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CHAPTER 3 - How good is your job? A framework for measuring and assessing job quality

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TABLE OF CONTENTS

HOW GOOD IS YOUR JOB? A FRAMEWORK FOR MEASURING AND ASSESSING JOB QUALITY	4
Key findings	4
Introduction	6
1. An operational framework for measuring and assessing job quality	7
2. Job quality outcomes and well-being	13
2.3 Quality of the working environment	30
3. A statistical portrait of job quality and its links to job quantity	41
Concluding remarks	47
References	49
ANNEX A3.1 A SYNTHETIC MEASURE OF THE EARNINGS QUALITY	56
ANNEX A3.2 DEFINING AND MEASURING JOB STRAIN	57

Tables

Table 3.1 Regression Analysis of Job Quality Measures	47
Table A3.2.1 Recent empirical studies on the health impact of job strain	57
Table A3.2.2 Definition of job demand and job resource variables	60
Table A3.2.3 Definition of job demand and job resource variables – EWCS and ISSP (2005)	61

Figures

Figure 3.1. An operational framework for defining and measuring job quality	13
Figure 3.2 The relationship between log household income and life satisfaction	15
Figure 3.3 Average earnings, earnings equality and the overall quality of earnings by country	18
Figure 3.4 Job-losing and job-finding rates for selected OECD countries, 2005-2010 averages	22
Figure 3.5 The degree and composition of effective unemployment insurance in selected OECD countries	23
Figure 3.6 Unemployment risk and insurance have important implications for well being	26
Figure 3.7 Labour market insecurity across countries	29
Figure 3.8 Cumulative and buffering effects of job demands and job resources	36
Figure 3.9 How defining job strain?	38
Figure 3.10 Incidence and intensity of job strain	39
Figure 3.11 Main drivers of cross-country differences in the incidence of job strain	40
Figure 3.12 Job-quality outcomes vary substantially across OECD countries	42
Figure 3.13 How do countries compare in terms of job quality and job quality outcomes?	43
Figure 3.14 Job quality and job quantity outcomes by socio-demographic group	45
Figure 3.15 Job quality and job quantity outcomes by socio-demographic group	46

Figure A3.2.1 Incidence of various job demands and job resources by socio-demographic group	62
Figure A3.2.2 Incidence of various job demands and job resources by type of employment.....	62

Boxes

Box 3.1 Recent international initiatives on measuring well-being.....	9
Box 3.2 Recent international initiatives on measuring job quality.....	11
Box 3.3 Measures of subjective well-being	12
Box 3.4 Analysing earnings, inequality and welfare using general means	19
Box 3.5 Analysing the role of unemployment risk and insurance for subjective well-being.....	26
Box 3.6 Measuring labour market insecurity at the individual and country level.....	29
Further material on the measurement of labour market insecurity by type of contract.....	30
Box 3.7 Quality of working environment and job strain: theoretical background	31
Box 3.8 Constructing synthetic indices of job demands and job resources.....	34
Box 3.9 Extending the coverage of QWE indices.....	40
Box A3.1.1 Analysing earnings, inequality and welfare using general means An example based on the comparison between France and the United Kingdom.....	56

HOW GOOD IS YOUR JOB? A FRAMEWORK FOR MEASURING AND ASSESSING JOB QUALITY

Key findings

1. This chapter represents the first output of a broader ongoing OECD project on the relationship between job quality, labour market performance and well-being. The overall aim of this project is to bring job quality to the forefront of the policy debate, by arguing that labour market performance should be assessed in terms of the increase in both the number and quality of job opportunities, *i.e.* policies should seek to promote more and better jobs. The main contribution of this chapter is i) to propose a new conceptual and operational framework to measure and assess job quality; ii) to provide an overview of job quality across countries and socio-economic groups.

2. Job quality refers to multiple aspects of employment that contribute to the well-being of workers and, hence, represents an inherently multi-dimensional construct. In particular, the chapter focuses on three key dimensions of job quality that have been shown to be particularly relevant for workers' well-being in the existing empirical literature on economics, sociology and occupational health. These are:

- *Earnings inequality*, which is characterised in terms of the level of earnings and its distribution. The need for a composite indicator of earnings quality that takes account of both average earnings and its distribution is motivated by previous evidence in the literature and new evidence in this chapter that suggests that both average earnings and its distribution have important implications for well-being. Average earnings and subjective well-being are positively correlated across countries as well as between persons within countries, highlighting the importance of economic growth for people's well-being. However, for a given level of average income, overall well-being will be higher the more equal is its distribution. Moreover, there is some evidence that individuals tend to be averse to inequality in the sense that individual well-being depends negatively on the degree of inequality, particularly across socio-economic groups.
- *Labour market security*, which is defined in terms of unemployment risk and unemployment insurance. Unemployment risk is defined by the combination of job security, which determines the risk of job loss, and employability, which determines the expected costs of job loss (without insurance). Unemployment insurance is defined in terms of the effective level of risk absorption through the tax-and-benefits system. New evidence in this chapter suggests that both are important determinants of subjective well-being. The effect of the risk of unemployment on the well-being of the employed is economically large: a one percentage-point increase in the risk of unemployment has an effect equivalent to a 3% reduction in household income. Furthermore, both job security, *i.e.* measured by the probability of becoming unemployed, and employability, *i.e.* the probability of finding another job once unemployed, matter for well-being, with the effect of the latter being somewhat larger than that of the former. This suggests that employed workers are concerned not only about becoming unemployed but also, and possibly even more, about not being able to find a new job when unemployed. The relative importance of the job-finding rate once unemployed also suggests that policies that speed up the transition back to work after job loss are important not only from an efficiency point of view but also from a welfare point of view. The adverse consequences of the risk of unemployment among those currently employed on well-being are partially offset by unemployment insurance programmes. Interestingly, the effect mainly from a lower expected cost of job loss.

- *Quality of the working environment*, which refers to the experience of work itself and includes factors that relate to the nature and intensity of work performed (so-called job demands), and to the resources and support that people have at their disposal to accomplish their job duties (so-called job resources). Job demands refer to the overall time pressure faced by employees, the existence of conflicts between job requirements and personal ways of thinking or behaving, the exposure to physical health risk factors at work and intimidation in the workplace. Job resources include work autonomy and opportunities to learn at work, well-defined work assignments, support from managers and good relationship with colleagues. Excessive demands combined with insufficient resources create job strain, which is a crucial risk factor for workers' physical and mental well-being. In this chapter, the incidence of job strain is retained as the summary measure of the quality of the working environment. On average over the 23 countries for which data are available, 15.6% of employees can be classified as working in strained jobs. Almost one in two workers with strained jobs report that their work is detrimental to health, against one in five among their counterparts with less demanding jobs. Strained jobs are also estimated to result in 10 sick leave days per year, as compared to 6 days in other jobs. Thus, by affecting workers' health, the quality of the work environment not only impacts the well-being of workers, but also has direct economic implications, in terms of reduced productivity, waste of human capital, and increased public expenditure on health.

3. This chapter uses the composite measures of each job quality dimension to present a broad picture of job quality across OECD countries and socio-economic groups. Job-quality outcomes vary substantially across OECD countries, in all the dimensions considered (i.e. earnings quality, labour market security or the quality of the work environment):

- The degree of overall earnings quality is highest in Denmark and Norway and lowest in the Central and Eastern European countries. The best performers have almost 10 times higher earnings quality than the worst performers.
- The overall degree of labour market insecurity is highest in Portugal and in the Baltic States (where it reaches 1.5-2.5 times the cross-country average) and lowest in countries such as the Netherlands, the United Kingdom, Denmark and Sweden (where it lies between one quarter and one half of the average).
- The quality of the work environment, as measured by the incidence of job strain, is highest in Denmark, the Netherlands, Ireland and Norway (where the incidence of job-strain is around half of the cross-country average), while it is lowest in Slovenia, Greece, France and Turkey (where the incidence of job strain is over 25 percent above the average).
- Overall, there is not a strong relationship between the different dimensions of job quality across countries. But there appears to be a positive relationship between job quantity, as measured by the employment rate, and job quality. At the top-end, countries like Denmark and the Netherlands are characterised by high levels of job quality and high employment. At the bottom end, Greece and Hungary rank lowly both with respect to quality and the employment rate.

4. Some socio-demographic groups appear to cumulate many disadvantages, while other groups show a good performance on all dimensions:

- The worst off are youth and low skilled workers. Young and unskilled workers cumulate the poorest performance in terms of job-quantity with poor outcomes along all three dimensions of job quality.

- By contrast, highly skilled workers perform well on all dimensions. They have access to more jobs, but also to the best quality jobs in all the dimensions analysed.
- As for women, the picture is mixed. A gender gap exists in terms of earnings quality and employment rate, but there are no significant differences in labour market security and job-strain between men and women.
- Temporary work is negatively and significantly associated with job quality in all three dimensions. As for part-time work, the picture is mixed. Overall earnings quality (in terms of hourly wages) is lower for part-time than for full-time workers, and labour market insecurity is considerably higher for part-timers. However, the risk of job strain tends to be lower among workers on part-time contracts.

Introduction¹

5. The jobs people hold is one of the most powerful determinants of well-being, as most people spend a substantial part of their time at work and work for a significant part of their life. But what is it about jobs or the quality of jobs that affects well-being? Broadly speaking, job quality reflects a combination of aspects relating to labour earnings, work-related economic security and other aspects that affect the quality of life at work and beyond. Job quality not only affects individual well-being and that of the households in which they live, but also labour force participation, productivity and aggregate economic performance.

6. Despite the importance of job quality, the *Europe 2020 Employment Strategy* and the *OECD Re-assessed Jobs Strategy* have largely focused their policy recommendations and indicators of progress on the quantity of jobs, *i.e.* job creation and access to jobs, with less attention paid to job quality per se. While these strategies underline the role of labour earnings and job security for labour market performance, the emphasis is placed on the role of policies and institutions to promote job creation, the stability of jobs and participation in the labour market, with less attention paid to their impact on workers well-being. In other words, the assessment of labour market policies and institutions has so far focused on their effects on the quantity of jobs, although many of these institutions were introduced with the aim of improving the quality of jobs. The overall aim of this chapter is to bring job quality to the forefront of the policy debate, by developing a conceptual framework to measure job quality across its principal dimensions which can be used to assess how job quality contributes to labour market performance and well-being.

7. A major obstacle to giving more prominence to job quality in the policy debate so far has been the difficulties of defining and measuring job quality in ways that are amenable to comparisons over time and especially across countries and socio-demographic groups. Indeed, job quality is a multi-dimensional concept that can be measured in many different ways and which does not have the same meaning for different individuals. Job quality has attracted increased interest in the academic community and by international organisations in recent years, and various statistical frameworks have been developed over the last decade (e.g. ILO Manual on Concepts and Definitions of Decent Work Indicators, UNECE framework for Measuring Quality of Employment). Taken together, these frameworks provide possible toolboxes for assessing job quality by drawing up a comprehensive list of indicators. While an important step forwards, further work is needed to develop the conceptual underpinnings of job quality and to build an operational framework, with a set of practical guidelines on how to use these statistical frameworks for

1 This chapter is part of a European Commission-funded project “Defining, Measuring and Assessing Job Quality and its Links to Labour Market Performance and Well-Being” [VS/2013/0180 (SI2.666737)]. It is a joint undertaking between the OECD Directorate for Employment, Labour and Social Affairs and the OECD Statistics Directorate running until the end of 2015.

the analysis of job quality across socio-demographic groups, countries and over time. Building on the extensive work already done by other international organisations, this chapter takes a pragmatic approach to assessing job quality, by focusing on those aspects of a job that have been shown to be important for well-being.

8. The remainder of this chapter is structured as follows. **Section 1** sets out the main features of the OECD's operational framework to measure and assess job quality. The approach is taken is explicitly multi-dimensional and is defined in terms of labour earnings, labour market security and the quality of work environment. For each of those three dimensions, **Section 2** provides an in-depth discussion of its links with well-being based on the existing literature as well as new evidence and proposes a framework for its measurement. Based on the operational framework developed so far, **Section 3** documents job quality across countries and socio-economic groups and provides a first attempt to assess labour market performance in terms of the quantity and quality of jobs.

1. An operational framework for measuring and assessing job quality

9. Today, there is a broad consensus that standard measures of economic performance, such as GDP growth or the unemployment rate, fail to give a complete account of people's living conditions. Although such indicators provide key benchmarks for policy-makers and continue to be widely used in public debates, "no single measure, or even a limited set of measures, can provide all the information required to assess and manage an economy" (Stiglitz, Sen and Fitoussi, 2009a, p.5). The topic is not new, but interest in broader and more inclusive measurement frameworks of socio-economic performance has taken a leap forward over the last years, at both national and international level. Considerable progress towards establishing an operational framework for defining and measuring societal well-being has been achieved. Likewise, a number of major initiatives to enhance the measurement of job quality have been taken recently at the international level to establish guidelines for producing internationally comparable indicators (e.g. the ILO Decent Work initiative and the UNECE framework for Measuring Quality of Employment).

10. Although the concept of job quality is intrinsically related to the concept of workers' well-being, measurement efforts on job quality and people's well-being have developed in parallel rather than in an integrated fashion. Building on these two streams of work, this section puts them together in a consistent conceptual framework for defining and measuring job quality. This section also discusses how this framework can be operationalized through the development of indicators that can be used to monitor job quality across countries, socio-economic groups and over time.

Defining the main dimensions of job quality...

11. Job quality refers here to those aspects of employment that contribute to the well-being of workers. The definition proposed in this chapter draws on existing well-being frameworks to identify the main dimensions of job quality.

12. Although there is no single definition of well-being, there is a general consensus that well-being is multi-dimensional and has to do with both economic resources and non-economic aspects of peoples' lives (see Box 3.1). The influential Report by the Commission on the Measurement of Economic Performance and Social Progress identifies a number of key aspects that are essential to well-being (Stiglitz, Sen and Fitoussi, 2009b, p.14). Three of these dimensions are closely related to people's employment situation: "material living standards"; "personal activities including work"; and "insecurity of an economic as well as a physical nature". Drawing on this approach, this chapter considers three complementary aspects of job quality:

- ***Labour earnings and incomes.*** This refers to the extent to which employment contributes to the material living standards of workers and their families.
- ***Labour market security.*** This captures those aspects of economic security that are related to employment. This includes the risk of job loss, its expected cost –which is closely related to a worker’s employability– and the means available to workers to protect themselves against joblessness, especially through unemployment insurance and assistance schemes. Labour market security affects not just people’s material well-being but also non-material aspects of well-being, such as people’s self-esteem and social inclusion.
- ***Quality of the working environment.*** This refers to the experience of work itself and includes factors that relate to the nature and intensity of work performed, and to the resources and support that people have at their disposal to accomplish their job duties. This aspect of job quality has no direct and immediate implications for material well-being but may have an impact on workers’ physical and mental health, on their life evaluations and emotional states (e.g. stress, anxiety, on the negative side, but also contentment and satisfaction for a work well-done) and on their opportunities to improve their skills.

13. These three dimensions jointly define job quality and should be considered simultaneously when assessing the quality of jobs. No attempt will be made in this chapter to aggregate these three dimensions into a single indicator of job quality.

14. By defining job quality in relation to its contribution to people’s well-being, the present framework explicitly puts the emphasis on workers as opposed to employers or investors. Therefore, it does not aim to take account of all aspects of employment. Productivity enters the picture indirectly, through its links with several aspects of job quality. Productivity is, for instance, a key determinant of wages, and as such, an important driver of job quality. Productivity can also be seen as an outcome of job quality. For example, to the extent that workers in safer and healthier jobs feel more involved and motivated, they will be more productive. The latter may in turn translate into higher wages, thereby creating a positive relationship between the quality of the working environment and the levels of earnings.

Box 3.1 Recent international initiatives on measuring well-being

Discussions about whether GDP is an accurate proxy of people's well-being have been going on for years. Many alternative approaches have been suggested, which extend the scope of measurement, to include a broader range of well-being aspects, and place a greater emphasis on distribution (OECD, 2011 and 2013). Several countries have launched well-being initiatives in the form of public national consultations (Australia, the United Kingdom), Parliamentary Commissions (Germany, Norway), National Roundtables (Italy, Spain, Slovenia), projects for integrating and disseminating statistics on the economic, social and environmental conditions of specific areas (the United States), dedicated statistical reports (Australia, Austria and Ireland) and a range of other initiatives (France, Japan, Korea, Luxembourg, Switzerland and China). Major initiatives for measuring progress and well-being have also been taken at the international level (e.g. OECD Better Life Initiative, the EU 'GDP and Beyond' initiative, the UNDP Human Development Index), and are shaping the ongoing discussions in the UN system on the post-2015 agenda and the Sustainable Development Goals.

In particular, the ground-breaking work by the Commission on the Measurement of Economic Performance and Social Progress, established in 2008 by French President Nicolas Sarkozy and headed by Joseph Stiglitz, Amartya Sen and Jean-Paul Fitoussi, has been critical in giving impetus to the OECD measurement work on well-being and to a range of other initiatives around the world. The report by the Commission was written primarily for political leaders and policymakers who wish to implement and assess policies aimed at improving well-being and fostering social progress, but it also provides detailed guidelines and recommendations for the statistical community on how to improve measures of well-being and progress (Stiglitz, Sen and Fitoussi, 2009b).

From a conceptual perspective, the report builds on the so-called "capabilities approach" proposed by Sen (1985). This approach conceives a person's life as a combination of activities and situations that he/she spontaneously recognises to be important. Its basic premise is that, what really matters to people, is the extent of their opportunity set and their freedom to choose from this set the life they value most. Therefore, to define well-being a multidimensional definition has to be used. Based on academic research and a number of initiatives around the world, the Commission identified eight key dimensions that should be taken into account when measuring economic performance and social progress: i) Material living standards (income, consumption and wealth); ii) Health; iii) Education; iv) Personal activities including work; v) Political voice and governance; vi) Social connections and relationships; vii) Environment (present and future conditions); viii) Insecurity, of an economic as well as a physical nature. The implications of the capability approach are not limited to the measurement of well-being but extend to the evaluation of policies, which should seek to expand the opportunities available to people.

Following many of the recommendations formulated by the Commission, the OECD Better Life initiative was launched in 2011.^{a)} This is a first attempt at the international level to go beyond the conceptual stage and to present a set of comparable well-being indicators for OECD countries and other major economies (OECD, 2011 and 2013). This set covers eleven domains of life and will, over the years, be improved by taking into account the outcomes of a number of methodological projects carried out at the OECD and elsewhere. This work is critically important, as it aims to respond to the needs of citizens for better information on well-being and to give a more accurate picture of societal progress to policy-makers.

a) The OECD framework for measuring well-being identifies "Jobs and Earnings" as one of the dimensions of "Material conditions"; and "Work-and-life balance" as a dimension of "Quality of Life". Work is currently ongoing to incorporate measures of "Economic Insecurity" in the framework.

... and translating them into indicators and evidence

15. Going beyond this conceptual stage requires choosing indicators that adequately capture the three main dimensions of job quality: labour earnings, labour market security and quality of the working environment. The approach followed in this chapter builds on the existing work done in other international organisations, which provides a comprehensive list of indicators that can be used for measuring various aspects of job quality (see Box 3.2). The overall aim pursued here is to operationalise these statistical frameworks, by making choices about which particular aspects of job quality are of greatest importance to workers and what is considered as a good or bad achievement in each of the three main dimensions of job

quality. This requires focusing on a limited set of indicators that are both conceptually sound and relevant for policy making, as well as defining criteria for valuing them. The approach taken here:

- Concentrates on **outcomes** (e.g. job security), as opposed to drivers of job quality (e.g. employment protection). This is important since the objective of policy is to improve outcomes, but also because outcomes are more readily comparable across countries and over time than attributes of employment, such as for example the type of contract, whose precise definition and related consequences in terms of employment stability depend on national regulations. Importantly, this implies that policies and institutions are considered in relation to their effectiveness in shaping better labour market *outcomes*, in terms of *both* job quality and job quantity.²
- Favours **objective** features of job quality in the sense that it excludes measures of a person's subjective state such as job satisfaction or the experience of positive or negative feelings at the workplace (e.g. work stress) from the definition of the different dimensions of job quality (see Box 3.3).³ It does not exclude the use of subjective measures of objective concepts, since several important aspects, such as the quality of workplace relationships, can only be measured through an individuals' self-assessment. Moreover, as discussed below, the literature on subjective well-being is used extensively to motivate the precise definition of the objective components of job quality.
- Is **micro-founded** in the sense that the indicators are derived from individual-level data. This is a key step in order to go beyond average indicators of job quality outcomes and take account of their distribution across the workforce. Taking individuals as the unit of analysis also allows for a more detailed analysis of the role of worker, firm and environmental characteristics for job quality.

² . While most indicators of policy settings refer to drivers rather than outcomes of job quality, the distinction between outcomes and drivers is not always clear-cut. This ambivalence applies to several elements of the tax and benefit system. For example, unemployment benefits can be seen as both an outcome (i.e. they constitute an important source of income for those workers in precarious employment) and a driver (because they have broader implications for job quality, e.g. through their impact on earnings by increasing worker bargaining power and/or match efficiency).

³ While job satisfaction captures important aspects of well-being it is not taken into account here for two reasons. First, to some extent the degree of job satisfaction is already taken into account by the three principal dimensions of job quality. Second, to the extent that it is not captured by the present framework it is not clear what it represents.

Box 3.2 Recent international initiatives on measuring job quality

Job quality has recently attracted increased interest in the international research and statistical community. Several major initiatives have been taken at international level to measure different aspects of job quality and for collecting indicators that would allow cross-country comparisons. Despite major progress, this remains an unfinished task and no internationally comparable database on job quality currently exists.

The International Labour Organization recently released a manual on concepts and definitions for over 50 Decent Work indicators that could be used for monitoring progress in implementing the ILO Decent Work Agenda (ILO, 2012). This manual also provides methodological and practical guidelines for producing these indicators, and constitutes a significant step towards the development of an internationally comparable database on Decent Work. Likewise, the United Nations Economic Commission for Europe (UNECE), in collaboration with Eurostat and the ILO, is developing operational guidelines for measuring the various dimensions listed in its framework for Measuring Quality of Employment (UNECE, 2010). Covering more than 50 indicators, this framework provides a useful toolbox for compiling data and calculating internationally comparable indicators on quality of employment. These statistical frameworks do not place explicit value judgments about what should be considered good or bad job quality, and do not prioritise any particular indicators or provide guidance how they should be used. They contain both indicators that measure job quality outcomes, such as earnings, and indicators that refer to drivers of job quality, such as the characteristics of industrial relations systems. The overall aim of these statistical frameworks is to provide a comprehensive set of indicators that can fit various national conditions, histories and challenges, while normative choices are left to the users of the data.

Going beyond these statistical frameworks, the European Foundation for the Improvement of Living and Working Conditions has developed and implemented a conceptual framework for measuring job quality in 33 European countries over the period 1995-2010 (Eurofound, 2012). By focusing on a limited set of indicators, this framework effectively make normative choices about which aspects of job quality are of greatest importance to the worker. The Eurofound framework identifies four main dimensions of job quality: earnings, prospects, intrinsic job-quality and working time quality. It focuses on those aspects of job quality that are driven by employee-employer relationships (including both contractual arrangements and working conditions), while the approach developed in this chapter also considers broader aspects such as the role played by UI benefits in providing workers with a buffer against the financial consequences of job loss. Despite this important difference in scope, the two approaches share several common features: they focus on workers, concentrate on objective features of job quality and capture job quality outcomes.

16. While no attempt will be made to aggregate the three principal dimensions into a single indicator of job quality, each of these components includes several aspects that need to be combined in order to generate a single indicator for each principal dimension. In order to guide the aggregation process within each component, the following guiding principles are applied:

- *Theories and evidence from the existing literature* provide an essential guide for constructing the different dimensions of job quality. Constructing a single indicator, particularly for labour market security and the quality of the working environment, is challenging as this requires taking account of different aspects within each dimension. Aggregating these requires understanding how their interrelations affect the well-being of workers. In this respect, psychologists, sociologists, epidemiologists and economists have developed theories and searched for empirical evidence that link workers' well-being to job quality. This work shed important light on both the various job attributes and the mechanisms that drive workers' fears of job loss or broader feelings of employment insecurity as well as well-being at the workplace.
- *Compensating and cumulative effects* are taken into account at the individual level, or at least at the group level. When aggregating the various components of labour market security or

developing a synthetic measure of the quality of the working environment, it is important to gauge the joint distributions of sub-outcomes, e.g. whether a person or a group with a disadvantage in one particular aspect of job quality also experiences poor outcomes in another. For example, taking account of such interaction effects allows considering the role of unemployment benefits in mitigating the financial consequences of job loss or the buffering effects of job resources and support on the relationship between work demands and well-being at the workplace.

- *Good and bad achievements on various sub-dimensions or dimensions of job quality are defined with respect to their impact on individual well-being.* This is done by relating the different aspects of job quality to measures of subjective well-being and self-reported health.

Box 3.3 Measures of subjective well-being *

In considering the place of subjective measures in the analysis of job quality, it is important to be clear about what is meant. In particular, it is important to distinguish between subjective measures of objective concept, (such as self-rated health) and measures of a person's subjective state (such as job satisfaction). In the former case, the measurement tool is 'subjective' but the subject matter being investigated is not, (i.e. it can be observed by a third party). In the latter case, where the subject matter itself is subjective, the person under investigation has privileged access to information on their internal states. It is true subjective measures of the latter sort that are the focus here.

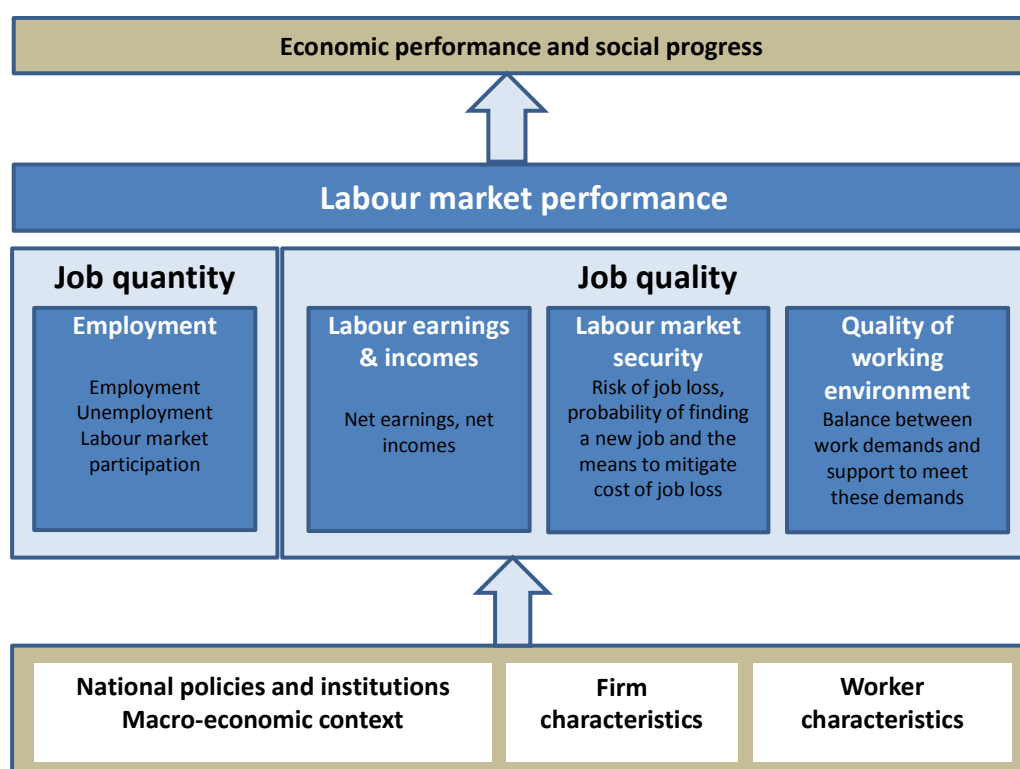
Measures of subjective well-being have received an increasing amount of attention from statisticians and economists over the last 15 years (Sen, Stiglitz, and Fitoussi, 2009), and there has been an exponential growth in the literature applying measures of subjective well-being to the analysis of various economic issues. There is now a large body of evidence on the validity and reliability of such measures. This evidence is strongest for measures of overall life evaluation and experienced well-being, but there is also good evidence on subjective measures of other outcomes such as job satisfaction (Clark, Georgellis and Sanfey, 1998), satisfaction with air and water quality (Brown and Silva, 2013), and material welfare (Ravallion, 2012). With respect to measures of overall life evaluation and experienced well-being, the evidence strongly supports the view that these measures capture valid information (OECD, 2013b). Such measures have low item-specific non-response rates and a low time to reply, suggesting that respondents find the questions easy to answer. Measures of subjective well-being correlate with ratings by friends and family, interviewers, smiling and, a range of bio-physical measures, and predict subsequent behavior of respondents. Finally, measures of subjective well-being display the expected relationship with other objective variables (OECD, 2013b).

This is not to say that all measures of subjective well-being are valid or useful. It is possible – indeed all too easy – for a poorly worded subjective question to perform poorly just as is the case with more objective questions. In particular, there are three issues relating to measures of subjective well-being that are particularly likely to be relevant to measuring job quality. First, measures of subjective well-being have a relatively high noise to signal ratio. This means that is necessary to be cautious when examining changes over time as the size of real change can be small relative to random noise. Second, people's responses to subjective questions are relatively sensitive to framing and context effects. This makes it difficult to compare measures if the surveys they are drawn from differ substantially in question order or content. Finally, measures of subjective well-being may be subject to cultural response bias, making it difficult to compare average responses between different countries. However, it is equally important not to make too much of these issues or to assume that they do not affect self-reports of more objective measures. If used appropriately measures of subjective well-being have the potential to add significant value alongside more conventional measures.

17. The key features of the present framework for defining and measuring job quality are sketched out in Figure 3.1 below. The ultimate objective of policy is to improve economic performance and foster social progress, which are represented at the top of the figure. As stressed above, labour market performance are assessed both in terms of the quantity of employment, and its quality, i.e. labour earnings, labour market security and the quality of the working environment. At the bottom of the figure are the determinants of labour market performance and its sub-components. These include the characteristics of workers, such as their qualifications and experience; the characteristics of firms, including the equipment,

technologies as well as their human resource policies; and the national environment, which includes the role of policies and institutions and the macro-economic context. The present framework allows analysing how labour market policies and institutions can promote more and better jobs. The approach is consistent with the OECD framework for measuring people's well-being, which was developed under the umbrella of the OECD Better Life initiative and which constitutes the basis of a broader effort to build an inclusive agenda for growth and to define more effective policy options for governments to achieve the ultimate goal to improve well-being of citizens (e.g. OECD initiatives on Inclusive Growth and on New Approaches to Economic Challenges).

Figure 3.1. An operational framework for defining and measuring job quality



2. Job quality outcomes and well-being

2.1 Earnings, incomes and subjective well-being

18. To measure the earnings dimension of job quality one needs to determine how to measure *individual* earnings and how to define earnings quality in the *aggregate*. Measuring earnings at the individual level requires choosing between gross earnings and net earnings (i.e. after deductions of taxes and social security contributions) as well as whether earnings should be measured on an hourly, monthly or even annual basis. Gross hourly wages measure the unit price of labour and provide the relevant measures from an employer or labour-demand perspective. Net earnings is the most relevant measure from a worker perspective as this determines the contribution of work to living standards and labour supply decisions, but tends to be less widely available in practice. Whether from a worker perspective earnings are best measured at an hourly or a monthly frequency depends on the voluntary nature of part-time (and overtime) work, i.e. whether individual well-being increases or decreases with hours of work. However, even when part-time is involuntary, it is more appropriately considered as a component of job quantity than as an

aspect of job quality.⁴ Overall earnings quality is usually measured using a combination of indicators such as average or median earnings, the degree of earnings inequality and the incidence of low-pay. The use of several indicators reflects the idea that they contain complementary information for the assessment of overall welfare. The role of earnings and its distribution for overall welfare is discussed below in more detail by reviewing the literature on the role of earnings and incomes for subjective well-being and providing some new evidence. Building on this assessment, a simple framework is put forward towards the end of this sub-section that can be used to measure overall earnings quality and analyse its link with average earnings and earnings inequality.

Average earnings and incomes are important for subjective well-being...

19. The bulk of the literature on the determinants of subjective well-being has concentrated on the role of earnings and incomes and, more specifically, the relative importance of absolute and relative earnings and income, without, however, providing a conclusive answer so far. In a seminal article, Easterlin (1974) posited that rising incomes do not, by themselves, increase the well-being of all, once basic needs have been met, and that beyond this threshold relative income is all that matters. His argument is based on the observation that changes in average income in a country are not significantly correlated with changes in average well-being in the long-term (Easterlin, 1974 for the United States, Easterlin, 1995, for Japan and nine European countries; Easterlin *et al.*, 2010, for a sample of 53 countries from around the world), despite evidence that income is positively correlated with well-being in the cross-section. This has become known as the Easterlin paradox. If true, this would imply that economic growth does not necessarily contribute to overall welfare, at least not beyond a point of satiation. This in turn would warrant a reorientation of public policy (Frank, 1985; Layard, 2005). Given the implications of Easterlin's thesis, it is not surprising that this has given rise to an intense debate on the role of earnings and incomes for subjective well-being.⁵

20. However, the view that absolute income does not matter for overall welfare has been challenged in a number of important recent contributions which suggest that there is a positive relationship between incomes and subjective well-being (Deaton and Kahneman, 2010; Sacks et al., 2012; Stevenson and Wolfers, 2008 & 2013). Indeed, it has been argued that the relationship between incomes and life satisfaction is approximately log-linear. This implies that each doubling in average income is associated with the same increase in overall well-being, or put more formally, that there are declining marginal returns to income in terms of subjective well-being. It follows that overall welfare is a function of both total income and its distribution within a country. Using data from Gallup World Poll for the period 2005-2010 for a large number of OECD and Key Partner countries, Figure 3.2 documents the relationship between log household income and life satisfaction both across and within countries. It confirms the earlier evidence by Deaton and Kahneman (2010), Sacks et al. (2012) and Stevenson and Wolfers (2008 & 2013) that both across as well as within countries the relationship is approximately log-linear.⁶ While the cross-sectional evidence is compelling, it does not directly assess Easterlin's thesis that money does not buy happiness since he focuses on the inter-temporal relationship between income and subjective well-being in

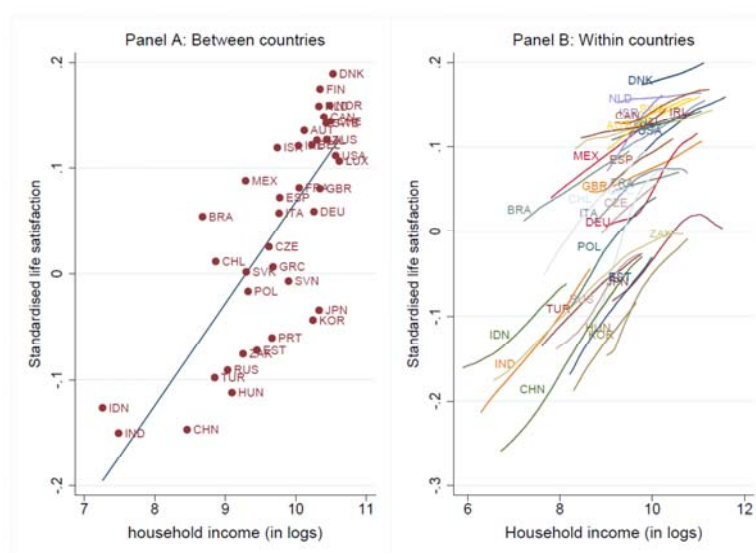
⁴ The difference between monthly and annual earnings is mostly driven by non-employment spells and therefore not directly of interest when assessing employment quality.

⁵ While most analysis has focused on the role of GDP per capita and household income, this is literature is also likely to provide useful insights for the relationship between earnings and well-being.

⁶ Panel B of Figure 3.2 also suggests that the linear relationship between life satisfaction and log income is weaker in high-income countries. Indeed, across countries, the gradient of income - obtained from a linear model of log income on life satisfaction - displays a significant negative relationship with GDP per capita. This suggests that the relationship between income and subjective well-being is not exactly log-linear.

the longer-term.⁷ However, Sacks et al. (2012) provide fairly comprehensive evidence that the positive relationship between income and subjective well-being also holds over longer time horizons.⁸

Figure 3.2 **The relationship between log household income and life satisfaction**



Notes: The right panel contains predictions from local linear regressions of life satisfaction on log household income for countries with at least 1000 observations in the data. Figures are based on individual data for the period 2005-2010.

Source: OECD calculations based on Gallup World Poll

... while the way they are distributed in society also matters

21. Easterlin's thesis has also been instrumental in promoting research on the role of relative earning and income comparisons for well-being and there is now considerable evidence that such comparisons matter (Clark et al., 2008).⁹ Earnings or income comparisons can take two forms. First, comparisons can be made with respect to an individual's previous experience and, thus, reflect habituation or adaptation effects. To the extent that individuals adapt or get used to changes in earnings or incomes, this limits their well-being effects in the longer-term and may, thus, help explaining in the Easterlin paradox. Clark (1999) and Di Tella et al. (2010) both find considerable evidence of adaptation using individual-level household

7. It is not obvious why the long-term relationship should differ from that in the cross-section. Indeed, cross-sectional results such as those presented in Figure 3.2 are often interpreted as emphasising the long-term relationship since these do not net out time-invariant fixed effects. While one might argue that permanent differences in income are correlated with many factors that affect life satisfaction, such as education, health and the quality of institutions, the same also applies for long-term changes in income within countries. More generally, this discussion suggests that both the cross-sectional evidence presented here as well as the long-term relationships in the literature are likely to be contaminated by omitted factors and, therefore, do not reflect pure income effects but rather the broader effects of economic development or socio-economic advancement.

8. Nevertheless, one should be cautious drawing strong conclusions given the quality of the data used here and elsewhere in the literature.

9. Clark et al. (2008) therefore emphasise the importance of taking account of relative income comparisons in the way utility function is specified in economic work since this can have important implications for the design of policies in many different areas (e.g. consumption, investment, economic growth, savings, taxation, labour supply, wages and migration).

panel surveys for respectively the United Kingdom and Germany, while Di Tella et al. (2003) provide macro-level evidence that goes in the same direction.¹⁰ Second, comparisons can be made with respect to a reference group. Most studies that have analysed the role of relative wage comparisons for subjective well-being have found negative effects (Clark and Oswald, 1996; Luttmer, 2005; Card et al., 2012).¹¹ These have typically been interpreted as status effects: the higher the earnings of the reference group relative to one's personal earnings the lower one's social status and subjective well-being. To the extent that the comparison effect is of similar size as the direct earnings effect, as has been suggested by a number of studies, this implies that a proportional earnings increase for all does not increase average well-being and, thus, provides a potential explanation for the Easterlin paradox. Comparison effects are likely to be more positive when the comparison contains relevant information about one's professional future, as may be the case when colleagues provide the relevant reference group (Brown et al., 2008; Clark and Senik, 2010).

22. There is also a growing literature on the relationship between subjective well-being and the distribution of incomes (see Senik, 2009 and Ferrer-i-Carbonell and Ramos, 2010, for an overview). While the presence of declining marginal returns from income to subjective well-being suggests that inequality reduces overall welfare, everything else equal, and may thus have implications for the debate on redistribution, this result is consistent with individuals having inequality-neutral preferences. Research on well-being and the distribution of incomes aims to assess to what extent people exhibit inequality aversion. Inequality aversion may derive from self-centred or altruistic motivations and depend on whether inequality reflects predominantly differences within or between socio-economic groups. To the extent that within-group differences are the result of individual actions and differences in effort, aversion to within-group inequality is most likely to derive from self-centred motivations and reflect the importance of upward income comparisons for well-being (Card et al., 2012). To the extent that between-group differences are more likely to be driven by factors beyond an individual's control and less likely to be relevant for inter-personal comparisons, altruistic considerations will dominate in the context of between-group inequality.¹²

23. By separately discussing the role of average incomes and its distribution for subjective well-being, it is implicitly assumed that the two are independent. This assumption is questionable since there is long-standing debate on the role of economic growth for the distribution of earnings within countries as well as that of the distribution of earnings for economic growth. The main insight from the literature is that the relationship can go in either direction and that the nature of this relationship depends on both the determinants of economic growth and on the way inequality is measured (OECD, ECO 2014a; OECD, ELS 2014b). The main message in the present context is that average earnings and its distribution are likely to be interdependent in practice and that policies that seek to act on one of these dimensions can have implications for the other as well.

A synthetic measure of the earnings quality should allow for at least some inequality aversion

24. This chapter measures the overall degree of earnings quality by taking account of both the average level of earnings and its distribution by making use of the general means framework following Atkinson (1970), Foster et al. (2013) and OECD (IG, 2014). General means allow taking account of

¹⁰. Since work-related well-being also affects effort and motivation, the evidence for adaptation provides an argument for offering earnings-experience profiles that are steeper than the profile of productivity.

¹¹. There are also several studies that have looked at the role of relative income instead of relative earnings effects. These include McBride (2001) for Canada, Blanchflower and Oswald (2004) for the US, Ferrer-i-Carbonell (2005) for Germany, and Graham and Felton (2006) for Latin American countries.

¹². Unreported regression results confirm the negative relationship between income inequality and subjective well-being generally found in previous studies, but also suggest that this is driven by inequality between age and education groups rather than inequality within groups.

average earnings and its distribution by specifying a certain level of inequality aversion (Box 3.4). This approach is, therefore, necessarily normative. It is, therefore, important to assess how the ranking of countries depends on the level of inequality aversion. A particular appealing feature of general means is that they can be given a social welfare interpretation. This interpretation is based on the observation by Atkinson (1970) that for each general mean there is an equally distributed level of income, which yields the same level of welfare as that of the original income distribution. Comparing the equally distributed equivalent income with the actual arithmetic mean provides an indication of the welfare loss due to inequality. Another attractive feature of general means is that they can be decomposed in terms of the arithmetic mean and a component that captures the degree of inequality. This is very useful in the present context as it allows getting a better understanding of why the earnings standard differs between two particular earnings distributions. A more detailed discussion of general means framework and the reasons for using it in the present is presented in Box 4.

25. The most commonly used general means that are consistent with inequality aversion are the geometric and harmonic means. For the purposes of this chapter, the harmonic mean is used as the principal indicator to characterise overall earnings quality (Figure 3.3, Panel C). The geometric mean is often used by labour economists and is fully consistent with the log-linear relationship between income and well-being documented above. However, it is not consistent with inequality aversion over and above what is implied by the log-linear relationship between income and well-being.

26. Using data from the 2006 wave of the European Commission's Structure of Earnings Survey (SES) and EU SILC¹³, Figure 3.3 plots Atkinson measures of equality using gross hourly earnings of employees for a wide range of European OECD countries. Gross hourly earnings are used because gross earnings are more widely available across countries and because it avoids having to take a stance on part-time work.¹⁴ Equality is measured on the vertical axis for different levels of inequality aversion while the arithmetic mean is used to measure affluence on the horizontal axis. The welfare isoquants, representing the 33th and 67th percentiles of the cross-country distribution of the general mean, connect those combinations of affluence and equality that are associated with the same general mean (i.e. level of social welfare). While Panel A is based on the geometric mean and thus can be used for direct well-being comparisons in the usual log-linear framework, Panel B is based on the harmonic mean which places more emphasis on the distribution of earnings.

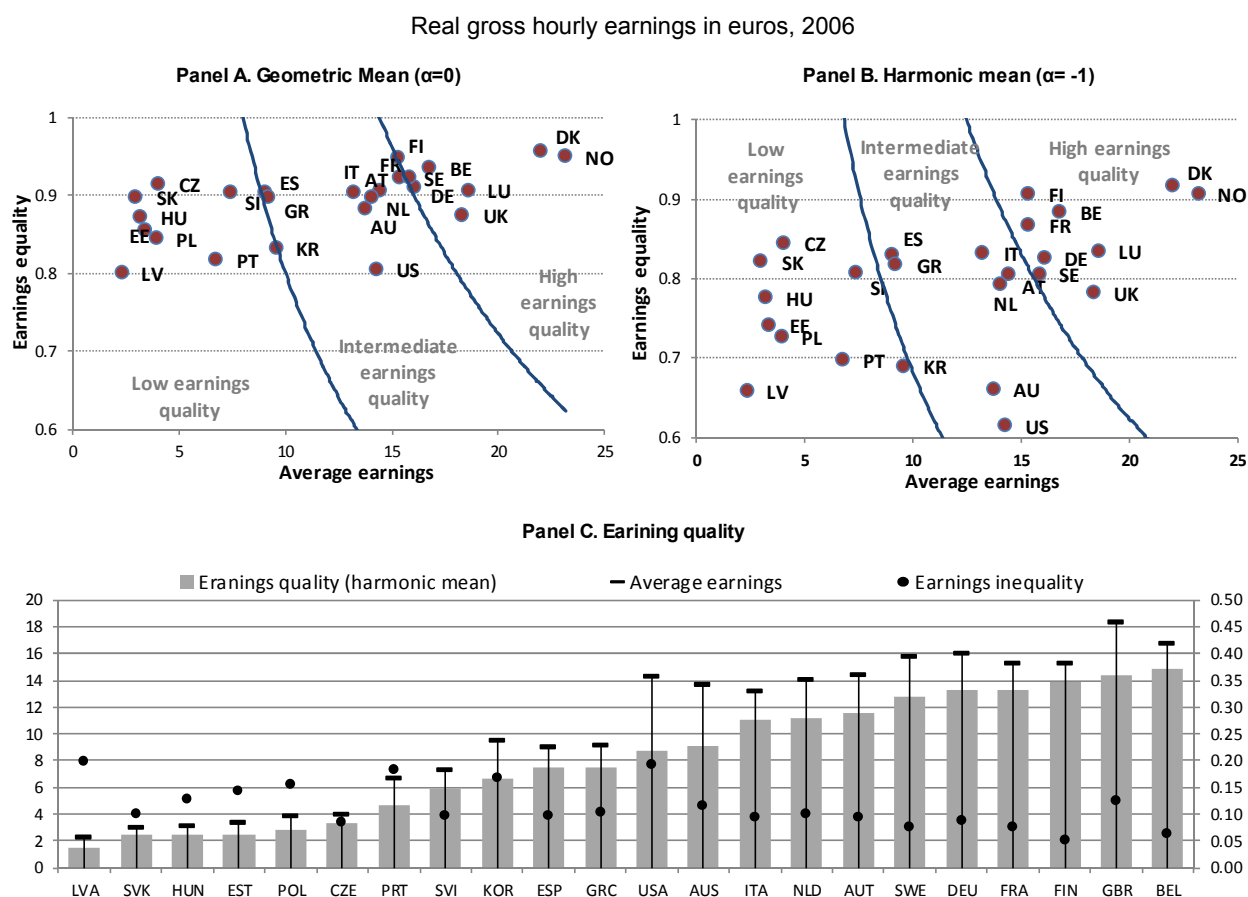
- The two welfare isoquants, which take account of the combination of average earnings and measured equality for overall welfare, define three regions characterised by, respectively, low, intermediate and high overall earnings inequality. Countries located to the right of the high-welfare isoquant are characterised by high overall earnings quality. These include Belgium, Denmark Luxembourg, Norway and the United Kingdom. Countries located to the left of the low-welfare isoquant are characterised by low overall earnings quality. These include the Central and Eastern European countries as well as Portugal. Most of the remaining countries lie in the area between the two welfare isoquants. There is a weak positive relationship between average hourly earnings and measured equality, with countries with higher average levels of labour earnings having slightly lower levels of measured inequality.

¹³ *[The figures will be replaced by the 2010 wave of the SES after the Working Party once these become available to the OECD.]*

14. Using monthly earnings effectively means penalising part-time work as this is associated with lower average earnings and higher inequality, even though part-time work may be a voluntary choice that contributes to individual well-being.

- The variation in terms of earnings equality across countries (measured along the vertical axis) depends on the weight given to inequality aversion for the construction of the equality indices. When measuring earnings equality in terms of the ratio of the geometric to the arithmetic mean in Panel A, the ratio generally varies between 0.8 and 0.95. The corresponding equality ratios based on the harmonic mean are presented in Panel B and feature lower levels of measured equality as well as more equality dispersion across countries. Australia, Latvia and the United States have the most unequal distribution of earnings, whereas it is most equal in Denmark, Finland and Norway. The ranking of countries in terms of overall earnings quality is only affected modestly by the choice of equality measure across the two panels.
- There is considerable variation in terms of average hourly earnings across countries (measured along the horizontal axis) and indeed average earnings tend to drive the cross-country ranking of overall earnings equality. The highest levels of average hourly earnings are observed in Denmark and Norway, while the lowest levels of average hourly earnings are observed in the Baltic States, Hungary and Slovak Republic.

Figure 3.3 Average earnings, earnings equality and the overall quality of earnings by country



Notes: Overall earnings quality is measured using general means which increase in average earnings (horizontal axis) and earnings equality (vertical axis). The curved lines represent welfare isoquants defined in terms of the general mean which connect those combinations of affluence and equality that are associated with the same level of social welfare (general mean). The low-welfare isoquant (left) corresponds to the 33th percentile of the cross-country distribution of overall earnings inequality, while the high-welfare isoquant corresponds to the 67th percentiles of the cross-country distribution.

Source: OECD calculations based on the Structure of Earnings Survey (SES), the European Union Statistics on Income and Living Conditions (EU-SILC) and the Cross-National Equivalent File (CNEF).

Box 3.4 Analysing earnings, inequality and welfare using general means

The discussion in this sub-section provides a number of important insights with respect to the measurement of the earnings dimension of job quality.

- The importance of absolute earnings for welfare suggests that the measurement of earnings should take account of earnings increases at both the individual and the aggregate level, or more formally, should reflect *monotonicity* and *linear homogeneity*. Monotonicity implies that an increase in the earnings/income of a single person should increase, or not worsen, the measured quality of earnings. Linear homogeneity implies that a proportional increase in the earnings of all should give rise to an equivalent increase in the measured quality of earnings. These requirements necessitate taking account of the entire distribution rather than concentrating on specific point of the distribution. This can be done using general means or Sen's mean.
- The measure of earnings quality should take account of the welfare loss associated with an unequal distribution in the context of inequality aversion. One justification, presented by Atkinson (1970), is the presence of declining marginal returns from earnings. This suggests that the distribution matters for overall welfare, even if individual preferences are inequality neutral. Another justification is that individuals, and by extension social planners, may exhibit inequality aversion based on either economic or altruistic motivations. In practice, this means that the chosen measure should increase as a result of progressive transfers, i.e. transfers from a richer to a poorer person that make the distribution more even. This *transfer principle* is satisfied by general means and Sen's mean.
- The measure of earnings quality should allow for consistent and robust comparisons across countries and sub-groups as well as over time. Given uncertainty about the appropriate degree of inequality aversion that is embedded in the earnings standard, it should allow assessing the robustness of *dominance* between two or more distributions to the level of inequality aversion. It should also allow assessing how overall earnings outcomes are distributed across different socio-groups. This requires *sub-group consistency*, which states that for a given composition of employment, a change in the incomes of one sub-group should be reflected in the overall earnings standard. General means satisfy these conditions.

This chapter, therefore, makes use of the general means framework based on Atkinson (1970) and Foster et al. (2013) to measure the earnings dimension of employment quality. General means are a family of normative earnings or income standards. The general mean (GM) of order α for a distribution of earnings y is defined as:

$$W_{GM}(y, \alpha) = \left[\frac{y_1^\alpha + y_2^\alpha + \dots + y_N^\alpha}{N} \right]^{1/\alpha} \text{ if } \alpha \neq 0 \quad \text{and} \quad W_{GM}(y, \alpha) = [y_1 \times y_2 \times \dots \times y_N]^{1/N} \text{ if } \alpha = 0$$

The choice of α is intimately related to how the general mean is connected to individual observations: as α approaches minus (plus) infinity, the general mean converges to the lowest (highest) observed earnings in society (see **Annex Box A3.1.1**). The order α can thus be taken to represent the level of inequality aversion, with lower levels of α placing more emphasis on the lower half of the distribution. The most relevant values of α in the present context are 1, 0 and -1 which correspond, respectively, to the arithmetic mean, the geometric mean and the harmonic mean. The arithmetic mean assumes that preferences are inequality neutral, while values of α smaller than one imply inequality aversion. Were earnings to be distributed equally between members of society, all general means would equal the arithmetic mean, which is also referred to as the normalisation property of general means.

General means for $\alpha < 1$ are commonly interpreted as measures of social welfare. This interpretation is based on the observation by Atkinson (1970) that for each general mean there is an equally distributed level of earnings or incomes, which yields the same welfare level as that of the original distribution. Normalizing the general mean, or its equally distributed equivalent, by the arithmetic mean provides a measure of the welfare loss due to inequality. This has become known as Atkinson's class of inequality measures. Formally, for $\alpha < 1$, this can be represented as follows:

$$I_A = \frac{W_A(y) - W_{GM}(y, \alpha)}{W_A(y)} = 1 - \frac{W_{GM}(y, \alpha)}{W_A(y)}$$

The Atkinson inequality index ranges from 0 when earnings are equally distributed to 1 when all earnings are concentrated in the hands of a single person, and decreases with α . It measures the loss of welfare as a percentage of the arithmetic mean, that is, the welfare level that would have prevailed had earnings been distributed evenly.

2.2 Labour market security: job security, employability and insurance

27. The efficient reallocation of workers across firms and sectors is crucial for economic growth, and hence, average earnings and incomes. However, the continuous process of job reallocation also entails important adjustment costs to workers and may give rise to worker concern over labour market security, with potentially detrimental effects for individual well-being as well as society at large. Indeed, job security appears to be a major determinant of individual well-being. When workers are asked to state their preferences with respect to different aspects of work, as is done, for example, in the European Social Survey (ESS) or the International Social Survey Programme (ISSP), the results rank job security consistently as the most important item in almost all countries for which data are available (Green, 2009; OECD, 2011). Moreover, the importance of labour market security for the individual well-being of workers also has been demonstrated in several studies that relate perceptions of job security to individual outcomes such as life satisfaction and health (e.g. Green, 2011). However, the effects of job security may go well beyond the well-being of individual workers. By reducing worker motivation and incentives to invest in firm-specific skills and by increasing work-related stress and worker turnover, concerns over job insecurity could reduce productivity and increase recruitment costs for firms. It may also affect society at large by shaping people's political views, social unrest and the demand for insurance, consumer confidence and savings.

Labour market security is defined terms of unemployment risk and insurance ...

28. The majority of frameworks measuring job quality measure job security in terms of the proportion of workers with short job tenure and the incidence of temporary work (OECD, 2013c). While both indicators focus on important and objectively measurable aspects related to the probability of job loss, they do not allow for consistent comparisons across countries or over time. Comparisons across countries of average job security in terms of the proportion of temporary contracts in employment may be misleading since the rules governing temporary and open-ended contracts vary widely across countries. In fact, the incidence of temporary work is primarily a measure of labour market duality rather than average job security (see the discussion in Chapter 4 of this publication). Comparisons across countries in terms of the proportion of short-tenured workers in employment may also be misleading as this reflects both voluntary quits and involuntary job loss. Comparisons over time using either indicator tend to be problematic since they tend to lead to pro-cyclical patterns in job security whereas job security is usually considered to be counter-cyclical, with the risk of job loss increasing in recessions. Eurofound (2012) takes a more sophisticated approach by proposing a synthetic indicator of “prospects” which is based on an unweighted average of perceived job security, perceived career prospects, and contract quality (open-ended, temporary or no contract).¹⁵ Thus, it assumes that contract type has an independent effect on prospects over and above that captured by job security and career prospects. While the forward-looking nature of this indicator is appealing, the reliance on subjective expectations about job security and career advancement may not be ideal for the purposes of making international comparisons.

... with risk being measured in terms of job security and employability...

29. The starting point for the approach to labour market security taken in the chapter is that concerns about job security reflect not only the probability of job loss but also its expected costs. While the importance of expected costs has been emphasised in several previous studies (OECD, 1997; Anderson and Pontusson, 2007; De Cuyper et al., 2008; Green, 2011), it has so far not been taken in up in statistical

¹⁵ Job security and career advancement are based on the extent to which the respondent agrees with the following statements on a five-point scale: “I might lose my job in the next 6 months” and “My job offers good prospects for career advancement”. It is not entirely clear what is captured by the second statement in practice.

frameworks of job quality. From a theoretical perspective, the expected cost of job loss can be described as a function of five factors: i) the value of the current job; ii) the probability of losing one's job; iii) the value of not having a job, i.e. insurance; iv) the probability of finding a new job, i.e. employability; v) the expected value of the new job (OECD, 1997). For the present purposes, it is assumed that the expected value of the new job equals that of the current job. While this involves ignoring a potentially important component of earnings losses due to job displacement (Jacobson et al., 1993), estimating the wages losses due to job displacement beyond the scope of this chapter. Moreover, previous evidence suggests that unemployment tends to account for the bulk of the cost of job displacement (Kuhn, 2002; OECD, 2013). This chapter, therefore, focuses on the expected costs of unemployment, which depend, respectively, on the combination of *unemployment risk* in terms of the probability of becoming and staying unemployed and *unemployment insurance*.¹⁶ Since the concept of job security employed here goes beyond that associated with the current job by taking account of the security of workers in and outside work, this chapter refers to this broader notion as labour market security.¹⁷

30. Figure 3.4 documents the main components of unemployment risk across selected OECD countries using data for 2010.¹⁸ Job security is measured by the job-losing rate, i.e. the probability of moving from employment into unemployment in a given month. Employability is measured by the job-finding rate, i.e. the probability of moving from unemployment to employment in a given month.¹⁹ The figure reveals considerable cross-country variation both in terms of overall magnitudes as well as the role of job security and employability as separate drivers of unemployment risk. Average monthly job-losing rates range between 0.2 and 1.2 percent across countries, while the rates of finding a job among the unemployed range from around 10 to 35 percent (which corresponds to average expected durations ranging from 3 to 10 months). These large variations tend to cumulate into a higher overall risk of unemployment as indicated by the negative, albeit weak, relationship between job security and employability across countries.²⁰

16. This approach is based on the assumption that unemployment is involuntary.

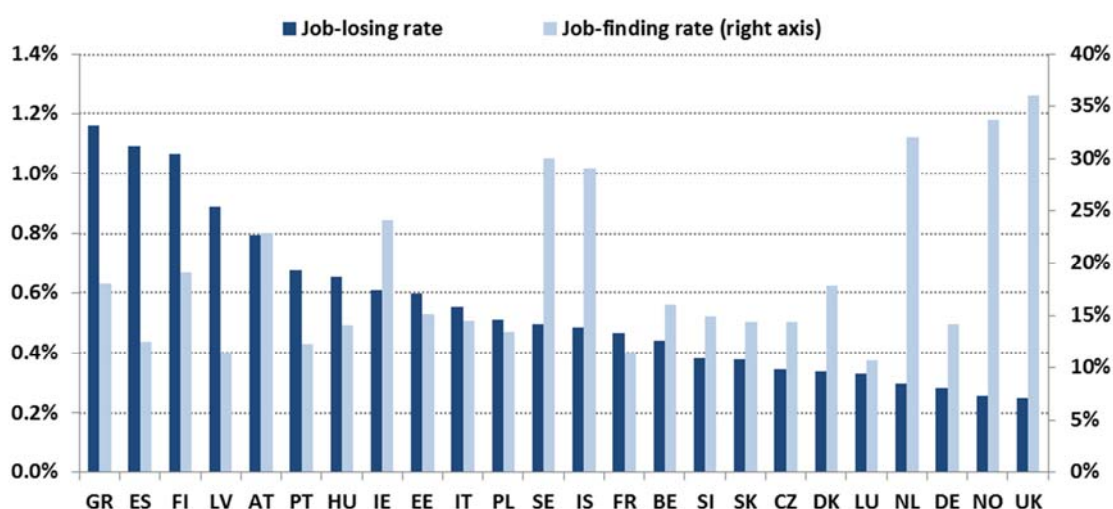
17. In order to measure unemployment risk empirically one may make use of either subjective or objective measures. Subjective measures of job security have been found to yield considerable predictive power about future events. For example, subjective expectations about the probability of losing one's job and that of finding a new job after job loss have considerable predictive power over actual job loss and job finding rates (Manski and Straub, 2000; Stephens, 2004; Campbell et al., 2007; Dickerson and Green, 2012). These results are confirmed using semi-aggregated data by country, year, age group and education groups based on the ESS and EU SILC. Moreover, several studies have shown that subjective expectations about job security can be used to predict economic behaviour in terms of consumer spending and saving behaviour (Benito, 2004; Lusardi, 1998; Stephens, 2004) or earnings growth and working bargaining power (Campbell et al., 2007). Perceptions of job security also have been shown to be associated with subjective well-being and health outcomes (Nolan et al., 2000; Wichert, 2002). Indeed, the main interest of measuring expectations using subjective measures instead of average probabilities derives from their importance in determining economic behaviour and individual outcomes. However, they are arguably less useful for the purposes of comparing job security across countries and groups, due to the role of cultural traits in shaping expectations. For this reason, this chapter focuses on the objective components of labour market risk related to job security and employability.

18. *[The country coverage will be extended after WP5 to include also a number of non-European countries.]*

19. The log difference between the job-losing and job-finding rates gives an indication of the overall level of unemployment risk.

20. The job-losing and job-finding rates reflect to an important extent the impact of the global financial crisis on the labour market.

Figure 3.4 Job-losing and job-finding rates for selected OECD countries, 2005-2010 averages



Notes: Job-losing and job-finding rates are average monthly transition probabilities between employment and unemployment for the working-age population. See Box 3.5 for further details on data and methodology.

... and insurance in terms of the effective level of risk absorption through the tax-and-benefits system

31. Previous studies of the role of insurance for mitigating the impact of unemployment risk on well-being have typically used country-level indicators related to the stated generosity of unemployment benefits to measure insurance (Di Tella et al., 2003; Helliwell and Huang, 2011; Sjöberg, 2010; Young, 2012). However, the stated generosity of unemployment insurance may be quite different from its actual generosity due to coverage issues and its dependence on household income and composition. This chapter takes a different and rather innovative approach. Consistent with the outcome-oriented framework used here, insurance is measured in terms of the *effective* level of risk absorption that takes place through the tax-and-benefits system. Effective insurance includes the accessibility of unemployment benefits and other welfare benefits, their generosity in terms of replacement income and their maximum duration as well as the progressivity of the tax system. While not part of the tax-benefit system, severance pay is also included since this is an essential part of the overall system of unemployment compensation in both advanced and emerging economies (OECD, 2011b). Informal insurance through risk-sharing within the household and private insurance through individual savings are not taken into account.²¹ Effective public insurance is measured as the degree to which the loss of income associated with unemployment is absorbed by the tax and benefit system using detailed information on the various components of household income in EU SILC. Three different measures of insurance are used: i) “narrow” unemployment insurance, which captures unemployment benefits (insurance and assistance) as well as severance pay; ii) “medium” unemployment insurance, which includes all personal and household benefits; iii) “broad” unemployment insurance, which includes all benefits after taxes (for details, see Box 3.5).

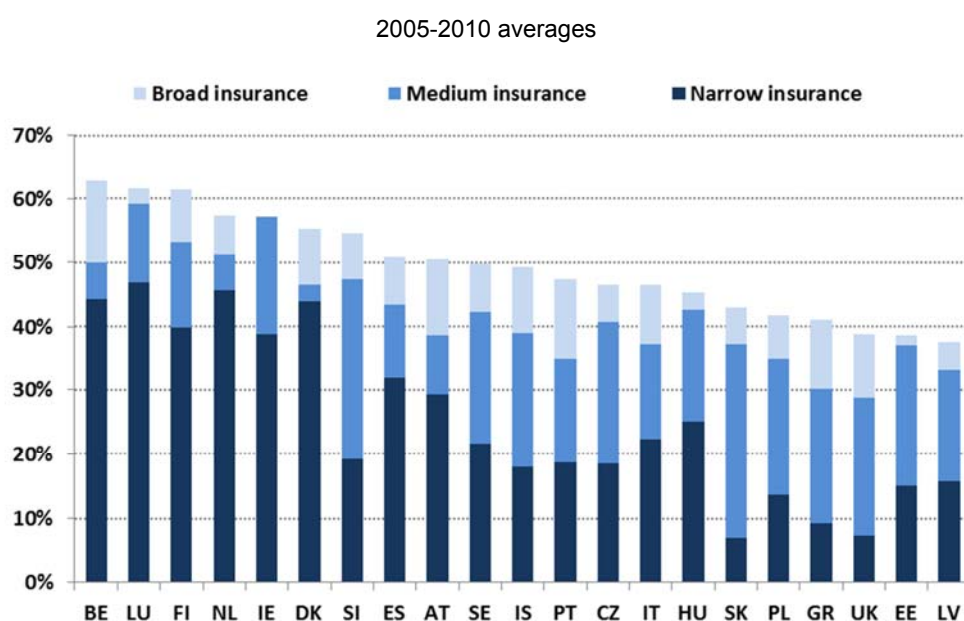
32. Figure 3.5 documents the degree of effective insurance across selected OECD countries. It shows, similarly to risk, considerable cross-country variation both in terms of the overall level of insurance as well as the relative importance of its sub-components. The main source of insurance in countries with

²¹

While these forms of insurance are likely to play an important role in mitigating the adverse effects of unemployment risk on well-being they are not an intrinsic part of job quality since these forms of insurance do not depend on one's employment or employment history as do, for example, unemployment insurance and income taxes.

the most effective overall systems of unemployment compensation (e.g. Belgium, Denmark, Finland, Luxembourg, The Netherlands) are unemployment benefits, while auxiliary social benefits absorb much of income losses associated with unemployment in many of the low-insurance countries (e.g. Greece, Slovakia and the United Kingdom). The role of taxes in mitigating income shocks associated with unemployment is rather limited in all countries in the sample.

Figure 3.5 The degree and composition of effective unemployment insurance in selected OECD countries



Notes: The “narrow” conception of unemployment insurance is confined to unemployment benefits, “medium” unemployment insurance includes all benefits that are part of gross household income, while “broad” unemployment insurance captures all benefits and taxes that determine households’ disposable income. See **Box 3.5** for further details on data and methodology.

Source: OECD calculations based on the European Union Statistics on Income and Living Conditions (EU-SILC).

Subjective well-being and the role of unemployment risk and insurance

33. In order to analyse the role of unemployment risk and insurance for subjective well-being, a semi-aggregated dataset was constructed by year, country and socio-economic group (age and education) with information on unemployment rates, job-losing rates and job-findings rates (from EU SILC) and information on subjective well-being (from the European Social Survey). For details on the data and methodology, see Box 3.5. The results with respect to the risk of unemployment and insurance are summarised in Figure 3.6 and are presented in more detail in Box 3.5. Figure 3.6 shows the impact of a 10 % increase in the job-losing rate, a 10 % reduction in the job-finding rate when unemployed and a 1 % increase in the unemployment rate on life satisfaction in the absence of effective public insurance as well as when effective unemployment insurance (narrow measure) absorbs, respectively, 20% and 40% of the income loss associated with unemployment.²² Several patterns stand out:

- *The role of job-security and employability.* The job-losing and job-finding rate both matter for subjective well-being (see also columns 1, 3 and 5 of the Box Table), although the effect of

22. Twenty percent roughly corresponds to the mean of the unemployment insurance (narrow measure) across the countries considered.

the job-finding rate is somewhat larger than that of the job-losing rate. These estimates, thus, suggest that employed workers are concerned not only about becoming unemployed but also, and possibly even more, about not being able to find a new job when unemployed. This also suggests that employees tend to care about working in general rather than working in a specific job or for a specific firm. In the absence of insurance, a 10% increase in the job-losing rate is associated with a 0.9 – 1.6 percent reduction in the standardized score of life satisfaction. Similarly, a 10% decrease in the job-finding rate is associated with a 1.8 to 4.0 percent reduction in the standardized score of life satisfaction. The larger estimated effect of the job-finding rate on reported life satisfaction than that of job-losing rate may explain previous findings in the literature on the positive association between the level of employment protection and perceived job insecurity or job strain (Postel-Vinay and Saint-Martin, 2005; Wasmer, 2006; Clark and Postel-Vinay, 2009; Salvatori, 2010). The larger role of the job-finding rate in driving changes in subjective well-being could indicate that the positive impact of employment protection in reducing the job-losing rate might well be outweighed by its negative consequences in terms of prolonged unemployment spells, even if the overall level of unemployment remains unaffected. This suggests that more emphasis may need to be given to the use active labour market policies and work-to-work schemes that can help to reduce the duration of unemployment and improve access to good quality jobs rather than to measures which seek to contain the risk of job loss.

- *The overall risk of unemployment.* Given the close theoretical and empirical link between the inflow and outflow rates, on the one hand, and the unemployment rate, on the other, the unemployment rate should provide a succinct measure of the risk of unemployment for those currently employed. Figure 3.6 shows that, in line with expectations, increases in the unemployment rate are indeed associated with large and statistically significant reductions in life satisfaction. A 1 percentage point increase in the unemployment rate reduces (standardized) life satisfaction by between 1.5 and 1.7 percent in the absence of insurance.²³ The effect of the unemployment rate on the life satisfaction of the employed is equivalent to the effect of a reduction in household income of more than 3%.²⁴ Interestingly, the compensating effect is considerably larger than the pure income effect associated with unemployment since this would imply that each percentage-point increase in the unemployment rate leads to around a 1% reduction in household income. This may indicate that the cost of unemployment is considerably larger than the loss of income²⁵ or that workers are risk averse (OECD, 2014c). However, it may also reflect a general deterioration in social conditions that may be associated with increased unemployment or reduced career prospects.^{26,27}

²³ This is comparable in magnitude to the findings above with respect to the job-losing and job-finding rates. At an initial unemployment level of 10%, a 10% change in either the job-inflow or job-outflow rate corresponds to approximately 1 percentage point change in the unemployment rate.

²⁴ . The importance of spillover effects of unemployment on the employed is consistent with evidence in the existing literature. For example, using data for Canada, Helliwell and Huang (2011) also find that a 1 percentage point increase in the unemployment rate has the equivalent effect on well-being as a 3% reduction in household income. They further show that, due to the much larger number of individuals concerned, the indirect effect of unemployment on well-being even exceeds its direct effect.

²⁵ . See, for example, Clark and Oswald (1994), Winkelmann and Winkelmann (1998), Clark (2003), Helliwell and Huang (2011) and Young (2012).

²⁶ . Luechinger et al. (2010) present similar findings using data for the United States, Germany and several other European countries. They find that these effects are more important for workers in the private than in

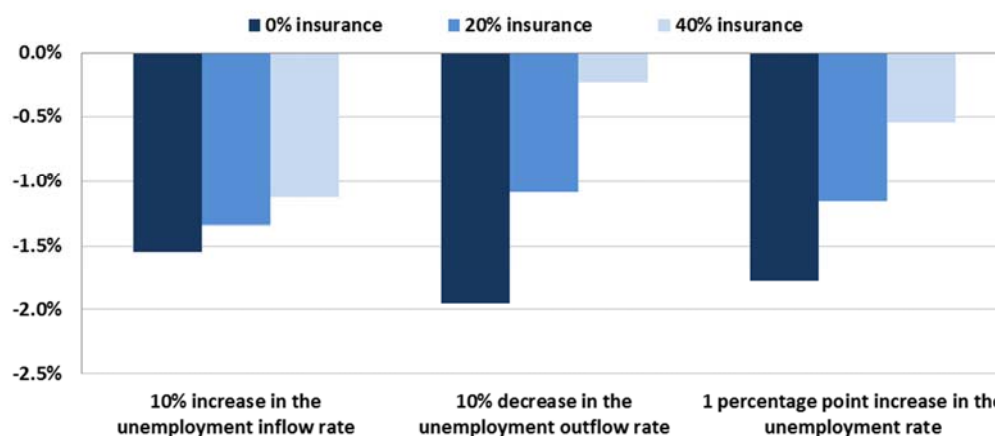
- *Effective public insurance.* The adverse consequences on subjective well-being of the risk of unemployment among those currently employed are partially offset by effective insurance. In particular, when unemployment insurance (narrow measure) is evaluated at its sample mean (around 20%) or twice the sample mean (around 40%), the adverse effects of labour market are substantially reduced, but not fully undone. Interestingly, the effect of insurance only appears to come about through its impact on the well-being effect of the job-finding rate, while it does not appear to have an impact on the well-being effect of the job-losing rate. This seems to make sense since this suggests that insurance reduces the expected cost of job loss rather than the effect of job loss conditional on its expected costs. Insurance also reduces the well-being effect of the overall risk of unemployment, although this effect is not statistically significant in all specifications. All in all, the estimated insurance effects seem very large. One reason for this may be that they do not capture the costs of insurance. The insurance effects are, therefore, best interpreted as upper bounds.²⁸

the public sector, suggesting that this does not reflect society-wide changes related to the risk of unemployment but its effects of individuals' perceptions of risk and opportunities.

- 27 . Green (2011) further finds using data from Australia that a higher job-finding rate strongly moderates the adverse effects of unemployment and job insecurity on life satisfaction and mental health.
- 28 . Most previous studies have concentrated on the direct effects of unemployment insurance on the well-being gap between the employed and the unemployed. While they tend to find that insurance has a positive impact on well-being, the effect seems to be similar for employed and unemployed workers. Using cross-country data, Di Tella et al. (2003) find evidence for large and positive effects of insurance of life satisfaction, both among the employed and the unemployed, but not effect for insurance on the well-being gap between the employed and the unemployed. Also using a cross-country dataset, Sjöberg (2010) confirms the findings by Di Tella et al. (2003), but also shows that the effects of insurance are stronger among those with higher levels of labour market risk (as measured by their previous unemployment experience) and financial vulnerability (measured by the ability to borrow). Using data for Canada, Helliwell and Huang (2011) also do not find that unemployment insurance reduces the well-being gap between unemployed and the employed, and even suggest that unemployment insurance makes it worse. Exploiting information on individual transitions between employment and unemployment for the United States, Young (2012) finds that insurance eligibility only has a minor effect on mitigating the adverse effect of unemployment on well-being. He suggests that the small effect reflects the fact that insurance cannot absorb the non-pecuniary cost of unemployment. However, it may also affect the possibility that unemployment insurance has similar impact on the employed and the unemployed as suggested by the studies discussed above.

Figure 3.6 Unemployment risk and insurance have important implications for well being

Estimated effects of the risk of unemployment, the risk of becoming unemployed and the risk of staying unemployed for reported life satisfaction, and the compensating effects of unemployment insurance



Notes: The well-being effect is measured in terms of standardized life satisfaction scores. As such, percentage changes are to be interpreted in terms of the standard deviation of life satisfaction.

The figure contains the partial effect of unemployment inflow (outflow) rates when the corresponding outflow (inflow) rate is controlled for. To create the graph, the “narrow” insurance concept was used that accounts for the loss absorption by all types of social benefits but not by taxes. See columns (3) and (4) of Table in **Box 3.5** for further details on data and methodology.

Source: OECD calculations based on the European Union Statistics on Income and Living Conditions (EU-SILC) and the European Social Survey (ESS).

Box 3.5 Analysing the role of unemployment risk and insurance for subjective well-being

In order to analyse the role of unemployment risk and insurance for subjective well-being, a semi-aggregated dataset is constructed by year, country and socio-economic group (three age categories: 15-29, 30-49, 50-64; and three education categories: lower secondary, upper secondary, tertiary) that links information on unemployment rates, unemployment inflows and outflows and household income from European Union Statistics on Income and Living Conditions (EU-SILC) with measures on subjective well-being from the European Social Survey (ESS). The resulting dataset can be used to analyse the relationship between labour market dynamics (derived from individual labour market histories) and various subjective well-being indicators for a wide range of countries. The dataset covers 21 OECD member countries in Europe for 2006, 2008 and 2010.

More specifically, the job-losing and job finding rates are based on monthly transition probabilities between employment and unemployment, derived from the monthly information on labour market status in EU-SILC. The job-losing and job-finding rates can be used to calculate a measure of the overall risk of unemployment (see Box 3.6 for details). Furthermore, information on the various components of household income allows defining the degree to which income losses associated with unemployment are absorbed through the tax and benefit system. This can be calculated at the individual level and takes account of benefit coverage, effective replacement rate and the role of taxation. Three different measures of insurance are used: i) “narrow” unemployment insurance which captures all benefits and other payments related to unemployment (e.g. full and partial unemployment benefits; early retirement for labour market reasons; severance and redundancy payments); ii) “medium” unemployment insurance which includes all personal and household benefits that are part of gross household income (e.g. old-age, sickness and disability benefits, family and housing allowances); iii) “broad” unemployment insurance which includes all benefits and taxes that determine households’ disposable income. The ESS is a bi-annual survey and contains ordinal information on life satisfaction, happiness, health and job satisfaction.

In order to analyse the role of unemployment risk and insurance for subjective well-being, the following linear regression model is estimated:

$$y_{it} = \alpha_1 RISK_{it} + \alpha_2 INSURANCE_{it} + \alpha_3 RISK_{it} * INSURANCE_{it} + \alpha_4 Z_{it} + \varepsilon_{it},$$

where subscript i refers to a combination of socio-economic group and country and subscript t to year. The dependent variable y stands for subjective well-being and is measured by the standardized score of life satisfaction. The right-hand side of the equation features one or several measures of unemployment RISK (unemployment rate, log job losing rate, log job finding rate), one of several measures of public INSURANCE (gross or net unemployment insurance) and a set of control variables Z (log household labour income, as well as age, education, country and time dummies). The model also contains an interaction term between RISK and INSURANCE that captures the potential compensating effect of insurance against the impact of the risk of unemployment on well-being. ε represents a random disturbance term. The empirical model above is estimated with OLS using labour-force shares within countries as weights. The regression results are presented below and discussed in the main text.

Estimates of the role of unemployment risk and insurance for subjective well-being
Dependent variable: standardized scores of life satisfaction

	DIFFERENT INSURANCE MARGINS					
	Narrow		Medium		Broad	
	(1)	(2)	(3)	(4)	(5)	(6)
Gross household labour income	0.473*** (0.147)	0.503*** (0.147)	0.526*** (0.152)	0.601*** (0.146)	0.431*** (0.149)	0.552*** (0.148)
Insurance rate	-0.607 (0.821)	-0.394** (0.188)	-0.641 (0.983)	-0.517** (0.203)	-2.191** (1.073)	-0.121 (0.220)
Job-losing rate	-0.155*** (0.045)		-0.163** (0.072)		-0.092 (0.088)	
Insurance rate * Job-losing rate	0.106 (0.139)		0.122 (0.163)		-0.084 (0.173)	
Job-finding rate	0.195*** (0.061)		0.212** (0.099)		0.450*** (0.121)	
Insurance rate * Job-finding rate	-0.430*** (0.141)		-0.396* (0.213)		-0.680*** (0.201)	
Unemployment rate		-1.774*** (0.493)		-1.659** (0.750)		-1.553* (0.83)
Insurance * Unemployment rate		3.064*** (1.241)		1.930 (1.620)		1.296 (1.499)
Observations	257	257	257	257	257	257
R-squared	0.844	0.837	0.842	0.838	0.845	0.833

Notes: Household income, job-losing and job-finding rates are all measured in logs. The “narrow” measure of unemployment insurance is confined to unemployment benefits and severance pay, “medium” unemployment insurance includes all benefits that are part of gross household income, while “broad” unemployment insurance captures all benefits and taxes that determine households’ disposable income. Stars *, **, *** denote significance at 10, 5 and 1 percent significance level, respectively. Standard errors in parentheses.

Source: OECD calculations based on the European Union Statistics on Income and Living Conditions (EU-SILC) and the European Social Survey (ESS).

Towards an overall measure of labour market insecurity

34. To sum up, labour market security in this chapter is defined in terms of two major components: unemployment risk and unemployment insurance (Box 3.6). Unemployment risk is defined as the probability of becoming unemployed times the probability of staying unemployed, while unemployment insurance is defined in terms of the effective level of risk absorption through the tax-and-benefits system.

When aggregating these components into single indicator of labour market security, three issues are worth highlighting:

- Aggregating the risk and insurance components of labour market security into a single component of labour market security is not straightforward as this requires deciding on the appropriate weighting factors and the unit of measurement to be used. Using equal weights for the risk and insurance dimensions effectively restricts the definition of overall labour market insecurity in terms of lost income. While this may be appropriate in certain contexts, it is unlikely to be the case when assessing labour market performance in terms of work-related well-being, since the risk of unemployment goes well beyond the loss of income.²⁹ Unfortunately, proposing a set of weights that is likely to garner widespread support is not obvious. This chapter, therefore, either considers the two main components of labour market security separately or explicitly confines itself to its financial aspects using equal weighting factors.
- In order to effectively take account of the mitigating role of insurance for labour market insecurity at the country level, it is important to first define labour market insecurity at the level of each socio-economic and then aggregate across groups. This is the case because of value of insurance depends positively on the degree of labour market risk. This also means that the distribution of risk and insurance matters for the overall degree of labour market insecurity. Indeed, it is often believed that in many OECD countries workers on part-time and temporary contracts not only face a higher risk of unemployment, but also are less likely to qualify for unemployment benefits. While the data used for the analysis confirm this is indeed the case for part-time workers, the data not reveal significant differences in terms of effective insurance rates between temporary and permanent workers. The latter is surprising given that temporary workers are much less likely to meet the minimum contribution requirements to qualify for unemployment insurance. Since this expectation is rather strong it seems likely that the current results for insurance by type of contract reflect particular issues in the data or the construction of the insurance measure. *[See the box with supplementary material at the end of this sub-section for further details].*
- Aggregating the risk and insurance components across sub-groups of the population to obtain country-level measures of risk and insurance also raises certain issues related to the role of risk and inequality aversion. The presumed presence of risk aversion provides an important motivation for considering labour market security as a separate dimension of employment quality. However, risk aversion also implies that the distribution of labour market security across sub-groups is likely to matter for aggregate welfare and, hence, may provide a justification for assuming inequality aversion when constructing an aggregate indicator of overall labour market security. However, doing so raises a variety of data and conceptual issues that are not easily addressed and is therefore not pursued here. Box 3.6 discusses the measurement of labour market insecurity in more detail and how this could be extended to take account of differences in the distribution of insecurity across socio-economic groups.

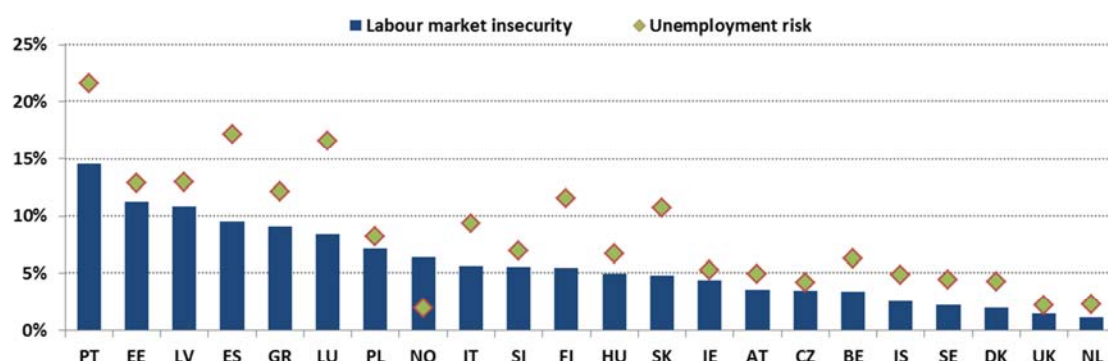
35. Figure 3.7 presents the composite measures of labour market risk and labour market insecurity. Among the countries considered, the highest average levels of labour market risk and insecurity are observed in Estonia, Latvia, Portugal and Spain, while the lowest levels are observed in Denmark, the United Kingdom, the Netherlands and Sweden.

²⁹

Osberg and Sharpe (2009) suggest using weights 0.8 for unemployment risk and 0.2 for unemployment insurance. OECD (2014) calculates shadow prices to overcome the problem of multi-dimensionality.

Figure 3.7 Labour market insecurity across countries

2005-2010 averages



Notes: Risk figures on the upper panel are (weighted) averages of the ratio of job-losing to job-finding hazard for 2010 in a given country. Insurance figures on the same panel represent cross-country averages for the 2005-2010 period using the “narrow” conception of unemployment insurance that includes unemployment benefits only. The ranking of countries in terms of labour market security is robust to the choice of insurance.

Source: OECD calculations based on the European Union Statistics on Income and Living Conditions (EU-SILC)

Box 3.6 Measuring labour market insecurity at the individual and country level

Given the multiplicative nature of the definitions of labour market security, it is important to define labour market insecurity at the individual level first before aggregating over individuals rather than to first aggregate the components of labour market insecurity and multiply them at the aggregate level. The resulting measures of overall labour market insecurity may be very different when the different components of labour market insecurity are correlated across individuals.

Individual labour market insecurity

When unemployment is in steady-state, that is, unemployment inflows equal unemployment outflows, one may approximate the unemployment rate by the job-losing and job-findings hazard rates, s_i and f_i (see Elsby et al., 2009; Shimer, 2012). Consequently, one may define the degree of labour market risk in terms of unemployment for a given individual i as $\rho_i^G = s_i / (s_i + f_i)$. The degree of labour market insecurity in terms of the unemployment risk and insurance for a given individual i is defined as $\rho_i^N = s_i(1 - r_i) / (s_i + f_i)$ where r refers to the effective degree of absorption of income shocks associated with unemployment through the tax and benefits system. For the present purposes, it is assumed that labour market insecurity is constant within sub-groups of the population defined in terms of age and experience but differs across groups with different types of contract. In principle, this assumption may be relaxed by predicting individual probabilities based on a person’s individual characteristics, but this is not done here.

Aggregate labour market insecurity

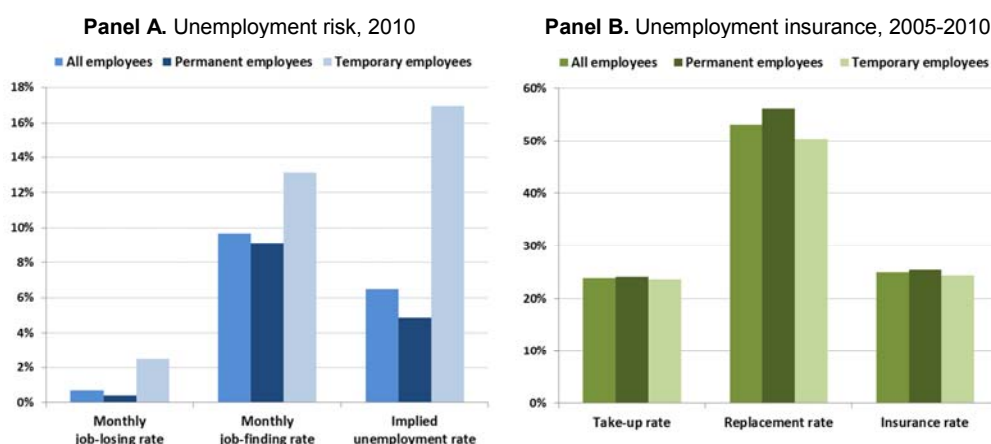
In order to measure overall labour market insecurity at the country level, one obvious possibility is to take a simple (arithmetic) average of labour market insecurity across individuals and this the approach followed here. However, this effectively involves assuming that the distribution of insecurity across individuals does not matter, although this may be important of overall labour market insecurity when individuals are risk averse or social planners have an aversion against the concentration of insecurity among specific groups. In principle, one could take account of risk and inequality aversion for the overall measurement of labour market insecurity by making use of the general means framework that was introduced in the previous sub-section to characterise the overall quality of earnings. Moreover, when focusing specifically on differences in labour market insecurity between temporary and permanent workers, one may be able to take account of certain aspects of labour market segmentation for the overall measurement of labour market insecurity. This is left for further work.

Further material on the measurement of labour market insecurity by type of contract (NOT FOR PUBLICATION)

The figure below documents the average risk of unemployment and effective unemployment insurance for temporary and permanent workers across the countries considered. It confirms that the risk of unemployment for temporary workers is substantially higher than for permanent workers but, contrary to expectations, that the effective rate of unemployment insurance as well as take-up are rather similar between temporary and permanent workers. This is surprising since there are strong reasons to believe that take up and hence effective insurance should be lower among temporary workers since they are less likely to meet the minimum contribution requirements to qualify for unemployment insurance. Since this expectation is rather strong it seems likely that the current results for insurance by type of contract reflect particular issues in the data or the construction of the measure of insurance. One possible explanation is that permanent and temporary contracts differ in their propensity to leave employment voluntarily and become voluntarily unemployed. Indeed, there is some evidence that permanent workers are more likely to become unemployed voluntarily when they become unemployed and as a result do not qualify for unemployment benefits. However, in many of these cases, permanent workers do receive negotiated severance pay which according to the description in EU SILC should be included under unemployment benefits (it includes all severance pay and termination payments that compensate employees for employment ending before the employee reached retirement age as well as redundancy compensation which includes capital paid to employees who have been dismissed through no fault of their own by an enterprise that is ceasing or cutting down activities). All in all, further work is required to establish reliable indicators of effective unemployment insurance by type of contract such since information does not exist on a cross-country basis.

[Even for OECD individual countries such information is difficult to obtain. The OECD Secretariat would be grateful for any studies or descriptive on coverage and replacement rates among the unemployed by last contract status that countries could bring to its attention. In a number of countries such information may be available from their administrative system of unemployment insurance].

Unemployment risk and insurance by type of contract (NOT FOR PUBLICATION)
Cross-country averages



Notes to Panel B: Unemployment insurance is based on narrow concept (see Box 3.5). Take-up rates denote the share of unemployed workers that report having received positive unemployment benefits in the reference period, while the replacement rate was derived as the ratio of the effective insurance rate and the take-up rate.

Source: OECD calculations based on the European Union Statistics on Income and Living Conditions (EU-SILC)

2.3 Quality of the working environment³⁰

36. The quality of the working environment (QWE) is a key determinant of life satisfaction, as people spend most of their daily life at work. Well-being in the workplace, as shaped by work organisation

30. This section has been prepared with the assistance of Hande Inanc.

and workplace relationships, has gained momentum in the public debate, in part due to an increasing awareness of work-related health problems among the public at large. This change went along with a wealth of research in occupational health, epidemiology, management and sociology, indicating that there is a strong relationship between QWE and workers' physical and mental well-being. But defining and measuring QWE is challenging as it requires looking at many different aspects of a job, as well as understanding their interrelations. No international framework for measuring job quality currently exists that provides a comprehensive picture of QWE. For instance, the ILO Decent Work framework does not cover this dimension (ILO, 2012). While the UNECE framework for Measuring Quality of Employment and the Eurofound framework on Job Quality include a number of QWE aspects, they do not fully account for their interrelations (UNECE, 2010; Eurofound, 2012a). Building on the literature on occupational health, recent studies have investigated this important issue at the international level, establishing strong links between job quality and various health outcomes (Eurofound, 2012b; OECD, 2012 and 2013).

Job strain and workers' well-being: a brief literature review

37. Numerous studies on occupational health have been conducted over the past three decades, investigating the mechanisms by which work organisation and workplace relationships can have an impact on employee well-being. Several models have been developed to identify the various components of QWE, i.e. the various attributes of a job that affect workers' physical and mental health (Box 3.7). These models postulate that in their daily work people face a variety of so-called "job demands", which require sustained physical, cognitive and emotional effort. Examples of such demands include dealing with heavy workload and time pressure, coping with conflicting demands, or performing physically demanding tasks. Workers also have a number of resources at their disposal, whether physical, psychological, organisational or social (e.g. work autonomy, well-defined work goals, appropriate feedback, opportunities to learn and support from colleagues and managers). These so-called "job resources" help workers to cope with difficult demands, to achieve work goals, and stimulate learning and personal development. One basic premise of occupational health models is that job demands are not necessarily negative, but they can turn into job stressors when the employee does not have enough job resources to meet these demands. Excessive demands combined with insufficient resources, hence, create job strain, which is a crucial risk factor for workers' physical and mental well-being. According to these models, it would be misleading to focus on job demands or resources in isolation, let alone on individual dimensions. A measure of job strain needs to be constructed.

Box 3.7 Quality of working environment and job strain: theoretical background

Two influential theoretical models have been developed regarding job strain as a health risk factor. The first one, the Job Demands-Control (JDC) model was developed by Karasek (1979). This model postulates that the primary source of job stress lies within the mismatch between two aspects of work: job demands and job control. Job demands are defined as factors increasing workload, such as high pressure and high pace at work, as well as difficult work. Job control, or decision latitude, is defined as workers' ability to control their own work activities and skill usage. What is detrimental for workers well-being is the strain arising from the joint effects of high job demands and lack of job control. The main prediction of this model then is that, the strongest adverse well-being outcomes will be experienced by those working in high demand jobs but with low control (so-called high-strain jobs). JDC model was extended in the late 1980s with the addition of a social support dimension (Johnson and Hall 1988, Johnson, Hall and Theorell 1989). According to the extended version, those high-strain jobs in which employees lack social support in the workplace are associated with the most adverse health outcomes.

An alternative model is the Effort-Reward Imbalance (ERI) model which emphasises the importance of rewards rather than job control (Siegrist, 1996). The main argument of this model is that effort at the workplace is exchanged with socially recognised occupational rewards such as adequate salary, esteem and job security. Job strain occurs when there is a lack of reciprocity between the level of effort put in and rewards received. According to the model, high effort/low reward conditions create psychological strain, which leads to cardiovascular diseases and other strain reactions. The ERI model introduces a personality component, as effort results from both extrinsic job demands and intrinsic work motivation to meet these demands. Some workers may overestimate the level of demands they face and

develop over-commitment as a coping mechanism; thereby putting excessive amount of effort with a strong desire of being approved and esteemed. The mismatch between the perceived level of job demands and effort also leads to psychological strain.

While both models have been widely applied in empirical research, they have some shortcomings. As they focus almost exclusively on work overload or excessive effort, and highlight work autonomy or reward as buffering elements, it is not clear whether they are relevant for, and can be applied to, all job positions and occupations. For instance, due to the emphasis on job control, both versions of JDC model tend to categorise manual/low skilled jobs as high strain jobs whereas the ERI model tends to classify fixed term jobs, or jobs without a career ladder, as high-strain jobs. Another possible limitation of the ERI model is its emphasis on personality traits, as this may raise issues of reverse causality and bias if overcommitted workers are more likely to report both high effort and stress.

The approach followed in this chapter draws on a more flexible and comprehensive model – the Job Demands-Resources (JDR) model (Bakker and Demerouti, 2007). The main premise of this model is that every occupation may have its specific underlying risk factors which can be classified as job demands and can be balanced with job resources. Extending beyond the “workload” and “excessive effort” dimensions used in JDC and ERI models, job demands refer to those aspects of the job that require sustained physical and psychological efforts (e.g. physically demanding tasks, heavy workload, time pressures, conflicting demands, or job insecurity). Likewise job resources extend beyond work autonomy and job reward, to include well-defined work goals and appropriate feedback on the work performed, opportunities to learn and support from colleagues and managers. Therefore, the JDR model provides an overarching framework which can be applied to a broad range of occupations. This aspect is of particular importance for international comparisons, as countries differ in their occupational composition.

38. There is a longstanding tradition of psychometric scales and indices constructed in order to measure job strain, going back to late 1960s (for a review, see Landsbergis et al. 2000).³¹ Detailed analyses of their measurement properties have been conducted in order to assess their reliability, content validity, diagnostic power and the extent to which they can be applied to workers in various occupations, sectors and countries. In medical research, these measurement tools were mostly used to investigate work risk factors of cardiovascular diseases, whereas in health care services they were used in examining the determinants of sickness absence and burnout. As a result, there is now abundant evidence that workers’ physical and mental health status is a major outcome of the QWE (see Annex Table A3.2.1 for a review of recent empirical studies).

39. In epidemiological research, a wide range of prospective studies have flourished over the last three decades, testing the job strain hypothesis in different countries coverage and over a variety of worker samples. These studies measure work characteristics at a baseline questionnaire, and then follow the sample over a number of years. They link initial working conditions with subsequent health status, accessed through official health registers, clinic examination or self-report of employees. Most of these studies select participants who are free of the health outcome in question at the baseline stage, and control for common risk factors, such as lifestyle factors (e.g. tobacco smoking, alcohol intake and physical activity) and conventional coronary risk factors (e.g. cholesterol and diabetes status). They provide good evidence for a causal role of poor working environment, as they consistently find a strong adverse effect of job strain on a number of health outcomes, including cardiovascular and coronary heart diseases, high blood pressure and musculoskeletal diseases (e.g. Kivimäki et al., 2012; Slopen et al., 2012).

31 . The most widely used of these scales are those included in and adopted from the Job Content Questionnaire (JCQ). This questionnaire, based on 27 questions, was taken from the American Quality of Employment Surveys, which were first used in 1969, then in 1972 and 1977 on a nationally representative sample of employed individuals. JCQ was updated in 1985 with an addition of 14 questions. The questionnaire has been widely used internationally, with generally good and similar measurement properties across countries and among men and women. Derivations of the JCQ, such as the Swedish Demand-Control Questionnaire, Whitehall Job Characteristics Questionnaire, the Effort-Reward Imbalance Questionnaire and the Occupational Stress Index were used in various contexts to assess the relationship between job strain and workers’ health.

40. Links have also been established between job strain and mental health of workers, most often through cross-sectional analyses based on self-reported measures of both working conditions and health status (Bakker and Demerouti, 2007). Interestingly, these studies look at both negative (burnout) and positive (work engagement) aspects of psychological well-being.³² They generally find a strong relationship between job demands and burnout, and between job resources and work engagement. A positive relationship between low job resources and burnout is also found, although this relationship is generally weaker than with job demands. Yet, these cross-sectional studies do not allow inferring any causal links. Workers facing poor working conditions are more likely to report mental health disorders because of high job strain, but individuals with mental health problems are also more likely to report high job strain because of their poor health conditions. To deal with potential reverse causality issues some studies incorporate work-unit aggregated scores of workplace conditions. An adverse health effect of job strain is still found, lending further support to the existence of a causal link (e.g. Kolstad et al. 2010). Available longitudinal studies tend to confirm these findings (Stansfeld and Candy, 2007; Netterstrøm et al., 2008). In particular, the few prospective studies that account for the duration and intensity of exposure to job strain find relatively strong links between job strain and the development of mental health disorders (e.g. Stansfeld and al., 2012).

A summary measure of the incidence of job strain

41. The literature on occupational health provides useful conceptual frameworks – supported by strong empirical evidence – that can serve as a basis for developing a summary measure of QWE. Not only this literature allows identifying the various aspects of QWE that are of greatest importance to workers, but it also provides important insights to address the dimensionality problem raised by its measurement. What ultimately shapes the overall QWE is the interaction of its various components; hence, the latter have to be aggregated at the individual level into few synthetic indices that account for both their cumulative and compensating effects on an individual physical and mental well-being. Accordingly, this section presents three synthetic indices related to QWE, using data from the European Working Conditions Survey (EWCS): an additive measure of various job demands, an additive measure of various job resources, and a synthetic index that accounts for the buffering effects of job resources on the relationship between job demands and well-being at work. The incidence of strained jobs, which combine a high level of demands with few resources, is retained as a summary measure of overall QWE.

42. Drawing on OECD (2013), the summary measure of total job demands relates to: i) the overall time pressure faced by employees; ii) the existence of conflicts between job requirements and personal ways of thinking or behaving (the so-called “emotional demand”); iii) the exposure to physical health risk factors at work; and iv) intimidation in the workplace. Regarding the index of total job resources, the following aspects of work organisation and workplace relationships are included: i) work autonomy and opportunities to learn at work; ii) well-defined work assignments; iii) support from managers; and iv) good relationship with colleagues. Each of these components of job demand and job resource is constructed from a set of EWCS questions reported in Annex Table A3.2.2. The underlying methodological choices are described in Box 3.8.

32. Burnout is often characterised by a combination of low energy (exhaustion) and low identification with one's work (cynicism), whereas work engagement is characterized by a combination of high energy (vigour) and high identification (dedication).

Box 3.8 Constructing synthetic indices of job demands and job resources

The measurement of job demands and job resources relies on various methodological choices, which imply: i) selecting a set of qualitative variables (i.e. survey questions) to measure the various aspects of QWE; ii) defining a normalisation procedure to compare these variables, initially measured on different scales; iii) aggregating these variables into a reduced number of components, which refer to broad categories of job demands or job resources; and iv) setting up corresponding thresholds for defining good and bad achievements on each of these components.

Existing psychometric scales and indices of job strain provide critical guidance on the type of survey questions that can be used for measuring the various components of total job demands and that of total job resources. Yet, the precise set of questions to be selected among the many included in the EWCS inevitably relies on some judgments and also depends on the purpose of the exercise. Since the approach followed in this chapter gives prominence to objective features of job quality, the subject matter of the question should be objective and precise (e.g. whether an individual can choose or change the order of tasks to be accomplished), as well as readily interpretable in terms of QWE. For instance, questions about tasks complexity or whether a job involves solving unforeseen problems were not selected as they are somewhat ambiguous in this context. While they are often used to describe autonomy and skill discretion (e.g. Eurofound 2012b, OECD 2012), they might also reflect poor work organisation. Likewise, broad questions about emotional demands (e.g. whether a person gets emotionally involved in his/her work) were not selected as they are difficult to interpret in terms of positive or negative outcomes. Based on these selection criteria, 31 variables have been retained and converted into binary variables, describing a range of specific demands and resources that workers in various occupations and industries may (or may not) face in their job (Annex Table A3.2.2). Altogether, these indicators cover many different aspects of work organisation and workplace relationships, going beyond OECD (2012) which concentrates on (quantitative and qualitative) workload and decision latitude to analyse the relationship between job strain and mental illness. But their scope is more limited than that of the Eurofound study on health and well-being at work, which also incorporates indicators on job security and earnings (Eurofound, 2012b).

The four main components of total job demands (time pressure, conflicting demands, emotional demands and workplace intimidation) and that of total job resources (autonomy and learning, task clarity, support from managers and relationship with colleagues) have been constructed by summing up the various binary variables selected for measuring them, and then, by setting up eight thresholds that define good and bad achievements on each of these components, respectively. In other words, this set of thresholds allows identifying whether a worker faces several types of demands and/or lacks several types of resources. Given the distribution of these components (Annex Figure A3.2.1), the following thresholds have been set up: i) for each component of total job demands, a worker is considered to face the corresponding type of demand if the component takes a value of at least one (on a scale of 0 to 3 or 4, depending on the component); ii) for each component of total job resources, a worker is considered to lack the type of resource in question if the value of the component is strictly below its maximum value (varying from 3 to 5, depending on the component). These thresholds have been chosen so that the total number of job demands and that of job resources follow, to the extent possible, a relatively balanced distribution over their range of possible values (from 0 to 4, Annex Figure A3.2.2). This, in turn, makes it possible to analyse various combinations of demands and resources, and therefore, to identify more precisely which ones are most likely to result in job strain and cause health impairment.

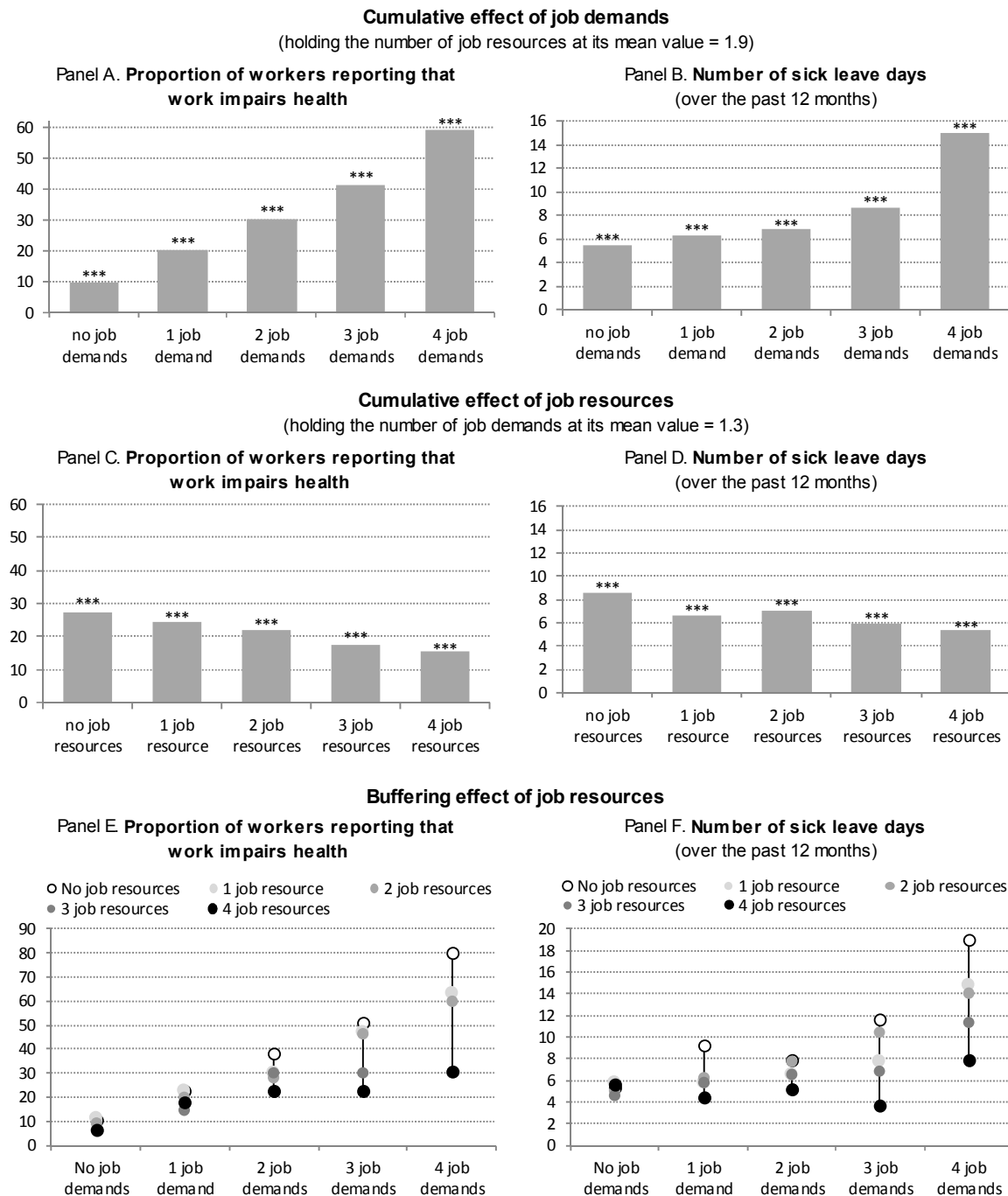
In order to test the validity of the set of raw variables used to measure the job demand and job resource components, and to investigate whether the choice of a particular set of thresholds affects the validity of these components, their link to workers' health status has been examined for each possible set of thresholds (around 35,000). Each component of total job demands is consistently found to be associated with an increased probability of reporting that work impairs health, while the opposite relationship is found with respect to each component of total job resources (Annex Figure A3.2.3). These results are in line with occupational health models and empirical studies. And while the estimated effects are not always statistically significant due to collinearity problems (e.g. task clarity and support from managers are two separate but correlated aspects of QWE – see Annex Figure A3.2.4), their size does not vary much with the set of thresholds retained. Taken together, these results suggest that the various components of total job demands and resources have sufficient face validity, i.e. they effectively capture what is intended to be measured. Some caveats need to be added, however. Beyond objective aspects of work, QWE indicators also reflect workers' subjective judgment about their job, notably with respect to components such as emotional demand, support by managers or relationship with colleagues. Despite the subject matters being objective (i.e. they can be observed by a third party), measurement tools are subjective since they rely on self-report of employees. Hence, these measures can be influenced by various factors such as adaptation, relative comparisons, personal circumstances and individual characteristics, or socio-cultural factors.

43. Empirical studies on occupational health provide clear indications on the type of survey questions that can be used for measuring the various components of total job demands and that of total job resources. But a difficult question – not addressed by these studies – is how to measure the incidence of job strain in a way that allows for comparisons across countries. Existing studies focus on the health impact of job strain, rather than on its incidence, using the median number of job demands and that of job resources observed in a particular country to define high or low levels of total job demands and high or low level of total job resources, respectively (e.g. Kivimäki et al., 2012). Therefore, cross-country studies assess the consequences of job strain for workers' physical or mental health in various countries, using country-specific measures of job strain (i.e. high demands and low resources are defined at country level). While this approach allows the health impact of job strain to be compared across countries, at least qualitatively, it does not allow for cross-country comparisons of its incidence.

44. OECD (2012) and OECD (2013) make a first attempt to address this issue by setting up thresholds for job demands and job resources that are common to all countries covered by the analysis and respectively correspond to the median (or average) number of job demands and job resources observed across those countries. This yields an internationally comparable measure of the incidence of job strain, based on a relative concept of job strain. Hence, this approach implies that the number of countries included in the analysis and, most importantly, their respective characteristics (e.g. job quality, size, etc.), impact the proportion of strained jobs observed in each country, by affecting the definition of job strain itself. Moreover, as with other relative concepts (e.g. the concept of relative poverty), comparisons over time can be difficult to interpret because the definition of the concept itself evolves over time (e.g. the poverty line changes over time; similarly the cut-off points for job demands and job resources). To overcome these difficulties, this section uses an absolute definition of job strain, by identifying the combinations of job demands and job resources that have a strong negative impact on workers' health.

45. The EWCS lends itself rather well to this exercise as it contains several questions related to workers' health status. Two measures of health outcomes are used: i) the share of workers reporting that work impairs their health, and ii) the average number of sick leave days taken by employees over the last 12 months. These two indicators have their own advantages and drawbacks. While the first indicator explicitly links health problems to working conditions, it partly relies on workers' subjective judgement about both their job and their health status. The second indicator provides a more objective measure of health problems, but these are not necessarily due to a poor working environment. Yet, taken together, these two complementary measures of health outcomes can shed important light on the relationships between job demands, job resources and workers' health (Figure 3.8).

Figure 3.8 Cumulative and buffering effects of job demands and job resources



***, **, *: statistically significant at 1%, 5% and 10% levels, respectively.

a) Pooled data for 23 countries (14,500 observations): Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovenia, Slovak Republic, Spain, Sweden, Turkey and United Kingdom.

b) Panels A-D show the estimated effects of job demands and job resources on the probability of reporting that work impairs health (logistic regression, Panels A and C) and on sickness absence (OLS regression, Panel B and D). Explanatory variables for Panels A and B (resp. Panels C and D): 5 dummy variables for the number of job demands (resp. job resources), and a discrete variable – ranging from 0 to 4 – corresponding to the number of job resources (resp. job demands). Additional control variables: age, sex, educational attainment, marital status, number of children and country dummies.

c) Panels E and F show the estimated effects of various combinations of job demands and job resources on the probability of reporting that work impairs health (logistic regression, Panel E) and on sickness absence (OLS regression, Panel F). Explanatory variables: 25 dummy variables corresponding to the 25 possible combinations between the number of job demands and that of job resources. Additional control variables: age, sex, educational attainment, marital status, number of children and country dummies. Estimated effects shown are significant at the 10% level (at least).

Source: EWCS (2010), Eurofound.

46. First, the accumulation of job demands has a strong negative impact on workers' health (Panels A and B). Everything else being equal (age, sex, educational attainment, marital status, number of children and number of job resources), workers with demanding jobs report higher exposure to work-related health problems and are also more frequently on sick leave. Differences are sizeable. On average across the 23 countries for which data are available, 60% of workers facing four job demands report that their work impairs their health, against 10% only among those workers with no job demands (Panel A). And on average over the past 12 months, the latter were absent from work for less than six days due to health problems, while the former took more than 14 days of sick leave (Panel B).

47. Second, the accumulation of job resources has a positive impact on workers' health, albeit less pronounced than the detrimental effect of job demands (Panels C and D). Everything else being equal, benefiting from adequate job resources reduces work-related health impairment, as self-reported by employees, and sickness absence. Almost 30% of workers lacking resources to accomplish their job duties report that their work is detrimental to health, as compared to 15% among workers with four job resources at their disposal (Panel C). This latter group also shows an average of 5 sick leave days over the past 12 months, 3 days less than workers with no job resources (Panel D).

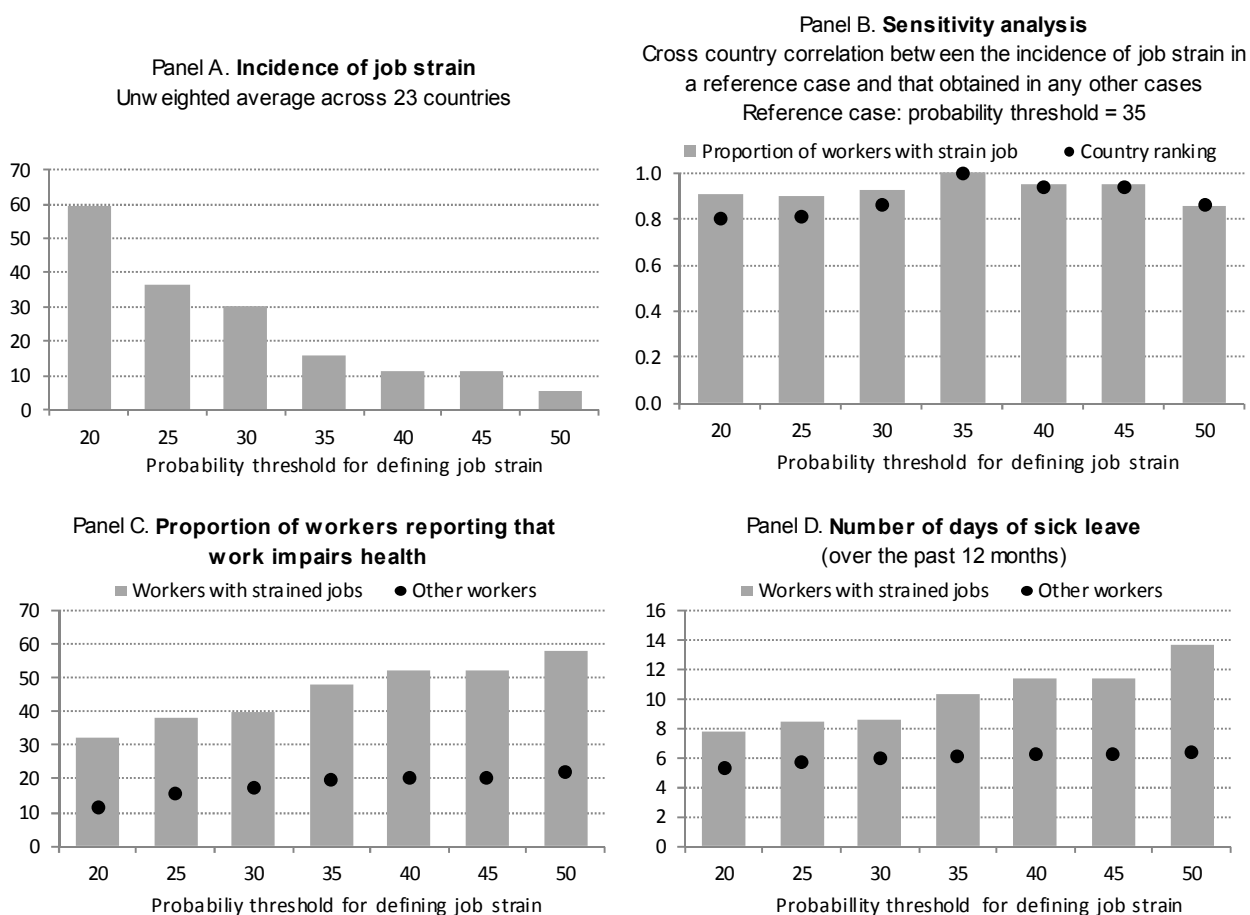
48. Third, the level of total job resources plays a significant role in mitigating the health impact of job demands, especially for high levels of total job demands (Panels E and F). Among workers facing four job demands, 30% of those with four job resources report that work impairs their health, a proportion that reaches 80% for their counterparts with no resources at their disposal (Panel E). The latter also report 18 days of sick leave over the past 12 months, as compared to eight days among workers also facing four job demands but benefiting from four job resources (Panel F).

49. While this cross-sectional analysis does not allow inferring causal links between QWE and health outcomes, the empirical literature on occupational health provides good evidence that a job combining high demands with insufficient resources *does* impair health (see Annex Table A3.2.1 for a review of recent empirical studies). The results presented above are qualitatively consistent with the findings of more rigorous longitudinal studies, providing confidence that the various indicators retained to measure job demands and job resources are relevant, at least to a certain extent. However, their estimated impacts on workers' health are likely to be overstated due to potential reverse causality biases (that cannot be controlled for in cross-sectional analyses). With these caveats in mind, these estimates will serve as criteria for defining job strain.

50. In what follows, job strain will be characterised by the set of combinations of total job demands and total job resources that are most likely to have a detrimental effect on workers' health. More precisely, job strain is made up of all combinations associated with a proportion of workers reporting work-related health impairment that is higher than a given threshold. Hence, defining job strain implies choosing this probability threshold. To take an example, Figure 3.8 (Panel E) shows that for a threshold of 40%, strained jobs will correspond to all jobs combining three or four job demands with two job resources or less. As no objective criteria exist that can guide the choice of a particular cut-off point, a sensitivity analysis is presented in Figure 3.9.

Figure 3.9 How defining job strain?

A criterion based on the probability of reporting that work impairs health^a



a) Job strain is defined by the set of combinations of job demands and job resources (in quantitative terms) that result in health impairment. More precisely, job strain is made up of all combinations associated with a probability of reporting that work impairs health (as shown in Figure 3.9, Panel E) that is higher than a given threshold (the so-called “probability threshold for defining job strain” in the above figures).

b) Country coverage: see Figure 3.9, note a).

c) Panel B: correlations coefficients shown are significant at the 1% level.

d) Panels C and D: estimated coefficients shown (logistic and OLS regressions, respectively) are significant at the 1% level. Control variables: age, sex, educational attainment, marital status, number of children and country dummies.

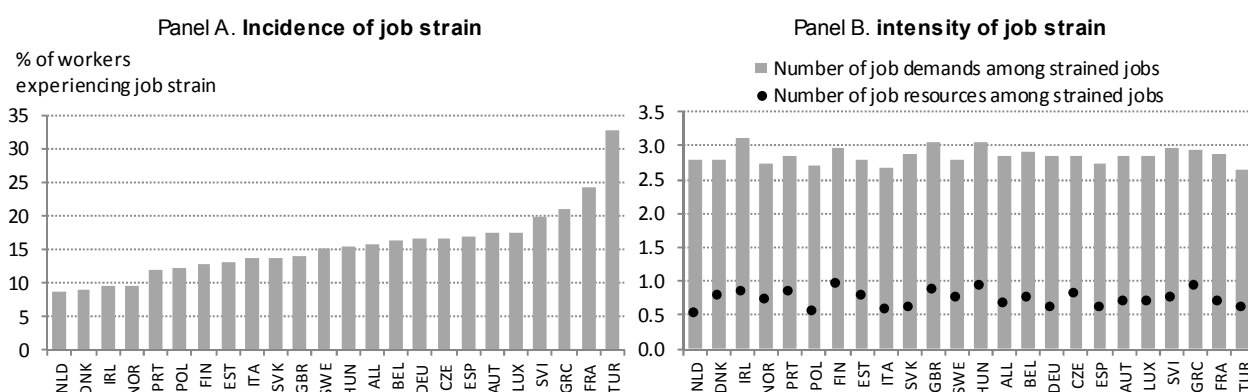
Source: EWCS (2010), Eurofound.

51. The incidence of job strain is highly sensitive to the probability threshold retained. On average over the 23 countries for which data are available, the proportion of strained jobs varies from 60% for a cut-off point corresponding to 20% of workers reporting that their work impairs their health to 5% for a threshold set up at 50% (Panel A). Yet, cross-country comparisons in the incidence of job strain are not affected much by the choice of a particular threshold (Panel B). Indeed, the proportions of strained job obtained for various thresholds (as well as their ranking) are highly correlated across countries, with a correlation coefficient of at least 0.8 in all cases. Regarding the portion of workers reporting work-related health impairment, as well as the number sick leave days, they increase with the probability threshold retained (by construction for the former), but with a gap at 35% and 50% in both cases (Panels C and D). The intermediate value of 35% is retained for *defining* job strain, where almost one in two workers with

strained jobs report that their work is detrimental to health (against one in five among their counterparts with less demanding jobs). With this cut-off point, strained jobs also result in 10 sick leave days per year, as compared to 6 days in other jobs.

52. On average over the 23 countries for which data are available, 15.6% of employees can be classified as working in strained jobs (Figure 3.10, Panel A), with a remarkable variation across countries. At the one end of the range lie the Netherlands, Denmark, Ireland and Norway, with less than 10 per cent of employees experiencing job strain. At the opposite side of the range are Slovenia, Greece, France and Turkey, where strained jobs constitute one fifth to one third of all jobs held by employees. The remaining countries are clustered in the middle, with the incidence of job strain varying between 12 and 17 percent. Another important question is how strained are strained jobs. The intensity of job strain can be captured through the average number of both job demands and job resources faced by workers in strained jobs (Figure 3.10, Panel B). These two measures do not vary much across countries: the average number of demands among strained jobs ranges between 2.5 and 3, and that of job resources between 0.5 and 1. This suggests that for the purpose of international comparison, QWE can be measured by the incidence of job strain, without paying too much attention to its intensity. A major challenge is to extend the country coverage of this indicator (see Box 3.9).

Figure 3.10 Incidence and intensity of job strain

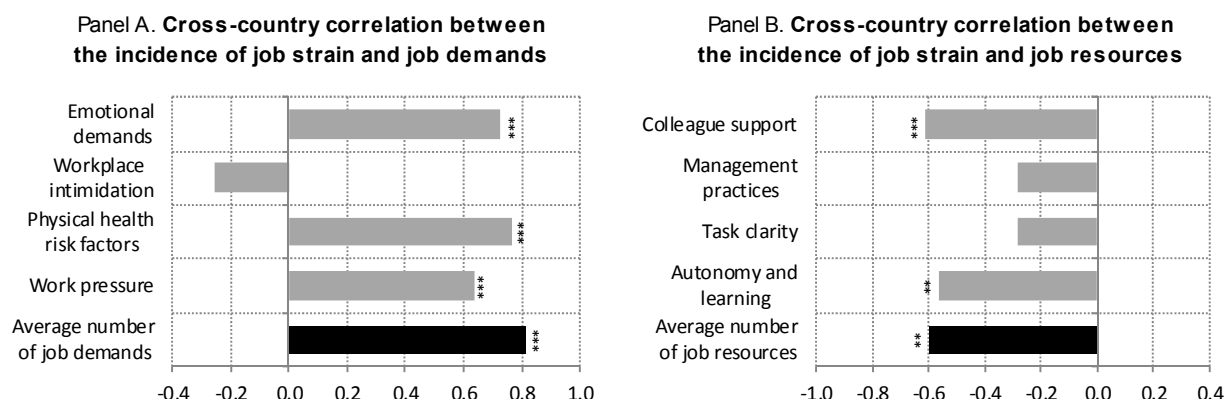


Panels A and B: countries are ranked by ascending order of the incidence of job strain.

Source: EWCS (2010), Eurofound.

53. Job demands are the main drivers of the cross-country variation in the incidence of job strain. Cross-country rankings of total job demands and the incidence of job strain have a correlation coefficient of 0.8, while the relationship is somewhat weaker regarding total job resources, with a correlation coefficient of -0.59. Likewise, some components of total job demands or total job resources are more important than others to explain the cross-country variation in the incidence of job strain. Taking job demands first, there is a strong correlation between the incidence of job strain and that of work pressure, exposure to physical health risk factors and emotional demands; whereas the incidence of workplace intimidation is not related to the cross-country ranking of job strain (Figure 3.11, Panel A). Turning to resources, the correlation with incidence of job strain is strong and statistically significant only for autonomy and learning opportunities, and for colleague support (Figure 3.11, Panel B). Note that even though workplace intimidation, task clarity and support from managers do not explain much of cross-country differences in the incidence of job strain, these dimensions still are strong determinants of work-related well-being at the individual level.

Figure 3.11 Main drivers of cross-country differences in the incidence of job strain



***, **, *: statistically significant at 1%, 5% and 10% levels, respectively.

Source: EWCS (2010), Eurofound.

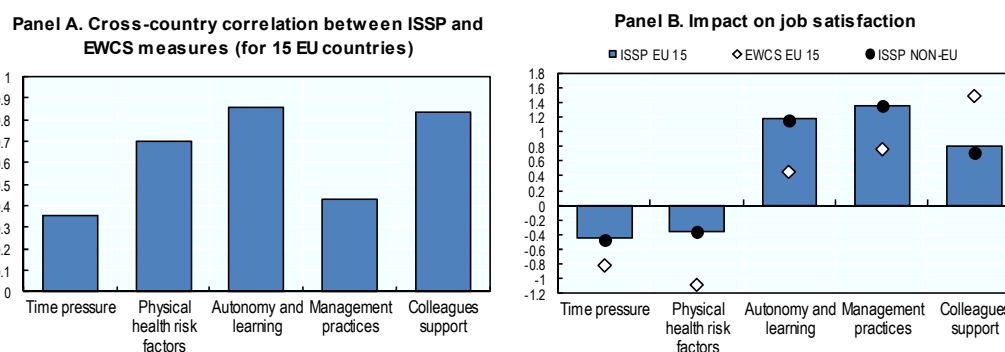
54. Summing up, this section has developed a summary measure of the QWE, which explicitly links QWE to both various job attributes and workers' health. By construction, the higher the incidence of job strain, the higher the incidence of work-related health problems and sickness absence. Therefore, this aspect of job quality, as defined and measured in this Chapter, has strong implications for the well-being of workers. Importantly, job strain can have important economic consequences: for employers in terms of lower workers' productivity, and for the society as a whole, entailing both a waste of human capital and an additional burden on public health systems. Better policies to improve the QWE are needed.

Box 3.9 Extending the coverage of QWE indices

To what extent can the QWE indices can be constructed for non-European member countries? The difficulty lies in the scarcity of international survey data which include the same aspects of workplace arrangements as to those in the EWCS. While being more limited in scope, the 2005 module of the International Social Survey Program (ISSP) provides information on some of the demands and resources included in the EWCS. ISSP data covers 26 of the OECD member countries and key partners, 15 of which are those European countries included in the EWCS. This set of common countries makes it possible to assess the comparability of the two data sources (using the 4th wave of the EWCS which was also collected in 2005), giving first indications as to whether ISSP could be used to analyse the QWE outside of the European countries. ISSP data provides questions relating to 2 of the demands (time pressure and physical health risk factors) and 3 of the resources (autonomy and learning opportunities, management practices and colleague support). Not only the question wordings are dissimilar, so do the number of questions measuring each dimension and answer scales to these questions (See Annex Table A3.2.3). For example, while there are a number of questions in the ISSP relating to autonomy and learning, there are only one question capturing management practices or colleague support.¹ Therefore, comparability of the two datasets depends on how well each demand and resource is correlated between the two data sources.

The Figure below compares the set of demand and resource variables that can be measured with both ISSP and EWCS data, in the 15 countries covered by both data sources. There is a positive and strong correlation across countries between the EWCS and ISSP measures in terms "physical health risk factors", "autonomy and learning opportunities" and "colleague support", while the correlation is weak for "work pressure" and "management practices" (Panel A). With respect to the well-being implications of QWE in non-EU countries, job satisfaction is the only comparable well-being indicator in both datasets (Panel B). As to the 15 common countries, EWCS and ISSP data provide a similar picture: job demands affect job satisfaction negatively whereas job resources have a positive impact on satisfaction with the job. In other words, the selected dimensions of QWE have a significant effect on subjective well-being of employed individuals, which is robust to differences in their measurement. The pattern is remarkably similar outside Europe. In a diverse group of countries including Australia, Canada, the United States and New Zealand as well as other countries such as Israel, Mexico, Japan and Korea, job demands reduce job satisfaction whereas job resources improve it. Overall, these results give some confidence that, even though questions differ, ISSP data could be used to assess some aspects of the QWE outside Europe.

Comparison between EWCS and ISSP data (2005)



EU countries (EWCS and ISSP): Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Netherlands, Norway, Portugal, Slovenia, Spain, Sweden and United Kingdom.

Non-EU countries (ISSP): Australia, Canada, Israel, Japan, Korea, Mexico, New Zealand, Russia, South Africa, Switzerland and the United States.

Panel A: Two countries have been excluded (outliers): Germany for time pressure, autonomy and learning, and colleagues support; and Portugal for management practices.

Panel B: Logistic regressions. All coefficients are significant at $p < 0.001$ level.

The OECD's Statistics Directorate is currently undertaking a stock taking exercise to create a permanent database and developing guidelines for national statistical agencies for measuring QWE. The database involves existing data sources capturing various aspects of the QWE that can be compared across OECD countries, as well as with the OECD's key partners. The approach is to assess comparability of QWE indices obtained from alternative cross-country datasets that contain differing combinations of job demands and resources. As seen before, it is possible to assess countries in terms of eight separate job demands and resources using the EWCS, whereas the ISSP provides information only on five of those dimensions. Other data sources cover a number of dimensions, some of which are not included in the EWCS. It is crucial therefore to determine whether or not a reduced job strain indicator can be developed that would give reasonably comparable cross-country rankings using alternative data sources. An indicator that is composed of a smaller number of QWE dimensions could be considered a good indicator provided that country rankings in job strain correlate well with country rankings with full indicator. If the exclusion of certain dimensions has a large impact on country rankings, then such job strain indicator cannot be used in international comparisons.

1. There have been some changes in the EWCS questions between 2005 and 2010 as well (see Annex Table A3.2.3).

3. A statistical portrait of job quality and its links to job quantity

55. Implementing effective policies that seek to promote more and better jobs requires a better understanding of potential interrelations between the various dimensions of job quality, as well as between job quality outcomes and employment outcomes. This section makes a first step in this direction, by providing a broad picture of job quality across countries and socio-demographic groups.

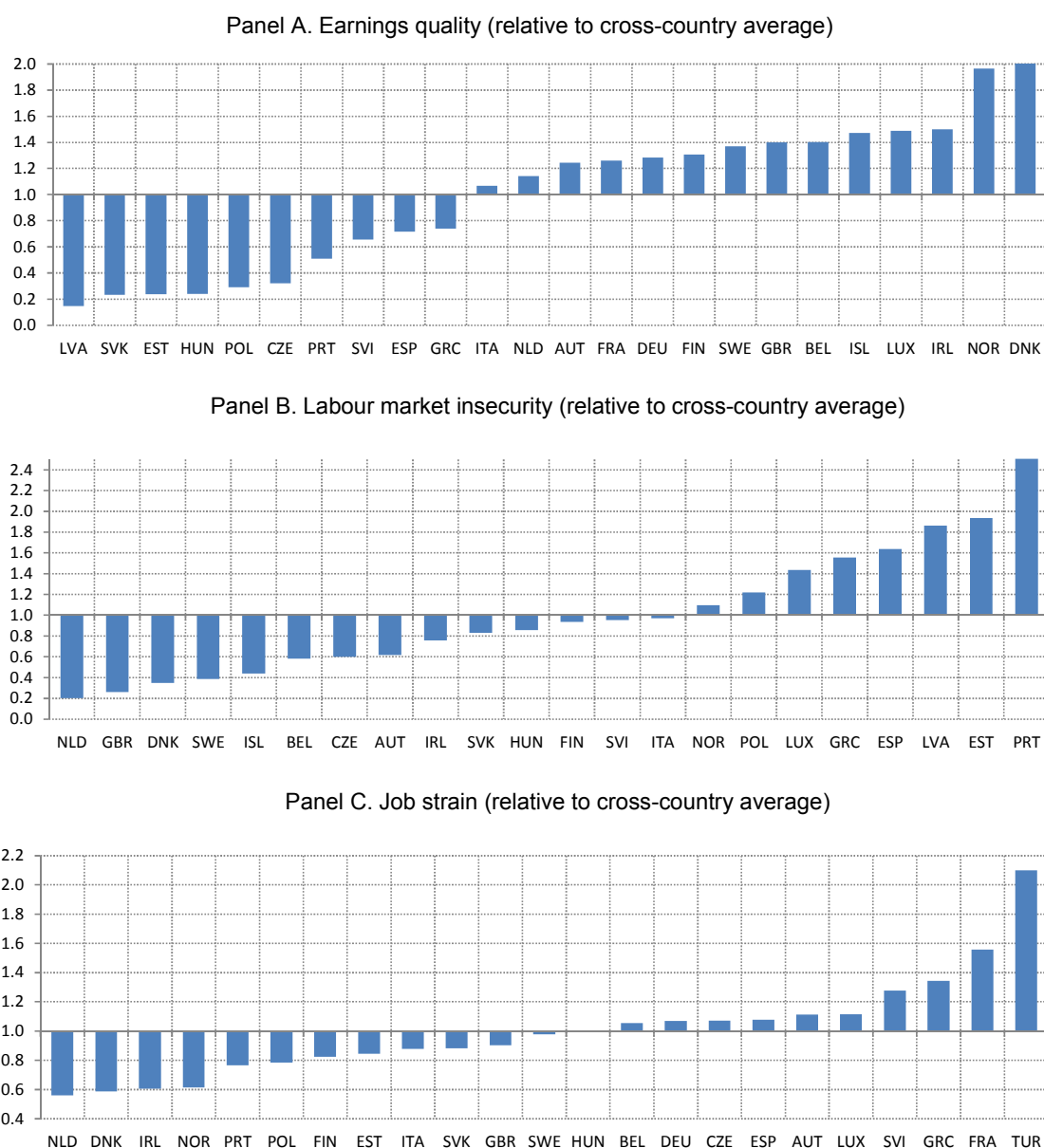
3.1. How do countries compare?

As seen in Section 2, job-quality outcomes vary substantially across OECD countries, whatever the dimensions considered (i.e. earnings quality, labour market security or the quality of the work environment). The results are summarised in Figure 3.12, where country performance on each dimension is reported as a percentage of the cross-country average. Summing up:

- The degree of overall earnings quality is highest in Denmark and Norway and lowest in the Central and Eastern European countries. The best performers have almost 10 times higher earnings quality than the worst performers.

- The overall degree of labour market insecurity is highest in Portugal and in the Baltic States (where it reaches 1.5-2.5 times the cross-country average) and lowest in countries such as the Netherlands, the United Kingdom, Denmark and Sweden (where it lies between one quarter and one half of the average). Interestingly, countries that are typically associated with relatively flexible labour markets tend to provide relatively high levels of labour market security.
- The quality of the work environment, as measured by the incidence of job strain, is highest in Denmark, the Netherlands, Ireland and Norway (where the incidence of job-strain is around half of the cross-country average), while it is lowest in Slovenia, Greece, France and Turkey (where the incidence of job strain is over 25 percent above the average).

Figure 3.12 Job-quality outcomes vary substantially across OECD countries



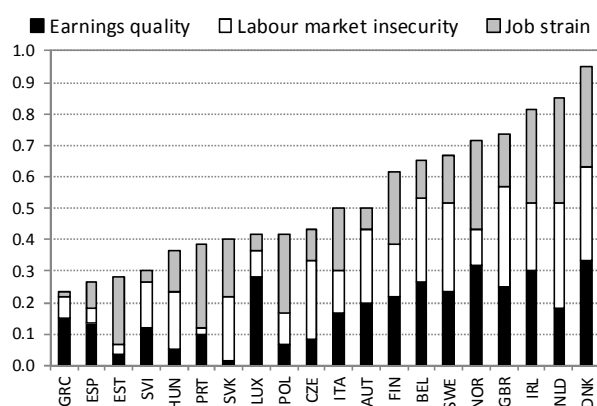
Source: Section 2 of this Chapter.

56. While the intention of this chapter is not to come up with a single composite indicator for the overall degree of job quality, it is nevertheless useful to get an idea of how the different dimensions of job-quality outcomes correlate across countries, i.e. whether they tend to reinforce each other in terms of overall labour market performance or, instead, give rise to potentially difficult trade-offs. For the countries for which information on each of the three dimensions is available, this can be done by aggregating the three measures based on a country's rank relative to its peers. Using rank-based aggregation allows getting a sense of how the different dimensions correlate across countries without having to assign explicit weights. Panel A in Figure 3.13 shows the results. The rank of a country in each separate dimension takes a value of up to .33, so that a country that ranks highest in all three dimensions should get an overall score of 1. Countries at the top of the overall rank-based distribution, such as Ireland, the Netherlands and Denmark, tend to do relatively well along all three dimensions, while Slovenia and Greece, which are located at the bottom end of the distribution, tend to do relatively poorly in each of the three dimensions. Nevertheless, there is not a strong correlation between the different dimensions across countries. This is mainly due to the countries in the middle of the distribution, which tend to perform rather differently along the various dimensions of job quality, despite having similar overall scores. For example, Austria and Belgium do relatively well on earnings quality, while they do relatively poorly with respect to the quality of the work environment. Similarly, Luxemburg does very well in terms of earnings quality, but its performance is very poor with respect to labour market security and quality of the work environment. By contrast, Czech Republic, Poland and Slovak Republic perform relatively well in terms of labour market security and the quality of the working environment, while they lag behind in terms of earnings quality.

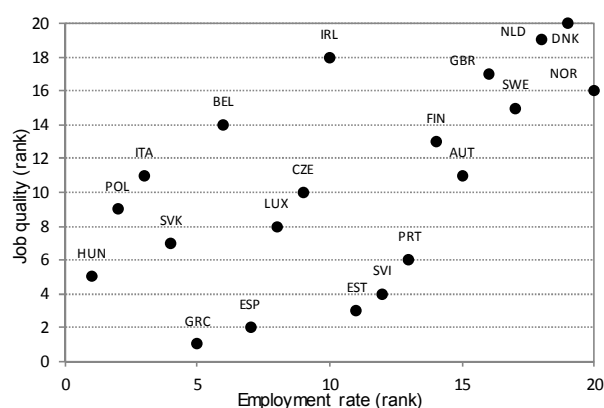
57. Panel B shows the relationship between the country ranking with respect to job-quality and their ranking with respect to the average employment rate between 2005 and 2010. There appears to be a clear relationship between labour market performance as measured by the employment rate and job quality. At the top-end, countries like Denmark and the Netherlands are characterised by high levels of job quality and high employment. At the bottom end, Greece and Hungary rank lowly both with respect to quality and the employment rate. Interestingly, at the bottom end the correlation is less strong. On one hand, countries like Poland and Italy have very low employment rates while they rank in the middle with respect to job-quality. By contrast, Estonia and Slovenia have a low rank with respect to job-quality while they rank in the top half with respect to employment.

Figure 3.13 How do countries compare in terms of job quality and job quality outcomes?

Panel A. Rank-based aggregation of job-quality outcomes by country



Panel B. Rank-based relationship between job quality and employment rates



Note: For every bar, each segment represents the country's position in the dimension-specific ranking.

Source: Section 2 of this Chapter.

3.2 Which workers hold quality jobs?

58. Apart from documenting job-quality outcomes across countries, it is also of interest to analyse outcomes across socio-economic groups, and in particular, to investigate whether so-called “disadvantaged workers”, who face reduced employment opportunities, also perform least well in terms of job-quality (Figure 3.14).

59. The overall degree of earnings quality varies substantially across socio-demographic groups (Panel A). It increases with age, which reflects increases in average earnings. Within-group earnings dispersion also increases with age and, if anything, therefore, has a tendency to offset the positive welfare impact of average earnings growth over the life-cycle.³³ There are also marked differences in average earnings across gender, a result that confirms the well-documented gender gap in earnings. But within-group earnings dispersions are larger for men than for women, hence the gender gap in the overall degree of earnings quality is less pronounced than it is with respect to average earnings. More education is associated with a higher quality of earnings, this relationship being largely driven by higher average earnings. Comparatively, within-group earnings dispersion plays a minor role, if any.

60. The overall degree of labour market insecurity differs across age groups and education levels (Panel B). The relationship between age and labour market insecurity is non-linear. Younger workers (15-29) face significantly higher labour market insecurity than prime-age workers (30-49), and the same applies, albeit to a lesser extent, to older workers (50-64). The relatively low level of overall labour market security for youth reflects a combination of above-average unemployment risk and below-average unemployment insurance. Older workers face the highest level of unemployment risk, but also the highest level of effective unemployment insurance. The high level of unemployment risk among older workers is likely to reflect the above-average expected duration of unemployment rather than the risk of becoming unemployed in the first place. More education is associated with greater labour market security due to a lower risk of unemployment, while the degree of unemployment insurance decreases with education. This partly reflects the fact that unemployment benefits are capped, implying that replacement rates decrease with (previous) earnings, and consequently, with education (since higher education is associated with higher earnings).

61. There is a strong negative relationship between education and the incidence of job strain (Panel C). More than 20% of low skilled workers experience job strain, against 11% among their high skilled counterparts. This appears to be driven by both declining job demands and increasing job resources with education, mainly because high skilled workers have more autonomy and learning opportunities at work and are less frequently exposed to physical health risk factors (Annex Figure 3A.2.5). Youth are also more likely to experience job strain than other workers, as they tend to face higher demand while having less job resources at their disposal. In particular, young workers report facing higher emotional demands and having less autonomy and opportunities to learn at work (Annex Figure 3A.2.5). Interestingly, there is no significant gender differential in job strain. While women face higher levels of emotional demands than men, they are less exposed to physical health risk factors at work (Annex Figure 3A.2.5).

62. Taking joint account of the quantity and quality of jobs available, some socio-demographic groups appear to cumulate many disadvantages, while other groups show a good performance on all dimensions:

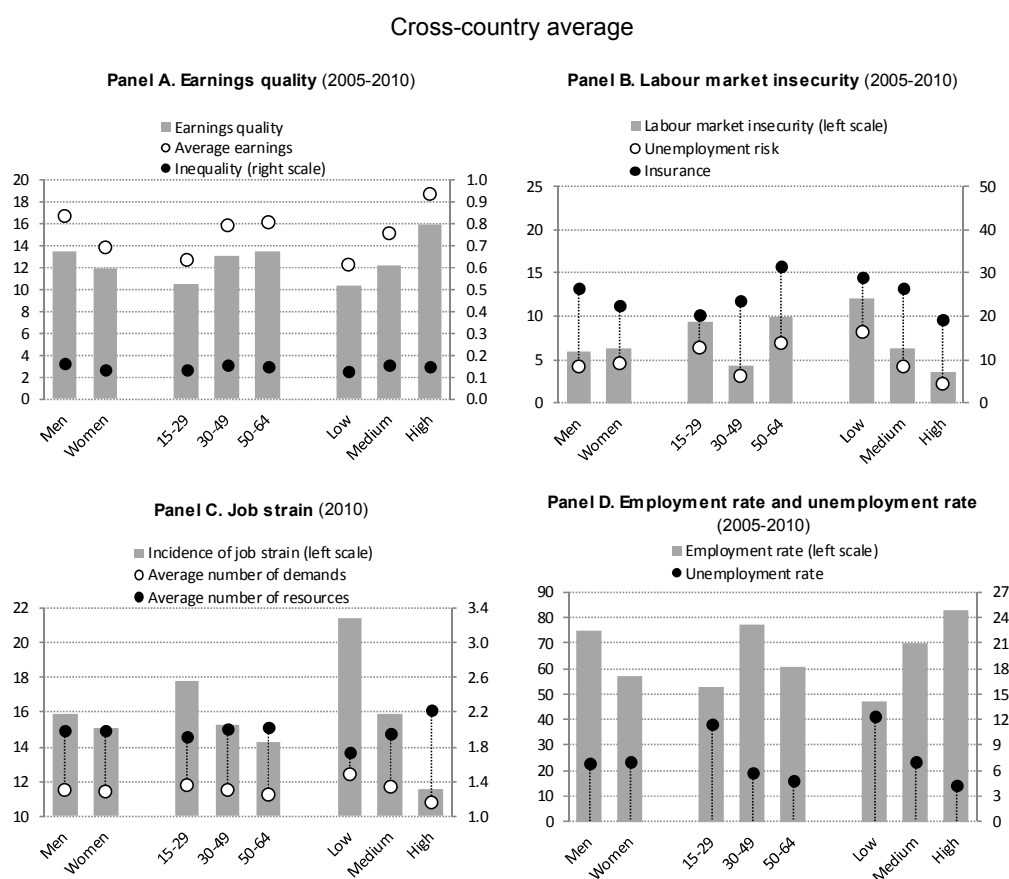
- *The worst off are youth and low skilled workers.* Young and unskilled workers face the lowest employment rates and the highest unemployment rates. Hence, they cumulate the poorest

33. The analysis in Section 2.1 suggests that between-group earnings inequality may be more important for individual welfare.

performance in terms of job-quantity with the worst outcomes with respect to job-quality. This is an important and novel result, which should further alert policy makers to the conditions of youth and unskilled workers in the labour market.

- *By contrast, highly skilled workers perform well on all dimensions.* The employment rate is significantly higher among more educated workers, while the unemployment rate decreases significantly with education. Such returns to skills in terms of job-quantity cumulate with the significant positive effects of education on job-quality, implying that educated workers have access to the best jobs in all dimensions.
- *As for women, the picture is mixed.* While unemployment rates are broadly similar between men and women, female workers face a significantly lower employment rate (a well-documented fact that reflects lower participation rates). This cumulates with the gender gap in earnings quality, but women's performance with respect to risk and job strain is not very different from men.

Figure 3.14 Job quality and job quantity outcomes by socio-demographic group



Source: see section 2 of this Chapter.

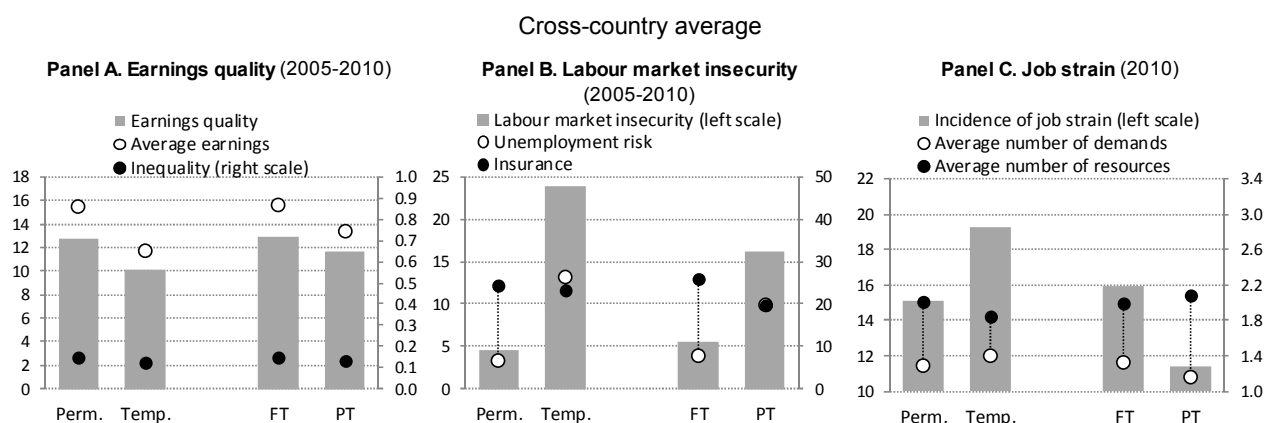
63. Another aspect of interest is the relationship between job quality and the type of employment defined as temporary vs. regular contracts or part-time vs. full-time work (Figure 3.15):

- *Temporary work is negatively and significantly associated with job quality in all three dimensions.* Temporary workers face lower earnings, higher levels of labour market insecurity

and higher job strain. While the findings with respect to earnings and labour market insecurity are well known (OECD, SPD 2013), the role of temporary contracts for job strain has received somewhat less attention so far, at least from economists. The higher incidence of job strain among temporary workers tends to be driven both by higher job demands and lower job resources. In particular, those workers report facing higher exposure to physical health risk factors at work and to workplace intimidation, while having less autonomy and learning opportunities and receiving lower support from their colleagues (Annex Figure 3A.2.6).

- *As for part-time work, the picture is mixed.* Overall earnings quality (in terms of hourly wages) is lower for part-time than for full-time workers. Likewise, labour market insecurity is considerably higher for part-time than full-time workers. This reflects a combination of higher risk of unemployment and lower degree of effective insurance. The weak level of protection against the risk of unemployment for part-time workers represents an important policy concern. However, the risk of job strain tends to be lower among workers on part-time contracts. This appears to be entirely driven by lower job demands. Not surprisingly, part-time workers face less time pressure at work than their full-time counterparts, but more interestingly, they are also less exposed to physical health risk factors. (Annex Figure 3A.2.6).

Figure 3.15 **Job quality and job quantity outcomes by socio-demographic group**



Source: see section 2 of this Chapter.

64. In order to better understand the role played by contract type and working time, it is useful to run a simple regression analysis of the different quality dimensions so as to isolate the relationship between quality and contracts net of the potential confounding effects of other worker characteristics. The results are reported in Table 3.1 and they strongly support the conclusions so far. Temporary workers face substantially lower job-quality in all three dimensions, even upon controlling for worker characteristics (i.e. holding gender, age and education constant), while part-time workers have significantly lower earnings quality, face higher labour market risk but lower risk of job-strain. All the previous conclusions with respect to the role of different demographic characteristics are also confirmed by the regression analysis.

Table 3.1 Regression Analysis of Job Quality Measures

	Earnings Quality	Labour market insecurity	Job Strain
Male	1.710*** (11.33)	-0.000448 (-0.08)	-0.00408 (-0.61)
Intermediate skill level	2.261*** (16.12)	-0.0231* (-2.12)	-0.0502*** (-4.71)
High skill level	6.398*** (25.24)	-0.0383*** (-4.43)	-0.0922*** (-8.57)
Aged 15-29	-2.614*** (-16.70)	0.0312*** (3.60)	0.0113 (1.10)
Aged 50-64	0.891*** (4.77)	0.0387*** (3.24)	-0.00790 (-0.99)
Temporary work	-0.939*** (-6.14)	0.110*** (11.68)	0.0282* (2.53)
Part-time work	-1.191*** (-6.17)	0.0734*** (3.31)	-0.0232* (-2.39)
Country dummies	yes	yes	yes
Number of observations	2601	4002	1256

Note: T statistics in parentheses; * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: see section 2 of this Chapter.

Concluding remarks

65. The main contribution of this chapter is to propose a new conceptual and operational framework to measure and assess job quality across countries and socio-economic groups. Job quality refers to all those aspects of employment that contribute to the well-being of workers and, hence, represents an inherently multi-dimensional construct. The chapter identifies three key dimensions which are consistent with conceptual work on measuring well-being and have been shown to be particularly relevant for worker well-being in the existing empirical literature on economics, sociology and occupational health. These are: i) *earnings quality*, which consists of both the average level of earnings and its distribution across the workforce; ii) *labour market security*, which was defined for the present purposes in terms of the risk of unemployment and the degree of insurance against it; and iii) *the quality of the work environment*, which is defined in terms of the balance of job demands and job resources that is necessary for sustaining a healthy working life.

66. Each of the three dimensions of job quality identified here touches on important and long-standing policy debates. For example, overall earnings quality depends on the role of growth-promoting policies, the accessibility and quality of education, the nature of wage-setting institutions (e.g. minimum wages, collective bargaining) and the design of the tax and benefits systems. The overall degree of labour market security is determined by the interplay of employment protection, unemployment compensations systems (in the form of unemployment benefits and severance pay) and active labour market policies. By affecting workers' health, the quality of the work environment does not only impact the well-being of workers, but also has direct economic implications, in terms of both productivity for the employers and public health expenditure. It is determined to an important extent by the nature of regulations with respect to occupational health and safety and the effectiveness of occupational health systems to prevent work-related health problems, but also social dialogue and employers' social responsibility.

67. This chapter only makes a first contribution towards providing a comprehensive portrait of job quality across countries and socio-economic groups, but much work remains to be done in order to give job quality the place it deserves in the policy debate on labour market performance. In particular, further work

is needed to better understand how the various dimensions of job quality interact with each other, as well as with job quantity, to form overall labour market performance. Extending the country coverage of job quality measures is another key area for future work.

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ANNEX A3.1

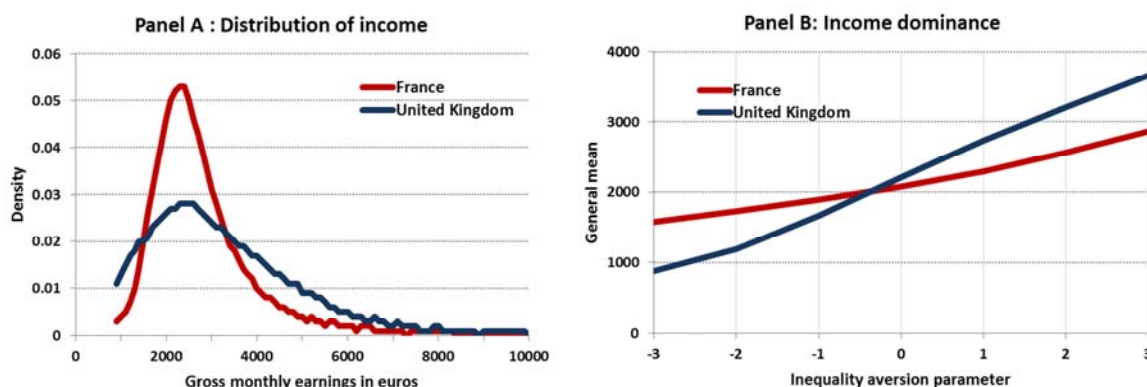
A SYNTHETIC MEASURE OF THE EARNINGS QUALITY

Box A3.1.1 Analysing earnings, inequality and welfare using general means

An example based on the comparison between France and the United Kingdom

A useful way to assess the robustness of dominance between a pair of distributions to the chosen level of inequality aversion is to represent the respective general means as functions of α . Distributions of different shape or scale might be evaluated very differently depending on the degree of inequality aversion. The Figure below shows the distribution of gross monthly earnings for France and the United Kingdom as well as the corresponding general means for different values of inequality aversion. The relatively low degree of dispersion and skewness of the French earnings distribution (left panel) is clearly reflected in the weaker slope of the corresponding general-means function (right panel). Moreover, the two general means functions cross each other between -1 and 0, implying that while the geometric mean of earnings is higher in the United Kingdom, the French outcome becomes preferable from a social welfare point of view even at moderate levels of inequality aversion (such as represented by the harmonic mean). *[This figure needs to be updated using hourly instead of monthly wages].*

The role of inequality aversion for general means: An example



Source: OECD calculations based on the Structure of Earnings Survey for 2006

ANNEX A3.2 DEFINING AND MEASURING JOB STRAIN

Table A3.2.1 Recent empirical studies on the health impact of job strain

	Sample size Country	Evaluation methods	Health outcomes	Job quality variables	Results
Backe et al. (2012)	Review of 26 longitudinal studies, based on 20 different cohorts (300-35,000 participants) Countries: BEL, DEU, DNK, FIN, FRA, GBR, JPN, SWE and USA.	Prospective cohort studies. Follow-up period varying from 3 to 25 years.	Cardiovascular disease: coronary heart disease, myocardial infarction, heart failure, angina pectoris, stroke and hypertension. Source: mortality registers, questionnaires, clinical diagnoses based on ECG or enzyme measurement.	Psychosocial risk factors , mainly based on the demand-control model (17 studies) or effort-reward imbalance model (4 studies).	Psychosocial risk factors increase the risk of cardiovascular disease in all studies. Results are statistically significant in 13 out of the 20 cohorts (7 out of 13 cohorts applying the demand-control model, all 3 cohorts using the effort-reward model).
Borritz et al. (2010)	1,734 participants employed within 82 work units in five different public organisations in the public human service sector Country: DNK	Work unit-aggregated scores of job quality variables	Sickness absence Source: national absence registers during the 18 th months following the baseline questionnaire.	Psychosocial work environment variables: emotional demands, role conflict, role clarity, predictability and quality of leadership (Copenhagen Psychosocial Questionnaire) Risk of burnout (Copenhagen burnout inventory) Personal, work-related and client-related burnout.	All job quality variables, as well as the burnout variable, as measured at work unit level, are significant predictors of long-term sickness absence (more than 2 weeks).
Chandola et al. (2005)	3,697 London based civil servants (from the Whitehall II study). Country: GBR	Prospective study, 6 phases, covering over a decade.	Coronary Heart Disease Source: self-reported doctor diagnosed angina or the Rose Angina Questionnaire	Effort at work (heavy work load, disturbances, interruptions, responsibility, pressure); Reward (esteem, job promotion prospects, job security); Over-commitment	Increase in ERI over time was associated with an increased risk of incident angina (which is the most frequent manifestation of CHD).
Eaker et al. (2004)	3,039 persons (1,711 men and 1,328 women) from the Framingham Heart Study. Country: USA	Prospective longitudinal cohort study.	Coronary heart disease. Source: clinic examinations	Job demand, Job Control (decision authority and skill utilization)	High job strain was not associated with mortality or incident CHD in either men or women over the follow-up period.
Hakanen and Shaufeli (2012)	Baseline: 3,255 participants (dentists); first follow up: 2,555 (3 years later); second follow up: 1,964 (7 years after baseline). Country: FIN	Longitudinal study covering a seven-year period. Structural Equation Modelling in order to test reverse and reciprocal causality.	Depressive symptoms and life satisfaction Source: self-reported.	Burnout assessed with two dimensions: emotional exhaustion and depersonalisation. Engagement (work-related well-being) assessed with three dimensions: Vigour, dedication and absorption.	Burnout and engagement predict depressive symptoms and life satisfaction over time.

	Sample size Country	Evaluation methods	Health outcomes	Job quality variables	Results
Hauke et al. (2011)	Review of 54 longitudinal studies published between 2000 and 2009. Countries: NLD (11); DNK (8); USA (6); GBR (5); FIN (4); CAN, FRA, NOR, BEL (2); CHE, DEU and GRC (1).	Meta-analysis	Musculoskeletal disorders in neck/shoulder, upper extremities (including arm, forearm, elbow, hand, and wrist) and low back. Source: mostly self-report questionnaires, others include company registers of sick absence, workers compensation insurers' database, medical bill, hospital registers and medical examination	Psychosocial work environment variables: social support, job demands, job control, decision authority, skill discretion, job satisfaction, job strain, and psychosocial distress.	Psychosocial risk factors are significant predictors of onset of MSDs, in particular the low back. Adverse psychosocial working conditions increase the risk of MSDs by 15 to 59%.
Kivimäki M. et al (2012)	197,473 participants from 13 independent cohort studies starting between 1985 and 2006. Countries: BEL, DNK, FIN, FRA, GBR, NLD and SWE.	Prospective cohort study. Mean follow-up period: 7.5 years. Job strain is measured only at the study baseline.	Coronary heart disease: first non-fatal myocardial infarction or coronary death. Source: national hospital admission and death registries	Job strain: quantitative work demands and time pressure and conflicting demands (job demand items); decision authority and learning opportunities at work (job control items).	Job strain increases the risk of coronary heart disease by 25% on average. Few differences in the effect of job strain on coronary heart disease between studies from Nordic countries, continental Europe, and the United Kingdom.
Kivimäki et al. (2002)	812 factory workers (545 men and 267 women) who were all free from cardiovascular diseases at baseline. Country: FIN	Prospective study. Baseline questionnaire and interview followed up by clinical examinations. Mean follow up period: 25,6 years.	Cardiovascular death, cholesterol, BMI, high blood pressure. Source: cardiovascular death obtained from the national mortality register.	Job demand (degree of responsibility, task difficulty, work load, pace, physical and mental load) Job control (task autonomy and skills discretion) Rewards at work (satisfaction with income, fairness of supervision, job security and promotion prospects)	Job strain and Effort-reward imbalance were each associated with a doubling of the risk of cardiovascular death. These working conditions also predicted adverse changes in biological factors. High job strain was associated with increased serum total cholesterol at the 5 year follow up. ERI predicted increased body mass index at the 10 year follow up.
Kolstad et al. (2010)	4,291 participants employed within 378 work units in several public organisations. Country: DNK	Work unit-aggregated scores of demands and decision latitude, excluding workers reporting depressive symptoms.	Depressive symptoms; diagnosis of depression Source: Self-reported (Common Mental Disorder Questionnaire and International Classification of Diseases)	Job strain: quantitative work demands and decision latitude – measured by possibilities for development and influence at work (Copenhagen Psychosocial Questionnaire)	At the individual level, high level of demands and low level of decision latitude are associated with significantly higher risk of depression (symptoms or diagnosis). Odds ratios are reduced by half (but remain significant) when demands and decision latitude are measured at the work unit level.
Kuper and Marmot (2003)	6,895 male and 3,413 female London based civil servants aged 35-55 in 20 civil service departments (sample from the Whitehall II study) Country: UK	Prospective cohort study. Follow up with a mean length of 11 years.	Cardiovascular heart Disease Source: death records of National Health Service Central Registry; self-report on chest-pain; recall of doctor's diagnosis and investigation; and treatment.	Psychosocial risk factors (various job demands, skill discretion, decision authority, social support at work).	High job demands, and, less consistently, low decision latitude, predicts CHD incidence.
Netterstrøm et al. (2008)	Review of 14 longitudinal studies Samples sizes: less than 1,000 (3); from 1,000 to 5,000 (8); more than 5,000 (3). Countries: CAN, DNK, FIN, FRA, JPN and NLD.	Meta-analysis Follow-up period: 1 to 8 years	Depression Source: psychiatric diagnoses, scales with diagnostic classifications, or antidepressant prescription (7 studies); questionnaire (7 studies).	Psychosocial work-related factors High demand, low control, lack of social support, effort/reward imbalance, or risk of violence.	High job demand increases the risk of future depression (relative risk of about 2). Social support at work lowers the risk of future depression (with relative risks of about 0.6)

	Sample size Country	Evaluation methods	Health outcomes	Job quality variables	Results
Schlottz et al (2004)	219 participants Country: DEU	Weekend-weekday differences	Biological stress reaction: level of cortisol (stress hormone) Source: by taking saliva samples few hours after awakening weekends and weekdays	Chronic quantitative work overload and worry (Trier inventory for the assessment of chronic stress)	Stress levels significantly higher over weekdays, as compared to weekends, due to chronic work overload and worry.
Shaufeli et al. (2009)	201 telecom managers. Country: NLD	Longitudinal study with 2 waves one year apart. Structural Equation Modelling	Burnout, work engagement and sickness absence (frequency and duration) Source: self-reported measures of burnout and engagement; company register data for sickness absence.	Job demand (overload, emotional demands, work-home interference) Job resource (social support, autonomy, opportunities to learn, performance feedback)	Increase in job demands and decrease in job resources predict increase in burnout. Increase in job resources predicts increase in engagement. High job demands are found to be related with sickness absence duration whereas low resources with sickness frequency
Slopen et al. (2012)	17,415 female health care professionals across 50 states. Country: USA	Prospective cohort study. Follow-up period: 10 years (1998-2008). Job strain is measured only at the study baseline.	Cardiovascular disease: non-fatal myocardial infarction, non-fatal ischemic stroke, revascularization procedure and CVD death. Source: self-reported for non-fatal CVDs (mail questionnaires, letters or telephone calls); medical records for fatal CVDs.	High strain and active jobs (Job Content Questionnaire) Job demand: pace, challenge and amount of work, time to complete work, and conflicting demands. Job control: decision authority and skill discretion	High strain jobs (high demand, low control) and active jobs (high demand, high control) increase the risk of CVD by 80% and 50%, respectively, as compared to low strain jobs (low demand, low control).
Stansfeld et al. (2012)	7732 civil servants. Country: GBR	Longitudinal studies Work characteristics and mental health status measured on 3 occasions over 10 years.	Major depressive disorders (MDD) Measured with the Composite International Diagnostic Interview.	Job strain (high demands associated with low decision latitude), Social support at work Work characteristics measured with an adapted version of the Job Content Questionnaire at phases 1, 2, and 3.	Repeated job strain was associated with increased risk of MDD (odds ratio=2.19, high job strain on 2 of 3 occasions vs. none). Repeated low work social support was associated with MDD (odds ratio=1.61, low work social support on 2 of 3 occasions vs. none). Repeated job strain remained associated with MDD after adjustment for earlier psychological distress.
Stansfeld and Candy (2006)	Review of 11 longitudinal studies Countries: CAN, BEL, FIN, FRA, GBR and NLD.	Meta-analysis Follow-up period: at least 1 year Samples sizes: from 2,000 to more than 10,000 persons	Common mental health disorders Measured with validated scales The study populations were free of common mental disorders at the start of the study.	Psychosocial work-related factors Low decision authority, low decision latitude, high demands, job strain (high demands associated with low decision latitude, low social, effort-reward imbalance and job insecurity)	Psychosocial work-related factors were found to increase the risk of common mental disorders: low decision authority (SOR=1.21), low decision latitude (SOR=1.23), high demands (SOR=1.39), job strain (SOR=1.82), low social support (SOR 1.32), effort-reward imbalance (SOR=1.84), job insecurity (SOR=1.33). (SOR: summary odds ratio)

Table A3.2.2 Definition of job demand and job resource variables

EWCS questions		EWCS coding	Final coding (scale 0-1)
Job demand variables			
1. Work pressure			
Long working hours	How many hours do you usually work per week in your main paid job? (Q18)	Number	1 if Q18>50; 0 otherwise.
Work overload	You have enough time to get the job done. (Q51G)	Scale 1–5 (always – never)	1 if Q51G>3; 0 otherwise.
Work-life imbalance	In general, do your working hours fit in well with your family or social commitments outside work? (Q41)	Scale 1–4 (very well – not at all well)	1 if Q41>2; 0 otherwise.
Time pressure	Does your job involve working at very high speed? (45A) Does your job involve working to tight deadlines? (Q45B)	Scale 1–7 (all of the time – never)	1 if Q45A<3 or Q45B<3; 0 otherwise.
2. Physical health risk factors			
Heavy loads	Does your job involve carrying or moving heavy loads? (Q24C)	Scale 1–7 (all of the time – never)	1 if Q24C<4; 0 otherwise.
Painful positions	Does your job involve tiring or painful positions? (Q24A)	Scale 1–7 (all of the time – never)	1 if Q24A<4; 0 otherwise.
Extreme temperatures	Are you exposed at work to low temperatures whether indoors or outdoors? (Q23D) Are you exposed at work to high temperatures which make you perspire even when not working? (Q23C)	Scale 1–7 (all of the time – never)	1 if Q23D<4 or Q23C<3; 0 otherwise.
High noise	Are you exposed at work to noise so loud that you would have to raise your voice to talk to people? (Q23B)	Scale 1–7 (all of the time – never)	1 if Q23B<4; 0 otherwise.
3. Workplace intimidation			
Bullying and harassment	And over the past 12 months, during the course of your work have you been subjected to bullying/harassment? (Q71B)	Yes/No	1 if Q71B=Yes; 0 otherwise.
Threats and humiliating behaviours	Over the last month, during the course of your work have you been subjected to threats and humiliating behaviour? (Q70C)	Yes/No	1 if Q70C=Yes; 0 otherwise.
Verbal abuse	Over the last month, during the course of your work have you been subjected to verbal abuse? (Q70A)	Yes/No	1 if Q70A=Yes; 0 otherwise.
4. Emotional demand			
Handling angry clients	Does your job involve handling angry clients? (Q24G)	Scale 1–7 (all of the time – never)	1 if Q24G<3; 0 otherwise.
Conflicts with personal values	Your job involves tasks that are in conflict with your personal values. (Q51L)	Scale 1–5 (always – never)	1 if Q51L<3; 0 otherwise.
Hiding personal feelings	Your job requires that you hide your feelings. (Q51P)	Scale 1–5 (always – never)	1 if Q51P<3; 0 otherwise.
Job resource variables			
1. Work autonomy and learning opportunities			
Order of tasks	Are you able to choose or change your order of tasks? (Q50A)	Yes/No	1 if Q50A=Yes; 0 otherwise.
Methods of work	Are you able to choose or change your methods of work? (Q50B)	Yes/No	1 if Q50B=Yes; 0 otherwise.
Speed or rate of work	Are you able to choose or change your speed or rate of work? (Q50C)	Yes/No	1 if Q50C=Yes; 0 otherwise.
Ideas	You are able to apply your own ideas in your work. (Q51I)	Scale 1–5 (always – never)	1 if Q51I<3; 0 otherwise.
Learning opportunities	Generally, does your main paid job involve learning new things? (Q49F)	Yes/No	1 if Q49F=Yes; 0 otherwise.
2. Task clarity			
Well defined work tasks	You know what is expected of you at work. (Q51K)	Scale 1–5 (always – never)	1 if Q51K<3; 0 otherwise.
Work organisation and planning	In general, your immediate manager/supervisor is good at planning and organising the work. (Q58D)	Yes/No	1 if Q58D=Yes; 0 otherwise.

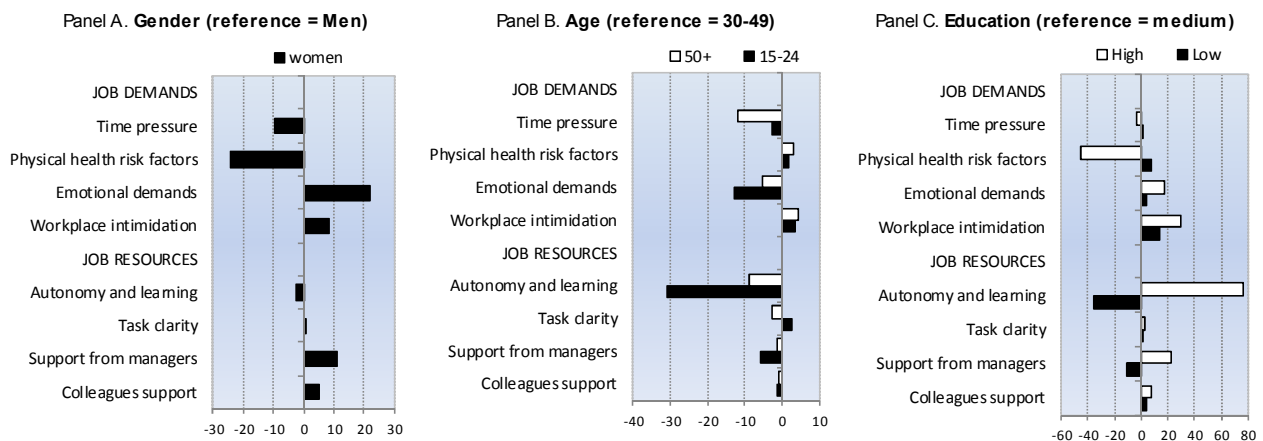
EWCS questions		EWCS coding	Final coding (scale 0-1)
Feedbacks	In general, your immediate manager/supervisor provides you with feedback on your work. (Q58A)	Yes/No	1 if Q58A=Yes; 0 otherwise.
3. Management practices			
Supportive manager	Your manager helps and supports you. (Q51B)	Scale 1–5 (always – never)	1 if Q51B<3; 0 otherwise.
Feel respected as a person	In general, your immediate manager/supervisor respects you as a person. (Q58B)	Yes/No	1 if Q58B=Yes; 0 otherwise.
Manager good at resolving conflicts	In general, your immediate manager/supervisor is good at resolving conflicts. (Q58C)	Yes/No	1 if Q58C=Yes; 0 otherwise.
Participative decision making process	In general, your immediate manager/supervisor encourages you to participate in important decisions. (Q58E)	Yes/No	1 if Q58E=Yes; 0 otherwise.
4. Colleagues support			
Supportive colleagues	Your colleagues help and support you. (Q51A)	Scale 1–5 (always – never)	1 if Q51A<3; 0 otherwise.
Good work atmosphere	I feel “at home” in this organisation. (Q77D)	Scale 1–5 (strongly agree – strongly disagree)	1 if Q77D>3; 0 otherwise.
Friendly work relationships	I have very good friends at work. (Q77E)	Scale 1–5 (strongly agree – strongly disagree)	1 if Q77E>3; 0 otherwise.

Table A3.2.3 Definition of job demand and job resource variables – EWCS and ISSP (2005)

EWCS 2005 question and coding		ISSP 2005 question and coding	
Job demand variables			
1. Work pressure			
Long working hours	How many hours do you usually work per week in your main paid job? (Q8A) Number; 1 if q8a>50; 0 otherwise.	Long working hours	How many hours, on average, do you usually work for pay in a normal week? (WRKHRS) Number; 1 if WRKHRS >52; 0 otherwise.
work-life imbalance	In general, do your working hours fit in well with your family or social commitments outside work? (Q18) Scale 1–4 (very well – not at all well): 1 if q18>2; 0 otherwise.	Work-life imbalance	How often do you feel that the demands of your job interfere with your family life? (V44) Scale 1–5 (always – never): 1 if V44<3; 0 otherwise.
2. Physical health risk factors			
Extreme temperatures	Are you exposed at work to: low temperatures whether indoors or outdoors? (Q10D) high temperatures which make you perspire even when not working? (Q10C) Scale 1–7 (all of the time – never): 1 if Q Q10D <4 or Q10D <4; 0 otherwise	Dangerous working conditions	Do you work in dangerous conditions? (V40) Scale 1–5 (always – never): 1 if V40<3; 0 otherwise.
High noise	Are you exposed at work to noise so loud that you would have to raise your voice to talk to people? (Q10A) Scale 1–7 (all of the time – never) 1 if Q10A <4; 0 otherwise.	Hard physical work	Do you have to do hard physical work? (V38) Scale 1–5 (always – never): 1 if V38<3; 0 otherwise.
Job resource variables			
1. Work autonomy and learning opportunities			
Order of tasks	Are you able to choose or change your order of tasks? (Q24A) Yes/No 1 if Q24A =Yes; 0 otherwise.	Daily work arrangements	Which of the following statements best describes how your daily work is organized? (V42) (1) I am free to decide how my daily work is organised (2) I can decide how my daily work is organised, within certain limits (3) I am not free to decide how my daily work is organised. 1 if V42 = 1 or 2; 0 otherwise.
Methods of work	Are you able to choose or change your methods of work? (Q24B) Yes/No: 1 if Q24B =Yes; 0 otherwise.		
Ideas	You are able to apply your own ideas in your work. (Q25J) Scale 1–5 (always – never): 1 if Q25J<3; 0 otherwise.	Independent work	I can work independently (V33) Scale 1–5 (strongly agree – strongly disagree): 1 if V33<3; 0 otherwise.
Learning	Generally, does your main paid job involve learning new	Learning	My job gives me a chance to improve my skills (V36)

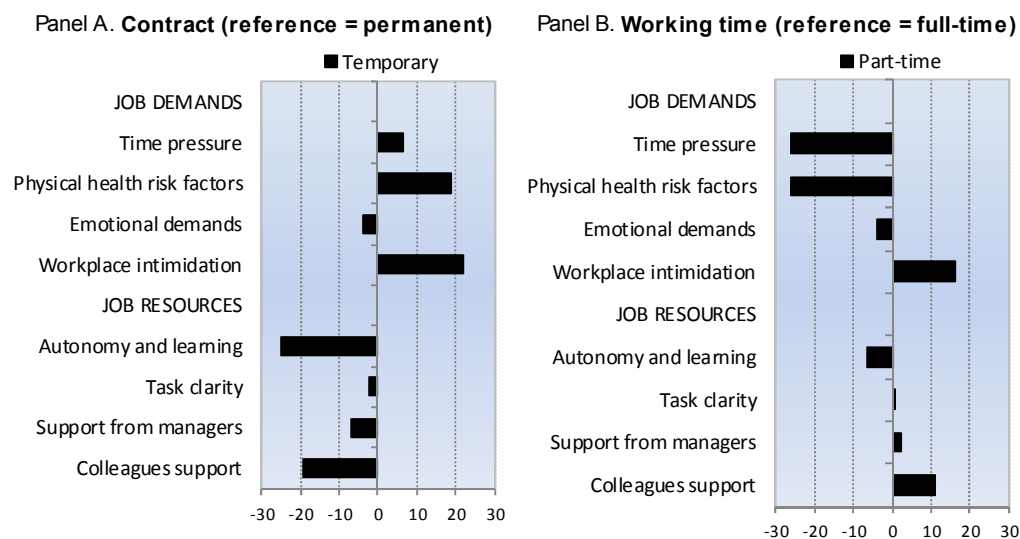
opportunities	things? (Q23F) Yes/No: 1 if Q23F =Yes; 0 otherwise.	opportunities	(strongly agree – strongly disagree): 1 if V36<3; 0 otherwise.
2. Management practices			
Supportive manager	You can get assistance from your superiors / boss if you ask for it. (Q25B) Scale 1–5 (always/never): 1 if Q25B<3; 0 otherwise.	Relation with manager	In general, how would you describe relations at your workplace between management and employees? (V49) Scale 1–5 (very good – very bad): 1 if V49<3; 0 otherwise.
3. Colleagues support			
Good work atmosphere	I feel “at home” in this organisation. (Q37D) Scale 1–5 (strongly agree/ strongly disagree): 1 if Q37D>3; 0 otherwise.	Supportive colleagues	In general, how would you describe relations at your workplace between workmates/colleagues? (V50) Scale 1–5 (very good – very bad): 1 if V49<3; 0 otherwise.
Friendly work relationships	I have very good friends at work. (Q37f) Scale 1–5 (strongly agree/strongly disagree): 1 if Q37F >3; 0 otherwise.		

Figure A3.2.1 Incidence of various job demands and job resources by socio-demographic group Figure 3A.2.5
Incidence of various job demands and job resources by socio-demographic group



Source: Section 2 of this Chapter.

Figure A3.2.2 Incidence of various job demands and job resources by type of employment
% difference as compared to a reference group



Source: see section 2.3 of this Chapter.