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# JOB STRESS AND WORKING CONDITIONS IRELAND IN COMPARATIVE PERSPECTIVE

HELEN RUSSELL, BERTRAND MAÎTRE, DOROTHY WATSON AND  
ÉAMONN FAHEY



# **JOB STRESS AND WORKING CONDITIONS: IRELAND IN COMPARATIVE PERSPECTIVE**

**An analysis of the European Working Conditions Survey**

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## GLOSSARY

Job demands	Job demands, also referred to as 'stressors', are aspects of the job, including features of the task, working environment or organisation which call upon workers' psychological and physical reserves. Examples include working under time pressure, emotional demands and experiencing bullying or harassment in the workplace.
Job resources	Job resources are the characteristics of an individual's job that can help them to cope with job demands. Examples include support from colleagues and having the freedom to decide how to execute tasks.
Subjective job stress	Subjective job stress refers to workplace stress that is reported by workers in the European Working Conditions Survey (EWCS). We deem a respondent to experience subjective stress if they report experiencing stress in work 'most of the time' or 'always'.
Stress reactions	In this study, stress reactions are common physiological and psychological responses to stress. They are self-reported sleep disturbance, fatigue and anxiety.
Psychosocial risks	According to the European Foundation for the Improvement of Living and Working Conditions, 'psychosocial risks are those aspects of the design and management of work, and its social and organisational context that have the potential for causing psychological or physical harm'.
Confidence interval (CI)	A confidence interval is the range within which we can say the population average or proportion falls at a certain confidence level (usually 95 per cent confidence). For example, the average age of a sample of farmers may be 40, with a 95 per cent confidence interval of 38 to 42. This means that we can be 95 per cent confident that the average age for the population of farmers lies between 38 and 42. The width of the CI depends on the way the sample was drawn, the sample size, the extent of variation in age in the population and the confidence level chosen.
Multivariate analysis/statistical models	Multivariate analysis is used to examine the impact of one factor (such as gender) on another (such as hourly earnings), after taking account of other differences (such as education and work experience). For instance, multivariate analysis would allow us to ask whether men's hourly earnings are higher than those of women because of differences in factors such as education or work experience, or whether there is still a difference even when we take account of these factors.
Odds ratio (OR)	This is an indicator of how much more or less likely an outcome is for one group compared to another. An odds ratio greater than one indicates a greater likelihood, while an odds ratio of less than one indicates a lower likelihood. For instance, if the odds ratio for being employed is 1.5 for men compared to women (reference category),

then men have 1.5 times the odds (or a 50 per cent higher chance) of being employed when compared to women.

Pearson  
correlation (r)

The Pearson correlation is a measure of the strength of a linear association between two variables, such as age and income. The correlation varies between zero and plus or minus one, where the closer the value is to zero, the weaker the association. A negative correlation means that as one variable increases the other tends to decrease. A positive correlation indicates that, as one variable increases the other also tends to increase. We cannot conclude that one variable causes change in another because they are correlated.

# EXECUTIVE SUMMARY

---

## BACKGROUND

Stress in the workplace is an issue of growing concern. There is an increasing recognition that job stress has significant implications for the physical and mental wellbeing of workers and costs for employers and the economy. The British Health and Safety Executive estimates the cost of work-related stress, anxiety and depression to be in the region of £5.2 billion in the UK for the year 2013/2014. Health and Safety legislation in Ireland, and the EU more widely, specifies that employers have a duty of care to ensure that the safety, health and welfare of employees are not unreasonably compromised by work. The duty of care extends to personal injury and the mental health of workers.

In the current study, we use two waves of a European-wide dataset, the European Working Conditions Survey, carried out in 2010 and 2015, to examine the working conditions that are associated with job stress. We focus in particular on Ireland and the UK, but also make comparisons with other countries in Western Europe. We draw on prevailing theories and the extensive research-evidence base to identify a range of job demands that are potential stressors and job resources that are proposed to moderate the effects of high work demands, and thus reduce job stress.

## RESEARCH QUESTIONS

The main research questions are:

1. What was the level of job stress in Ireland in 2015 and how has this changed since 2010? How do levels of job stress in Ireland compare to other countries in Western Europe?
2. What are the main job characteristics and features of work organisations that are associated with higher job stress? Are these the same in Ireland and the UK?
3. Which sectors and occupations exhibit the highest levels of job stress and what features of these jobs are most important in accounting for this risk?
4. What are the implications of these findings for policy at the national level and for practices at the organisational level?

## LEVELS OF JOB STRESS

We develop a measure of job stress that combines both the subjective experience of job stress (respondents report that they experience stress in their work ‘always’ or ‘most of the time’) and the experience of stress reactions (general fatigue, anxiety, sleep disturbance). Workers who are subjectively stressed and who report at least one of the three stress reactions are counted as experiencing job stress. Combining the indicators in this way means we minimise the risks that the stress reactions are due to another cause (for example an unrelated health problem) and that the subjective stress measure alone may be unduly affected by response biases.

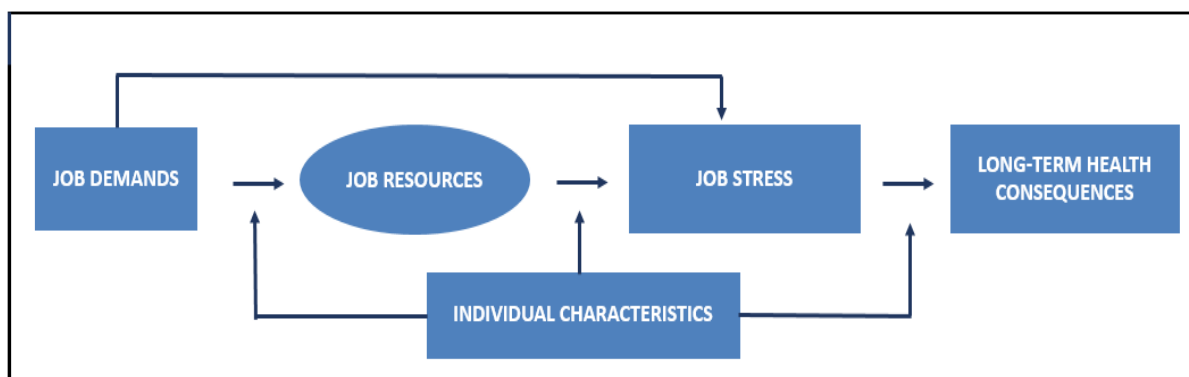
Using this measure, we find that in 2015, 17 per cent of Irish employees experienced job stress. This was an increase from 8 per cent in 2010, meaning that job stress doubled over the course of five years. In order to benchmark the findings for Ireland, we compare them to results for nine other countries in Western Europe and see that the incidence of job stress among employees in Ireland was below the average in both years. In our closest comparator, the UK, levels of job stress were 13 per cent in 2010 and 18 per cent in 2015. Ireland was one of the countries showing the steepest increase in job stress between 2010 and 2015.

### **What job characteristics are associated with job stress?**

Based on previous research and literature, we examine a range of job characteristics that are thought to influence job stress. These are grouped into job demands (or stressors) and job resources. Job demands are aspects of the job, including features of the task, working environment or organisation, which call upon workers’ psychological and physical reserves. According to the predominant theories in the area, job stress occurs where these demands are too great for the worker to cope with, leading to stress reactions. In our study, job demands include factors such as time pressure (for example having to work at speed), emotional demands, physical demands and exposure to bullying/harassment.

In contrast, job resources are thought to have a more positive impact on worker wellbeing and to moderate the effect of job demands on stress. Resources include supportive relationships in the workplace, autonomy or control and intrinsic rewards. A simplified version of the theoretical model on which this analysis is based is shown in Figure 1 (a more detailed version is displayed in Chapter 1).

FIGURE 1 SIMPLIFIED THEORETICAL MODEL



The effects of these job characteristics on job stress are examined through statistical models. In the models, we also take account of other factors that may influence respondents' experience of stress, including family status, gender and household financial pressure. This reduces the possibility that the relationships found are due to factors external to work.

### Job demands/stressors

In our analysis we find that a number of work demands are strongly associated with job stress (using the combined stress measure)<sup>1</sup> among employees in Ireland and in the UK.

- **Emotional demands:** (i.e., dealing with angry clients/customers or having to hide emotions while at work). Those experiencing high levels of emotional demands were 21 times more likely to experience job stress than those with the lowest levels.
- **Time pressure:** those with the highest levels of time pressure were ten times more likely to experience job stress than those under the least time pressure.
- **Bullying, harassment, violence, etc.:** those with the highest exposure were eight times more likely to experience job stress than those with no exposure.
- **Physically demanding work:** workers in the UK and Ireland who experienced the highest physical demands were almost twice as likely to report job stress as people with no such demands.

1 As the data are cross-sectional, we cannot establish if these associations are causal.

- **Effort-reward imbalance:** this is the extent to which workers feel they are underpaid for the work they carry out. Workers in Ireland who reported the highest effort-reward imbalance were over four times more likely to experience job stress than those who felt adequately rewarded for their work.
- **Long working hours:** those working over 40 hours per week were twice as likely to experience job stress than those working 36 to 40 hours.

### **Job resources**

Job resources were found to have a weaker relationship with job stress than job demands. When job demands were not taken into account, we found that support from co-workers and managers, and intrinsic reward (i.e., a feeling of work well-done and/or a feeling that the job was useful) were associated with a lower risk of job stress. However, when job demands were taken into account, these effects were no longer significant.

Autonomy/job control did not have a significant direct effect on stress; nor did it moderate the impact of job demands on stress, as has been found in other studies.

Support from co-workers and managers was found to be important in moderating the effect of high emotional demands. This relationship was only significant in the pooled Ireland and UK model, though the direction of the relationship was the same in the Irish model.

### **Worker characteristics and household characteristics**

We found that age, gender and family status were not strongly associated with levels of job stress in Ireland. In the UK, however, women were more likely to experience job stress than men. Household financial difficulty was not associated with job stress, once the characteristics of the job were taken into account.

### **Long-term consequences**

Given the cross-sectional nature of our data, we do not analyse the issue of long-term health consequences of stress in this report. However, the link between stress and negative health and behavioural outcomes is well founded in the literature. Stress is found to be causally linked to poor physical and mental health outcomes such as cardiovascular disease (CVD) and depression, to spill over into family life and relationships, and to impact negatively on firms through absenteeism, increased job turnover and reduced morale.

## LIMITATIONS AND FURTHER RESEARCH

The main limitation of this research is the cross-sectional design of the data, i.e., information on stressors and stress outcomes is collected at the same point in time, which warrants caution in inferring causal relationships. Using these data also raises challenges around selection bias and subjectivity. For instance, it is possible that those most affected by job stress have already left the labour market and therefore have not been included in the study. However, despite these limitations, the EWCS remains a high-quality research data source and throughout the report we have noted where the particular limitations of its design may be consequential for the conclusions we can draw.

We suggest two main avenues for further research. One is that the link between job stress and long-term health consequences could be explored using longitudinal data, such as information from the Irish Longitudinal Study on Ageing (TILDA). The other is that more detailed comparisons could be made with other European countries using the EWCS, as the modelling in the current report is limited to the UK and Ireland. We focus on the UK here, because it shares many institutional similarities with Ireland, in terms of employment regime, and therefore provides a useful benchmark for the Irish results.

## POLICY IMPLICATIONS

In a cross-national perspective, Ireland's position regarding job stress is relatively positive. The level of job stress was below the average for ten Western European countries in 2015. For the most part, Irish values for job demands are similar to, or slightly lower than, the ten-country average. The exceptions are that Irish workers report higher-than-average levels of emotional demands and exposure to bullying, harassment or other forms of mistreatment. Regarding job resources, Irish employees enjoy relatively high levels of support from managers and co-workers.<sup>2</sup> However, Ireland witnessed the greatest increase in job stress between 2010 and 2015 among the selected countries.<sup>3</sup> Our models show that the increase over time was sharper in Ireland than it was in the UK, when we control for a wide range of work conditions and worker characteristics.

Employers already have a duty of care for employees' mental and physical health under Health and Safety legislation. There is also sufficient evidence in the existing literature to show that it is in the interests of employers to address workplace stress. Under current legislation, employers are required to ensure that the demands placed on workers are reasonable and that control measures are in place

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<sup>2</sup> These comparisons do not take into account differences in the composition of the workforce or the distribution of jobs across countries.

<sup>3</sup> This may be related to the scale of the economic crisis. However, the rise in Ireland was steeper than it was in Greece and Spain, where the crisis was also severe.



to address them. Employers must ensure that the risks of job-related stress are assessed and managed (see HSA, *Work-related stress: a guide for employers*).

The analysis in this report sheds light on some of the mechanisms driving workplace stress and suggests ways in which policy at the national and organisational level can be changed to yield even greater improvements. We discuss these options under four headings:

### **1. Managing high job demands**

In terms of job demands, we find that the most urgent need for action is in addressing psychosocial risks such as bullying, harassment and violence, and high levels of emotional demands. The impact of these risks on stress is substantial. Both national bodies (HSA, 2007) and international organisations have issued guidelines on preventing and addressing bullying, harassment and violence at work. Formal policies and organisational culture are both important in addressing these risks.

Dealing with other psychosocial risks, such as high emotional demands and time pressure, are also important, especially in the Health and Hospitality sectors. However, European-wide research suggests that employers can find these types of risks more challenging to address than traditional physical and chemical risks (EU–OSHA, 2016). This is partly because they are less visible and are complex and dynamic (Jespersen et al., 2016). Guidance for employers and employees to deal with workplace stress is available from the HSA, as is an audit tool, Work Positive CI, to help employers to identify, manage and record stress risks in their workplace. Despite this assistance, employer survey data suggest that only 40 per cent of Irish firms have policies in place to deal with job stress. This is much lower than the proportion with such systems for workplace bullying (EU–OSHA, 2016). International best practice in the development of these policies at the organisational level, and in dealing with workplace stress more generally, dictates that there must be engagement with both senior management and employees to maximise efficacy.

Hours of work also need to be considered in addressing workplace stress. Those working more than 40 hours per week experienced higher levels of stress. Due to the size of our sample, we could not disaggregate this group beyond those working more than 40 hours per week. Current legislation prohibits average work weeks in excess of 48 hours. However, stress reactions appear to accelerate before this threshold.

## 2. Enhancing worker resources

While employee resources (such as autonomy, support and intrinsic rewards) had a weaker relationship with job stress, we found some evidence that the negative effects of high emotional demands were moderated by greater support from colleagues and managers. Organisational-level strategies to reduce job stress can make use of this insight. For example, creating a supportive organisational environment and culture is a potential antidote to the effect of job stress in jobs where employees face high emotional demands.

## 3. Focusing on at-risk sectors and occupations

The report also examines the industrial sectors and occupational groupings that are most prone to job stress and uses multivariate modelling to assess which job demands and resources are driving the differences. Workers in the Health sector, public administration and the Manufacturing sector experience the highest levels of job stress. Workers in the Health sector experience high emotional and physical demands and higher-than-average exposure to bullying, harassment and/or violence and are more likely to feel inadequately rewarded for their work. These factors all contribute to higher levels of job stress. Workers in the Manufacturing sector are more exposed to time pressure and long working hours than in other sectors, and this contributes to the higher level of job stress observed. Workers in public administration are most likely to feel inadequately rewarded for their work, and transport and manufacturing workers have the longest work weeks. Finally, workers in the Hospitality sector and in education are exposed to high emotional demands.

Differences in job stress are also observed across occupational groups. We find that technical/associate professionals, managers and professional workers experience higher levels of stress. Managers are the most time-pressured group and work the longest hours.<sup>4</sup> Professionals experience higher-than-average emotional demands and also report higher scores on the bullying/harassment/violence scale.

The changing nature of work, including the long-term shift to services and the continuing expansion of the Health and Care sectors, alongside the rise in professional and managerial occupations, means that illnesses related to job stress are likely to account for an increasing proportion of work-related illnesses in the future. Increasing emotional demands and work intensification have been identified as key risks for the future occupational health and safety of workers (EU–OSHA, 2007). Managing these and other stressors is therefore increasingly important for worker wellbeing in Ireland and elsewhere.

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<sup>4</sup> It is not possible to look at differences in occupations within sectors, because the numbers involved become too small.

#### **4. Improving data collection**

Just as firms and organisations can begin to tackle job stress by gathering information about potential job stressors and mediators, there is scope to improve data collection at the national level. A good starting point would be to capture more disaggregated data on recipients of Illness Benefit. Because people suffering from mental health issues from job stress are not eligible for Occupational Injury Benefit, and must instead claim Illness Benefit, it is not currently possible to count incidences of such stress in administrative data. Recording this additional information in the administrative data would facilitate estimates of the cost of job stress to the Exchequer and to the economy more broadly. A new national workplace survey, which was last conducted in 2009/2010, would also provide valuable evidence on stress and changing working conditions in Ireland.

# CHAPTER 1

---

## Introduction

### 1.1 BACKGROUND AND RATIONALE FOR THIS STUDY

Job stress is an issue of growing concern for individuals, employers and society. The changing nature of work from industrial production to services means that employees are increasingly exposed to psychological, rather than physical, demands. Research shows that stress-related problems feature prominently as a source of work-related illness. In Ireland, analysis of Quarterly National Household Survey (QNHS) data have shown that ‘stress, anxiety and depression’ (SAD) accounted for 13 per cent of all self-reported work-related illnesses and that the length of absence arising from these illnesses was somewhat longer than for other types of work-related illness (Russell et al., 2016).<sup>5</sup> Evidence from European Labour Force Surveys reveals similar patterns at the European level. In 2007, stress, anxiety and depression were the second most common work-related health problems among workers, affecting 14.5 per cent of people in work. One quarter of European workers who reported SAD as their most serious health problem had sick-leave absences of at least one month in the previous 12-month period (Eurostat, 2010). Similarly, the results of the European Working Conditions Survey, which is the dataset used in this report, consistently show that job stress is among the most prevalent job-related health problems reported by workers across the EU, along with musculoskeletal disorders, such as backache and muscle pain (Eurofound, 2007, 2010).

In Ireland, figures based on self-reports from the QNHS show no upward trend in the rate of work-related SAD between 2002 and 2013 (Russell et al., 2016). However, using a measure of subjective job stress rather than SAD, data from the European Working Conditions Survey (EWCS) (used in this study) show a slight increase in the prevalence of job stress over a similar period – from 23 to 27 per cent of employees between 2005 and 2010. A review of data gathered through national surveys conducted by Eurofound finds that trends in the prevalence of job stress vary across countries (Eurofound, 2010). This may be due to differences in measurement practices across the agencies and organisations that gather the data. According to the review, job stress declined in Norway, Finland and Romania, but increased in Germany, Denmark and Estonia. In both the UK and Belgium, workers registered very little change over time (Eurofound, 2010).

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<sup>5</sup> Unlike depression and anxiety, stress is not a clinically defined illness or a psychiatric disorder. While stress can precipitate episodes of anxiety and depression, it is a distinct concept (Lovibond and Lovibond, 1995). The QNHS and LFS group the three concepts together, meaning that it is not possible to quantify stress on its own.

Given its prevalence, the costs of job stress are substantial. However, because of the difficulties associated with measurement, there is uncertainty around the estimation of costs at the national or European level. According to a literature review by the European Agency for Safety and Health and Work, work-related stress was estimated to cost the economy of the European Union (15 countries) €20 billion in 2002 (EU–OSHA, 2014). Attempts have also been made to quantify the cost of work-related stress, anxiety and depression in the UK. However, experts have been unable to agree on a consistent figure. Chandola (2010) estimates that the total annual cost of work-related SAD in the year 2001/2002 ranged between £7 billion and £13 billion, that is, between 0.5 per cent and 1.2 per cent of the UK’s GDP. Evidence from the UK Labour Force Survey, which shows that 35 per cent of all work-related health problems were due to SAD, was used to arrive at this estimate. Chandola’s figure for the overall cost of these disorders was calculated as 35 per cent of the total cost of work-related ill-health. The Health and Safety Executive (HSE) in the UK produced a more conservative estimate of £3.6 billion in 2010/2011 (as cited by the European Agency for Safety and Health at Work, 2014), but this rose to £5.2 billion in 2013/2014 (HSE, 2016). To arrive at this figure, the HSE estimated the cost of one case of stress, anxiety or depression and multiplied it by its incidence across the economy.<sup>6</sup>

In addition to the direct costs in terms of work absence, sickness benefits and health services costs, there are significant indirect financial and non-financial costs of job stress, such as spillover into family life and relationships (Dembe, 2001), greater conflict and deterioration of relationships within organisations, and higher job turnover (Le Blanc et al., 2008).

## 1.2 PREVIOUS RESEARCH: THEORETICAL APPROACHES

The study of job stress, defined by Le Blanc et al. (2008, p. 124) as ‘an experienced incongruence between job demands and job or individual resources that is accompanied by cognitive, emotional, physical or behavioural symptoms’, traverses the disciplines of psychology, epidemiology, sociology and management studies, among others. Here we focus on the main theories that have been developed, and on reviews of the empirical research.

There are three highly influential theories of job stress. First is the *job demands control* (JDC) model developed by Karasek (1979). This model posits that there are two key dimensions in accounting for job stress – job demands and job control. The latter consists of decision authority<sup>7</sup> and skill-discretion<sup>8</sup>. The JDC model classifies

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<sup>6</sup> Note that in both the case of Chandola (2010) and the HSE, the cost estimates account for costs that are borne by the entire economy, not just the cost borne by employers.

<sup>7</sup> Decision authority is captured by items such as freedom to decide how to do one’s own work and having a say over what happens. This is also sometimes referred to as task discretion (Green et al., 2016).

<sup>8</sup> Skill discretion refers to opportunity for skill use and variety of work.

jobs into four types: high strain jobs – where demands are high and job control is low; active jobs – combining high demands and high control; low strain jobs – characterised by low demands and high control; and passive jobs – where both demands and control are low. Stress is expected to be highest in high-strain jobs. Those working in active jobs are expected to have medium levels of stress, because high control allows them to manage the demands of the job. Active jobs are also believed to promote learning and motivation.

Within the model, psychological job demands include job intensity, mental work load, task interruption and task conflict. The JDC model was later extended to encompass *support* from co-workers and supervisors as an important buffer against the negative effects of high-strain jobs (Karasek and Theorell, 1990). While the central focus of the model was on psychological demands, the revised questionnaire developed to operationalise the model (Karasek et al., 1998) also included measures of physical demands, because of their independent effect on stress reactions, and job insecurity, which was seen as part of work's psychological burden.

Second is the *effort-reward imbalance* (ERI) model. This is a sociological theory of work stress developed by Siegrist (1996). The central premise is that imbalance in the demands made of the employee, i.e., effort (including hours/overtime, frequency of interruptions, time pressure, physical load) and the rewards of work, for example money, status, job security, and career opportunities, contravenes the reciprocity expected in the employer-employee relationship and leads to work stress. Relatedly, it is argued that over-commitment, which is a personality trait, when combined with ERI will lead to greater stress and poorer health outcomes (Siegrist, 1996).

The ERI model can be viewed as part of the broader concept of organisational justice. In its most basic form, organisational justice can be conceived as either distributive, procedural or relational (Colquitt, 2001). Distributive justice within an organisation means that resources and rewards are allocated between workers based on some 'fair' criterion, such as merit or equality. Procedural justice occurs when the rules for setting the allocation are applied consistently (Colquitt, 2001; Rupp, 2011). Relational justice concerns the treatment of staff by co-workers and managers. Effort-reward imbalance is a symptom of an absence of distributive justice, because all else being equal, we would expect greater effort to lead to greater reward in a just environment (Kivimäki et al., 2007).

The third model is the *job demands-resources* model proposed by Demerouti et al. (2001). Bakker and Demerouti (2007) argue that the range of demands and resources considered by the JDC and ERI models are too limited to capture the complex reality of working organisations. Demands are defined more broadly as 'those physical, social or organizational aspects of the job that require sustained

physical and/or psychological (cognitive and emotional) effort or skills' (2007, p. 312). These demands turn into stressors when they exhaust employees' physical and mental resources. The model also expands the range of resources that are believed to buffer the effects of job demands beyond the autonomy and support proposed by Karasek and Theorell (1990). These can include factor such as physical, social, psychological and organisational resources, the effectiveness of which may also differ, depending on the type of demands. Bakker and Demerouti (2007, pp. 312–313) also highlight that job resources can be located at a range of levels:

*at the level of the organization at large (e.g. pay, career opportunities, job security), the interpersonal and social relations (e.g. supervisor and co-worker support, team climate), the organization of work (e.g. role clarity, participation in decision making), and at the level of the task (e.g. skill variety, task identity, task significance, autonomy, performance feedback).*

### 1.3 PREVIOUS RESEARCH: EMPIRICAL EVIDENCE

The theories outlined above have been applied in a multitude of studies, using a wide range of measures to operationalise the key concepts of job resources, demands, efforts and rewards. The choice of outcome variables examined also varies substantially. The literature encompasses self-reported stress measures, job satisfaction, exhaustion and sleep disruption, through to physiological and mental illnesses, including cardiovascular disease (CVD) and depression.

#### 1.3.1 Psychological/wellbeing outcomes

A substantial body of research has set out to test Karasek's demand-control-(support) models. In a review of research, van der Doef and Maes (1999) found that 28 of 41 studies supported the hypothesis that low-control, high-demand jobs were detrimental to psychological wellbeing on outcome measures such as General Health Questionnaire scores,<sup>9</sup> life satisfaction and depression. The findings were more consistent in samples of male workers. The results were partly related to how the model was tested: studies in which demand and control indicators were combined into categorical measures of high strain showed more consistent support for Karasek's hypothesis than those where continuous measures were used. The majority of the studies used cross-sectional designs and only two of the nine longitudinal studies found a relationship between change in demands and control and subsequent psychological wellbeing (van der Doef and Maes, 1999). A subset of the studies explicitly examined the buffer hypothesis, i.e., that high control moderates the negative effects of high intensity,<sup>10</sup> and of these, half found (partial)

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<sup>9</sup> The General Health Questionnaire is a widely used measure of psychological wellbeing (Goldberg and Blackwell, 1970), which is also used for general screening for psychological distress.

<sup>10</sup> These studies test the interaction between demands and control.

evidence to support the proposal. Tests of the moderating effect of support were also mixed. While support was commonly found to be associated with greater wellbeing, non-significant results were equally common and only two of the seven studies supported the buffering hypothesis.

A number of studies cited in the review also examined job-related psychological wellbeing outcomes, such as self-reported occupational stress/worries and these showed 'fairly consistent' support that high-strain work is associated with lower job-related psychological wellbeing (van der Doef and Maes, 1999, p. 106). The review also indicated that specific measures of demands (for example time pressure) with specific corresponding measures of control (for example control over pace and method) were particularly likely to find a moderating effect of control (van der Doef and Maes, 1999). A more general review of 228 studies on the effects of work-place stressors on health concluded that high job demands and low job control impacted on self-rated physical and mental health to a similar degree as exposure to second-hand tobacco smoke (Goh et al., 2015).

### **1.3.2 Physiological outcomes**

Understanding of the physiological outcomes of job stress has been influenced by the allostatic load model, which has emerged as the dominant physiological theory of the stress process (see Juster et al., 2010; Ganster and Rosen, 2013). The model proposes a three-stage process: primary mediators (for example stress hormones), secondary processes that are the body's response to chronic activation of the primary mediators (for example high blood pressure, high cholesterol, and immune system reactions) and tertiary reactions, such as CVD, depression and even death.

A meta-analysis of prospective (longitudinal) studies (Kivimäki et al., 2006) found that there was a significant relationship between effort-reward imbalance and subsequent risk of CVD. The review also found a higher risk of future CVD for those in high-strain jobs (high demand and low control), which was significant within age and gender, but became non-significant with a wider set of controls. The Whitehall II longitudinal study of civil servants in the UK also provided compelling evidence that workers experiencing high demands, low control and low support had an elevated risk of CVD, using rigorous longitudinal methodology and controls (for example Marmot et al., 1997; Kuper and Marmot, 2003; Kivimäki et al., 2011).

Previous research has also demonstrated the link between job stress and depression, including longitudinal studies that can rule out reverse causality (for example de Lange et al., 2002; Wang et al., 2009). These studies have found a relationship between depression and a variety of stressors suggested by the theoretical approaches outlined above, such as long hours, low control/high demand and effort-reward imbalance (see Ganster and Rosen, 2013 for a review).

In a review of 25 effort-reward imbalance studies that examined cardiovascular



outcomes,<sup>11</sup> van Vegchel et al. (2005) found that people in high-effort, low-reward situations were between 1.2 and nine times more likely to experience CVD than those in the reverse situation. Most of the studies used a prospective research design but a number were restricted to men, reducing the generalisability of the findings to women.

While the majority of studies focus on psychological and physiological outcomes, there is also evidence that job stress and the stressors that cause it are linked to behavioural outcomes. Frone (1999) presents evidence of the association between work stress and increased alcohol consumption and an overview of the explanatory models applied in the research. Brown and Richman (2012) suggest that the effect of stress on alcohol consumption is stronger among men than among women. Other relevant behavioural outcomes relate to the spillover of work stress into family life. Previous research has found that work stress is associated with a decline in the quality of relationships with partners and children (Dembe, 2001; Story and Repetti, 2006; Repetti et al., 2009).

Finally, there is evidence that job stress brings about negative outcomes at the organisational level. For instance, Taris' (2006) meta-analysis of 16 studies on the link between burnout and poor work performance shows substantial negative correlations between exhaustion and work performance, organisational citizenship and customer satisfaction. Halter and colleagues (2017) recently carried out a 'review of reviews' on the effect of job stress on staff turnover among nurses. Notwithstanding some concerns about the quality of the studies reviewed, the paper reports that stress is an important individual-level factor in predicting job turnover (Halter et al., 2017). In the UK, it has been estimated that about a fifth of staff turnover can be related to stress at work (CIPD, 2007). There is also evidence that work-related stress can increase absenteeism and 'presenteeism' and can even lead to early retirement (Hoel et al., 2001; Bubonya et al., 2017;). Hoel et al. estimate that 30 per cent of sickness absence is directly caused by stress. These outcomes are likely to lead to reductions in overall productivity. Halkos and Bousinakis' (2010) study on 425 Greek workers found that stress reduces productivity, and that the effect is particularly profound when work interferes with employees' personal lives. However, the authors interpret this finding cautiously, because they concede that 'active' and 'energetic' staff are on average more productive, suggesting that a healthy level of stress may be beneficial.

### **1.3.3 Differences in stress by gender**

Gender segregation in the labour market means that men and women are often located in different types of jobs, which may have different sets of job demands and job resources. It is also argued that, regardless of occupation, women are exposed

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<sup>11</sup> The outcomes measures included CVD mortality and morbidity and symptoms such as hypertension and cholesterol.

to particular stressors in the form of multiple roles, lack of career progress, and discrimination. A review of the literature in 2005 by Gyllensten and Palmer was inconclusive on the role of gender in the level of workplace stress. Some studies and reviews showed higher stress levels for women and others showed no gender effect, and the studies were of varying quality. In an earlier meta-analysis of 15 studies, Martocchio and O’Leary (1989) found no gender difference in occupational stress.

These reviews demonstrate that studies examining whether specific stressors have a different effect on outcomes for men and women are rare. One exception: Robertson Blackmore et al. (2007) found that job strain, psychological demands and job insecurity were associated with a significantly greater risk of depression for men but not women. In contrast, autonomy was a significant predictor for women but not for men.

#### **1.4 POLICY AND ORGANISATIONAL RESPONSES**

Policies to tackle job stress operate at the European, national, sectoral and organisational level. At the European level, action on work-related stress has taken the form of campaigns by EU bodies, agreement among social partners, and legislation. In 2012, the Senior Labour Inspectors Committee, a body set up to assist the European Commission in monitoring implementation of Occupational Health and Safety legislation in Member States, launched a campaign on the assessment of psychosocial risks.<sup>12</sup> This involved distributing guides and informational flyers on stress at work and on workplace inspection practices to national inspectors. In 2014–2015, the European Agency for Safety and Health at Work focused its annual Healthy Workplaces Campaign on the issue of job stress. Under this campaign, the Occupational Safety and Health Administration (OSHA) disseminated information on best practices and issued awards to firms that had used innovative strategies to manage job stress.

The social partners have also been involved in measures to combat job stress at the European level. In 2004, a Framework Agreement on Work-Related Stress was signed by the European Trade Union Confederation, the Union of Industrial and Employers’ Confederations of Europe and a number of other business and labour organisations. This agreement was developed in an attempt to set standards, albeit voluntarily, to improve understanding of the issue and to set out the roles of employers and employees in mitigating job stress.

At the national level, job stress is covered by Health and Safety legislation. In accordance with the EU Health and Safety Directive (89/391/EEC), the *Safety,*

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<sup>12</sup> Psychosocial risks are those aspects of a work environment that are likely to increase the potential for negative psychological outcomes.

*Health and Welfare at Work Act 2005* sets out the roles and responsibilities of employers in preventing mental and physical ill health among workers. Under Part 2, Section 8 of this Act, employers have a general duty to take all reasonably practicable steps to ensure the health and welfare of their employees, including protecting against any personal injury to mental health arising from job stress. Other relevant legislation in this area is the *Organisation of Working Time Act 1997*, which lays down minimum provisions for leave from work (Sections 19 to 23) and maximum limits on hours of work to ensure that workers are not subjected to excessive work demands and that they have adequate rest periods (Sections 11 to 18).

The state also provides social insurance to compensate workers for injuries and illness incurred due to work. While the Occupational Injury Benefit is available for people suffering physical injuries from accidents that occur at work, or from prescribed occupational diseases contracted at work, no equivalent payment is available for work-related illnesses arising from stress, such as anxiety and depression.<sup>13</sup> Instead, sufferers of these conditions must fall back on Illness Benefit – a scheme designed to insure against all kinds of illnesses, regardless of whether they stemmed from the workplace. This poses two problems. One is that, at the time of writing, Illness Benefit, unlike Occupational Injury Benefit, is linked to previous earnings, so that the full rate is only paid to people with average weekly earnings in excess of €300, whereas injury benefit is paid at the full rate, regardless of previous earnings. Second, from a policy-evaluation point of view, claims for Illness Benefit among people suffering from work-related stress get lost among the total, meaning that it is not possible to keep track of the cost of work-related stress to the Exchequer.

Policies to prevent and to deal with job stress also occur at the organisation level. Le Blanc et al. (2008) identify three categories of intervention against psychosocial risks. The first type occurs across the entire organisation itself and seeks to prevent the stressors from occurring in the first place. Organisational-level interventions also take place at the individual/organisation interface. These aim to improve the employees' ability to cope with stressors that do occur. Finally, some organisational-level interventions deal with the individual workers and attempt to reduce the impact of stress on the employee.

A meta-analysis of organisation-level anti-stress programmes found that, on balance, interventions were effective, but that there were significant differences in the size of the effect. The most effective type of intervention used cognitive-behavioural stress reduction techniques (Richardson and Rothstein, 2008). More generally, workplace wellness programmes that target stress reduction and other

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<sup>13</sup> Workers may claim for Occupational Injury Benefit for stress-related illnesses if the stress emerged as a result of a prescribed illness/injury. See Russell et al. (2016) for details.

health outcomes are found to be effective in reducing absenteeism, increasing job satisfaction and reducing the prevalence of unhealthy behaviour, such as smoking and physical inactivity (Parks and Steelman, 2008; Mattke et al., 2013), though the effects of these programmes are difficult to measure. Similar conclusions are reached in a review of employee assistance programmes in Australia (Kirk and Brown, 2003). However, the authors warn that such programmes can be viewed as a drive to shift responsibility for finding a solution to job stress to the individual employee, when in reality an organisational solution would be more appropriate. This criticism is also espoused by Foster (2018), who argues that there is a qualitative difference between how job stress is viewed in the health/wellbeing literature and the occupational health and safety literature: experts in health/wellbeing primarily conceive of job stress as a cause of other health outcomes, while the health and safety literature views it as an outcome in and of itself.

In Ireland and across Europe, the experience of implementing these kinds of intervention is mixed. The second European Survey on New and Emerging Risks, carried out in 2014 by the European Agency for Safety and Health at Work, found that half of Irish employers had insufficient information to assess the extent of psychosocial risks. In recent years, the Health and Safety Authority (HSA) has promoted its Wellbeing audit tool known as ‘Work Positive CI’, which is an organisational risk assessment for psychosocial hazards, recently upgraded to include critical incidents, and which can be carried out anonymously on the online platform, [workpositive.ie](http://workpositive.ie).

A report published by the European Foundation for the Improvement of Living and Working Conditions (2010) found that much of the best practice among industries and organisations across the continent involved gathering information on employee experiences of job stress and subsequently adjusting work practices – known as a primary prevention approach. The report emphasises that engagement with all relevant stakeholders, including workers and senior management, and clear communication between these actors, are key factors in developing an effective stress management policy. According to the report, an employee survey, followed up by an action plan in a French manufacturing firm, was found to have made a significant impact on employee stress levels. Re-organisation of work roles also made an impact in both an Italian clothing manufacturing plant and a Slovakian oil refinery.

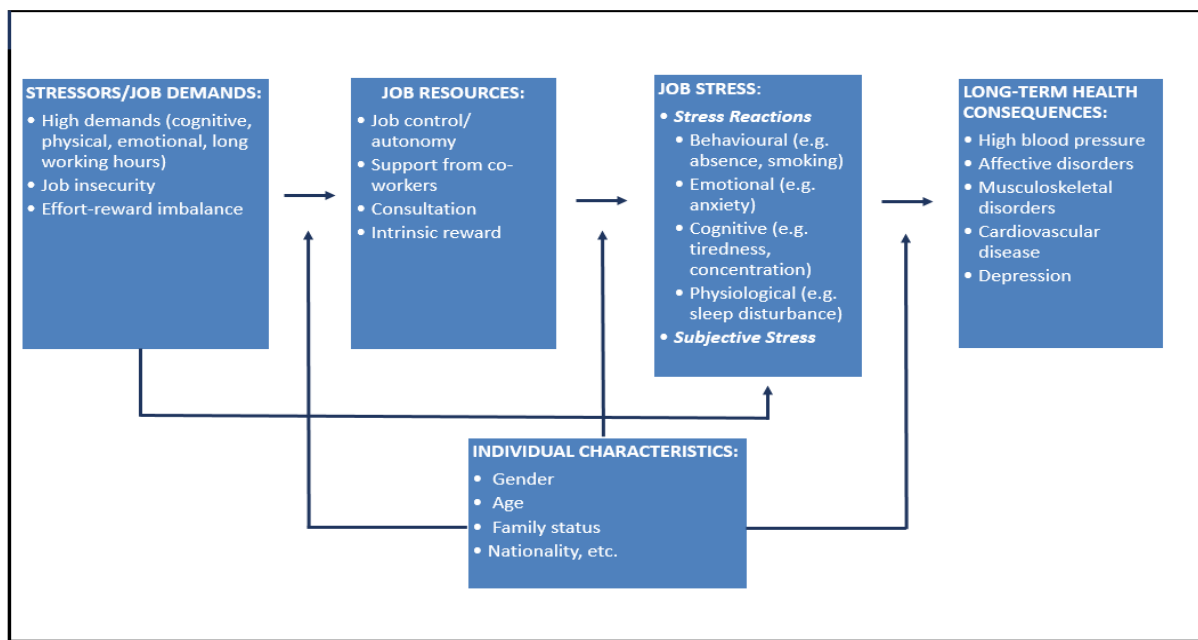
## **1.5 CONCEPTUAL FRAMEWORK AND RESEARCH QUESTIONS**

In the analysis that follows, we draw on existing theoretical and empirical research to identify a range of demands that are potential sources of job stress and a number of resources that can mitigate or moderate/buffer the effects of job demands.

We address the following questions:

1. What was the level of job stress in Ireland in 2015 and how has this changed since 2010? How do levels of job stress in Ireland compare to other countries in Western Europe?
2. What are the main job characteristics and features of work organisations that are associated with higher job stress? Are these the same in Ireland and the UK?
3. Which sectors and occupations exhibit the highest levels of job stress and what features of these jobs are most important in accounting for this risk?
4. What are the implications of these findings for policy at the national level and for practices at the organisational level?

To answer these questions, we draw on the conceptual model outlined in Figure 1.1. Among the stressors are the various job demands identified in the theoretical models and empirical research. We separate out the job resources, such as autonomy and support. The arrows indicate that demands may influence job stress directly, or the effect may be moderated through job resources. In the current study, we use both subjective reports and stress reactions as measures of job stress. Stress reactions can take the form of behavioural, emotional, cognitive or physiological responses. Job stress, in turn, is associated with longer-term health outcomes. These relationships can be influenced by individual-level characteristics such as gender, age, education and personality type. Due to the nature of the available data, in the analysis that follows we focus on the risks and stress reactions and not on the long-term health consequences.

**FIGURE 1.1** CONCEPTUAL MODEL OF CAUSES AND CONSEQUENCES OF WORK-RELATED STRESS

Source: Adapted from Eurofound (2010), citing Kompier and Marcelissen (1990).

## 1.6 METHODOLOGY

### 1.6.1 The data

The data used in this report come from the EWCS, which is managed by the European Foundation for the Improvement of Living and Working Conditions. The EWCS is the ideal data source for this analysis, since it provides information at a number of time points that is harmonised across countries and includes measures highly relevant to examining the relationship between working conditions and stress.<sup>14</sup>

The EWCS was launched in 1990 as a face-to-face survey of a random sample of people in employment in European countries and has since been conducted every five years. We draw on data from the two most recent waves of the survey, 2010 and 2015, for our analysis. While the EWCS is a rich source of information on job demands/stressors, job resources and stress reactions, the surveys are repeated cross-sections, and therefore the relationships found in the analysis cannot be established as causal. Furthermore, as information on risks, stress reactions and health are measured at the same point in time, we do not focus on longer-term physiological outcomes.

<sup>14</sup> Questionnaires and methodological documents are available on the website of the European Foundation: [www.eurofound.europa.eu/surveys/european-working-conditions-surveys](http://www.eurofound.europa.eu/surveys/european-working-conditions-surveys).

Randomly selected samples ranging in size from 1,000 to 3,000 are taken in each country.<sup>15</sup> It is a multistage sample, stratified by region and degree of urbanisation within the country. The target sample consisted of residents of the countries aged 15 or older, who had worked in the week preceding the survey. Where possible, up-to-date lists of addresses of individuals were used as the sampling frame. In both Ireland and the UK, address registers were used. Fieldwork was conducted by Ipsos NV, which interviewed respondents face to face in their own homes. The overall response rate for the 2015 EWCS was 43 per cent across all 35 countries. Across the ten countries included in the descriptive analysis in this report, the average response rate was just a little lower (41 per cent), ranging from 11 per cent in Sweden to 64 per cent in Greece. The figures for Ireland and the UK were 54 per cent and 41 per cent, respectively (Ipsos, 2016).<sup>16</sup>

Data were weighted to ensure they were representative of the working population within each country. The weights took account of age group within gender, occupation, industry and region (Ipsos, 2016).

In the present report, we focus on the data from 2010 and from 2015, the two most recent years available. Although employers and the self-employed are included in the survey, we focus on employees, because many of the aspects of workplace organisation – such as autonomy, being consulted and support – are most relevant to them. The meaning of key concepts, such as security, pay/reward also differs for the self-employed, compared to employees.<sup>17</sup>

### 1.6.2 Comparative context

We include ten countries in the descriptive results: Ireland, the UK, Denmark, Sweden, France, Belgium, Germany, Italy, Spain and Greece. We chose these Western European countries to give a context to the patterns we saw in Ireland. These countries are chosen because their labour market conditions are more comparable to Ireland than the former communist/transition countries of Eastern Europe. Furthermore, these ten countries include representatives of four major employment regimes: the social democratic, continental, liberal and Southern European regimes.<sup>18</sup> In the analysis where we model the relationships between job and worker characteristics and work stress, we narrow the focus to Ireland and our nearest neighbour, the UK. We selected the UK for more detailed comparison, because the UK and Ireland are often grouped together as representatives of the

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<sup>15</sup> For further details on sampling and weighting see IPSOS (2016), *6<sup>th</sup> European Working Conditions Survey Technical Report*. Available: [www.eurofound.europa.eu/sites/default/files/ef\\_survey/field\\_ef\\_documents/6th\\_ewcs\\_-\\_technical\\_report.pdf](http://www.eurofound.europa.eu/sites/default/files/ef_survey/field_ef_documents/6th_ewcs_-_technical_report.pdf)

<sup>16</sup> Response rates for the 2010 survey were similar, at 44 per cent across countries and 50 per cent in Ireland (Gallup Europe, 2010).

<sup>17</sup> While levels of job stress and its antecedents among the self-employed compared to employees is a very interesting research question, it is beyond the scope of the current study.

<sup>18</sup> An employment regime is a set of institutional characteristics relating to employment, such as skill development, wage setting, employment rights, collective bargaining and work insecurity.

liberal employment regime (Gallie, 2013). The UK therefore provides a useful benchmark for stress levels among Irish workers and offers a larger sample for examining the relationship between job demands, resources and stress outcomes.

The number of employee interviews in each country is shown in Table 1.1. We note that the EWCS does not include people who may have left work because of illness or injury. This means that any patterns we observe among those currently in employment may understate the differences between economic sectors and groups.

Measures of stress, stress reactions and stressors are described in the next chapter and descriptive statistics are provided.

**TABLE 1.1**      **SELECTED SAMPLE SIZE IN EACH COUNTRY**

Regime	Country	2010	2015
<b>Social democratic</b>	Denmark DK	965	940
	Sweden SE	902	927
<b>Continental</b>	France FR	2,683	1,394
	Belgium BE	3,445	2,237
	Germany DE	1,903	1,852
<b>Liberal</b>	Ireland IE	834	829
	United Kingdom UK	1,372	1,366
<b>Southern</b>	Italy IT	1,147	991
	Spain SP	884	2,776
	Greece GR	654	643

*Source:* European Working Conditions Survey, 2010 and 2015, employees only.

*Notes:* Full sample for Ireland (including self-employed) is 1,003 in 2010 and 1,057 in 2015.

### 1.6.3 Statistical models

Multiple regression analysis can help us to explore how several independent or predictor variables can influence a dependent or outcome variable. In the present report, this type of analysis is used to explore how job stress is related to key aspects of the individual's working situation. In Chapter 3, where we examine factors associated with job stress, we use statistical models to help identify the most salient factors. Those used are logistic regressions which control for other factors, such as age, family status, and financial difficulty. The inclusion of these variables means that we are assessing the effects of job demands on job stress, while holding constant the effect of stress arising outside the workplace.



## 1.7 OUTLINE OF REPORT

This chapter has discussed the literature on job stress, noting that there is strong evidence of a causal relationship between work stress and both physical and mental health outcomes. It has also pointed to a number of work demands that are associated with a heightened risk of job stress, including time pressure, physical demands, emotional demands and factors such as insecurity and effort-reward imbalance. Job resources such as support and autonomy have been identified as playing a possible moderating role between demand and stress outcomes. The chapter closes with a description of the EWCS data and the methods used in the report.

In the next chapter, we present the measures of subjective stress, stress reactions and workplace stressors and provide descriptive results of the ten countries included in the analysis in 2010 and 2015. In Chapter 3, we examine the factors associated with job stress, based on a statistical model designed to disentangle the effects of related characteristics such as work demands and sector. Finally, in Chapter 4, we draw together the results of the study to answer the research questions and discuss the policy implications of the findings.

## CHAPTER 2

### Job stress: measures, prevalence and antecedents

#### 2.1 INTRODUCTION

In this chapter, we first describe our measure of job stress and how it was constructed. We present comparative data on the prevalence of job stress and its component parts across ten Western European countries and show how levels have changed between 2010 and 2015. In Section 2.3, we outline the measures of job demands (or workplace stressors) that we use in the study. Following that, Section 2.4 describes the measures of job resources. These indicators form the basis of the multivariate analyses in later chapters. We present some descriptive results here as a background to that analysis, examining differences across countries and over time. The analysis is based on employees for the reasons described in the previous chapter.

#### 2.2 MEASURING JOB STRESS

The European Working Conditions Surveys (EWCS) of 2010 and 2015 contain both a subjective measure of job stress and a set of indicators of stress reactions. Each measure has strengths and weaknesses, so we combine respondents' answers on each to construct our measure of job stress. Here we describe each component of the measure in turn and then discuss the final combined measure.

##### 2.2.1 Subjective job stress

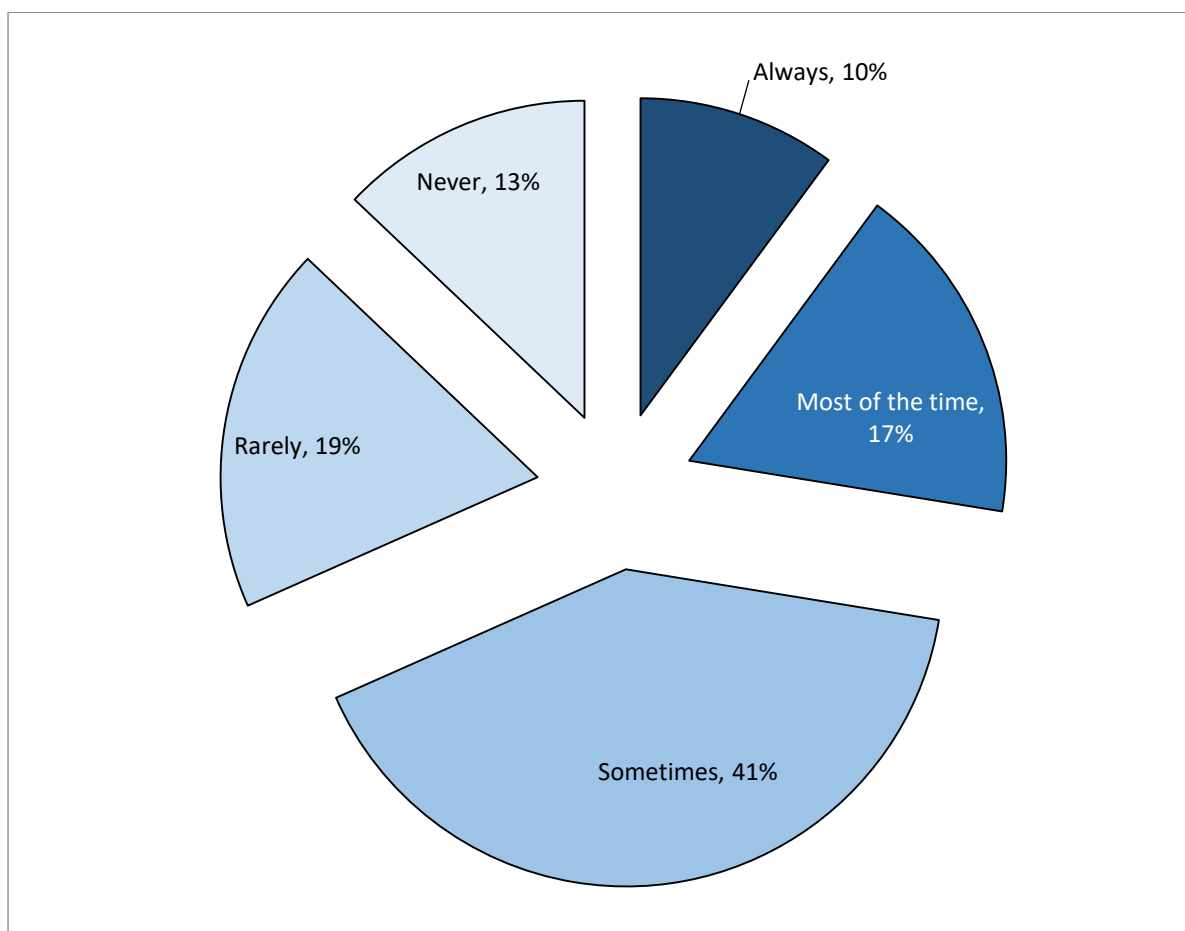
The subjective measure of job stress in the EWCS requires respondents to assess the stressfulness of their work situation but it is not explicit in terms of the aspect of the job that is causing the problem for them. The wording of this item is shown in Table 2.1. We define high stress as the condition of those who report that they experience stress 'always' or 'most of the time'.

**TABLE 2.1 SUBJECTIVE JOB STRESS MEASURE**

Component questions	Response categories
Select the response which best describes your work situation ... You experience stress in your work	All of the time/most of the time/sometimes/ rarely/never

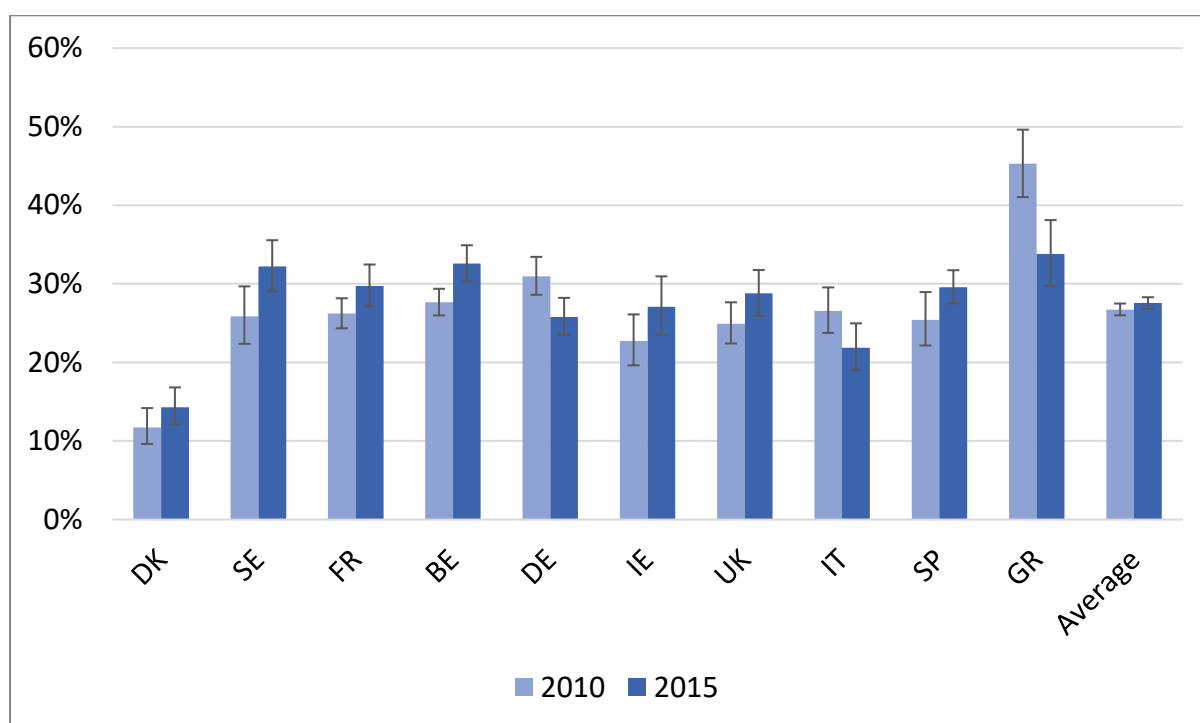
Source: European Working Conditions Survey, 2010 and 2015.

As shown in Figure 2.1, in 2015 10 per cent of workers always found their jobs stressful and a further 17 per cent found their work stressful most of the time. The largest group, 41 per cent, found work stressful sometimes.

**FIGURE 2.1 SUBJECTIVE JOB STRESS – AVERAGE FOR EMPLOYEES ACROSS TEN COUNTRIES IN 2015**

Source: European Working Conditions Survey, 2015; analysis by authors. See Table 2.1 for question wording.

In Figure 2.2, we show the rate of high subjective work stress by country and year (2010 and 2015). The average increased slightly over the period, from 27 per cent in 2010 to 28 per cent in 2015. However, there were marked differences across countries. Ireland experienced an increase from 23 per cent to 27 per cent, while six of the other countries also experienced increases (Denmark, Sweden, France, Belgium, the UK and Spain). The rate of subjective job stress fell in Germany, Italy and Greece. The fall in Greece is puzzling. It may be due to loss of employment in jobs that were more stressful in 2010, so that the remaining set of jobs comprises those characterised by lower stress levels. On the second component of our stress measure this fall is not evident in Greece (see below).

**FIGURE 2.2 HIGH SUBJECTIVE JOB STRESS BY COUNTRY AND YEAR**

Source: European Working Conditions Survey, 2010 and 2015; analysis by authors.

The advantage of this subjective measure of job stress is that it is explicitly linked to the work situation. Therefore, we can have some confidence that the stress is not caused by an external factor, such as relationship problems, though of course there may well be spillover of stress from home to work and from work to home (see discussion of spillover effects in Chapter 1). The disadvantage of this measure is that different social groups may vary in their propensity to identify or disclose the experience of stress at work, leading to response bias. Cultural differences in responses might lie behind some of the country patterns seen above.

A subjective assessment of stress may also be influenced by underlying personality traits or dispositions, such as negative affect (Brief et al., 1988).<sup>19</sup> Therefore, we do not rely on this indicator alone for our measure of job stress, but combine it with information on stress reactions.

### 2.2.2 Stress reactions

The second component of our job stress measure draws on a set of physiological stress reactions captured in the data. These are sleep disturbance, fatigue and anxiety. These indicators are not explicitly linked to the experiences of work, although they have been identified in the literature as common stress reactions

<sup>19</sup> Negative affect refers to 'pervasive individual differences in negative emotionality and self-concept' (Brief et al., 1988).

(Knudsen et al., 2007; EU–OSHA, 2009; Jones et al., 2016). Moreover, of the set of physiological outcomes captured in the EWCS, these are the three items most strongly correlated with subjective job stress measure.<sup>20</sup>

Table 2.2 shows the wording of the items measuring these stress reactions. In all three indicators, respondents are asked about their experience over the last 12 months. The measure of sleep disturbance changed between 2010 and 2015. In order to construct a 2015 sleep disturbance measure that would be comparable to the direct measure collected in 2010, we tested the construction of alternative possible sleep disturbance measures for 2015.

The measure selected was based on an additive scale using all three sleep problems (as listed in Table 2.2 with the items, A, B and C). The scale ranged from 0 to 12, with higher scores indicating greater problems. In 2010, across the ten countries 19 per cent of workers reported general sleep difficulties over the previous 12 months. We therefore adopted a threshold for the combined scale of the three sleep disturbance items (A, B and C) that identified, as closely as possible, the top quintile within each country.<sup>21</sup>

**TABLE 2.2 MEASURING STRESS REACTIONS**

Indicator	Component questions	Response categories
	Over the last 12 months, did you have any of the following health problems	
<b>Anxiety</b>	... anxiety?	Yes/No
<b>Fatigue</b>	... overall fatigue?	Yes/No
<b>Sleep disturbance 2010</b>	... insomnia or general sleep difficulties?	Yes/No
<b>Sleep disturbance 2015</b>	Over the last 12 months, how often did you have any of the following sleep related problems? ... Difficulty falling asleep ... Waking up repeatedly during the sleep ... Waking up with a feeling of exhaustion and fatigue	Daily/several times a week/ several times a month/less often/never

Source: European Working Conditions Survey, 2015.

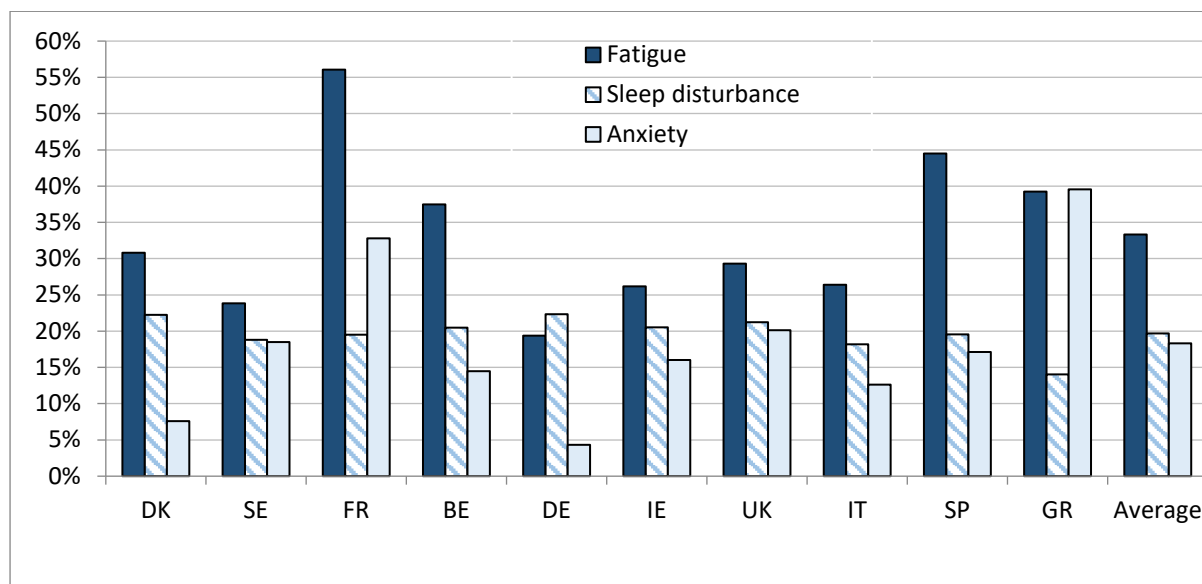
Figure 2.3 shows the proportion of workers in each country who experienced each of the three stress reactions in 2015. The average across countries for anxiety is 18 per cent; the figure for Ireland is slightly below the average, at 16 percent. The average for fatigue is much higher, at 33 per cent. France and the Southern

<sup>20</sup> An additional item on whether the respondent had experienced headaches or eye strain was available but the correlation with subjective job stress was low, at 0.14.

<sup>21</sup> The threshold on the 0–12 scale was therefore allowed to vary across the countries from five in Greece to eight in France. As the scale is ordinal rather than fully continuous, the cut-off is not always at exactly 20 per cent within each country. Across the ten countries selected in Chapter 2, the correlation between sleep disturbance and fatigue is only of 0.33. Many other factors than sleep disturbance can explain fatigue.

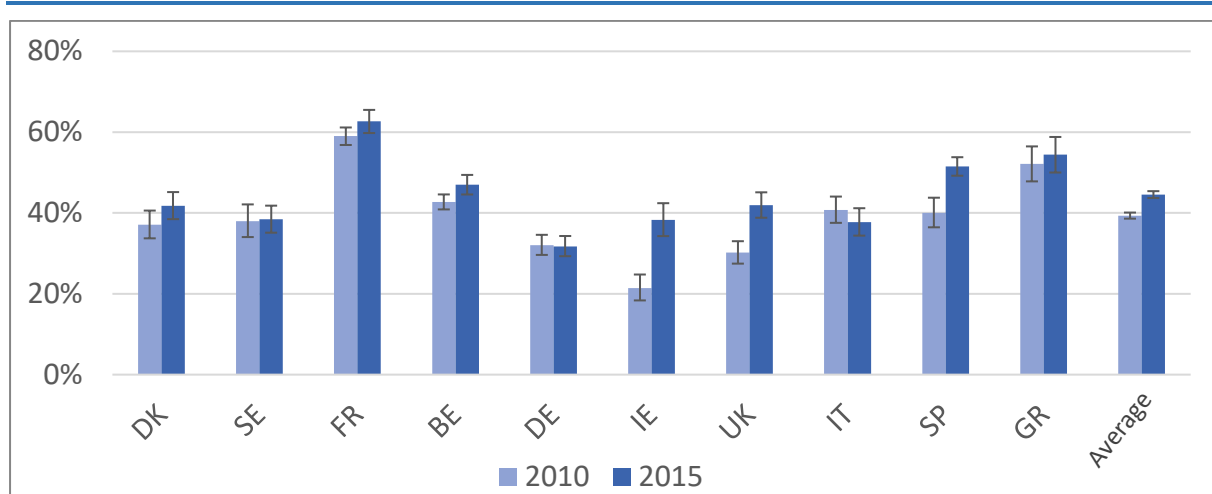
European countries report particularly high levels of overall fatigue. The figure for Ireland is below the average (21 per cent). Because we define the sleep disturbance measure as the top quintile on the scale, all countries have a value close to 20 per cent.

**FIGURE 2.3 STRESS REACTIONS (ANXIETY, FATIGUE AND SLEEP DISTURBANCE) IN 2015 BY COUNTRY**



Source: European Working Conditions Survey, 2015, employees; analysis by authors.

Figure 2.4 shows the change between 2010 and 2015 in the percentage of workers experiencing one or more of the stress reactions by country. There was very little increase in the average across countries between the two years (from 41 per cent to 45 per cent). However, the variation across a few countries is substantial. The figures remained similar in most countries, such as Germany and Sweden, or increased modestly for the others, but the increases were substantial in three countries (Ireland, the UK and Spain). The increase was greatest in Ireland (from 21 per cent to 38 per cent), followed by the UK (from 30 per cent to 42 per cent) and then Spain (from 40 per cent to 52 per cent). The only decrease was in Italy (from 41 per cent to 38 per cent).

**FIGURE 2.4 EXPERIENCE OF ONE OR MORE OF THE THREE STRESS REACTIONS IN 2010 AND 2015 BY COUNTRY**

*Source:* European Working Conditions Survey, 2010 and 2015; analysis by authors.

*Notes:* Stress reaction is indicated by a 'yes' score on one or more of the three sub-indicators (sleep disturbance, anxiety and fatigue).

These indicators are not explicitly linked to work experience and therefore something else in the person's life could be accounting for their stress reactions. While this approach may introduce some 'noise', when it comes to examining job stress, the advantage is that it does not require the person to attribute their problems to their jobs. People are likely to differ in the level of knowledge they have about how job stress can affect their health and wellbeing. These differences in knowledge could distort attempts to measure stress reactions that are due to different working conditions, if we required people to make the link to their jobs. We address the issue that the stress reactions may arise from another, non-work related, source in two ways. First, we combine the stress reaction indicators with the subjective measure of job stress. Second, in the analysis that follows in Chapter 3, we measure the effect of job experience on job stress, while controlling for other external influences, such as household characteristics and financial difficulties.

### 2.2.3 Combined measure of job stress

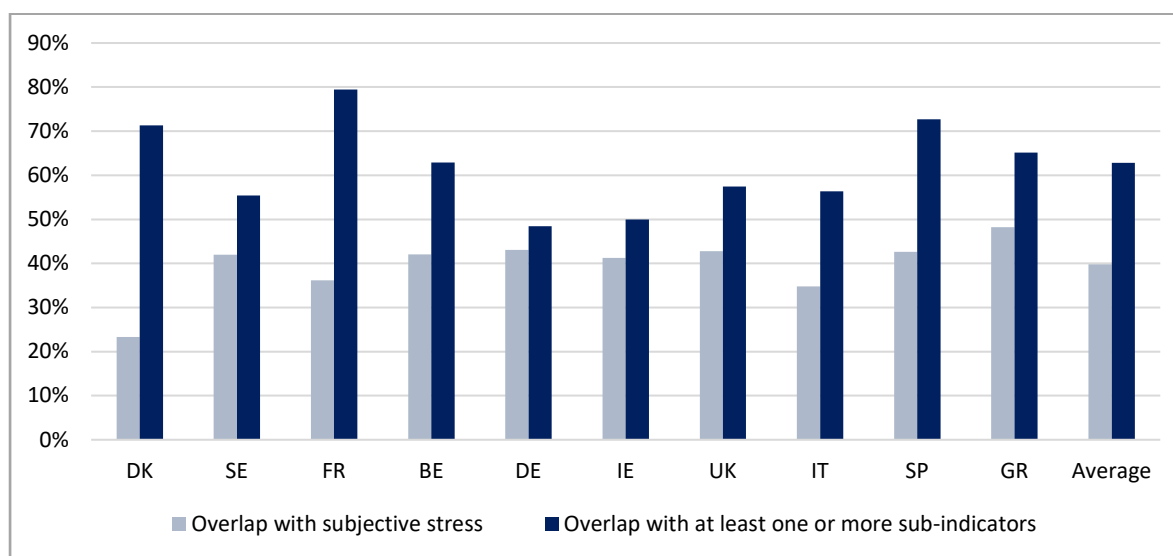
As both the subjective measure of job stress and the stress reaction measures described above have individual weaknesses and strengths, we combine the two dimensions to produce our measure of job stress. Workers are identified as experiencing job stress if they report at least one of the three stress reactions (sleep disturbance, anxiety and fatigue) and report high subjective stress (always or most of the time).<sup>22</sup>

<sup>22</sup> For a robustness test, we used a threshold of at least two stress reactions. On average, the main effect was to divide by two the percentage of employees experiencing work stress. The pattern of distribution of work stress across countries and time stayed the same, except for Greece, where a more stringent threshold reversed the trend over time. By using a larger sample size, based on a threshold of at least one stress reaction, we can have more robust estimates, as analysed in Chapter 3.

The rationale for combining these two measures is that we exclude people experiencing any of these three physiological reactions who do not report any subjective stress, thereby reducing the possibility that the reactions are due to external causes only. Including the physiological reactions reduces the biases that may be caused by differences in the propensity to report subjective job stress across subjects that would affect an indicator based on this single item alone.

In Figure 2.5, we show the relationship between stress reactions and subjective stress (Pearson correlation of 0.24). Looking at the first set of columns, we note that the overlap between those experiencing at least one or more of the three stress reaction indicators and reporting subjective stress is quite modest, at 40 per cent overall. The variation across countries is quite narrow, as it varies between 35 per cent in Italy and 48 per cent in Greece, and only in Denmark is it much lower at 23 per cent. However, the reverse relationship reveals a much higher degree of overlap between the measures. Indeed, on average 63 per cent of employees reporting high subjective stress also experience at least one of the stress reactions. The overlap is the lowest in Germany, at 48 per cent and it is the highest in France, at 79 per cent; and in Ireland it is 50 per cent.

**FIGURE 2.5** OVERLAP BETWEEN STRESS REACTIONS AND SUBJECTIVE STRESS BY COUNTRY, AVERAGE 2010-2015



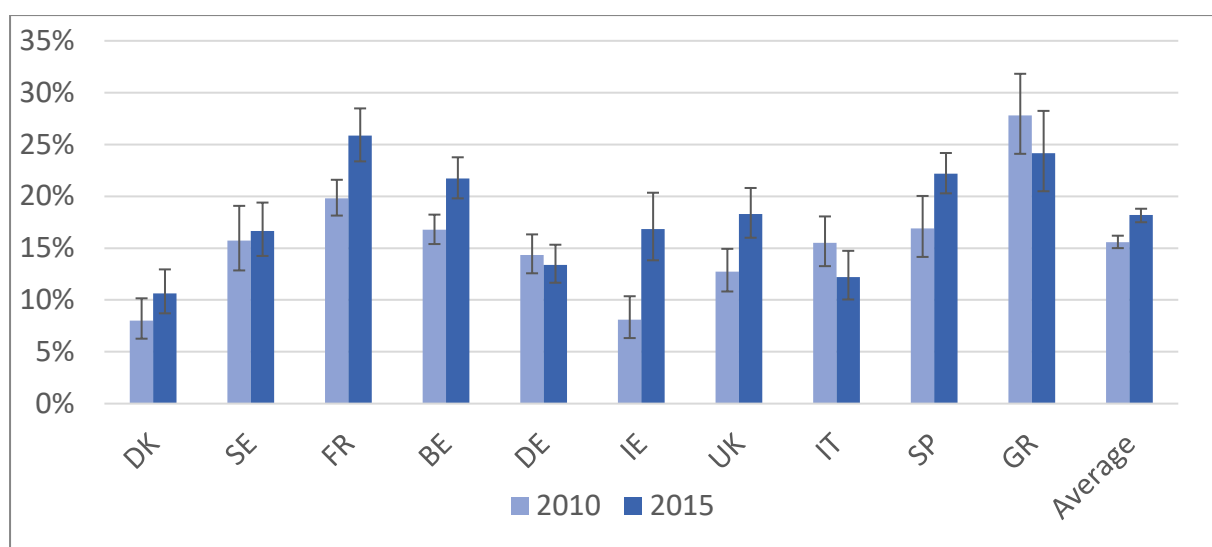
Source: European Working Conditions Survey, 2010 and 2015, employees; analysis by authors. Experiencing subjective stress and one of the three stress reactions (sleep disturbance, anxiety and fatigue).



Figure 2.6 shows the percentage of employees experiencing the combined measure of stress in 2010 and 2015. On average, there was a small increase over time, from 16 per cent to 19 per cent. However, there was a marked difference in trends across countries. Ireland was among the group of countries where there was a significant increase in job stress over time. In Ireland, the rate increased from 8 per cent to 17 per cent. France, Belgium, the UK and Spain also record a significant increase in job stress over this time period. In the remaining countries considered, the change over time was not significant, at least at the broad national level.

In terms of comparative position, the level of job stress observed in Ireland was lowest among the ten selected countries in 2010, while levels were highest in Greece. In 2015, job-stress levels in Ireland were above those in Denmark, Germany and Italy, and were at the same level as that recorded in Sweden, leaving Ireland marginally below the average (18 per cent) across the ten countries. In 2015, the highest levels of job stress occurred in France, Belgium, Greece and Spain. The pattern of job stress across the countries does not indicate clustering by employment regime types. In other words, levels of job stress do not seem to reflect cross-national differences in institutional features such as employment rights and training and staff development policies.

**FIGURE 2.6 COMBINED JOB STRESS MEASURE BY COUNTRY 2010 AND 2015**



*Source:* European Working Conditions Survey, 2015, employees; analysis by authors. Experiencing subjective stress and one of the three stress reactions (sleep disturbance, anxiety and fatigue).

*Notes:* The confidence intervals show the significance of the estimates within countries i.e., whether the change over time is significant.

### 2.3 JOB DEMANDS

In this section, we describe the measurement of a range of job demands that have been identified in the literature as significant causes of work stress. The wording of the items is shown in Table 2.3.

The measure of **time pressure** is based on three items involving working at high speed, tight deadlines and having enough time to get the job done. These three indicators are combined, and mean scores are calculated. The final variable is rescaled to range from zero to one, where one indicates the highest score on the combined scale (see Appendix for details).

**TABLE 2.3 MEASURING JOB DEMANDS/STRESSORS: QUESTION WORDING**

Indicator	Component questions	Response categories
<b>Time pressure</b>	Does your job involve working at very high speed? Does your job involve working to tight deadlines? Do you have enough time to get the job done?	All the time to never All the time to never Always to never
<b>Emotional demands</b>	Does your job require that you hide your feelings? Does your job involve handling angry clients, customers, patients, pupils, etc.?	Always to never
<b>Job insecurity</b>	I might lose my job in the next six months	Strongly agree to strongly disagree
<b>Effort-reward imbalance</b>	Considering all my efforts and achievements in my job, I feel I get paid appropriately	Strongly agree to strongly disagree
<b>Physical demands</b>	Tiring or painful movements Lifting or moving people Carrying or moving heavy loads Repetitive hand or arm movements	All of the time to never
<b>Bullying, harassment, violence etc.</b>	Unwanted sexual attention (last month) Physical violence (last 12 months) Bullying/harassment (last 12 months) Sexual harassment (last 12 months) Threats/humiliating behaviour (last month) Discrimination at work (last 12 months) Verbal abuse (last month)	Yes/No

Source: European Working Conditions Survey, 2015.

**Emotional demands** are based on two items: the job requiring the employee to hide their feelings and the job involving handling angry clients or customers. Responses are on a five-point scale (always, most of the time, sometimes, rarely, never) and are coded so that higher scores indicate greater demand. The two questions are combined into one scale, which is then rescaled to range from zero to one.

**Job insecurity** refers to the perceived likelihood that the person will lose their job in the next six months. Respondents are asked whether they strongly disagree, tend to disagree, neither agree nor disagree, tend to agree or strongly agree that they might lose their job in the next six months. The responses are rescaled so that strongly disagree is coded as zero and strongly agree is coded as one, with the other responses at equal intervals between (.25, .5, .75).

**Effort-reward imbalance** relies on a single question of whether the respondent feels that they are paid appropriately for all their efforts and achievements. As with the job insecurity measure, there are five response categories ranging from strongly disagree to strongly agree and they are rescaled in the same way.

The measure of **physically demanding work** draws on earlier analyses of the EWCS by Watson et al. (2015). The measure draws on four items: whether the job involves painful or tiring positions almost all the time, lifting or moving people, carrying or moving heavy loads, or constant repetitive hand or arm movements.

The questions on which these indicators are based are shown in Table 2.3. For each indicator, a threshold is chosen that is related to the health and safety risk attached to that level of physical demands. An exposure was deemed a potential risk if more than 40 per cent of workers with that intensity of exposure considered their health or safety were at risk because of their job.<sup>23</sup> A threshold of ‘around ¾ of the time’ is used for ‘carrying or moving heavy loads’ and a threshold of ‘almost all of the time’ is used for ‘tiring or painful positions’.

The final indicator of work demands is exposure to **bullying, harassment or violence**.<sup>24</sup> This measures whether the respondent had any experience of unwanted sexual attention, sexual harassment, physical violence, verbal abuse bullying/harassment, threats/humiliating behaviour or discrimination.<sup>25</sup> Each variable had a score of zero for ‘no’ and one for ‘yes’. The scale takes the mean score across all seven indicators, so that zero indicates a ‘no’ on all seven and one means ‘yes’ on all seven.

### 2.3.1 Job demands across countries

Figure 2.7 summarises the variation in workplace stressors across countries in 2015. It shows the average level of time pressure reported in each of the ten countries. Across the ten countries, the average level of time pressure is 0.41, ranging from 0.36 in Italy to 0.45 in Greece and Sweden. The figure in Ireland is 0.39. Scores for emotional demands range from 0.27 in Denmark to 0.43 in Greece. The average across the ten countries is 0.35. The Irish score for emotional demands is higher than the average, at 0.38.

Looking at the lower panel of Figure 2.7, the perceived job insecurity score ranges from a low of 0.15 in Denmark to 0.42 in Greece. The figure in Ireland is 0.22, below the average of 0.26. On the effort-reward imbalance scale there is less variation

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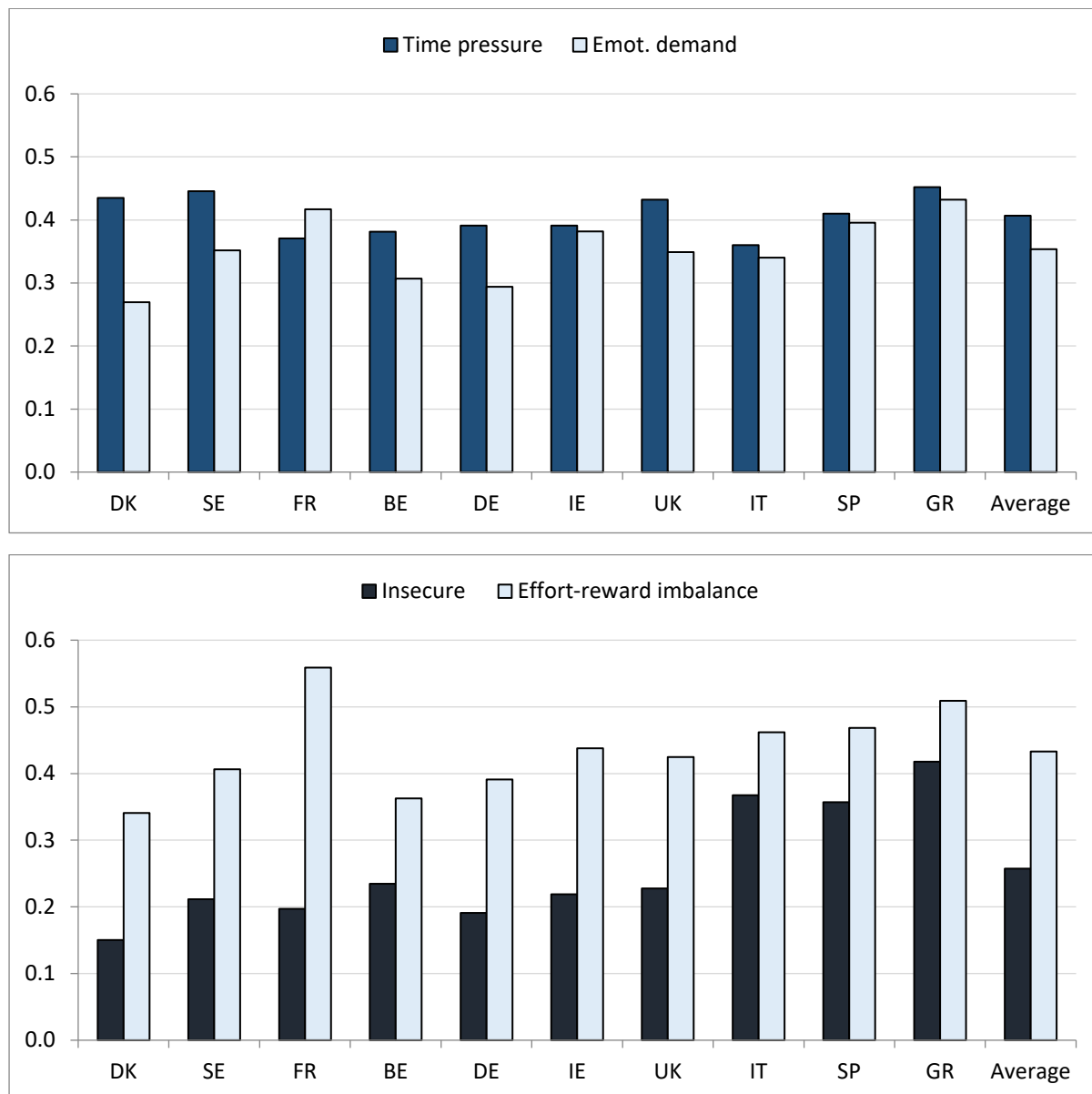
<sup>23</sup> This was based on analysis of the 2010 EWCS.

<sup>24</sup> Watson et al. (2015) labelled bullying, harassment etc. as ‘psycho-social risks’ but as we consider other psychosocial risks here we do not use that term. Watson et al. (2015) had examined four workplace risk types, but two of these (physical risks and chemical/biological risks) proved in preliminary analysis to have no significant relationship to stress reactions, so they are not included here.

<sup>25</sup> There is no indication from the EWCS questionnaire that a definition of bullying or harassment was given to the interviewees.

across countries than with the previous scale. Except for France and Greece, which have high scores of 0.56 and 0.51, respectively, the scores for all other countries range from 0.34 in Denmark to 0.47 in Spain. The score in Ireland, at 0.44, is close to the average, which stands at 0.43.

**FIGURE 2.7** WORKPLACE STRESSORS BY COUNTRY IN 2015 (0=LOW TO 1=HIGH)

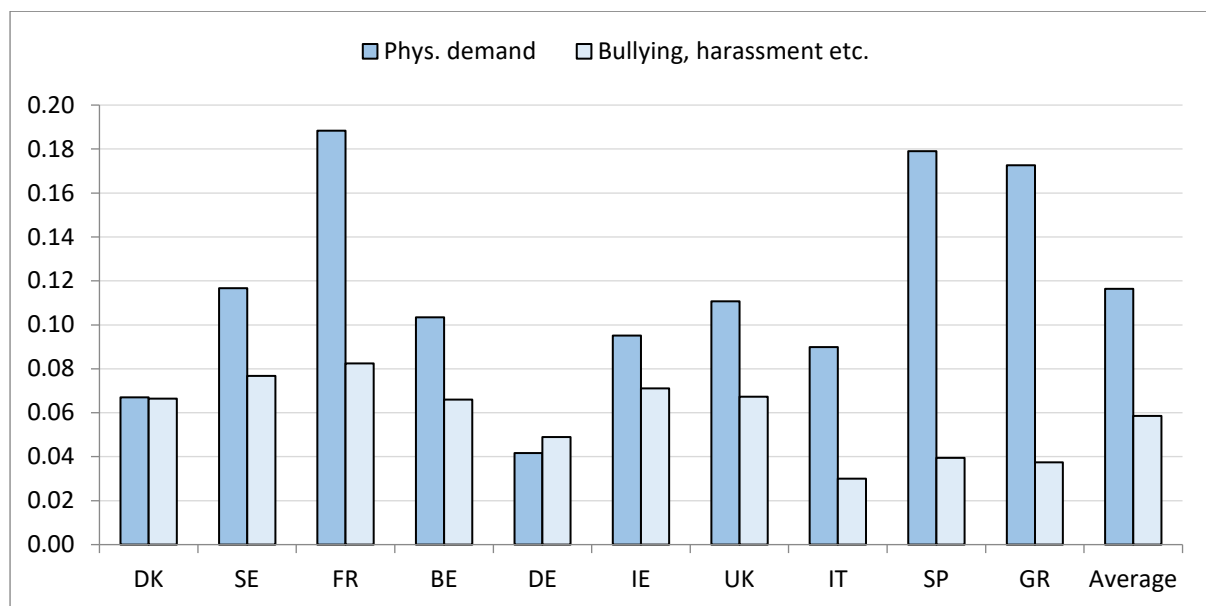


Source: European Working Conditions Survey, 2015, employees; analysis by authors.

In Figure 2.8, we show the average scores for physical demands and bullying/harassment. The average exposure across the ten countries is 0.12 for physically demanding work and 0.06 for bullying, harassment and violence. The level of physically demanding work is low in Germany (0.04) and Denmark (0.07) and high in France, Spain and Greece (0.17 to 0.19). It is below average in Ireland (0.10). The level of bullying/harassment/violence etc., as observed by Watson et al. (2015),

tends to be higher in the more affluent countries, perhaps reflecting a greater awareness of the right to dignity at work and a greater willingness to disclose this kind of experience. The figures range from 0.03 to 0.04 in Italy, Spain and Greece, rising to 0.08 in Sweden and France and with a figure of 0.07 in both Ireland and the UK, which is just above the average of 0.06. Overall, 24 per cent of employees in Ireland reported at least one of these types of mistreatment and 14 per cent reported two or more, compared to average figures of 21 per cent and 10 per cent, respectively, across the ten countries.

**FIGURE 2.8 PHYSICAL DEMANDS, BULLYING AND HARASSMENT BY COUNTRY 2015 (0=LOW TO 1=HIGH)**



Source: European Working Conditions Survey, 2015; analysis by authors.

Some additional analysis revealed that there were very few changes in the country averages between 2010 and 2015 that were greater than 0.1 on the scales running from 0 to 1. The only exceptions were an increase in emotional demands in Italy and Spain (0.1 and 0.11, respectively), a reduction in insecurity in Ireland (-.16) and an increase in cognitive demand in France (0.14).

## 2.4 JOB RESOURCES

Following the theoretical model outlined in Chapter 1, there are a number of job resources that are thought to promote worker resilience in the face of work pressures. These include autonomy, support, consultation and the intrinsic rewards of the work. Table 2.4 describes the measurement of each of these constructs and Figure 2.9 shows how they vary across the countries.

The first factor is autonomy, which is measured as the capacity to choose the order

of tasks, the methods of work or the speed of work. From Figure 2.9 we can see that the average on the autonomy scale is highest in Denmark (0.83) and lowest in Greece (0.43). However, the range in the remaining countries falls in a much narrower band, from 0.62 (in Spain) to 0.73 (in Belgium). The level is towards the middle of the range in Ireland, at 0.66.

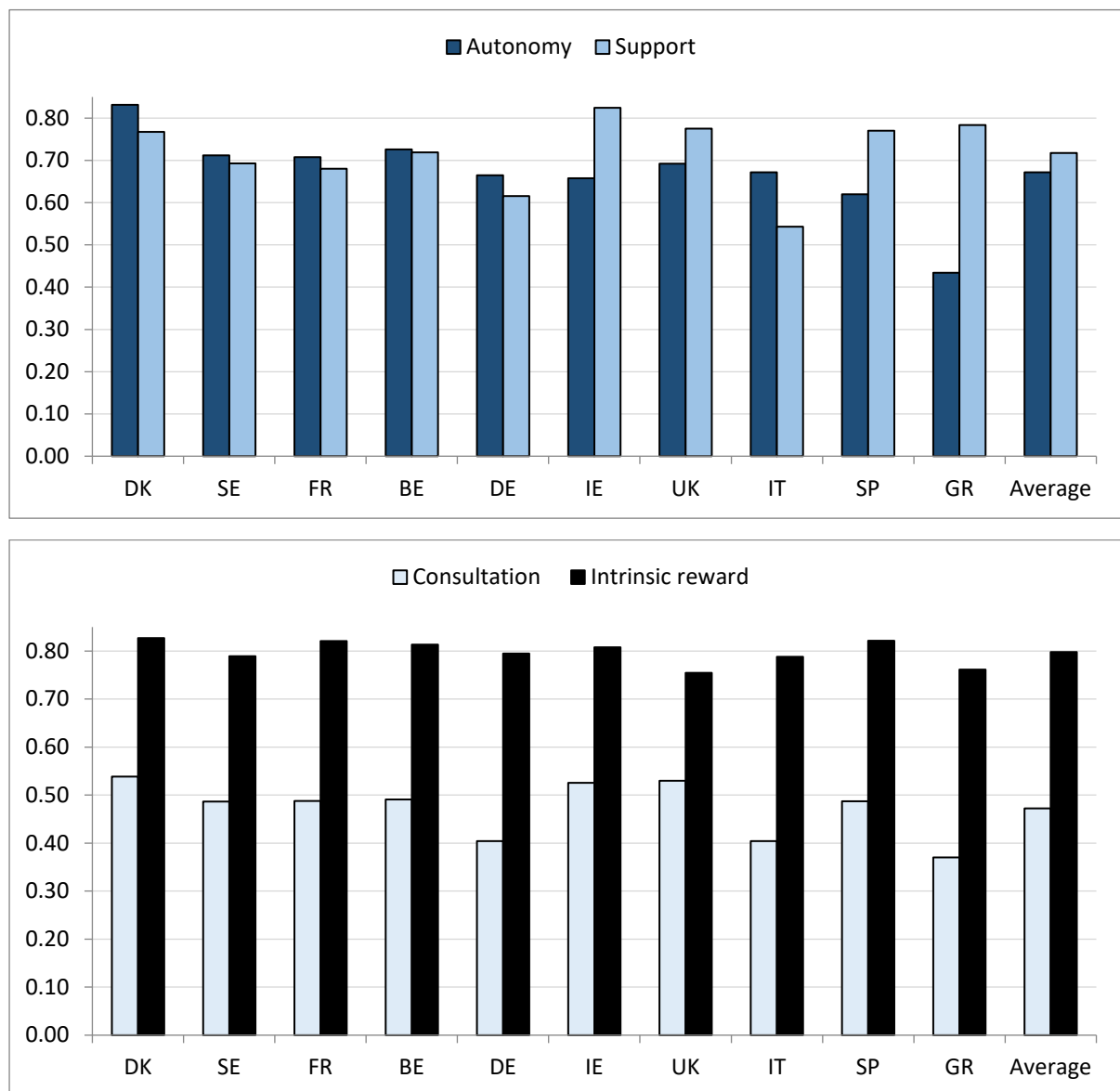
**TABLE 2.4 MEASURING JOB RESOURCES**

Indicator	Component questions	Response categories
<b>Autonomy</b>	Are you able to choose or change your order of tasks? Are you able to choose or change your methods of work? Are you able to choose or change your speed or rate of work?	Yes/No Yes/No Yes/No
<b>Support</b>	Your colleagues help and support you Your manager helps and supports you	Always to never
<b>Consultation</b>	You are consulted before targets for your work are set You are involved in improving the work organisation of your department You have a say in the choice of your working partners You can influence decisions that are important for your work	Always to never
<b>Intrinsic reward scale</b>	Your job gives you the feeling of work well done You have the feeling of doing useful work	Always to never

Source: European Working Conditions Survey, 2015.

Support is based on the degree of assistance the employee receives from colleagues and managers. The highest value on this scale in 2015 is found in Ireland (0.82) and the lowest value is found in Italy (0.54). The level of support is also high in Denmark, the UK, Spain and Greece (0.77 to 0.78). Support may vary with the type of organisation and sector and these will be controlled in models in later chapters.

The third scale shown in the bottom panel of Figure 2.9 is consultation. This is based on four items dealing with whether the employees are consulted before targets are set for their work, have a say in the choice of working partners, can influence decisions that are important for their work and are involved in improving the work organisation of their department. The average value on this scale is lowest in Greece (0.37) but is also low in Germany and Italy (0.40). The highest levels of consultation are found in Denmark (0.54), Ireland and the UK (both 0.53).

**FIGURE 2.9 JOB RESOURCES BY COUNTRY IN 2015**

Source: European Working Conditions Survey, 2015, employees; analysis by authors.

The balance between effort and reward is also relevant to whether the employee finds their job stressful. Intrinsic reward is measured with two items: whether the job gives the employee a sense of work well done and whether the employee has the feeling of doing useful work. Overall, the level of intrinsic reward is high, with a mean of 0.80. The mean does not vary a great deal across countries, with values ranging from 0.75 in the UK to 0.83 in Denmark. The level in Ireland is 0.81.

Table 2.5 shows how the items are correlated. The correlation coefficients in the table show the strength of the relationship between each pair of factors (scoring from zero to one). A correlation of zero indicates no relationship; a correlation of one indicates a positive relationship (the two are always found together) and a correlation of -1 indicates a negative relationship (the two factors are never found together). The correlations are all positive, suggesting that these aspects of work organisation and employee experience tend to be found together. However, the relationships are only moderate: the strongest correlation ( $r=0.40$ ) is between autonomy and consultation.<sup>26</sup>

**TABLE 2.5 CORRELATIONS BETWEEN JOB RESOURCES**

	Autonomy	Support	Consultation
Support	0.10		
Consultation	0.40	0.35	
Intrinsic reward	0.19	0.31	0.34

*Source:* European Working Conditions Survey, 2010 and 2015, employees; ten countries, weighted by country design weights.  
*Notes:* Correlations obtained from the scaled items ranging from 0 to 1.

Table 2.6 shows the correlation between the workplace organisation factors and the combined work stress measure. The correlations are low, indicating that there is not a strong association. Time pressure, emotional demands and bullying/harassment are the factors most associated with combined work stress, while job insecurity has very little association with work stress. The signs of the correlations are as expected: work demands are positively associated with job stress, while the mediating factors such as autonomy and support tend to reduce it.

<sup>26</sup> In the subsequent models, we find that consultation is not significantly associated with stress levels. Therefore, given the correlation between consultation and autonomy, we drop consultation from the model.



**TABLE 2.6 CORRELATIONS BETWEEN COMBINED STRESS AND JOB DEMANDS AND JOB RESOURCES**

	Combined job-stress measure
Time pressure	0.32
Work pace	0.17
Emotional demands	0.25
Insecurity	0.07
Physical demands	0.20
Bullying/harassment	0.25
Effort-reward imbalance	0.17
Autonomy	-0.04
Support	-0.13
Consultation	-0.03
Intrinsic reward	-0.11

Source: European Working Conditions Survey, 2010 and 2015, employees; ten countries, weighted by country design weights.

The relationship between job resources and stress is negative, but weak (correlations range from -0.03 to -0.13). The weak relationship is not surprising, since the theory suggests that it is in the presence of the stressors that the mediating factors will be beneficial. In other words, autonomy on its own may not reduce stress, but autonomy where someone has high demands at work will reduce stress, compared to how the situation might otherwise have been.

## 2.5 OTHER WORKPLACE CHARACTERISTICS IN IRELAND AND THE UK

As well as the aspects of the job that we expect to be significant for stress, we include other job characteristics, as shown in Figure 2.10. These are included as controls in the statistical models in later chapters. Since the models include only Ireland and the UK, we distinguish these two countries separately from the other eight.

The distribution of occupations across countries is similar overall. However, Ireland and the UK are quite distinctive from the other European countries by having a much greater percentage of service/sales (22 per cent in Ireland and 16 per cent in the other European countries) and professional occupations (21 per cent in Ireland and 17 per cent in the other European countries). The opposite is true for technical associate professionals, where it is the lowest in Ireland (10 per cent), compared to the other European Countries (17 per cent).

In terms of distribution across broad industrial sectors, Ireland's employees are quite similar to those in the other European countries, apart from the fact that there is a slightly higher proportion working in health and related services (23 per

cent, compared to 21 per cent in the UK). The pattern of work time – focusing on weekend work and shiftwork – is also quite similar to that of the other countries (22 per cent and 50 per cent in Ireland, respectively). Weekend working is more common in the UK (55 per cent).

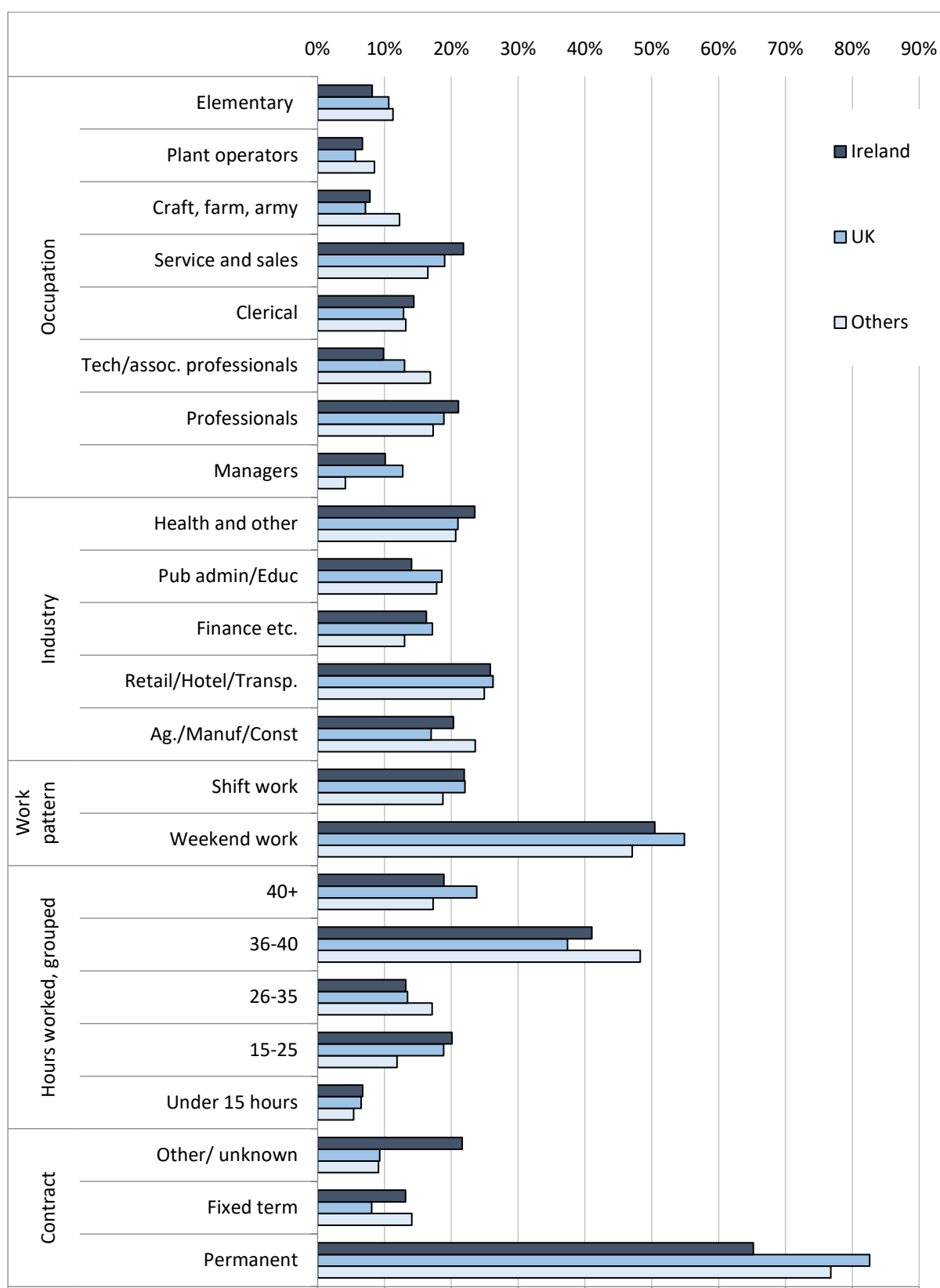
In terms of hours worked, the biggest group of Irish employees (41 per cent) works between 36 and 40 hours a week, with a further 19 per cent working more than 40 hours. Seven per cent work fewer than 15 hours per week and 20 per cent work between 15 and 25 hours. The distribution is quite similar to the UK, but a slightly higher proportion of employees in the UK work over 40 hours per week (24 per cent).

While we know that most employees have a permanent contract (65 per cent), we do not know what type of contract 22 per cent of Irish workers have. Some of this group may be casual workers.<sup>27</sup>

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<sup>27</sup> Further analysis with statistical modelling showed that controlling for employees' type of contract had no significant effect on work stress. It was therefore removed from the final models, as shown in Chapter 3.

**FIGURE 2.10 OTHER CHARACTERISTICS OF JOBS IN IRELAND AND THE UK**



Source: European Working Conditions Survey, 2010 and 2015, employees; ten countries; analysis by authors.

## 2.6 CHARACTERISTICS OF WORKERS IN IRELAND AND THE UK

Figure 2.11 shows the socio-demographic characteristics of workers that we control in the models in later chapters: gender, age group, age of youngest child and household financial difficulties. These represent the averages across the 2010 and 2015 surveys for employees. Ireland has a relatively high percentage of women among employees: they account for just over half of employees, compared to 49 per cent in the UK and 48 per cent in other countries.<sup>28</sup>

Compared to the UK, Ireland has fewer employees aged under 25 (11 per cent, compared to 14 per cent), more aged 25–44 (55 per cent, compared to 46 per cent), and fewer aged 45 and over (34 per cent, compared to 40 per cent).

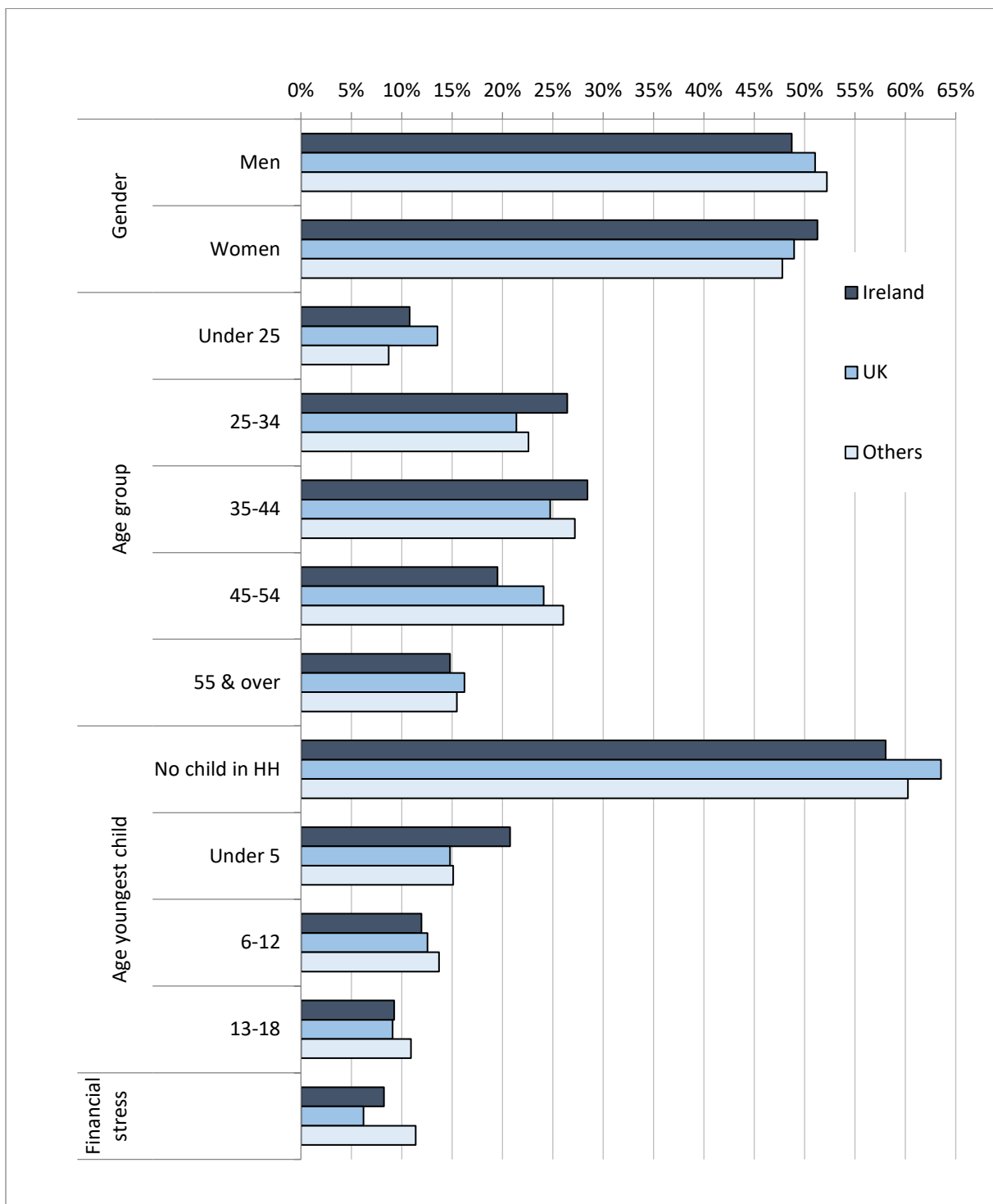
In terms of having children, employees in Ireland are considerably more likely to have children under the age of five (21 per cent, compared to 15 per cent in the UK and a similar figure on average across the other eight countries).

Finally, we look at the financial circumstances of the household of the employees. During the interviews, workers were asked if, taking account of their household income, they were able to make ends meet, with six possible answers ranging from ‘very easily’ to ‘with great difficulty’. We report in Figure 2.11 the percentage of employees having ‘difficulty’ and ‘great difficulty’. Employees in Ireland report a higher percentage of financial difficulties (8 per cent) than in the UK (6 per cent), but the figure is still lower than in other European countries (11 per cent), despite the strong impact of the Great Recession on the standard of living of Irish households.

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<sup>28</sup> The self-employed are more likely to be male.

**FIGURE 2.11 OTHER CHARACTERISTICS OF WORKERS IN IRELAND AND THE UK**



Source: European Working Conditions Survey, 2010 and 2015, employees; analysis by authors.

## 2.7 SUMMARY

This chapter has described the data that form the basis of the present report. The analysis is based on the EWCS for 2010 and 2015, focusing on employees. We discussed the measurement of the key indicators: subjective job stress and stress reactions, as well as a combined job stress measure capturing the overlap between self-assessed stress and stress reactions. The combined measure showed large variation in the experience of work stress across ten countries, where on average slightly less than a fifth of employees experienced job stress. Overall, there was a modest increase between 2010 and 2015, but for some countries such as Ireland, the increase was stronger, where the proportion rose from 8 per cent to 17 per cent.

Looking at workplace demands/stressors (for example time pressure, emotional demands, job insecurity), we find that employees in Denmark and Sweden tend to be less exposed to these stressors than their Southern European counterparts, while employees in Ireland are close to the average on most measures.

Finally, we looked at job resources that may ameliorate the impact of stressors (autonomy, support, consultation, intrinsic job reward). Except for Greece, employees across the ten countries tend to report a high level of autonomy and support in their work. Employees in Ireland report a similar level of autonomy as the average across the ten countries but have the highest level of support of all ten countries. There was very little variation across countries in the level of intrinsic job reward among employees, with all countries, including Ireland, having strongly positive scores. The consultation scores were less positive, but again Ireland had a similar value to the ten-country average for this measure. The models in subsequent chapters will control for other job characteristics, as described in this chapter (industry, hours worked, work pattern), and some key characteristics of the worker (gender, age, age of youngest child) that have also been described above.



## CHAPTER 3

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### Working conditions and job stress

#### 3.1 INTRODUCTION

In this chapter, we set out to examine whether the job demands and resources identified in the stress literature are useful in explaining the job-stress levels of Irish workers. The analysis also includes a comparison with the UK labour market. We select the UK as the comparator, because many of the labour market institutions are similar across the two countries and it therefore provides a useful benchmark. In comparative analyses of employment regimes, Ireland and the UK are usually grouped together as 'liberal regimes' that are characterised by relatively low levels of employment protection legislation and union density (Gallie, 2013). We use formal statistical modelling to examine the relationship between job characteristics and the experience of job stress. This allows us to hold constant other relevant factors and to assess the independent impact of each job demand and resource. The second aim of the chapter is to provide a profile of high-stress occupations and sectors in Ireland and to assess if there are particular job demands or a lack of job resources at play in these cases.

We use the European Working Conditions Survey (EWCS) pooled data from 2010 and 2015 to allow us to examine change over time and to maximise the number of cases available for analysis. We begin by presenting the results for Ireland (Section 3.2) and then repeat the analysis with a joint model for Ireland and the UK (Section 3.3). This allows us to identify any factors that have a significantly different impact on job stress in Ireland and the UK. Finally, we explore which sectors and jobs are most stressful in Ireland (Section 3.4).

#### 3.2 MULTIVARIATE ANALYSIS OF WORK-RELATED STRESS IN IRELAND

We first examine results from statistical models of job stress in Ireland. The dependent variable in the models is the combined job stress measure described in Chapter 2. This measure takes a value of one if the respondent is both subjectively stressed and reports at least one of three stress reactions (anxiety, fatigue, sleep disturbance) and zero, if not. The results are presented as odds ratios. An odds ratio greater than one indicates that the group in question is more likely to experience job stress than the reference group. An odds ratio less than one indicates that the group is less likely to experience stress than the reference group.

All the explanatory variables, such as level of autonomy and time pressure, have been rescaled to range from zero to one, where zero represents the lowest score and one the highest score (see Chapter 2). This allows us to compare the size of the



effects across the indicators of job demands and resources. For these variables, the odds ratios show the effect of being at the top of the scale, compared to being at the bottom. For example, those experiencing the highest levels of time pressure are 10.4 times more likely to experience job stress than workers with the lowest levels of time pressure (Table 3.1, Model 2).

### **3.2.1 Change over time**

Starting with Ireland, Model 1 in Table 3.1 shows that between 2010 and 2015 there was a significant increase in the level of job stress, even when we control for changes in worker and job characteristics that may have occurred over the period. All else being equal, employees were 2.3 times more likely to experience stress in 2015 than in 2010.

### **3.2.2 Characteristics of workers and households**

The first set of variables in the model relate to the non-work characteristics of workers and households. We include family characteristics to take account of the possibility that the causes of stress may arise within the family, rather than the job. Neither gender, age nor the presence of children is significantly related to job stress in Ireland. In the literature, the presence of young children is found to be associated with different measures of work-related wellbeing, such as work-family conflict (McGinnity and Russell, 2013). Those in financial difficulty, i.e., people finding it difficult or very difficult to make ends meet, do not experience higher levels of job stress than people with no financial difficulties, once other characteristics are held constant. This reassures us that our job stress measure is picking up work-related stresses, rather than stress from other sources.

**TABLE 3.1 LOGISTIC REGRESSION OF JOB STRESS IRELAND AND UK**

		Model 1 Ireland	Model 2 Ireland and UK
		Odds Ratio	Odds Ratio
Year	2015 (ref=2010)	2.34***	1.68***
Country	Ireland		0.67**
Gender	Men (ref)	Ref	Ref
	Women	0.90	1.15
Age	Under 25	0.57	0.86
	25–34 (ref)	1.00	1.00
	35–44	1.46	1.43
	45–54	0.65	1.13
	55 & over	1.16	1.28
Children	No child < 18 years (ref)	1.00	1.00
	Youngest child age <5	0.77	0.77
	Youngest child age 5–12	1.01	1.03
	Youngest child 13–18	1.19	0.89
Financial difficulty	(Very) Difficult make ends meet	1.58	1.46
Job demands	Time pressure 0–1	10.36***	7.74***
	Emotional demands 0–1	21.28***	14.04***
	Perceived insecurity 0–1	1.06	1.20
	Physical demands 0–1	2.20	1.92*
	Bullying/harassment 0–1	8.28***	10.43***
	Effort-reward imbalance 0–1	4.26***	2.27***
Job resources	Autonomy 0–1	1.56	1.34
	Support 0–1	0.77	0.86
	Intrinsic 0–1	0.40	0.40*
Hours	Under 15 hours	3.05*	1.32
	15–25	1.02	0.93
	26–35	1.26	0.97
	36–40 (ref)	1.00	1.00
	Over 40 hours	2.12*	1.93***
Work schedule	Weekend work	0.76	1.31
	Shiftwork	1.02	0.79
	Constant	0.00***	0.01***
	Observations	1384	3813
	R-squared	0.27	0.23

Source: European Working Conditions Survey, 2010 and 2015; analysis by authors.

Notes: \*\*\* p<0.001, \*\* p<0.01, \* p<0.05, #p<0.1; Job stress measure: high subjective job stress and at least one stress reaction (fatigue, sleep disturbance, anxiety) See Appendix, Table A.1 for UK model.

### 3.2.3 Job demands/stressors

The next set of factors is a series of job demands that have been identified in the literature as contributing to work-related stress. These stressors have been described in Chapter 2. Of all the stressors in the model, that of emotional demands (hiding feelings and dealing with angry customers, client, pupils, etc.) has by far the strongest association with job stress. Those who report the highest level of emotional demands are 21.3 times more likely to experience stress than those with the lowest emotional demands.

The second largest effect on work-related stress is found in time pressure. Those under the greatest time pressure are 10.4 times more likely to experience job stress than those with no time pressure. Exposure to bullying/harassment is also strongly correlated with job stress. Employees with the highest exposure are almost eight times more likely to experience job stress than the group with no such experience.

Job stress is also elevated when workers feel that their pay is inadequate for their effort and achievements in the job, a phenomenon known in the literature as ‘effort-reward imbalance’. Those with the strongest sense of imbalance were 4.3 times more likely to experience job stress than those who had the lowest score.

Physical demands tend to increase stress among employees, but they do not reach statistical significance in the model for Ireland. Unexpectedly, perceived job insecurity was not a good predictor of job stress. This was also true of contract type, which was dropped from the model.<sup>29</sup> Previous research has found a significant association between job insecurity and other measures of psychological wellbeing (De Witte, 1999, 2005; Sverke et al., 2002). We tested whether the result was due to diverging effects at the two time points. There was a stronger negative effect of perceived insecurity on job stress in 2010, at the height of the Great Recession, than in 2015, a period of early recovery, though the interactions did not reach statistical significance. The results could suggest that insecurity is more stressful when there are fewer outside options, though further evidence is needed to confirm this hypothesis.

### 3.2.4 Job resources

The literature on job stress identifies a series of job resources that are expected to reduce stress and to moderate the effects of work demands. We include three job resources: having autonomy at work, getting support from co-workers/management, and intrinsic rewards. We also tested the effect of consultation. This was found to be insignificant and, because it was correlated with autonomy, was dropped from the final models.

When resources are included without job demands (see Model 1 in Appendix, Table A.1), we see that support from colleagues and managers, and intrinsic rewards are associated with reduced job stress, though the latter is only significant at the 10 per cent level. The odds ratio for autonomy is also less than one, suggesting that the relationship is in the expected direction but is not statistically significant. Once job demands are included in the model, none of the three job resources has a

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<sup>29</sup> Contract type is thought to be a weaker indicator of working conditions in liberal regimes, such as Ireland and the UK, where the employment protections of permanent workers are relatively weak, compared to those on permanent contracts in Continental and Southern European regimes. We therefore retained the subjective insecurity measure – perceived likelihood of job loss.

significant impact on job stress among employees in Ireland. Additional analysis shows that job resources and demands are negatively correlated with one another. Significant correlations emerge between autonomy and time pressure (-0.12), job insecurity (-0.18) and physical demands (-0.16).<sup>30</sup> Likewise, intrinsic rewards are negatively associated with time pressure (-0.14), physical demands (-0.11), bullying/harassment (-0.18) and effort-reward imbalance (-0.23). Support is negatively correlated with bullying/harassment (-0.19), effort-reward imbalance (-0.24) and time pressure (-0.10).

A number of theories suggest that job resources operate primarily as buffers or moderators of high levels of job demand. This hypothesis suggests that there may be an interaction effect, whereby autonomy (or other resources such as support) has a particularly beneficial effect among those experiencing high demands. The proposed interaction of autonomy and demands is given particular prominence in Karasek's demand-control model, where jobs that combine high demand and low autonomy are seen to be most stressful. We therefore explicitly examine whether autonomy, support and intrinsic rewards moderate the effects of the most influential job demands (namely time pressure, emotional demands, and exposure to bullying/harassment). We find that in Ireland, none of the nine possible interaction effects is statistically significant.<sup>31</sup>

### 3.2.5 Working patterns

The final set of variables examined relates to working patterns, namely the weekly hours worked and atypical work patterns, such as working at weekends or doing shiftwork. Those working at over 40 hours were twice as likely to experience job stress as those working 36 to 40 hours per week. Those employed for very short hours also experience elevated levels of stress, compared to those working a standard 36–40-hour week. This pattern is consistent with our previous findings, which show that those with the shortest working hours had a high risk of work-related illness (including SAD) and work-related injury per hour worked (Russell et al., 2016). This result may arise because these comprise a marginalised group of workers or because those with poor mental health may be more likely to work very short hours.

Among employees in Ireland, neither shiftwork nor weekend work is significantly associated with job stress, when other working conditions are controlled.

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<sup>30</sup> Time pressure was the main variable responsible in the model for changing the direction of the effect of autonomy.  
<sup>31</sup> As we used nonlinear (logistic) models, we cannot interpret the coefficients (or the odds ratios) of the interaction terms directly from the main results. We therefore used more formal statistical analysis by using the Stata command 'inteff' (Norton et al., 2004) to draw out our findings on the sign and the significance of the interaction terms for the combination of the relevant demand and resource variables.

### 3.3 WORK-RELATED STRESS: IRELAND AND THE UK COMPARED

In Model 2 (Table 3.1), we report the results of a model using pooled data from the UK and Ireland gathered in 2010 and 2015. The UK sample is larger than the Irish one, so to prevent the results from being excessively influenced by the UK data, we adjusted the weight so that both countries have the same sample size and equal importance in the data analysis. Pooling the data for the two countries allows us to explicitly test for any significant differences between the two countries. The model for the UK alone is available in the Appendix (Table A.1, Model 2).

The variables are the same as in Model 1, apart from the fact that we add a comparison of the level of stress in Ireland and the UK overall. Where there appear to be differences in the relationship between work factors and job stress in Ireland and the UK, we run models with country interactions to test whether the difference is statistically significant.

In the joint model, the odds ratio for Ireland is 0.67, which means that Irish employees are one third less likely than UK employees to experience job stress, even when all job characteristics are controlled (Table 3.1, Model 2).

Taking both countries together, there was a significant increase in the level of job stress between 2010 and 2015. Workers were 1.7 times more likely to experience job stress in 2015 than in 2010. There was a significant interaction between country and year (see Appendix, Figure A.1 and Table A.1), which shows that there was a steeper increase over time in Ireland than in the UK, where the change was not significant. Furthermore, while in 2010 Irish workers had a lower stress level than UK workers, by 2015 there was no significant difference in stress levels between the two countries.

The pooled model shows that there is no significant gender difference in job stress, as was the case in the Irish model. However, in the UK, female employees were 1.4 times more likely to experience job stress than their male counterparts (Appendix, Table A.1).<sup>32</sup>

In the pooled model, all the job demand indicators are associated with a significant increase in job stress, except for perceived insecurity. Physical demands now have a significant relationship with job stress, which is due to the higher number of observations in the pooled model, rather than any difference in the effect in the UK and Ireland. None of the job demands effects is found to differ significantly between the two countries, when the interactions are formally tested.

The main effects of autonomy and support remain non-significant in the pooled Ireland/UK model. Intrinsic rewards are found to reduce the odds of job stress by

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<sup>32</sup> However, the interaction between country and gender is not statistically significant.

60 per cent. This is the same coefficient as in the Irish model but is now statistically significant, due to the larger number of cases.

In the joint model, we found that availability of support moderated the effect of emotional demands. Those who experienced high emotional demands, combined with high support from colleagues/managers, were more likely to experience stress than those who experienced high emotional demands in the context of low social support in the workplace (see Appendix, Figure A.2 and Table A.3).

Neither shiftwork nor weekend work has a significant effect on stress in the pooled model. However, this disguises a significant difference between the UK and Ireland. In the UK, employees who work at weekends have significantly higher levels of stress, but this is not the case in Ireland.<sup>33</sup> The interaction between shiftwork and country is not significant.

Work weeks in excess of 40 hours remain associated with higher job stress in the pooled model, but the effect of low-work hours is no longer significant, suggesting that this effect is confined to Ireland. This is confirmed by the UK-only model (Appendix, Table A.1).

### **3.4 WHICH SECTORS AND JOBS ARE MOST STRESSFUL IN IRELAND?**

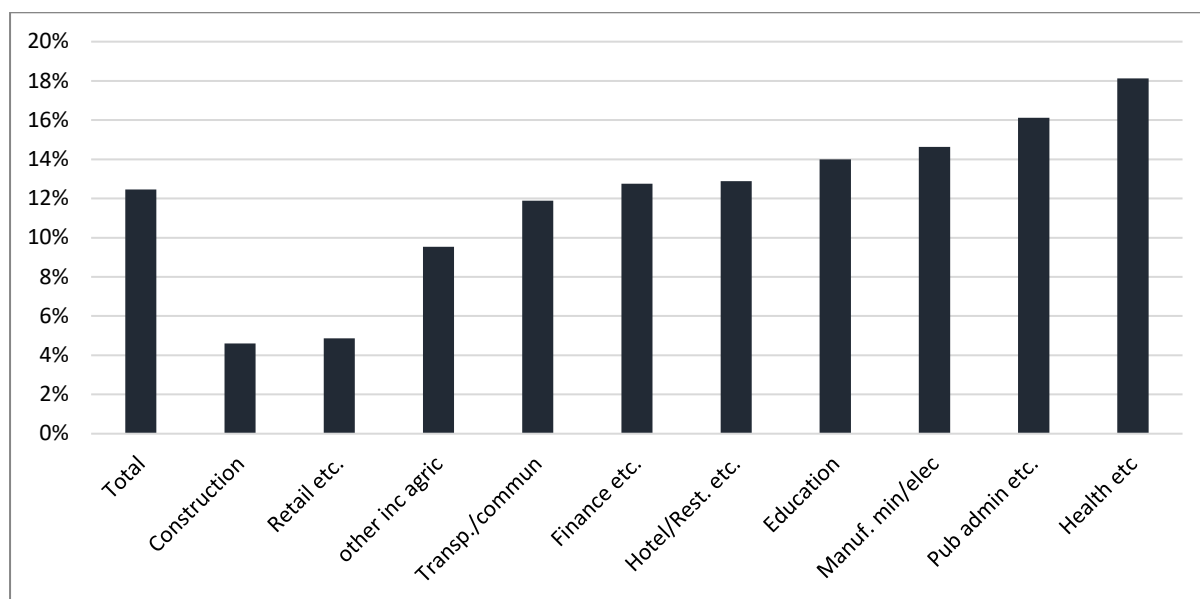
Our analysis is primarily concerned with how specific demands and resources within jobs affect stress outcomes for workers. However, these demands and resources may, to some extent, be clustered in sectors or occupations. In the following analysis, we examine whether certain sectors and occupations have particularly high levels of stress and consider the extent to which this can be accounted for by specific demands or low availability of job resources. We do this by comparing job stress in occupations and sectors before and after controlling for other factors.

#### **3.4.1 Job Stress by Sector**

Figure 3.1 shows that the experience of job stress among employees in Ireland varies by sector. Health sector workers, over a fifth of whom (18 per cent) experience job stress, are most at risk. A higher-than-average proportion of employees reports job stress in public administration (16 per cent) and in manufacturing (15 per cent). Workers in the Construction and Retail sectors report the lowest levels of job stress (5 per cent or less).

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<sup>33</sup> This is confirmed by testing the interaction between country and weekend work. In the UK, even when controlling for industry and occupation, there is still a positive effect on job stress for working at weekends.

**FIGURE 3.1 EXPERIENCE OF JOB STRESS BY INDUSTRIAL SECTOR: EMPLOYEES IN IRELAND**

Source: European Working Conditions Survey, 2010 and 2015, pooled. Weighted. N=1623

Notes: Job stress measure = high subjective job stress *and* at least one stress reaction (fatigue, sleep disturbance, anxiety).

In Table 3.2 we examine which set of factors accounts for the sectoral patterns observed. Each set of factors is entered separately, and our main interest is in the extent to which the control variables mediate the effect of industrial sectors on stress.

Column A shows the relationship between sector and job stress, when no other factors are taken into account. It shows that stress levels are significantly higher in the Health sector and the Manufacturing sector than in Construction, which we take as a reference category. Column B shows the sector differences when the personal characteristics of workers and year are held constant. The addition of these controls does not alter the odds ratio for Health sector workers, while the odds ratio for manufacturing is only marginally reduced, suggesting that personal characteristics do not play a significant role in explaining sector differences in job stress.

**TABLE 3.2**      **SECTORAL DIFFERENCES IN JOB STRESS IN IRELAND: MEDIATING FACTORS**

	A	B	C	D	E	F
Controls	No controls	Personal and year	Job demands	Job resources	Hours/Schedule	All
	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio
<b>Construction (ref)</b>						
<b>Manufacturing</b>	2.75#	2.47	2.96*	2.61	2.48	2.31
<b>Retail, etc.</b>	0.82	0.68	0.71	0.77	0.80	0.65
<b>Hospitality</b>	2.13	1.99	0.82	1.99	1.83	0.86
<b>Transp./comm.</b>	1.58	1.50	0.90	1.36	1.32	1.00
<b>Finance, etc.</b>	2.10	1.76	1.87	2.24	2.29	1.66
<b>Public admin.</b>	2.31	2.10	0.97	2.32	2.53	0.97
<b>Education</b>	2.15	1.72	1.83	2.60	2.99#	1.56
<b>Health, etc.</b>	3.62*	3.64*	1.06	3.95*	3.48*	1.25
<b>Other (incl. agri.)</b>	2.06	1.86	1.86	2.12	1.90	1.78
<b>N</b>	1368	1368	1368	1368	1368	1368

Source: European Working Conditions Survey, 2010 and 2015, pooled.

Notes: \*\* p<0.01, \* p<0.05, # p<0.1. The ranking of the sectors in Model A differs somewhat from that shown in Figure 3.1, because of exclusion of cases where information is missing on the explanatory variables.

In Column C, we control only for work demands – time pressure, physical demands, bullying/harassment, emotional demands and effort-reward imbalance. The odds ratio for the Health sector is reduced to 1.06 and is no longer statistically significant, showing that relatively high levels of stress in the Health sector work through the pathway of high work demands. Table 3.3 highlights that Health sector workers have higher-than-average exposure to four of the five work demands: emotional, physical, bullying/harassment and effort-reward imbalance.

The results in Column D show that job resources (autonomy, support and intrinsic rewards) have little impact when explaining sectoral difference. In fact, the odds ratio for the Health sector increases marginally (compared to Column A). Employees in the Health sector score above average in the intrinsic rewards and the result suggests that, in the absence of this, stress levels would be even higher.

We next test the impact of hours of work and work scheduling on sectoral difference in stress levels (Column E). These factors reduce the odds ratio for the Manufacturing sector, compared to the model with no controls (column A), but they account for little of the Health sector effect.

In the final model (Column F), we include all controls. We find that with all controls, there are no remaining unexplained sectoral differences.



Table 3.3 shows in detail which sectors are characterised by high and low job demands and resources. These findings are illustrative in understanding variation in stress levels across the economy. Health sector workers are exposed to the greatest number of stressors. They exhibit high scores in emotional and physical demands, bullying/violence/harassment, and effort-reward imbalance. Workers in public administration are most likely to feel inadequately rewarded for their work, and transport and manufacturing workers have the longest work weeks. Transport workers receive the least support from co-workers and managers, and along with employees in the Hospitality sector, they have the lowest levels of autonomy. A comparison with the UK (Appendix, Table A.5) shows similar levels of job demands, overall, across sectors, but lower levels of support and intrinsic rewards in the UK. Health sector workers in the UK are also distinctive in the high levels of work demands they face. The largest difference between Ireland and the UK is the greater percentage of employees in the UK working over 40 hours a week, particularly in the Construction, Finance and Education sectors.

**TABLE 3.3 MEAN DEMANDS AND RESOURCES BY SECTOR, IRELAND 2010, 2015**

	Job demands					
	Time pressure	Emotional demands	Physical demands	Bullying, etc.	ERI	>40hrs <sup>1</sup>
<b>Manufacturing</b>	.47	.25	.13	.05	.45	31%
<b>Construction</b>	.41	.30	.15	.01	.37	19%
<b>Retail, etc.</b>	.34	.33	.11	.05	.38	14%
<b>Hospitality</b>	.44	.49	.08	.08	.41	11%
<b>Transp./comm.</b>	.41	.40	.14	.08	.44	31%
<b>Finance, etc.</b>	.43	.33	.05	.03	.39	23%
<b>Public admin.</b>	.38	.42	.06	.09	.49	16%
<b>Education</b>	.31	.42	.05	.07	.47	7%
<b>Health, etc.</b>	.40	.49	.17	.13	.50	12%
<b>Other (incl. agri.)</b>	.33	.29	.07	.04	.46	24%
<b>All</b>	.40	.37	.10	.06	.44	19%

	Job Resources		
	Autonomy	Support	Intrinsic Reward
<b>Manufacturing</b>	.61	.81	.76
<b>Construction</b>	.61	.83	.83
<b>Retail, etc.</b>	.56	.82	.77
<b>Hospitality</b>	.51	.88	.77
<b>Transp./comm.</b>	.50	.74	.75
<b>Finance, etc.</b>		.85	.82
<b>Public admin.</b>	.70	.84	.79
<b>Education</b>		.87	.88
<b>Health, etc.</b>	.61	.80	.86
<b>Other (incl. agri.)</b>		.82	.83
<b>All</b>	.63	.83	.81

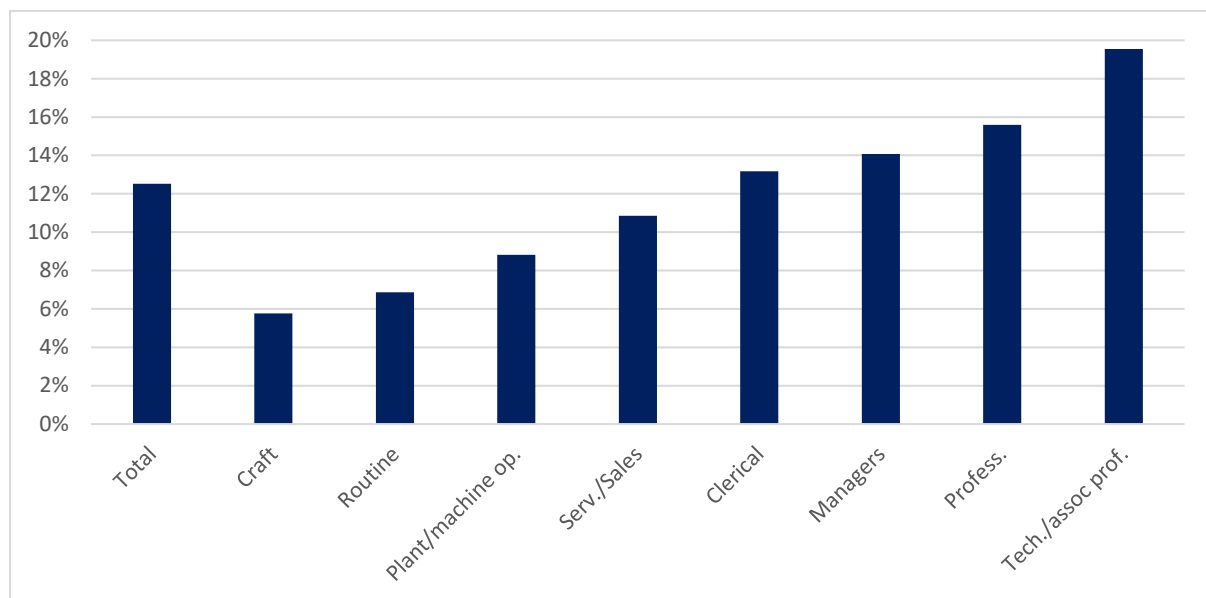
<sup>1</sup> The hours are presented as a percentage working over 40 hours per week. The other variables are all scales ranging from zero to one

### 3.4.2 Job Stress by Occupation

In Figure 3.2, we outline differences in job stress across occupational groups in the Irish labour market. The occupational groups most likely to experience job stress are technical/associate professionals (20 per cent), professionals (16 per cent) and managers (14 per cent). These groups cluster near the top of the occupational hierarchy. The lowest levels of job stress occur for craft workers (6 per cent) and routine (7 per cent). Routine occupations are those that are unskilled or semi-skilled and can be manual or non-manual, for example, the work of cleaners, labourers, drivers, porters and messengers. Model A in Table 3.4 shows that the difference in stress between those in routine occupations on the one hand, and technical/associate professional and professional occupations on the other, is

statistically significant at the 5 percent level. The difference in stress between managerial and clerical employees and those occupying unskilled routine jobs is significant, at the 10 per cent level.

**FIGURE 3.2 OCCUPATIONAL DIFFERENCE IN JOB STRESS AMONG IRISH EMPLOYEES (%)**



Source: European Working Conditions Survey, 2010 and 2015, pooled. Weighted.

What aspects of these job or worker characteristics increase stress levels? We answer this question by testing how the effect size of occupation changes when we hold other sets of factors constant, in the same way as we did for the Industrial sector. Model A (Table 3.4) shows the effect of occupational group before any other factors are taken into account. Controlling for worker characteristics and year (column B) makes little difference to the effects of occupational group.

Controlling only for job demands (time pressure, emotional, physical, bullying/harassment, effort-reward imbalance) eliminates the effect of being in professional, managerial and clerical occupations, suggesting that workers in these roles experience high stress due to the nature of the work demands. The higher level of stress in the technical/associate professional group is reduced, but not fully accounted for by higher work demands.

Controlling only for resources (support, intrinsic satisfaction and autonomy) actually increases the difference between occupations (column D, compared to column A), suggesting that without the additional resources experienced in higher-level occupations, the occupational differences in stress would be even greater.

Controlling for hours and work scheduling reduces the stress effect for managerial workers, suggesting that their higher stress is partly due to longer work hours. In the final model, when all controls are included, only the technical/associate professional group is significantly different from routine workers: the odds ratio shows that employees in these occupations are 3.4 times more likely to experience job stress than routine employees, even with all factors controlled.

**TABLE 3.4 OCCUPATIONAL DIFFERENCES IN STRESS REACTIONS/SYMPTOMS IRELAND: MEDIATING FACTORS**

	A	B	C	D	E	F
Controls	No controls	Personal and year	Job demands	Job resources	Hours/schedule	Add controls
	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio
<b>Routine/elementary (ref)</b>						
<b>Managers</b>	2.29#	2.49#	1.46	3.19*	1.74	1.26
<b>Professionals</b>	2.83*	2.92*	1.22	3.91**	2.54*	1.32
<b>Tech/assoc. professionals</b>	4.40**	4.15**	3.25*	6.00**	4.65**	3.38*
<b>Clerical</b>	2.51#	2.66#	1.21	3.12*	2.72*	1.42
<b>Service and sales</b>	2.01	2.00	0.66	2.48#	1.46	0.70
<b>Craft, farm, etc.</b>	1.17	1.18	0.83	1.42	0.96	0.64
<b>Plant operators</b>	1.16	0.85	0.89	1.11	0.78	0.52
<b>N</b>	1382	1382	1382	1382	1382	1382

Source: European Working Conditions Survey, 2010, 2015, Ireland; analysis by authors.

Notes: \*\* p<0.01, \* p<0.05, # p<0.1

Table 3.5 repeats the analysis of Table 3.3 for occupational groups, looking at the extent of job demands and resources across the groups. We find that technical/associate professionals and managers are disproportionately exposed to some of the stressors, though they also have relatively high job resources.<sup>34</sup> Managers, in particular, appear to face significantly greater time pressure and tend to work longer hours. Perhaps surprisingly, we find that professionals reported more bullying/harassment, etc. than any other occupational grouping. This is consistent with previous research, which finds that higher educated groups are more likely to identify discrimination and ill-treatment (McGinnity et al., 2012).

<sup>34</sup> There is some overlap between occupation and sector, for example, technical/associate professional workers are concentrated in the Financial sector, while professionals are most likely to be located in the Health and Education sectors. Managers are spread across sectors but are also over-represented in the Finance and Retail sectors. However, if we control for sector, the occupational patterns still remain, with technical/associate professional employees being more likely to experience job stress. The smaller number of cases across sectors and occupations does not allow for further reliable statistical analysis.

Further research could consider looking at interaction effects between the Industrial sector and occupational groups, to see, for instance, if managers face greater risks in some sectors than others. Comparing Ireland and the UK, we find similar levels and patterns of job demands across occupations (Appendix, Table A.6). However, the routine occupations in the UK tend to experience greater job demands and lower levels of resources. Also, a greater proportion of employees in the UK works more than 40 hours per week, and this is particularly true for craft/farm, professionals and those in routine occupations.

**TABLE 3.5 MEAN DEMANDS AND RESOURCES BY OCCUPATIONAL GROUPING, IRELAND 2010, 2015**

	Job demands					
	Time pressure	Emotional demands	Physical demands	Bullying, etc.	ERI	>40hrs <sup>1</sup>
<b>Managers</b>	.46	.39	.04	.05	.39	43%
<b>Professionals</b>	.41	.40	.10	.09	.46	21%
<b>Tech/assoc. professionals</b>	.42	.36	.06	.05	.39	21%
<b>Clerical</b>	.40	.39	.07	.06	.42	7%
<b>Service and sales</b>	.34	.46	.12	.09	.47	12%
<b>Craft, farm, etc.</b>	.43	.26	.19	.03	.41	23%
<b>Plant operators</b>	.43	.25	.17	.04	.49	25%
<b>Routine/ Elementary</b>	.31	.22	.11	.03	.41	9%
<b>Total</b>	.40	.37	.10	.06	.44	19%

	Job Resources		
	Autonomy	Support	Intrinsic Reward
<b>Managers</b>	.85	.86	.81
<b>Professionals</b>	.72	.84	.85
<b>Tech/assoc. professionals</b>	.73	.84	.83
<b>Clerical</b>	.64	.84	.78
<b>Service and sales</b>	.51	.83	.82
<b>Craft, farm, etc.</b>	.58	.83	.84
<b>Plant operators</b>	.41	.78	.72
<b>Routine/ Elementary</b>	.56	.76	.77
<b>Total</b>	.63	.83	.81

Source: European Working Conditions Survey, 2010 and 2015, Ireland; analysis of authors.

<sup>1</sup>Unlike the other job demand measures, hours of work have not been transformed into a scale.

### 3.6 SUMMARY

In this chapter, we have examined the relationship between job demands, job resources, personal characteristics and stress reactions among employees in Ireland and in the UK.

In both countries, employees experienced an increase in stress between 2010 and 2015 but the increase was more pronounced among Irish workers. This means that while in 2010 stress scores were significantly lower in Ireland than in the UK, by 2015 the gap had disappeared. Neither age nor having children played a significant role in the experience of stress in either country. We find that while women are more likely than men to report stress reactions in the UK data, there is no significant difference between male and female employees in Ireland.

In terms of work demands, we find that emotional demands, time pressure and exposure to bullying/harassment or other forms of mistreatment are the factors most strongly associated with job stress in both Ireland and the UK. Greater effort-reward imbalance is also associated with significantly higher levels of job stress in both countries. We found no evidence that the relationship between work demands and job stress differed between the UK and Ireland.

Job resources, which are often thought to reduce workers' stress emerge here as far less influential than job demands. Neither autonomy, support nor intrinsic rewards have a significant association with job stress in Ireland, when job demands are taken into account. Only when we pool the Irish and British data do we find that access to intrinsically rewarding work reduces job stress.

We found no interaction effects to show that autonomy moderates the impact of work demands (time pressure, emotional demands or bullying/harassment). We did find that social support moderates the effect of high emotional demands in the joint Ireland-UK model. This suggests that workers who experience high emotional demands will be better able to cope with them if they have adequate support from colleagues.

Working long hours (over 40 hours per week) is associated with increased job stress in both Ireland and the UK, though an interesting finding of higher stress levels among those working very low hours applied only to Ireland.

In the following chapter, we consider the implications of these findings for policy and organisational practice in Ireland.



## CHAPTER 4

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### Conclusion and policy implications

#### 4.1 INTRODUCTION

##### 4.1.1 Levels, trends and causes of job stress

This report has sought to investigate the levels, trends and causes of job stress in Ireland in a comparative perspective. The analysis was guided by a conceptual model that was developed based on the main theories in the existing research. The model views job stress as a reaction to a 'stressor' or a demand of the job. The job demands/resources theories suggest that this relationship may be moderated by the job resources that are available to the individual. Levels of job stress may also be influenced by individual characteristics. We therefore take account of these characteristics in our statistical models.

We use two complementary indicators to produce a combined measure of job stress. Respondents who recorded high subjective job stress (experiencing stress at work 'always' or 'most of the time') and who reported at least one of three stress reactions (anxiety, sleep disturbance and fatigue) were counted as experiencing job stress.

Looking across ten West-European nations, Ireland ranks joint fourth-lowest in job-stress levels in 2015. However, Ireland experienced one of the sharpest increases in job stress between 2010 and 2015, from 8 per cent to 17 per cent. This increase remains evident in the models, meaning that it is not driven by changes in the composition of the population by age, family type or work characteristics. As this increase is net of changes in job demands/resources, it may also be linked to changes in the economic environment that impacted on organisations.<sup>35</sup> While the Irish economy improved between 2010 and 2015, there may have been a lagged effect in the workplace, as firms restructured and staff had to operate with a reduced workforce as demand increased. France, Belgium, the UK and Spain also experienced an increase in job stress.<sup>36</sup>

We find that Ireland fares relatively well on many of the aspects of job demands and resources. Except for emotional demands and exposure to bullying/harassment/violence, employees in Ireland report work demands that are close to, or slightly below, the average across the ten countries examined.

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<sup>35</sup> Previous research has shown that organisational changes such as downsizing increased job pressure among employees (Russell and McGinnity, 2014).

<sup>36</sup> However, in the UK, the change over time is not significant when worker characteristics, job demands and resources are controlled.



Employees in Ireland also report higher-than-average levels of support from co-workers and management. However, we do not take account of differences in the composition of the labour force within countries in these comparisons.

Looking within Ireland, by far the strongest predictor of job stress among employees is the level of emotional demands in the job. Those with the highest scores in emotional demands are 21 times more likely to experience job stress than those with the lowest scores in emotional demands. Emotional demands are strongly correlated with service work and are found to be particularly high in the Hospitality sector and in the Health sector.

**TABLE 4.1 SUMMARY OF INFLUENCES ON JOB STRESS IN IRELAND, EWCS, 2010–2015**

		Association with Job stress
<b>Demands</b>	Time pressure	++
	Emotional demands	++
	Job insecurity	n.s.
	Physical demands	n.s.
	Bullying, etc.	++
	Effort-reward imbalance	++
<b>Resources</b>	Autonomy	n.s.
	Support	n.s.
	Intrinsic reward	- (before demands)

*Notes:* Summary of results Table 3.1, Model 1.  
+ associated with increase; ++ associated with strong increase; - associated with a decrease.

The second strongest predictor of job stress is time pressure. Employees working under high time pressure are ten times more likely to experience job stress than those in jobs with the lowest level of time pressure.

Exposure to bullying/harassment and other forms of mistreatment in the workplace is also strongly associated with job stress. Those with the highest exposure are 8.3 times more likely to experience job stress than those with no exposure.

Effort-reward imbalance, which stands at a similar level in Ireland to the average across the ten countries, is also found to have a substantial impact on workplace stress. It has the fourth largest impact on job stress of all stressors studied here.

Once these other demands are controlled, as well as hours of work and scheduling, we find no significant relationship between job stress and physical demands or job security. There was some tendency for job insecurity to have a stronger association with job stress in 2010 at the height of the Great Recession, but this did not reach statistical significance.

The three job resources examined have a much weaker influence on job stress among employees. However, we do find that more intrinsically rewarding work is associated with lower job stress among employees in the pooled Ireland and UK model.

Contrary to the prediction of the demand-control theory of job stress, we did not find evidence to suggest that worker autonomy moderates the harmful effect of job demands (time pressure, emotional demands, bullying/harassment). It appears that in Ireland and the UK, autonomy is correlated with work demands and these demands have a much stronger influence on the experience of job stress. This finding may be a feature of the liberal employment regime that prevails in these two countries and therefore future research could usefully explore if autonomy at work has a different influence within other regime types.

Bakker and Demerouti (2007) argue that the demand-control model is too narrowly defined and that different types of resources may moderate specific types of job demands. We find some evidence to support this approach: higher levels of support moderate high levels of emotional demands.

Finally, long working hours also emerged as a significant predictor of stress. We find that those working over 40 hours per week experience significantly more stress than those working more typical hours (36–40). In Ireland, we also find that those working under 15 hours per week are more likely to experience job stress. This is consistent with previous findings for Ireland (Russell et al., 2016). Very low hours of work may indicate a level of precariousness in employment, which leads to job stress. Alternatively, the association may be due to reverse causality, i.e., those who are highly stressed may choose to work fewer hours.

#### **4.1.2 Stress across economic sectors and occupations**

Another aim of the study was to compare job stress across industrial sectors and occupational groupings. Differences in job stress across sectors ranged from 18 per cent in the Health sector to 4 per cent in Construction. Higher-than-average levels of stress were also recorded in the Manufacturing sector<sup>37</sup> and public administration. Our analysis shows that long hours and time pressure are particularly prevalent in the Manufacturing sector, while Health sector employees experience higher-than-average levels of demand across a whole range of dimensions: emotional demands, bullying/harassment/violence, physical demands and effort-reward imbalance.

Further analysis shows that the variation in stress outcomes across economic sectors is largely accounted for by job demands, while cross-sectoral differences in job resources are relatively poor predictors of stress at the sectoral level. In the case

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<sup>37</sup> Note manufacturing also includes workers in utilities and mining.

of the Health sector, adding job resources to the model actually increases the odds ratio, compared to the reference group (Construction). This suggests that in the absence of the high levels of intrinsic reward reported by Health sector employees, workers in this sector would have even higher levels of stress.

Job stress appears to vary more widely by occupation than by sector. Managers, technical/associate professionals and professionals record the highest levels of stress. In the case of managerial workers, high stress is associated with high levels of time pressure and long hours.

## 4.2 LIMITATIONS AND FUTURE RESEARCH

While this research has succeeded in addressing the research questions set out in the introduction, the analysis is limited by a number of issues with the data and scope of the project.

One limitation concerns the nature of the data. Because the European Working Conditions Survey (EWCS) is a repeated cross-sectional survey, i.e., it does not follow the same cohort of people over time, it is not possible to say with confidence that the relationships we uncover are causal. However, the careful inclusion of controls and the use of multiple robustness checks mitigate the risk of drawing unwarranted conclusions.

Another limitation in the data is that the groups we analyse are not necessarily representative of the entire population. This is because the survey excludes those who are unemployed or outside the labour force, meaning that people who suffer stress reactions that are severe enough to cause them to leave employment are not captured in the data. Consequently, the level of job stress observed may be an underestimation.

Finally, the components of our measure of stress have not been validated by a medical or psychological expert and the respondents may or may not have a diagnosis, meaning that respondent subjectivity may be an issue. However, physician-supplied data also show that stress-related illnesses are common (Money et al., 2015). Moreover, physician data are highly selective, in that they are limited to those that seek and have access to treatment. In Ireland, where much of the primary care provision is private and paid for out of pocket, access to health care is socially stratified (Nolan, 2008). There are also gender and cultural differences in health service usage (for example, Sheikh and Furnham, 2000; Galdas and Cheater, 2005).

A promising avenue for future research would be to test the final step of the model proposed in Chapter 1, which is the hypothesis that stress reactions caused by job-stressors lead to long-term mental and physical health consequences. However,

longitudinal data or data providing a detailed job history would be required to robustly test this theory. The longitudinal study of ageing in Ireland (TILDA) should allow for such analysis, though it does not include a full work history of the respondents.

The current project is limited to a cross-national multivariate comparison to the UK, with summary statistics provided for ten European countries. Producing more detailed analysis of the causes of job stress in a comparative (cross-national European) perspective would advance our understanding of this topic across a broader range of countries. Additional analysis could also address whether stressors and resources operate in the same way for different groups of workers, for example, male/female, older/younger. The EWCS data also offer the opportunity to consider stress among self-employed workers.

### 4.3 POLICY IMPLICATIONS

Work-related stress is increasingly recognised as an issue for both management and workers. The analyses presented here show that while the levels of job stress in Ireland were below the average for the ten Western European countries, there was a strong increase in the proportion of employees in Ireland experiencing job stress between 2010 and 2015. This is a concern not only for the individuals involved, but also for employers, the government and society in general. Work-related stress is associated with absenteeism and low job satisfaction, factors which, in turn, are likely to lead to higher job turnover and reduced productivity (Hoel et al., 2001). There is also abundant evidence that stress causes both physical and mental health problems and is associated with negative spillovers for family life and relationships (Dembe, 2001; Repetti et al., 2009). While the costs of job stress for the economy are difficult to assess, estimates suggest that this is substantial, amounting to up to €20 billion per year in the EU in 2015 (EU–OSHA, 2014). Preventing excessive work stress is therefore an important goal for government, employers, and workers.

The protection of workers' mental health is covered in Irish health and safety regulation, which recognises that:

*Employers have a Duty of Care to all employees, to ensure they are both mentally and physically safe at work and that their health is not adversely affected by work. This Duty of Care means employers must behave and react reasonably in relation to such matters (HSA, 2018).*

The European agency for Health and Safety at Work reported that 40 per cent of employers across Europe found that psychosocial risks, including stress and many of the stressors outlined above, were more difficult to manage than traditional physical risks (EU–OSHA, 2016). The study also found that 50 per cent of firms in Ireland and 40 per cent in the EU28 reported that they did not have sufficient

information on how to assess psychosocial risks. Moreover, less than 45 per cent of Irish firms surveyed had an action plan in place to prevent workplace stress. Further analysis showed that across the EU28, half of all firms with at least 250 employees had these action plans in place, compared to just 30 per cent of firms with 20–49 employees. In terms of concrete actions by companies, the most common strategy for dealing with psychosocial risks in Irish organisations was to re-organise work to reduce job demands (48 per cent of Irish firms) and to set up a conflict resolution procedure (38 per cent of Irish firms).

The HSA has published guidelines for employers underscoring causes and interventions for the prevention and management of work-related stress. Reviewing the guidelines with reference to the current findings may help to highlight additional areas for focus. For example, the strong link between emotional demands and workplace stress may require additional attention.

Conducting a risk assessment or stress audit is a key part of the recommended approach (HSA, 2011). The HSA and the State Claims Agency’s online audit tool ‘Work Positive CI’, which is designed to help employers identify potential causes of workplace stress, is useful in this regard. The risk assessment tool allows employers to identify risks within their workplace in the areas of demand, control, support, relationships, role, and change. A similar approach to dealing with stress is supported by the European Foundation for the Improvement of Living and Working Conditions. This body advocates a ‘risk management’ approach to stress in work, which involves identifying and mitigating stressors before stress reactions can develop (Weiler, 2005).

The HSA Work Positive tool has not been formally evaluated in Ireland, because of the difficulties associated with measuring the impact of such interventions. However, it has been validated against the World Health Organisation (WHO’s) five-item wellbeing index (WHO–5). Stronger analysis of its efficacy may significantly enhance the case for buy-in from employers, notwithstanding their legal imperatives to manage workplace risks, including job stress.

At the national level, this effort would be greatly assisted with more disaggregated data collection on illness benefit cases. Because people suffering from mental health issues from work-related stress are not eligible for Occupational Injury Benefit, and must instead claim Illness Benefit, this group cannot currently be identified in administrative data. This makes it very difficult to estimate the cost of work-related stress to the Exchequer and to the economy more broadly. A new national workplace survey, which was last conducted in 2009/2010, would also provide valuable evidence of job stress and changing working conditions in Ireland.

### 4.3.1 Addressing workplace stressors

Exposure to bullying/harassment/violence has the strongest impact in terms of stress outcomes. Therefore, having robust policies and procedures to protect workers from these risks is important. Analysis by Eurofound (2015) suggests that Ireland was among the best performing group of countries in terms of awareness of, and policy to prevent and deal with, violence and harassment, including bullying. The involvement of the social partners, specifically the employers' organisation Ibec and Irish Congress of Trade Unions (ICTU), was noted by Eurofound as contributing to this positive environment. In particular, Ibec's issuance of employment law guidelines for employers and ICTU's formation of an advisory commission on stress, bullying and violence at work in 2010 are highlighted as effective actions (Eurofound, 2015).

The national survey on workplace bullying carried out in 2007 (O'Connell et al., 2007) found that while 87 per cent of public sector workplaces had a formal anti-bullying policy, this was true for only 37 per cent of private sector workplaces. The survey found a higher prevalence of bullying in larger organisations, in the public sector and in workplaces experiencing organisational change. The 2009 European Survey of Enterprises on New and Emerging Risks (ESENER) survey of employers reported that almost 90 per cent of organisations had procedures in place to deal with workplace harassment. Updated employer information is needed to clarify the issue and to track what progress has been made since then.

Other studies have highlighted the role of leadership styles and organisational culture in explaining patterns of bullying. Organisational cultures with a hierarchical system of power relations are more likely to normalise bullying behaviour (Archer, 1999; Beale and Hoel 2011), while inaction by management has been identified as a way in which bullying cultures can emerge (Lewis, 2006). Results from the 2017 Irish Workplace Behaviour Study also found that workplace culture impacted on ill-treatment of employees. Workers who said they were not treated as individuals, or who felt they had to compromise their own personal principles, were more likely to encounter physical violence at work (Hodgins et al., 2017).

The Health and Safety Authority (HSA) issued a code of practice for employers to prevent and deal with bullying in the workplace (HSA, 2007). Guidelines on work-related violence have been issued by the European social partners (European Social Dialogue, 2010). The guidelines cover issues such as developing policies and responsibilities, promoting awareness, monitoring, training for managers to deal with bullying complaints, process guidelines, carrying out investigations, and supports for the victims. More generally, promoting a supportive organisational culture with fewer hierarchical relationships would also appear to be beneficial. Harassment and other forms of mistreatment in the workplace other than bullying are covered by equality legislation, if the person is victimised based on any of the

nine equality grounds, for example gender, ethnicity, nationality, age or sexual orientation.

Updating existing policies to address emerging risks is critical to maintaining the efficacy of any of these approaches. The Department of Business, Enterprise and Innovation recently announced that the HSA and the Workplace Relations Commission's Codes of Practice are currently under review, with the possibility of developing a single Code.

The data presented in Chapter 2 show that the levels of emotional demands faced by workers in Ireland (i.e., the extent to which they are required to deal with angry clients/customers or to hide their emotions while at work) are above average from a cross-national perspective. Strategies to cope with angry customers are covered by policies that deal with third-party violence and abuse but dealing with the emotions of others is a more common day-to-day phenomenon for Service sector workers. The need for adequate training and supports for workers in these high-risk sectors is therefore important.

Longer working hours were a significant predictor of stress reactions and time pressure was a significant factor in self-reports of job stress. Long hours were most frequently cited in the Industry and Transport sector, with 31 per cent working more than 40 hours per week. Working time regulation is already in place but can be undermined by organisational cultures that promote 'presenteeism', especially among those in managerial positions (Worrall et al., 2016). Previous research in Ireland found a pro-cyclical relationship between employment growth and stress, anxiety and depression among workers (Russell et al., 2016). It is likely that this particular work demand will increase further, as the economy recovers. Therefore, organisational strategies to deal with increasing demands for products and services are important, to ensure that workers do not experience increases in stress and stress reactions.

#### **4.3.2 Enhancing job resources**

Job resources played a weaker role than job demands in predicting job stress, suggesting that policies to address demands are likely to be more effective for reducing stress outcomes. Nevertheless, improving job resources can also play a part. Access to intrinsically rewarding work was associated with reduced stress reactions in the joint Ireland/UK model. Furthermore, interacting support with the emotional demands revealed a significant interaction effect, showing that support from colleagues/managers effectively helps workers to cope with high levels of emotional demands in the workplace. Nurturing positive relationships within the workplace can therefore set up a 'virtuous circle', in terms of job-stress reduction.

Similarly, employer actions to address effort-reward imbalance, either through addressing demands or financial rewards, are also likely to have positive effects on

reducing elements of job stress. The evidence suggests that this imbalance is particularly prevalent among public administration and Health sector workers in Ireland, as well among plant operators and those employed in service/sales occupations.

The benefits of tackling job stress accrue not only to employees, but also to employers, through reduced absenteeism, greater employee satisfaction and reduced turnover, and to society, in terms of reduced health and welfare costs.





## APPENDIX

### SCALE CONSTRUCTION

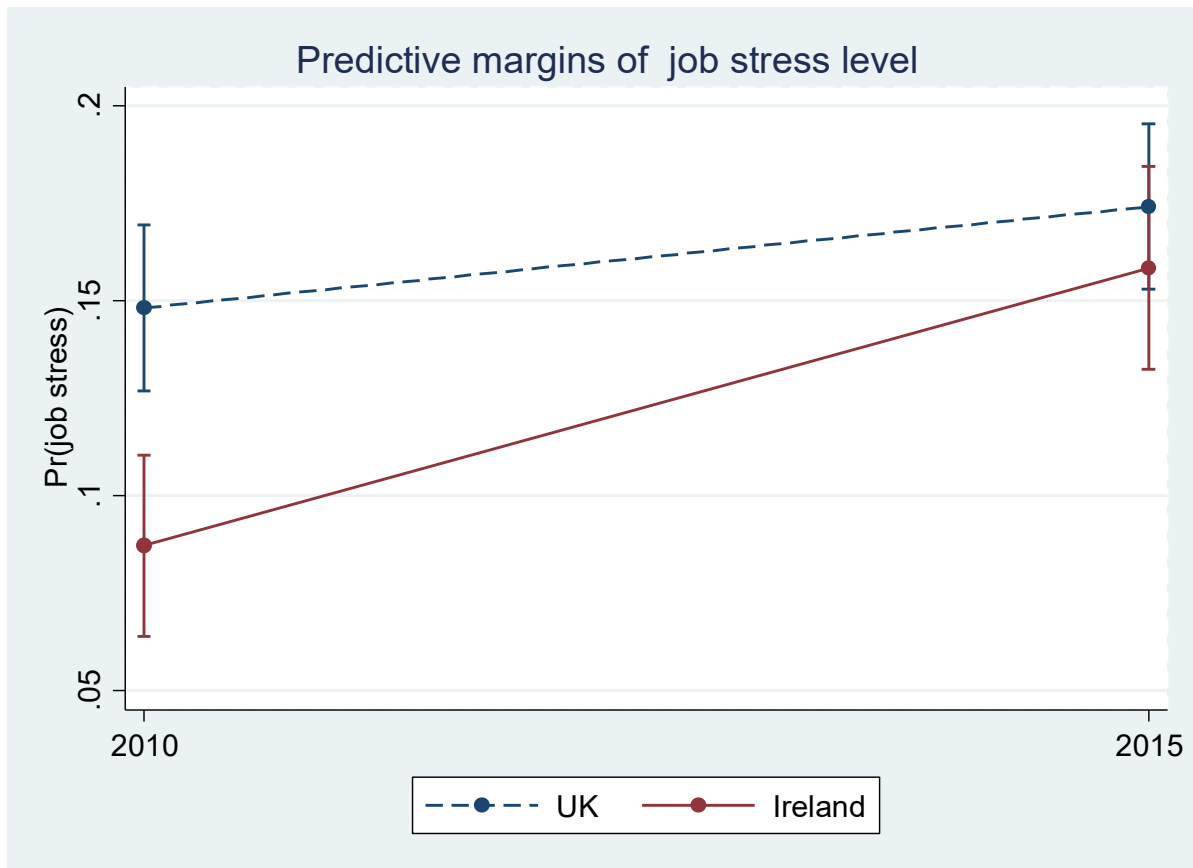
Here we use the example of time pressure to describe how we constructed some of the scale indicators with values ranging from 0 to 1.

In Table 2.3, we showed that time pressure is based on respondents' answers to three questions concerning working at high speeds, working to tight deadlines and not having enough time to get the job done. For each of the first two questions, there are seven possible answers (excluding the 'don't know' and 'refusal') going from 'all of the time' to 'never', with a respective code value of one to seven. For each of these two questions, we are interested in constructing a scale going from zero to one, where zero would mean 'never' and one would mean 'all of the time'. To do so, we need to reverse the order of the scores and rescale them to a zero to one range. The formula we used is then:  $\text{new score} = (\text{seven} - \text{old score}) / \text{six}$ . So, someone scoring seven with the old metric will now get a score of zero, while someone scoring one with the old metric will have a score of one with the new metric. For the third question, there are five possible answers from 'always' to 'never'. We use the same methodology as for the two other questions, by applying the following formula:  $\text{new score} = (\text{five} - \text{old score}) / \text{four}$ , which will give a score ranging from zero to one. The overall physical demands score based on these three questions is simply the mean score across the three questions.

**TABLE A.1 ADDITIONAL LOGISTIC REGRESSION MODELS OF JOB STRESS**

		Model 1 Ireland (job resources)	Model 2 UK
		Odds Ratio	Odds Ratio
Year	2015 (Ref=2010)	2.42***	1.33
Gender	Men (ref)	ref	ref
	Women	0.99	1.39*
Age	Under 25	0.60	1.08
	25–34 (ref)	1.00	1.00
	35–44	1.37	1.37
	45–54	0.71	1.39
	55 & over	0.68	1.42
Children	No child <18 years (ref)	ref	1.00
	Youngest child age <5	0.82	0.75
	Youngest child age 5–12	0.77	1.05
	Youngest child age 13–18	1.67	0.76
Financial difficulty	(Very) difficult make ends meet	1.99*	1.28
Job demands	Time pressure 0–1		6.60***
	Emotional demands 0–1		10.54***
	Perceived insecurity 0–1		1.55
	Physical demands 0–1		2.21*
	Bullying/harassment 0–1		13.25***
	Effort-reward imbalance 0–1		1.42
Job resources	Autonomy 0–1	0.88	1.15
	Support 0–1	0.39*	1.01
	Intrinsic 0–1	0.37#	0.42*
Hours	Under 15 hours		0.71
	15–25		0.88
	26–35		0.85
	36–40 (ref)		1.00
	Over 40 hours		1.86**
Work schedule	Weekend work		1.92***
	Shiftwork		0.67*
	Constant	0.045	0.01***
	Observations	1384	2429
	R-squared	.05	0.21

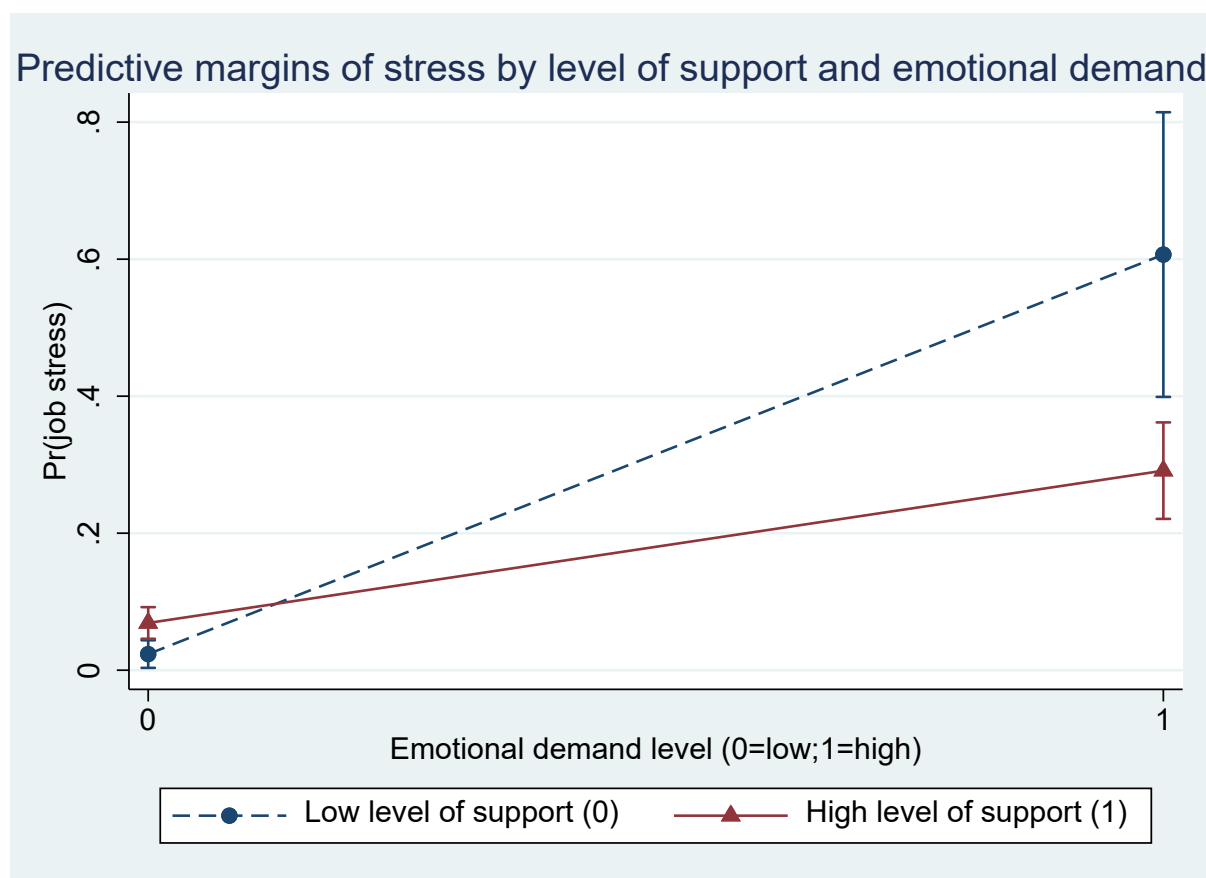
**FIGURE A.1 PREDICTIVE MARGINS ON JOB STRESS BY COUNTRY AND TIME, IRELAND AND UK, 2010 AND 2015**



**TABLE A.2 MARGINAL EFFECT OF TIME AND COUNTRY ON JOB STRESS, IRELAND AND UK, 2010 AND 2015**

	Marginal effect of time on stress level	P value
<b>UK</b>	0.026	0.091
<b>Ireland</b>	0.071	0.000

**FIGURE A.2 PREDICTIVE MARGINS ON JOB STRESS BY LEVEL OF SUPPORT AND EMOTIONAL DEMANDS, IRELAND AND UK, 2010 AND 2015**



**TABLE A.3 MARGINAL EFFECT OF SUPPORT AND EMOTIONAL DEMANDS ON JOB STRESS, IRELAND AND UK, 2010 AND 2015**

	Marginal effect of support on stress level	Sig
Low emotional demands (0)	0.057	0.047
High emotional demands (1)	-0.284	0.008

### SENSITIVITY ANALYSIS

As a test of the robustness of our results, we re-ran the analyses, applying a different threshold to the job-stress measure. We changed the cut-off from one of the three stress reaction measures to two of three (fatigue, anxiety, and sleep disturbance). As before, the respondents had to also report a high level of subjective job stress (often or always experienced stress at work) in order to be included. Using this stricter definition, a smaller number of employees was defined as experiencing stress. In Ireland, this definition identifies 3.8 per cent of employees as experiencing job stress in 2010 and 9.5 per cent in 2015.

Re-running the full model with this alternative measure produces a very similar pattern of results to those discussed in Chapter 3. Looking at the model for Ireland, we see that the same set of work demands is associated with higher levels of job stress: emotional demands, time pressure, bullying/harassment and effort-reward imbalance. These relationships are similar in strength to those of the original models, but the effects of time pressure and bullying/harassment are somewhat stronger.

The results for three job resource measures (autonomy, support and intrinsic rewards) also mirror the earlier findings: the direction of the odds ratios is the same, i.e., below one for support and intrinsic resources, and the results remain statistically significant.

The association between hours of work and job stress becomes somewhat weaker using the higher threshold, and the effect for long hours and very short hours is no longer statistically significant in Ireland. This may signal that hours of work are less important than other job demands in more severe cases of stress. The effect of long hours of work remains significant in the joint Ireland and UK models.

The relationships between personal and household characteristics and job stress are also unchanged using the higher threshold. These results suggest that the findings presented in Chapter 3 are robust.

**TABLE A.4 SENSITIVITY TEST: MODEL OF JOB STRESS MEASURE USING A THRESHOLD OF AT LEAST TWO STRESS REACTIONS PLUS SUBJECTIVE STRESS**

		Ireland	Ireland & UK
<b>Year</b>	2015 (ref: 2010)	2.56**	1.57**
<b>Country</b>	UK		Ref
	Ireland		0.51***
<b>Sex</b>	Male	1.00	1.00
	Female	0.73	1.14
<b>Age group</b>	Under 25	0.74	0.83
	25–34 (ref)	1.00	1.00
	35–44	0.94	1.09
	45–54	0.55	1.11
	55 & over	0.93	1.24
<b>Children</b>	No children <18	Ref	Ref
	Youngest child age <5	0.54	0.78
	Youngest child age 5–12	0.53	0.94
	Youngest child age 13–18	1.61	1.15
<b>Financial difficulty</b>	(v) Difficult make ends meet	2.12	1.64
<b>Job demands</b>	Time pressure 0–1	13.07**	8.00***
	Emotional demands 0–1	19.63***	13.99***
	Insecure 0–1	0.72	1.14
	Physical demands 0–1	3.24	1.55
	Bullying/harassment 0–1	14.12***	12.18***
	Effort-reward imbalance 0–1	3.68**	2.19**
<b>Job resources</b>	Autonomy–01	1.98	1.48
	Support 0–1	0.42	0.57
	Intrinsic 0–1	0.22	0.29**
<b>Hours</b>	Under 15 hours	2.04	0.94
	15–25	0.98	0.95
	26–35	0.58	0.82
	36–40 (ref)	1.00	1.00
	Over 40 hours	1.77	1.86**
<b>Work schedule</b>	Weekend work	0.85	1.32
	Shiftwork	1.08	0.95
	Constant	0.00***	0.01***
	Observations	1390	3838

**Notes:** Odds ratios of less than one mean that increasing the value on the predictor variable reduces the odds that an individual will report subjective stress relative to the reference category; odds ratios greater than one mean that increasing the value on the predictor variable increases the odds that an individual will report subjective stress relative to the reference category (see Glossary for details).

**TABLE A.5 MEAN DEMANDS AND RESOURCES BY SECTOR, UK 2010, 2015**

	Job demands						Job resources		
	Time pressure	Emot. demands	Physical demands	Bully	ERI	>40hrs	Auton.	Support	Intrinsic reward
<b>Manufacturing</b>	0.42	0.23	0.10	0.03	0.45	31%	0.63	0.77	0.72
<b>Construction</b>	0.42	0.23	0.14	0.04	0.38	45%	0.65	0.79	0.78
<b>Retail, etc.</b>	0.39	0.36	0.13	0.05	0.44	16%	0.57	0.77	0.68
<b>Hospitality</b>	0.43	0.38	0.12	0.07	0.42	16%	0.52	0.80	0.67
<b>Transport</b>	0.46	0.32	0.14	0.07	0.44	32%	0.51	0.72	0.70
<b>Finance, etc.</b>	0.46	0.32	0.09	0.05	0.38	32%	0.74	0.78	0.75
<b>Public admin.</b>	0.40	0.38	0.05	0.09	0.41	16%	0.76	0.77	0.76
<b>Education</b>	0.37	0.39	0.04	0.05	0.43	23%	0.73	0.81	0.82
<b>Health, etc.</b>	0.42	0.45	0.14	0.12	0.51	17%	0.70	0.80	0.82
<b>Other</b>	0.34	0.32	0.10	0.06	0.43	17%	0.77	0.77	0.77
<b>All</b>	0.41	0.35	0.10	0.06	0.43	24%	0.67	0.78	0.75

**TABLE A.6 MEAN DEMANDS AND RESOURCES BY OCCUPATIONAL GROUPING, UK 2010, 2015**

	Job demands						Job resources		
	Time pressure	Emot. demands	Physical demands	Bully	ERI	>40hrs	Auton.	Support	Intrinsic reward
<b>Managers</b>	0.43	0.38	0.04	0.05	0.34	41%	0.88	0.82	0.81
<b>Professionals</b>	0.45	0.39	0.08	0.08	0.42	31%	0.82	0.77	0.80
<b>Tech/assoc. professionals</b>	0.39	0.34	0.06	0.05	0.44	18%	0.73	0.81	0.79
<b>Clerical</b>	0.40	0.34	0.09	0.05	0.44	8%	0.64	0.78	0.73
<b>Service and sales</b>	0.37	0.43	0.13	0.11	0.48	12%	0.53	0.79	0.72
<b>Craft workers</b>	0.42	0.22	0.14	0.02	0.42	41%	0.64	0.77	0.77
<b>Plant operators</b>	0.43	0.23	0.20	0.04	0.48	35%	0.45	0.71	0.66
<b>Routine/elementary</b>	0.41	0.23	0.15	0.04	0.48	18%	0.48	0.72	0.68
<b>All</b>	0.41	0.35	0.10	0.06	0.43	24%	0.67	0.78	0.75





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