctable drive towards technological progress, further automation seems inevitable. Over the coming decades new technologies are likely to irrevocably alter the labour market, in particular the rapid advancement of Artificial Intelligence (AI). AI describes the development of computer systems able to perform tasks that normally require human intelligence. AI is already encroaching into domains once thought to be the unique presence of humans. Computer systems have been developed that are able to drive cars (Gibbs, 2017), and outperform the world's best players at the cognitively demanding game Go (Silver et al., 2016). To date, job automation has centred on routine and repetitive tasks (Autor et al., 2003; Autor and Dorn, 2009), but this need not be the case in the future. We are nearing a point where AI systems are able to perform a number of roles previously resistant to automation, including customer service and security roles (Ford, 2015). There is considerable uncertainty about what labour markets will look like in the AI world, and a great deal of concern about the potential for these developments to exacerbate inequality. It is unclear whether we will continue to see a 'hollowing out' of the labour market, or whether a different pattern will emerge. The OECD have warned that "AI puts more low-skilled jobs at risk than previous waves of technological progress" (Nedelkoska and Quintini, 2018: 8). The result may be fewer low-paid jobs, perhaps companied by rising unemployment (Ford, 2015) and an increase in short-hour working designed to minimise job losses.

In this new AI world, questions of how paid work is to be distributed across the labour force are more relevant than ever (O'Connor, 2017). This brings us full circle, back to Keynes and his vision of a 15-hour working week. Rather than

becoming uniformly low as Keynes predicted, working hours have expanded and diversified. This is perhaps unsurprising if we consider how working hours are embedded in structures of power in capitalist, patriarchal, class-based societies. We have become a nation of 'work rich' and 'work poor'[82], a divide closely linked to existing inequalities in age, gender, class and parental status. In reducing the overall amount of work available, AI is likely to exacerbate this issue. Given the dizzying speed of technological advance, there is an urgent need to understand how job automation will progress in the twenty-first century, and how it will affect the distribution of paid work. Research will be essential if the potential negative consequences of technology-driven labour market change are to be avoided, or mitigated. As this thesis has shown, part-time employment in the UK is already closely linked to low pay. Research will be essential in understanding how these relationships develop in the context of AI, and how best to support those less well placed to protect themselves from technology's inescapable advance.

[82] This language is more commonly used to describe working hours or 'work intensity' at the household level. However, the polarization of working hours at the individual level is also important. Individuals, too, may be 'work rich' or 'work poor' – increasingly so – and this is important in understanding inequality within households as well as between households.

VII. Conclusion

This thesis has presented new evidence on the nature of part-time employment in contemporary labour markets, focusing on Europe and the UK in particular. Rather than looking at the implications of working part time relative to full time for the average worker, this thesis looks to the lower end of the earnings distribution, examining the relationship between part-time employment and low pay. All things being equal, part-time workers experience low pay at higher rates than full-time workers, and face a lower likelihood of pay progression. If anything, men face a steeper part-time low pay penalty than women, demonstrating the importance of bringing men into the discussion around part-time employment. Due to the high proportion of part-time workers who are female, however, this part-time penalty makes a major contribution to the gender gap in low wages. Patterns of full-time and part-time employment are by far the most important observable trend accounting for the gender gap in low pay for UK employees. The analysis also highlights how part-time employment is both shaped by and contributes to social class inequalities.

It is clear from these findings that inequality in contemporary labour markets cannot be fully understood without taking part-time employment into account. There is little precedent for direct and explicit regulation of working hours in the UK, and we are unaccustomed to viewing this as a political issue. Nevertheless, working hours are a political issue; they are embedded in structures of power and inequality and they reproduce and perpetuate social divisions. The divide between 'work rich' and 'work poor' crosscuts various

inequalities in relation to age, gender, class and parental status. This has long been a domain in which women are disadvantaged as a result of their disproportionate involvement in care and domestic work. Increasingly, however, the 'work poor' are men - often young men with few skills and qualifications, who face limited opportunities for full-time employment. In the context of rapid technological advancement, these inequalities are likely to become further entrenched.

Working hours are also a political issue in that they are partly a product of the institutional environment. Social policy plays a role in shaping the distribution of working hours, as well as its relation to earning levels. This thesis has highlighted several ways in which social policy in the UK may have promoted a part-time role for some workers, particularly lone parents and second earners in couple households. That it does so regardless of concerns expressed by the government itself that this perpetuates gender inequality is indicative of a hierarchy of policy goals, in which considerations of equality and fairness are subordinated to economic priorities. Social policy also has an important role to play in mitigating overall wage inequality, as illustrated by the comparative analysis in this thesis. Part-time workers fare worse with regard to low pay in more unequal labour markets such as the UK, strengthening the case for policy interventions to compress the wage distribution and enable progression for low-waged workers. This thesis highlights the need to address this issue in a multifaceted way, by improving part-time job opportunities, reducing the incidence of low pay, improving progression opportunities for low-paid workers, and dismantling barriers to full-time employment.

VIII. Bibliography

Allaart P and Bellmann L (2007) Reasons for part-time work: an empirical analysis for Germany and The Netherlands. *International Journal of Manpower* 28(7): 557–570.

Allison P (1982) Discrete-Time Methods for the Analysis of Event Histories. *Sociological Methodology* 13(1982): 61–98.

Allison P (1999) Comparing Logit and Probit Coefficients Across Groups. *Sociological Methods & Research* 28(2): 186–208.

Allison P (2002) *Missing data*. London: Sage.

Altintas E and Sullivan O (2016) Fifty years of change updated: Cross-national gender convergence in housework. *Demographic Research* 35(16): 455–470.

Anderson L (2003) Sound Bite Legislation: The Employment Act 2002 and New Flexible Working 'Rights' for Parents. *Industrial Law Journal* 32(1): 37–42.

Angrist JD and Pischke J (2009) *Mostly Harmless Econometrics*. New Jersey: Princeton University Press.

Angrist JD and Pischke J (2015) *Mastering 'Metrics: the path from cause to effect*. Princeton, New Jersey: Princeton University Press.

Anttila T, Nätti J and Väisänen M (2005) The Experiments of Reduced Working Hours in Finland. *Community, Work and Family* 8(2): 187–209.

Anxo D, Fagan C, Smith M, et al. (2005) *Part-time work in European companies*. Eurofound, Dublin.

Arulampalam W, Booth AL and Bryan ML (2007) Is There a Glass Ceiling over Europe? Exploring the Gender Pay Gap across the Wage. *Industrial and Labor Relations Review* 60(2): 163–186.

Asplund R and Persson I (2000) Low Pay - A Special Affliction of Women. In: Gregory M, Salverda W, and Bazen S (eds), *Labour Market Inequalities: problems and policies of low-wage employment in international perspective*, Oxford: Oxford University Press, pp. 53–81.

Asthana A (2017) Take care of your elderly mothers and fathers, says Tory minister. *The Guardian*, 30th January.

Atkinson J (2017) Shared Parental Leave in the UK: Can it advance gender equality by changing fathers into co-parents? *International Journal of Law in Context* 13(3): 356–368.

Autor DH and Dorn D (2009) *Inequality and specialization: the growth of low-skill service jobs in the United States*. IZA Discussion Paper No. 4290, Bonn.

Autor DH, Levy F and Murnane RJ (2003) The Skill Content of Recent Technological Change: An Empirical Exploration. *The Quarterly Journal of Economics* 118(4): 1279–1333.

Barck-Holst P, Hellgren C, Åkerstedt T, et al. (2017) Reduced working hours and stress in the Swedish social services: a longitudinal study. *International Social Work* 60(4): 897–913.

Bardasi E and Gornick JC (2008) Working for less? Women's Part-time Wage Penalties Across Countries. *Feminist Economics* 14(1): 37–72.

Barnard C, Deakin S and Hobbs R (2003) Opting out of the 48-hour week: Employer necessity or individual choice? An empirical study of the operation of article 18(1)(b) of the working time directive in the UK. *Industrial Law Journal* 32(4): 223–252.

BBC (2016) Reality Check: Do men earn less for part-time work? *BBC News*, 21st December.

Beattie J (2017) Number of men working part-time in low paid jobs has quadrupled in 20 years. *The Mirror*, 13th January.

Beham B, Baierl A and Eckner J (2017) *Does Part-Time Employment Allow Parents to Stay on the Career Track? An Experimental Study Among German Managers*. Conference presentation, 7th International Community, Work and Family (CWF) conference, Milan.

Belfield C, Blundell R, Cribb J, et al. (2017) *Two decades of income inequality in Britain: the role of wages, household earnings and redistribution*. Institute for Fiscal Studies Working Paper W17/01, London.

Bell DNF and Blanchflower DG (2013) Underemployment in the UK revisited. *National Institute Economic Review* 224: F8–F22.

Bennett F (2012) Universal Credit: overview and gender implications. In: *Social Policy Review 24*, Bristol: Policy Press/Social Policy Association, pp. 15–34.

Bergman H and Hobson B (2002) Compulsory fatherhood: the coding of fatherhood in the Swedish welfare state. In: Hobson B (ed.), *Making Men into Fathers: Men, Masculinities and the Social Politics of Fatherhood*, Cambridge: Cambridge University Press, pp. 92–124.

Blau FD and Kahn LM (1996) International Differences in Male Wage Inequality: Institutions versus Market Forces. *Journal of Political Economy* 104(4): 791–837.

Blau FD and Kahn LM (2003) Understanding International Differences in the Gender Pay Gap. *Journal of Labor Economics* 21(1): 106–144.

Blau FD and Kahn LM (2007) The Gender Pay Gap: Have Women Gone as Far as They Can? *Academy of Management Perspectives* 21(1): 7–23.

Bleijenbergh I, de Bruijn J and Bussemaker J (2004) European Social Citizenship and Gender: The Part-time Work Directive. *European Journal of*

Industrial Relations 10(3): 309–328.

Blinder AS (1973) Wage Discrimination: Reduced Form and Structural Estimates. *Journal of Human Resources* 8(4): 436–455.

Böheim R and Mühlberger U (2009) Dependent self-employment: workers between employment and self-employment in the UK. *Zeitschrift für ArbeitsmarktForschung* 42(2): 182–195.

Brandth B and Kvande E (1998) Masculinity and child care: The reconstruction of fathering. *Sociological Review* 46(2): 293–313.

Brandth B and Kvande E (2009) Gendered or gender-neutral care politics for fathers? *Annals of the American Academy of Political and Social Science* 624(1): 177–189.

Brewer M and Finch D (2018) *Breaking Out: progressing out of low pay in the UK labour market*. Host Country Discussion Paper – United Kingdom, from the Peer Review on 'In-work progression - approaches and challenges'. Directorate-General for Employment, Social Affairs and Inclusion Mutual Learning Programme, European Commission.

Brewer M and Shaw J (2018) How taxes and welfare benefits affect work incentives: a lifecycle perspective. *Fiscal Studies* 39(1): 5–38.

Brewer M, Shaw J and Dias MC (2012) *A dynamic perspective on how the UK personal tax and benefit system affects work incentives and redistributes income*. Institute for Fiscal Studies Briefing Note BN132, London.

Brewer M, Dias MC and Shaw J (2012) *Lifetime inequality and redistribution*. Institute for Fiscal Studies Working Paper W12/23.

Brewer M, Finch D and Tomlinson D (2017) *Universal Remedy: Ensuring Universal Credit is fit for purpose*. Resolution Foundation, London.

Brien MO (2005) *Shared caring: bringing fathers into the frame*. Equal Opportunities Commission Working Paper No. 18, Manchester.

Bruegel I and Perrons D (1998) Deregulation and Women's Employment: The Diverse Experiences of Women in Britain. *Feminist Economics* 4(1): 103–125.

Bryan ML and Jenkins S (2015) Multilevel Modelling of Country Effects: A Cautionary Tale. *European Sociological Review* 32(1): 3–22.

Bryman A (2012) *Social Research Methods (4th edition)*. Oxford: Oxford University Press.

Buddelmeyer H, Mourre G and Ward M (2004) *Recent developments in part-time work in EU countries: Trends and policy*. IZA Discussion Paper No. 1415, Bonn.

Buddelmeyer H, Mourre G and Ward M (2008) *Why Do Europeans Work Part-Time? A Cross-Country Panel Analysis*. European Central Bank Working

Paper Series No. 872.

Budig MJ, Misra J and Boeckmann I (2016) Work-Family Policy Trade-Offs for Mothers? Unpacking the Cross-National Variation in Motherhood Earnings Penalties. *Work and Occupations* 42(2): 119–177.

Buis ML (2015) *Logistic regression: Why we often can do what we think we can do*. Downloaded from http://www.maartenbuis.nl/wp/odds_ratio.pdf.

Bukodi E, Dex S and Goldthorpe JH (2011) The conceptualisation and measurement of occupational hierarchies: A review, a proposal and some illustrative analyses. *Quality and Quantity* 45(3): 623–639.

Bünning M (2015) What happens after the 'Daddy Months'? Fathers' involvement in paid work, childcare, and housework after taking parental leave in Germany. *European Sociological Review* 31(6): 738–748.

Butler A and Rutter J (2016) *Creating an anti-poverty childcare system*. Joseph Rowntree Foundation (Programme Paper, York.

Cai L (2015) The dynamics of low pay employment in Australia. *International Journal of Manpower* 36(7): 1095–1123.

Cappellari L and Jenkins S (2008) Estimating low pay transition probabilities accounting for endogenous selection mechanisms. *Journal of the Royal Statistical Society: Series C (Applied Statistics)* 57(2): 165–186.

Card D and DiNardo JE (2002) Skill-Biased Technological Change and Rising Wage Inequality: Some Problems and Puzzles. *Journal of Labor Economics* 20(4): 733–783.

Carmichael F, Hulme C, Sheppard S, et al. (2008) Work-life imbalance: Informal care and paid employment in the UK. *Feminist Economics* 14(2): 3–35.

Castro-García C and Pazos-Moran M (2016) Parental Leave Policy and Gender Equality in Europe. *Feminist Economics* 22(3): 51–73.

Centre for Social Justice (2018) *The Future of Work. Part I: State of the Nation*. London.

Cha Y and Weeden KA (2014) Overwork and the Slow Convergence in the Gender Gap in Wages. *American Sociological Review* 79(3): 457–484.

Chandler M (2017) *Monitoring the quality of Labour Force Survey results*. Office for National Statistics, London.

Checchi D and Salverda W (2014) *Labour-Market Institutions and the Dispersion of Wage Earnings*. IZA Discussion Paper No. 8220, Bonn.

Chevalier A (2007) Education, occupation and career expectations: Determinants of the gender pay gap for UK graduates. *Oxford Bulletin of Economics and Statistics* 69(6): 819–842.

Christian Dreger, Lopez-Bazo E, Ramos R, et al. (2015) *Wage and Income Inequality in the European Union*. European Parliament, Brussels.

Christofides LN, Polycarpou A and Vrachimis K (2013) Gender wage gaps, 'sticky floors' and 'glass ceilings' in Europe. *Labour Economics* 21(March 2009): 86–102.

Ciccia R and Bleijenbergh I (2014) After the Male Breadwinner Model? Childcare Services and the Division of Labor in European Countries After the Male Breadwinner Model? Childcare Services and the Division of Labour in European countries. *Social Politics* 21(1): 50–79.

CIPD (2016) *Labour Market Outlook – Focus on Working Parents*. London.

Clark K and Kanellopoulos NC (2013) Low pay persistence in Europe. *Labour Economics* 23: 122–134.

Connolly S and Gregory M (2008) Moving Down: Women's Part-Time Work and Occupational Change in Britain 1991-2001. *The Economic Journal* 118(526): 52–76.

Connolly S, Aldrich M, O'Brien M, et al. (2016) Britain's slow movement to a gender egalitarian equilibrium: parents and employment in the UK 2001–13. *Work, Employment and Society* 30(5): 838–857.

Cory G (2015) *Extending the Early Years Entitlement Costings, Concerns and Alternatives*. Institute for Public Policy Research, London.

Crompton R (2010) Class and Employment. *Work, Employment and Society* 24(1): 9–26.

Crompton R and Lyonette C (2008) Who does the housework? The division of labour within the home. In: Park A, Curtice J, Thomson K, et al. (eds), *British Social Attitudes: The 24th Report.*, London: Sage, p. 53–80.

D'Arcy C (2018) *Low Pay Britain 2018*. Resolution Foundation, London.

D'Arcy C and Finch D (2017) *The Great Escape? Low pay and progression in the UK's labour market*. Resolution Foundation and the Social Mobility Commission, London.

D'Arcy C and Gardiner L (2014) *Just the job - or a working compromise? The challenging nature of self-employment in the UK*. Resolution Foundation, London.

D'Arcy C, Hurrell A, Grimshaw D, et al. (2014) *Escape Plan: understanding who progresses from low pay and who gets stuck*. Resolution Foundation, London.

Dahl S-Å, Nesheim T and Olsen KM (2009) *Quality of work – concept and measurement*. Working Papers on the Reconciliation of Work and Welfare in Europe REC-WP 05/2009, Edinburgh.

Daly M (2011) What Adult Worker Model? A Critical Look at Recent Social Policy Reform in Europe from a Gender and Family Perspective. *Social*

Politics 18(1): 1–23.

de Beer P (2007) Why work is not a panacea: A decomposition analysis of EU-15 countries. *Journal of European Social Policy* 17(4): 375–388.

Department for Work and Pensions (2010) *Universal Credit: Welfare that Works*. London.

Dex S and Bukodi E (2012) The Effects of Part-Time Work on Women's Occupational Mobility in Britain: Evidence from the 1958 Birth Cohort Study. *National Institute Economic Review* 222: R20–R37.

Dex S, Sutherland H and Joshi H (2000) Effects of Minimum Wages on the Gender Pay Gap. *National Institute Economic Review* 173(1): 80–88.

Dex S, Ward K and Joshi H (2008) Changes in women's occupations and occupational mobility over 25 years. In: Scott J (ed.), *Women and Employment: Changing Lives and New Challenges*, Cheltenham: Edward Elgar, pp. 54–80.

Dias MC, Joyce R and Parodi F (2018) *The gender pay gap in the UK: children and experience in work*. Institute for Fiscal Studies, London.

Dick P (2010) The transition to motherhood and part-time working: Mutuality and incongruence in the psychological contracts existing between managers and employees. *Work, Employment and Society* 24(3): 508–525.

Dickens R and Manning A (2004) Has the National Minimum Wage Reduced UK Wage Inequality? *Journal of the Royal Statistical Society* 167(4): 613–626.

Dolton P, Bondibene CR and Wadsworth J (2010) The UK National Minimum Wage in Retrospect. *Fiscal Studies* 31(4): 509–534.

Dwyer P and Wright S (2014) Universal credit, ubiquitous conditionality and its implications for social citizenship. *Journal of Poverty and Social Justice* 22(1): 27–35.

Edwards R and Duncan S (1997) Lone Mothers and Paid Work - Rational Economic Man or Gendered Moral Rationalities? *Feminist Economics* 3(2): 29–61.

El-Erian MA (2010) *Navigating the New normal in industrial countries*. Per Jacobsson Foundation, Washington, DC.

Elsayed A, de Grip A and Fouarge D (2017) Computer Use, Job Tasks and the Part-Time Pay Penalty. *British Journal of Industrial Relations* 55(1): 58–82.

Equality Act (2010) The Equality Act (Gender Pay Gap Information) Regulations 2017.

Erikson R, Goldthorpe JH and Portocarero L (1979) Intergenerational Class Mobility in Three Western European Societies: England, France and Sweden. *British Journal of Sociology* 30(4): 415–441.

Ermisch JF and Wright RE (1993) Wage Offers and Full-Time and Part-Time Employment by British Women. *Journal of Human Resources* 28(1): 111–133.

Esping-Andersen G (2002) A New Gender Contract. In: Esping-Andersen G (ed.), *Why We Need a New Welfare State*, Oxford: Oxford University Press, pp. 68–95.

Esping-Andersen G (2009) *The Incomplete Revolution: Adapting to Women's New Roles*. *European Sociological Review*, Cambridge: Polity Press.

Eurofound (2006) *Working Time Options Over the Life Course: New Work Patterns and Company Strategies*. Dublin.

Eurofound (2009) *Working conditions in the European Union: Working time and work intensity*. Dublin.

Eurofound (2015) *Recent developments in the distribution of wages in Europe*. Publications Office of the European Union, Luxembourg.

European Commission (2014) *Structure of Earnings Survey 2014: Eurostat's arrangements for implementing the Council Regulation 530/1999, the Commission Regulations 1916/2000 and 1738/2005*. Eurostat, Luxembourg.

European Commission (2018) *Key policy messages from the Peer Review on 'In-work progression – approaches and challenges'*. Directorate-General for Employment, Social Affairs and Inclusion Mutual Learning Programme.

Eurostat (2016) *Eurostat Database*. Luxembourg.

Evans G (1992) Testing the Validity of the Goldthorpe Class Schema. *European Sociological Review* 8(3): 211–232.

Evans G and Mills C (1998) Identifying class structure: A latent class analysis of the criterion-related and construct validity of the Goldthorpe class schema. *European Sociological Review* 14(1): 87–106.

Fagan C (2001) Time, Money and the Gender Order: Work Orientations and Working-Time Preferences in Britain. *Gender, Work and Organization* 8(3): 239–266.

Fagan C and Norman H (2012) Men and gender equality: tackling gender segregation in family roles and in social care jobs. In: Bettio F, Plantenga J, and Smith M (eds), *Gender and the European Labour Market*, London: Routledge, pp. 199–223.

Fagan C and Rubery J (1996) The Salience of the Part-time Divide in the European Union. *European Sociological Review* 12(3): 227–250.

Fagan C and Rubery J (2017) Advancing Gender Equality through European Employment Policy: The Impact of the UK's EU Membership and the Risks of Brexit. *Social Policy and Society*: 1–21.

Fagan C and Walthery P (2014) Working time capabilities at the workplace: individual adjustment options between full-time and part-time working in

European firms. In: Hobson B (ed.), *Work-Life Balance: The Agency and Capabilities Gap*, Oxford: Oxford University Press, pp. 174–205.

Fagan C, Grimshaw D and Rubery J (2006) The subordination of the gender equality objective: the National Reform Programmes and 'making work pay' oplicies. *Industrial Relations Journal* 37(6): 571–592.

Fagan C, Norman H, Smith M, et al. (2013) *In Search of Good Quality Part-time Employment*. International Labour Office, Geneva.

Fairlie RW (2006) *An Extension of the Blinder-Oaxaca Decomposition Technique To Logit and Probit Models*. IZA Discussion Paper No. 1917, Bonn.

Flynn L (2017) Childcare markets and maternal employment: A typology. *Journal of European Social Policy* 27(3): 260–275.

Ford M (2015) *The Rise of the Robosts: Technology and the Threat of Mass Unemployment*. London: Oneworld Publications.

Freedland M and Kilpatrick C (2004) The United Kingdom: how is EU governance transformative? In: Sciarra S, Davies P, and Freedland M (eds), *Employment Policy and the Regulation of Part-time Work in the European Union*, Cambridge: Cambridge University Press, pp. 299–357.

Friedman G (2014) Workers without employers: shadow corporations and the rise of the gig economy. *Review of Keynesian Economics* 2(2): 171–188.

Fuchs Epstein C, Seron C, Oglensky B, et al. (1999) *The Part-Time Paradox: time norms, professional lives, family and gender*. New York and London: Routledge.

Gallie D (2007) Production Regimes and the Quality of Employment in Europe. *Annual Review of Sociology* 33(1): 85–104.

Gallie D and Zhou Y (2011) The changing job skills of female part-time workers in Britain 1992-2006. *Human Resource Management Journal* 21(1): 28–44.

Galor O and David W (1996) The Gender Gap, Fertility and Growth. *The American Economic Review* 86(3): 374–387.

Ganzeboom HBG, De Graaf PM and Treiman DJ (1992) A standard socio-economic index of occupational status. *Social Science Reserach* 21(1): 1–56.

Gardiner L and Gregg P (2017) *Study, Work, Progress, Repeat? How and why pay and progression outcomes have differed across cohorts*. Resolution Foundation, London.

Gash V (2008) Preference or constraint? Part-time workers' transitions in Denmark, France and the United Kingdom. *Work, Employment and Society* 22(4): 655–674.

Gibbs S (2017) Google sibling Waymo launches fully autonomous ride-hailing service. *The Guardian*, 7th November.

Giddens A (1996) *Capitalism and modern social theory : an analysis of the writings of Marx, Durkheim and Max Weber*. Cambridge: Cambridge University Press.

Gilles Raveaud (2007) The European employment strategy: Towards more and better jobs? *Journal of Common Market Studies* 45(2): 411–434.

Ginn J, Arber S, Brannen J, et al. (1996) Feminist fallacies: a reply to Hakim on women's employment. *British Journal of Sociology* 47(1): 167–174.

Goldthorpe J (2007) *On Sociology*. 2nd ed. Stanford, California: Stanford University Press.

Goos M and Manning A (2007) Lousy and lovely jobs: the rising polarization of work in Britain. *The Review of Economics and Statistics* 89(1): 118–133.

Goos M, Manning A and Salomons A (2009) Job Polarization in Europe. *American Economic Association* 99(2): 58–63.

Grant L, Yeandle S and Buckner L (2006) *Working Below Potential: Women and Part-time Work*. Centre for Social Inclusion, Sheffield Hallam University.

Gregg P and Wadsworth J (2010) Employment in recession. *Economic and Labour Market Review* 4(8): 37–43.

Gregory M (2012) Gender and Economic Inequality. In: Nolan B, Salverda W, and Smeeding TM (eds), *The Oxford Handbook of Economic Inequality*, Oxford: Oxford University Press, pp. 284–384.

Gregory M and Connolly S (2008) The Price of Reconciliation: Part-Time Work, Families and Women's Satisfaction. *The Economic Journal* 118: F1–F7.

Grimshaw D (2011) *What do we know about low-wage work and low-wage workers? Analysing the definitions, patterns, causes and consequences in international perspective*. International Labour Office, Geneva.

Grimshaw D and Rafferty A (2011) Social Impact of the Crisis in the United Kingdom: Focus on Gender and Age Inequalities. In: Vaughan-Whitehead D (ed.), *Work Inequalities in the Crisis: Evidence from Europe*, Cheltenham: Edward Elgar, pp. 525–569.

Grimshaw D and Rubery J (2007) *Undervaluing women's work*. Equal Opportunities Commission Working Paper Series No. 53, European Work and Employment Research Centre, University of Manchester.

Haas L and Hwang CP (2008) The impact of taking parental leave on fathers' Participation in childcare and relationships with children: Lessons from Sweden. *Community, Work and Family* 11(1): 85–104.

Hakim C (1991) Grateful Slaves and Self-Made Women: Fact and Fantasy in Women's Work Orientations. *European Sociological Review* 7(2): 101–121.

Hakim C (1995) Five Feminist Myths about Women's Employment. *British Journal of Sociology* 46(3): 429–455.

Hakim C (2001) A Sociological Perspective on Part-time Work. In: Blossfeld H-P and Hakim C (eds), *Between Equalization and Marginalization: women working part-time in Europe and the United States of America*, Oxford: Oxford University Press, pp. 22–70.

Hakim C (2002) Lifestyle Preferences as Determinants of Women's Differentiated Labor Market Careers. *Work and Occupations* 29(4): 428–459.

Hall PA and Soskice D (2001) *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford: Oxford University Press.

Hanushek EA (1974) Efficient Estimators for Regressing Regression Coefficients. *The American Statistician* 28(2): 66–67.

Harding C, Wheaton B and Butler A (2017) *Childcare Survey 2017*. Family and Childcare Trust, London.

Hardoy I and Schøne P (2006) The part-time wage gap: How large is it really? *British Journal of Industrial Relations* 44(2): 263–282.

Harkness S (1996) The Gender Earnings Gap: Evidence from the UK. *Fiscal Studies* 17(2): 1–36.

Harkness S and Waldfogel J (1999) *The family gap: evidence from seven industrialised countries*. CASE Working Paper No. 29, London School of Economics.

Harrison E and Rose D (2006) *The European Socio-economic Classification (ESeC) User Guide*. Institute for Social and Economic Research, University of Essex.

Harrison E, Pevalin D and Rose D (2009) The European Socio-economic Classification: a prolegomenon. In: Rose D and Harrison E (eds), *Social Class in Europe: An introduction to the European Socio-economic Classification*, London and New York: Routledge, pp. 3–38.

Heckman JJ (1979) Sample Selection Bias as a Specification Error. *Econometrica* 47(1): 153–161.

Heyes J, Tomlinson M and Whitworth A (2017) Underemployment and well-being in the UK before and after the Great Recession. *Work, Employment and Society* 31(1): 71–89.

Himmelweit S and Sigala M (2004) Choice and the Relationship between Identities and Behaviour for Mothers with Pre-School Children: Some Implications for Policy from a UK Study. *Journal of Social Policy* 33(3): 455–478.

Hirsch BT (2005) Why do part-time workers earn less? The role of worker and job skills. *Industrial and Labor Relations Review* 58(4): 525–551.

Hook JL (2006) Care in Context: Men's Unpaid Work in 20 Countries, 1965–2003. *American Sociological Review* 71(4): 639–660.

Horemans J, Marx I and Nolan B (2015) *Hanging in, but only just. Part-time employment and in-work poverty throughout the crisis*. CSB Working Paper No.15/03, University of Antwerp, Antwerp.

House of Commons (2016) *Gender Pay Gap*. Women and Equalities Select Committee Report, Second Report of Session 2015-2016, London.

ILO (2006) *Decent Working Time: New Trends, New Issues*. Geneva.

ILO (2007) *Working Time Around the World:Trends in Working Hours, Laws and Policies in a Global Comparative Perspective*. Geneva.

ILO (2016) *ILOSTAT Database*. Geneva.

Inman P (2017) UK's low pay culture traps people in poorly paid jobs, study finds. *The Guardian*, 18th October.

Istenič T, Ograjenšek I and Sambt J (2018) The gender gap in economic dependency over the life cycle: Some theoretical and practical considerations. *Economic Research-Ekonomska Istraživanja*, Routledge 31(1): 188–205.

Jann B (2008) The Blinder–Oaxaca decomposition for linear regression models. *Stata Journal* 8(4): 453–479.

Jenkins S (2008) *Survival Analysis using Stata*. Downloaded from https://www.iser.essex.ac.uk/resources/survival-analysis-with-stata.

Jepsen M, O'Dorchai S, Plasman R, et al. (2001) *The wage penalty induced by part-time work: the case of Belgium*. Document de Travail Working Paper N°05-17.RS, Brussels.

Jones A (2018) Shift in working patterns means more men are working part time. *The Independent*, 14th January.

Jones D (2015) The National Living Wage - some good news, some big questions. *NESTA blog*, 7th September.

Joshi H, Paci P and Waldfogel J (1999) The Wages of Motherhood: Better or Worse? *Cambridge Journal of Economics* 23(5): 543–564.

Joshi H, Makepeace G and Dolton P (2007) More or Less Unequal? Evidence on the Pay of Men and Women from the British Birth Cohort Studies. *Gender, Work and Organization Organization* 14(1): 37–55.

Kallis G, Kalush M, Flynn HO, et al. (2013) "Friday off": Reducing Working Hours in Europe. *Sustainability* 5: 1545–1567.

Kan MY (2007) Work Orientation and Wives' Employment Careers. *Work and Occupations* 34(4): 430–462.

Kan MY, Sullivan O and Gershuny J (2011) Gender convergence in domestic work: Discerning the effects of interactional and institutional barriers from large-scale data. *Sociology* 45(2): 234–251.

Karamessini M and Rubery J (eds) (2014) *Women and austerity: the economic crisis and the future for gender equality*. London and New York: Routledge.

Karlson KB, Holm A and Breen R (2012) Comparing Regression Coefficients Between Models using Logit and Probit: A New Method. *Sociological Methodology* 42(1): 286–313.

Keynes JM (2010) *Essays in Persuasion*. London: Palgrave Macmillan.

Knabe A and Plum A (2013) Low-wage jobs - springboard to high-paid ones? *Labour* 27(3): 310–330.

Knies G (2016) *Understanding Society: The UK Household Longitudinal Study Waves 1-6 User Guide*. Institute for Social and Economic Research (ISER), University of Essex.

Knies G (2017) *Understanding Society: The UK Household Longitudinal Study Waves 1-7 User Guide*. Institute for Social and Economic Research, University of Essex.

Kodz J, Davis S, Lain D, et al. (2003) *Working long hours: a review of the evidence.* Department of Trade and Industry Employment Relations Research Series No. 16, London.

Kohler U, Karlson KB and Holm A (2011) Comparing coefficients of nested nonlinear probability models. *Stata Journal* 11(3): 420–438.

Kuha J and Mills C (2017) On Group Comparisons with Logistic Regression Models. *Sociological Methods and Research*: 1–28.

Kuhn P and Lozano F (2008) The Expanding Workweek? Understanding Trends in Long Work Hours among U.S. Men, 1979–2006. *Journal of Labor Economics* 26(2): 311–343.

Labour Party (2017) *The Labour Party Manifesto 2017*. London.

Lader D, Short S and Gershuny J (2006) *The Time Use Survey*. Office for National Statistics, London.

Lallement M (2011) Europe and the economic crisis: Forms of labour market adjustment and varieties of capitalism. *Work, Employment and Society* 25(4): 627–641.

Levanon A and Grusky DB (2016) The Persistence of Extreme Gender Segregation in the Twenty-first Century. *American Journal of Sociology* 122(2): 573–619.

Lewis J and Campbell M (2007) Work/family balance policies in the UK since 1997: A new departure? *Journal of Social Policy* 36(3): 365–381.

Lewis J and West A (2016) Early Childhood Education and Care in England under Austerity: Continuity or Change in Political Ideas, Policy Goals, Availability, Affordability and Quality in a Childcare Market? *Journal of Social Policy* 46(2): 1–18.

LLoyd C, Mason G and Mayhew K (eds) (2008) *Low-Paid Work in the United Kingdom*. New York: Russel Sage Foundation.

Local Government Association (2011) *Adult Social Care Funding: State of the Nation 2017*. London.

Longhi S and Nandi A (2015) *A Practical Guide to Using Panel Data*. London: Sage.

López Bóo F, Madrigal L and Pagés C (2010) Part-Time Work, Gender and Job Satisfaction: Evidence from a Developing Country. *Journal of Development Studies* 46(9): 1543–1571.

Low Pay Commission (2017) *National Minimum Wage: Low Pay Commission Report 2017*. London.

Lucifora C and Salverda W (2012) Low Pay. In: Nolan B, Salverda W, and Smeeding TM (eds), *The Oxford Handbook of Economic Inequality*, Oxford: Oxford University Press, pp. 257–283.

Lucifora C, McK, Night A, et al. (2005) Low-wage employment in Europe: a review of the evidence. *Socio-Economic Review* 3(2): 259–292.

Lynn P (2006) *Quality Profile: British Household Panel Survey*. Institute for Social and Economic Research, University of Essex.

Lynn P and Knies G (2016) *Understanding Society Waves 1-5 Quality Profile*. Institute for Social and Economic Research, University of Essex.

Lynn P and Lugtig PJ (2016) *Total Survey Error for Longitudinal Surveys*. Understanding Society Working Paper Series No. 2016 – 07, Essex.

Lynn P, Burton J, Kaminska O, et al. (2012) *An initial look at non-response and attrition in Understanding Society*. *Understanding Society Working Paper Series*, Understanding Society Working Paper Series No. 2012 – 02, Essex.

Lyonette C and Crompton R (2015) Sharing the load? Partners' relative earnings and the division of domestic labour. *Work, Employment and Society* 29(1): 23–40.

Maître B, Nolan B and Whelan CT (2012) Low Pay, in-Work Poverty and Economic Vulnerability: a Comparative Analysis Using Eu-Silc. *The Manchester School* 80(1): 99–116.

Mandel H and Semyonov M (2014) Gender Pay Gap and Employment Sector: Sources of Earnings Disparities in the United States, 1970–2010. *Demography* 51(5): 1597–1618.

Manning A and Petrongolo B (2008) The Part-Time Pay Penalty for Women in Britain. *The Economic Journal* 118(526): 28–51.

Marx I and Nolan B (2012) *In-Work Poverty*. AIAS, GINI Discussion Paper No. 51.

Marx I and Verbist G (1998) Low-Paid Work and Poverty: A Cross-Country Perspective. In: Gregory M, Salverda W, and Bazer S (eds), *Low-Wage Employment in Europe*, Cheltenham: Elgar, Edward, pp. 63–86.

Marx I, Nolan B and Marchal S (2012) *Mind the Gap : Net Incomes of Minimum Wage Workers in the EU and the US*. IZA Discussion Paper No. 6510, Bonn.

Mason G, Mayhew K, Osborne M, et al. (2008) Low Pay, Labor Market Institutions and Job Quality in the United Kingdom. In: Lloyd C, Mason G, and Mayhew G (eds), *Low-Wage Work in the United Kingdom*, New York: Russel Sage Foundation, pp. 41–95.

Matteazzi E, Pailhé A and Solaz A (2014) Part-time wage penalties for women in prime age: A matter of selection or segregation? Evidence from four European countries. *Industrial and Labor Relations Review* 67(3): 955–985.

McDowell L, Ray K, Perrons D, et al. (2005) Women's paid work and moral economies of care. *Social and Cultural Geography* 6(2): 219–236.

McGinnity F and McManus P (2007) Paying the price for reconciling work and family life: Comparing the wage penalty for women's part-time work in Britain, Germany and the United States. *Journal of Comparative Policy Analysis: Research and Practice* 9(2): 115–134.

McKnight A and Stewart K (2015) *Low pay and in-work poverty: preventative measures and preventative approaches*. Centre for Analysis of Social Exclusion, LSE.

Mills C and Evans G (2000) In search of the wage-labour/service contract: new evidence on the validity of the Goldthorpe class schema. *British Journal of Sociology* 51(4): 641–661.

Misra J, Budig M and Böckmann I (2010) *The Motherhood Penalty in Cross-National Perspective: The Importance of Work-Family Policies and Cultural Attitudes*. Luxembourg Income Study Working Paper No. 542.

Möhring K (2012) *The fixed effect as an alternative to multilevel analysis for cross-national analyses*. GK SOCLIFE Working Paper No. 16, Cologne.

Mood C (2010) Logistic regression: Why we cannot do what We think we can do, and what we can do about it. *European Sociological Review* 26(1): 67–82.

Mutari E and Figart DM (2001) Europe at a Crossroads: Harmonization, Liberalization and the Gender of work Time. *Social Politics* 8(1): 36–64.

Naldini M, Pavolini E and Solera C (2016) Female employment and elderly care: the role of care policies and culture in 21 European countries. *Work, Employment and Society* 30(4): 607–630.

Nedelkoska L and Quintini G (2018) *Automation, skills use and training*. OECD Social, Employment and Migration Working Papers, No. 202, Paris.

Neuburger J, Joshi H and Dex S (2011) *Part-time working and pay amongst*

Millennium Cohort Study mothers. Centre for Longitudinal Studies Working Paper 2011/2, London.

Neuman S and Oaxaca RL (2004) Wage decompositions with selectivity-corrected wage equations: A methodological note. *Journal of Economic Inequality* 2(1): 3–10.

Neumark D (1988) Employers' Discriminatory Behavior and the Estimation of Wage Discrimination. *The Journal of Human Resources* 23(3): 279–295.

New Economics Foundation (2010) *21 Hours: why a shorter working week can help us all to flourish in the 21st century*. London.

Nightingale M (2018a) Looking beyond average earnings: why are male and female part-time employees in the UK more likely to be low paid than their full-time counterparts? *Forthcoming*.

Nightingale M (2018b) Part-time employment and the gender gap in low pay for UK employees: what changed over the period 1996 – 2016? *Forthcoming*.

Norman H (2010) Involved fatherhood : an analysis of the conditions associated with paternal involvement in childcare and housework. Doctoral thesis, University of Manchester.

O'Brien M, Brandth B and Kvande E (2007) Fathers, Work and Family Life. *Community, Work and Family* 10(4): 375–386.

O'Connor S (2017) Robots will drive us to rethink the way we distribute work. *Financial Times*, 28th November.

O'Dorchai S, Plasman R and Rycx F (2007) *The part-time wage penalty in European countries: how large is it for men?* IZA Discussion Paper No. 2591, Bonn.

O'Reilly J, Smith M, Deakin S, et al. (2015) Equal Pay as a Moving Target: International perspectives on forty-years of addressing the gender pay gap. *Cambridge Journal of Economics* 2(1): 299–317.

Oaxaca RL (1973) Male-Female Wage Differentials in Urban Labor Markets. *International Economic Review* 14(3): 693–709.

Oaxaca RL and Ransom MR (1994) One Discrimination and the Decomposition of Wage Differentials. *Journal of Econometrics* 61: 5–21.

OECD (2008) *Growing Unequal: Income Distribution and Poverty in OECD Countries*. Paris.

OECD (2010) *OECD Employment Outlook 2010: Moving Beyond the Jobs Crisis*. Paris.

OECD (2012) *Closing the Gender Gap: Act Now*. Paris.

OECD (2016a) *OECD.stat (database)*. Paris.

OECD (2016b) *Parental leave: Where are the fathers?* OECD Policy Brief, Paris.

Oliver D (2015) We cannot keep ignoring the crisis in social care. *BMJ* 350(h2684).

Olivetti C and Petrongolo B (2016) The Evolution of Gender Gaps in Industrialized Countries. *Annual Review of Economics* 8(1): 405–434.

ONS (2005) *The National Statistics Socio-economic Classification User Manual*. London.

ONS (2016a) *Contracts that do not guarantee a minimum number of hours: September 2016*. London.

ONS (2016b) *Trends in Self-employment in the UK: 2001 to 2015.* London.

Orloff AS (1993) Gender and the Social Rights of Citizenship : The Comparative Analysis of Gender Relations and Welfare States. *American Sociological Review* 58(3): 303–328.

Pavlopoulos D and Fouarge D (2010) Escaping low pay: Do male labour market entrants stand a chance? *International Journal of Manpower* 31(8): 908–927.

Pedulla DS (2016) Penalized or Protected? Gender and the Consequences of Nonstandard and Mismatched Employment Histories. *American Sociological Review* 81(2): 262–289.

Peña-Casas R and Ghailani D (2011) Towards Individualizing Gender In-Work Poverty Risks. In: Fraser N, Gutiérrez R, and Peña-Casas R (eds), *Working Poverty in Europe: A Comparative Approach*, New York: Palgrave Macmillan, pp. 202–231.

Pennycook M, Cory G and Alakeson V (2013) *A Matter of Time: The rise of zero-hours contracts*. Resolution Foundation, London.

Pfau-Effinger B (1998) Gender cultures and the gender arrangement—a theoretical framework for cross-national gender research. *Innovation: The European Journal of Social Science Research* 11(2): 147–166.

Phimister E and Theodossiou I (2009) Gender differences in low pay labour mobility and the national minimum wage. *Oxford Economic Papers* 61(122–146).

Phimister E, Theodossiou I and Upward R (2006) Is it easier to escape from low pay in urban areas? Evidence from the United Kingdom. *Environment and Planning A* 38(4): 693–710.

Plantenga J (2002) Combining work and care in the polder model: an assessment of the Dutch part-time strategy. *Critical Social Policy* 22(1): 53–71.

Puhani P (2000) The Heckman Correction for Sample Selection and Its Critique. *Journal of Economic Surveys* 14(1): 53–68.

Rainsford E, Rawlings LJ and Mistry L (2018) *The Role of Family in Social Mobility: Impact of Family Resources of Young People's Progress*. Newcastle University and Youth Employment UK.

Ray R, Gornick JC and Schmitt J (2010) Who Cares? Parental leave policies in 21 countries assessing generosity and gender equality. *Journal of European Social Policy* 20(3): 196–216.

Robson P, Dex S, Wilkinson F, et al. (1999) Low Pay, Labour Market Institutions, Gender and Part-time Work: Cross-National Comparisons. *European Journal of Industrial Relations* 5(2): 187–207.

Rose D and Harrison E (2007) The European Socio-Economic Classification: a New Social Class Schema for Comparative European Research. *European Societies* 9(3): 459–490.

Rose D and Harrison E (eds) (2009) *Social Class in Europe An introduction to the European Socio-economic Classification*. London and New York: Routledge.

Rose D and Pevalin D (2003) *A researcher's guide to the National Statistics Socio-economic Classification*. London: Sage.

Rubery J (2017) *Why is Women's Work Low-Paid? Establishing a framework for understanding the causes of low pay among professions traditionally dominated by women*. Oxfam Discussion Papers, Oxford.

Rubery J and Grimshaw D (2016) Precarious work and the commodification of the employment relationship: the case of zero hours in the UK and mini jobs in Germany. In: G B, S L, and C W (eds), *Den Arbeitsmarkt verstehen, um ihn zu gestalten*, Wiesbaden: Springer VS, pp. 239–254.

Rubin DB (2004) *Multiple Imputation for Nonresponse in Surveys*. Hoboken, New Jersey: John Wiley & Sons.

Russo G and Hassink W (2005) *The part-time wage gap: A career perspective*. IZA Discussion Paper No. 1468, Bonn.

Salvador RG, Lamo A and Ramón VG (2005) *European Women: Why (Do'n't) They Work?* European Central Bank Working Paper Series No. 454.

Salverda W, van Klaveren M and van der Meer M (2008) *Low-Wage Work in the Netherlands*. Russel Sage Foundation.

Schafer JL and Graham JW (2002) Missing data: Our view of the state of the art. *Psychological Methods* 7(2): 147–177.

Sefton T, Evandrou M and Falkingham J (2011) Family ties: Women's work and family histories and their association with incomes in later life in the UK. *Journal of Social Policy* 40(1): 41–69.

Sen A (1999) *Development as Freedom*. Oxford: Oxford University Press.

Silva FJF, Vieira JAC and Pimenta AMS (2011) *Duration of Low Wage Employment: A Study Based on a Survival Model*. IZA Discussion Paper No.

5972, Bonn.

Silva HC and Lima F (2016) *A Trap for Some, a Stepping Stone for Others: Low-Pay Duration and Transitions out of Low-Pay Among Young Men*. Centro de Estudos de Gestão (CEG-IST), Instituto Superior Técnico, Universidade de Lisboa.

Silver D, Huang A, Maddison CJ, et al. (2016) Mastering the game of Go with deep neural networks and tree search. *Nature* 529(7587): 484–489.

Simon H, Nolan B, Meixide A, et al. (2004) *Low Wage Employment in Europe*. PIEP Working Paper.

Skinner C, Stuttard N, Beissel-Durrant G, et al. (2002) The measurement of low pay in the UK labour force survey. *Oxford Bulletin of Economics and Statistics* 64: 653–676.

Sloane PJ and Theodossiou I (1996) Earnings Mobility, Family Income and Low Pay. *The Economic Journal* 106(436): 657–666.

Smith AJ and Williams DR (2007) Father-friendly legislation and paternal time across Western Europe. *Journal of Comparative Policy Analysis: Research and Practice* 9(2): 175–192.

Smith M and Villa P (2010) The ever-declining role of gender equality in the European Employment Strategy. *Industrial Relations Journal* 41(6): 526–543.

Speight S and Roberts (2017) *Childcare use and attitudes: Literature review and feasibility study*. NatCen research paper, prepared for Save the Children, London.

Stewart MB (2007) The interrelated dynamics of unemployment and low-wage employment. *Journal of Applied Econometrics* 22(3): 511–531.

Stewart MB and Swaffield JK (1999) Low Pay Dynamics and Transition Probabilities. *Economica* 66(261): 23–42.

Tanaka S and Waldfogel J (2007) Effects of parental leave and work hours on fathers' involvement with their babies. *Community, Work and Family* 10(4): 409–426.

Taylor M, Marsh G, Nicol D, et al. (2017) *Good Work: The Taylor Review of Modern Working Practices*. Department for Business, Energy and Industrial Strategy, London.

Tijdens KG (2002) Gender Roles and Labor Use Strategies: Women's Part-Time Work in the European Union. *Feminist Economics* 8(1): 71–99.

Tilly C (1992) Dualism in Part-Time Employment. *Industrial Relations* 31(2): 330–447.

Timewise (2017) Leading UK retailers take action to unlock talent and productivity [press release]. 16th May.

Tonurist P and Pavlopoulos D (2014) *Part-Time Wage-Gap in Germany: Evidence across the Wage Distribution*. AMCIS Working Paper 2014/2, Amsterdam.

Treiman DJ (1976) A Standard Occupational Prestige Scale for Use with Historical Data. *The Journal of Interdisciplinary History* 7(2): 283–304.

TUC (2014) Flexible working change welcome but it's still too easy to say no [Press release]. 30th June.

TUC (2015) 15 per cent increase in people working more than 48 hours a week risks a return to 'Burnout Britain' [press release]. 9th September.

Uhlendorff A (2006) *From no pay to low pay and back again? A multi- state model of low pay dynamics*. IZA Discussion Paper No. 2482, Bonn.

Uhrig SCN (2008) *The Nature and Causes of Attrition in the British Household Panel Survey*. ISER Working Paper Series No. 2008-05, Essex.

Ussher K (2016) *Improving pay , progression and productivity in the retail sector productivity in the retail sector*. Joseph Rowntree Foundation, York.

van Bastelaer AG, Lemaître G and Marianna P (1997) *The Definition of Part-Time Work for the Purpose of International Comparisons*. OECD Labour Market and Social Policy Papers No. 22, Paris.

van de Ven WPMM and van Praag BMS (1981) The Demand for Deductibles in Private Health Insurance. *Journal of Econometrics* 17: 229–252.

Vandello JA, Hettinger VE, Bosson JK, et al. (2013) When equal isn't really equal: The masculine dilemma of seeking work flexibility. *Journal of Social Issues* 69(2): 303–321.

Villa P and Smith M (2014) Policy in the Time of Crisis: Employment policy and gender equality in Europe. In: Karamessini M and Rubery J (eds), *Women and austerity: the economic crisis and the future for gender equality*, London: Routledge, pp. 273–294.

Visser J (2002) The first part-time economy in the world: a model to be followed? *Journal of European Social Policy* 12(1): 23–42.

Visser J (2006) Union membership statistics in 24 countries. *Monthly Labor Review* 129(1): 38–49.

Visser J (2016) *ICTWSS Database, version 5.1*. Amsterdam.

Visser J and Checchi D (2011) Inequality and the Labor Market: Unions. In: Salverda W, Nolan B, and Smeeding TM (eds), *The Oxford Handbook of Economic Inequality*, Oxford: Oxford University Press, pp. 230–256.

Walters S (2005) Making the best of a bad job? Female part-timers' orientations and attitudes to work. *Gender, Work and Organization* 12(3): 193–216.

Ward T and Ozdemir E (2015) *The characteristics of workers on low wages*. European Commission Research Note No. 9 / 2015, Brussels.

Warren T (2003) Class and Gender-based Working Time? Time Poverty and the Division of Domestic Labour. *Sociology* 37(4): 733–752.

Warren T (2010) Penalties of part-time work across Europe. In: Scott JL, Crompton R, and Lyonette C (eds), *Gender inequalities in the 21st Century: New barriers and continuing constraints*, Cheltenham: Edward Elgar, pp. 109–125.

Warren T (2015) Work-time underemployment and financial hardship: class inequalities and recession in the UK. *Work, Employment and Society* 29(2): 191–212.

Warren T and Lyonette C (2015) The Quality of Part-Tme Work. In: Felstead A, Gallie D, and Green F (eds), *Unequal Britain at Work*, Oxford: Oxford University Press, pp. 62–82.

Warren T and Walters P (1998) Appraising a Dichotomy: A Review of 'Part-time/Full-time' in the Study of Women's Employment in Britain. *Gender, Work and Organization* 5(2): 102–118.

Warren T, Pascall G and Fox E (2010) Gender Equality in Time: Low-Paid Mothers' Paid and Unpaid Work in the UK. *Feminist Economics* 16(3): 193–219.

Weber M (1948) Class, Status and Party. In: Gerth H and C.W.Mills (eds), *From Max Weber*, London: Routledge, pp. 180–95.

Weichselbaumer D and Winter-Ebmer R (2005) A Meta-Analysis of the International Gender Wage Gap. *Journal of Economic Surveys* 19(3): 479–511.

Weinkopf C (2009) Germany: Precarious Employment and the Rise of Mini-Jobs. In: Vosko E, MacDonald M, and Campbell I (eds), *Gender and the Contours of Precarious Employment*, London and New York: Routledge, pp. 177–193.

Weinkopf C (2014) *Women's Employment in Germany: Robust in Crisis but Vulnerable in Job Quality*. Revue de l'OFCE 2014/2 N° 133.

Wheatley D (2017) Employee satisfaction and use of flexible working arrangements. *Work, Employment and Society* 31(4): 567–585.

Williams M (2017) An old model of social class? Job characteristics and the NS-SEC schema. *Work, Employment and Society* 31(1): 153–165.

Winship C and Morgan SL (1999) The Estimation of Causal Effects From Observational Data. *Annual Review of Sociology* 25(1): 659–706.

Wolf E (2001) *Comparing the part-time wage gap in Germany and the Netherlands*. ZEW Discussion Papers No. 01-18.

World Economic Forum (2016) *The Future of Jobs: Employment Skills and Workforce Strategy for the Fourth Industrial Revolution*. Geneva.

Yerkes M (2013) Choice or constraint? Women's weekly working hours in comparative perspective. *Sociologia, Problemas e Praticas* 72: 9–30.

Yerkes M and Visser J (2006) Women's preferences or delineated policies? The development of part-time work in the Netherlands, Germany and the United Kingdom. In: *Decent Working Time: New trends, New issues*, Geneva: ILO.

Yerkes M, Standing K, Wattis L, et al. (2010) The disconnection between policy practices and women's lived experiences: combining work and life in the UK and the Netherlands. *Community, Work and Family* 13(4): 411–427.

Yun M-S (2004) Decomposing differences in the first moment. *Economics Letters* 82(2): 275–280.

Yun M-S (2005) A simple solution to the identification problem in detailed wage decompositions. *Economic Inquiry* 43(4): 766–772.

Zou M (2015) Gender, work orientations and job satisfaction. *Work, Employment and Society* 29(1): 3–22.

IX. Appendix A: Appendix to Paper #1

Table AI. Variables in the main (probit) regression

Name	*Variable type*	*Values*
Dependent variable		
Low pay	Binary	1 Low paid 0 Not low paid
Independent variables		
Age	Nominal	1 16 – 24 2 25 – 34 3 34 – 44 4 45 – 54 5 55+
Health	Binary	1 Work-limiting health condition 0 No work-limiting health condition
Family structure	Nominal	1 Single adult 2 Couple (no dependent children) 3 Couple living with dependent children 4 Single adult living with dependent children
Highest educational qualification	Nominal	1 Degree 2 Higher education 3 GCE/A Level or equivalent 4 GCSE grades A*-C or equivalent 5 Other qualifications 6 No qualifications
Job tenure (in years)	Numeric	
Full-time or part-time	Binary	1 Part-time 0 Full-time
Social class (NS-SEC coding)	Nominal	1 Managerial and professional occupations 2 Intermediate occupations 3 Routine and manual occupations
Contract type	Binary	1 Temporary 0 Permanent
Industry (SIC 07 coding)	Nominal	1 Agriculture, energy and water 2 Manufacturing and construction 3 Hotels and restaurants; distribution 4 Transport and communication 5 Banking and finance 6 Education and health; public administration
Employer size	Nominal	1 1-10 employees 2 11-49 employees 3 50+ employees
Selection term	Numeric	

Table AII. Variables in the selection (biprobit) regression

Name	*Variable type*	*Values*
Dependent variables		
In work	Binary	1 In work 0 Not in work
Full-time	Binary	1 Full-time 0 Part-time or non-employed
Independent variables		
Age	Nominal	1 16 – 24 2 25 – 34 3 34 – 44 4 45 – 54 5 55+
Health	Binary	1 Work-limiting health condition 0 No work-limiting health condition
Family structure	Nominal	1 Single adult 2 Couple (no dependent children) 3 Couple living with dependent children 4 Single adult living with dependent children
Highest educational qualification	Nominal	1 Degree 2 Higher education 3 GCE/A Level or equivalent 4 GCSE grades A*-C or equivalent 5 Other qualifications 6 No qualifications
Inactive 12 months ago (men only)	Binary	1 Yes 0 No
Number of children aged 2-4 in the household (women only)	Numeric	
Number of children aged 5-9 in the household (women only)	Numeric	

Table AIII. Distribution of variables in the main (probit) regression, by gender and full-time/part-time status; mean (standard deviation) or percentage

		Female employees		*Male employees*	
		Part time	*Full time*	*Part time*	*Full time*
Dependent variable					
Low paid	Yes	39.87	18.52	40.88	12.23
Independent variables					
Age	16-24	5.33	8.24	14.73	6.31
	25-34	17.33	24.28	12.43	21.71
	35-44	26.80	23.26	15.25	26.81
	45-54	26.36	28.38	13.65	27.32
	55+	24.18	15.85	43.95	17.85
Health	Work-limiting condition	12.25	7.12	16.40	6.67
Family structure	Single adult	10.90	22.8	20.69	18.55
	Couple, no children	31.86	43.27	48.69	39.01
	Couple with children	44.13	26.59	27.16	41.27
	Lone parent	13.11	7.34	3.46	1.17
Highest educational qualification	Degree	24.20	39.36	24.51	31.78
	Higher education	12.13	11.09	8.99	10.30
	GCE/A-level	20.76	19.61	26.65	25.62
	GCSE grades A*-C	26.88	20.26	18.18	18.2
	Other	9.45	6.67	12.81	9.86
	None	6.58	3.01	8.86	4.23
Job tenure (in years)		8.65 (8.26)	8.84 (8.55)	7.08 (9.08)	9.71 (9.31)
Social class (NS-SEC)	Managerial and professional	29.89	54.56	28.44	52.33
	Intermediate	26.20	22.53	10.70	9.39
	Routine and manual	43.91	22.92	60.86	38.28
Contract type	Temporary	8.30	4.32	17.39	3.70
Sector	Private	38.31	39.18	20.25	19.11
Industry (SIC 07)	Agriculture, energy and water	0.87	1.21	1.62	4.40
	Manufacturing and construction	5.06	9.54	9.40	27.65
	Hotels, restaurants; distribution	23.86	14.71	33.79	15.11
	Transport and	3.14	4.88	8.82	13.34

	communication				
	Banking and finance	12.13	15.92	13.49	16.55
	Education, health; public admin	54.93	53.73	32.88	22.95
Employer size	1-10 employees	26.43	13.91	32.20	16.74
	11-49 employees	31.81	27.33	30.17	23.88
	50+ employees	41.76	58.75	37.63	59.38
Selection correction term		-0.47 (0.14)	-0.09 (0.17)	-0.44 (0.28)	0.05 (0.05)
Observations		6,955	9,940	1,561	14,370

Note: data source LFS 2012-2016.

Table AIV. Biprobit model estimating selection into (i) employment and (ii) full-time employment for male and female employees in the UK 2012-2016; log-odds ratios

		Female employees	*Male employees*
Employment			
Age	16-24 (ref)		
	25-34	0.78 (0.03)***	0.55 (0.04)***
	35-44	0.96 (0.03)***	0.73 (0.04)***
	45-54	0.890 (0.03)***	0.66 (0.04)***
	55+	-0.20 (0.03)***	0.08 (0.04)*
Health	Work-limiting condition	-0.80 (0.02)***	-0.70 (0.03)***
Family structure	Single adult (ref)		
	Couple, no children	0.09 (0.03)***	0.38 (0.03)***
	Couple with children	-0.14 (0.03)***	0.42 (0.03)***
	Lone parent	-0.30 (0.04)***	-0.11 (0.08)
Highest educational qualification	Degree (ref)		
	Higher education	-0.20 (0.03)***	0.02 (0.04)
	GCE/A-level	-0.17 (0.03)***	-0.12 (0.03)***
	GCSE grades A*-C	-0.39 (0.03)***	-0.28 (0.04)***
	Other	-0.66 (0.03)***	-0.34 (0.04)***
	None	-1.17 (0.03)***	-0.76 (0.04)***
Number of children aged 2-4 in the household		-0.18 (0.03)***	
Number of children aged 5-9 in the household		-0.28 (0.02)***	
Economically inactive 12 months ago			-2.13 (0.03)***
Constant		0.53 (0.04)***	0.79 (0.05)***
Full-time employment			
Age	16-24 (ref)		
	25-34	0.88 (0.03)***	1.20 (0.04)***
	35-44	0.78 (0.03)***	1.33 (0.04)***
	45-54	0.58 (0.03)***	1.30 (0.03)***
	55+	-0.11 (0.03)***	0.67 (0.03)***
Health	Work-limiting condition	-0.46 (0.02)***	-0.50 (0.03)***
Family structure	Single adult (ref)		
	Couple, no children	-0.08 (0.02)***	0.21 (0.03)***
	Couple with children	-0.73 (0.03)***	0.04 (0.03)
	Lone parent	-0.68 (0.03)***	-0.56 (0.06)***

Highest educational qualification	Degree (ref)		
	Higher education	-0.25 (0.03)***	0.01 (0.04)
	GCE/A-level	-0.31 (0.02)***	0.01 (0.03)
	GCSE grades A*-C	-0.43 (0.02)***	-0.10 (0.03)***
	Other	-0.53 (0.03)***	-0.13 (0.04)***
	None	-0.99 (0.03)***	-0.52 (0.04)***
Number of children aged 2-4 in the household		-0.18 (0.03)***	
Number of children aged 5-9 in the household		-0.28 (0.02)***	
Economically inactive 12 months ago			-0.86 (0.02)***
Constant		0.24 (0.04)***	0.11 (0.04)**
Observations		31,666	28,585
Log likelihood		-21849662	-14020763
Rho		0.37 (0.01)***	0.39 (0.01)***

Notes: data source LFS 2012-2016; log-odds ratios (coefficients) with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001.

Table AV. Probit model estimating the probability of being low paid for male and female employees in the UK 2012-2016 with the inclusion of instrumental variables; average marginal effects

		Female employees	*Male employees*
Focal explanatory variable			
Work status	Part-time	0.06 (0.01)***	0.08 (0.01)***
Demographic variables			
Age	16-24 (ref)		
	25-34	-0.11 (0.01)***	-0.13 (0.01)***
	35-44	-0.13 (0.01)***	-0.16 (0.01)***
	45-54	-0.13 (0.01)***	-0.18 (0.01)***
	55+	-0.12 (0.01)***	-0.17 (0.01)***
Health	Work-limiting condition	0.01 (0.01)***	0.04 (0.01)***
Family structure	Single adult (ref)		
	Couple, no children	-0.02 (0.01)*	-0.01 (0.01)
	Couple with children	0.01 (0.01)	-0.02 (0.01)*
	Lone parent	0.02 (0.01)	-0.00 (0.02)
Human capital variables			
Highest educational qualification	Degree (ref)		
	Higher education	0.02 (0.01)	0.02 (0.01)*
	GCE/A-level	0.08 (0.01)***	0.03 (0.01)***
	GCSE grades A*-C	0.13 (0.01)***	0.09 (0.01)***
	Other	0.19 (0.01)***	0.15 (0.01)***
	None	0.28 (0.02)***	0.28 (0.02)***
Job tenure (in years)		-0.01 (0.00)***	-0.01 (0.00)***
Labour market variables			
Social class	Managerial and professional (ref)		
	Intermediate	0.08 (0.01)***	0.02 (0.01)**
	Routine and manual	0.38 (0.01)***	0.14 (0.01)***
Contract	Temporary	0.04 (0.01)***	0.07 (0.01)***
Sector	Private	0.05 (0.01)***	0.03 (0.01)***
Industry	Agriculture, energy and water	-0.02 (0.03)	0.01 (0.01)
	Manufacturing and construction (ref)		
	Distribution, hotels and restaurants	0.09 (0.01)***	0.06 (0.01)***
	Transport and	-0.02 (0.02)	0.03 (0.01)**

	communication		
	Banking, finance and insurance	0.00 (0.01)	0.04 (0.01)***
	Education, health, administration	0.06 (0.01)***	0.05 (0.01)***
Employer size	1-10 employees	0.09 (0.01)***	0.12 (0.01)***
	11-49 employees	0.05 (0.01)***	0.05 (0.01)***
	50+ employees (ref)		
Number of children aged 2-4 in the household		-0.02 (0.01)	
Number of children aged 5-9 in the household		0.01 (0.01)	
Economically inactive 12 months ago			0.01 (0.02)
Observations		16,441	15,450
Log likelihood		-3668995.6	-3080420

Notes: data source LFS 2012-2016; average marginal effects with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001.

Table AVI. Selected results from a model with the inclusion of an interaction between working part time and being female; log-odds ratios

		All employees
Main effect – work status	Full time (ref)	
	Part time	0.50 (0.05)***
Main effect – gender	Male (ref)	
	Female	0.49 (0.03)***
Interaction effect	Female * Part time	-0.14 (0.05)**
Observations		31,948
Log likelihood		-6885492.1

Notes: data source LFS 2012-2016; log-odds ratios (coefficients) with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001. Model also controls for age, health status, education, job tenure, household type, social class, contract type, public/private sector, industry and employer size.

Further information on the data imputation procedure

Not only is there a high rate of missingness on the earnings variable, but also this is associated with several predictor variables and therefore not Missing Completely At Random (MCAR). The situation with regards to the weaker missing at random (MAR) assumption is less clear-cut. There are reasons to doubt the MAR assumption in this context, since non-response on earnings questions in surveys is linked to earnings (Dickens and Manning, 2004). The MAR assumption is only violated if missingness is related to earnings after holding other characteristics constant (Skinner et al., 2002).. Controlling for a rich set of covariates may eliminate the association between earnings and missingness. Previous evidence suggests that unless departures from MAR are serious, working under this assumption is likely to have only a minor effect on parameter estimates and standard errors (Schafer and Graham, 2002). As such, imputation is undertaken on the assumption of data being missing at random (MAR) but not missing completely at random (MCAR) (Rubin, 2004). Multiple imputation is performed for each calendar year, producing predicted values for missing earnings data, adjusted for variation across 20 imputed data sets. The dependent variable – low pay – is then constructed based on this imputed distribution. The third empirical paper also uses LFS data, and the same approach to data imputation is used. Robustness checks (Tables AVII and AVIII; Table CVI) show that for both papers similar results are produced with and without this data imputation step, adding confidence in the results.

Table AVII. Robustness checks: comparison of the average marginal effect of working part time relative to full time on the risk of low pay for male/female employees across alternative models

	(1) Main results		*(2) Part time <30 hours per week*		*(3) No data imputation*	
	Female	*Male*	*Female*	*Male*	*Female*	*Male*
Part time (ref: full time)	0.06 (0.01)***	0.10 (0.01)***	0.04 (0.01)***	0.06 (0.01)***	0.05 (0.01)***	0.11 (0.01)***
Observations	16,482	15,466	16,316	15.281	11,022	10,044

Notes: data source LFS 2012-2016; average marginal effects with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001. Model also controls for age, health status, education, job tenure, household type, social class, contract type, public/private sector, industry, employer size and selection bias.

Table AVIII. Robustness checks: comparison of mediation percentages for the decomposition of the full-time/part-time gap in low pay for male/female employees across alternative models

	(1) Main results		*(2) Part time <30 hours per week*		*(3) No data imputation*		*(4) Blinder-Oaxaca*	
	F	*M*	*F*	*M*	*F*	*M*	*F*	*M*
Characteristics component	57.72	46.25	61.15	48.99	57.79	39.58	56.56	42.17
Worker characteristics	*7.94*	*12.95*	*9.50*	*15.17*	*9.98*	*8.75*	*7.78*	*11.82*
Job characteristics	*49.78*	*33.30*	*51.65*	*33.82*	*47.81*	*30.83*	*48.77*	*30.36*
Selection correction term	20.08	13.12	21.68	23.24	24.30	16.77	19.67	11.96
Unexplained	22.20	40.63	17.17	27.77	17.91	43.65	23.77	45.87

Notes: data source LFS 2012-2016; the characteristics component describes the combined importance of worker- and job-related characteristics; F = female and M = male.

Table AIX. Robustness checks: comparison of the average marginal effect of working part time relative to full time on the risk of low pay for male/female employees using a detailed hours breakdown

	Female employees	*Male employees*
Marginal part time (1-14 hours per week) (ref)		
Regular part time (15-29 hours per week)	0.00 (0.01)	0.01 (0.02)
Full time (30+ hours per week)	-0.06 (0.01)***	-0.08 (0.02)***
Observations	16,317	15,281
Log likelihood	-3664786.5	-3063453.4

Notes: data source LFS 2012-2016; average marginal effects with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001. Model also controls for age, health status, education, job tenure, household type, social class, contract type, public/private sector, industry and employer size.

X. Appendix B: Appendix to Paper #2

Table BI. Variables in the analysis

Name	*Type*	*Values*	*Definition*
Dependent variable			
Low pay	Binary	1 Low paid 0 Not low paid	Gross hourly earning below two-thirds of the mean for all employees in each calendar year
Focal explanatory variables			
Model 1	Binary	1 Part time 0 Full time	1 Usual weekly working hours 1-29 0 Usual weekly working hours 30+
Model 2	Nominal	1 Part time – Part time 2 Part time – Full time 3 Full time – Full time 4 Full time – Part time	1 Part time at t and part time at t+1 2 Part time at t and full time at t+1 3 Full time at t and full time at t+1 4 Full time at t and part time at t+1
Control variables			
Age	Nominal	1 16 – 24 2 25 – 34 3 34 – 44 4 45 – 54 5 55+	
Highest educational qualification	Nominal	1 Degree 2 Higher education 3 GCE/A Level or equivalent 4 GCSE or equivalent 5 Other qualifications 6 No qualifications	
Household type	Nominal	1 Single person 2 Lone parent household 3 Couple, no children 4 Couple with children 5 Other household	
Number of children in the	Numeric		

household			
Job tenure	Numeric		In years
Social class (ESeC coding)	Nominal	1 Salariat 2 Intermediate 3 Working class	1 ESeC codes 1 – 2 2 ESeC codes 3 and 6 3 ESeC codes 7 – 9
Share of part-time workers in occupation	Numeric		Proportion of employees in each occupation (ISCO-88, coded to 2 digits) part-time (derived variable)
Contract type	Binary	1 Temporary 0 Permanent	
Private sector	Binary	1 Private 0 Public	
Industry (SIC coding)	Nominal	1 Agriculture, energy and water 2 Manufacturing and construction 3 Hotels and restaurants; distribution 4 Transport and communication 5 Banking and finance 6 Education and health; public administration	
Employer size	Nominal	1 1-24 employees 2 25+ employees	
Spell duration	Nominal	1 1 year 2 2-3 years 3 4-5 years 4 6-7 years 5 8+ years	
Employer change	Binary	1 Yes 0 No	New employer at t+1 compared to t
Occupation change	Nominal	1 No change 2 Moved to higher-skilled occupation 3 Moved to lower-skilled occupation	Derived from comparing 3 digit occupational coding (ISCO-88) at wave t+1 compared to time t

Table BII. Descriptive statistics on the number of low pay spells for male and female employees in the UK 2001-2017; percentages

	Female employees	*Male employees*
0 spells (never low paid)	75.98	87.85
1 spell	17.83	9.68
2 spells	4.71	1.96
3 spells	1.26	0.40
4 spells	0.21	0.09
5 spells	0.02	0.02
Observations (individuals)	47,152	42,888

Notes: Data source: USoc/BHPS 2001-2017; sample restricted to employees

Table BIII. Descriptive statistics on the duration of low pay spells for male and female employees in the UK 2001-2017

	Female employees	*Male employees*
Min	1.0	1.0
Max	13.0	11.0
Mean (standard deviation)	1.9 (1.5)	1.6 (1.1)
Median	1.0	1.0
Observations (spells)	3,954	2,179

Notes: Data source: USoc/BHPS 2001-2017; sample restricted to low-paid employees

Table BIV. Selected results for Model 1 allowing for an interaction between working part time and spell duration; hazard ratios

		Female employees	*Male employees*
Part time	Full time (ref)		
	Part time	0.90 (0.07)	0.62 (0.08)***
Duration of low pay spell	1 year (ref)		
	2-3 years	0.86 (0.07)	0.79 (0.07)**
	4-5 years	0.80 (0.11)	0.61 (0.11)**
	6-7 years	0.61 (0.13)*	0.35 (0.14)**
	8+ years	0.26 (0.11)**	0.15 (0.15)*
Interaction	1 year*part time (ref)		
	2-3 years*part time	0.85 (0.09)	1.20 (0.26)
	4-5 years*part time	0.83 (0.14)	0.85 (0.39)
	6-7 years*part time	0.80 (0.23)	2.42 (1.58)
	8+ years*part time	1.03 (0.53)	
Rho		0.07 (0.03)*	0.10 (0.05)*
Log likelihood		-4114.0943	-1918.2458
Observations (person-years)		8,091	3,349
Observations (individuals)		2,697	1,495

Notes: Data source: USoc/BHPS 2001-2017; sample restricted to employees; hazard ratios (exponentiated coefficients) with standard error in parenthesis; significance testing: * p <0.05; ** p <0.01; *** p <0.001; model also controls for age, education, household type, number of children in the household, job tenure, social class, contract type, sector, industry, employer size and the share of part-time workers in the occupation.

Table BV. Selected results for Model 1 and Model 2 allowing for an interaction between working part time and gender; hazard ratios

		All employees	
		Model 1	*Model 2*
Model 1	Full time (ref)		
	Part time	0.68 (0.07)***	
Model 2	Full time - full time (ref)		
	Part time - part time		0.69 (0.09)**
	Part time - full time		1.04 (0.21)
	Full time - part time		0.78 (0.16)
Gender	Male (ref)		
	Female	0.85 (0.05)**	0.85 (0.06)*
Interaction	Female * part time	1.18 (0.13)	
	Female * PT - PT		1.12 (0.17)
	Female * PT - FT		0.88 (0.21)
	Female * FT - PT		1.45 (0.35)
Duration of low pay spell	1 year (ref)		
	2-3 years	0.78 (0.04)***	0.75 (0.04)***
	4-5 years	0.67 (0.06)***	0.61 (0.05)***
	6-7 years	0.50 (0.07)***	0.47 (0.07)***
	8+ years	0.23 (0.06)***	0.25 (0.06)***
Rho		0.08 (0.03)**	0.07 (0.03)*
Log likelihood		-6057.0755	-3633.5352
Observations (person-years)		11,452	6,391
Observations (individuals)		4,192	2,663

Notes: Data source: USoc/BHPS 2001-2017 (Model 1) and 2004-2017 (Model 2); sample restricted to employees; hazard ratios (exponentiated coefficients) with standard error in parenthesis; significance testing: * p <0.05; ** p <0.01; *** p <0.001.

Model comparison: Model 1 controls for age, education, household type, number of children in the household, job tenure, social class, contract type, sector, industry, employer size and the share of part-time workers in the occupation. In addition to these variables, Model 2 controls for employer change and occupational change.

Table BVI. Selected results for Model 1 distinguishing between full-time employment (30+ hours), regular part-time employment (15-29 hours) and marginal part-time employment (1-14 hours); hazard ratios

		Female employees	*Male employees*
Working hours	Full time (30+ hours)	1.66 (0.15)***	1.71 (0.36)*
	Long part time (15-29 hours)	1.48 (0.12)***	1.16 (0.26)
	Short part time (1-14 hours) (ref)		
Duration of low pay spell	1 year (ref)		
	2-3 years	0.78 (0.04)***	0.80 (0.07)*
	4-5 years	0.71 (0.07)***	0.60 (0.10)**
	6-7 years	0.53 (0.08)***	0.44 (0.14)*
	8+ years	0.26 (0.07)***	0.11 (0.10)*
Rho		0.05 (0.03)*	0.10 (0.05)*
Log likelihood		-4103.9493	-1919.6278
Observations (person-years)		8,091	3,361
Observations (individuals)		2,697	1,495

Notes: Data source: USoc/BHPS 2001-2017; sample restricted to employees; hazard ratios (exponentiated coefficients) with standard error in parenthesis; significance testing: * p <0.05; ** p <0.01; *** p <0.001; model also controls for age, education, household type, number of children in the household, job tenure, social class, contract type, sector, industry, employer size and the share of part-time workers in the occupation.

Table BVII. Comparison of selected Model 1 results for all low pay exits (higher pay for at least one year) and sustained low pay exits (higher pay for three consecutive years) for female employees; hazard ratios

		Female employees	
		All exits	*Sustained exits*
Working hours	Full time (ref)		
	Part time	0.83 (0.05)**	0.67 (0.07)***
Duration of low pay spell	1 year (ref)		
	2-3 years	0.78 (0.04)***	0.76 (0.08)**
	4-5 years	0.72 (0.07)**	0.68 (0.12)*
	6-7 years	0.54 (0.08)***	0.35 (0.12)**
	8+ years	0.27 (0.07)***	0.15 (0.11)**
Rho		0.06 (0.03)*	0.10 (0.05)**
Log likelihood		-4115.7318	-1919.8522
Observations (person-years)		8,091	3,361
Observations (individuals)		2,697	1,495

Notes: Data source: USoc/BHPS 2001-2017; sample restricted to employees; hazard ratios (exponentiated coefficients) with standard error in parenthesis; significance testing: * p <0.05; ** p <0.01; *** p <0.001; model also controls for age, education, household type, number of children in the household, job tenure, social class, contract type, sector, industry, employer size and the share of part-time workers in the occupation.

Table BVIII. Comparison of selected Model 1 results for all low pay exits (higher pay for at least one year) and sustained low pay exits (higher pay for three consecutive years) for male employees; hazard ratios

		Male employees	
		All exits	*Sustained exits*
Working hours	Full time (ref)		
	Part time	0.67 (0.07)***	0.34 (0.08)***
Duration of low pay spell	1 year (ref)		
	2-3 years	0.76 (0.08)**	0.54 (0.08)***
	4-5 years	0.68 (0.12)*	0.19 (0.07)***
	6-7 years	0.35 (0.12)**	0.33 (0.20)
	8+ years	0.15 (0.11)**	
Rho		0.25 (0.08)*	0.25 (0.08)
Log likelihood		-1885.3728	-1885.3728
Observations (person-years)		8,091	8,091
Observations (individuals)		2,697	2,697

Notes: Data source: USoc/BHPS 2001-2017; sample restricted to employees; hazard ratios (exponentiated coefficients) with standard error in parenthesis; significance testing: * p <0.05; ** p <0.01; *** p <0.001; model also controls for age, education, household type, number of children in the household, job tenure, social class, contract type, sector, industry, employer size and the share of part-time workers in the occupation; insufficient sample size to estimate the effect of a duration of 8+ years for men.

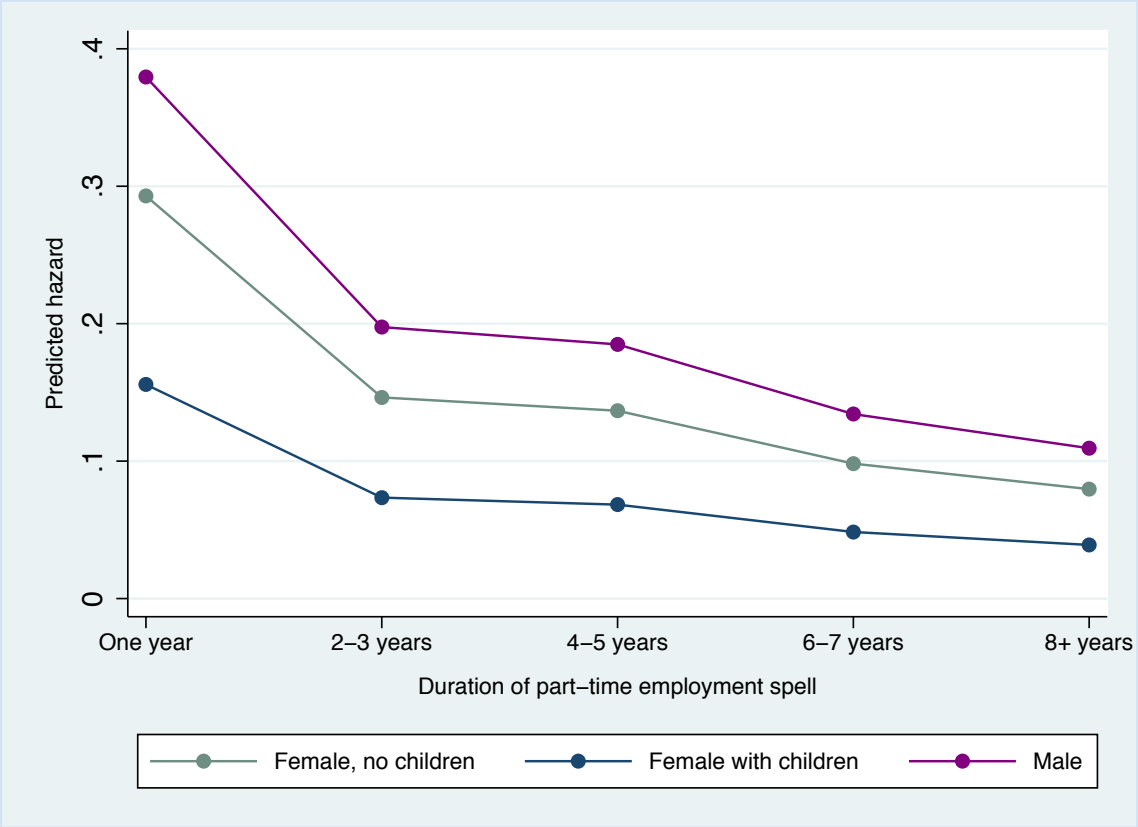
Table BIX. Hazard ratios from a discrete-time model estimating the probability of transitioning from part-time to full-time employment for employees in the UK 2001-2017

		All employees	*Female employees*	*Male employees*
Gender	Female (ref: male)	0.57 (0.04)***		
Age	16-24 (ref)			
	25-34	0.68 (0.06)***	0.59 (0.06)***	1.01 (0.16)
	35-44	0.71 (0.06)***	0.66 (0.07)***	0.75 (0.15)
	45-54	0.62 (0.05)***	0.55 (0.06)***	0.65 (0.12)*
	55+	0.22 (0.03)***	0.18 (0.03)***	0.25 (0.05)***
Highest educational qualification	Degree (ref)			
	Higher education	0.79 (0.08)*	0.81 (0.10)	0.76 (0.15)
	GCE/A-level	0.84 (0.07)*	0.88 (0.08)	0.77 (0.11)
	GCSE grades A*-C	0.91 (0.07)	0.90 (0.09)	0.92 (0.14)
	Other	0.78 (0.08)*	0.74 (0.09)*	0.92 (0.19)
	None	0.81 (0.10)	0.71 (0.11)*	1.11 (0.24)
Household type	Single adult (ref)			
	Lone parent	1.145 (0.15)	0.96 (0.16)	1.42 (0.36)
	Couple no children	0.90 (0.11)	0.70 (0.11)*	1.17 (0.24)
	Couple & children	1.07 (0.13)	0.82 (0.13)	1.66 (0.33)*
	Other	1.02 (0.13)	0.92 (0.15)	1.07 (0.233)
Children in the household		0.77 (0.03)***	0.73 (0.03)***	0.91 (0.07)
Job tenure (in years)		0.99 (0.01)*	0.99 (0.01)	1.00 (0.01)
Social class	Salariat (ref)			
	Intermediate	0.95 (0.07)	1.07 (0.09)	0.73 (0.11)*
	Working class	0.84 (0.06)*	0.90 (0.08)	0.67 (0.09)***
Share of part time in occupation		0.99 (0.00)*	0.99 (0.00)	0.99 (0.00)
Contract	Temporary (ref: permanent)	0.97 (0.07)	0.99 (0.09)	0.90 (0.12)
Sector	Private (ref: public)	1.15 (0.08)	1.18 (0.10)	0.96 (0.14)
Industry	Manufacturing, construction (ref)			

	Agriculture, energy water	2.12 (0.45)***	1.99 (0.65)*	1.82 (0.52)
	Hotels and restaurants	1.20 (0.14)	1.22 (0.19)	1.17 (0.22)*
	Transport and communication	1.42 (0.22)*	1.51 (0.32)	1.18 (0.29)
	Banking, finance insurance	1.17 (0.15)	1.28 (0.21)	1.04 (0.23)
	Education, health, administration	1.27 (0.16)	1.42 (0.23)*	1.01 (0.22)
Size	25+ employees (ref: <25)	1.09 (0.05)	1.06 (0.06)	1.23 (0.11)*
Duration of part-time spell	1 year (ref)			
	2-3 years	0.44 (0.03)***	0.49 (0.04)***	0.41 (0.04)***
	4-5 years	0.41 (0.03)***	0.46 (0.05)***	0.43 (0.07)***
	6-7 years	0.29 (0.03)***	0.34 (0.04)***	0.26 (0.08)***
	8+ years	0.23 (0.05)***	0.29 (0.06)***	0.09 (0.09)*
Constant		0.90 (0.17)	0.56 (0.14)*	0.79 (0.26)
Rho		0.03 (0.04)	0.09 (0.05)*	0.00 (0.00)
Log likelihood		-4983.5378	-3883.7778	-1049.7816
Observations (person-years)		14,482	12,185	2,297
Observations (individuals)		4,379	3,359	1,021

Notes: Data source: USoc/BHPS 2001-2017; sample restricted to part-time workers; hazard ratios (exponentiated coefficients) with standard error in parenthesis; significance testing: * p <0.05; ** p <0.01; *** p <0.001.

Figure BI. Predicted hazard of transitioning from part-time to full-time employment according to spell duration for men, women with children and women without children in the UK 2001-2017



Notes: Data source: USoc/BHPS 2001-2017; compares the likelihood of transitioning to full-time employment for three groups of part-time workers according to the length of time they have worked part time. Predicted hazards are based on the model shown in Table BIX.

This graph is included to demonstrate that gender differences are considerably smaller comparing men to women without children, than comparing men to women with children. Although the presence of dependent children in the household does not in itself decrease the odds of progressing out of low pay (Table III-II), it does – at least, for women – lengthen the duration of part-time employment. In this way, parenthood can be seen as indirectly influencing the odds of progressing out of low pay for women (but not for men).

XI. Appendix C: Appendix to Paper #3

Table CI. Variables in the analysis

Name	*Type*	*Values*	*Definition*
Low pay	Binary	1 Low paid 0 Not low paid	Gross hourly earning below two-thirds of the mean for all employees in each calendar year
Age	Nominal	1 16 – 24 2 25 – 34 3 34 – 44 4 45 – 54 5 55+	
Marital status	Binary	1 Married 0 Not married	Married encompasses both legal marriage and cohabitation
Single parent	Binary	1 Yes 0 No	Not married (as above) with dependent children in the household
Highest educational qualification	Nominal	1 Degree 2 Higher education 3 A Level or equivalent 4 GCSE or equivalent 5 Other qualification 6 No qualification	
Job tenure	Continuous		In years
Working hours	Binary	1 Part time 0 Full time	Respondent self-identified
Contract type	Binary	1 Temporary 0 Permanent	
Social class	Nominal	1 Higher managerial and professional 2 Lower managerial and professional 3 Intermediate occupations 4 Lower supervisory and technical occupations 5 Semi routine occupations 6 Routine occupations	NS-SEC coding
Sector	Binary	1 Private 0 Public	SIC coding
Industry		1 Agriculture, energy and water	

		2 Manufacturing and construction 3 Hotels and restaurants; distribution 4 Transport and communication 5 Banking and finance 6 Education and health; public administration
Employer size	Nominal	1 1-10 employees 2 11 – 49 employees 3 50+ employees

Table CII. Results from logistic regression estimating the probability of being low paid for UK employees 1996-2016, with an interaction between gender and time; odds ratios

		Model 1	*Model 2*
Gender	Female	3.02 (0.04)***	2.33 (0.04)***
Calendar year		1.01 (0.00)***	1.05 (0.00)***
Female * calendar year		0.98 (0.00)***	0.99 (0.00)***
Age	16-24		
	25-34		0.42 (0.01)***
	35-44		0.37 (0.01)***
	45-54		0.36 (0.01)***
	55+		0.39 (0.01)***
Marital status	Married		0.76 (0.01)***
Single parent	Yes		1.24 (0.02)***
Education	Degree		
	Higher education		1.35 (0.03)***
	A Level or equivalent		1.86 (0.03)***
	GCSE A-C or equivalent		2.64 (0.05)***
	Other qualification		3.80 (0.07)***
	No qualifications		6.50 (0.13)***
Job tenure	Continuous (in years)		0.95 (0.00)***
Part time	Yes		1.97 (0.02)***
Contract	Temporary		1.49 (0.03)***
Social class	Higher managerial and professional		
	Lower managerial and professional		1.28 (0.03)***
	Intermediate		2.37 (0.06)***
	Lower supervisory and technical		4.68 (0.13)***
	Semi-routine		9.64 (0.25)***
	Routine		15.86 (0.41)***
Sector	Private		1.69 (0.02)***
Industry	Agriculture, energy and		1.24 (0.04)***

	water		
	Manufacturing and construction		
	Distribution, hotels and restaurants		2.25 (0.03)***
	Transport and communication		1.00 (0.02)
	Banking and finance		1.18 (0.02)***
	Public administration, health and education		1.844 (0.03)***
Employer size	1-10 employees		2.45 (0.03)***
	11-49 employees		1.55 (0.01)***
	50+ employees		
Constant		0.14 (0.00)***	0.01 (0.00)***
Pseudo R2		0.027	0.372
Observations		677,297	664,541

Notes: data source LFS 1996-2016; odds ratios with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001.

Model comparison: Model 1 includes only the main effects for gender and time and the interaction term (the unadjusted gap); Model 2 also controls for other predictors of low pay (the adjusted gap). In both models, the interaction effect is statistically significant, indicating that the positive effect of being female (i.e. the extent to which it increases the risk of low pay) declines over time.

Table CIII. Relative odds of being low paid for female relative to male employees in the UK in each calendar year (1996 – 2016); odds ratios

	Model 1	*Model 2*
1996	2.89 (0.03)***	2.08 (0.04)***
1997	2.79 (0.03)***	2.16 (0.04)***
1998	2.78 (0.03)***	2.12 (0.04)***
1999	2.59 (0.03)***	2.07 (0.05)***
2000	2.77 (0.03)***	2.12 (0.04)***
2001	2.67 (0.03)***	2.40 (0.05)***
2002	2.82 (0.03)***	2.65 (0.04)***
2003	2.56 (0.03)***	2.63 (0.05)***
2004	2.58 (0.03)***	2.58 (0.05)***
2005	2.39 (0.03)***	2.48 (0.05)***
2006	2.28 (0.03)***	2.28 (0.05)***
2007	2.18 (0.03)***	2.26 (0.05)***
2008	2.17 (0.03)***	2.33 (0.05)***
2009	2.06 (0.03)***	2.03 (0.05)***
2010	1.98 (0.03)***	2.15 (0.05)***
2011	1.85 (0.03)***	1.95 (0.05)***
2012	1.99 (0.03)***	2.24 (0.05)***
2013	1.97 (0.03)***	2.14 (0.05)***
2014	1.82 (0.03)***	2.02 (0.05)***
2015	1.88 (0.03)***	2.08 (0.05)***
2016	2.00 (0.03)***	2.29 (0.05)***

Notes: data source LFS 1996-2016; odds ratios with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001.

Model comparison: Model 1 includes only the main effects for gender and time (the unadjusted gap); Model 2 also controls for other predictors of low pay (the adjusted gap).

Table CIV. Results from a Blinder-Oaxaca decomposition of the gender gap in low pay for UK employees in each calendar year (1996 – 2016); mediation percentages

	1996 (%)	*1997 (%)*	*1998 (%)*	*1999 (%)*	*2000 (%)*	*2001 (%)*	*2002 (%)*
Age	0.32	0.15	0.31	0.11	0.13	-0.11	0.14
Marital status	0.52	0.68	0.69	0.72	0.82	0.60	0.78
Single parent	0.31	1.29	1.74	1.68	1.24	0.22	0.06
Education	6.73	6.80	5.92	6.12	6.47	5.24	3.62
Job tenure	7.42	7.00	6.27	5.63	5.56	4.58	4.19
Temporary	0.44	0.36	0.37	0.42	0.55	0.37	0.20
Part time	21.71	20.38	19.83	21.77	20.29	15.00	15.10
Social class	4.99	3.84	3.95	3.02	4.84	0.44	0.56
Industry	2.04	2.63	2.68	2.68	3.18	1.86	1.50
Sector	-6.36	-5.95	-4.32	-6.34	-4.84	-4.28	-3.62
Employer size	5.31	4.91	5.32	4.44	4.17	3.41	3.21
Observations	34,577	41,974	41,664	31,263	40,654	28,945	35,182

Notes: data source LFS 1996-2016; mediation percentages express the size of the estimated coefficient for each variable as a proportion of the total gender gap; these figures are included to show how effects have changed in direction over time, but they should not be directly compared since the size of the total gap varies; negative percentages indicate that women are disadvantaged relative to men in relation to each characteristic, with disadvantage here indicating a higher probability of low pay. Positive percentages indicate that men are disadvantaged compared to women.

Table CIV (continued). Results from a Blinder-Oaxaca decomposition of the gender gap in low pay for UK employees in each calendar year (1996 – 2016); mediation percentages

	2003 (%)	*2004 (%)*	*2005 (%)*	*2006 (%)*	*2007 (%)*	*2008 (%)*	*2009 (%)*
Age	-0.13	0.00	0.20	-0.08	-0.07	0.03	0.11
Marital status	0.66	0.78	1.07	1.20	1.37	1.15	1.44
Single parent	0.51	0.07	0.12	0.67	1.61	0.85	0.89
Education	4.35	3.54	2.62	2.49	1.23	0.04	0.42
Job tenure	3.08	3.39	2.75	3.79	3.11	2.77	3.00
Temporary	0.39	0.09	0.24	0.16	0.70	0.37	0.24
Part time	15.26	14.96	16.34	19.45	18.39	16.99	19.35
Social class	-0.07	0.35	-1.58	-2.30	-2.27	-2.12	-0.54
Industry	0.81	-0.52	1.37	3.57	2.16	3.29	3.63
Sector	-4.53	-3.45	-5.46	-7.34	-5.90	-5.80	-7.48
Employer size	2.68	2.18	1.94	2.59	2.90	2.10	2.43
Observations	36,426	25,490	34,083	33,102	32,332	31,651	29,856

Notes: data source LFS 1996-2016; mediation percentages express the size of the estimated coefficient for each variable as a proportion of the total gender gap; these figures are included to show how effects have changed in direction over time, but they should not be directly compared since the size of the total gap varies; negative percentages indicate that women are disadvantaged relative to men in relation to each characteristic, with disadvantage here indicating a higher probability of low pay. Positive percentages indicate that men are disadvantaged compared to women.

Table CIV (continued). Results from a Blinder-Oaxaca decomposition of the gender gap in low pay for UK employees in each calendar year (1996 – 2016); mediation percentages

	2010 (%)	*2011 (%)*	*2012 (%)*	*2013 (%)*	*2014 (%)*	*2015 (%)*	*2016 (%)*
Age	-0.21	-0.59	-0.55	-0.25	-0.62	-0.58	-0.60
Marital status	1.23	1.25	1.37	1.16	1.20	1.89	0.77
Single parent	0.50	0.77	1.10	1.81	1.69	0.57	1.50
Education	-0.55	-0.49	-1.45	-1.33	-2.04	-2.04	-1.70
Job tenure	2.33	2.13	1.58	1.41	2.24	1.67	0.84
Temporary	0.12	0.41	0.36	0.22	0.27	0.39	0.46
Part time	14.91	19.32	14.41	16.58	16.61	15.66	12.00
Social class	0.11	-4.07	-3.96	-2.43	-4.52	-4.42	-2.37
Industry	2.59	1.56	5.86	4.99	5.10	4.75	1.42
Sector	-6.93	-4.74	-6.73	-6.33	-5.30	-4.27	-2.56
Employer size	1.64	1.74	1.52	1.84	2.19	2.24	2.03
Observations	27,651	26,184	26,542	26,482	25,699	25,380	29,404

Notes: data source LFS 1996-2016; mediation percentages express the size of the estimated coefficient for each variable as a proportion of the total gender gap; these figures are included to show how effects have changed in direction over time, but they should not be directly compared since the size of the total gap varies; negative percentages indicate that women are disadvantaged relative to men in relation to each characteristic, with disadvantage here indicating a higher probability of low pay. Positive percentages indicate that men are disadvantaged compared to women.

Table CV. Results from a Blinder-Oaxaca decomposition of the gender gap in low pay for UK employees in each calendar year (1996 – 2016); coefficients

	1996	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*
Age	-0.001 *	0.000	-0.001 *	0.000	0.000	0.000	0.000
Marital status	-0.001 **	-0.001 ***	-0.001 ***	-0.001 ***	-0.001 ***	-0.001 ***	-0.001 ***
Single parent	-0.001 *	-0.002 ***	-0.003 ***	-0.003 ***	-0.002 ***	0.000	0.000
Education	-0.011 ***	-0.012 ***	-0.010 ***	-0.010 ***	-0.011 ***	-0.008 ***	-0.006 ***
Job tenure	-0.013 ***	-0.012 ***	-0.011 ***	-0.009 ***	-0.009 ***	-0.007 ***	-0.007 ***
Temporary	-0.001 ***	-0.001 ***	-0.001 ***	-0.001 ***	-0.001 ***	-0.001 **	0.000 *
Part time	-0.037 ***	-0.035 ***	-0.033 ***	-0.034 ***	-0.033 ***	-0.023 ***	-0.024 ***
Social class	-0.009 ***	-0.007 ***	-0.007 ***	-0.005 ***	-0.008 ***	-0.001	-0.001
Industry	-0.003 **	-0.004 ***	-0.004 ***	-0.004 **	-0.005 ***	-0.003 *	-0.002 *
Sector	0.011 ***	0.010 ***	0.007 ***	0.010 ***	0.008 ***	0.007 ***	0.006 ***
Employer size	-0.009 ***	-0.008 ***	-0.009 ***	-0.007 ***	-0.007 ***	-0.005 ***	-0.005 ***
Observations	34,577	41,974	41,664	31,263	40,654	28,945	35,182

Notes: data source LFS 1996-2016; significance testing: * p <0.05; ** p <0.01; *** p <0.001; whilst coefficients have a less intuitive interpretation than mediation percentages, they can be directly compared across years; negative coefficients indicate that women are disadvantaged relative to men in relation to each characteristic, with disadvantage here indicating a higher probability of low pay. Positive coefficients indicate that men are disadvantaged compared to women.

Table CV (continued). Results from a Blinder-Oaxaca decomposition of the gender gap in low pay for UK employees in each calendar year (1996 – 2016); coefficients

	2003	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*
Age	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Marital status	-0.001 ***	-0.001 ***	-0.001 ***	-0.002 ***	-0.002 ***	-0.001 ***	-0.002 ***
Single parent	-0.001 *	0.000	0.000	-0.001 *	-0.002 ***	-0.001 *	-0.001 *
Education	-0.006 ***	-0.005 ***	-0.004 ***	-0.003 ***	-0.002 *	0.000	0.000
Job tenure	-0.005 ***	-0.005 ***	-0.004 ***	-0.005 ***	-0.004 ***	-0.003 ***	-0.003 ***
Temporary	-0.001 ***	0.000	0.000 **	0.000 *	-0.001 ***	0.000 ***	0.000 **
Part time	-0.022 ***	-0.022 ***	-0.022 ***	-0.025 ***	-0.023 ***	-0.021 ***	-0.023 ***
Social class	0.000	-0.001	0.002 *	0.003 **	0.003 **	0.003 **	0.001
Industry	-0.001	0.001	-0.002	-0.005 ***	-0.003 *	-0.004 ***	-0.004 **
Sector	0.007 ***	0.005 ***	0.007 ***	0.009 ***	0.007 ***	0.007 ***	0.009 ***
Employer size	-0.004 ***	-0.003 ***	-0.003 ***	-0.003 ***	-0.004 ***	-0.003 ***	-0.003 ***
Observations	36,426	25,490	34,083	33,102	32,332	31,651	29,856

Notes: data source LFS 1996-2016; significance testing: * p <0.05; ** p <0.01; *** p <0.001; whilst coefficients have a less intuitive interpretation than mediation percentages, they can be directly compared across years; negative coefficients indicate that women are disadvantaged relative to men in relation to each characteristic, with disadvantage here indicating a higher probability of low pay. Positive coefficients indicate that men are disadvantaged compared to women.

Table CV (continued). Results from a Blinder-Oaxaca decomposition of the gender gap in low pay for UK employees in each calendar year (1996 – 2016); coefficients

	2010	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*
Age	0.000	0.001 **	0.001 *	0.000	0.001	0.001	0.001 **
Marital status	-0.001 ***	-0.001 ***	-0.002 ***	-0.001 ***	-0.001 ***	-0.002 ***	-0.001 ***
Single parent	-0.001	-0.001 *	-0.001 **	-0.002 ***	-0.002 ***	-0.001	-0.002 ***
Education	0.001	0.000	0.002 **	0.002 **	0.002 ***	0.002 ***	0.002 ***
Job tenure	-0.003 ***	-0.002 ***	-0.002 ***	-0.002 ***	-0.002 ***	-0.002 ***	-0.001 **
Temporary	0.000	0.000 **	0.000 **	0.000 *	0.000 **	0.000 **	-0.001 ***
Part time	-0.017 ***	-0.019 ***	-0.016 ***	-0.019 ***	-0.017 ***	-0.016 ***	-0.013 ***
Social class	0.000	0.004 ***	0.004 ***	0.003 *	0.005 ***	0.005 ***	0.003 **
Industry	-0.003 *	-0.002	-0.007 ***	-0.006 ***	-0.005 ***	-0.005 ***	-0.002
Sector	0.008 ***	0.005 ***	0.008 ***	0.007 ***	0.005 ***	0.004 ***	0.003 ***
Employer size	-0.002 ***	-0.002 ***	-0.002 ***	-0.002 ***	-0.002 ***	-0.002 ***	-0.002 ***
Observations	27,651	26,184	26,542	26,482	25,699	25,380	29,404

Notes: data source LFS 1996-2016; significance testing: * p <0.05; ** p <0.01; *** p <0.001; whilst coefficients have a less intuitive interpretation than mediation percentages, they can be directly compared across years; negative coefficients indicate that women are disadvantaged relative to men in relation to each characteristic, with disadvantage here indicating a higher probability of low pay. Positive coefficients indicate that men are disadvantaged compared to women.

Further information on the shift-share decomposition methodology

The shift-share decomposition used in the article is adapted from the poverty literature (de Beer, 2007; Horemans et al., 2015). Change in the low pay rate for men and women over the reference period (1996 – 2016) is decomposed into three components: (1) change in the risk of low pay associated with working part time (2) change in the risk of low pay associated with working full time and (3) change in the share of part-time employment. The decomposition model can be expressed as follows, where ΔLP is the change in the rate of low pay for male/female employees in 2016 compared to 1996, disaggregated into the change in rate for part-time workers (ΔLP_{pt}) and full-time workers (ΔLPft), as well as the change in the part-time employment rate over this period (ΔPT). This analysis is conducted separately for men and women.

$$\Delta LP = \overline{PT} * \Delta LP_{pt} + \overline{FT} * \Delta LP_{ft} + \left(LP_{pt} - LP_{ft}\right) * \Delta PT$$

Table CVI. Robustness checks: comparison of mediation percentages for the decomposition of the gender gap in low pay for UK employees 1996-2016 across alternative models

	(1) Main results	*(2) Part time <30 hours per week*	*(3) No data imputation*	*(4) KHB decomposition*
Age	-0.08	-0.06	-0.05	-0.09
Marital status	1.23	1.19	1.46	1.37
Single parent	1.13	1.24	1.51	1.26
Education	2.49	2.51	3.17	2.78
Job tenure	3.76	3.73	4.43	4.19
Contract type	0.39	0.39	0.47	0.44
Part time	19.71	16.02	25.06	21.97
Social class	-0.23	-0.17	1.47	-0.26
Industry	3.84	3.92	3.89	4.27
Sector	-6.76	-6.74	-10.39	-7.55
Employer size	3.37	3.32	3.84	3.75
All covariates	28.85	25.34	34.84	32.16
Observations	664,541	659,269	502,131	664,541

Notes: data source LFS 1996-2016; robustness checks based on a pooled model of all calendar years; mediation percentages express the size of the estimated coefficient for each variable as a proportion of the total gender gap; negative percentages indicate that women are disadvantaged relative to men in relation to each characteristic, with disadvantage here indicating a higher probability of low pay. Positive percentages indicate that men are disadvantaged compared to women.

XII. Appendix D: Appendix to Paper #4

Table DI. Description of individual-level variables from the Structure of Earnings Survey (ESES) data set

Variable	*Values*	*Definition*
Low pay	1 Low paid 0 Not low-paid	Gross hourly earnings below two-thirds of the median in each country-year
Gender	1 Female 0 Male	
Age	1 14 - 19 2 20 - 29 3 30 - 39 4 40 - 49 5 50+	
Education	1 High 2 Medium 3 Low	ISCED 5A – 6 ISCED 3 – 5B ISCED 0 -2
Full time or part time	1 Part time 0 Full time	Part-time workers identified by the employer at those working below full-time hours in the workplace
Social class	1 Salariat 2 Intermediate 3 Working class	ESeC coding (derived from ISCO-88 occupational codes)
Industry	1 Mining, quarrying, energy and water 2 Manufacturing and construction 3 Hotels, restaurants, other service 4 Transport and communication 5 Banking, and finance 6 Public administration, education and health	Derived from NACE Rev. 2 coding.
Sector	1 Private 2 Public	

Table DII. Macro-level variables relating to working time regimes and wage structure based on Eurostat statistics for the year 2014

	Part-time employment rate	*Proportion of part-time workers involuntary*	*Proportion of part-time workers who are female*	*Incidence of low pay*
BE	23.70	10.10	81.03	3.79
BG	2.50	63.20	54.17	18.19
CY	13.50	64.90	60.42	19.33
CZ	5.50	21.10	74.44	18.69
DE	26.50	14.50	81.65	22.48
EE	8.30	15.10	64.00	22.76
ES	15.80	64.00	73.54	14.59
FI	14.10	29.00	66.77	5.28
FR	18.60	42.40	79.36	8.81
IT	18.10	65.40	75.08	9.44
LT	8.60	31.30	63.64	23.96
LU	18.40	12.90	84.44	11.94
LV	6.80	38.10	65.52	25.46
MT	15.50	15.10	71.43	15.08
NL	49.60	10.90	71.78	18.52
NO	25.60	20.30	71.89	8.29
PL	7.10	32.30	65.73	23.56
PT	10.10	49.30	61.31	12.03
RO	8.70	56.90	46.81	24.40
SE	24.50	29.80	72.87	2.64
SI	10.00	9.60	62.92	18.47
SK	5.10	33.40	58.82	19.21
UK	25.30	18.80	76.53	21.26

Notes: data source: Eurostat database 2014; the part-time employment rate, the proportion of part-time workers who are female and the share of involuntary part-time workers are taken from the EU Labour Force Survey (EU-LFS); the incidence of low pay is based on the European Structure of Earnings Survey (ESES).

Table DIII. Full results from the first-stage regression for women: effect of personal and job characteristics on the likelihood of being low paid for female employees in each country in 2014; coefficients (log-odds ratios)

Country	*BE*	*BG*	*CY*	*CZ*	*DE*	*EE*
Part time (ref: full time)	0.03 (0.06)	0.62 (0.03)***	0.44 (0.14)**	0.61 (0.05)***	1.05 (0.02)***	0.42 (0.03)***
Age group 16-19 (ref)						
Age group 20-29	-1.55 (0.15)***	0.13 (0.12)	-0.53 (0.44)	-0.84 (0.10)***	-1.01 (0.09)***	-0.28 (0.17)
Age group 30-39	-2.97 (0.17)***	0.16 (0.12)	-1.48 (0.44)***	-1.02 (0.10)***	-1.65 (0.09)***	-0.17 (0.17)
Age group 40-49	-3.70 (0.17)***	0.04 (0.12)	-1.77 (0.44)***	-1.00 (0.10)***	-1.77 (0.09)***	0.20 (0.17)
Age group 50+	-4.02 (0.17)***	-0.26 (0.12)*	-1.92 (0.44)***	-0.99 (0.10)***	-1.69 (0.09)***	0.58 (0.17)***
Low education (ref)						
Medium education	-0.44 (0.06)***	-0.43 (0.03)***	-0.83 (0.14)***	-0.51 (0.03)***	-0.46 (0.02)***	-0.50 (0.05)***
High education	-2.92 (0.40)***	-1.09 (0.05)***	-1.72 (0.17)***	-1.72 (0.07)***	-0.96 (0.03)***	-0.94 (0.06)***
Salariat (ref)						
Intermediate	-0.19 (0.39)	1.91 (0.06)***	0.48 (0.18)**	1.03 (0.06)***	0.39 (0.03)***	1.08 (0.05)***
Working class	1.20 (0.38)**	2.12 (0.05)***	1.15 (0.16)***	2.31 (0.05)***	1.81 (0.02)***	2.44 (0.04)***
Manufacturing (ref)						
Mining and utilities	-1.14 (1.02)	-0.35 (0.07)***	-0.57 (0.44)	-0.14 (0.10)	-0.31 (0.08)***	-0.43 (0.13)***
Hotels and restaurants	1.54 (0.14)***	-0.35 (0.02)***	-0.06 (0.12)	0.82 (0.03)***	0.19 (0.02)***	0.97 (0.04)***
Transport and communication	-0.38 (0.31)	-0.38 (0.06)***	-1.11 (0.22)***	-0.63 (0.07)***	0.02 (0.03)	0.27 (0.07)***
Banking and finance	-0.61 (0.27)*	-0.27 (0.04)***	-1.59 (0.17)***	0.14 (0.08)	-0.34 (0.03)***	0.96 (0.07)***
Education and health	0.23 (0.14)	0.25 (0.04)***	-0.40 (0.17)*	0.91 (0.04)***	-0.01(0.02)	0.59 (0.06)***
Private sector (ref: public)	-0.33 (0.11)**	1.39 (0.04)***	2.10 (0.14)***	0.80 (0.04)***	1.64 (0.02)***	-0.31 (0.05)***
Constant	-0.76 (0.46)	-3.70 (0.15)***	-0.30 (0.50)	-1.88 (0.12)***	-1.87 (0.10)***	-2.33 (0.18)***
Pseudo R2	0.29	0.18	0.29	0.23	0.25	0.22
Observations	56,794	91,797	16,067	1,105,155	362,942	70,265

Notes: ESES 2014; coefficients with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001

Table DIII (continued). Full results from the first-stage regression for women: effect of personal and job characteristics on the likelihood of being low paid for female employees in each country in 2014; coefficients (log-odds ratios)

Country	*ES*	*FI*	*FR*	*IT*	*LT*	*LU*
Part time (ref: full time)	0.33 (0.04)***	0.43 (0.03)***	0.57 (0.04)***	0.75 (0.04)***	0.79 (0.08)***	0.46 (0.08)***
Age group 16-19 (ref)						
Age group 20-29	0.14 (0.50)	-0.80 (0.08)***	0.01 (0.55)	-1.77 (1.16)	-0.27 (0.30)	0.16 (0.51)
Age group 30-39	-0.20 (0.50)	-1.22 (0.08)***	-0.76 (0.55)	-2.42 (1.16)*	-0.21 (0.30)	-0.45 (0.51)
Age group 40-49	-0.43 (0.50)	-1.42 (0.09)***	-1.08 (0.55)	-2.87 (0.16)*	-0.06 (0.30)	-0.59 (0.51)
Age group 50+	-0.62 (0.50)	-1.60 (0.08)***	-1.34 (0.55)*	-3.02 (1.16)**	0.04 (0.30)	-0.81 (0.51)
Low education (ref)						
Medium education	-0.15 (0.04)***	-0.66 (0.04)***	-0.58 (0.04)***	-0.84 (0.06)***	-0.32 (0.15)*	-1.14 (0.08)***
High education	-0.74 (0.05)***	-1.21 (0.05)***	-1.42 (0.05)***	-1.41 (0.09)***	-1.12 (0.16)***	-1.63 (0.18)***
Salariat (ref)						
Intermediate	1.11 (0.06)***	1.49 (0.08)***	0.89 (0.07)***	0.52 (0.09)***	1.40 (0.10)***	0.55 (0.25)*
Working class	1.49 (0.06)***	2.47 (0.07)***	1.89 (0.05)***	1.52 (0.09)***	1.80 (0.09)***	2.25 (0.23)***
Manufacturing (ref)						
Mining and utilities	-0.44 (0.11)***	-0.27 (0.33)	-0.37 (0.15)*	0.02 (0.15)	-0.02 (0.13)	-1.72 (1.04)
Hotels and restaurants	0.13 (0.05)**	0.26 (0.09)**	0.36 (0.06)***	0.02 (0.10)	0.74 (0.09)***	0.18 (0.13)
Transport and communication	-0.04 (0.07)	-0.04 (0.13)	-0.80 (0.09)***	0.09 (0.12)	0.27 (0.12)*	-0.98 (0.25)***
Banking and finance	0.44 (0.05)***	0.32 (0.12)**	-0.50 (0.06)***	-0.50 (0.11)***	0.59 (0.10)***	-1.38 (0.20)***
Education and health	0.37 (0.05)***	0.89 (0.09)***	0.51 (0.05)***	1.44 (0.09)***	0.59 (0.09)***	0.27 (0.13)*
Private sector (ref: public)	1.61 (0.06)***	0.18 (0.03)***	-0.04 (0.04)	2.13 (0.08)***	0.48 (0.07)***	1.54 (0.13)***
Constant	-3.47 (0.50)***	-3.16 (0.14)***	-0.72 (0.55)	-1.68 (1.17)	-2.03 (0.34)***	-3.71 (0.58)***
Pseudo R2	0.16	0.18	0.24	0.32	0.22	0.33
Observations	89,493	180,894	118,443	84,363	22,366	8,851

Notes: ESES 2014; coefficients with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001

Table DIII (continued). Full results from the first-stage regression for women: effect of personal and job characteristics on the likelihood of being low paid for female employees in each country in 2014; coefficients (log-odds ratios)

Country	*LV*	*MT*	*NL*	*NO*	*PL*	*PT*
Part time (ref: full time)	0.46 (0.04)***	-0.44 (0.12)***	0.49 (0.04)***	0.28 (0.02)***	0.02 (0.02)	0.26 (0.09)**
Age group 16-19 (ref)						
Age group 20-29	-0.11 (0.27)	-0.63 (0.25)*	-1.68 (0.09)***	-1.43 (0.03)***	-0.23 (0.18)	-0.38 (0.30)
Age group 30-39	-0.08 (0.27)	-0.98 (0.25)***	-3.23 (0.09)***	-2.70 (0.03)***	-0.82 (0.18)***	-0.82 (0.29)**
Age group 40-49	0.10 (0.27)	-0.61 (0.25)*	-3.38 (0.09)***	-3.43 (0.04)***	-1.02 (0.18)***	-0.67 (0.92)*
Age group 50+	0.27 (0.27)	-0.57 (0.25)*	-3.42 (0.09)***	-3.79 (0.04)***	-1.12 (0.18)***	-0.91 (0.29)**
Low education (ref)						
Medium education	-0.36 (0.06)***	-0.63 (0.11)***	-0.70 (0.04)***	-0.44 (0.02)***	-0.13 (0.02)***	-0.86 (0.08)***
High education	-1.12 (0.07)***	-1.39 (0.15)***	-1.18 (0.05)***	-0.72 (0.02)***	-1.27 (0.03)***	-1.86 (0.15)***
Salariat (ref)						
Intermediate	0.67 (0.07)***	1.02 (0.17)***	0.62 (0.05)***	0.78 (0.04)***	1.04 (0.02)***	1.15 (0.17)***
Working class	1.40 (0.06)***	1.79 (0.14)***	1.87 (0.04)***	1.63 (0.02)***	2.21 (0.02)***	2.43 (0.14)***
Manufacturing (ref)						
Mining and utilities	-0.31 (0.06)***	1.27 (0.42)**	-1.62 (0.32)***	-0.65 (0.10)***	-0.70 (0.05)***	-1.20 (0.21)***
Hotels and restaurants	0.48 (0.06)***	0.23 (0.14)	0.03 (0.06)	0.98 (0.03)***	0.62 (0.02)***	-0.86 (0.07)***
Transport and communication	-0.37 (0.08)***	-0.52 (0.24)*	-0.43 (0.08)***	0.32 (0.05)***	-0.39 (0.03)***	-1.12 (0.17)***
Banking and finance	-0.12 (0.08)	-0.95 (0.22)***	-0.70 (0.07)***	0.46 (0.05)***	-0.26 (0.02)***	-1.77 (0.14)***
Education and health	0.29 (0.05)***	0.30 (0.15)*	-0.02 (0.07)	0.35 (0.04)***	0.92 (0.02)***	-0.45 (0.08)***
Private sector (ref: public)	0.11 (0.04)**	1.19 (0.11)***	1.85 (0.05)***	1.12 (0.02)***	1.12 (0.02)***	0.74 (0.10)***
Constant	-1.27 (0.28)***	-2.00 (0.32)***	-0.25 (0.13)	-1.99 (0.05)***	-1.94 (0.19)***	-2.01 (0.24)***
Pseudo R2	0.17	0.23	0.40	0.42	0.31	0.28
Observations	99,449	19,827	76,030	789,323	363,912	39,010

Notes: ESES 2014; coefficients with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001

Table DIII (continued). Full results from the first-stage regression for women: effect of personal and job characteristics on the likelihood of being low paid for female employees in each country in 2014; coefficients (log-odds ratios)

Country	*RO*	*SE*	*SI*	*SK*	*UK*
Part time (ref: full time)	0.97 (0.06)***	0.53 (0.06)***	0.75 (0.14)***	0.64 (0.04)***	0.83 (0.02)***
Age group 16-19 (ref)					
Age group 20-29	0.90 (0.20)***	-1.47 (0.11)***	-0.34 (0.69)	-0.38 (0.17)*	-1.19 (0.06)***
Age group 30-39	0.80 (0.20)***	-2.94 (0.12)***	-1.02 (0.68)	-0.57 (0.17)***	-1.64 (0.06)***
Age group 40-49	0.72 (0.20)***	-3.53 (0.13)***	-1.33 (0.68)	-0.60 (0.17)***	-1.69 (0.06)***
Age group 50+	0.62 (0.20)**	-4.03 (0.13)***	-1.46 (0.68)*	-0.56 (0.17)**	-1.71 (0.06)***
Low education (ref)					
Medium education	-0.44 (0.03)***	-0.54 (0.10)***	-0.82 (0.06)***	-0.92 (0.03)***	-0.19 (0.03)***
High education	-1.63 (0.05)***	-1.02 (0.12)***	-1.79 (0.10)***	-2.18 (0.06)***	-0.51 (0.03)***
Salariat (ref)					
Intermediate	1.06 (0.06)***	1.02 (0.12)***	0.51 (0.11)***	0.78 (0.06)***	0.56 (0.08)***
Working class	1.73 (0.04)***	0.99 (0.09)***	1.85 (0.08)***	2.10 (0.05)***	2.44 (0.06)***
Manufacturing (ref)					
Mining and utilities	-0.00 (0.08)	-0.77 (0.65)	0.08 (0.16)	-0.09 (0.08)	-1.34 (0.24)***
Hotels and restaurants	1.14 (0.03)***	0.55 (0.23)*	0.53 (0.07)***	0.55 (0.03)***	0.93 (0.05)***
Transport and communication	0.14 (0.07)*	0.51 (0.34)	0.25 (0.19)	-0.26 (0.06)***	-0.85 (0.08)***
Banking and finance	0.50 (0.05)***	1.38 (0.25)***	0.27 (0.14)	0.29 (0.06)***	-0.74 (0.06)***
Education and health	1.46 (0.04)***	1.70 (0.22)***	1.19 (0.09)***	1.04 (0.04)***	0.40 (0.05)***
Private sector (ref: public)	0.72 (0.04)***	0.22 (0.07)**	1.33 (0.08)***	0.32 (0.04)***	1.42 (0.03)***
Constant	-3.88 (0.21)***	-2.71 (0.26)***	-1.26 (0.70)	-1.54 (0.19)***	-3.51 (0.10)***
Pseudo R2	0.21	0.24	0.29	0.24	0.33
Observations	136,802	147,011	122,905	426,564	91,206

Notes: ESES 2014; coefficients with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001

Table DIV. Full results from the first-stage regression for men: effect of personal and job characteristics on the likelihood of being low paid for male employees in each country in 2014; coefficients (log-odds ratios)

Country	*BE*	*BG*	*CY*	*CZ*	*DE*	*EE*
Part time (ref: full time)	0.22 (0.07)**	0.73 (0.04)***	0.74 (0.19)***	0.93 (0.09)***	2.15 (0.02)***	0.71 (0.05)***
Age group 16-19 (ref)						
Age group 20-29	-1.53 (0.15)***	-0.23 (0.14)	-0.27 (0.45)	-0.57 (0.10)***	-0.67 (0.09)***	-0.57 (0.19)**
Age group 30-39	-2.98 (0.16)***	-0.29 (0.14)*	-1.17 (0.48)*	-0.81 (0.10)***	-1.18 (0.09)***	-0.51 (0.19)**
Age group 40-49	-3.96 (0.18)***	-0.39 (0.14)**	-1.33 (0.48)**	-0.82 (0.10)***	-1.38 (0.09)***	-0.29 (0.19)
Age group 50+	-4.30 (0.19)***	-0.43 (0.14)**	-1.59 (0.48)***	-0.73 (0.10)***	-1.17 (0.09)***	0.05 (0.19)
Low education (ref)						
Medium education	-0.64 (0.06)***	-0.60 (0.04)***	-0.39 (0.13)**	-0.77 (0.03)***	-0.53 (0.02)***	-0.38 (0.05)***
High education	-2.14 (0.34)***	-1.28 (0.05)***	-0.83 (0.17)***	-1.45 (0.08)***	-1.01 (0.03)***	-0.68 (0.06)***
Salariat (ref)						
Intermediate	1.08 (0.37)**	2.08 (0.08)***	0.70 (0.23)**	0.83 (0.09)***	0.94 (0.04)***	0.26 (0.08)***
Working class	2.25 (0.37)***	2.45 (0.06)***	1.46 (0.19)***	1.59 (0.06)***	1.81 (0.03)***	0.95 (0.05)***
Manufacturing (ref)						
Mining and utilities	-1.05 (0.33)**	-1.20 (0.07)***	-0.79 (0.34)*	0.09 (0.06)	0.63 (0.05)***	-0.35 (0.10)***
Hotels and restaurants	1.93 (0.09)***	-0.31 (0.03)***	0.40 (0.11)***	1.31 (0.04)***	1.28 (0.02)***	0.91 (0.05)***
Transport and communication	-2.13 (0.29)***	-0.45 (0.05)***	-0.35 (0.20)	1.04 (0.04)***	1.38 (0.02)***	0.67 (0.05)***
Banking and finance	0.15 (0.25)	0.47 (0.05)***	-0.43 (0.20)*	1.12 (0.09)***	0.81 (0.03)***	1.21 (0.07)***
Education and health	1.310 (0.10)**	1.53 (0.04)***	0.71 (0.21)***	1.76 (0.03)***	1.35 (0.03)***	0.93 (0.06)***
Private sector (ref: public)	-0.81 (0.12)***	1.87 (0.05)***	3.32 (0.21)***	1.41 (0.03)***	1.33 (0.03)***	1.01 (0.05)***
Constant	-2.00 (0.43)***	-4.34 (0.16)***	-3.93 (0.57)***	-3.01 (0.12)***	-3.82 (0.10)***	-2.74 (0.20)***
Pseudo R2	0.34	0.20	0.22	0.16	0.33	0.10
Observations	66,525	76,730	15,579	1,097,481	361,078	52,389

Notes: ESES 2014; coefficients with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001

Table DIV (continued). Full results from the first-stage regression for men: effect of personal and job characteristics on the likelihood of being low paid for male employees in each country in 2014; coefficients (log-odds ratios)

Country	*ES*	*FI*	*FR*	*IT*	*LT*	*LU*
Part time (ref: full time)	0.68 (0.06)***	0.93 (0.05)***	0.68 (0.06)***	1.56 (0.06)***	1.30 (0.07)***	1.01 (0.12)***
Age group 16-19 (ref)						
Age group 20-29	-0.95 (0.29)**	-1.57 (0.15)***	-1.22 (0.53)*	-1.35 (0.58)*	0.03 (0.31)	-1.82 (0.39)***
Age group 30-39	-1.49 (0.29)***	-2.48 (0.15)***	-2.19 (0.52)***	-2.17 (0.58)***	-0.07 (0.31)	-2.74 (0.39)***
Age group 40-49	-1.80 (0.29)***	-2.74 (0.16)***	-2.59 (0.52)***	-2.68 (0.58)***	0.01 (0.31)	-3.20 (0.39)***
Age group 50+	-1.95 (0.29)***	-2.81 (0.15)***	-2.76 (0.52)***	-2.84 (0.58)***	0.12 (0.31)	-3.14 (0.39)***
Low education (ref)						
Medium education	-0.43 (0.05)***	-0.35 (0.06)***	-0.44 (0.04)***	-0.40 (0.07)***	-0.21 (0.11)	-1.07 (0.09)***
High education	-0.99 (0.07)***	-0.98 (0.09)***	-1.26 (0.05)***	-1.20 (0.10)***	-0.68 (0.13)***	-1.34 (0.20)***
Salariat (ref)						
Intermediate	0.93 (0.09)***	1.50 (0.12)***	0.47 (0.14)***	0.69 (0.12)***	1.27 (0.14)***	1.36 (0.27)***
Working class	1.04 (0.08)***	2.00 (0.10)***	1.77 (0.05)***	1.32 (0.10)***	1.24 (0.09)***	1.94 (0.26)***
Manufacturing (ref)						
Mining and utilities	-0.26 (0.07)***	0.18 (0.19)	0.22 (0.08)**	0.07 (0.12)	-0.40 (0.09)***	-1.65 (0.72)*
Hotels and restaurants	0.81 (0.05)***	1.21 (0.09)***	0.69 (0.05)***	0.83 (0.10)***	0.72 (0.09)***	1.51 (0.11)***
Transport and communication	0.89 (0.07)***	0.48 (0.11)***	0.101 (0.06)	0.85 (0.10)***	0.63 (0.07)***	0.11 (0.15)
Banking and finance	1.12 (0.07)***	1.47 (0.14)***	0.20 (0.07)***	-0.02 (0.11)	0.94 (0.10)***	0.13 (0.20)
Education and health	1.05 (0.05)***	1.95 (0.09)***	1.14 (0.05)***	1.89 (0.09)***	0.59 (0.08)***	1.20 (0.12)***
Private sector (ref: public)	1.41 (0.08)***	-0.02 (0.06)	0.22 (0.05)***	2.08 (0.09)***	1.14 (0.07)***	-0.53 (0.12)***
Constant	-2.89 (0.31)***	-3.11 (0.20)***	-0.57 (0.53)	-3.01 (0.59)***	-2.90 (0.34)***	-1.26 (0.46)**
Pseudo R2	0.14	0.24	0.22	0.26	0.14	0.24
Observations	119,943	134,021	145,745	100,564	22,586	13,941

Notes: ESES 2014; coefficients with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001

Table DIV (continued). Full results from the first-stage regression for men: effect of personal and job characteristics on the likelihood of being low paid for male employees in each country in 2014; coefficients (log-odds ratios)

Country	*LV*	*MT*	*NL*	*NO*	*PL*	*PT*
Part time (ref: full time)	0.58 (0.04)***	0.24 (0.13)	1.03 (0.03)***	0.79 (0.02)***	0.81 (0.02)***	0.36 (0.13)**
Age group 16-19 (ref)						
Age group 20-29	0.42 (0.26)	-0.54 (0.21)**	-1.84 (0.10)***	-2.28 (0.03)***	-0.73 (0.11)***	-0.65 (0.25)**
Age group 30-39	0.43 (0.26)	-1.28 (0.22)***	-3.58 (0.10)***	-3.48 (0.04)***	-1.21 (0.11)***	-1.31 (0.25)***
Age group 40-49	0.76** (0.26)	-1.35 (0.22)***	-4.18 (0.10)***	-3.93 (0.04)***	-1.36 (0.11)***	-1.51 (0.25)***
Age group 50+	0.90*** (0.26)	-0.92 (0.21)***	-4.07 (0.10)***	-4.05 (0.04)***	-1.22 (0.11)***	-1.65 (0.26)***
Low education (ref)						
Medium education	0.06 (0.05)	-0.74 (0.09)***	-0.49 (0.04)***	-0.72 (0.02)***	-0.26 (0.02)***	-0.54 (0.07)***
High education	-0.42 (0.07)***	-1.28 (0.14)***	-0.86 (0.06)***	-0.75 (0.03)***	-1.21 (0.03)***	-1.78 (0.18)***
Salariat (ref)						
Intermediate	0.04 (0.11)	0.69 (0.19)***	0.79 (0.07)***	0.66 (0.04)***	0.88 (0.03)***	1.24 (0.14)***
Working class	0.65 (0.06)***	1.76 (0.14)***	1.46 (0.05)***	1.44 (0.03)***	1.53 (0.02)***	1.76 (0.12)***
Manufacturing (ref)						
Mining and utilities	-0.19 (0.05)***	-0.05 (0.28)	-0.75 (0.21)***	-1.03 (0.06)***	-0.78 (0.03)***	-0.49 (0.13)***
Hotels and restaurants	0.64 (0.06)***	0.25 (0.10)*	0.79 (0.04)***	1.20 (0.02)***	0.73 (0.01)***	0.19 (0.08)*
Transport and communication	0.22 (0.05)***	-0.34 (0.15)*	0.22 (0.06)***	0.51 (0.03)***	0.75 (0.02)***	-0.38 (0.09)***
Banking and finance	-0.08 (0.08)	-0.14 (0.23)	0.19 (0.07)**	0.64 (0.05)***	0.37 (0.03)***	-0.98 (0.17)***
Education and health	0.56 (0.05)***	0.06 (0.12)	0.39 (0.06)***	0.62 (0.03)***	1.79 (0.02)***	-0.27 (0.09)**
Private sector (ref: public)	0.79 (0.04)***	0.59 (0.10)***	0.26 (0.07)***	0.62 (0.02)***	1.85 (0.02)***	0.29 (0.14)*
Constant	-2.85 (0.26)***	-1.71 (0.26)***	0.31 (0.14)*	-1.32 (0.05)***	-2.73 (0.11)***	-2.13 (0.31)***
Pseudo R2	10.08	0.20	0.39	0.37	0.18	0.14
Observations	73,104	26,156	79,456	702,487	359,794	46,191

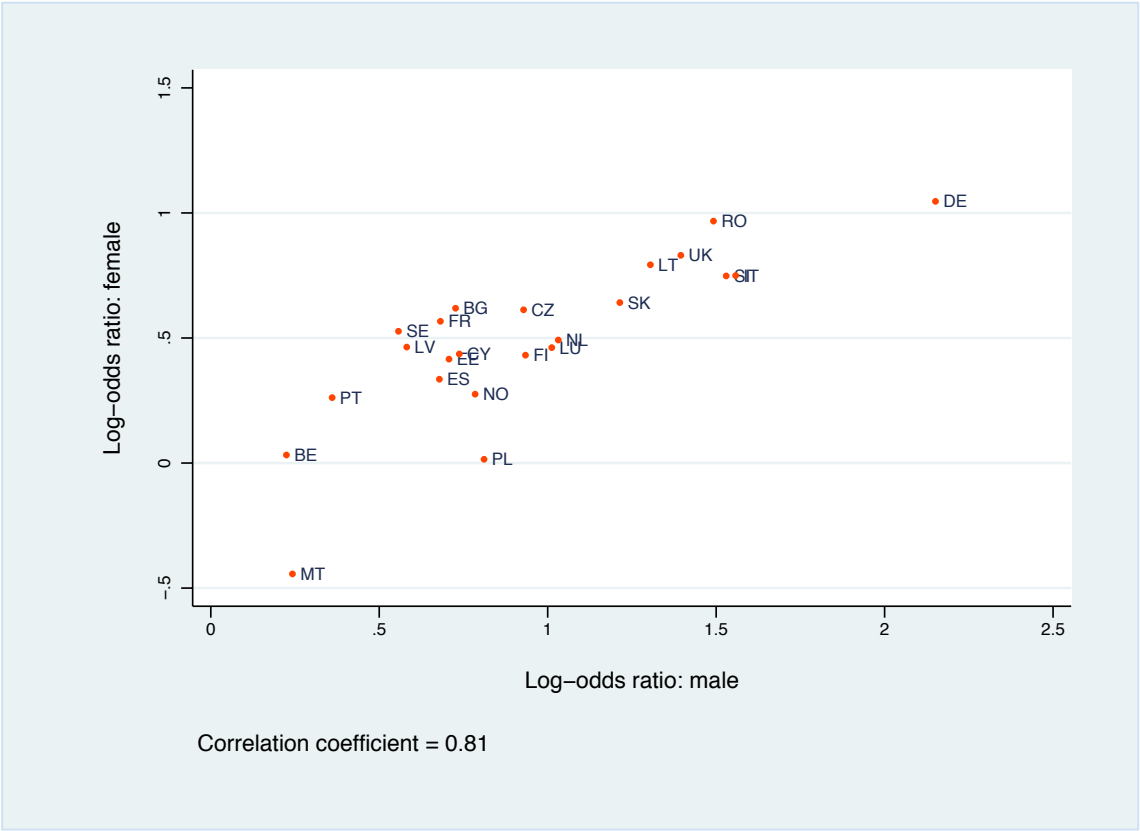
Notes: ESES 2014; coefficients with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001

Table DIV (continued). Full results from the first-stage regression for men: effect of personal and job characteristics on the likelihood of being low paid for male employees in each country in 2014; coefficients (log-odds ratios)

Country	*RO*	*SE*	*SI*	*SK*	*UK*
Part time (ref: full time)	1.49 (0.06)***	0.56 (0.10)***	1.53 (0.19)***	1.21 (0.06)***	1.40 (0.03)***
Age group 16-19 (ref)					
Age group 20-29	-0.41 (0.17)*	-1.53 (0.18)***	-0.71 (0.22)**	-0.32 (0.15)*	-1.09 (0.06)***
Age group 30-39	-0.49 (0.17)**	-3.36 (0.20)***	-1.10 (0.22)***	-0.56 (0.15)***	-1.71 (0.07)***
Age group 40-49	-0.70 (0.17)***	-4.13 (0.23)***	-1.25 (0.22)***	-0.48 (0.15)**	-1.91 (0.07)***
Age group 50+	-0.88 (0.17)***	-4.07 (0.22)***	-1.30 (0.22)***	-0.32 (0.15)*	-1.90 (0.07)***
Low education (ref)					
Medium education	-0.50 (0.04)***	-0.30 (0.14)*	-0.48 (0.06)***	-1.35 (0.04)***	-0.15 (0.03)***
High education	-1.80 (0.06)***	-1.30 (0.16)***	-1.17 (0.12)***	-2.08 (0.06)***	-0.37 (0.04)***
Salariat (ref)					
Intermediate	0.28 (0.07)***	0.28 (0.13)*	0.58 (0.12)***	0.35 (0.09)***	1.16 (0.07)***
Working class	1.21 (0.04)***	0.23 (0.09)**	0.98 (0.08)***	1.07 (0.05)***	2.03 (0.05)***
Manufacturing (ref)					
Mining and utilities	-0.59 (0.04)***	-1.93 (0.54)***	0.08 (0.08)	-0.12 (0.04)**	-0.19 (0.13)
Hotels and restaurants	0.73 (0.03)***	0.56 (0.20)**	0.40 (0.07)***	0.93 (0.04)***	1.27 (0.04)***
Transport and communication	0.33 (0.04)***	0.16 (0.24)	0.70 (0.08)***	0.99 (0.04)***	-0.37 (0.06)***
Banking and finance	0.35 (0.05)***	0.81 (0.21)***	0.51 (0.12)***	0.53 (0.07)***	0.10 (0.07)
Education and health	1.45 (0.03)***	1.81 (0.16)***	1.42 (0.07)***	1.41 (0.04)***	0.98 (0.04)***
Private sector (ref: public)	1.16 (0.03)***	-0.41 (0.08)***	2.29 (0.06)***	1.19 (0.03)***	2.20 (0.07)***
Constant	-2.18 (0.18)***	-1.60 (0.31)***	-2.50 (0.24)***	-2.19 (0.16)***	-4.92 (0.12)***
Pseudo R2	0.18	0.27	0.16	0.16	0.33
Observations	149,916	114,548	146,853	460,488	82,319

Notes: ESES 2014; coefficients with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001

Figure DI. Scatter plot showing the estimated effect (log-odds ratio) of working part time relative to full time on the risk of low pay for male and female employees in each country



Note: the effect for working part time relative to full time on the risk of low pay comes from a series of logistic regressions (one for male and female employees in each country) estimated using ESES 2014

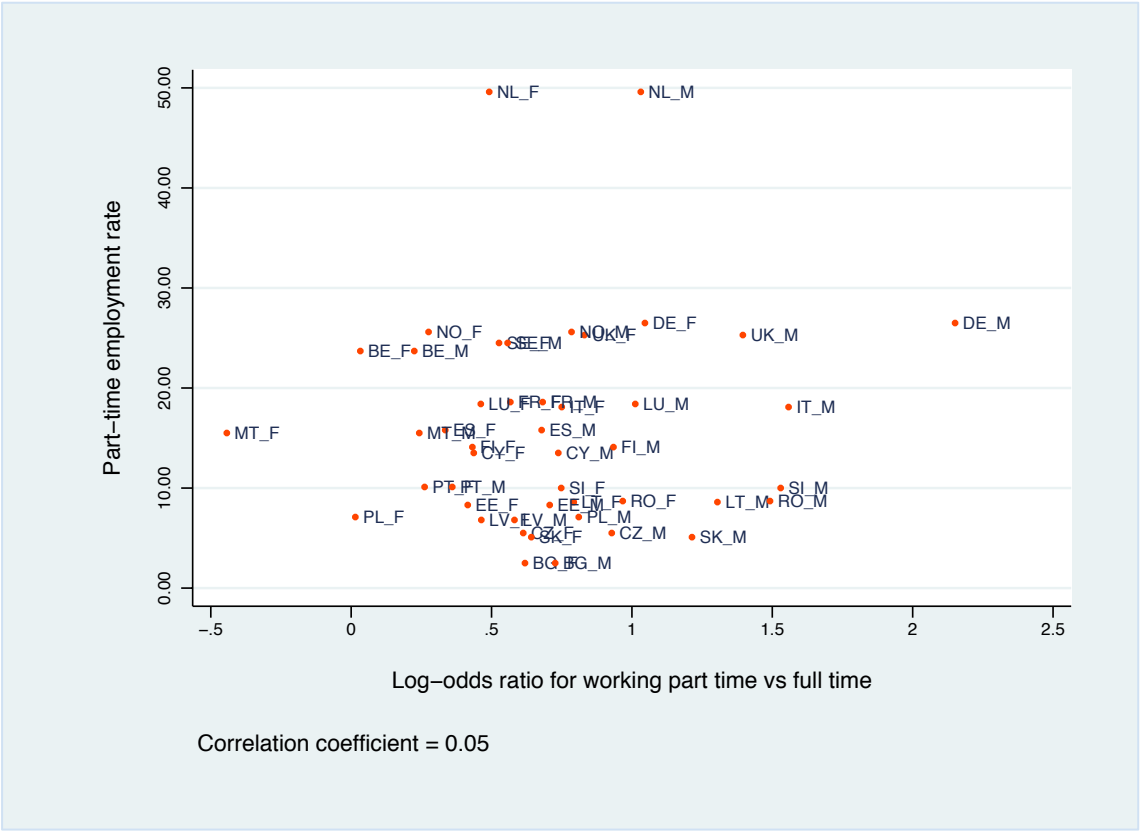
Table DV. Selected results from a first-stage regression for a pooled sample of both men and women, including an interaction between working part time and gender; coefficients (log-odds ratios)

Country	*Main effect: part time*	*Main effect: female*	*Interaction: part time * female*
BE	0.29 (0.07)***	0.15 (0.06)*	-0.33 (0.09)***
BG	0.73 (0.04)***	0.14 (0.02)***	-0.18 (0.05)***
CY	0.77 (0.20)***	0.79 (0.06)***	-0.34 (0.24)
CZ	1.13 (0.09)***	0.68 (0.02)***	-0.60 (0.10)***
DE	2.25 (0.02)***	0.86 (0.02)***	-1.26 (0.02)***
EE	0.81 (0.05)***	0.70 (0.02)***	-0.48 (0.06)***
ES	0.73 (0.06)***	0.78 (0.03)***	-0.41 (0.07)***
FI	1.07 (0.05)***	0.44 (0.04)***	-0.69 (0.06)***
FR	0.73 (0.07)***	0.61 (0.03)***	-0.17 (0.07)**
IT	1.62 (0.06)***	0.62 (0.06)***	-0.91 (0.09)***
LT	1.43 (0.08)***	0.37 (0.05)***	-0.74 (0.10)***
LU	1.04 (0.12)***	0.85 (0.07)***	-0.60 (0.14)***
LV	0.64 (0.04)***	0.42 (0.04)***	-0.23 (0.06)***
MT	0.23 (0.13)	0.56 (0.06)***	-0.63 (0.17)***
NL	1.08 (0.03)***	0.69 (0.04)***	-0.53 (0.05)***
NO	0.82 (0.02)***	0.54 (0.02)***	-0.56 (0.02)***
PL	0.95 (0.02)***	0.81 (0.01)***	-0.95 (0.03)***
PT	0.75 (0.13)***	1.31 (0.05)***	-0.62 (0.16)***
RO	1.53 (0.07)***	-0.03 (0.02)	-0.61 (0.09)***
SE	0.59 (0.09)***	-0.12 (0.06)*	-0.09 (0.10)
SI	1.66 (0.21)***	0.65 (0.04)***	-0.97 (0.24)***
SK	1.33 (0.06)***	0.69 (0.02)***	-0.72 (0.07)***
UK	1.40 (0.03)***	0.57 (0.02)***	-0.53 (0.04)***

Notes: ESES 2014; coefficients with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001; regressions estimated separately for each country; model also controls for age, education, social class, sector and industry of work.

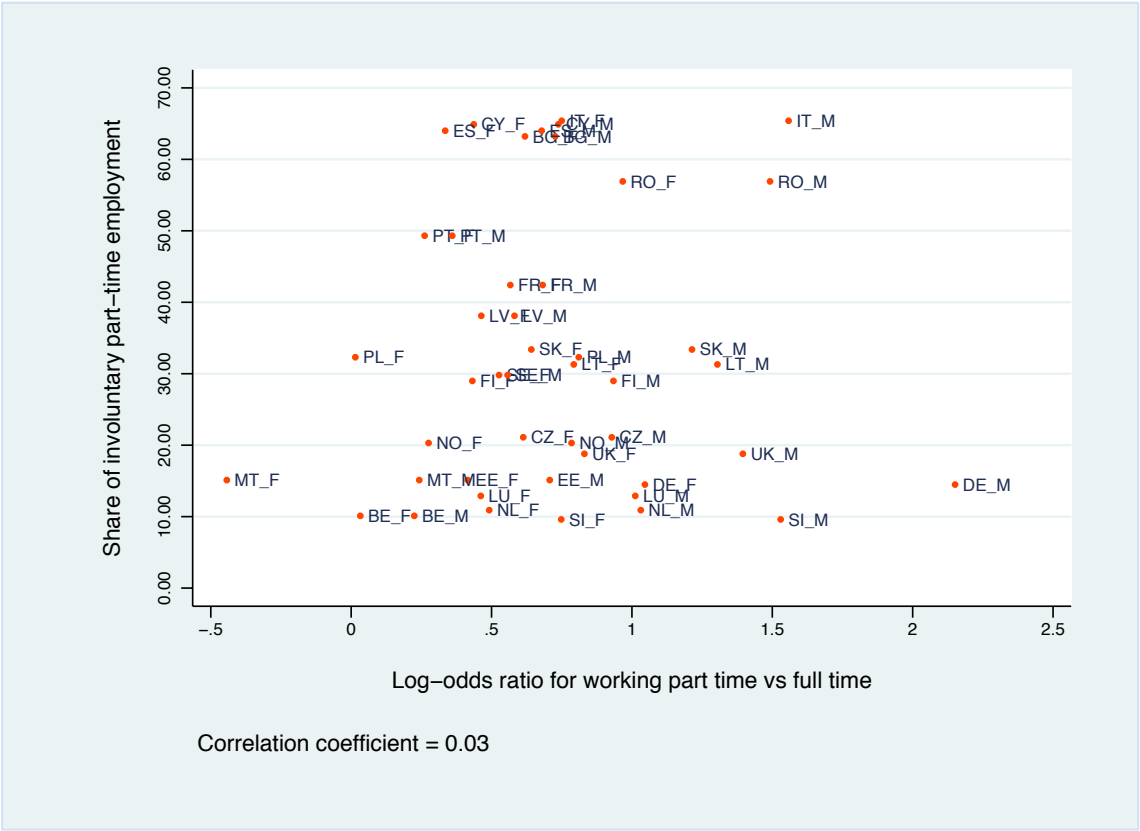
Interpretation: in all countries, the effect of working part time relative to full time is positive i.e. it increases the likelihood of being low paid. In all countries, the interaction effect between being female and working part time is negative (although non-significant in Cyprus and Sweden). This indicates that the positive effect of working part time (i.e. the extent to which it increases the risk of low pay) is less pronounced for women than for men.

Figure DII. Scatter plot showing the relationship between the estimated effect of working part time relative to full time on the risk of low pay for men and women in each country and the part-time employment rate



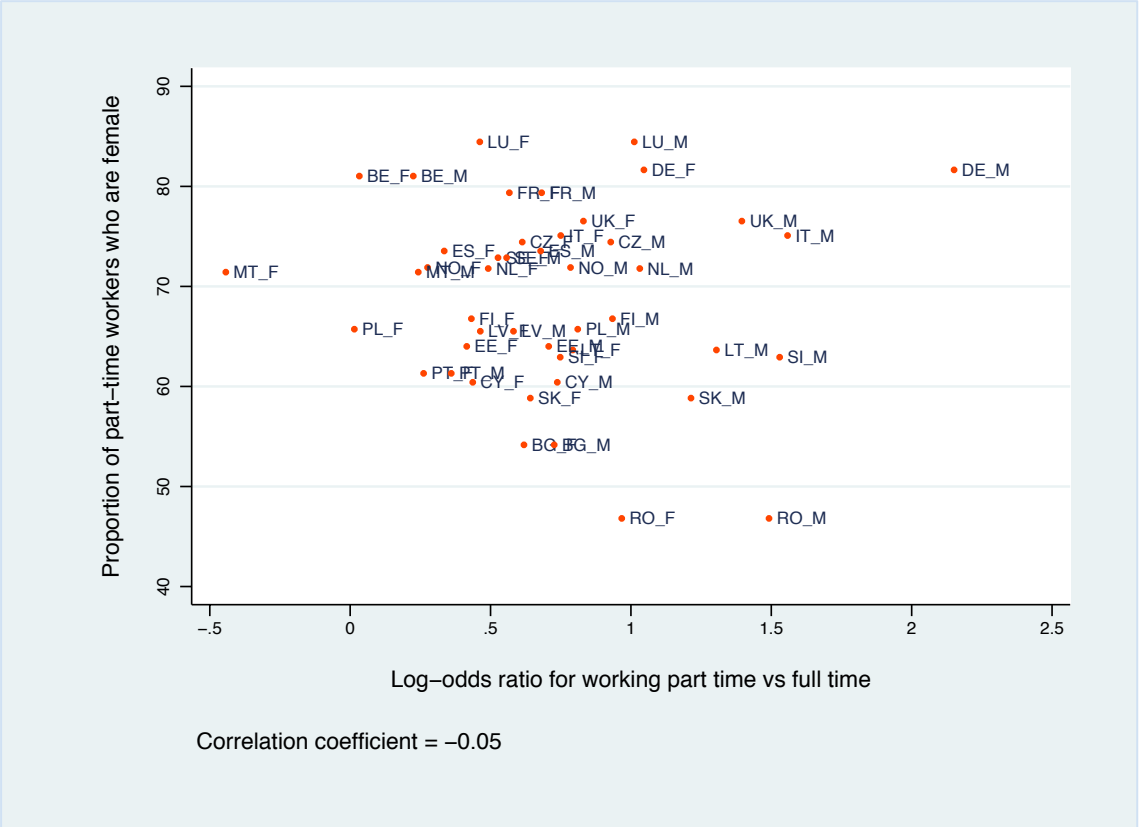
Notes: the effect for working part time relative to full time on the risk of low pay comes from a series of logistic regressions (one for male and female employees in each country) estimated using ESES 2014; the part-time employment rate is based on Eurostat statistics (derived from EU-LFS 2014 data), and reflects the proportion of employees in each country who identify as part time rather than full time; _F = estimated effect for women; _M = estimated effect for men; the correlation for female employees only is r=-0.00 and the correlation for male employees only is r=0.10

Figure DIII. Scatter plot showing the relationship between the estimated effect of working part time relative to full time on the risk of low pay for men and women in each country and the share of involuntary part-time employment



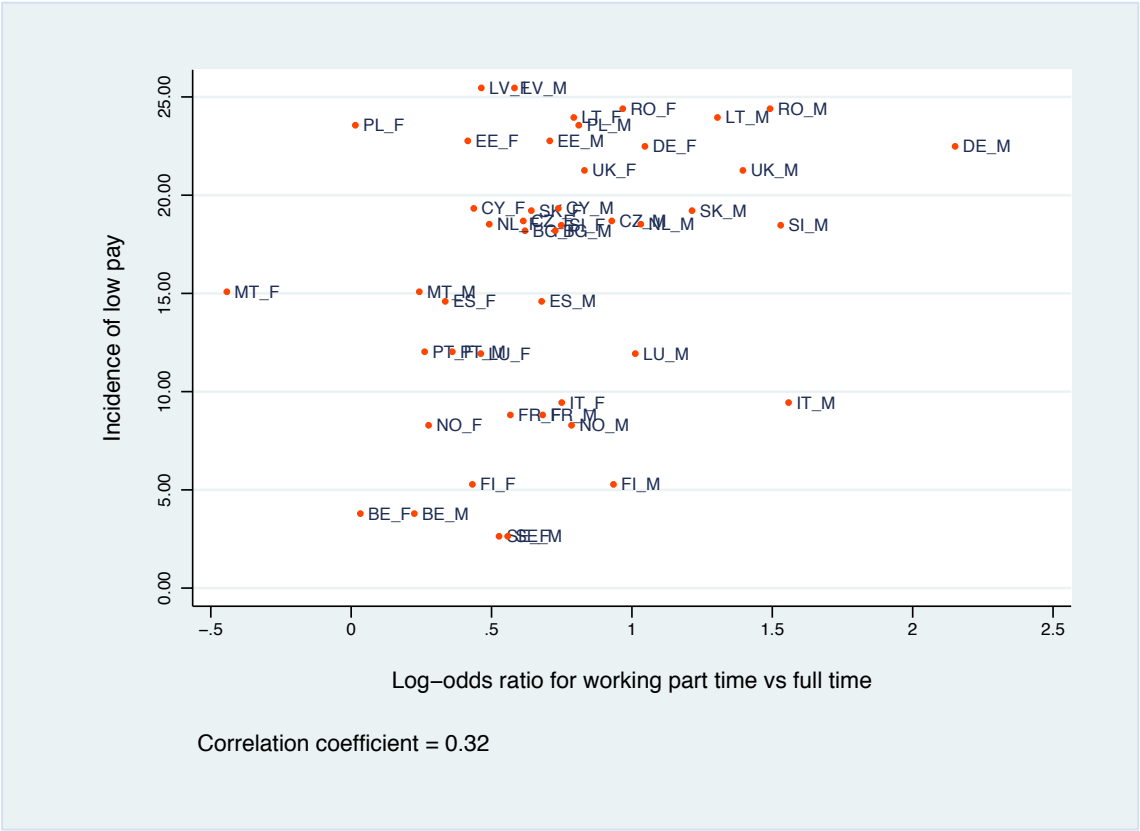
Notes: the effect for working part time relative to full time on the risk of low pay comes from a series of logistic regressions (one for male and female employees in each country) estimated using ESES 2014; the share of involuntary part-time employment is based on Eurostat statistics (derived from EU-LFS 2014 data), and reflects the proportion of part-time employees in each country who work part time because they are unable to find a full-time job; _F = estimated effect for women; _M = estimated effect for men; the correlation for female employees only is r=0.16 and the correlation for male employees only is r=-0.06

Figure DIV. Scatter plot showing the relationship between the estimated effect of working part time relative to full time on the risk of low pay for men and women in each country and the proportion of part-time workers who are female



Notes: the effect for working part time relative to full time on the risk of low pay comes from a series of logistic regressions (one for male and female employees in each country) estimated using ESES 2014; the proportion of part-time workers who are female is based on Eurostat statistics (derived from EU-LFS 2014 data); _F = estimated effect for women; _M = estimated effect for men; the correlation for female employees only is r=0.14 and the correlation for male employees only is r=-0.01

Figure DV. Scatter plot showing the relationship between the estimated effect of working part time relative to full time on the risk of low pay for men and women in each country and the incidence of low pay



Notes: the effect for working part time relative to full time on the risk of low pay comes from a series of logistic regressions (one for male and female employees in each country) estimated using ESES 2014; the incidence of low pay is based on Eurostat statistics (derived from ESES 2014 data), and reflects the proportion of employees in each country who earn below two-thirds of the median hourly wage; _F = estimated effect for women; _M = estimated effect for men; the correlation for female employees only is r=0.32 and the correlation for male employees only is r=-0.40

Then definition and measurement of part-time employment in the article

In the article, full-time and part-time workers are distinguished according to whether their employer identifies them as working below standard full-time hours in the workplace. There are a number of potential problems with this approach. Firstly, how employers regard employees with regards to full-time/part-time employment may or may not align with how employees see themselves. It is not possible to test this directly using ESES data, since information is collected from employers and/or administrative records, not from employees. It is, however, possible to compare the proportion of employees in each country identified as part time according to the ESES and the EU Labour Force Survey (EU-LFS), an employee survey (Table DVI). There is a strong positive correlation (r = 0.85) between the two measures, indicating a close degree of alignment between how employers and employees understand part-time employment.

In the main text it is argued that the salient concept is working below the prevailing full-time norm, rather than working below a specified hours threshold. Nevertheless, it is important to consider whether the results change if a universal hours threshold is applied, not least because some of the existing literature on part-time employment adopts such an approach. The ESES also includes information on hours worked, and therefore it is possible to compare results produced using these two different approaches. There is a strong correlation (r = 0.96) between the prevalence of part-time employment in each country using the main definition (employer-designated status) and an alternative hours-based definition (working fewer than 30 hours per week). The estimated effect (log-odds ratio) for working part time relative to full time on the

risk of low pay for male/female employees is very similar using these two measures, as shown in Figure DVI.

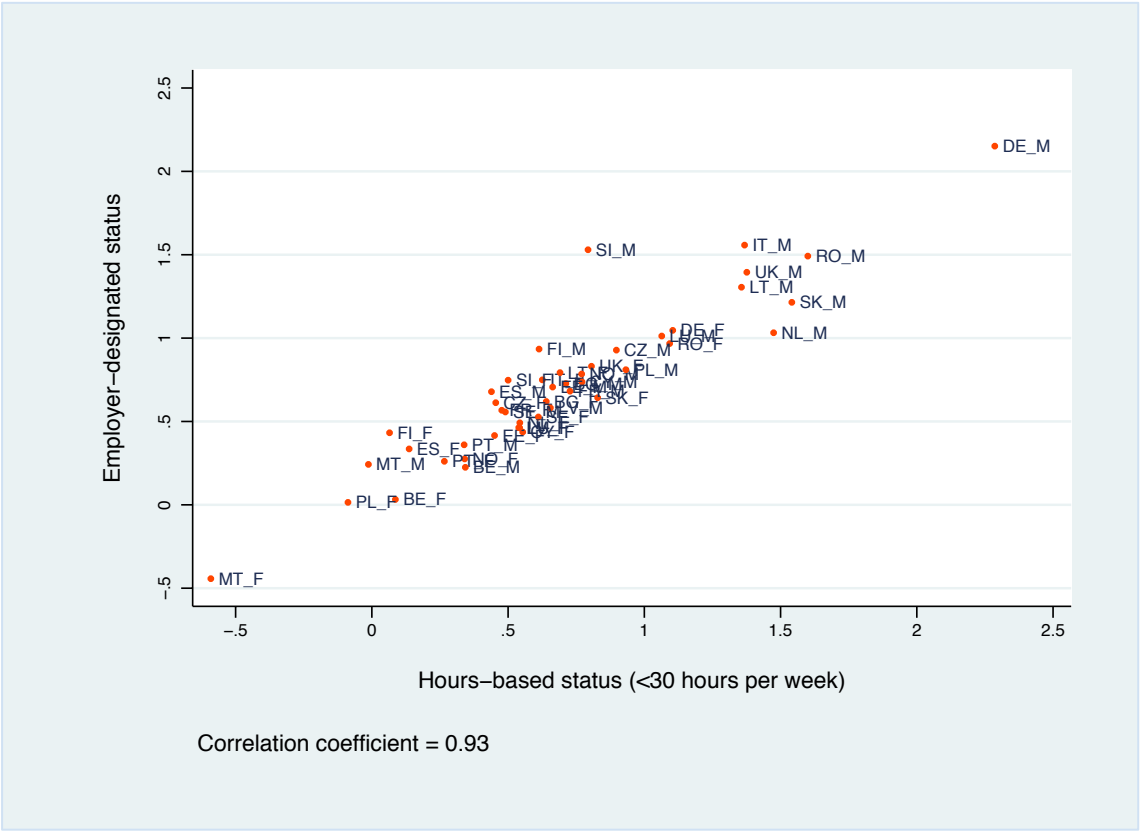
Table DVI. Comparison of the share of part-time employment in each country in 2014 using three alternative measures: hours-based, employee self-defined and employer-designated

Country	*Employee self-defined*	*Employer-designated*	*Hours-based*
BE	23.70	22.60	23.12
BG	2.50	8.12	7.58
CY	13.50	6.31	4.58
CZ	5.50	4.32	2.39
DE	26.50	38.22	29.48
EE	8.30	14.97	11.07
ES	15.80	17.63	12.60
FI	14.10	13.07	8.23
FR	18.60	15.31	11.99
IT	18.10	22.03	15.38
LT	8.60	17.01	14.86
LU	18.40	19.20	11.47
LV	6.80	29.15	20.14
MT	15.50	9.28	10.61
NL	49.60	53.61	39.42
NO	25.60	33.37	27.45
PL	7.10	7.69	9.32
PT	10.10	5.69	4.46
RO	8.70	3.63	3.21
SE	24.50	26.27	13.27
SI	10.00	1.44	4.27
SK	5.10	5.72	2.87
UK	25.30	31.36	27.83

Notes: employer-designated status is the main measure used in the article, and is based on ESES 2014; the hours-based definition is also based on ESES 2014, and identifies part-time workers as those who work fewer than 30 hours per week in their main job; employee-self defined status reflects the proportion of employees in the EU-LFS 2014 who identify as part time rather than full time

Correlations: between employer-designed and employee self-defined: $r = 0.85$; between employer-designed and hours-based: $r = 0.96$; between employee self-defined and hours-based: $r = 0.83$

Figure DVI. Scatter plot showing the relationship between the estimated effect for working part time relative to full time on the risk of low pay for men and women in each country using employer-designated part-time status and an alternative hours-based measure

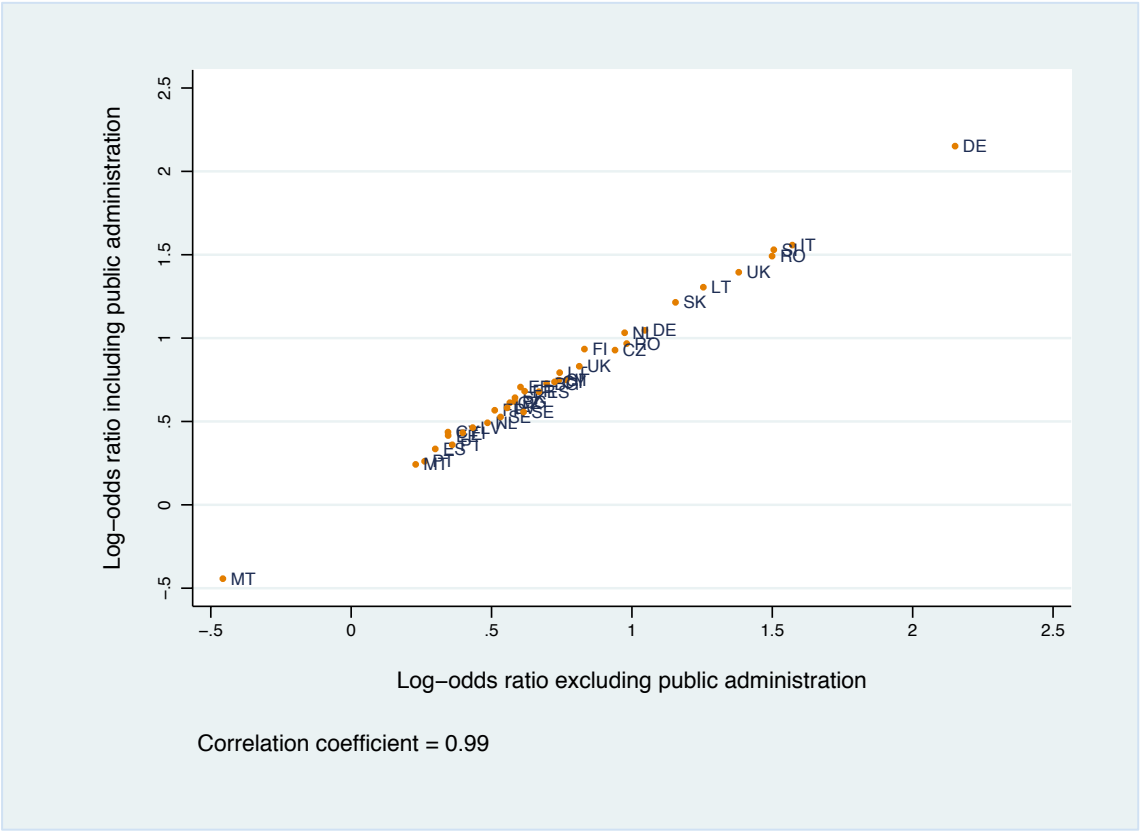


Notes: the effect for working part time relative to full time on the risk of low pay comes from a series of logistic regressions (one for male and female employees in each country) estimated using ESES 2014; employer-designated status is the main measure used in the article, and is based on ESES 2014; the hours-based definition is also based on ESES 2014, and identifies part-time workers as those who work fewer than 30 hours per week in their main job; _F = estimated effect for women; _M = estimated effect for men; the correlation for female employees only is r=0.93 and the correlation for male employees only is r=0.90

The uneven representation of workplaces in public administration, defence and social security in the ESES 2014

This section concerns whether the exclusion of workplaces in NACE Rev. 2 category O (public administration, defence and compulsory social security) in certain countries might skews the results. It is not mandatory to include workplaces in category O in the ESES, and in the 2014 wave four countries do not (Belgium, Luxembourg, Norway and Portugal). If part-time jobs in NACE category O are better or worse paid than average, this could introduce bias into the interactional comparison. If there are a large number of reasonably well-paid part-time jobs in the area of public administration, the exclusion of these workplaces may cause us to underestimate the strength of the relationship between part-time employment and low pay. It is not possible to assess the impact of this data omission directly. It is, however, possible to assess the effect of excluding workplaces in NACE Rev.2 category O for countries where this data is available in the ESES (n=19). Figure DVII compares the estimated effect (log-odds ratio) for working part time relative to full time on the risk of low pay with/without the inclusion of workplaces in public administration for these 19 countries. There is a very strong correlation between the two sets of estimated coefficients (r = 0.99). This indicates (although does not prove) that the exclusion of workplaces in public administration in BE, LU, NO and PT is not a source of bias in the main results.

Figure DVII. Scatter plot showing the relationship between the estimated effect for working part time relative to full time on the risk of low pay for men and women in each country with and without the inclusion of workplaces in public administration (NACE Rev. 2 category O)



Notes: the effect for working part time relative to full time on the risk of low pay comes from a series of logistic regressions (one for male and female employees in each country) estimated using ESES 2014 for countries in which workers in NACE Rev.2 O (public administration) are represented in the sample; _F = estimated effect for women; _M = estimated effect for men; the correlation for female employees only is r=0.99 and the correlation for male employees only is r=0.99

Exclusion of Hungary as an outlier

The ESES 2014 wave includes data on 24 countries, but one country, Hungary, is omitted from the analysis as an outlier. Tables DVII and DVIII show the results of a logistic regression predicting low pay for employees in Hungary using ESES data for female and male employees respectively. The coefficient (log-odds ratio) for the main effect for working part time relative to full time is strongly negative for both male and female employees, indicating that part-time workers are much less likely than full-time workers to be low paid. This finding stands apart from the results from all other countries, and with a small sample of countries an outlier of this kind is likely to skew the results. This result also appears to contradict other sources about the earnings position of part-time workers in Hungary. Ward and Ozdemir estimate that the odds of being low paid are 2.8 times higher for part-time workers than for full-time workers in Hungary. To offer additional insight on this issue, additional analysis is run for Hungary using the EU-SILC 2014 data set. This is a household survey rather than an employer survey, and it is not possible to specify all variables in precisely the same way as in the ESES. Nevertheless, comparing the results gives an indication of the reliability of ESES estimates for Hungary. As in the main analysis, low pay is defined as earning below two-thirds of the median hourly wage for all employees. Part time workers are identified as those who define themselves as an employee working part time. In the EU-SILC regression, the coefficient for working part time is positive and statistically significant for both men and women (see Tables DVII and DVIII), strengthening the case for discarding the ESES result for Hungary.

Table DVII. Coefficients (log-odds ratios) from a logistic regression estimating the probability of being low paid for female employees in Hungary using ESES and EU-SILC data for the year 2014

	ESES		*EU-SILC*
Part-time	-3.97 (0.08)***	Part-time	0.99 (0.27)***
Age 16-29 (ref)		Age 16-29 (ref)	
Age 20-29	-0.44 (0.18)*	Age 20-29	0.79 (0.76)
Age 30-39	-0.52 (0.18)**	Age 30-39	0.43 (0.76)
Age 40-49	-0.58 (0.18)**	Age 40-49	-0.08 (0.75)
Age 50+	-0.66 (0.18)***	Age 50+	-0.28 (0.75)
Low education (ref)		Low education (ref)	
Medium education	-0.81 (0.03)***	Medium education	-1.47 (0.18)***
High education	-2.23 (0.05)***	High education	-2.48 (0.45)***
Salariat (ref)		Low-skilled (ref)	
Intermediate	1.07 (0.04)***	Medium-skilled	1.66 (0.75)*
Working class	1.74 (0.03)***	High-skilled	2.59 (0.78)**
Manufacturing (ref)		Manufacturing (ref)	
Mining and utilities	-0.54 (0.09)***	Mining and utilities	0.43 (0.83)
Hotels / restaurants	0.91 (0.04)***	Hotels / restaurants	0.22 (0.26)
Transport and comm.	-0.14 (0.06)*	Transport and comm.	-0.16 (0.52)
Banking and finance	0.61 (0.06)***	Banking and finance	0.49 (0.30)
Education and health	0.79 (0.03)***	Education and health	1.35 (0.21)***
Constant	-0.83 (0.19)***	Constant	-3.89 (1.08)***
Pseudo R2	0.29	Pseudo R2	0.22
Observations	541,024	Observations	3,957

Notes: ESES 2014 and EU-SILC 2014; female employees only; coefficients with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001; EU-SILC does not include information required to distinguish between employees in public and private sector employment. This variable is therefore not included in the estimates based on data for Hungary. The other main difference is that occupation reflects occupational skill-level rather than social class.

Table DVIII. Coefficients (log-odds ratios) from a logistic regression estimating the probability of being low paid for male employees in Hungary using ESES and EU-SILC data for the year 2014

	ESES		*EU-SILC*
Part-time	-3.46 (0.10)***	Part-time	1.14 (0.39)**
Age 16-29 (ref)		Age 16-29 (ref)	
Age 20-29	-0.11 (0.13)	Age 20-29	-0.32 (0.54)
Age 30-39	-0.27 (0.13)*	Age 30-39	-0.90 (0.55)
Age 40-49	-0.24 (0.13)	Age 40-49	-0.62 (0.54)
Age 50+	-0.25 (0.13)	Age 50+	-0.67 (0.54)
Low education (ref)		Low education (ref)	
Medium education	-0.90 (0.03)***	Medium education	-1.33 (0.18)***
High education	-1.88 (0.05)***	High education	-2.07 (0.45)***
Salariat (ref)		Low-skilled (ref)	
Intermediate	1.14 (0.05)***	Medium-skilled	2.03 (0.66)**
Working class	1.20 (0.03)***	High-skilled	3.14 (0.66)***
Manufacturing (ref)		Manufacturing (ref)	
Mining and utilities	-1.01 (0.05)***	Mining and utilities	0.30 (0.29)
Hotels / restaurants	0.76 (0.03)***	Hotels / restaurants	0.31 (0.33)
Transport and comm.	-0.07 (0.04)	Transport and comm.	-1.41 (0.45)**
Banking and finance	0.68 (0.06)***	Banking and finance	0.10 (0.34)
Education and health	0.51 (0.02)***	Education and health	2.13 (0.19)***
Constant	-0.83 (0.13)***	Constant	-3.76 (0.86)***
Pseudo R2	0.17	Pseudo R2	0.28
Observations	341,349	Observations	3,886

Notes: ESES 2014 and EU-SILC 2014; male employees only; coefficients with standard errors in parentheses; significance testing: * p <0.05; ** p <0.01; *** p <0.001; EU-SILC does not include information required to distinguish between employees in public and private sector employment. This variable is therefore not included in the estimates based on data for Hungary. The other main difference is that occupation reflects occupational skill-level rather than social class.

Separate vs. combined second-stage regression analysis for men and women

In the main article, the second-stage regression (i.e. the regression estimating the effect of macro-level characteristics) is run on a sample of 46 observations: 23 observations for women (one for each country) and 23 observations for men. The decision to combine male and female results into a single sample was motivated by a desire to augment the sample size in light of the small-N problem. This decision was also informed by the fact that the effect of macro-level characteristics was similar for men and women, as shown below.

Table DIX. Coefficients from bivariate correlations and OLS regression estimating the effect of macro-level characteristics on the country-specific effect of working part time relative to full time on the risk of low pay for male and female employees in 2014

	Female employees		*Male employees*	
	r	*Coefficient*	*r*	*Coefficient*
Part-time employment rate	-0.04	0.07 (0.06)	0.10	0.11 (0.10)
Share of involuntary part-time employment	0.16	0.08 (0.08)	-0.06	0.04 (0.14)
Proportion of part-time workers who are female	-0.14	0.01 (0.08)	-0.06	0.07 (0.15)
Incidence of low pay	0.32	0.13 (0.07)*	0.40	0.25 (0.12)**
Constant		0.49 (0.07)***		0.94 (0.09)***
R2		0.16		0.23
Observations	23	23	23	23

Notes: dependent variable estimated using ESES 2014; explanatory variables from Eurostat 2014; bivariate correlations and OLS coefficients with standard errors in parentheses; significance testing: * p <0.10; ** p <0.05 *** p <0.01

Second-stage regression with interactions

Exploratory analysis was conducted to assess whether there are mediation effects between macro-level variables i.e. whether the effect of one macro-level characteristic depends on the level of another. The only model that produced a statistically significant result was interacting the share of involuntary part-time employment with the incidence of low pay (all other results are non-significant, and are not shown here). As shown in Table DX, the main effect for both variables is positive i.e. these factors are associated with an increase in the size of the part-time low pay penalty. The interaction term is negative, indicating that the effect of each variable decreases as the other variable increases. In other words, the share of involuntary part-time employment is less important in countries with a high prevalence of low pay, and the prevalence of low pay is less important in countries with a high rate of involuntary part-time employment. The interaction effect is relatively weak, however; statistically significant at a 90 per cent but not a 95 per cent level of confidence.

Table DX. Interaction model: coefficients from OLS regression estimating the effect of macro-level characteristics on the country-specific effect of working part time relative to full time on the risk of low pay

	Coefficient
Part-time employment rate	0.08 (0.06)
Share of involuntary part-time employment	0.02 (0.01)*
Proportion of part-time workers who are female	-0.01 (0.08)
Incidence of low pay	0.05 (0.01)***
Male	0.45 (0.11)***
Low pay * Involuntary part-time employment	-0.01 (0.00)*
Constant	-0.41 (0.28)
R2	0.42
Observations	46

Notes: dependent variable estimated using ESES 2014; explanatory variables from Eurostat 2014; OLS coefficients with standard errors in parentheses; significance testing: * p <0.10; ** p <0.05 *** p <0.01; this analysis explored potential interactions between all explanatory variables; other interactions were non-significant and are not shown here